

Smallholders and forest landscape transitions: locally devised development strategies of the tropical Americas

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SUMMARY

The paper introduces the Special Issue of International Forestry Review, *Smallholders and forest landscape transitions: Locally devised development strategies of the tropical Americas*. It reviews the existing knowledge on the role of smallholders in rural development, and then contrasts this with the major insights gained from the studies presented in this Special Issue. The paper shows that while there is opportunity to more actively engage smallholders in local development and environmental protection of tropical America, this requires major changes in policy design and implementation. Within the prevailing policy frameworks only a smaller proportion of smallholder families can become economically successful, providing they receive the right support. If policy frameworks are better adapted to the needs and capacities of smallholders, their role in regional sustainable development can be significantly boosted. Whether such a shift of the policy framework is likely in a world where relevant policy mechanisms are dominated by decision makers representing the interests of the societies in urban and developed contexts is an open question. The fact that also these societies will be increasingly faced with the severe effects of climate change, poverty migration, financial crises and food insecurity give grounds for a cautious optimism that more integrative approaches to rural development will be pursued that put smallholders of tropical America and elsewhere, and nature at the centre.

Keywords: Amazon, Central America, rural development policy, small-scale land uses, forested landscapes

Petits exploitants et transitions de paysage forestier: stratégies de développement des Amériques tropicales formées localement

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Ce papier introduit l'édition spéciale du rapport de la Foresterie internationale *Petits exploitants et transitions de paysage forestier: stratégies de développement des amériques tropicales formées localement*. Il examine tout d'abord la connaissance existante du rôle des petits exploitants dans le développement rural, et place en contraste les points de vue majeurs des papiers de cette édition spéciale avec cette connaissance. Le papier montre que bien qu'il existe une opportunité d'engagement des petits exploitants dans le développement local et dans la protection environnementale de l'Amérique des tropiques, des changements majeurs sont nécessaires dans la formation et la mise en exécution des politiques. Seule une faible proportion des familles de petits exploitants peuvent espérer devenir des acteurs économiques viables dans les principaux cadres de politiques actuels, et ce, si elles reçoivent un soutien. Si les cadres de politiques sont mieux adaptés aux besoins et aux capacités des petits exploitants, leur rôle dans le développement régional durable peut être considérablement magnifié. Une question ouverte demeure: un changement dans le cadre politique est-il probable dans un monde où les mécanismes politiques appropriés sont dominés par des preneurs de décision représentant les intérêts des sociétés des contextes urbains et développés? A la lueur des menaces énormes, incluant le changement climatique, la migration de la pauvreté, les crises financières et l'insécurité alimentaire, de fortes raisons existent de poursuivre des approches plus intégrantes de développement rural plaçant les petits exploitants, de l'Amérique tropicale et d'ailleurs, et la nature au centre.

Los pequeños productores y la transición de los paisajes forestales: estrategias de desarrollo locales las Américas tropicales

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El artículo introduce un Volumen Especial del *International Forestry Review*, Los pequeños productores y la transición de los paisajes forestales: Estrategias de desarrollo locales las Américas tropicales. El artículo revisa el conocimiento existente sobre el papel de los pequeños productores en el desarrollo rural, y contrasta esto con las conclusiones de los artículos del Volumen Especial. El artículo muestra que, si bien existe la oportunidad de que los pequeños productores participen en el desarrollo local y la protección del medio ambiente de América tropical, esto requiere cambios importantes en el diseño y aplicación de políticas relacionadas. Dentro de los marcos políticos imperantes sólo una pequeña

proporción de familias de pequeños productores logran éxitos económicos, y solo cuando reciban el apoyo adecuado. Si los marcos de la política de desarrollo rural se adaptan mejor a las necesidades y capacidades de los pequeños productores, el papel de ellos en el desarrollo sostenible de la región podrá aumentar de manera significativa. Si un cambio de las políticas de este tipo es probable en un mundo donde los mecanismos de política pertinentes están dominados por los tomadores de decisiones que representen los intereses de las sociedades en contextos urbanos y desarrollados, es una pregunta abierta. El hecho que también estas sociedades confrontaran fuertemente las amenazas enormes del cambio climático, la migración de la pobreza, las crisis financieras y la inseguridad alimenticia, dan razón por un optimismo cuidadoso de que en el futuro se aplicara enfoques más integradores para el desarrollo rural que pondrán los pequeños productores de las Américas tropicales y de otros lugares, y la naturaleza en el centro.

INTRODUCTION

An important proportion of rural dwellers in the tropical Americas live in or near forests. Many of those rely for an important part of their livelihoods on the goods and services provided by forests. Hundreds of ethnic indigenous groups living in the tropical forest biome use forest and nature for agriculture, clothing and traditional medicines (Denevan 2003). Multiple other rural residents with mixed local or extra-local origins have likewise adapted their lifestyle to the forest habitat or cultivated their lands as farmers in accordance to their cultural origins and ever changing socio-economic circumstances. Since the 16th century, colonial occupation of the Americas brought with it workers and entrepreneurs from Europe and Africa and later from North America and Asia to exploit neotropical forest products such as quinine, vanilla, sarsaparilla, rubber, Brazil nut and guaraná. After independence, most national governments incentivized large-scale agriculture and cattle ranching, and started programs to colonize the remoter forest regions (Aramburú *et al.* 1982, Bunker 1983, Hecht and Cockburn 1989, Kohlhepp 1991, Limachi *et al.* 2006, Nelson 1977). In modern times, corporate ranching, mechanized agriculture, immigration of smallholder colonists from outside forest regions brought new modes of natural resource production that drastically changed the land use dynamics in the region. The immigrants diligently adapted livelihoods and land use to the new environment (Moran 1993, Pacheco 2006, Smith *et al.* 1999).

Resource exploitation and landscape transformation at the agricultural frontier continue with technical innovations and improving roads favouring large, medium and small cattle producers (Kaimowitz *et al.* 2004, Walker *et al.* 2009). In parallel, the logging industry has been pushing forward to keep ahead of the agricultural frontier, but at the same time facilitating its expansion (Scholz 2001). Soy bean fields, oil palm and fast growing timber plantations have expanded significantly in the region (Nepstad *et al.* 2006, Jonasse 2009). In a latest twist, tropical America, like the tropical regions of Africa and Asia, has become the target of land grabbing for overseas food and biofuel production (Borras *et al.* 2012, Cotula 2012, Fairhead *et al.* 2012). Governments in the region continue to invest heavily in vast infrastructure and energy networks (Orta-Martinez and Finer 2010) and the construction of hydropower dams (Fearnside 2006).

The dynamic in regional natural resource use presents new challenges but also offers new opportunities for the families

living in the hinterlands. The booms seriously affect the livelihoods of many poor rural families, undermine cultural heritage, and reduce local abilities to adapt to changes (Pokorny *et al.* 2012). The ambivalent environmental and social consequences of prevalent development strategies have been much debated since the 1992 UN Sustainable Development Conference (UNCED 1992), a discussion that entered new dimensions after the evidenced negative consequences of such development models on greenhouse gases emission (IPCC 2007).

An important body of academic inquiry on the economic and social transformation in the forest landscapes of the rural tropics has contributed much evidence that local land users have developed sophisticated adaptations to local environmental and socio-economic conditions and emerging challenges. There is a social, economic and environmental mobility outside of national or multi-nationally devised development programs that is driven by local actors without significant external support of capital, technologies and scientific knowledge. Such locally devised adaptations and responses have proven their potential to trigger equitable economic growth and simultaneous positive environmental outcomes, like biodiversity conservation, provision of environmental services, including safeguarding and enhancing carbon stocks, and contributions to regional food chains (Godar *et al.* 2012, Pacheco *et al.* 2011, Pokorny *et al.* 2013, de Jong *et al.* 2010). This suggests that local natural resource management capacities and cultures can provide important alternative options for the region's rural development that avoids social and economic marginalisation and negative environmental outcomes.

At the same time, national governments and their development agencies widely disregard the potential of local dwellers to meaningfully contribute to the development of forest landscapes (e.g. Pokorny *et al.* 2013, de Jong *et al.* 2010). Rather, they assign them the role of executors or passive participants of proposed production and conservation models that favour large investments and target global markets, or design social support programs to soften the social implications of global markets driven agricultural expansion.

Against this backdrop, this Special Issue of the International Forestry Review brings together a number of papers that critically reflect on local land users as drivers of a rural development that avoid or at least reduce negative outcomes of policies that follow mainstream tropical rural development thinking. The papers each explore cases of adaptation and responses to new challenges among smallholder communities

in tropical Central and South America's forest landscapes, and provide insights in the processes of local socio-economic transformation and their economic, social and environmental outcomes.

This paper compiles available knowledge on the role of smallholders in rural development, and contrasts the major insights of the papers in this Special Issue with this knowledge. Through this analysis we aim to move forward the understanding of how adaptations and strategies of local resource managers may become the starting point for generating social and economic improvements without excessively taxing environmental and cultural wealth and heritage. For this purpose, the two sections following this introduction establish the conceptual basis for analysis. The first of the two defines the term 'smallholder' in comparison with other actor-groups active in the region, and the second of the two explores the concept of 'rural development' to establish a set of key standards with which rural development outcomes should comply. Following, the paper summarizes the available knowledge about the contribution of smallholders with regard to these standards. This again is followed by a summary of the contribution of the papers of this Special Issue to this debate. The final section discusses the implications of the new insights of the papers for the understanding of how locally devised natural resource management practices and related social and cultural assets can provide alternatives to achieve economic and social improvement under environmental and cultural sustainability scenarios.

The paper will show that smallholders can contribute to local development goals and environmental protection of tropical America. However, under the prevailing globalization policy frameworks, smallholders seldom are able to successfully compete with other actors to pursue pathways that yield better social, economic, environmental and cultural outcomes. This requires major changes in policy design and implementation, which in turn needs willingness among regional, national and global decision makers and their advisory support groups to accept a local perspective on the issue of rural development. The massive global challenges such as climate change, food security and migration indicate the urgent need for re-thinking of rural development paradigms.

SMALLHOLDERS IN TROPICAL AMERICA

In all the Latin-American countries urbanization rates have increased from around 50% in the 1970s until near 80% in 2015 (UN-HABITAT 2013). Despite this dominant demographic trend, millions of families still live in rural areas and their absolute number even continues to grow. Ortega (1986) estimated that during the 1980s almost two-third of Latin America's rural population of 75 million were small farmers. They held about 16 million properties that together occupied an area of more than 60 million hectares; equivalent to a third of total arable land. Alone in Brazil more than 11 million people were linked to 4.3 million family farms (FAO and INCRA 2000). The region's universe of people constitutes a diverse mix of groups many of which can be attributed a

unique identity, but who at the same time share similar features. Importantly, many of these groups have progressively managed to organize themselves and acquired a social, cultural, economic and political presence. Some of their organizations significantly influence political life and some of their members even have become presidents. Since the 1990s families and communities have obtained legal tenure over huge tracks of land (Sunderlin *et al.* 2008, Silva *et al.* 2002).

Who are smallholders?

The total population of Latin America is slightly above 600 million, which, with a 70% of the people living in urban environments, leaves a population of 180 million of rural residents. In addition to the original ethnic indigenous groups that reside often in the more remote corners of various countries, centuries of immigration – continuing until today – have resulted in an amalgam of people with different geographic origins and ethnic, cultural and socio-economic characteristics. Any attempt to characterize the smallholders of tropical America will not do justice to this tremendous diversity. Nevertheless, in this section we attempt to signal common characteristics of some of the major rural groups of the region.

The diversity among smallholders in tropical America is reflected in multiple attempts to identify rural residents of the region. Already in 1965 Wolf defined *peasants* as rural cultivators who operate largely as independent production and consumption units with family labour and small plots. The term *peasant* was much used in academic discussion, sometimes referred to as the *peasant literature*. The concept was central in discussion of small farmers in tropical Americas, especially of Central America and Mexico (e.g. Bartlett 1980), but also used as a generic term to identify non-ethnic indigenous farmers in Amazonia. Related to the Amazon region, scholars defined other local groups with similar identities, such as the ribereños of Peru (Chibnik 1991) who are similar to the ribeirinhos or caboclos of Brazil (Adams *et al.* 2010). These groups descent from immigrants from Europe, the US, but also other Latin American countries, who followed new waves of resource exploitation into the region, and mixed with indigenous residents. In more general terms, these traditional communities or traditional peoples (Barretto Filho 2006) distinguish Amazonian smallholders from ethnic indigenous groups on the one side and colonists who are more recent arrivals who came to the Amazon since the second half of the 20th century on the other. A recent term to characterize forest dwelling residents of the tropical Americas is forest dwelling societies, or *bosquesinos* (Gasché and Vela 2012). Gasché and Vela argue that different rural residents of the tropical Americas share similar material cultures, as well economic ethics and values. *Bosquesinos* thus may include ethnic indigenous groups, ribereños, caboclos or traditional communities.

Mostly distinguished from ethnic indigenous and traditional dwellers are tropical American colonists. Colonists are more recent arrivals into forest zones who settled spontaneously, or who followed government sponsored programs and

projects of the second half of the 20th century, intended to expand the agricultural frontier into remote forest regions. In the Amazon, they include Andean migrants from Peru, Ecuador, Bolivia and Colombia and poor farmers from the Brazilian Northeast, but also the recent migrants that arrived at the forest frontiers in Central America. Even though colonist smallholders are the more recent arrivals to the tropical American forest regions, there are many examples of how they adapted and adopted forest and agricultural practices not distinguishable from those of the long-term residents.

While the above suggests a distinction between three idealized groups of smallholders – ethnic indigenous groups, the multiple long-term residents of mixed descendancy, and colonists – in practice, the three groups oftentimes overlap. Furthermore, in the continuously changing contexts of advancing agricultural frontiers, many new forms of smallholders have emerged, because they adopted highly intensified production systems (Costa 2010), adapted their livelihood activities towards particular commodity markets (Soler *et al.* 2014), or developed new economic strategies linking into rapidly growing peri-urban areas (Padoch *et al.* 2008). Studies on agrarian contexts also point to a significant number of sharecroppers who have houses and families on the owner's property and work the land for a portion of the revenue, respectively lease land in exchange for part of their production to be paid to the owner (Adams *et al.* 2010).

Within the above outlined smallholder categories, groups can be placed in a virtual multidimensional space along continuums that include aspects such as integration into a market economy, ratio of market oriented versus household production, integration into a cultural social collective, and holding size and the property status, as well as availability and relative distribution of the productive factors land, labour, finances and technology. This variability is linked to the specific environmental and institutional conditions that smallholders face in a given context, like conditions of forests and other natural resources, fertility of soil, water availability, access to public infrastructure including roads, energy, health, education and markets, as well as social organisation. These conditions significantly vary throughout the region. Thus, smallholders can reside in or somewhere between remote, poorly connected regions or highly cultivated landscapes with good infrastructure and access to government services. Remote regions are still widely covered with intact natural forests and show low population densities; in many of these reside ethnic-indigenous and traditional groups (Barbier 2012). The locations that are more integrated into mainstream economies host degraded or second-growth forests, which are part of a diverse mosaic of different land-uses, often with rapidly growing urban and peri-urban areas. These contexts are typically dominated by a diverse mix of colonist-smallholders with different cultural backgrounds and economic situations, as well as commercial farmers and companies occupying large areas (Godar *et al.* 2014). While, particularly in large parts of the Amazon region, remote forest and savannah landscapes still prevail, more than a quarter of them are under legal protection schemes (Nelson and Chomitz 2011). The proportion of cultivated landscapes is continuously increasing

as a result of infrastructural development driven not only by national policies and markets but also by global market dynamics associated with an increased role for transnational traders and investors (Pacheco *et al.* 2011).

Characterising smallholders

Smallholders of the tropical Americas follow a wide range of land use strategies and models of social organization that are further diversified within the specific conditions found in the different agrarian contexts, and in accordance to individual experiences and specializations. Commonly, families operate as independent units, even among ethnic-indigenous smallholders, and thus pursue their own livelihood strategy with a complex combination of different production activities that reflect household endowment, capacities and preferences. Despite their diversity, they share a number of common characteristics. The principal distinguishing criterion of smallholders is that they cultivate small areas, in comparison to non-smallholders. There is, however, great divergence of what is considered a small holding. Berdegú and Fuentealba (2011), for example, suggest a typical size of a smallholder farm of around two ha, while within the Amazonian context, commentators consider 100 ha or more to be the limit between small and medium producers (Margulis 2003, Pacheco 2005, Siegmund-Schultze *et al.* 2007, Godar *et al.* 2012). Ethnic indigenous groups, and also traditional farmer communities, have in recent years acquired rights over much larger areas. But within these territories, families still tend to exploit intensively only small plots that seldom exceed one ha a year (Siren 2007) while wider forest areas are used for forest product collection.

Smallholders of tropical America engage in productive activities that can be grouped in four categories: (1) The livelihood basis for the vast majority of smallholders still is agroforestry production, which combines swidden production in combination with swidden fallow management, silvopastoral animal production, forest gardening or more specialized tree production; (2) many smallholders combine this with specialized market oriented agricultural production that relies on improved planting stock, fertilization and tilling, and which requires some financial investment; (3) those who practice agroforestry production may also engage in commercialized forest products harvesting from entirely wild stands, but also from stands that are being managed or have been reproduced; (4) finally, for many families the exploitation of water bodies, either rivers or lakes, plays a key role. Relying on these four activities, tropical American smallholders employ a range from extensive to intensive production strategies (Scoones 1998, Swift 1998). Natural resource production through any of these activities may be combined with processing and refinement of the products before they are being traded or consumed. Smallholders may exclusively rely on farm income, but increasingly have significant off-farm income from urban employment or even remittances from abroad (Reardon 2001), or they may also benefit from non-contributory pensions (Dethier *et al.* 2010).

Another feature commonly cited is that smallholders suffer from a lack of substantial financial resources and

limited access to agricultural technologies (D'Antona *et al.* 2006). Generally, their endowments do not include financial reserves and their access to bank loans is rather limited. For many smallholder families, land and labour are the only productive resources they have available (Banerjee and Duflo 2007). Typically available cash is invested in immediate consumption, or when funds are needed, like for instance for education or health care expenses, specific action is taken to obtain those.

Grounded in a history of oppression and exploitation, and unfair power relationships perpetuating to our days, smallholders, in comparison to more resource endowed actor groups with more political influence, are more vulnerable to risks such as fire, floods, droughts, but also the death of children or the drastic fall of commodity prices. This is exacerbated by lack of recognized or poorly protected land tenure (Larson *et al.* 2008), or a lacking capacity to seek justice when rights are not respected or violated. Many smallholders furthermore reside in environmentally fragile landscapes, not the least due to improper settlement schemes or because they have been pushed out of the more fertile lands by agroindustrial colonization, which partly explains the correlation between rural poverty and poor quality lands (Barbier 2012). As a result, smallholders typically do not have adequate buffers to weather economic, social or environmental setbacks. This vulnerability is one of the reasons that smallholders' production system primarily rely on family labour, which often includes contribution of children (Berdegué and Fuentealba 2011). Seasonal peaks in labour demand are overcome by contracting temporary workers or through work parties (*mingas* or *multirão*; e.g. Chibnik and de Jong 1989).

For most smallholder families, risk avoidance and securing livelihood sustenance are at the centre of their decisions, and not the maximization of profits prioritized by other commercial actors (Perz 2005). Thus, smallholders show a preference for low-input, low-risk entrepreneurship. They avoid or cannot afford costly inputs such as machines, fertilizers, pesticides and seeds and often produce the majority if not all of their own food consumption by themselves. Despite an increasing importance of non-farm income, among the majority of smallholders, food production is still the most important activity (IFAD 2013). Many ethnic indigenous and traditional families produce agricultural crops in swiddens for household consumption, complemented by forest and water products (Angelsen and Wunder 2003, Neumann and Hirsch 2000, Belcher and Schreckenberg 2007). Access production may be sold, or when need for cash arises, activities are temporarily designated for such purpose. Even the increasing number of small farmers that designate a larger part of economic activities to market-oriented production tend to maintain part of their agricultural production to meet family food needs (Fan *et al.* 2013). Smallholders will also have a relationship with their land that goes beyond its market value as a production factor. Even colonist families develop tight emotional linkages to their land (Quinn and Halfacre 2014). Smallholders also tend to know very well their land and resources and hold profound practical experiences and knowledge of the land, crops and natural resources within their realm (IAASTD

2009). Whilst this is the case, however, this traditional knowledge is poorly valued by smallholders themselves (Gasché and Vela 2010). Smallholders, instead, tend to place unconditional faith in outside experts who represent the dominant national society (Pokorny 2013). In addition, there is a clear lack of capacity and knowledge among many smallholders resulting from insufficient access to schooling. Smallholders have little scientific knowledge of ecology, and the long-term effects of the improper use of resources (IAASTD 2009). They may also lack knowledge and skills in processing, logistics, and commercialization (IFAD 2013, Pfitzer *et al.* 2009).

A lack of technical knowledge and capacities, however, may be compensated for by solidarity and reciprocity among many smallholders, which then serve as a basis for setting up effective systems of local governance (Ostrom 2000). These principles of trust remain important also when smallholders integrate progressively with a peri-urban or urban setting (Berdegué and Proctor 2014). The social relations based on reciprocity also play an important part in the exchange of information, although the level of communication regarding essential aspects of daily life and production might be low (Selener 1997). Related to this, the ability of smallholders to create formal organizations that are able to communicate with outside actors or effectively integrate in policy processes also remains limited. Paternalistic structures, but also large distances make the exchange of information with external actors rare. This social isolation is improving slowly as a result of better education and the expansion of the electricity and communication infrastructure, and related use of satellite dishes and radio and television (Martín-Barbero 2006, Steinbrenner 2011). In many locations, NGOs and church organizations promote the integration of the smallholders in wider society (Cleary *et al.* 2003). Grassroots organization representing local people, however, are still confronted with huge challenges due to limited national visibility and influence in comparison with, for instance, labour organizations (Medina *et al.* 2009).

With all the challenges they face, however, smallholders possess great flexibility and openness to change. Rural families eagerly seize opportunities to improve their situation when they occur. For instance, in case of accessible attractive markets, they specialize and intensify their production (Fan *et al.* 2013), and when NGOs arrive with proposals, the vast majority of families are open and interested to collaborate (Medina *et al.* 2009). The most common strategy to improve well-being and secure social mobility, however, remains rural-urban migration (Wunder 2001). Hecht (2011) even suggests that migration has become an intrinsic part of the livelihood strategy of a vast proportion of the rural poor.

SMALLHOLDERS AND RURAL DEVELOPMENT

Defining rural development

Rostow (1990) understood rural development as a transition from a largely agrarian society to a consumer society

dominated by industrial production and service sectors. Development in these terms aims to improve economic well-being, including for people living in isolated and sparsely populated rural areas (Moseley 2003). Improvement of well-being is measured through standards of living (FAO 2007). Until the early 1970's, rural development essentially aimed at this kind of transformation from rural economies towards more industrialized economies through the expansion of industrial and service sectors (Anríquez and Stamoulis 2007). National governments promoted and supported the exploitation of minerals, oil, gas or intensive natural resources production, including agriculture and forestry (López and Galinato 2007). Rural development was often used as a synonym for agricultural development.

The realization of modernization of agriculture and industrialization, however, requires enormous investments that exceeded the capacities of most countries. Even in the few successful examples of rural industrialization, access to social services and amenities seldom yielded improvements for the local population (Ruttan 1984). The single focus on economic growth subsequently was replaced by the pursuit of the broader goals of human development (UNDP 1990) and the provision of social services in rural areas (FAO 2007). In the late 1980s endogenous growth goals emerged that put emphasis on locally produced economic development (Aghion and Howitt 1998), which could be achieved through investments in both human and physical capital. In line with this, the 1992 UNCED expanded rural development objectives as part of sustainable development goals, and with it the adoption of social, economic and environmental standards. The sustainable development paradigm also implied that rural families were perceived as integral members of the larger national and global society, and a new understanding of rural as one end of a rural and urban continuum (de Janvry and Sadoulet 2007). Since then, rural development projects and programs started to highlight the nexus between issues such as well-being, environment, governance, production, institutions and infrastructure. Despite the emergence of new economic options such as tourism, niche manufacturers, and recreation (Ward and Brown 2009), in the development practice, still extraction and agriculture are the dominant economic drivers.

Priority areas of action

The changed understanding of what constitutes rural development has also resulted in a shift of indicators for its assessment. Nowadays, not only international organizations like the World Bank, Organization for Economic Cooperation and Development, the Food and Agriculture Organization, but also national governments and civil society organizations consider a wide range of social, economic, institutional, cultural, natural, and technological dimensions when assessing progress, particularly including interests in the global commons and regulating the impacts of their exploitation (Hass *et al.* 2002, UNECE 2007, World Bank 2014, SDSN 2014). From these conceptualizations four essential ingredients can be derived that mainstream existing international and national

efforts for rural development: (1) economic growth still considered as the key driver of development and being of utmost importance to generate the finance needed for investments in public infrastructure and services to overcome poverty and improve well-being (World Bank 2014); (2) the provision of employment opportunities seen as an essential requirement for broad societal participation in the benefits of economic development (UN 2007); (3) the production of food in sufficient quantity and quality to eradicate hunger and to feed a world population that will grow by 50 percent and reach 9 billion by 2050 (FAO, IFAD and WFP 2014); and (4) the protection of the remaining tropical forests and their unique biological and genetic biodiversity presenting an important repository of potential new uses and guaranteeing the continuous provision of a wide range of goods and services such as the protection of soil, water and climate, pollination of agricultural crops, and the delivery of products and income for forest-dependent people (MEA 2005).

Although all the four rural development goals have relevance at global, national and local level, controversy exists about whether what is good for a global or national constituency is also desirable for local residents. Considering the interests of actor groups at these three levels, there might be discrepancies in the interpretation and prioritization (Table 1).

Naturally, from the perspective of smallholders, rural development should primarily serve their interests in improved well-being, stability and attractive future perspectives. Thus, while rural regions might be of limited relevance for economic development and employment at a national scale, for smallholders, these are essential for improving their situation. Similarly, food production for many smallholders is primarily seen under the perspective of food security, while from a more global perspective food is understood as a commodity. Contrary to this, some global actors in particular are highlighting the importance of forest conservation, while for many smallholders forests don't present an attractive land-use option.

The consideration of smallholders in rural policies

Rural dynamics are strongly influenced by actors from outside the forest regions, be it economic actors interested in land and resources, national governments located in the urban centres, or international processes and agreements dominated by industrialized countries. Accordingly, rural development policies tend to reflect the priorities and interpretations of these actor groups. To discuss the contribution of smallholders to rural development requires an understanding of these policies because they define the institutional frame in which the local families act. The policies that national governments design to address smallholders needs fall into four categories: (1) control-and-command, (2) economic integration, (3) political recognition and (4) social support.

The control-and-command approach primarily aims to create regulatory frameworks and institutional capacities to effectively enforce them to ensure that local people act in

TABLE 1 *Spatially related perspectives on common rural development goals*

Goal	Perspective		
	Global	National	Local
Economic growth	Low interest in rural regions because growth relevant impetus comes from the second and, most importantly, the third sector.	Primarily for delivery of raw materials and energy to subsidize further developed regions, mostly located in non-forest areas.	No priority, although interest in public investments.
Employment	No significant employment effect. In contrast, interest in mechanized low-labour technologies.	No significant employment effect at a national level, but relocation of labour force to urban settings.	High as a preferred opportunity for income generation.
Food production	Significantly increasing interest in assuring future food production.	Priority of promoting for export rather than for national markets.	Interested in the production for own consumption (subsistence), local markets, and non-local niche markets.
Protection of natural forests	Latent interest since the 1990s which strongly increased in response to climate change concerns.	Not of first priority but has become more important in response to international stimulations.	Interested, but on non-agricultural and non-individually owned land respectively and on collectively owned forests.

accordance to laws. This category of policies primarily sees the need to better control smallholders to avoid adverse effects like deforestation and forest degradation, as well as non-payment of taxes (Pokorny and Johnson 2008). Governments largely favour the promotion of sectors that develop wide-reaching global value chains, and related transformation of local economies to adapt to those value chains. Where this happens, local contributions to economic growth and existing capacities are disregarded. Nevertheless, there are many initiatives – often with involvement of international development organizations – to integrate smallholders into global value chains in which local resource production and related socio-cultural attributes are incorporated. The corresponding development projects and programs for credits and technical assistance generally imply that smallholders have to modify current practices, cultural organization and working institutions to better benefit from emerging market opportunities (Arias *et al.* 2013, Macqueen *et al.* 2014). However, the vast majority of smallholders have only limited access to such programs (Zeller and Meyer 2002, Fan *et al.* 2013).

Particularly over the last decades, many governments in the tropical Americas have started serious efforts to respect and formally recognize existing customary rights of smallholders on land and resources (Larson *et al.* 2010, Sikor and Stahl 2011). Land tenure titles issued for individual and collective forest properties are expected to stimulate long-term investments and restrain owners from inappropriate land uses, and to constrain large-scale conversion of forest land to commercial uses (Agrawal 2007). In parallel, there have been remarkable, although not always successful, initiatives to enhance the participation of local actors in mechanisms for the design and realization of public policies, including efforts for decentralization (Falleti 2010), support for social movements (Prevost *et al.* 2010), and participatory development projects (Pokorny 2013). Finally, governments in the region

have initiated social support programs that reach a rapidly increasing proportion of families in rural settings. These programs include, particularly, the payment of pensions (Dethier *et al.* 2010), social assistance for poor and marginalized families (Barrientos and Hinojose 2009, Lentz *et al.* 2013) as well as family reliance for education and health provided in so-called conditional cash transfer programs (Rawlings 2005).

Smallholders' contributions to rural development

To adequately value the role of tropical American smallholders in rural development requires a careful comparison to the contributions of other actor groups active in the region, including medium and large cattle ranchers (Fearnside 2008), well-endowed entrepreneurs and agro-businesses who produce soybean, biofuels, and rice, among others (Rudel *et al.* 2009), explorers of natural resources such as timber and minerals, as well as energy companies that exploit oil, gas and hydropower (Tissot 2012). This section reviews the literature on how smallholders' resource use compares to the four indicators listed above, and also on outcomes of competing actors in this comparative understanding. The available literature, however, is focussed most intensively on the contribution of smallholders to deforestation and not so much on their economic contributions. Studies deal even less with the social contributions of smallholders. The literature largely describes social and cultural attributes of smallholder livelihoods and the challenges faced by smallholders.

Economic growth

Due to significant sector diversification many countries in the region are categorized as transformed countries. Nevertheless, agricultural production, with a contribution of 5% of the region's gross domestic product (GDP), still remains the

backbone of national economies, particularly in poorer countries (World Bank 2013). The aggregated output of agriculture is estimated to have surpassed US\$300 billion with an increasing share in commodities for export. More than half of worldwide exports of sugar, soybeans and coffee are produced in the region (FAO 2014). Agricultural produce accounts for about 23% of the region's total exports (World Bank 2012). A further increase of the sector is expected driven both by increases in the value of agricultural commodities and also gains in productivity and area under production (Vergara *et al.* 2014). Considering that almost 90% of farmed land in the region is rain-fed, irrigation can also be an important measure to increase agricultural production (Wani *et al.* 2009). However, tapping this potential requires substantial additional infrastructure and capital, and it may conflict with land conservation and avoiding deforestation unless expansion of agricultural activity is directed to restore already degraded lands (Vergara *et al.* 2014).

Smallholders have an important share in the agricultural sector. Across the region 15 million family farms are practicing agriculture on almost 400 million ha land (Berdegué and Fuentealba 2011). Some 75 million people, representing roughly two-thirds of Latin America's total rural population, economically depend on the output of these farms. The agricultural share of total household income is more than 50% among poor rural households in some Latin American countries (Vergara *et al.* 2014). Beyond the contributions of small farms to domestic supply, they also engaged in the production for exports such as of coffee, cacao and timber. For example, in Colombia – where coffee represents almost 22% of agricultural GDP – coffee plantations of five hectares or less represent 95% of all producers and 62% of the total area (Fonseca 2003), and in many countries exported timber originates from smallholder forests (Pacheco 2012).

Few countries have ever achieved economic growth without a substantial growth in agriculture (Hazel *et al.* 2010). Agriculture is the dominant livelihood strategy among subsistence farmers, accounting for 70% of total income of poor households. Thus, supporting small farmers has proven to be a particularly successful strategy for reducing rural poverty (World Bank 2007). There are several examples in which smallholders have proved their capacity to accumulate wealth when they are able to access markets that offer attractive prices for their production such as cacao, cattle, Brazil nut, açai etc. (Pokorny *et al.* 2013). Farming system research has provided evidence of the economic and agro-ecological efficacy of traditional multiple cropping systems (Altieri and Nicholls 2012). There is broad empirical evidence that small farms generate higher per-unit output than larger farms due to more intensive use of inputs and lower costs associated with supervising highly motivated family labour (Heltberg 1998, Fan *et al.* 2013). Small-scale and diversified production take better advantage of varying production conditions, so that even without fertilizers, reasonable productivities can be achieved (Altieri and Kooafkan 2008). A good knowledge of local conditions combined with applied techniques and intensive monitoring allow for flexible responses when they

are needed (Hazell *et al.* 2010). Thus, particularly in case of labour intensive production systems, small farms may have advantages over larger production units (Heltberg 1998). If, however, the use of capital intensive technology increases and wages become higher, the advantage shifts to larger farms (Hazell *et al.* 2007).

On the other hand, it is widely recognized that smallholders are far from generating the financial means needed to set up a satisfactory level of public services, and that subsistence oriented smallholder production actually may constitute a poverty trap (Barbier 2012). While there is potential for future productivity gains among small and medium producers (Hazell *et al.* 2010, Vergara *et al.* 2014), many undercapitalized and undereducated farmers lack the capacity to engage successfully in emerging opportunities (Hazell *et al.* 2007). Increasingly globalized and liberalized food-chain markets dominated by commercial actors will increase standards of food safety and quality that many smallholders are unable to meet. These farmers will need financial support in the short run and viable exit strategies in the long run (Fan *et al.* 2014).

Employment

While the economic impact of agriculture is small and even shrinking relative to other sectors in many rapidly transforming countries in the region, farming activities employ a significant share of unskilled rural labour (Vergara *et al.* 2014), of up to 91% in the case of Nicaragua (Bambrilla *et al.* 2010). Poor farmers use much labour, both from their own households and from their equally poor, or poorer, neighbours (Heltberg 1998). However, farmers in consolidated settlement contexts contribute to local employment by employing temporary helpers hired in times of working peaks as well as permanently workers (Berdegué and Fuentealba 2011). Because of low mechanization, small farms invest more labour per hectare than large, often mechanized, producers, and accordingly employ more people per hectare than mechanized farm enterprises, often to the benefit of the landless and unemployed (Madeley 2002). In Brazil, each eight hectares cultivated by small farmers using mixed cropping generates one job, while large-scale mechanized monocultures generate 1 job per 67 hectares (Altieri and Kooafkan 2008). The created employment however is poorly rewarded (Wiggins 2008). Many workers employed in agriculture live with their families below the poverty line (Barbier 2012).

Additionally, smallholders contribute indirectly to jobs for the processing and commercialization of agricultural or forest production. As the related logistics are often also relying on small entrepreneurs, the multiplier effect of smallholder production can be significant (De Leán 2008). They, in contrast to more capitalized economic actors, also spend a higher share of their income on labour-intensive goods and services produced in local villages and towns (Hazell *et al.* 2007). Finally, it has also to be considered that, at least in the case of peri-urban areas, the presence of smallholders implies the need for extensive employment in the public sector, be it in the municipal administration, education or health services

(Sainz 2005). As a result, in comparison with estate commodity production, smallholders contribute more intensively to local value chains, and a higher proportion of the wealth generated by smallholders is likely to remain in the region.

It has been also observed, that for more and more smallholders, income from off-farm employment is becoming the principle source of sustenance. Often this employment is with agricultural large holders or with successful smallholders who had used their capital to expand their production activities (Reardon 2001) or from urban employment. Against this backdrop, there is strong evidence that the creation of employment, mostly related to investments of non-local actors, plays a crucial role in improving the situation of many smallholders, particularly those with limited capacity to adequately respond to the requirements of globalized supply chains regarding quality, quantity, timeliness, traceability and flexibility (Hazell *et al.* 2007).

Food production

Many authors argue that smallholders do not significantly contribute to national food production because they achieve only low per hectare production (e.g., Chomitz and Thomas 2003, Margulis 2003, Michalski *et al.* 2010, Walker *et al.* 2000). In some smallholder regions more food is consumed there than is produced (Murphy 2012). However, other studies indicate that smallholders contribute significantly to supplying a region's food needs, but that this is insufficiently reflected in official statistics (Vuletin 2008). Smallholders produce a wide range of annual and perennial crops such as cocoa, coffee, or manioc, and catch fish and hunt bushmeat for regional markets (Browder *et al.* 2004, Walker *et al.* 2002, Pacheco 2005). It is estimated that traditional or subsistence agriculture produces 51% of the maize, 77% of the beans, and 61% of the potatoes consumed in the American tropics (Altieri and Toledo 2011). In some regions that are poorly connected by roads, food supply may rely exclusively on smallholders. They assure food for their families but also contribute significantly to regional food chains (Godar *et al.* 2014, Chambwera *et al.* 2011). It is estimated that nearly 80% of the developing world's food is produced on small farms (FAO 2011). In tropical America smallholder agriculture provides 41% of domestic food consumed, especially through the production of cassava, beans and maize (Toledo *et al.* 1985 in Barbiere 2012). In Brazil, family farms account for 70% of national food production (França *et al.* 2009) and generate one-third of the agricultural and food sector's GDP (Guilhoto *et al.* 2007).

The possibility for improving smallholder production systems, in combination with the fact that more than 90% of farm holdings are family based, explain the renewed interest of FAO in intensifying the promotion of smallholders in securing food (FAO, IFAD and WFP 2014). Some authors highlight the potential of traditional multiple cropping systems and smart agriculture to effectively respond to the challenges of climate change, food security and soil degradation (Altieri and Nicholls 2012, FAO 2013).

Protection of natural forests

It is a point of contention whether smallholders are among the main contributors of deforestation or are rather forest conservationists (Chomitz and Thomas 2003, Kissinger *et al.* 2012, Rudel *et al.* 2009). Doubtlessly, the transformation of forests into other land uses is an essential part of most of their production systems. Smallholders' relative contribution to deforestation is especially high where they are part of an advancing agricultural frontier, while it declines when the frontier moves on and smallholder remain in a mosaic forest landscape. The degree of deforestation, furthermore, depends somewhat on the particular characteristic of the smallholders and the economic and institutional circumstances in which they find themselves. They may follow government settlement programs, which are still promoted in tropical America, but parallel spontaneous immigration into new territory remains quite common (Carr 2009).

Smallholders tend to concentrate to meet immediate needs and in consequence, deforestation activities are minimal compared to other economic actors (Banerjee and Duflo 2007, Pokorny *et al.* 2013, Godar *et al.* 2012), oftentimes also explained as resulting from a lack of capital and available labour (Wunder 2001). Smallholders, however, also consciously maintain forest reserves as household productive assets (Pokorny 2013). In locations with little government presence, smallholders will expand their estates into public or collective forests without any legal improvement, although some legal sanctioning is often granted once smallholders have settled. Massive large scale deforestation is related to cattle production (Pacheco 2005, Parker and Meretsky 2004). Smallholders who engage in cattle-raising usually absorb larger land areas than non-cattle smallholders (FAO 2006). For many smallholders, cattle production is attractive, because it is profitable and it allows an increase in the household asset value. Cattle production requires slashing of areas of forests for pastures, which constitutes an important contribution of smallholders to deforestation. Comparatively, deforestation resulting from swidden agriculture is relatively low, even when considering the negative impact from accidental fires (Carmenta *et al.* 2011).

Smallholders who operate in a confined space with formal or informal recognized tenure rights, generally transform much of their forests into financially more attractive land uses (Billard *et al.* 2014). Especially when properties are small, forests progressively make room for crops and pastures. Commonly, trees and forests are preserved, or eventually left to recover, and secondary forests and primary forest remnants become part of smallholder production (Pokorny 2013). Some older settlements eventually may experience an increase in forest cover, because families reduce their cultivation area or even temporarily or permanently abandon their land when they move to regional towns or cities (Grau and Aide 2008). Many smallholders tend to cultivate relatively small patches on an annual basis, and their properties typically show a diverse spatial and temporal mosaic of crop fields, swidden fallows, secondary forests, and sometimes high forest remnants (Godar *et al.* 2012). Productive soils and good access to transport, markets and public services actually

appear to favour such diverse land use that includes forests (Pokorny *et al.* 2012). In consequence, smallholder-dominated landscapes provide better environmental services if compared to those dominated by large cattle ranchers and agro-industries (Godar *et al.* 2012). It is widely agreed that agriculture and small farmers will continue to contribute to deforestation in a significant way (Vergara *et al.* 2014), and that supporting small farmers is key for any mitigation effort (FAO, IFAD and WFP 2014).

For smallholders who reside in more remote places, where there is yet little state sanctioned land planning or assignment of family plots, the balance of forest and croplands tends even more to the former. Smallholders concentrate on swidden production and swidden fallow management, but not on market oriented crop or cattle production. Rather, forest product collection, and fishing and hunting are more common among such remotely located smallholders, with a consequent reduced impact on forests. In cases where vast territories have received the status of ethnic indigenous territories, they actually prevent the expansion of the agricultural frontier, and thus reduce forest conversion (Campos and Nepstad 2006, Chhatre and Agrawal 2009, Nelson and Chomitz 2009). These territories, however, do suffer from mostly illegal but often condoned logging (Medina *et al.* 2009), gold mining, extra regional settlers (Tacconi 2007), and even expropriations for mining and the construction of dams and other infrastructure projects (BID 2006).

THE CONTRIBUTION OF THE PAPERS TO THE DEBATE

Within the above outlined debate, the papers of this Special Issue explore case studies from Brazil, Bolivia, Peru, Ecuador and Mexico to tackle a wide range of relevant issues from distinct disciplinary perspectives (Table 2). The majority of the papers deal with the capacity of smallholders for forest management or respectively with the question about the potential of forests and forest regulatory instruments, for instance REDD+, to contribute to local livelihoods. Some papers apply a broader economic perspective and analyse the role of forests and smallholders in national economies. In doing so, the papers reflect specific understandings of rural development and related challenges, while indicating possible actions for the stimulation of eventually existing local capacities.

In their paper, Porro *et al.* explore in detail the case of forest settlements initiated by the Brazilian government as an alternative to classic agricultural settlements. This case challenges a development approach that aims not to transform, but use forests as a continuous complementary source of income for colonist households. The paper documents the capricious history of this experience since its establishment in 2004, with a difficult start, a promising phase based on a partnership with a timber enterprise, and the eventual failure of the experiment. The findings indicate that even farmers relatively well connected to public and social support networks are not

necessarily prepared to endure the sequential stages needed to consolidate sustainable livelihoods in forest environments. A continuously changing policy framework in combination with a constant lack of adequate support reduces the possibility for success in the challenging environment of agricultural frontiers. The analysis emphasizes the importance of institutions that create a sense of community, and the stability, reciprocity and trust to overcome the pressures derived from continuously unequal power relations and related enticements, especially when the government itself is not prepared to assure a fair context.

Smallholders dominate the supply of timber for national markets that originates from native forests in the Ecuadorian Amazon, yet the contribution of smallholders to total timber supply in the country is relatively small due to the importance of plantations. Yet, how smallholders manage their forests through small-scale timber extraction and how it contributes to smallholders' incomes depends much on the way in which timber extraction is organized, as well as the volumes and species harvested. Mejia *et al.* demonstrate in their paper that how middlemen engage with smallholders constitutes a key defining factor in explaining how small-scale logging is conducted in practice. There is an unexpected outcome that when smallholders dominate timber extraction they tend to comply less with legal requirements, but smallholders obtain a higher value per volume unit of timber, and tend to harvest less number of trees. In contrast, if middlemen organize the extraction, it tends to be more compliant with regulations, smallholders obtain a higher total incomes since the scale of operations is larger, but receive less value per volume unit of timber. It is not yet quite clear what the impact is on forest condition, but it can be hypothesized that smallholder dominance of timber exploitation in Ecuador may be a better option in the long run, in terms of smallholder income capturing and sustainable timber exploitation in the Amazon. The paper supports the point made in this introduction paper that a larger control of the timber value chain by smallholders may be socially and environmentally beneficial, but additional conditions are required such as improved access to credit and know-how, as well as more transparent markets able to distribute more efficiently the benefits from timber extraction. National policies and other measures that enable smallholders to control timber exploitation and trading could possibly enhance such outcomes.

Rockwell and Kainer, in their paper, reflect on the role that smallholders play in the management of so-called bamboo forests in Brazil, perceived as vulnerable and with limited potential for timber production, but important for the provision of environmental services. They highlight that families, while showing a certain preference to swidden subsistence farming, also hold significant knowledge about these forests, and that this knowledge can be instrumental in managing them sustainably. The maximization of potential returns from this forest type through a diversified management for timber, non-timber, and multiple-use species is crucial for sustaining both the forest and smallholder families for the long term. In this sense, the protection of bamboo-forests will depend on

TABLE 2 Overview of topics and contents of the paper of the Special Issue

Authors	Smallholder type	Country	Analytical lens / development perspective	Smallholder's contribution to development	Challenges / critical points	Scope for action	Discipline
Porro <i>et al.</i>	Small colonists	Brazil	Sustainable timber management in forest settlements	Depending on context	Dependence on volatile policy framework	Strengthening of social capital, promotion of improved governance	Anthropology
Mejia <i>et al.</i>	All types of smallholders	Ecuador	Small-scale timber extraction	Competent forest managers	Improper forest regulations	Regulations in accordance with local realities	Forestry
Rockwell and Kainer	Traditional communities	Brazil	Bamboo forests	Good forest managers	Too low income from forests	Multiple-use forest management and protection from outsiders	Ecology
Skutsch <i>et al.</i>	Ejidos (small settlers (collective))	Mexico	REDD+ / landscape / CO2	In theory, yes.	Limited financial attractiveness of REDD+ options	Investments in institutional frameworks and community infrastructure	Geography
Ferreira Filho and Fachi-nello	All types of smallholders	Brazil	Employment through NTFP	Provision of economically relevant raw materials from forests	Value-adding outside local contexts	Promotion of local industries	Economy
Vazquez-Barquero and Alfonso-Gil	All types of smallholders	Region with focus on Mexico	Endogenous Development	Important actor within local economic networks	Emphasis on exogenous development approaches	Promotion of local slow-growth approaches	Economy
Christman <i>et al.</i>	Smallholder farmers	Mexico	Specialization or diversification of production by scale	Marginal, peripheral	Only larger farmers can take advantage of market opportunities	Improve access to information and credits	Geography
Schneider <i>et al.</i>	Small farmers	Brazil	REDD+ (forest conservation)	Important in achieving municipal deforestation target (to lift economic restrictions)	Very different needs to end deforestation	Incentives rather than punishments, and design of differentiated policies for equity	Politics

effective measures for supporting the families in how they will pursue their livelihood strategies, and how much they will be able to consider sustainable resource use, while preventing outsiders from accessing forests and land.

Skutsch and her co-authors explore the potential for REDD+ to contribute to the development of agrarian communities and indigenous communities in Mexico. Their paper analyses seven case studies of villages located close to biosphere reserves, all of which are in areas designated 'REDD+ early action' areas under the national approach to REDD+. Community forestry is practiced in all these villages in some

form, but REDD+ may not offer many further opportunities. The paper demonstrates that up to 50% of families involved in the management of land and forests do not hold tenure rights and may not be able to benefit from REDD+ payments. Moreover, the financial returns from REDD+ are likely to be too low to compensate for reduced cattle ranching and abandonment of agricultural uses of forest lands. In addition, internal conflicts further reduce the probability of success. However, in some cases, a certain concentration of decision making and funds in the hands of a small group has been helpful in ensuring sustainable management of the forest

resources. Holistic approaches are envisaged in Mexico, including the creation of associations of municipalities with a broad interest in both rural development and environmental protection. Investments in institutional frameworks and community infrastructure are seen as much more promising than payments to individual land holders.

Non timber forest products (NTFPs) are often attributed to be the most relevant type of products from tropical forests for traditional and indigenous communities. Ferreira Filho and Fachinello investigate the contribution of products from Amazonian forests, namely NTFPs, to Brazil's national economy considering multiplier effects of processing both for local use and exports. In this sense, their analysis follows a classic economic approach of sustainable forest management with a harvest of products from natural forests and their subsequent processing by Brazilian manufacturers. Their analysis reveals that timber is by far the economically most important single product from tropical forests, but also that NTFPs have some potential to create jobs and income through labour multipliers in processing industries. While economically marginal from the national perspective, from a local perspective NTFPs have a potential to boost local economies if the degree of local processing increases. However, overexploitation on the one hand, and domestication of commercial NTFPs on the other, pose great challenges to value chains relying on traditional extraction schemes.

Vazquez-Barquero and Alfonso-Gil study in their paper the feasibility of endogenous approaches for rural development, in which, in contrast to classic approaches, the capacities of smallholders have an active and decisive role to play within the design, implementation and control of development initiatives. In this perspective, economic growth grounded on the sustainable use of local resources creates a much higher social benefit for the local actors. Through the review of political economy literature relevant to the region, they demonstrate that a rural development grounded on local resources and actors is meaningful and generates long-term social and environmental benefits, but is a slow gradual process. To make such an approach work in practice, however, requires significant input and joint action from State organizations.

The paper of Christman *et al.* explores a case study in Mexico to learn about the economic responses of small farmers to a typical post-frontier dynamic. Within an understanding that livelihoods and landscapes are co-produced, the study asks how small and larger farmers, as well as the landless poor, respond to a continuous economic and environmental changes characteristic of agricultural frontiers. Particularly, the authors challenge the assumption that diversification is an effective strategy of farmers to cope with risks and uncertainty and to ensure the wellbeing of rural families. The findings indicate that all farmer groups, in spite of cultural affinity for traditional *milpa* agriculture that is well-adapted to the environmental conditions, are often required to significantly change their livelihood strategies. However, while the large land holders with access to information and credits pursued more specialized and lucrative new opportunities, small farmers and landless instead were faced with less profitable income options, which led to new vulnerabilities and risks.

Specialization as well as diversification and expansion of land uses resulted in a more varied and dynamic landscape and an increasing fragmentation. The authors conclude that in typical frontier settings, and with prevailing land and credit policies, smallholders lack the means and capacities to adequately respond to emerging challenges and opportunities.

In similar fashion, Schneider *et al.* acknowledge in their analysis of a frontier case study located in the Eastern Brazilian Amazon the diversity of land users, and how this plays a role in how smallholders can contribute to potential REDD+ initiatives. The paper investigates into the perception smallholders have of their needs to achieve a sustainable use of natural resources. However, the findings suggest that better-off farmers are more successful in using emerging opportunities and mostly are already pursuing more sustainable land use practices, while the poorer farmers' find themselves in tight situations, facing the dilemma of developing economically or deforesting. The lack of innovative capacity and of adapted support continues to be the strongest driver of deforestation. While smallholders generally need incentives rather than punishments to engage in a sustainable transition, the design of differentiated policies that take into account the specific needs of the different types of farmers, is necessary to guarantee more equity. As this is, however, not necessarily an approach that national and international programs such as REDD+ can follow, only the economically successful farmers will have the capacity to contribute to sustainable land uses.

DISCUSSION

In the quest for evidence of the existing potential of smallholder-devised development strategies to contribute to a more sustainable development of the tropical Americas, the reflections presented in this Special Issue provide some enlightening hints to enrich the ongoing academic debate about this topic as well as to formulate recommendations for policy makers. Millions of people live and will continue to live in remote rural areas characterized by fragile environments consisting of upland areas, and forest of various sizes and conditions that often suffer from low agricultural productivity (Barbier 2012, Chen and Ravallion 2011). Despite an occasionally stronger presence of the State (Afonso *et al.* 2013) and a continuously growing importance of off-farm employment (Banerjee and Duflo 2007) the livelihoods of these people as well as local development still rely to a large extent on the use of land, forests and other natural resources. Thus, any type of action must take into account these local families, be it as motor, participant or beneficiary of rural development. The huge diversity of contexts, people and livelihood strategies within tropical America's forest landscapes, however, precludes simplifications and blueprints. Accordingly, considerations about the specific role of smallholders in rural development have to explicitly be grounded on their specific situation. The review presented in the previous sections, and the papers in the Special Issue show relevant trends and insights that may allow some meaningful extrapolations.

The smallholder – forest nexus

There is wide consensus that many families in the forested landscapes of the tropical Americas strongly rely on the manifold goods and services provided by forest ecosystems. However, there is clear evidence that for many smallholders forests, from an income perspective, have significantly lost their importance (Reardon 2001). Nevertheless, a vast amount of literature, including nearly all of the papers presented in this Special Issue, highlight or at least consider the possibility of generating income from the sustainable management of forests. Many of the articles even reversed the focus to question if and to what degree smallholders can contribute to the conservation of forests. This reversal of perspective is also reflected in the fact that many papers deal with the issue of REDD+, interpreted as a synonym for sustainable local development based on appropriate local forest management. Obviously, when working within forest landscapes in the tropics, it is challenging to overcome the habit of looking first to forests to identify win-win opportunities and only then to people. In accordance with the above cited studies on the positive function of indigenous and traditional communities to act as barriers for deforestation, there is a real danger of assigning smallholders the wrong role in an externally defined forest conservation agenda. On the other hand, the linking of smallholders with forest conservation may indicate one of the few competitive advantages of smallholders compared with other economic actors active in the region. Nevertheless, optimistic statements on the potential of forests to lift poor people out of poverty should even more carefully consider the limited financial benefit potential of forest management (Wunder 2001, Pokorny *et al.* 2012).

Smallholders' competitive disadvantages

This review and the papers of the Special Issue also indicate that within the social and institutional realities found in frontier regions, smallholders suffer significant disadvantages to compete with other economic actors for land and resources. The reason for this weak position can be explained by: (1) the historical trajectories characterized by social injustices, power imbalances, and exploitative and paternalistic relations to local elites that are still reflected by a lack of valorisation of local culture and competences (Bunker 1984, Pokorny 2013); (2) remoteness characterized by limited access to means of communication and public services, as well as fragmentation and poor infrastructure, which makes social and political organization extremely difficult (Coomes *et al.* 2011); (3) environmental marginality that further aggravates a competitive agricultural production (Barbier 2012); and (4) policy frameworks that favour the capacities and interests of economic actors from outside the marginalized regions, mostly well-endowed entrepreneurs who aim to invest in mining, energy, timber concessions or the production of commodities for global markets (Gwynne and Cristobal 2014). The poorer the families, the less competitive they are. Despite a clear regional trend of reducing extreme poverty, these

adverse conditions still threaten the basic livelihoods and survival of millions of families (World Bank 2013). All papers of the Special Issue underline this point as they all highlight the need for policy frameworks specially designed to support poor smallholders.

Smallholders' capacities

Many of the papers report on the proven capacity of smallholders to establish stable livelihood strategies relying on the effective use of natural resources in often very difficult contexts. The large majority of smallholders in the region rely on subsistence production which is complemented by activities to derive cash incomes, or they rely on insecure low-paid off-farm activities. These livelihood strategies seldom allow for more than basic consumption and social reproduction (Barbier 2012). While some of the papers report on such contexts, others refer to cases of higher economic success resulting from an effective management of natural resources. Such examples of success are extensively described in the literature, including the collective management of forest resources for the production of timber and NTFP by indigenous groups and traditional communities (e.g. Shanley *et al.* 2008, Macqueen *et al.* 2012), the production of perennials by farmer cooperatives (e.g. Vásquez-León 2010) as well as the cultivation of agricultural crops in agroforestry systems (e.g. Altieri and Nicholls 2012). Such successes are primarily reported for situations where smallholders are somewhat protected from outside competitors, and hold formally recognized tenure rights to land and resources (Larson *et al.* 2008), as well as the existence of externally facilitated market niches, or limitations for mechanization of production that require comparatively high manual labour (Homma 2006). The availability of adequate natural resources is highly important. In this regard, the fertility of soils and constant access to sufficient water is more important than the size and type of resource (Lal and Stewart 2015). In addition, most of the reported successes are supported by external organizations, mostly NGOs but also governmental agencies (Pokorny 2013). In varying intensities, these organizations provide technical assistance and advice, stimulate social organization, give financial support, and, most importantly, facilitate the commercialization of marketed products. The latter include the catalysing niche markets for certified or locally labelled products and the creation of public-private partnerships where the processing and commercialization of the production is State financed or under the responsibility of private companies with special social or environmental standards.

Local versus global perspective

Although most of the papers of the Special Issue are concerned with environmental conservation, they implicitly apply a local perspective in their analysis. From this angle, they conclude that, under certain conditions, at least some of the smallholders have the capacity to produce food, generate societal benefits and protect ecosystems. However, from a

national or global perspective such positive interpretations may become relative, because capital endowed and professionally qualified actor groups employing input-intensive systems for managing, processing and commercializing of land and natural resources may often be more effective in contributing to non-local societal goals such as national GDP, the production of commodities for global markets, generation of well-paid employment and the proper management of large timber concessions. Obviously, the perspective (both local and global) on rural development as well as the specification and prioritization of social, economic and environmental goals have a strong influence on the potential role of smallholders. Doubtless, a rural development that targets local rather than national or global goals and interests would put smallholders in a much better position to fulfil a more active role in these processes.

CONCLUSIONS

The insights presented in this Special Issue, *Smallholders and forest landscape transitions: Locally devised development strategies of the tropical Americas*, give room for ambivalent conclusions. In some contexts, smallholders in comparison with other land users occasionally seem to have a greater potential to create environmentally stable landscapes for the generation of social and economic benefits particularly for the local population. However, smallholders often rely on poor resources and suffer from suboptimal conditions while their schemes for land management and social organization are not always effective. Thus, despite some evidence found in specific contexts of the capacity of smallholders to actively contribute to local development, it is debatable whether – under the prevailing globalization policy framework – smallholders will be able to successfully compete with other actors without significant interventions that compensate for structural disadvantages.

In this sense, asking about smallholder capacities should take into account two widely differing perspectives: first, their capacity to effectively act within the prevailing policy framework, and second, their capacity to take advantage of eventually changing, more favourable policy frameworks. The insights from this Special Issue suggest that within the prevailing policy frameworks only a few smallholder families with adequate support will have a real chance to become economically successful actors while many others will continue their marginal livelihoods and thus require assistance or support to access livelihood alternatives including off-farm employment and rural-urban migration. Only policy frameworks better adapted to the interests and capacities of smallholders will allow them to play a more active role in local development. This, however, necessarily leads to the question, if and to what degree such a shift of the policy framework is likely in a world where relevant policy mechanisms are dominated by decision makers representing the interests of the societies in urban and developed contexts. In view of

the enormous threats to these societies including climate change, poverty migration, financial crises and food insecurity, there are indications for an increasing interest of at least parts of these societies in more integrative approaches to rural development that put local people and nature at the centre.

However, it might be more probable that decision makers will continue responding to the massive global societal and environmental challenges with the classic means of markets, technological innovation and command-and-control mechanism for the enforcement of social and environmental appeasement policies. This insistence on integrating local people in global value chains and conservation approaches set up by actors from outside the region will continue to ignore the capacities of smallholders and their willingness to accept the challenging conditions of the rural Americas, including the limited financial attractiveness of using marginal lands and resources.

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