



Development Review

Land Sparing and Land Sharing Policies in Developing Countries – Drivers and Linkages to Scientific Debates

OLE MERTZ and CHARLOTTE FILT MERTENS*

University of Copenhagen, Denmark

Summary. — The need for developing land sparing or land sharing policies for protecting the environment has been a polarized debate in the scientific literature. Some studies show that “spared” landscapes with clearly separated intensive agriculture and pristine forest are better for biodiversity and other ecosystem services, whereas others demonstrate the benefits of “shared” mosaic landscapes composed of a mix of forest types, agricultural fields, grassland, and plantations. Increasingly, these scientific views have been depolarized, recognizing that both shared and spared landscapes have a role to play, depending on the context. However, it is less clear from the literature what drives actual policy-making related to land sparing and land sharing in developing countries and what the outcomes of these policies are. We therefore reviewed the international peer-reviewed literature for evidence of policies that aim at land sparing or land sharing in developing countries, the driving forces behind these policies and their outcomes. We also searched for evidence of whether the scientific debates have had an effect on land policy-making and explored the hypothesis that land sparing is the dominant land policy paradigm. We show that all countries represented in the studies have land sparing policies and half of them also have land sharing policies, although the latter appear inferior and under-funded. Drivers of land policies are very diverse, ranging from international commitments in conventions to various national-level pressures, but there is little evidence that scientific results have affected these policies. The policy outcomes in terms of ecosystem services and livelihoods are also very diverse. We conclude based on the studies reviewed that context is indeed very important for understanding different design and outcomes of land sparing and land sharing policies and that more evidence is needed on the processes for integration of rapidly evolving scientific debates in land policy-making in developing countries.

© 2017 Elsevier Ltd. All rights reserved.

Key words — land sparing, land sharing, land use policy, conservation, agricultural intensification, science-policy interface

1. INTRODUCTION

One of the fundamental trade-offs between environmental and development policies is related to how we use land for either protection of nature and ecosystem services or for a variety of human activities that require considerable modification of the land cover. Few people will question that we need at least some elements of both, but how to balance this trade-off has been debated intensively in the literature. One of the debates focuses on the assumption that intensified agriculture would reduce deforestation as demand for land would decrease with higher yields, a relationship that is based on counterfactual scenarios of how much land would have been needed for current agricultural production levels without intensification (Ausubel, Wernick, & Waggoner, 2013; Burney, Davis, & Lobell, 2010). This is also known as the “Borlaug hypothesis” (Pirard & Belna, 2012; Rudel et al., 2009) emanating from the proposed win–win solutions of the Green Revolution and projections of future cropland needs (Balmford, Green, & Scharlemann, 2005). Indeed, the Green Revolution has been shown to be land sparing (Hertel, Ramankutty, & Baldos, 2014), but market forces, land claims, and economic development also stimulate expansion even under intensified agriculture with high productivity and it is uncertain how much land sparing can be achieved in developing countries in the future (e.g., multiple studies in the book by Angelsen & Kaimowitz, 2001; Lambin & Meyfroidt, 2011; Meyfroidt et al., 2014; Rudel et al., 2009). These issues have been shown to be particularly prevalent in so-called frontier

areas, e.g., in the Brazilian Amazon, whereas land sparing might work in areas where land use has already been intensified due to land scarcity (Barretto, Berndes, Sparovek, & Wirsenius, 2013). Similarly, green revolution scenarios for Africa may not be land sparing under conditions of global market integration and low yields (Hertel et al., 2014). Moreover, Ceddia, Bardsley, Gomez-y-Paloma, and Sedlacek (2014) added nuance to this debate by showing that in six South American countries, high governance scores caused agricultural intensification to lead to further expansion, thus confirming the so-called Jevon’s paradox whereby higher efficiency in resource use does not necessarily lead to a decline in demand for that resource (e.g., Lambin & Meyfroidt, 2011).

In another line of debate, several papers analyzed whether “spared” landscapes without any human interference are better at conserving natural forests and habitats for endangered species than “shared” landscapes, where agriculture and forests are both present and interact, such as “wild-life friendly farming” promoted in Europe and in shifting cultivation or other agroforestry systems in the tropics (Balmford et al., 2005; Green, Cornell, Scharlemann, & Balmford, 2005; Mattison & Norris, 2005). This was done without much reference to the other debate (that intensification may indeed have

* This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors. The research contributes to the Global Land Programme, <https://glp.earth/>. Final revision accepted: May 10, 2017.

the opposite effect), although externalities of intensification such as the use of GMOs and excessive use of fertilizers and pesticides are recognized in the literature advocating land sparing (Green et al., 2005). The result was a surge in research and new empirical evidence from case studies (e.g., Gibson et al., 2011; Phalan, Onial, Balmford, & Green, 2011) suggesting that intensification of agriculture on existing farmland would be needed to avoid further agricultural expansion.

This spurred a strong counter reaction from research demonstrating that biodiversity can be just as high – or even higher – in mosaic landscapes with low-intensity agriculture such as agroforestry and shifting cultivation as long as old-growth forests are maintained to a certain extent (Berry et al., 2010; Padoch & Pinedo-Vasquez, 2010; Rerkasem et al., 2009; Xu, Lebel, & Sturgeon, 2009) and that agro-ecological approaches and wild-life friendly farming would overall be better for biodiversity (Kremen, 2015; Kremen & Miles, 2012; Perfecto & Vandermeer, 2008, 2010). Several of the biodiversity studies concluding that sparing would be most beneficial were also criticized for using too limited plot-level data to derive landscape-level outcomes (von Wehrden et al., 2014).

From the beginning, some authors cautioned against too rigorous and uncritical application of either land sparing or land sharing (Fischer et al., 2008) and more recently, it has been argued that such polarized debates are not productive (Tscharnkte et al., 2012). For example, Navin Ramankutty has at Global Land Programme conferences attempted to lay the heated debates on whether land sparing or land sharing is best to rest by stating that he was in favor of “land sparing”. The point is that both shared and spared landscapes have functions, especially when it comes to looking beyond biodiversity and focusing on a broader range of ecosystem services (Baudron & Giller, 2014; Fischer et al., 2014; Grau, Kuemmerle, & Macchi, 2013), and it has been suggested that the term “wildlife-friendly farming” should be reframed as “environmentally friendly farming” (Ramankutty & Rhemtulla, 2012). Moreover, it is not evident that following “pure” sparing or sharing approaches will lead to optimal conservation and production outcomes (Butsic & Kuemmerle, 2015; Fischer et al., 2008; Paul & Knoke, 2015; Ramirez & Simonetti, 2011) and the best choices are evidently also very context specific, depending on which ecosystem services are most relevant (Law & Wilson, 2015) and how intense the conflicts between conservation and agriculture are (Shackelford, Steward, German, Sait, & Benton, 2015). Kremen (2015) argues that based on a review of 21 cases and the wider literature on land sparing and land sharing, this terminology should be abandoned as it is not productive for the development of policy. Instead, sustainable intensification of agriculture that will have to take different forms in different contexts is suggested as an alternative terminology (Kremen, 2015). Although this may not be fully agreed on by the authors originally suggesting the land sparing-land sharing framework (Balmford, Green, & Phalan, 2015; Phalan, Green, & Balmford, 2014), the scientific debate does seem to be converging toward more agreement and looking for solutions to engage the best of both worlds for optimization of land use policies related to agriculture and nature conservation.

However interesting these scientific debates may be, they have considered much less how actual policies related to land sparing and land sharing are developed and implemented as well as how effective such policies are. In most developing countries, for example, it appears that land sparing is more or less directly a development goal (Phelps, Carrasco, Webb,

Koh, & Pascual, 2013) as there are often explicit policies on both conservation of forests in some areas and intensification of agriculture in others (Kremen, 2015). Several studies demonstrate that policy decisions on land sparing may not lead to the intended outcomes (Meyfroidt et al., 2014; Phelps et al., 2013) and while this may be a result of inadequate understanding of the complex land use dynamics at play, it may also be a result of how policies have little impact or relevance for the reality of local people or because of disconnects between development and environmental policy-making (DeFries & Rosenzweig, 2010; Vongvisouk, Castella et al., 2016). It has been argued that although policies set clear guidelines for land sparing approaches, the outcome is sometimes that neither sparing nor sharing is occurring as more or less intensive agriculture is spreading at the expense of both natural forests and shared landscapes (Barrett, Travis, & Dasgupta, 2011; Ferraro, Hanauer, & Sims, 2011; Hansen & Mertz, 2006; Vongvisouk, Broegaard et al., 2016). On the other hand, there is also evidence that some land policies may provide the best of both land sparing and land sharing (Montoya-Molina et al., 2016). These diverse experiences highlight the need to obtain an overview of which policies are pursued where and how successful they are in achieving the ultimate goals of development policies for reducing poverty and environmental policies aimed at conserving and protecting valuable natural resources and habitats. Moreover, it would be highly useful to understand to what extent the current policies are actually influenced by the scientific debates of a more nuanced approach to land sparing and land sharing. The hypothesis here is that unfortunately there may be little uptake of such debates and that policy tends to favor scientific results that are in line with overall political goals as a century of policy of shifting cultivation in Southeast Asia has shown (Fox et al., 2009; Mertz & Bruun, 2017; Padoch & Pinedo-Vasquez, 2010).

The aim of this paper is therefore first to provide an overview of actual land sparing and land sharing policies in developing countries and their outcomes based on a review of the scientific literature that uses the terms land sparing and land sharing. We examine the scientific evidence for what drives land sparing and/or land sharing policy-making in developing countries and specifically look at whether there is any evidence that the scientific debates have had an effect on land policy-making and implementation. Finally, we explore the hypothesis that land sparing remains the dominant land policy paradigm despite mounting scientific evidence that more nuanced approaches are needed.

2. METHODS

In order to obtain an overview of the current state of the knowledge in the peer reviewed literature on land sparing and land sharing policies in developing countries, it was decided to limit the search to literature indexed in Web of Science and Scopus. The search string “land sparing” or “land sharing” under [Topic] was thus implemented in Web of Science “All databases” on February 18th 2016 and redone on July 12th 2016. The two searches yielded a total of 196 records. The same search was implemented in Scopus (www.scopus.com) on 12th July 2016 returning 205 records. All records were imported into EndNote for further processing. The selection of records followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow procedure for systematic reviews (Moher, Liberati, Tetzlaff, & Altman, 2010) as outlined in Table 1.

Download English Version:

<https://daneshyari.com/en/article/5105161>

Download Persian Version:

<https://daneshyari.com/article/5105161>

[Daneshyari.com](https://daneshyari.com)