Strategic Spatial Planning in Emerging Land-Use Frontiers – Evidence from Mozambique

ABSTRACT. Strategic spatial planning (SSP) represents a consolidated long-term governance practice across developed and developing countries. It articulates sectoral policies, and it involves vision making and an array of stakeholders regarding land use and development issues around urban and rural territories. Land-use frontiers are territories with abundant land for agriculture and forestry, availability of natural resources relative to labor or capital, and rapid land-use change, often driven by large-scale investments and capitalized actors producing commodities for distal markets. Among various reasons, one of the objectives of SSP processes is to articulate a more coherent and future-oriented spatial logic for sustainable land-use patterns, resource protection and investments. SSP may thus constitute a useful approach to address some of the challenges posed to the governance of land-use frontiers, thus far, its potential contribution in land-use frontiers lacks an explicitly exploration. Here, we examine how SSP can play a role in governing land-use frontiers, through a case-study analysis of Mozambique as an emerging investment frontier. We gathered empirical evidence by interviewing experts involved in resource management, planning and strategizing territorial development in the country, complemented by a content analysis of literature and policy documents. We show that emerging land-use frontiers face several challenges, such as transnational land deals and intensification of commercial plantations. Interview data show that Mozambique lacks a strategic territorial vision, and the short-termism of political cycles hinders long-term territorial development, primarily in rural areas with plentiful land. Our analysis shows that SSP processes could contribute to address both global and country-specific challenges such as poverty traps and land degradation spirals, if various local and distant actors join forces and marry interests. We conclude by presenting a systematic framework explaining how SSP could play a role in governing emerging land-use frontiers for sustainable pathways.

Key Words: *Africa, agribusiness, ecosystems, farmers, forestry, frontiers, governance*

INTRODUCTION

There is widespread agreement amongst sustainability scientists that the mainstream development models need a substantial rethinking (Moriggi et al. 2020). The global growing demand for food, climate change mitigation and biodiversity conservation strategies, rapid urbanization and linked lifestyle changes, pose increasing pressures on land use and other natural resources (Lambin and Meyfroidt 2011, Creutzig et al. 2019). Furthermore, drivers of land-use change increasingly operate at multiple spatial scales. In an increasingly telecoupled world, demands and decisions in one place and spatial scale can have effects on other places and across spatial scales, leading to governance challenges affecting the well-being and sustainability of different societal groups (Meyfroidt et al. 2013) but particularly local communities in rural regions of developing countries (Busscher et al. 2018).

While the demand for land-based resources spreads all over the globe (Fuchs et al. 2017), the increase in supply is concentrated in regions that host sufficient land and other ecosystems services to meet these global demands, which thereby constitute hotspots of land use change, often entailing deforestation and ecosystem degradation (Wolff et al. 2020). Research on the effectiveness of both public and private land use policies reveals that only limited progress has been made in halting ecosystem degradation and deforestation in land-use change hotspots (Weisse and Dow Goldman 2019, Lambin et al. 2014). Along with an expansion of agriculture, these regions often experience a surge of private land leases or concessions to companies or

individual investors (Nolte et al. 2016), pushing local communities to marginal areas and thereby aggravating their social and economic condition (Gomes 2020).

Here, we focus on these land-use frontiers, understood as regions or territories with abundant land for agriculture and forestry, availability of natural resources relative to labor or capital, and rapid land-use change, often driven by large-scale investments and capitalized actors producing commodities for distant markets (Pacheco 2012, le Polain de Waroux et al 2018) such as beef, soybeans, or palm oil (Verburg et al. 2014). Developing and implementing spatial planning that adequately address these challenges and support the governance and sustainability of local communities is a complex and demanding task. International organizations such as the World Bank or Food and Agriculture Organization of the United Nations (FAO) as well as many governmental and non-governmental organizations (NGOs) in frontier regions, particularly in developing countries, are struggling to develop spatial planning processes. However, spatial planning processes play a key role in the governance of land-use change dynamics, which result from interacting political/institutional, economic, cultural, technological and natural/spatial driving forces that sectoral approaches cannot adequately address (Bürgi et al. 2004, Hersperger et al. 2010).

Spatial planning is about setting frameworks and principles to guide the location of economic development and physical infrastructure (Healey 1997). It consists of a set of governance practices, in which one could include strategic spatial planning and land-use planning processes, for developing and implementing strategies, plans, policies and projects, and for regulating the location, timing and form of development and land use (Albrechts 2013). These planning practices are shaped by the dynamics of economic and social change, which give rise to demands for land, natural resources and existing qualities of places, both tangible and intangible (Walsh, 2020). Through these interactions, global economic and social tendencies interrelate with local conditions and concerns to produce distinctive, contingent responses to territorial dynamics. Spatial planning and SSP in particular, are active forces in shaping investment decisions, principles for regulating land-use change, and ideas about spatial organization, which generate constraints and opportunities (Hersperger et al. 2018).

In frontier regions, spatial planning can play a major governance role as an underlying driver for many different land-use change processes (Van Vliet et al. 2016). In many frontier regions, the absence of public-led spatial planning enables unchecked agricultural expansion with negative consequences to communities' livelihoods (Brannstrom 2009). In the context of policies to control deforestation such as REDD+, indigenous land-use planning processes play a role to reconcile global environmental objectives and participation of local communities in the planning process (Nelson and Chomitz 2011, Ricketts et al. 2010).

Here, we focus on one specific approach to spatial planning, strategic spatial planning (SSP), which is conceived as a social process through which various stakeholders from diverse institutional settings come together to develop strategies and projects for the management of spatial change (Hersperger et al. 2019). SSP has been shown capable of influencing patterns of land use and land cover (Couclelis 2005), with its strong focus on a strategic mission in these plans, often 20–50 years into the future (Hermelin 2009, Albrechts 2004). SSP is understood as a response to the complexity of spatial developments reflecting a shift away from government, as a single actor, towards multi-actor and territory-based governance configurations (Oliveira and Hersperger 2018). SSP is described as a set of concepts, procedures and tools that must be tailored carefully to different spatial contexts (Albrechts et al. 2017, Albrechts 2010). SSP, which has already been linked to ecosystem services (Wilkinson et al. 2013), environmental

governance theories (Partelow et al. 2020) or adaptive capacity of threatened communities (Blythe et al. 2014) is thus selective and oriented towards issues that are prioritized by a myriad of stakeholders. Urban and rural regions often develop SSP processes in an attempt to transform spatial-economic, social and ecological conditions, as well as to support structural shifts away from, for example, an industry-based approach, towards a service-oriented urban region or the knowledge-economy (Oliveira 2016).

In recent years, sustainable development and environmental concerns such as climate change adaptation and reversing land degradation have become important objectives of strategic spatial plans (Frank and Marsden 2016, Hersperger et al. 2019). SSP processes can open opportunities for discussion, arbitration and settling conflicts between preserving biologically-diverse ecosystems and issues of economic development, particular crucial in land-use frontiers (Demazière and Serrano 2017, Huaranca et al. 2019). SSP also enables regulating the strategies and interests of private actors and subjecting them to shared rules and vision (Bryson and Slotterback 2017). Hence, SSP may constitute a useful but yet under-researched approach to address some of the challenges posed to the governance of land-use frontier regions, including the livelihoods needs of rural communities and smallholder farmers, land grabbing (Tanner 2013, Batterbury and Ndi 2018) and commodity crop expansion and associated deforestation (Meyfroidt et al. 2014).

The objective of this study was to investigate how SSP can play a role in governing land-use frontiers, with a focus on a case-study analysis of Mozambique as an emerging investment frontier (see Bey et al. 2020, and Abeygunawardane et al. 2020 for studies on Mozambique as a land-use frontier). We gathered empirical data by means of qualitative in-depth interviewing with a range of stakeholders in rural issues and planning in Mozambique. Below, we begin by providing a description of the methodologies used in the analysis. This is followed by the results section in which we explore current global challenges in land-use frontiers based on a literature review. Then, we debate the structural factors hindering longer-term territorial development in Mozambique based on qualitative analysis of the interviews and policy documents content. This section concludes with a summary of the key domains of a SSP process applied to the spatial context of land-use frontiers. Based on this, we propose and discuss a framework to explain how SSP could play a role in governing emerging land-use frontiers and supporting a socially, economically and ecologically sustainable future for the local communities involved, whilst addressing prime global land-use challenges in such land-use change hotspots.

Ultimately, this study complements and pushes forward Rudel and Meyfroidt's (2014) call for developing strategic approach to spatial planning in regions where local communities articulate visions, elaborate strategies and mobilize an array of resources to achieve common land-use purposes, foster the resilience of land systems and sustain ecosystem services and livelihoods. Furthermore, and given the multi-level and multi-scale participatory nature of SSP, enabling wider citizen engagement, this paper aligns with Scoones's (2016) research agenda on transformations for sustainability and development (cf. Reis et al. 2020). Scoones (2016) appeals to new forms of governance connecting people to places globally across networks and linking diverse actors—state and non-state—through political alliances, diverse knowledge exchange and collective organization.

METHODS

Our study builds on a case-study investigation of Mozambique as a land-use frontier. Case studies are an appropriate research strategy for seeking insights into the dynamics of a specific territorial and institutional setting (Eisenhardt 1989) as an investment frontier (Kronenburg García et al. 2021). We interviewed 30 experts based in Mozambique's capital, Maputo, who were affiliated to governmental and non-governmental entities involved in the broad field of spatial planning and natural resources management (Table 1). The interviews were carried out in Portuguese at the interviewees' workplaces throughout June 2019. The interviews lasted, on average, 90 minutes and were recorded digitally and subsequently fully transcribed. The interviews were conducted by using a semi-structured interview guide composed with open-end questions and expanded according to the insights gathered after conversation with the research team involved in the project XXXX. We also built on the results from a workshop organized in Maputo in September 2018 involving academics, local-based land governance and territorial planning experts along with actors from the food-and-agribusiness sector. Interview data were complemented with a content analysis of literature and policy documents, specifically regarding Mozambique's National Land Use Policy nº 10/95 and Land Law nº 19/97, as well as official territorial management plans (see notes in Table 1).

Table 1. Interviewees of this study, presented by primary focus of the questions

Land policy and administration	**Land delimitation, including community land delimitation and DUAT† registry support**	**Supporting, cooperation or advisory work on natural-resources management**	**Researching (or supporting research) on territorial development challenges**
National Directorate for Spatial Planning and Resettlement (DINOTER)# *(2 interviewees)*	Community Land Initiative Foundation (iTC-F) *(2 interviewees)*	National Sustainable Development Fund (FNDS)†† *(2 interviewees)*	Faculty of Agronomy and Forestry Engineering, Eduardo Mondlane University (UEM)†††† *(3 interviewees)*
National Directorate for Land (DINAT)# *(2 interviewees)*	Rural Aid Association or Association for Rural Mutual Help (ORAM) *(2 interviewees)*	Norwegian Embassy *(2 interviewees)*	Rural Environment Observatory (OMR) *(2 interviewee)*
Mozambique National Union of Peasants (UNAC)# *(1 interviewee)*	*Terra Firma Lda* (1 interviewee)	*We Effect* and the Swedish Embassy *(1 interviewee)*	
	Verde Azul Lda (4 interviewees)		
		World Bank††† *(1 interviewee)*	
		Swiss Agency for Development and Cooperation *(1 interviewee)*	
		Japan International Cooperation Agency (JICA) *(2 interviewees)*	
		France-Mozambique Chamber of Commerce and Industry *(1 interviewee)*	
		The Food and Agriculture Organization (FAO) *(1 interviewee)*	

†*Direito do Uso e Aproveitamento da Terra* or Right of Use and Benefit of Land also translated as Right to Use and Profit from the Land (DUAT).
††Primarily focused on MOZLAND project – Mozambique Land Administration Project (or *Terra Segura*).
†††Primarily focused on MOZLAND project, National Territorial Development Plan (PNDT), and Strategy and Plan for Agricultural Development 2020-2029 (PEDSA II).
††††Primarily focused on spatial planning efforts as well as former territorial-based programs as PROAREA – Sustainable Rural Development or PROAGRI – Rehabilitation and Development Program for the Agriculture Sector 1999-2005.
#Primarily focused on spatial planning instruments and land policy instruments such as Mozambique's National Land Policy nº 10/95 (*Resolução 10/95 Política Nacional de Terras*) and Land Law nº 19/97 (*Lei de Terras, Lei nº 19/97, 1st of October*) and land-related legal framework. DINAT has day-to-day responsibility for land administration and is charged with maintenance and management of the national cadastral system. DINOTER is charged with spatial planning.

RESULTS

In this section, we present three sets of results. First, the results of a literature review identifying central challenges in land-use frontiers (Table 2). Second, an analysis of the structural factors hindering longer-term territorial development in Mozambique, based on interview data and policy documents (Table 3). Here we report some of the common themes and implicit consensus that emerged from the interviews, but we cannot go in full depth in analyzing the distinct views and how they relate to the strategic positioning and governance approaches of the different interviewees. Third, an articulation of the key steps toward an effective strategic spatial planning process in emerging land-use frontiers, based on literature review (Table 4). We acknowledge also that other ways of dealing with the issues at stake are possible and alternative ways of thinking governance in land-use frontiers would have been worth investigating.

Global challenges in land-use frontiers

Building on a larger literature review on strategic spatial planning instruments in tropical regions (XXXX and XXXX, in preparation), we identified here three broad underlying trends or factors that drive and influence land-use challenges in land-use frontiers (Table 2). These are, (i) economic globalization (Gasparri and le Polain de Waroux, 2015), (ii) a looming scarcity of productive land (Lambin et al. 2013), and (iii) land-governance systems (Oberlack et al. 2018). These three factors underlie six pressing challenges that interact with each other. These are commodity crop expansion and intensification of commercial plantations (Rodriguez-García et al. 2020), the particular challenges linked to transnational land deals (Nolte et al. 2016), scarcity of productive land, itself linked to heightened land competition or land rush, poverty traps and land degradation spirals in smallholder production systems, and institutional fragility hindering the development of agricultural systems that could contribute to sustainable development.

Table 2. Global challenges in land-use frontiers

Global driver		
Economic globalization →	The relaxing of international trade barriers and subsequent globalization of supply chains is an underlying driver of land-use challenges worldwide and in land-use frontiers (Lawrence et al. 2019). Economic globalization also increases the influence of large-scale agribusiness enterprises and international financial flows on land use decisions. This may in some cases lead to a weakening of national policies intended to promote land governance supporting smallholder farmers (Lambin and Meyfroidt, 2011). These economic-driven challenges affect global supply chains and demand land-based resources, resulting in changes in international prices, as well as transnational flows of commodities, capital and labor (Hertel et al. 2019).	
	Global challenge	**Explanation**
	(A) Commodity crop expansion and intensification of commercial plantations	Expansion of large-scale, export-oriented, intensive crop production has transformed dramatically rural landscapes and communities within in frontier regions (Meyfroidt et al. 2010). Commodity crop expansion into forests or available cropland also affect local communities as they use this land for logging, grazing, or fallows among other uses (Haberl et al. 2007, Ramankutty et al. 2008). Commercial or large-scale plantations of palm trees or timber in frontier regions involve different socio-spatial challenges (Garrett et al. 2018). For example, the overcapacity of wood-based industries require large amounts of timber, which encourages forest clearing (Curran et al. 2004).
	(B) Transnational land deals or transnational land acquisitions	Transnational land deals or large-scale land deals specifically refer to the acquisition of land or land-based investments (i.e. deals), primarily targeting the Global South and Eastern Europe. This term is usually restricted to deals in low and middle-income countries only and exclude deals where only domestic actors are involved (Anseeuw et al. 2012). The main land uses envisioned in these deals are agriculture, forestry and speculation.

<table>
<tr><td rowspan="4">Looming scarcity of productive land →</td><td colspan="2">Economic globalization combined with the looming global land scarcity increases the complexity of future pathways of land-use change globally (Lambin and Meyfroidt 2011). Land resource scarcities will likely continue to be a constraint in the quest for achieving food security in land-use frontiers (cf. Alexandratos and Bruinsma 2012).</td></tr>
<tr><td>Global challenge</td><td>Explanation</td></tr>
<tr><td>Land scarcity*</td><td>The acceleration of economic globalization in tandem with a looming scarcity of productive land globally (Lambin et al. 2013) may render land governance strategies or land use policies less effective in promoting land uses that enhance food production while preserving ecosystems (Meyfroidt et al. 2013). Productive land suitable for cropping is a globally finite and scarce natural resource, to which commodity crop expansion contributes (Ridoutt and Navarro Garcia 2020).</td></tr>
<tr><td>Land competition or land rush*

*In Figure 1 included under (B)</td><td>Investors are competing for land with smallholder farmers and local farming communities (Anseeuw et al. 2012). Developing countries supply important commodities, biodiversity, and carbon sinks to the rest of the world. In this context, land-use frontiers emerge as satisfying demands from distant countries for agricultural goods and mining products (Andriamihaja et al. 2019). These land-use dynamics are leading to the emergence of trans-scalar situations, where external forces outpace local conditions of land-use change (Eakin et al. 2014), and driving increasing strain on existing land governance systems.</td></tr>
<tr><td rowspan="4">Land governance systems →</td><td colspan="2">The dynamic interactions between different local and distant actors are part of the challenges of governing land use globally, primarily along the nexus subsistence versus commercial agriculture and the nexus smallholder versus large-holder agricultural systems (Meyfroidt et al. 2020)</td></tr>
<tr><td>Global challenge</td><td>Explanation</td></tr>
<tr><td>(C) Poverty traps and land degradation spirals in smallholder production systems</td><td>Smallholder-led production systems are an important piece of current agricultural production, with 70% of the food calories in Latin America, sub-Saharan Africa, and South and East Asia produced in likely smallholder-dominated areas (Samberg et al. 2016). Literature suggests that positive spillovers can arise from the coexistence of large-scale and smallholder farming (Deininger and Xia 2016). However, large-scale investments often result in smallholders' marginalization (Oberlack et al. 2016), leaving them without prospects outside agriculture due to the limited absorption capacity of other sectors of the economy (Li 2011). Smallholders' challenges are mostly linked to a poverty circle in which they are embedded and often incapable of leaving. This social condition aggravates because of increasingly small plots for crop production associated to degraded land (Nhantumbo 1997, Meyfroidt et al. 2018).</td></tr>
<tr><td>(D) Institutional fragility hindering the development of a commercial agriculture that contributes to sustainable development</td><td>Institutional fragility is often defined as a situation in which different institutional dimensions are not progressing at the same pace and thus create internal friction and conflict during development processes (Shi et al. 2017). This fragility or weak institutional capacity is considered as challenge for developing a commercial agriculture that contributes to sustainable development i.e. improve livelihoods, contribute to food security, among others. First, from a spatial planning perspective, there are often strong relationships between hard infrastructures as roads and railways and land-use dynamics (Searle 2017). For example, Meir et al. (2019) reports that the lack of quality roads is a conspicuous feature of frontiers hindering their development path. Emerging or consolidated land-use frontiers, as the Amazon Region, have seen an exponential grow, not only in roads but also in large-scale water projects, such as hydropower dams and navigation facilities. The Amazon Region is actually one of the most active frontiers of infrastructure expansion, resource extraction and socioecological exploitation in the world today (Ioris 2020). Transportation costs of agricultural or forestry products can be substantially modified by investments in infrastructures (Chomitz and Gray 1996). Institutions can be perceived as soft infrastructures (Fung et al. 2005). Examples are unclear contract rules for service providers, tardiness of market or broadly economic reforms or inadequate procedures for declaring farm income.</td></tr>
</table>

Source: Authors' own elaboration.

Structural factors hindering long-term territorial development in Mozambique

From our interview data, we identified several insights on the structural factors hindering long-term territorial development in Mozambique: (i) lack of a strategic vision, (ii) short-termism of political cycles, (iii) non-legal recognition of local-rural communities, (iv) weak land rights

registration and community land delimitation system, and (v) pronounced dependency of donors' agendas, programs and their funding schemes (Table 3).

Table 3. Structural factors hindering longer-term territorial development in Mozambique

Structural factors	Explanation
(i) Lack of a strategic vision	According to interviewees, Mozambique public authorities embrace a 'reactive' approach towards development in contrast to a 'pro-active' one, the latter often entailing the definition of a long-term vision targeting territorial development over 20 to 50 years. This means that, overall, spatial planning and territorial development are primarily project-based, supported through short-term interventions. A strategic spatial planning approach is commonly associated to a focus on key strategic domains i.e. domains in which the country could anchor its development approach (Hersperger et al. 2019, Albrechts et al. 2017). However, these key domains have not yet been identified in the country. Some interviewees suggest that the forthcoming National Territorial Development Plan (PNDT) identifies and describes key strategic domains; however, other interviewees remain unconvinced about the efficacy of PNDT and of those domains in steering long-term territorial development. Specifically, one interviewee stated that 'PNDT is done but nobody knows if Government will implement its visions or not'.
(ii) Short-termism of political cycles	The five-year political cycle hinders a more strategic-oriented, long-term definition of spatial planning and territorial development. Interviewees highlight that public entities spend five years defining their strategies and short-terms actions and in the end of the fifth year, new elections lead to a new government, which requires then a reframing of governance arrangements and approaches towards territorial development. The political cycles, and therefore the political systems, break with pathways of progress, according to interviewees. They further clarify: 'Mozambique was often in a positive development path but a new government, and therefore, new political visions arrive, impacting ongoing projects and ending programs'. One interviewee stressed that there is within the public entities an 'incapacity to secure a continuous development when examples are positive', the interviewee gave the agroecological zoning plans of early 1990s as example of a positive intervention balancing the three pillars of sustainability that was discontinued.
(iii) Non-legal recognition of local-rural communities	Although Mozambique's Land Law gives communities the right to control and participate in the development of their land and so communities can offer proof of land rights through oral testimony, eliminating the costly obstacles of surveying, registration, and titling, local-rural communities across the country are only a group of individuals, interviewees have stated. This means, that communities are not properly defined and self-proclaimed communities' leaders or spokespersons may only represent certain interest within the community. For example, if a local or distal investor applies for land held under a community Right of Use and Benefit of Land (DUAT), the above-mentioned law requires the investor to consult with the community, and secure their agreement to cede their rights to the investor. However, this often raises land-based conflicts due to the lack a community land registration system that is up-to-date and accessible nationwide. Consequently, local-rural communities have a weak sense of identity or belonging, which associated to a deep-rooted poverty, hinders the definition of endogenous development paths that could support their economic and social sustainability.
(iv) Weak land rights registration and community land delimitation system	Although the State ultimately owns all land, Mozambicans, women and men, have the right to use and benefit from the land. This right is known as a DUAT. The law defines three ways by which communities, individuals and companies can obtain a DUAT under specific conditions stated in the Law. However, Mozambicans encounter difficulties in requesting a DUAT. The process is expensive, requires several meetings at centralized locations such as the capital-cities of each province and only but a few Mozambicans can afford the process. To overcome this, the World Bank, approved in December 2018 the MOZLAND project (*Terra Segura*).broadly intended to strengthen land tenure security and improve the efficiency and accessibility of land administration services. Critics of *Terra Segura* underline that the project does not account for social transformation within a family such as dead of the title' holder and consequent transfer of DUAT. Furthermore, an integrated, nationwide digital land-registration system is not yet in place.
(v) Pronounced dependency of donors' agendas, programs and their funding schemes	Aligned with the lack of territorial strategic thinking that is holistic at the spatial and sectorial levels, is the strong dependency on third-party agendas, mainly those from donors (World Bank, Diplomatic representations). Some of the interviewees contend that this reliance is positive as it brings about some changes that otherwise would not be possible. Some argue that this relation would gain effectiveness if donors follow a nationally defined strategic agenda instead of the State following agendas defined by cooperation partners (or *parceiros da cooperação*).

Source: Authors' own elaboration based on interview data collected in June 2019 in Mozambique.

Complementing Table 3, interviewees holding expertise on land policy and administration including community land delimitation, explained that political decisions have been leading to an inefficiency of projects and donors' agendas, as different programs unfold as a hit-and-run

without being articulated within coherent development strategy. These set of interviewees underlined that a territorial-based strategy capable of transforming local-bases resources in national assets for development is necessary to secure a continuous territorial development. The same interviewees, along with those tasked with supporting or advisory work on natural-resources management, including land, pointed out that the *Agenda 2025–Mozambique's Vision and Strategies* (Committee of Counsellors 2003) could emerge as a strategic planning instrument in this quest of a collectively defined and long-term strategy for the country. Agenda 2025 is an initiative whereby a group of citizens representing the most diverse sectors of society prepared, in an independent, non-partisan and professional manner, tries to break with the government's five-year plans/agenda (*planos quinquenais*). The Agenda 2025 has the objective of establishing new ways for driving development in Mozambique. Interviewees' expect this strategic document to increase capacity in government, institutions and civil society for defining, implementing and coordinating national economic policies, programs and projects, and to ensure consistency among short-, medium- and long-term economic and social policies. Agenda 2025, however, lacks a more ambitious approach towards strategic spatial planning in rural communities. In this context, interviewees, primarily those experienced with spatial planning, argue that community level planning is pivotal to provide the foundation for a community's realistic and effective economic development efforts. Interviewees also argued that community engagement is necessary in order to have constructive relationships between government and communities. This community–government cooperation linkage is expected to lead to more equitable and sustainable public decisions and, hopefully, improve the liveability of local communities.

The group of interviewees linked to land administration as well as research on territorial development challenges in the country, highlighted that strategic plans or the general planning of the territory need to establish a mix of incomes and development activities that can act as resilience tools. This will be particularly beneficial for society during a context of crisis/catastrophe, but would need to be designed based on local-based assets and related narratives (for example, know how to best use land for production of specific local-based seeds), they further argue. They considered also that plans are required to be adapted to local realities at the present and anticipate possible negative scenarios in future (i.e. shocks such as natural disasters, economic or health crises). Spatial plans in Mozambique, independently of the level i.e. national, provincial or district level are often a onetime exercise lacking follow up processes that could adapt them to changing political or societal circumstances. In this context, interviewees underlined the need for long-term perspectives supporting territorial development. One interviewee from the group of experts on territorial cooperation specifically pointed out that linking land use plans in the rural areas to an overarching strategic plan of the whole territory is not only a governance challenge of aligning actors onto the same development narrative but also an engineering challenge. This is due to the size of the country, its heterogeneity and lack of financial resources. Interviewees also from the group of cooperation and advisory noted sharply that Mozambique's national government lacks technical and financial capacity to implement a strategy to secure long-term development. Based on these shortcomings, interviewees urged for stronger cooperation between private and public actors including multinational corporations, investors from the agribusiness and forestry operators and

donors. From the group of interviewees experts on land policy and administration, spatial planning in general and its strategic approach in particular, are considered useful, necessary and urgent yet a joint-agreement that can generate benefits for the rural communities is paramount. In this context, these interviewees reinforced that community-level, participatory planning should be the corner stone of any spatial planning process in Mozambique.

The Association for Rural Mutual Help (ORAM) has been playing an important role in supporting overarching community economic and social development in the country as well as in supporting their active engagement in decision-making concerning land uses. ORAM has been centrally involved in the dissemination of information on the land law, the identification of communities who wish to register their land and the provision of facilitation services for community land delimitation as well as in the carrying out of participatory planning and mapping exercises and in the required liaison with government structures (cf. Norfolk and Liversage 2002). Although efforts are underway to link Mozambique's administrative reforms to local participatory processes, to develop a more responsive and downwardly accountable territorial governance (Helling et al. 2005), interviewees revealed preoccupations towards the effectiveness of participatory processes within spatial planning at the community level. Interviewees from the group of experts on land delimitation, including community land delimitation emphasized that community-level planning processes, where communities are led through a series of steps to formulate their own visions and plans for the use of their land and natural resources for their own economic development, is fundamental for achieving sustainable development. In this context, crop-based associations such as the Cotton Association of Mozambique (*Associação Algodoeira de Moçambique*) or MozaCajú could help to boost civic participation and sense of identity of local communities (MozaCajú is a United States Department of Agriculture funded initiative that supports the Mozambican cashew industry).

On a more technical dimension, yet important in the broader context of social sustainability, some interviewees stressed the need for an iterative, user-friendly cadastral system, able to account for social changes such as the death of a *Direito do Uso e Aproveitamento da Terra* or Right of Use and Benefit of Land (DUAT) holder. In such a circumstances, the heirs of the parcel of land face a bureaucratic and costly process of DUAT re-titling. Interviewees who deal with these issues daily, as ORAM, *Terra Firma* and *Verde Azul* stressed also that delimited community land parcels have not been systematically and accurately incorporated into the national cadastral system by provincial cadastral services, often due to limited technical and human resources capacity, leading to data overlaps with private DUATs and concessions, and uncertainties about customary boundaries. Another hot topic in debate is the reform of the land law being led by the Ministry of Land, Environment and Rural Development (MITADER, transformed in 2020 into the *Ministério da Terra, Ambiente e Desenvolvimento Rural*). It has been in dormancy since early 2018, due to its political sensitivity during the election campaigns of 2018 and 2019. Follow up online discussions carried out by the authors with some of the interviewees in 2020 evidence that such reform process will likely go ahead, but as several institutions and actors have overlapping roles, this could become a rather complex and confusing process (cf. Norfolk et al. 2020).

Interviewees clustered in Table 1 within land delimitation, cooperation or advisory work as well as researchers concur that Mozambique lacks a genuine, effective and strategic spatial planning process. This is coupled with a lack of decentralized public administration and community involvement in developing local-level spatial plans. Early experiments in building local participation into district level planning such as PROAREA or PROAGRI were discontinued. PROAREA, a project supported by United Nations Development Program (UNDP), was designed to address the transition from reconstruction to sustainable rural development of districts hosting post-war returnees (UNDP 2000). PROAGRI, the Rehabilitation and Development Program for the Agriculture Sector 1999-2005, focused on the development of planning and financial management tools, capacity enhancement, and encouraging greater local involvement in program development. Decentralization of the financial responsibilities and planning process to the district and provincial levels took place, but was hampered by poor transition planning and erratic fund delivery from central government (Ministry of Agriculture of Mozambique, 2007). Other initiatives intended to, for instance, boost economic development of local communities by organizing it across different agroecological zones were also discontinued. For example, the objective to establish a strategic seed reserve was never implemented, this strategy was envisioned to, among other goals, teach selected farmers how to produce seeds that will be sold to other farmers. PROAGRI called for researchers to work along the whole production and value chains, and to make their findings known to farmers in collaboration with extension, private sector and policy makers. The interviewees, however, reported that prime civil society institutions such as Mozambique National Union of Peasants (UNAC) and ORAM still lack access to the latest findings of agricultural-based research. Therefore, strategies for community-led planning and capacity development allied with tried and tested approaches to natural resources management must be developed in cooperation between national government, investors in the agribusiness and forestry, and civil society.

Steps towards an effective strategic spatial planning process in emerging land-use frontiers

Based on a literature review, we here assess the key dimensions of a strategic spatial planning (SSP) process that could support the governance of emerging land-use frontiers. We expand the four-track approach of strategic spatial planning developed by Albrechts et al. (1999) and Van den Broeck (2001) into nine steps (Table 4). The original four-track approach is based on four interrelating types of rationality. *First*, the value rationality, i.e. the design of alternative futures. *Secondly*, communicative rationality, i.e. involving a growing number of private operators and public actors in the process. *Thirdly*, instrumental rationality, i.e. looking for optimal ways to solve the problems and achieve the envisioned future. *Fourthly*, strategic rationality, i.e. defining strategies for dealing with power relations (Albrechts 2004).

Thinking of SSP processes in emerging land-use frontiers through the lens of the four-track approach paves the way for alternatives to look into the future, to think about efficacy and action and to deal with visioning and place-based governance challenges, including consensus building (Innes et al. 1994). The proposed steps are thought as fluid and dynamic, meaning that they are not a set of rigid rules but rather flexible and adaptive tools, corresponding to the dynamic and uncertain context of emerging land use frontiers, which constitute "a spatial-based ground of response" to shocks in distal markets (Ioris 2020).

Table 4. Key steps toward an effective strategic spatial planning (SSP) process in emerging land-use frontiers

Steps	Strategic intent of the step and key literature
Track one: Value rationality > *the design of alternative futures*	
(1) Vision making > Designing visions of alternative development paths	A vision is an integrated long-term spatial logic in which land use regulations, including zoning, are framed (Albrechts 2010). These regulations are used for resource protection, for sustainable development (Hersperger et al. 2019), for spatial quality, for equity, to enhance action-orientation and to create a more open, multi-level type of governance arrangements based on local knowledge (Mäntysalo et al. 2015). A strategic vision is a political program aimed at community development, that is, a future community that is assumed to be better prepared to face global societal challenges than the present one (Mazza 2010).
(2) Action-oriented schemes > defining short-term actions, projects or programs	Strategic plans are often implemented through projects (Oliveira and Hersperger 2018). Projects, as strategic development projects (Pagliarin et al. 2020). These are typically medium- to large-scale projects, working as fast-track plan-implementation approaches to ensure that spatial transformation happens on the ground along the key strategic domains defined in (1). The combination of long-term perspectives (or the vision, 1) with short-term actions and projects makes creativity tangible and enables it to react almost immediately to certain urgent global societal challenges with a clear perspective as to where to go and what the likely impacts of decisions are (Albrechts 2010).
(3) Selective nature > Focused on strategic key issues supporting plan-implementation	The success of SSP depends on being focused on a limited number of issues/challenges aiming at managing transformative socio-spatial and spatial-economic change (Albrechts 2004). This means that strategic planning implies that some decisions and actions are considered more important than other decisions and that much of the process lies in making the tough decisions about what is most important for the purpose of producing fair, structural responses to those challenges involving diversity, sustainability, equity, spatial quality and equality (Albrechts 2010). However, this also means that SSP can be co-opted, in a highly selective manner, to serve a range of different, even competing and conflicting, ideological, political and policy agendas (Atkinson 2010).
Track two: Communicative rationality > *involving a growing number of private operators and public actors*	
(4) Political engagement > bringing political agents to support the defined vision (1)	The success of a SSP process in influenced by how political agents are in favor of the defined vision (1) (Albrechts and Balducci 2013). Therefore, SSP is a political process and political agents are involved in the definition of the vision they will likely support it throughout the process (Mazza 2010), which includes plan-making and plan-implementation (Oliveira and Hersperger 2018). For Kunzmann (2000), a strategic plan is a possible opportunity, depending on political will and on specific circumstances, a blank slate waiting for collective action, which considers possible convergences of opinion, political views and compromises (Forester 1989, Friedmann 1992).
(5) Co-production > multi-level and trans-scalar governance arrangements	Co-production acknowledges the value of multi-actor collaboration. It opens consensus-based governance networks more widely, to cover diverse interests related to, not only economic (Mäntysalo and Grišakov 2017), but also social (Hersperger et al. 2019) and environmental issues (Servillo 2017), including land use conflicts (Nae et al. 2019, Helbron et al. 2011) and rural development (Tomaney et al. 2019).
(6) Participatory scenarios > civic participation in scenario building	This step is fundamental to deal with drivers of expansion or intensification in land-uses frontiers. Building future scenarios aids in simulating possible impacts of spatial policies, including land use policies, land-based legislation on future land uses (Henríquez-Dole et al. 2018). Scenarios prepared trough participatory-action research methodologies such as workshops (Zaehringer et al. 2018) are crucial inputs to the effectiveness of strategic planning, as future potential land uses will be determined and conflicts can be avoided (Heinrichs et al. 2009). In this context, land-use scenarios support planners and land experts to tailor land capabilities to specific spatial settings.
Track three: Instrumental rationality > *looking for optimal ways to solve problems and achieve the envisioned future*	
(7) Mapping > integrating a spatial dimension in SSP	The effectiveness of strategic spatial planning processes depends mostly of governance arrangements (Oliveira and Hersperger 2018) but also of the inclusion of visual elements, primarily maps (Grădinaru and Hersperger 2018), for example, asset mapping or mapping strategic key issues (3). Maps support plan-implementation and contribute

	to sustainable uses of land by identifying the spatial location of different types of land use (e.g. built-up areas, for nature conservation) and land cover (e.g. cropland, grassland) (Mazza, 2010, Amler et al. 2011). Hillier (2007) proposes a reflection on the activity of mapping practiced in strategic planning as explorations of potentials.
Track four: Strategic rationality > *defining strategies for dealing with power relations and path-dependencies*	
(8) Strategic framing > designing strategic frameworks for action	Strategic framing implies alternative institutional work and a sensibility for new debates and struggles of a territory (Balducci 2010). Framing a strategy during the plan-making phase requires an interrelation of the active work of individuals and institutions. These within a social processes (the level of agency) with interactions, in the form of discussions and action-oriented cooperation, with economic organizations, political organizations, social dynamics with due considerations for natural forces (the level of structure of social relation) (Healey 2007). This recognizes that, although occurring within a context of powerful structuring forces (power relationships) as well as governance arrangements (Oliveira and Hersperger 2018), strategic spatial planning, may be used by social groups to design strategic frameworks. These frameworks could influence the flows of events that affect them within a structured field of action, in a social, political and cultural constructivist perspective (Healey 1997, Balducci 2010,).
(9) Defining finances > strategically defining funding schemes supporting the vision (1)	The implementation of strategic plans depends on the availability of funding (Oliveira and Hersperger 2018). Credible commitments to action engagement and a clear and explicit link to the budget are needed, where the citizens, the private sector, different levels of governance and planners enter fair, administrative and financial agreements to realize the vision (1) through short-term actions (3) (Albrechts 2010) or projects (Pagliarin et al. 2020).

Source: Authors' own elaboration.

These steps of a SSP process are presented not as a normative proposition for land-use frontiers but as a set of tools, organized in a method, for creating and steering a range of better futures.

DISCUSSION

Here we articulate the insights from the three Results section, to discuss how the nine steps identified toward an effective SSP (Table 4) can contribute to address the structural factors in Mozambique that hinder long-term territorial development (Table 3), in order to find solutions to major global land-use challenges in emerging land-use frontiers (Table 2) (see Figure 1). This integrated perspective produces quite a different picture than that resulting from traditional land-governance policies such as land use plans or zoning, while focusing on local assets and networks in a global context. Figure 1 represents a hybrid framework, combining insights from case-study work (the red boxes in the right side, derived from Table 3) and literature inputs in the blue boxes in the left side, derived from Table 2 and green boxes placed in the center (derived from Table 4). The elbow connectors (the backbone of this discussion and novelty of this analysis) represent how we envision strategic spatial planning (center) to support the governance of land-use frontiers i.e. (i) addressing global challenges, while (ii) contributing to overcome structural barriers to sustainable development in Mozambique. We hereby propose alternative pathways of territorial development for the country as well as for emerging land-use frontiers confronted with similar contexts and dynamics. We underline again the heterogeneity of the case-study work and insights from the interviews, which, taken together, helped to reveal some of the issues at stake.

Our results reflect a conundrum of challenges and possible ways to overcome them. Although the issues overlap and intersect one another, and other ways to analyze these issues could have

been possible, our analytical framework and embedded components, emerged from putting into perspective the discourses and priorities ventilated by interviewees along with several scholarly perspectives on land-use issues in frontier regions. Further, it is not the contention of this study to dissect, for instance, the differences or similarities between transnational land deals and land competition or a reaction to land scarcity. This will be done properly elsewhere. Global land-based drivers and challenges usually require local solutions, with the preferred approach depending on current use, soil characteristics, topography, access to water and agricultural inputs, infrastructure, as well as socio-economic conditions and governance. Nevertheless, analyses of local realities, such as those of Mozambique, and development of local solutions can be more effective if they build on an understanding of national and global contexts, in order to foresee future system stresses and anticipate the spillovers and broader consequences of local solutions (Rounsevell et al. 2012). In order for strategic plans to transform the spatial condition of a territory, their narratives have to be persuasive in the broader society, often by borrowing on and engaging with already, existing narratives (Van Assche et al. 2021). Furthermore, long-term perspectives can act as powerful coordination tools for policy processes (Beunen and Lata 2021).

Below we discuss five key insights that emerge from the interconnectedness among the components (numbers and letters in parentheses refer to boxes in Figure 1). We bring forward here a narrative that, to the best of our knowledge, is meaningful and relevant, but perhaps not the only one that could have been explored within land-use change hotspots as frontier regions.

1. The design of visions for alternative futures (1) combined with short-term actions (2) focused on strategic key issues (3) are the steps that better suit a response to commodity crop expansion and intensification of commercial plantations (A) and to overcome a lack of a strategic vision in Mozambique (i).

The process of designing a territorial-based vision and its product are useful learning schemes for raising awareness of the need for change in the direction of development patterns. Envisioning is the process by which individuals, or preferably groups, develop visions of future states for their organizations, their cities or their countries (Goodstein et al. 1993). Commodity crop expansion is a common issue across emerging land-use frontiers, including Mozambique (see Meyfroidt et al. 2014 for commodity crop expansion in tropical forest landscapes and Abeygunawardane et al. 2020 for an overview of land-based investing in Southern and Eastern Africa). However, a lack of a sensible long-term and strategic vision for the country put local actors in a passive position, hindering the development of an alternative and sustainable response to such global land use pressures. Such a vision needs to be designed in relation to the social values and assets to which a particular territory is historically committed (Ozbekhan 1969). Such an envisioning process aims to provide a long-term vision, and thus needs to be complemented with short-term actions focused on strategic key issues (cf. Albrechts 2010). The vision provides a bridge from what a territory is, in terms of its assets and key strategic domains (e.g. quality of transportation facilities, education systems responding to job-market demands, agricultural potential for crops or pastures), to what communities want it to become in the future (Cerreta et al. 2010). However, the literature on SSP shows that the success of strategic plans

often depends on how abstract discourses articulated in the above-mentioned vision are turned into tangible projects and are redefined into a more familiar vocabulary of statutory planning (Olesen and Richardson 2012) or short-term actions (Albrechts 2010). Short-term actions concern acting in such a way as to make the future conform to the designed vision through a realistic implementation scenario. In the case of Mozambique our evidence suggest that improvement of road infrastructures, including along development corridors (e.g. *Nacala Corridor*, *The Beira Agricultural Growth Corridor*), reinforcing other infrastructures such as storage capacity for agriculture-based products, seed inventory and storage or the upgrade of the telecommunication and energy grid would be effective in supporting a longer-term vision. Aligning a vision with short-term actions, focused on key strategic domains or spatial qualities (cf. Oliveira 2016), would allow land-use frontiers to steer a trajectory of development (defined by the vision) in a more autonomous yet sustainable manner in coordination, but not in dependence with large-scale land investors for commercial crop expansion or intensification of commercial plantations.

2. A focus on strategic key issues supporting plan-implementation (3) coupled with the SSP step of bringing political agents to support the defined vision (4) are fit to respond to transnational land deals or land acquisitions issues (B) and to compensate for the short-termism of political cycles in Mozambique (ii).

Fueled, in part, by the 2008 global food crisis, an estimated 90 million hectares of arable land have been purchased or leased by foreign investors since the early 2000s (The Land Matrix 2021). These transnational land deals or land acquisitions predominantly target agricultural land in sub-Saharan Africa, Asia, Eastern Europe, and Latin America, where prevailing yield gaps and land commodification allow distant actors to profit by developing commodity agriculture production or through land speculation (D'Odorico and Rulli 2013). These investments often proclaim fast-track paths to rural development but often fail in sustaining livelihoods of local communities (Russo Lopes et al. 2021). By replacing traditional farming with intensified agriculture, this global land rush poses key challenges to food systems in Mozambique (Gomes 2020). Yet, transnational investors are highly heterogeneous in their motivations, agricultural systems and potential contributions to unlocking capital constraints in agricultural and rural development (Abeygunawardane et al. 2020). A strategic spatial planning is thought to cultivate a mindset that is willing to explore new concepts and new ideas and to look for alternatives that build on local and expert knowledge and constitute responsive, well-informed, just and context-sensitive planning processes (Albrechts 2017). Framing SSP as co-production reframes the relation between government and citizens (Kalliomäki 2015). This aligns with the idea of strategic action field of Fligstein and MacAdam (2011), where individual and collective actors interact based on a set of common understandings about the purposes of the field. Emerging land-use frontiers are socio-spatial territories prolific with opportunities and possibilities (Meyfroidt et al. 2018). A SSP would focus on their key issues (arable land available *versus* lack of local-based financial capital resources, potential for increasing crop production by own means of labor force *versus* neglected infrastructures hindering distribution and commercialization of agricultural products). It would also focus on spatial qualities or assets

(e.g. fertile land, availability of water, expertise on growing specific crops for use as fiber and food) and bring together divergent voices.

In the context of Mozambique, a SSP process for the longer-term, i.e. 15 or more years, would supporting land governance more independently than the current scenarios of stronger attachment to governmental decision-making (political cycle five years long). Political volatility creates uncertainty for territorial development and the governance of land-based resources, with rotations of politicians and shifting demands (Giezen 2012). In a vision of SSP as a co-production approach (Albrechts 2012), a planning process becomes a private-public-citizen-driven activity and thus spatially embedded (i.e. embedded in local communities) and encroached into place-based governance settings. With this, decisions into the future (those 15 or more years) will result from joint public and private interests, they will be carried on by independent mobilization in civil society and the strategic vision will emerge beyond political cycles, outside a single government's agenda. In the majority of cases, this includes not only formal or informal negotiations with the public sector, but also the ability to navigate those spheres which influence policy making i.e. mainstream media, social media narratives, global opinion makers, donors or the academic sector (cf. Galuszka 2020). Transnational land deals involve strong power imbalances, yet mobilizing actors around a shared vision can counterbalance these power imbalances to support local communities in using their own qualities or assets, both tangible (their land) and intangible (their knowledge). The nurturing of social capital and a sense of identify and attachment within local communities can contribute to embed trajectories of territorial development in local realities and in localized governance settings. As suggested by Ackerman (2004), this may involve three levels of actions. First, reflecting participatory mechanism in strategic sectoral/spatial documents of government. Secondly, setting up new agencies, which assure societal participation. Thirdly, inscribing civic participatory mechanism into law, which in the case of Mozambique already exists (Article 24 of the Land Law n º 19/97) but according to interviewees is seldom used when, comes to land-based investment decisions.

3. Gathering political agents to support the defined vision (4) paves the way to mitigate poverty traps and land degradation spirals in smallholder production systems (C) by overcoming the negative impacts of the non-legal recognition of local-rural communities in Mozambique (iii). To this end, multi-level and trans-scalar governance arrangements (5) and civic participation in scenario building (6) are required.

Although this paper is sympathetic in relation to SSP as co-produced process (i.e. wider involvement of public, private and civil society), political agents nevertheless play a key role in designing a territorial vision. In contrast with traditional land use planning, the context of global land pressures that manifest in contextual outcomes calls for a SSP that is more multi-level and trans-scalar governance arrangements (Rudel and Meyfroidt 2014). In the case of Mozambique, defining an effective strategic vision and supporting short-term actions requires going beyond what national-level decision-makers and experts based in Maputo think about. Provincial, district as well as local leaders need to join forces, procedures and be resourceful in shaping a vision. A trans-scalar planning would (i) bring together public and private actors

influencing directly or indirectly land systems, but typically operate at different scales, from global to local, (ii) take into account tradeoffs between local realities and broader sustainability issues, and (iii) integrate emerging private-led and market-based instruments of land use governance. This approach is particular relevant in Mozambique as smallholder agriculture is still the dominant form of agricultural production and the basis of livelihoods of the rural population. Nearly 80% of the rural population relies on subsistence agriculture from small-scale farming, practiced with low inputs of technology, fertilizer, and irrigation (Rose and Carrilho 2012), 70% of the population lives below the national poverty line, and 35% of households are chronically food insecure (Di Matteo and Schoneveld 2016, Chigara 2013, IFAD 2016, Zagema 2011). These is also in in line with Norfolk et al. (2020). These researchers, experienced with planning and land-use rights in Mozambique, contend that transfer of power and control to communities opens up chances to improve management practices, to benefit from statutory incentives for natural resource management and conservation and to more effectively contribute to broader spatial planning processes. Their work (Norfolk et al. 2020) also describes how participatory land use planning and visioning exercises at community level, when coupled with the documentation and certification of community, household and individual land rights, can establish a basis for identifying and negotiating access to land for investment purposes. In an analysis of the efforts in Mozambique to level the playing field for local communities, in the context of a surge in private investment, German et al. (2016) stressed that if communities had any meaningful role in the planning process, they would undoubtedly push for crops with more immediate financial returns in comparison to, for example, planting of eucalyptus. Multidisciplinary ideas, methods and theories are needed to support smallholder production systems, including scenario building. Scenario building is a tool for designing possible futures and for determining how to get from here (a current state of development) to there (a future, ideally alternative development state), what has to be changed first and what next (Albrechts 2010). Scenarios augment understanding by helping planners and decision-makers to see what possible futures might look like. Without scenarios or new ideas about how to tackle the developments and challenges into the future, planning efforts seem doomed to repeat past failures (Cerreta et al. 2010). Building on Barbanente et al. (2002) and Albrechts (2010), such scenario building can become a learning process if realized through civic participation and the integration of the knowledge of what might happen with an understanding of the driving forces and a sense of what it means to local communities. Active participation in a collective action of scenario building may generate trust, as participants in the process are likely to find that (and to understand why) some scenarios present a future that they would like, while others would be highly undesirable. It is widely acknowledged that scenario building is also relevant to coordinate sustainable rural development policies (Lowery et al. 2020), which are becoming increasingly complex and challenging, particular in land-use frontiers (Nascimento et al. 2019).

4. Integrating a spatial dimension in SSP (7) is necessary for addressing institutional fragility hindering the development of a commercial agriculture (D) and straightening, simultaneously, the weak land rights registration and community land delimitation system in Mozambique (iv).

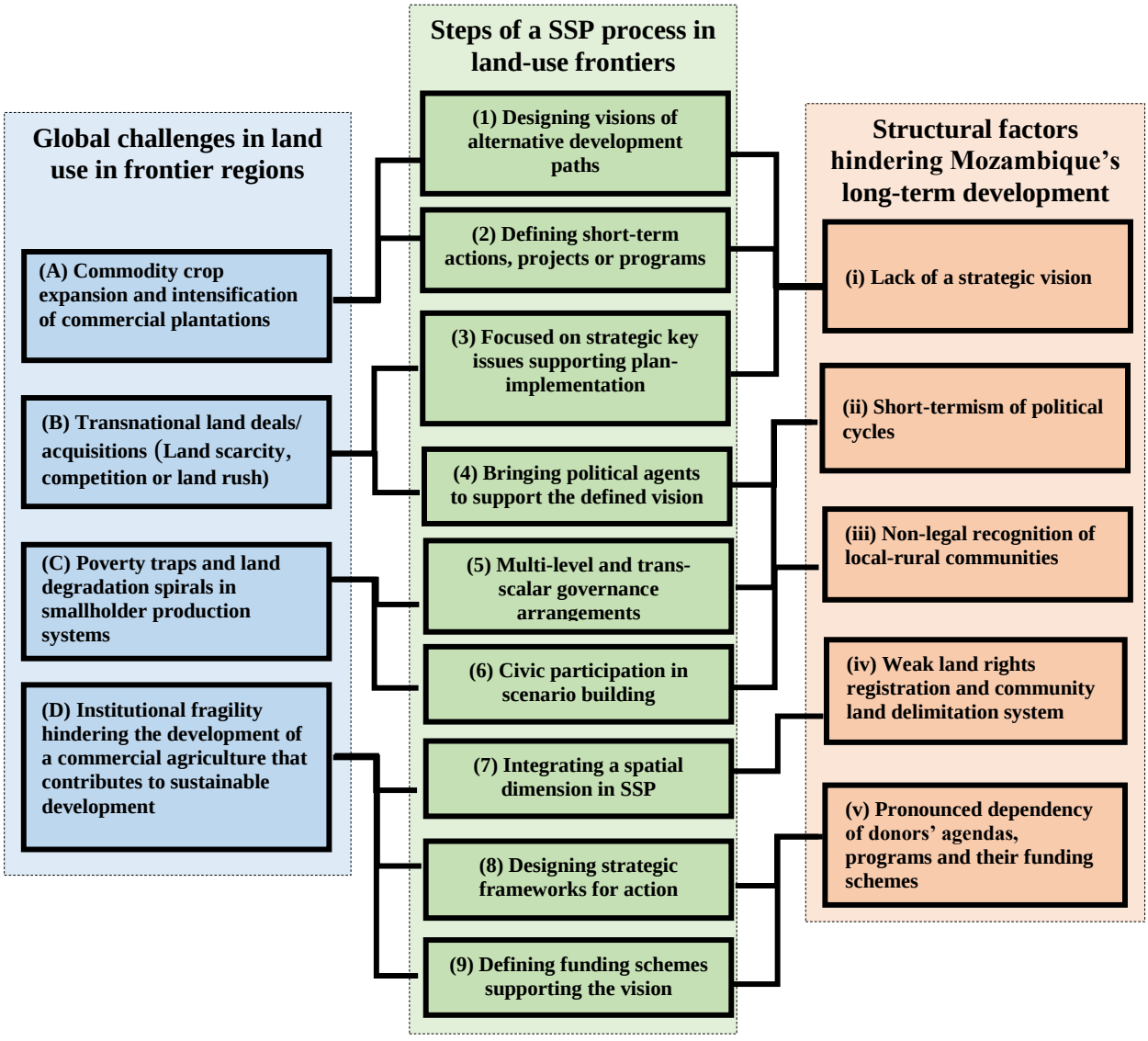
The rational of this interconnectedness complements Hamilton's (2003) argument that the concept of sustainability cannot be imagined without acknowledging the politics of difference, spatial qualities, cultural differences and the spatial dimension of these differences and qualities. In strategic spatial plans, the spatial dimension refers to an explicit geographical location (the *where* of natural and social landscape amenities as rivers, water reservoirs, available land parcels, conservation areas etc.) (cf. Healey 2006). In line with Healey (1997), SSP processes need to balance strategy and 'spatialization' (geographical location) such as providing land supply for demographic projections of new households or coordinating infrastructure and development as well as identifying land for developing commercial agriculture. To address the factors hindering the development of a commercial agricultural sector that contributes to sustainability and rural livelihoods, such a spatial dimension must address the key issues of weak land rights registration and community land delimitation system in Mozambique. In most European countries with a consolidated planning practice, the spatial dimension remains central (cf. Oliveira and Hersperger 2018). In this respect, SSP have kept a very strong focus on the spatiality of economic and social processes. Institutions such as governments, development agencies and donors will have access to scenario storylines of possible future developments and how they play out on a map or a physical plan. Hence, a strategic spatial plan will go beyond narratives or often abstract scenarios but will put forward concrete, geographically identifiable issues and assets, most notably on investments (e.g. for agribusiness, forestry), business climate, transportation and governance. In synthesis, a vision of future developments becomes spatially integrated providing a coherent logic for designing strategic frameworks for action (cf. Healey 1997).

5. Designing strategic frameworks for action (8) complemented with the definition of funding schemes supporting the vision (8) would reduce dependency of donors' agendas, programs and their funding schemes (v).

In line with the above, achieving a long-term vision demands short-terms actions based on tangible, realistic strategic frameworks. As Pfeffer and Sutton (2000) put it, the gap between knowing what to do and actually doing, can be excruciatingly real. Strategic frameworks for action help to fill this gap by proposing concrete activities, projects, measures not as punctual interventions (short-term actions) but strategic in nature. Strategic frameworks build on two views. First, the dynamic view of strategy (cf. Regnér 2008). This means that strategy manifests in purposive action rather than in intentions – this would support land-use frontiers to become more resilient. Under a SSP, Figure 1 suggests this 'frameworks for action' as a way to support land-use frontiers to become more resilient to economic, political and natural shocks. Public entities would not need to draw a new vision in the context of change but to develop frameworks responding to those potential changes or shocks while staying within the long-term track of the strategy. Secondly, the 'bricolage' view. In strategy making, 'bricolage' refers to a creative and adaptive management of knowledge and local-based practices and available resources towards a needed change, it can also be seen as an adaptation of knowledge and practices (cf. Concilio 2010). In this sense, *bricoleurs* acting as brokers e.g. planners, decision-makers and other territorial experts act in chaotic conditions and put order out of them (Weick 2001). In addition to being adaptive, these frameworks for action require funding schemes or financial mechanisms

(Oliveira and Hersperger 2018). The availability of funding influences the implementation of strategic frameworks for action integrated in SSP (Buček 2016, Legacy and Leshinsky 2016). In land-use frontiers, obtaining financial capital is highly dependent of donors' agendas, programs and their funding schemes. Interviewees in Mozambique convincingly stated that it has become the habit that the national government expect continuous support for initiatives and projects from donors. This has led to a new dependency culture, and has fostered an attitude where applications for funding follow the interest of the program managers, rather than local needs and requirements. Emerging land-use frontiers as Mozambique need to be able to establish independent funding sources, which is extremely challenging. Synergies with private actors can contribute to this, but requires being combined with the steps discussed above in order for SSP processes to be rooted in local communities, their key issues and their spatial qualities.

Figure 1. Strategic spatial planning (SSP) framework in and for land use frontiers. ***Authors' own.***



CONCLUSION

The strength of strategic spatial planning (SSP) in emerging land-use frontiers lies in the *how* – working with societal stakeholders, including large-scale land-based investors, to pave the way for a more sustainable and equitable territorial development of rural local communities. Drawing from interviewees' statements, this study evidence that even if there are promising avenues for creating sustainable development and agricultural production in land-use frontiers that delivers benefits for every stakeholder, including local communities, realizing these benefits requires that a sufficient number of public and private actors marry their incumbent interests to make sustainability the standard approach. Specifically in the case-study area, our findings reveal a centralized land-governance regime in Mozambique intertwined with well-established political elites. Government-led planning processes largely neglect rural populations, mainly those using and benefiting from land through the customary-rights regime. Displacement of local communities with weak bargaining power from the land they have been accessing for years, and resettlement with insufficient compensations, are issues that might grow with unchecked transnational investments. In addition, interviewees express that during planning processes or when confronted with a proposal for a land acquisition, public entities overlook community consultation (and their active participation) in the privilege of large transnational agricultural and forestry corporations' interest. To overcome these constraints, the majority of the interviewees call for a thorough long-term territorial development strategy. Complementing their views with insights from SSP literature, we conclude by proposing nine steps of a SSP process. These steps are essential components in which strategic planning could support the governance of land-use frontiers towards sustainability. We pointed out these components in Table 4 and Figure 1. There are, however, caveats. First, SSP does not flow smoothly from one phase to the next or from one-step to another. It is a dynamic and creative process. Secondly, SSP is highly context-sensitive – this means that SSP needs a specific political and institutional context and is sensitive to specific intellectual traditions, narratives and governance settings. Therefore, the capacity of a SSP process to support the governance of land-use frontiers, including streamlining longer-term territorial development in the direction of sustainability, is dependent not only on the legal-political system itself (land law, planning acts), but also on the conditions underlying that legal-political system. This demands a contextual understanding of power dynamics – including donors' agendas and interests of the food-and-agribusiness sector. Here are our proposals to overcome these limitations:

First, strengthening institutional and decision-making capacity – at the community level would enable them to define their own development paths. Key instruments are the formal delimitation of community land rights and establishing an entity with legal personality for the community that allows it to deal directly and autonomously with land-based investors, nationals of foreign. Secondly, facilitating the participatory mapping and planning of current and future land and natural-resource uses within local communities, and identifying local threats and opportunities related to their land rights would enable individuals and families within communities to demarcate their lands and address tenure issues for women and other vulnerable members of the community. Supporting local communities' entity and its members to exercise their rights in benefiting and using land. In this quest, a SSP process should account for increasing participation

of local communities in land allocation processes by the central government. Consequently, this will help leveraging their statutory rights to access resources and therefore to establish partnerships with capitalized actors producing commodities for distal markets. A SSP in frontiers regions should also build on synergies with landscape conservation approaches related to enhancing carbon sequestration or protecting ecosystem services. As a note for future research – jurisdictional approaches to sustainable resource management have attracted increasing attention as a potential alternative to traditional conservation strategies and thus deserve additional research in the spatial context of emerging land-use frontiers, which are under pressure and in combination with SSP. This study thereby push the agenda for transdisciplinary sustainability science, approaches to co-produce transformative changes in land systems of emerging land-use frontiers as Mozambique toward social, economic and ecological sustainability.

Acknowledgements:

This research was conducted in the framework of the European Research Council (ERC) under the European Union's Horizon 2020 research and innovation program (Grant agreement No. XXXX, project XXXX).

LITERATURE CITED

Abeygunawardane, D., García, A. K., Sun Zhan, L., Müller, D., Sitoe, A. and Meyfroidt, P. 2020. Resource frontiers and agglomeration economies: the varied logics of land-based investing in Southern and Eastern Africa. AgriRxiv 34 (preprint).

Albrechts, L. 2004. Strategic spatial planning re-examined. *Environment Planning B*, 31:743-758.

Albrechts, L. 2010. How to Enhance Creativity, Diversity and Sustainability in Spatial Planning: Strategic Planning Revisited. Pages 03-25 *in* M. Cerreta, G. Concilio and V. Monno editors, *Making Strategies in Spatial Planning*. Dordrecht, the Netherlands: Springer.

Albrechts, L. 2013. Reframing strategic spatial planning by using a coproduction perspective. *Planning Theory* 121:46-63.

Albrechts, L. 2017. Some ingredients for revisiting strategic spatial planning. Pages 389–404 *in* L. Albrechts, A. Balducci, and J. Hillier editors, Situated practices of strategic planning. An international perspective. Routledge: London, UK.

Albrechts, L., and Balducci, A. 2013. Practicing strategic planning: In search of critical features to explain the strategic character of plans. *disP-The Planning Review* 49; 16–27.

Albrechts, L., and Van den Broeck, J. 2004. From discourses to acts: The case of the ROM-project in Ghent, Belgium. *Town Planning Review* 752; 127–150.

Albrechts, L., Balducci, A. and Hillier, J. editors. 2017. *Situated practices of strategic planning. An international perspective*. Routledge: London, UK.

Albrechts, L., Van den Broeck, J., Verachtert, K., Leroy, P., and Van Tatenhove, J. 1999. *Geïntegreerd Gebiedsgericht Beleid: een Methodiek. Research report by KU-Leuven and KUNijmegen en AMINAL*, Ministry of the Flemish Community, Leuven.

Alexandratos, N. and Bruinsma, J. 2012. World Agriculture: Towards 2030/2050 Global Perspective Studies Unit, Food and Agriculture Organization of the United Nations, Rome.

Amler, B., Etke, D., Eger, H., Ehrich, C., Kohler, A., Kutter, A., et al. 2011. *Land use planning: Methods, strategies and tools*. Deutsche Gesellschaft für Technische Zusammenarbeit.

Andriamihaja, O. R., Metz, F., Zaehringer, J. G., Fischer, M., and Messerli, P. 2019. Land competition under telecoupling: distant actors' environmental versus economic claims on land in north-eastern Madagascar. *Sustainability* 11:851.

Atkinson, R. 2010. Spatial Planning, Urban Policy and the Search for Integration: The Example of a Medium-Sized City. Pages 101-122 *in* M. Cerreta, G. Concilio and V. Monno, editors. *Making Strategies in Spatial Planning*. Springer: Dordrecht, the Netherlands.

Balducci, A. 2010. Strategic Planning as a Field of Practices. Pages 47-65 M. Cerreta, G. Concilio and V. Monno, editors. *Making Strategies in Spatial Planning*. Springer: Dordrecht, the Netherlands.

Barbanente, A., Khakee, A., and Puglisi, M. 2002. Scenario building for metropolitan Tunis. *Futures*, 346; 583–596.

Beunen, R. and Lata, I. B. 2021. What makes long-term perspectives endure? Lessons from Dutch nature conservation. *Futures*. 126: 102679.

Bey, A., Jetimane, J., Lisboa, S.N., Ribeiro, N., Sitoe, A. and Meyfroidt, P. 2020. Mapping smallholder and large-scale cropland dynamics with a flexible classification system and pixel-based composites in an emerging frontier of Mozambique. *Remote Sensing of Environment* 239: 111611.

Blythe, J. L., G. Murray, and M. Flaherty. 2014. Strengthening threatened communities through adaptation: insights from coastal Mozambique. *Ecology and Society* 192: 6.

Bryson, J. M., and Slotterback C. S. 2017. Strategic Spatial Planning in the USA. Pages 117-134 *in* Situated Practices of Strategic Planning: An International Perspective; Albrechts, L., Balducci, A., Hillier, J., editors. Routledge: London, UK.

Buček, J., 2016. Urban development policy challenges in East-Central Europe: governance, city regions and financialisation. *Quaestiones Geographicae, Sciendo* 35(2):7–26.

Bürgi, M., Hersperger, A.M. and Schneeberger, N. 2004. Driving forces of landscape change - current and new directions. *Landscape Ecology*, 19: 857-868.

Busscher, N., Parra, C., and Vanclay, F. 2018. Land grabbing within a protected area: The experience of local communities with conservation and forestry activities in Los Esteros del Iberá, Argentina. *Land Use Policy*, 78: 572–582.

Cerreta, M., Concilio, G. and Monno, V. editors. 2010. *Making Strategies in Spatial Planning*. Dordrecht, the Netherlands: Springer.

Chomitz, K. M. and Gray, D. A. 1996. Roads, land use, and deforestation: a spatial model applied to Belize. *The World Bank Economic Review* 10: 487–512.

Committee of Counsellors 2003. Agenda 2025 - The Nation's Vision and Strategies.

Concilio, G. 2010. Bricolaging Knowledge and Practices in Spatial Strategy-Making. Pages 281-301 M. Cerreta, G. Concilio and V. Monno, editors. *Making Strategies in Spatial Planning*. Springer: Dordrecht, the Netherlands.

Couclelis, H. 2005. Where has the future gone? Rethinking the role of integrated land-use models in spatial planning. *Environment and Planning A*, 37:1353-1371.

Creutzig, F., Bren d'Amour, C., Weddige, U., Fuss, S., Beringer, T., Gläser, A., Kalkuhl, M., Steckel, J. C., Radebach, A. and Edenhofer, O. 2019. Assessing human and environmental pressures of global land-use change 2000–2010. *Global Sustainability* 2:1–17.

Curran, L. M., Trigg, S. N., McDonald, A. K., Astiani, D., Hardiono, Y. M., Siregar, P., Caniago, I. and Kasischke, E. 2004. Lowland forest loss in protected areas of Indonesian Borneo, *Science*, 303: 1000–3.

D'Odorico, P. and Rulli, M. C. 2013. The fourth food revolution. *Nature Geoscience*. 6: 417–418.

Deininger, K., and Xia, F., 2016. Quantifying spillover effects from large land-based investment: the case of Mozambique. *World Development* 87: 227–241.

Demazière, C. and Serrano, J. 2017. The role of strategic spatial planning in territorial sustainability: The case of France. Pages 101–116 *in* Situated Practices of Strategic Planning: An International Perspective; Albrechts, L., Balducci, A., Hillier, J., editors. Routledge: London, UK.

Di Matteo, F. and Schoneveld, G. C., 2016. Agricultural Investments in Mozambique: An Analysis of Investment Trends, Business Models and Social and Environmental Conduct. Center for International Forestry Research (CIFOR).

Fligstein, N., and MacAdam, D., 2011. Toward a general theory of strategic action fields. *Sociological Theory* 29 1:1–26.

Forester, J. 1989. Planning in the face of power. Berkeley, CA: University of California Press.

Frank, A. I., and Marsden, T. K. 2016. Regional spatial planning, government and governance as recipe for sustainable development? Pages 241-271 *in* K. Andersson, S. Sjoblom, L. Granberg, P. Ehrstrom, T. Marsden editors. *Metropolitan Ruralities, Research in Rural Sociology and Development*, Emerald.

Friedmann, J. 1992. *Empowerment. The politics of alternative development*. Blackwell: Oxford, UK.

Fuchs R, Prestele R, and Verburg P.H. 2017. A global assessment of gross and net land change dynamics for current conditions and future scenarios. *Earth System Dynamics* 9:441–458.

Fung, K. C., Garcia-Herrero, A., Iizaka, H., and Siu, A. 2005. Hard or soft? Institutional reforms and infrastructure spending as determinants of foreign direct investment in China. *The Japanese Economic Review*, 564: 408–416.

Galuszka, J. 2020 Co-production- between service delivery strategy and urban governance transformation approach. Unpublished doctoral thesis. Technischen Universität Berlin.

Gasparri, N.I., and le Polain de Waroux, Y., 2015. The coupling of South American soybean and cattle production frontiers: new challenges for conservation policy and land change science. *Conservation Letters* 8: 290–298.

German, L., Cavane, E., Sitoe, A., and Braga, C. 2016. Private investment as an engine of rural development: A confrontation of theory and practice for the case of Mozambique. *Land Use Policy*, 52: 1–14.

Giezen, M. 2012. Keeping it simple? A case study into the advantages and disadvantages of reducing complexity in mega project planning. *International Journal of Project Management*, 30: 781-790.

Gomes, C. 2020. Trusted land: land deals, climate vulnerability and adaptation in Northern Mozambique, *Climate and Development*, Online first.

Goodstein, L., Nolan, T. and Pfeiffer, J. 1993. *Applied Strategic Planning*. McGraw-Hill, New York, USA.

Grădinaru, S.R. and Hersperger, A.M. 2018. Green infrastructure in strategic spatial plans: evidence from European urban regions. *Urban Forestry and Urban Greening* 40: 17-28.

Haberl, H., Erb, K.H., Krausmann, F., Gaube, V., Bondeau, A., Plutzar, C., Gingrich, S., Lucht, W., Fischer-Kowalski, M. 2007. Quantifying and mapping the human appropriation of net primary production in earth's terrestrial ecosystems. *Proceedings of the National Academy of Sciences of the United States of America* 104: 12942–12947.

Hamilton, C. 2003. *Growth fetish*. Pluto Press: London, UK.

Healey P 1997. The revival of strategic spatial planning in Europe. Pages 3–19 *In* Healey P, Khakee, A., Motte, A. and Needham, B. editors. *Making Strategic Spatial Plans*. UCL Press: London, UK.

Healey, P. 2006. Relational complexity and the imaginative power of strategic spatial planning, *European Planning Studies*, 144: 525-546.

Healey, P. 2007. *Urban complexity and spatial strategies: Towards a relational planning for our times*. Routledge: London, UK.

Heinrichs, D., Nuissl, H., and Rodríguez Seeger, C., 2009. Dispersión urbana y nuevos desafíos para la gobernanza metropolitana en América Latina: el caso de Santiago de Chile. Revista *EURE (Santiago)*, 35(104): 29–46.

Helbron, H., Schmidt, M., Glasson, J., and Downes, N. 2011. Indicators for strategic environmental assessment in regional land use planning to assess conflicts with adaptation to global climate change. *Ecological Indicators*, 111: 90–95.

Helling, L., Serrano, R. and Warren, D. 2005. Linking Community Empowerment, Decentralized Governance, and Public Service Provision Through a Local Development Framework. *SP Discussion Paper* 0535.

Henríquez-Dole, L., Usón, T. J., Vicuña, S., Henríquez, C., Gironás, J., and Meza, F. 2018. Integrating strategic land use planning in the construction of future land use scenarios and its performance: The Maipo River Basin, Chile. *Land Use Policy* 78: 353–366.

Hermelin, B. 2009. Spatial strategic planning in the Stockholm region - discourses on the space-economy and growth factors, *European Planning Studies* 17: 131-148.

Hersperger, A. M., Oliveira, E., Pagliarin, S., Palka, G., Verburg, P., Bolliger, J., and Grădinaru, S. 2018. Urban land-use change: the role of strategic spatial planning. *Global Environmental Change* 51: 32-42.

Hersperger, A.M., Gennaio, M.P., Verburg, P.H. and Bürgi, M. 2010. Linking land change with driving forces and actors: four conceptual models. *Ecology and Society*, 15(4): 1-17.

Hersperger, M.A., Grădinaru, S., Oliveira, E., Pagliarin, S., and Palka, G. 2019. Understanding strategic spatial planning to effectively guide development of urban regions. *Cities*, 94, 96-105.

Hertel, T. W., West, T., Boerner, J., and Villoria, N. B. 2019. A review of global-local-global linkages in economic land-use/cover change models. *Environmental Research Letters*, 14: 2–18.

Hillier, J. 2007. *Stretching beyond the horizon. A multiplanar theory of spatial planning and governance*. Ashgate: Aldershot, UK.

Huaranca, M.A. Iribarnegaray, F. Albesa, J.N. Volante, C. Brannstrom, L. and Seghezzo 2019. Social perspectives on deforestation, land use change, and economic development in an expanding agricultural frontier in northern Argentina. *Ecological Economics*, 165.

IFAD=International Fund for Agricultural Development 2016. *Investing in rural people in Mozambique*.

Innes, J., Gruber, J., Neuman, M., and Thompson, R. 1994. *Coordinating growth and environmental management through consensus building*. Policy Research Program Report, University of California, Berkeley, CA.

Ioris, A.A.R. 2020. *Frontier Making in the Amazon: Economic, Political and Socioecological Conversion*. Springer: Cham, Switzerland.

Kalliomäki, H. 2015. Reframing strategic spatial planning as a 'coproductive trading zone' between state-led and place-based interests: Reflections from Maryland and Finland, *Land Use Policy* 42: 113–23.

Kronenburg García A., Meyfroidt P., Abeygunawardane D., and Sitoe A. 2021. Waves and legacies: The making of an investment frontier in Niassa, Mozambique. (Preprint.

Kunzmann, K. 2000. Strategic Spatial Development through Information and Communication. Pages 259-265 *in* Salet, W. and Faludi, A. editors. The Revival of Strategic Spatial Planning. Royal Netherlands Academy of Arts and Sciences, Amsterdam, The Netherlands.

Lambin, E. F., and Meyfroidt, P. 2011. Global land use change, economic globalization, and the looming land scarcity. *Proceedings of the National Academy of Sciences of the United States of America*, 1089: 3465–3472.

Lambin, E. F., Gibbs, H. K., Ferreira, L., Grau, R., Mayaux, P., Meyfroidt, P., Morton, D. C., Rudel, T. K., Gasparri, I. and Munger, J. 2013. Estimating the world's potentially available cropland using a bottom-up approach. *Global Environment Change* 23: 892–901.

Lambin, E.F., Meyfroidt, P., Rueda, X., Blackman, A., Börner, J., Cerutti, P.O., Dietsch, T., Jungmann, L., Lamarque, P., Lister, J. et al. 2014. Effectiveness and synergies of policy instruments for land use governance in tropical regions. *Global Environment Change* 28: 129–40.

Lawrence, T.J., Stedman, R. C., Morreale, S.J., and Taylor, S.R. 2019. Landscape Conservation: Linking Globalized Agriculture to Changes to Indigenous Community-Managed Landscapes. *Tropical Conservation Science* 12: 1–19.

le Polain de Waroux, Y., Baumann, M., Gasparri, N. I., Gavier-Pizarro, G. Godar, J. Kuemmerle, T., Müller, R., Vázquez, F., Volante, J. N. and Meyfroidt, P. 2018. Rents, Actors, and the Expansion of Commodity Frontiers in the Gran Chaco, *Annals of the American Association of Geographers* 108(1): 204-225.

Legacy, C., and Leshinsky, R., 2016. Planning instruments and the urban change process. Pages 1–9 *in* Leshinsky, R., Legacy, C. editors. *Instruments of Planning: Tensions and Challenges for More Equitable and Sustainable.* Routledge: London, UK.

Li, T.M., 2011. Centering labor in the land grab debate. *Journal of Peasant Stud*ies 38(2):281–298.

Lowery, B., Dagevos, J., Chuenpagdee, R., and Vodden, K. 2020. Storytelling for sustainable development in rural communities: An alternative approach. *Sustainable Development* 28(6): 1813-1826.

Mäntysalo, R., and Grišakov, K. 2017. Framing 'evidence' and scenario stories in strategic spatial planning. Pages 348-361 *in* L. Albrechts, A. Balducci, and J. Hillier editors, Situated practices of strategic planning. An international perspective. Routledge: London, UK.

Mäntysalo, R., Kangasoja, J. K., and Kanninen, V. 2015. The paradox of strategic spatial planning: A theoretical outline with a view on Finland. *Planning Theory and Practice*, 162: 169–183.

Mazza, L. 2010. Notes on strategic processes in land-use planning. Pages 79-85 M. Cerreta, G. Concilio and V. Monno, editors. *Making Strategies in Spatial Planning*. Springer: Dordrecht, the Netherlands.

Meyfroidt, P., Boerner, J., Garrett, R., Gardner, T., Godar, J., Kis-Katos, K., Soares-Filho, B., and Wunder, S. 2020. Focus on leakage and spillovers: informing land-use governance in a tele-coupled world. *Environmental Research Letters* 29:486–490.

Meyfroidt, P., R. R. Chowdhury, A. de Bremond, E. C. Ellis, K.- H. Erb, T. Filatova, R. D. Garrett, J. M. Grove, A. Heinimann, T. Kuemmerle, C. A. Kull, E. F. Lambin, Y. Landon, Y. le Polain de Waroux, Y., P. Messerli, D. Müller, J. Ø. Nielsen, G. D. Peterson, V. Rodriguez García, M. Schlüter, B. L. Turner II, and P. H. Verburg 2018. Middle-range theories of land system change. *Global Environmental Change*, 53:52-67.

Meyfroidt, P., Rudel, T. K., and Lambin, E. F. 2010. Forest transitions, trade, and the global displacement of land use. *Proceedings of the National Academy of Sciences of the United States of America* 107:20917–20922.

Ministry of Agriculture of Mozambique 2007. Final Evaluation of The First Phase Of The National Agriculture Development Programme PROAGRI 1999-2005 Volume I: Main Report.

Moriggi, A., Soini, K., Franklin, A. and Roep, D. 2020. A care-based approach to transformative change: ethically-informed practices, relational response-ability and emotional awareness, *Ethics, Policy and Environment* Online first.

Nae, M., Dumitrache, L., Suditu, B. and Matei, E. 2019. Housing Activism Initiatives and Land-Use Conflicts: Pathways for Participatory Planning and Urban Sustainable Development in Bucharest City, Romania. *Sustainability*, 11: 6211.

Nascimento, N., West, T.A.P., Biber-Freudenberger, L., de Sousa-neto, E.R., Ometto, J., and Börner, J. 2019. A Bayesian network approach to modelling land-use decisions under environmental policy incentives in the Brazilian Amazon. *Journal of Land Use Science* 15(2-3): 127-141.

Nelson, A., Chomitz, K.M., 2011. Effectiveness of strict vs. multiple use protected areas in reducing tropical forest fires: a global analysis using matching methods. *PLoS ONE* 6(8): e22722.

Nolte K, Chamberlain W, and Giger M 2016. International land deals for agriculture fresh insights from the land matrix: analytical report II. Bern Open Publishing, Bern.

Norfolk, S. and Liversage H. 2002. Land reform and poverty alleviation in Mozambique. *Paper for The Southern African Regional Poverty Network, Human Sciences Research Council*.

Norfolk, S; Quan, J.; and Mullins, D. 2020. Options for Securing Tenure and Documenting Land Rights in Mozambique: A Land Policy and Practice Paper. LEGEND.

Oberlack, C., S. Boillat, S. Brönnimann, J.-D. Gerber, A. Heinimann, C. Ifejika Speranza, P. Messerli, S. Rist, and U. Wiesmann. 2018. Polycentric governance in telecoupled resource systems. *Ecology and Society* 23(1):16.

Oberlack, C., Tejada, L., Messerli, P., Rist, S., and Giger, M., 2016. Sustainable livelihoods in the global land rush? Archetypes of livelihood vulnerability and sustainability potentials. *Global Environment Change* 41: 153–171.

Olesen, K. and Richardson, T. 2012. Strategic Spatial Planning in Transition: Contested Rationalities and Spatial Logics in 21st Century Danish Spatial Planning. *European Planning Studies*, 2010: 1689–1706.

Oliveira, E. 2016. *Place branding in strategic spatial planning: an analysis at the regional scale with special reference to Northern Portugal*. PhD thesis, University of Groningen, the Netherlands.

Oliveira, E., and Hersperger, A. M. 2018. Governance arrangements, funding mechanisms and power configurations in current practices of strategic spatial plan implementation. *Land Use Policy*, 76:623–633.

Ozbekhan, H. 1969. Towards a general theory of planning. Pages 45-155 *in* E. Jantsch Ed., Perspective of planning. OECD: Paris, France.

Pacheco, P. 2012. Actor and frontier types in the Brazilian Amazon: Assessing interactions and outcomes associated with frontier expansion. *Geoforum*, 434: 864–874.

Pagliarin, A., Hersperger, M. A. and Rihoux, B. 2020. Implementation pathways of large-scale urban development projects lsUDPs in Western Europe: a qualitative comparative analysis QCA, *European Planning Studies* 28(6):1242-1263.

Partelow, S., A. Schlüter, D. Armitage, M. Bavinck, K. Carlisle, R. Gruby, A.-K. Hornidge, M. Le Tissier, J. Pittman, A. M. Song, L. P. Sousa, N. Văidianu, and K. Van Assche. 2020. Environmental governance theories: a review and application to coastal systems. *Ecology and Society* 25(4):19.

Pfeffer J., and Sutton R. I. 2000. *The Knowledge-Doing Gap: How Smart Companies Turn Knowledge into Action*, Harvard Business School Press: Boston, USA.

Ramankutty N, Evan AT, Monfreda C, and Foley JA 2008. Farming the planet: 1. Geographic distribution of global agricultural lands in the year 2000. *Global Biogeochem Cycles* 22: GB1003.

Regnér, P. 2008. Strategy-as-practice and dynamic capabilities: Steps towards a dynamic view of strategy. *Human Relations*, 614: 565–588.

Reis T. N. P. d., Meyfroidt, P., zu Ermgassen, E. K.H.J., West, C., Gardner, T., Bager, S.L., Croft, S., Lathuillière, M. J., Godar, J. 2020. Understanding trade stickiness to improve the sustainability of global commodity supply chains. *One Earth* 3 (1): 100-115.

Ricketts, T.H., Soares-Filho, B., da Fonseca, G.A.B., Nepstad, D., and Pfaff, A., 2010. Indigenous lands, protected areas, and slowing climate change. *PLoS Biol.* 8(3): e1000331.

Ridoutt, B., and Navarro Garcia, J. 2020. Cropland footprints from the perspective of productive land scarcity, malnutrition-related health impacts and biodiversity loss. *Journal of Cleaner Production*, 260: 121150.

Rounsevell, M.D.A., Pedroli, B., Erb, K. -H., Gramberger, M., Busck, A.G., Haberl, H., et al. 2012. Challenges for land system science. *Land Use Policy*, 29: 899–910.

Rudel, T. K. and Meyfroidt, P. 2014. Organizing anarchy: The food security–biodiversity–climate crisis and the genesis of rural land use planning in the developing world. *Land Use Policy*, 36: 239–247.

Russo Lopes, G. Bastos Lima, M. G. and dos Reis, T. N.P. 2021. Maldevelopment revisited: Inclusiveness and social impacts of soy expansion over Brazil's Cerrado in Matopiba. *World Development*, 139: 105316.

Samberg, L.H., Gerber, J.S., Ramankutty, N., Herrero, M., and West, P.C., 2016. Subnational distribution of average farm size and smallholder contributions to global food production. *Environmental Research Letters* 11(12):124010.

Scoones, I. 2016. The Politics of Sustainability and Development. *Annual Review of Environment and Resources*, 411:293–319.

Servillo, L. A. 2017. Strategic planning and institutional change: a karst river phenomenon. Pages 331-347 *in* L. Albrechts, A. Balducci, and J. Hillier editors, Situated practices of strategic planning. An international perspective. Routledge: London, UK.

Shi, W. S., Sun, S. L., Yan, D., and Zhu, Z. 2017. Institutional fragility and outward foreign direct investment from China. *Journal of International Business Studies*, 484: 452-476.

Tanner, C. 2013. *Valorizar a terra em Moçambique: um processo inclusive ou divisive?* In: C. M. Serra and J. Carrilho Dinâmicas da Ocupação e do Uso da Terra em Moçambique, Escolar Editora, Maputo, Moçambique.

The Land Matrix 2021. https://landmatrix.org

Tomaney, J., Krawchenko, T., and McDonald, C. 2019. Regional planning and rural development: Evidence from the OECD. Pages 170-182 *in* M. Scott, N. Gallent, and M. Gkartzios editors, The Routledge companion to rural planning, Routledge: London, UK.

UNDP=United Nations Development Program 2000. PROAREA - Sustainable Rural Development, Evaluation Plan 2000-2001, *Nordic Consulting Group/Afrisur*.

Van Assche, K. Verschraegen, G., Gruezmacher, M. 2021. Strategy for collectives and common goods: Coordinating strategy, long-term perspectives and policy domains in governance. *Futures* 128: 102716.

Van den Broeck, J. 2001. Informal arenas and policy agreements changing institutional capacity. *Paper of the first world planning school congress*, Shanghai, China.

Van Vliet, M. T. H., and Van Beek, L. P. H., Eisner, S., Flörke, M., Wada, Y., and Bierkens, M. F. P. 2016. Multi-model assessment of global hydropower and cooling water discharge potential under climate change. *Global Environmental Change* 40: 156–170.

Verburg, R., Filho, S. R., Lindoso, D., Debortoli, N., Litre, G., and Bursztyn, M. 2014. The impact of commodity price and conservation policy scenarios on deforestation and agricultural land use in a frontier area within the Amazon. *Land Use Policy*, 37:14–26.

Rodriguez-García, V., Gaspart, F., Kastner, T., Meyfroidt, P. 2020. Agricultural intensification and land use change: Assessing country-level induced intensification, land sparing and rebound effect. *Environmental Research Letters* 15: 085007.

Walsh, C. 2020. Transcending land–sea dichotomies through strategic spatial planning. *Regional Studies*. Online first.

Weick, K. 2001. *Making sense of the organization*. Blackwell: Oxford, UK.

Weisse M and Dow Goldman E. 2019. The world lost a Belgium-sized area of primary rainforests last year. *World Resources Institute*, Washington, DC, USA.

Wilkinson, C., T. Saarne, G. D. Peterson, and J. Colding 2013. Strategic spatial planning and the ecosystem services concept – an historical exploration. *Ecology and Society* 181: 37.

Wolff, S., Meijer, J., Schulp, C.J.E., and Verburg P.H. 2020. Contextualizing local landscape initiatives in global change: a scenario study for the high forest zone, Ghana. *Regional Environmental Change* 20, 115.

XXXX, X. and XXXX, X. (in preparation) The role of strategic land-use planning in the governance of land systems of tropical landscapes: State of the Art and Future Research.

Zaehringer, J. G., Atumane, A., Berger, S., and Eckert, S. 2018. Large-scale agricultural investments trigger direct and indirect land use change: New evidence from the Nacala corridor, Mozambique. *Journal of Land Use Science* 13(3):325–343.