



Research

Strategic spatial planning in emerging land-use frontiers: evidence from Mozambique

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ABSTRACT. Land-use frontiers are territories with abundant land for agriculture and forestry, availability of natural resources relative to labor or capital and predisposed to rapid land-use change, often driven by large-scale land investments and capitalized actors, producing commodities for distal markets. Strategic spatial planning (SSP) represents a consolidated long-term governance practice across high- and low-income countries. One of the objectives of SSP processes is to articulate a more coherent and future-oriented spatial logic for the sustainability of land-use patterns and typologies, natural-resources protection, and investments. SSP may thus constitute a useful approach in addressing some of the challenges affecting land governance in frontier settings; to date, its potential contribution to land-use frontiers lacks explicit exploration. In this paper, we examine how SSP can play a role in governing land-use frontiers through a case-study analysis of Mozambique as an emerging frontier, located on the southeast coast of Africa. We gathered empirical evidence by interviewing experts involved in resource management, territorial planning, and development in the country. The theoretical spine of the paper builds on the literature focusing on land-use challenges and SSP. We show that emerging land-use frontiers face several challenges, such as transnational land deals and the intensification of commercial plantations. Interview data show that several structural factors are hindering the establishment of a long-term territorial development strategy. These are, among others, the short-termism of political cycles and the absence of a long-term strategic vision. Our analysis reveals that SSP processes could contribute to addressing land-use challenges in frontier contexts, such as poverty traps and land degradation spirals, should various local and distant actors join forces and marry interests. We conclude by presenting a systematic rationale, explaining how SSP could play a role in governing land-use frontiers, with a view to promoting the well-being and sustainability of rural communities.

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

INTRODUCTION

The research community, focusing on the way in which land is used and changes over time, from environmental to land-system science, has been arguing that a rethinking of current development models is required (Moriggi et al. 2020). Others argue that a new paradigm that merges the development of human societies and the long-term planning and sustainability of ecological systems is required (Steffen et al. 2015). Land, in this context, is an essential component of the sustainability of human societies, as it provides, among others, food, fuel, and fibers (Bey et al. 2020). The growing global demand for food, climate change mitigation, and biodiversity conservation strategies, as well as rapid urbanization and its associated lifestyle changes, impose increasing pressure on land and other natural resources (Lambin and Meyfroidt 2011, Creutzig et al. 2019). Furthermore, drivers of land-use change increasingly operate at multiple spatial scales (Meyfroidt et al. 2018). In this increasingly telecoupled, spatial context, the demands and decisions made in one place and spatial scale can have an effect on other locations and across spatial scales, leading to governance challenges affecting the well-being and sustainability of different societal groups (Meyfroidt et al. 2013), particularly local communities in low-income countries (Busscher et al. 2018). A telecoupled setting entails the functional interactions of land-use change across space (Müller and Munroe 2014); it refers to socioeconomic and environmental relationships, involving distant yet tangled human and natural systems (Hull and Liu 2018). Although the demand for land-based resources is spread across the globe (Fuchs et al. 2017), the increase in supply is concentrated in regions that have sufficient land to meet these

global demands, which thereby constitute hotspots of land-use change. These hotspots of land-use change are territories with copious resources, where new land use is expanding quickly (Rindfuss et al. 2007). Along with an expansion of agriculture, these land-use change hotspots, especially in low-income countries in sub-Saharan Africa, Latin America, and Southeast Asia, often experience a surge of private land leases or concessions to companies or individual investors (Nolte et al. 2016), pushing rural communities to marginal areas and affecting the social and economic conditions in these regions (Gomes 2021).

In this paper, we focus on rural land-use frontiers in low-income countries as land-use change hotspots (also referred in the paper as frontier contexts; e.g., Kronenburg García et al. 2022). Rural land-use frontiers are regions or territories with abundant land for agriculture as well as forestry, an availability of natural resources relative to labor or capital, and rapid land-use change (Le Polain de Waroux et al. 2018). According to Rindfuss et al. (2007), frontier settings are also characterized by the emergence or spread of land management practices that differ from the practices that were already in place. It is a process that, by definition, involves land-use change and the actions of one actor/stakeholder, e.g., agribusiness, and is capable of affecting the actions or common practices of others, e.g., smallholder farmers. Increasingly, large-scale, land-based investments and capitalized actors, producing commodities for distant markets (Pacheco 2012) such as beef, soybeans, or palm oil (Verburg et al. 2014) drive these fast-paced, land-use changes. Developing and implementing spatial planning that adequately addresses some of these challenges, including counteracting the negative effects of

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land degradation (e.g., Oliveira et al. 2018) and supporting the governance and socioeconomic sustainability of rural local communities, is a complex and demanding task (Todes 2012). Land degradation results in a substantial reduction in the economic value of ecosystem services and goods derived from the land, primarily due to human-dominated systems or natural biophysical evolution (DeFries et al. 2012, Thomas et al. 2013). Land degradation in most low-income countries is threatening the future growth and development of rural communities' livelihoods (Weisse and Dow Goldman 2019, Lambin et al. 2014). International organizations, such as the World Bank or the Food and Agriculture Organization (FAO) of the United Nations, as well as many governmental and non-governmental organizations (NGOs) in frontier regions, particularly in low-income countries, are struggling to develop spatial planning processes (Meyfroidt 2015, Azevedo et al. 2021).

Spatial planning relates to the establishment of frameworks and principles to guide the location of economic development and physical infrastructure (Healey 1997, Hersperger et al. 2019). It consists of a set of governance practices, in which one could include strategic spatial planning (SSP) and land-use planning processes to develop and implement strategies, plans, policies, and projects, and to regulate 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 the demand for land, natural resources, and the existing qualities of places, both tangible and intangible (Walsh 2021). Through these interactions, global economic and social tendencies interrelate with local conditions and concerns to produce distinctive, contingent responses to territorial dynamics, e.g., growth of land-based investments. Spatial planning processes play a key role in the governance of land-use change dynamics, which result from the interaction of political/institutional, economic, cultural, technological, and natural/spatial driving forces, that sectoral approaches cannot adequately address (Bürgi et al. 2005, Hersperger et al. 2010). Nadin et al. (2021) further argue that spatial planning, as a governance process, is better suited to address contemporary societal and political conditions if it promotes the integration between policy sectors and involves citizens and other public and private actors in decision-making processes. In line with Watson (2021), we argue that spatial planning in low-income countries—where land-use frontiers are primarily located and are the geographical focus of this paper—presents significant differences in comparison to high-income regions, such as those located in Europe or North America. In low-income countries, as stated by Andres et al. (2021), planning processes entail temporary and informal dynamics, acting as “alternative substitutes in places experiencing real difficulties in creating, implementing and enforcing formal planning processes” (p. 30). The existing processes contrast between spatial planning in high-income regions and middle- and low-income countries (Harrison 2006, Watson 2021). In the latter set of countries, the issues are influenced by a post-colonialism stage, in which acute social and economic inequalities in living standards, in life expectancy, in access to resources, including land for smallholder production systems and housing, need to be taken into consideration in the planning processes. These planning processes must be “highly sensitive to social, economic and environmental dynamics in any context and the kind of impact

they can have on human lives and futures’ (Bhan et al. 2017:13). Although we focused on this paper in terms of a conceptualization of spatial planning, rooted in the knowledge of Western, high-income societies (e.g., Healey 1997, Hersperger et al. 2018), we are aware of the nuances that exist between planning issues in high-income countries/societies and planning in middle- or low-income countries. These specific planning issues in low-income countries are related, although not exclusively, to the need to acknowledge and respect the land rights of indigenous populations, and the necessity of preserving parcels of land for subsistence farming, while seeking a fair balance with commercial agriculture. 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 frontiers, the absence of public-led spatial planning enables unchecked agricultural expansion, with negative consequences for communities' livelihoods (Brannstrom 2009), resulting in land degradation (Briassoulis 2019). For example, policies to control deforestation, such as REDD+ (or Reducing Emissions from Deforestation and Forest Degradation) and indigenous land-use planning processes play a role in reconciling global environmental objectives and fostering the participation of local communities (Ricketts et al. 2010, Nelson and Chomitz 2011).

In this paper, we focus on strategic spatial planning (SSP). A strategic spatial planning process brings together public governments, private interest groups, such as agribusiness or the pulp and paper industry, as well as informal groups, namely, indigenous, and rural communities or smallholder farmers. Ultimately, these groups join forces to develop plans, visions, and projects for the management of spatial change (Hersperger et al. 2019 for examples in high-income countries, Thakur et al. 2020 in relation to low-income countries). SSP has been shown to be capable of influencing patterns of land use and land cover (Couclelis 2005), with a strong focus on its strategic mission in these plans, often 20–50 years into the future (Albrechts 2004, Hermelin 2009). SSP is regarded as a response to the complexity of spatial developments, reflecting a shift away from government, as a single actor, toward 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 2010, Albrechts et al. 2017). SSP, which has already been linked to ecosystem services (Wilkinson et al. 2013), environmental governance theories (Partelow et al. 2020), and the adaptive capacity of threatened communities (Blythe et al. 2014) is thus selective and oriented toward issues that are prioritized by a myriad of actors, both formally and informally represented. Regions, in high- and low-income countries often develop SSP processes to transform spatial-economic, social, and ecological conditions, as well as supporting structural shifts away from, for example, an industry based on a service-oriented 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). However, SSP remains an under-researched approach in terms of addressing certain challenges regarding the governance of land-use frontiers, such as land grabbing (Tanner 2013, Batterbury and Ndi 2018) and

commodity crop expansion with its associated deforestation (Meyfroidt et al. 2014). Acknowledging that planning in low-income countries is largely undertaken by communities and informal providers rather than the state (Horn 2020), we develop an approach to SSP in this paper that is sensitive to the challenges faced by land-use frontiers in middle- and low-income countries. We do this by means of a single case study.

The goal of this study was to investigate how SSP could play a role in governing land-use frontiers, focusing on a case-study analysis of Mozambique, as an emerging investment land-use frontier, located on the southeast coast of Africa, (e.g., Bey et al. 2020, Abeygunawardane et al. 2022). To achieve this goal, we proposed a systematic reflection on how SSP is a suitable response to address, simultaneously, context-specific, structural factors, hindering the development of a long-term, territorial, development strategy in the frontier setting of Mozambique, while considering more spatially generalized land-use challenges in frontier contexts. Mozambique, with its perceived availability of land suitable for agriculture and large-scale forestry plantations, combined with the increasing “appetite” of foreign investors for land-based investments to accommodate large-farming operations and the extractive sector, could be regarded as an emerging land-use frontier (see also Zaehring et al. 2018, Kronenburg García et al. 2022). Other examples of emerging frontiers are the soybean frontier of South Africa (Gasparri et al. 2016), the gold mining frontier of Burkina Faso, a landlocked country in West Africa (Côte and Korf 2018), or the agricultural frontiers of Argentina, Bolivia, and Paraguay (Le Polain de Waroux 2019). In this study, we gathered empirical data by means of qualitative in-depth interviewing of a range of stakeholders, involved in spatial planning and natural resources management in Mozambique. These stakeholders were diplomatic representatives in the country, e.g., Sweden and Switzerland, or members of international organizations, dedicated to providing finance, advice, and research to Mozambique, e.g., the World Bank and the FAO. Local researchers, affiliated with Eduardo Mondlane University, the oldest and largest university in the country, and representatives of Mozambique National Union of Peasants (UNAC), were also interviewed.

METHODS AND CASE STUDY AREA

Overview

The method was based on two main stages. The first stage consisted of an in-depth reading of academic literature, published in peer-reviewed journals, and focusing on land-system science publications, aimed at retrieving land-use challenges in frontier contexts but specifically focused on low-income countries of sub-Saharan Africa, Latin America, and Southeast Asia. Literature on SSP, aimed at retrieving the key elements of an SSP process in frontier settings, was also studied. The second stage consisted of a single, in-depth, qualitative case study analysis of Mozambique, based on the interview data ($n = 30$). We opted for the case-study method because case studies are an appropriate research strategy for seeking insights into the dynamics of a specific territorial and institutional setting (Eisenhardt 1989) as a land-use frontier. For example, Kronenburg García et al. (2022) applied the case-study method to a study on northern Mozambique as an investment frontier. The results of the literature review, completed as part of the first stage, constitute the theoretical backbone of the paper.

A diagram and discussion link the findings from both stages. The arrows of this diagram—the cornerstone of this discussion and the novelty of this analysis—represent how we envision SSP (left side) as supporting the governance of emerging land-use frontiers. First, SSP contributes to overcoming structural barriers hindering a long-term territorial development strategy in Mozambique as an emerging land-use frontier (center of the diagram) and second, contributes to addressing land-use challenges in land-use frontiers (right side). The objective of this diagram, which reinforces the overall goal of the paper, is to provide alternative pathways of territorial development for the country of Mozambique, as well as for land-use frontiers, affected by similar contexts and land-use dynamics.

Case study area

This study was conducted in Mozambique or República de Moçambique. This country is a republic in southern Africa, bordered by Tanzania in the North, Malawi, Zambia, Zimbabwe, and South Africa in the West, Eswatini and South Africa in the South, and the Indian Ocean in the East. The country spans approximately 800,000 square kilometers, with a population of approximately 30 million in 2019 (World Bank 2019), growing at an annual rate of 3%; Mozambique had a rural population in 2019 of approximately 19 million, the 11th highest rural population in Africa, according to the World Bank (2019). We interviewed 30 experts based in Mozambique’s capital, Maputo, who were affiliated to governmental entities and NGOs, involved in the broad field of spatial planning and natural resources management (Table 1; see also Appendix 1 for detailed overview on interviewees, planning and policy documents consulted). Because of worldwide travel restrictions throughout 2020, it was not possible to interview farmers as initially planned. We did, however, interview members of organizations dealing directly with smallholder farmers in processes of community land delimitation and land registration, such as the Community Land Initiative Foundation (iTC-F). The purpose of the interviews was to gather information regarding overall spatial planning in the country at national, provincial, and local levels (districts), as well as to determine the way in which the planning processes adapt to the pressure of foreign investors seeking land and other natural resources for profit purposes. Furthermore, it was also our aim to understand how the planning system, i.e., the entities in charge, the type and duration of their plans, their legal status, and the overall land governance, considers the needs of rural communities, such as access to farming land in the context of large-scale, land-based investments for commodity crops or forestry.

The interviews, including those with the World Bank or the FAO, were conducted in Portuguese at the interviewees’ workplace throughout June 2019. A semi-structured interview guide was used, with open-ended questions. The interviews lasted, on average, 90 minutes, they were recorded digitally and subsequently fully transcribed by the authors. First, the interview transcripts were organized following the order in which they took place, i.e., 4–28 June 2019, and a single PDF file was created; a full reading was then conducted. Second, we manually coded the elements of a SSP process and used these to identify and cluster in five groups, the structural factors hindering long-term territorial development in Mozambique. Third, each page that contained a structural factor was isolated for an in-depth analysis of the context and

Table 1. Interviewees of the study (n = 30), clustered by the primary focus of interview questions.

The primary focus of the interview questions	Entities interviewed and number of interviewees in each entity
Supporting, cooperation or advisory work on natural-resources management, including land use in face of foreign investments	France-Mozambique Chamber of Commerce and Industry (1 interviewee); Japan International Cooperation Agency (JICA) (2 interviewees); National Sustainable Development Fund (FNDS) (2 interviewees); Norwegian Embassy (2 interviewees); Swiss Agency for Development and Cooperation (1 interviewee); The Food and Agriculture Organization (FAO) (1 interviewee); We Effect and the Swedish Embassy (1 interviewee); World Bank (1 interviewee).
Working on land delimitation, including community land delimitation and Right of Use and Benefit of Land (DUAT) and land registry support	Community Land Initiative Foundation (iTC-F) (2 interviewees); Rural Aid Association or Association for Rural Mutual Help (ORAM) (2 interviewees); Terra Firma Lda (1 interviewee); Verde Azul Lda (4 interviewees).
Working on spatial planning, land policy, and land administration issues	Mozambique National Union of Peasants (UNAC) (1 interviewee); National Directorate for Land (DINAT) (2 interviewees); National Directorate for Spatial Planning and Resettlement (DINOTER) (2 interviewees).
Researching (or supporting research) on spatial planning and territorial development challenges	Faculty of Agronomy and Forestry Engineering, Eduardo Mondlane University (UEM) (3 interviewees); Rural Environment Observatory (OMR) (2 interviewees).

See also Appendix 1.

interplay with other factors and land-use challenges. Land development (Terra Segura) and natural resources management projects (SUSTENTA), as well as spatial plans (National Territorial Development Plan, PNDDT) were identified. Dawson et al. (2017) and Legacy and Leshinsky (2016) have adopted a similar method for interview-data collection and analysis.

RESULTS

We present three sets of results. We start with the results of the structuring of the literature, first in the domain of land-system science (e.g., Lambin and Meyfroidt 2011) identifying central trends and challenges in land-use frontiers (Table 2), and second in the domain of SSP literature identifying the key elements of SSP, which disentangle the four-track approach in SSP (Albrechts 2003; Table 3). Third, we present the results of the case-study material in an analysis of the structural factors hindering longer term territorial development in Mozambique as an emerging land-use frontier (Table 4).

Central trends and challenges in land-use frontiers

We identify three broad underlying trends that drive and influence land-use challenges in frontier settings (Table 2). These trends are, (i) economic globalization (Gasparri and Le Polain de Waroux 2015), (ii) a looming scarcity of productive land (Lambin et al. 2013), and (iii) increasing polycentricity of land-governance systems (Oberlack et al. 2018). These three trends underlie six pressing challenges that interact with each other. These challenges are, (i) commodity crop expansion and intensification of commercial plantations (Rodríguez-García et al. 2020), (ii) challenges linked to transnational land deals (Nolte et al. 2016), (iii) scarcity of productive land, itself linked to (iv) heightened land competition or land rush, (v) poverty traps and land degradation spirals in smallholder production systems, and (vi) institutional fragility hindering the development of agricultural systems that could contribute to sustainable development.

Key elements of a strategic spatial planning process

We assess the key elements of a SSP process that could support the governance of emerging land-use frontiers. We developed the four-track approach of SSP proposed by, among others, Albrechts (2003) into nine elements (Table 3). These elements, in our view, help to disentangle the four-track approach typically applied in high-income societies to more challenging planning and land governance contexts of low-income countries, including emerging land-use frontiers. The original four-track approach is based on four interrelating types of rationality: (1) the value rationality, i.e., the design of alternative futures; (2) communicative rationality, i.e., involving a growing number of private operators and public actors in the process; (3) instrumental rationality, i.e., searching for optimal ways to solve the problems and achieve the envisioned future; (4) strategic rationality, i.e., defining strategies for dealing with power relations (see also Albrechts 2004). This approach has been widely used. For example, Servillo (2017:340) argues that the “four-track approach ... appears to be one of the most comprehensive ways of conceiving the components of a strategic planning approach.” The purposes for undertaking SSP through the four-track approach are diverse. These are, among others, economic development (most cases in both high income and low-income countries), controlling urban sprawl (e.g., France), planning-system reform (e.g., Italy), flooding mitigation (e.g., Vancouver, Canada), political integration geared at macro-economic issues (East Africa, namely Kenya, Uganda, Tanzania, Rwanda, and Burundi), economic restructuring and institutional reform (China), and change in the political landscape (France, Italy, South Africa; Albrechts 2017). Furthermore, the four-track approach to SSP has been used to balance global challenges posed to countries and regions with more context, local-based issues (Esho and Obudho 2016). For example, one of the priority areas of Kenya Vision 2030—a strategic spatial plan for this country in Eastern Africa—is to achieve sectoral objectives, including

Table 2. Central trends and challenges in land-use frontiers.

Central trends and challenges in land-use frontiers	
Economic globalization	<p>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).</p> <p>Challenges driven by economic globalization</p> <p>(A) Commodity crop expansion and intensification of commercial plantations</p> <p>(B) Transnational land deals or transnational land acquisitions</p>
	<p>Explanation and corresponding literature</p> <p>Expansion of large-scale, export-oriented, intensive crop production has dramatically transformed rural landscapes and communities in low-income countries (Meyfroidt et al. 2010). Commodity crop expansion into forests or available cropland also affects local communities as they use this land for logging, grazing, or fallow 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 requires large amounts of timber, which encourages forest clearing (Curran et al. 2004).</p> <p>Transnational land deals or large-scale land deals specifically refer to the acquisition of land or land-based investments, i.e., deals, primarily targeting low-income countries in Africa, Latin America, and Eastern Europe. This term is usually restricted to deals in low- and middle-income countries only and excludes deals where only domestic actors are involved (Anseeuw et al. 2011). The land uses that are envisioned in these deals are agriculture, forestry, and speculation.</p>
Looming scarcity of productive land	<p>Looming 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).</p> <p>Challenges driven by looming scarcity of productive land</p> <p>(B) Land scarcity</p> <p>(B) Land competition or land rush</p>
	<p>Explanation and corresponding literature</p> <p>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 public and private 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).</p> <p>Investors are competing for land with smallholder farmers and local farming communities (Anseeuw et al. 2011). Low-income 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 drive increasing strain on existing land governance systems.</p>
Land governance systems	<p>The dynamic interactions between different local and distant actors are part of the challenges of governing land use globally, primarily along with the nexus subsistence versus commercial agriculture and the nexus smallholder versus large-holder agricultural systems (Meyfroidt et al. 2020).</p> <p>Challenges associated to land governance systems</p> <p>(C) Poverty traps and land degradation spirals in smallholder production systems</p> <p>(D) Institutional fragility hindering the development of a commercial agriculture that contributes to sustainable development in frontier contexts</p>
	<p>Explanation and corresponding literature</p> <p>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 because of 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 with land degradation (Nhanumbo 1997, Meyfroidt et al. 2018).</p> <p>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 a challenge for developing 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 infrastructure such as roads and railways and land-use dynamics (Searle 2016, Schindler et al. 2018). For example, Meir et al. (2019) report 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 exponential growth, not only in roads but also in large-scale water projects, such as hydropower dams and navigation facilities. The Amazon Region is one of the most active frontiers of infrastructure expansion, resource extraction, and social-ecological exploitation in the world today (Ioris 2020). Transportation costs of agricultural or forestry products can be substantially modified by investments in infrastructure (Chomitz and Gray 1996). Institutions can be perceived as soft infrastructure (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.</p>

Table 3. Key elements of a strategic spatial planning (SSP) process.

Key elements of strategic spatial planning (SSP)	Strategic intent of the key element of SSP and literature
Track one:	
Value rationality > the design of alternative futures	
(1) Vision making >	
Designing long-term 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 natural 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 arrangement 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), including those related to land use as identified in Table 3, e.g., transnational land deals or transnational land acquisitions.
(2) Action-oriented schemes >	
Defining short-term actions, projects, or programs	Strategic spatial plans are often implemented through spatial and sectorial 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 (the vision, as in 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 spatial planning as a process implies that some decisions and actions are considered more important than other decisions and that much of the process lies in making the tough choices about what is most important for the purpose of producing socially 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) or interests of private actors, e.g., private investors that are competing for land with smallholder farmers and rural communities (Anseeuw et al. 2011) as identified in Table 3.
Track two:	
Communicative rationality > involving a growing number of private operators and public actors in the process	
(4) Political engagement >	
Bringing political agents to support the defined vision	The success of an SSP process is influenced by how political agents are in favor of the defined vision (1) (Albrechts and Balducci 2013). Therefore, SSP is a political process. Political agents that are involved in vision making (1) 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). Therefore, SSP seems a valid approach to, for example, counteract the downsides and uncertainty of political cycles of four or five years (Albrechts 2017).
(5) Knowledge 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 (Helbron et al. 2011, Nae et al. 2019) and rural development (Tomaney et al. 2019). Knowledge co-production by embracing a multi-level and trans-scalar governance approach will consider the possible visions that distant actors may have for the emerging land-use frontier, and, proportionally, the possible visions that the local actors may have about how their own territory may contribute goods and services to distant places, for example, through agricultural and forestry production (Rudel and Meyfroidt 2014, Meyfroidt 2015). Trans-scalar governance arrangements bring together public and private actors influencing directly or indirectly the land systems in frontier contexts, but typically operate at different scales, from global to local. This element proposes knowledge co-production across scales as a means of considering trade-offs between local realities and broader land-use challenges, and further integrate emerging private-led actors in long-term territorial development.
(6) Participatory scenarios >	
Civic participation in scenario building	This element is fundamental to deal with drivers of expansion or intensification in land-use frontiers. Building future scenarios aids in simulating possible impacts of spatial policies, including land-use policies, land-based legislation on future land uses (Henriquez-Dole et al. 2018). Scenarios, prepared through participatory-action research methodologies, such as workshops (Zaehring et al. 2018) or serious games as participatory-role playing (Castella et al. 2020), are useful input methodologies in SSP processes, as future potential land uses will be determined and conflicts could be avoided (Heinrichs et al. 2009), for example, between private land-based investors and smallholder farmers. In this context, land-use scenarios support planners and land-management experts to tailor land capabilities to specific spatial settings.

(con'd)

Track three:

Instrumental rationality > searching for optimal ways to solve the problems and achieve the envisioned future

(7) Mapping >

Integrating a spatial dimension in strategic spatial planning

Strategic spatial planning processes depend to a greater extent on governance arrangements (Oliveira and Hersperger 2018) but also on the inclusion of visual elements, primarily maps (Grădinaru and Hersperger 2019), 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; Amler et al. 1999, Mazza 2010). Hillier (2007) proposes a reflection on the activity of mapping practiced in strategic spatial plan-making processes as explorations of territorial potentials or assets.

Track four:

Strategic rationality > defining strategies for dealing with power relations

(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 are within a social process (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 2006). 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

The implementation of strategic plans depends, among other factors, on the availability of funding (Oliveira and Hersperger 2018). Credible commitments to active engagement and a clear and explicit link to funding schemes 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) proposes equitable short-term actions (3) or projects (Albrechts 2010, Pagliarin et al. 2020). Defining funding schemes during the SSP process could help to overcome the shortcomings of institutional fragility that often characterized land-use frontiers (Shi et al. 2017).

Notes: 1 to 9 correspond to the key elements of strategic spatial planning based on reviewed academic literature.

meeting regional and global commitments (Government of Kenya 2008). Rwanda Vision 2050 sets as a prime priority the reconstruction, human resources development and integration into the regional and global economy (Government of Rwanda 2015).

Thinking of SSP processes in land-use frontiers through the lens of the four-track approach paves the way for alternatives to investigate 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 elements are thought of 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). These nine elements 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 futures in which local communities and national economies can both thrive.

Structural factors hindering a long-term territorial development strategy in Mozambique

From the 30 interviews, we identified insights on the structural factors hindering the definition of a long-term territorial development strategy for the case study area. These are, (i) lack of a long-term 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 4).

Five interviewees holding expertise on spatial planning, 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 five interviewees underlined that a territorial-based strategy capable of transforming local-base resources in national assets for development is necessary to secure a continuous territorial development. The same five interviewees, along with those tasked with supporting or advisory work on natural-resources management, including land (15 interviewees in total), 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 from the 11 provinces of Mozambique, the highest administrative division before the national level, representing the most diverse sectors of society prepared, in an independent, non-partisan, and professional manner, a path trying 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. These 15 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 toward strategic spatial planning in rural communities. In this context, interviewees, primarily those experienced with

Table 4. Structural factors hindering longer term territorial development in Mozambique.

Structural factors	Explanation of the structural factors hindering territorial development in Mozambique
(i) Lack of a long-term strategic vision	According to the majority of the 30 interviewees, Mozambique public authorities embrace a “reactive” approach toward 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 with a focus on key strategic domains, i.e., domains in which the country could anchor its development approach (Albrechts et al. 2017, Hersperger et al. 2019). However, these key domains have not yet been identified in the country. Most of the interviewees suggest that the forthcoming National Territorial Development Plan (PNDT) identifies and describes key strategic domains; however, a minor number of the 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. The majority of the 30 interviewees highlight those public entities spend five years defining their strategies and short-term actions and at 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 most of the 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 agro-ecological zoning plans of the early 1990s as examples of a positive intervention balancing the three pillars of sustainability that was discontinued.
(iii) Non-legal recognition of rural local 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, the majority of the 30 interviewees have stated. This means, that communities are not properly defined, and self-proclaimed community leaders or spokespersons may only represent certain interests 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 because of the lack of 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 is associated with deep-rooted poverty, which 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 the death 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). The majority of the 30 interviewees contend that this reliance is positive because it brings about some changes that otherwise would not be possible. Some argue that this relation will gain effectiveness if donors follow a nationally defined strategic agenda instead of the state following agendas defined by cooperation partners (or <i>parceiros da cooperação</i>).

spatial planning (five interviewees), argue that community level planning is pivotal to provide the foundation for a community’s realistic and effective economic development efforts. These five interviewees also argued that community engagement is fundamental to secure 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 livability of rural local communities. However, these five interviewees pointed out that the mechanisms to operationalize community engagement and participation remain undeveloped or in an exploratory stage.

The five interviewees holding expertise on spatial planning, land policy, and administration including community land delimitation, as well as the five interviewees researching territorial development challenges in the country, highlighted that strategic

plan or the general planning of the territory need to establish a mix of incomes and development activities that can support a socioeconomic development of rural communities. 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, independent of government 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, five interviewees underlined the need for long-term perspectives supporting territorial development. One interviewee

from the group of experts on territorial cooperation (n = 11 interviewees) 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 because of the size of the country, its heterogeneity, and lack of financial resources. One interviewee also from the group of cooperation or advisory work on natural-resources management 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 five interviewees also from the group of cooperation or advisory 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 five interviewees, experts on land policy and spatial planning, a strategic approach to long-term planning and territorial development is considered useful, necessary, and urgent yet a joint agreement that can generate benefits for the rural communities is paramount. In this context, the 11 interviewees tasked with supporting, cooperation, or advisory work on natural-resources management, reinforced that community-level, participatory planning should be the cornerstone 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 calls have been made to link Mozambique's administrative reforms to local participatory processes, to develop a more responsive and downwardly accountable territorial governance (referring to Helling et al. 2005), five interviewees from the group of researchers on territorial development challenges share preoccupations toward the effectiveness of participatory processes within spatial planning at the community level. Five from the nine interviewees from the group of experts on land delimitation emphasized that community-level planning processes, where communities are led through a series of elements 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 rural 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, four 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 circumstance, the heirs of the parcel of land face a bureaucratic and costly process of DUAT re-titling. Three 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. This is often due to limited technical and human resources capacity, leading to data overlaps with private DUATs and concessions, and uncertainties about customary boundaries. Another land-related topic of debate in the country is the reform of the land law being led by the Ministry of Land and Environment (*Ministério da Terra e Ambiente*, MTA). It has been in dormancy since early 2018, because of its political sensitivity during the election campaigns of 2018 and 2019. Follow up online discussions carried out by the authors with three interviewees from the group of experts on land delimitation in 2020 offer evidence that such reform process will likely go ahead, but because several institutions and actors have overlapping roles, this could become a rather complex and confusing process (cf. Norfolk et al. 2020).

Nine interviewees clustered in Table 1 within land delimitation, cooperation, or advisory work as well as researchers concur that Mozambique lacks a genuine, long-term, and strategic-oriented 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. The Agriculture and Natural Resources Landscape Management Project (SUSTENTA), which has been under implementation by the Government of Mozambique with the assistance of the World Bank since 2017, can also be discussed as a continuation of local participation and local-capacity building. SUSTENTA's objective is to promote integrated sustainable rural development while setting out a model for interventions in integrated rural development (MTA 2019). One of the aims of SUSTENTA is to ensure that rural communities and their representatives are properly placed to take care of the needs of smallholder farmers and to promote the local resource management capacity. With this, the goal is of placing the agriculture sector as an important and long-lasting economic and social development sector.

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). This is typical in spatial planning approaches in low-income countries (Spaliviero et al. 2019, Todes 2012), including in Mozambique as reported by Monteiro et al. (2017) and Norfolk et al. (2020). 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. Five of the nine interviewees clustered in Table 1 within land delimitation, 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 rural communities.

DISCUSSION

We articulate the insights from the Results section (see Fig. 1) to discuss how the nine elements of a SSP process identified (Table 3) can contribute to addressing the structural factors in Mozambique that hinder the definition of a long-term territorial development strategy (Table 4) that would address central trends and challenges in land-use frontiers (Table 2). 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 articulates insights from the literature inputs on SSP in the green boxes placed at the left side and land-systems science in the blue boxes on the right side. Case-study findings are reported in the center of the diagram in the red boxes. 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 in emerging land-use frontiers, by taking Mozambique not only as a case study but illustrative of the central trends and challenges in land-use frontiers. These can also be associated with the challenges of spatial planning in low-income countries (e.g., Bhan et al. 2017, Thakur et al. 2020).

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 expressed by the majority of the 30 interviewees along with several scholarly perspectives on land-use challenges 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. Addressing land-use challenges requires local solutions, with the preferred approach depending on land capabilities (i.e., appraisal of the physical characteristics of the land), soil characteristics, topography, access to aquifers and other water-supply systems and agricultural inputs, infrastructure, as well as socioeconomic conditions and governance settings (Meyfroidt 2015). Nevertheless, analyses of local realities, such as those of Mozambique, and the development of local solutions could be more effective in improving the social and economic conditions of communities if they build on an understanding of national

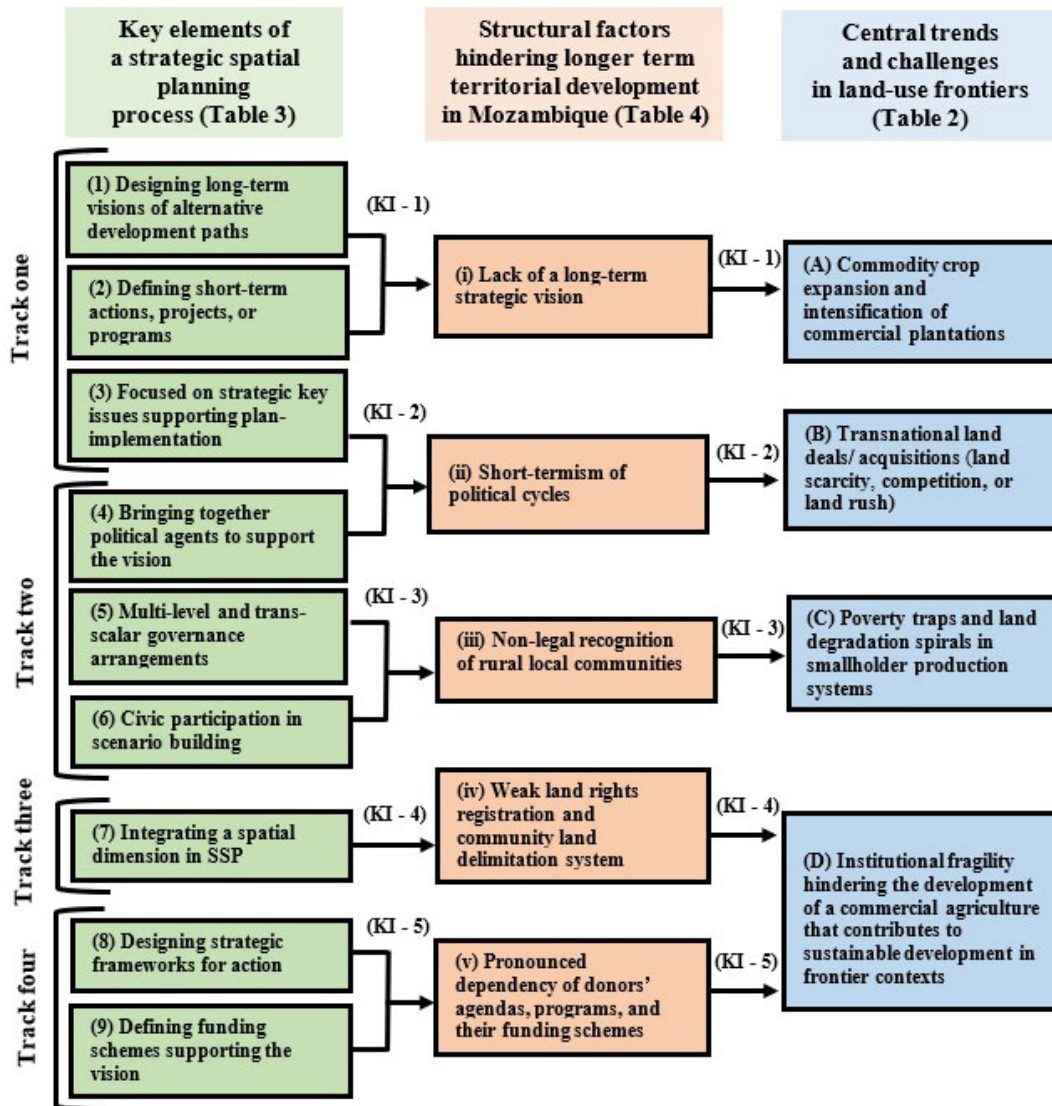
and global contexts, to foresee future system stresses and anticipate the spillovers and broader consequences of local solutions (Rounsevell et al. 2012). For strategic plans to transform the spatial condition of a territory, their narratives must be persuasive in the broader society, often by borrowing 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 (KI as in Figure 1) that emerge from the interconnectedness among the three clusters of results (numbers and letters refer to frames in Fig. 1). We bring forward in this paper 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 frontier regions.

Track one - key insight 1 (KI-1): Designing long-term visions of alternative development paths (1) combined with short-term actions (2) are SSP elements that better suit a response to overcome a lack of a strategic vision in Mozambique (i) while responding to the land-use challenges of commodity crop expansion and intensification of commercial plantations (A).

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 (Nolan et al. 2008). Commodity crop expansion is a common issue across emerging land-use frontiers, including Mozambique (Meyfroidt et al. 2014, Abeygunawardane et al. 2022). However, a lack of a sensible long-term strategic vision for the country puts local actors in a passive position, hindering the development of an alternative and sustainable response to such global land-use pressures. Such a long-term strategic vision—going beyond physical spatial or master plans—needs to be designed in relation to the social values and assets to which a particular territory is historically committed (Ozbekhan 1968). Such an envisioning process aims to provide a long-term vision, i.e., 20, 30, 50 years, 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 territory is, in terms of its assets and key strategic domains (e.g., quality of transportation facilities, education systems responding to job-market demands, the 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 suggests that improvement of road infrastructure, including along development corridors (e.g., Nacala Corridor, The Beira Agricultural Growth Corridor), reinforcing other infrastructure 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

Fig. 1. Diagram linking and explaining how we envision the key elements of strategic spatial planning supporting long-term territorial development in Mozambique as an emerging land-use frontier while addressing central land-use challenges in frontier contexts (KI = Key Insight). Note, for an optimal interpretation, please read the diagram from the left (green frame) to the right-hand side. The arrows represent how we envision strategic spatial planning contributing to overcome structural barriers while addressing land-use challenges in these regions. Based on Tables 2 and 3 (academic literature) and Table 4 (interview data, n = 30). Authors' own design.



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.

Track one and two - key insight 2 (KI-2): A focus on strategic key issues supporting plan-implementation (3) coupled with the SSP element of bringing political agents to support the defined vision (4) are fit to compensate for the short-termism of political cycles

in Mozambique (ii) while responding to transnational land deals or land acquisitions issues (B).

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 (Nolte et al. 2016). 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 the livelihoods of rural 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 2021). 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. 2022). 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 knowledge co-production reframes the relation between government and citizens (Kalliomäki 2015). This aligns with the idea of the 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). An SSP would focus on their key issues (arable land available versus lack of local-based financial capital resources, the 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, an SSP process for the longer term, i.e., 20 or more years, would support land governance more independently than the current scenarios of a stronger attachment to governmental decision making, i.e., political cycle of one (five years) or more terms (10 years, for example). 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 2013), 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 20 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 most cases, this includes not only formal or informal negotiations with the public sector but also the ability to navigate those spheres that 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 rural 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 identity and attachment within rural local communities can contribute to embedding trajectories of territorial development in local realities and in localized governance settings.

As suggested by Ackerman et al. (2005), this may involve three levels of actions: (1) reflecting participatory mechanism in strategic sectoral/spatial documents of government; (2) setting up new agencies, which assure societal participation; (3) inscribing civic participatory mechanism into law, which in the case of Mozambique already exists (Article 24 of the Land Law n° 19/97) but according to the majority of the 30 interviewees is seldom used when it comes to land-based investment decisions. This is in line with the work of Filipe and Norfolk (2017). These authors argue that there is already a raft of reasonable policies and legal frameworks for land administration, spatial planning, and environmental management in Mozambique, and all are designed to safeguard and regulate how the control of natural resources, including land, is awarded between different interests. They further contend that what is needed are “political commitment and the skills to support land policies that are pro-poor and inclusive” (Filipe and Norfolk 2017:14). Norfolk et al. (2020) reinforce this by underlining that Mozambique public authorities need to find ways of “facilitating the participatory mapping and planning of current and future land and resource uses within the community and identifying local threats and opportunities related to their acquired rights to own and manage the land and natural resource assets” (p. 45).

Track two - key insight 3 (KI-3): Multi-level and trans-scalar governance arrangements (5), coupled with civic participation in scenario building (6), aids in overcoming the negative impacts of the non-legal recognition of rural communities in Mozambique (iii) while paving the way to mitigate poverty traps and land degradation spirals in smallholder production systems (C).

Although we are sympathetic in relation to SSP as a 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 an SSP that is more multi-level and trans-scalar governance arrangements (Rudel and Meyfroidt 2014). In the case of Mozambique, defining a social equitable strategic vision and supporting short-term actions requires going beyond what national-level decision makers and experts based in Maputo think about. The provincial, district, as well as local leaders need to join forces, procedures, and be resourceful in shaping a vision. Therefore, a trans-scalar governance approach to the planning process would align the interests of public and private actors influencing directly or indirectly land systems but typically operate at different scales, i.e., global, regional, and local. It would also support a balance between context-specific challenges such as access to land for smallholder farming and broader land-use challenges such as commodity crop expansion and intensification of commercial plantations (Meyfroidt 2015). This approach is particularly relevant in Mozambique because 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 (Zagama 2011, Chigara et al. 2013, Di Matteo and Schoneveld 2016, IFAD 2016). This is also 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 the 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 rural 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 must be changed first, and what next (Albrechts 2010). Defining 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 (Cerreto 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 rural 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, particularly in land-use frontiers (Nascimento et al. 2020).

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

The rationale 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 has 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).

Track four - key insight 5 (KI-5): Designing strategic frameworks for action (8) complemented with the definition of funding schemes supporting the long-term vision (9) would reduce dependency of donors' agendas, programs, and their funding schemes (v), while contributing to the sustainability of frontiers (D).

In line with the above, achieving a long-term vision demands short-term actions based on tangible, realistic strategic frameworks. As Pfeffer and Sutton (2000) put it, the gap between knowing what to do and 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 an SSP, Figure 1 suggests these "frameworks for action" 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. Second, there is the "bricolage" view. In strategy making, "bricolage" refers to creative and adaptive management of knowledge and local-based practices and available resources toward 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 try to establish some order or organization (Weick 2000). 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 into SSP (Buček 2016, Legacy and Leshinsky 2016). In land-use frontiers, obtaining financial capital is highly dependent on donors' agendas, programs, and funding schemes. A majority of the 30 interviewees convincingly stated that it has become the habit that the national government expects 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 elements discussed above in order for SSP processes to be rooted in local communities, their key issues, and their spatial qualities. We acknowledge also that other ways of dealing with the issues at stake are possible and alternative ways of thinking about governance in land-use frontiers would have been worth investigating, among others the application of jurisdictional approaches because these approaches have become popular as encouraging strategies to guarantee sustainable commodity supply (Brandão et al. 2020). Jurisdictional approaches are frameworks that pursue the alignment of governments, businesses, NGOs, and local and regional stakeholders in specific administrative jurisdictions around collective interests in land-use governance (Fishman et al. 2017, Boyd et al. 2018).

In this paper we emphasize the contrasts between SSP in high-income societies, in which privately driven agendas have been playing an increasing role but also in which governance arrangements involving public and private stakeholders, as well as citizens, aid in balancing interests in favor of sustainable-oriented spatial transformation (Oliveira and Hersperger 2018). In emerging land-use frontiers, planning and the overall governance of the territory are becoming increasingly challenging (Garrett et al. 2018). Governance challenges include the fragile coordination between government agencies or land tenure insecurity issues in relation to land-use planning (Chigbu et al. 2019). Other challenges are the power struggles in dealing with contradictory policy incentives, unplanned mutations in tenure regimes, and corruption involving land and other natural resources (Corbera 2012).

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

CONCLUSION

The strength of strategic spatial planning (SSP) in emerging land-use frontiers lies in its ability to pave the way for a more sustainable and equitable territorial development of local, rural communities, by working with societal actors/stakeholders, including large-scale land-based investors. This paper has sought to provide evidence that despite the promising avenues to create sustainable development and commercial agriculture in land-use frontiers, which deliver benefits for every stakeholder, including rural communities, to realize these benefits, public and private actors

must 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 the land through the customary-rights regime. The displacement of local, rural communities, with weak bargaining power, from the land they have been accessing for years and their resettlement with insufficient compensation are issues that might increase with unchecked transnational investments. In addition, the majority of the 30 interviewees argued that during planning processes or when confronted with a proposal for land acquisition, public entities overlook community consultation (and their active participation) to accommodate the interests of large transnational agricultural and forestry corporations. To overcome these constraints, the majority of the 30 interviewees called for a thorough, long-term, territorial, development strategy. Complementing their views with insights from SSP literature, we conclude by proposing nine elements of the SSP process. These elements are essential in enabling strategic planning to support the governance of land-use frontiers with a focus on sustainability. We present these elements in Figure 1. There are, however, caveats. First, SSP does not flow smoothly from one track to the next or from one element to another. It is a dynamic and mutually enforcing process. Second, 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 an 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 the interests of the food and agribusiness sector. Below we discuss our proposals to overcome these limitations.

First, strengthening institutional and decision-making capacity at community level would enable local communities to define their own development paths. The key instruments are the formal delimitation of community land rights and the establishment of an entity for the community with legal powers, enabling it to deal directly and autonomously with land-based investors and foreign nationals. Second, facilitating the participatory mapping and planning of current and future land and natural resource uses within rural 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. This would ensure support for local communities' entities and their members to exercise their rights in benefiting from and using the land. In this quest, an SSP process should account for an increase in the participation of local communities in land allocation processes currently controlled by the central government. Consequently, this will help to leverage communities' statutory rights to access resources and therefore establish partnerships with capitalized actors, producing commodities for distal markets. An SSP process in frontier

contexts should also build on synergies with landscape conservation approaches, related to enhancing carbon sequestration or halting and reversing land degradation.

We emphasize that despite the usefulness of mainstream concepts, such as SSP, their application in middle- and low-income countries must be tailored to individual contexts. In addition, action-oriented schemes need to respond to the wants and needs of local communities, need to consider the availability of natural and financial resources, and seek wider involvement of public and private actors as well as work across sectorial and institutional boundaries. This study thereby pushes the agenda for multi- and trans-disciplinary approaches to knowledge co-production of transformative changes in the governance of land-use frontiers, primarily in low-income countries, to promote equitable development, well-being, and sustainability of rural communities.

Responses to this article can be read online at:
<https://www.ecologyandsociety.org/issues/responses.php/13001>

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Data Availability:

An interview guide, in Portuguese, along with a summary of interview results in English and scripts of the interviews are available from the corresponding author upon request. The digital recording of the interviews, for reasons of anonymity, is not available.

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Appendix 1. Interviewees of the study (n = 30), clustered by the primary focus of interview questions.

The primary focus of interview questions	Entities interviewed and number of interviewees in each entity
Supporting, cooperation or advisory work on natural-resources management, including land use in face of foreign investments (n=11 interviewees)	<ul style="list-style-type: none"> • France-Mozambique Chamber of Commerce and Industry (1 interviewees) • Japan International Cooperation Agency (JICA) (2 interviewees) • National Sustainable Development Fund [FNDS (2)] (2 interviewees) • Norwegian Embassy (2 interviewees) • Swiss Agency for Development and Cooperation (1 interviewees) • The Food and Agriculture Organization (FAO) (1 interviewees) • We Effect and the Swedish Embassy (1 interviewees) • World Bank (3) (1 interviewees)
Working on land delimitation, including community land delimitation and Right of Use and Benefit of Land [DUAT (1)] and land registry support (n=9 interviewees)	<ul style="list-style-type: none"> • Community Land Initiative Foundation (iTC-F) (2 interviewees) • Rural Aid Association or Association for Rural Mutual Help (ORAM) (2 interviewees) • Terra Firma Lda (1 interviewees) • Verde Azul Lda (4 interviewees)
Working on spatial planning, land policy and land administration issues (n=5 interviewees)	<ul style="list-style-type: none"> • Mozambique National Union of Peasants [UNAC (4)] (1 interviewees) • National Directorate for Land [DINAT (4)] (2 interviewees) • National Directorate for Spatial Planning and Resettlement [DINOTER (4)] (2 interviewees)
Researching (or supporting research) on spatial planning and territorial development challenges (n=5 interviewees)	<ul style="list-style-type: none"> • Faculty of Agronomy and Forestry Engineering, Eduardo Mondlane University [UEM (5)] (3 interviewees) • Rural Environment Observatory (OMR) (2 interviewees)

Notes:

(1) *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).

(2) Primarily focused on MOZLAND project – Mozambique Land Administration Project (or *Terra Segura*) and Agriculture and Natural Resource Landscape Management Project (or *SUSTENTA*).

(3) Primarily focused on MOZLAND project, [National Territorial Development Plan](#)

(PNDT), and Strategy and Plan for Agricultural Development 2020-2029 (PEDSA II).

(4) Primarily focused on spatial planning instruments and land policy instruments such as Mozambique's National Land Policy n° 10/95 (*Resolução 10/95 Política Nacional de Terras*) and Land Law n° 19/97 (*Lei de Terras, Lei n° 19/97, 1st of October*) and land-related legal framework. DINAT has day-to-day responsibility for land administration and is charged with the maintenance and management of the national cadastral system. DINOTER is charged with spatial planning.

(5) 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.

Design: Authors' own elaboration.
