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SEA making inroads in land-use planning in Brazil: The case of the Extreme South of Bahia with forestry and biofuels

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ABSTRACT

In Brazil, incorporating the environmental dimension to the planning process is a challenging process. Planning has historically been carried without considering environmental protection concerns. The country's large development projects have engendered a discussion on the feasibility of these works given the conflicts with environmental policies. The strategic environmental assessment (SEA) is a tool that has the potential to integrate the sectoral, territorial and environmental perspectives to promote sustainable development, as shown by international experience. Its use has not yet been regulated in Brazil, only been voluntary initiatives, both public and private, have been implemented. This paper presents the structure and results of the SEA of the plans to expand silviculture of eucalyptus and biofuels in the Extreme South Region of Bahia state, in the Brazilian Northeast, in a context of sectoral planning dissociated from government guidelines for land use policy and environmental protection. It portrays a practical case of methodological proposal for the use of socio-environmental criteria to establish limits for land occupation by monocultures, for each of the municipalities of the study region, according to their specific climate, soil, relief and environmental preservation characteristics. Various alternatives were identified to ensure areas with greater productivity for small family farming and areas with potential for preservation. SEA helped to a better understanding of the effects of the expansion of the planting areas in each alternative, which was essential to help all stakeholders visualize the consequences of their strategies. Consequently, as results the SEA outlined a series of guidelines and restrictions for the various levels of government and the production sector. For instance, SEA suggested for Federal, State and Municipality governments that areas with better soil and climate conditions could be reserved for public policies to incentive the diversification of the uses of the territory, such as food production. SEA also suggests the adoption of incentive programs to establish multiple-use forests. The SEA recommended that the state government integrate its program for strengthening family agriculture with land-use planning criteria, based on cooperative systems The methodology employed has evidences to be replicable in other regions of Brazil and in developing countries.

Introduction

The difficulty in accomplishing sustainable development and the lack of solutions to address the problems of conventional development led to the increasing importance of environmental management and planning instruments (Jones et al., 2010). Setting environmental problems in the context of geographical and territorial limits is essential to understand the social, cultural, economic and political relations developed among stakeholders and of these with nature (Söderman and Saarela, 2010).

Nevertheless, in developing countries, particularly in Brazil, incorporating the environmental dimension to sectoral planning is a challenging process, contextualizing its effects on the land (Sánches, 2008; Teixeira, 2008). Land-use planning is also dissociated from sectoral one and both lack the environmental dimension, limiting their guidelines strictly to economic and territorial aspects (MMA, 2002).

Brazilian context presents a specificity, the booming economy is leading to sighted public policies proposals centered in infrastructure, logistics and sectoral investments sometimes ignoring

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the necessity to check the environmental feasibility in a proper way (Agra Filho, 2001). The environmental issue has been put aside, even if internationally it is seen as a competitive edge of the Brazilian development. In this regard, the discussion on the environmental feasibility of major development projects highlights the conflicts between the objectives of environmental, sectoral and land-use policies (Teixeira, 2008).

The strong development of biofuels and planted forests markets in Brazil has placed these sectors at the center of a debate about their real collaboration as sustainable activities. Even with potential for greenhouse gases' mitigation, it has been frequently questioned their social effectiveness due to the impact on land distribution and migration consequences. The environmental and land use management instruments, which could give more balance to the expansion plans, have not solved the impacts on land distribution, and that has raised tension in the regions involved. The main failure seems to be the inability to assess the problem in an integrated manner and to influence the decision-making process. In addition, they are not able to capture the synergistic effects.

In this way, the experience of industrialized countries in integrating the various perspectives of sustainable development in the planning process shows the potential of several environmental management tools, specially the strategic environmental assessment (SEA). SEA is understood as a second generation instrument because it has the potential to bring the principles of environmental impact assessment to higher decision-making levels, integrating all points of view in the same decision process (Chaker et al., 2006; Noble, 2000; Partidário, 1996; Sadler and Verheem, 1996; Sadler, 1996; Therivel and Partidário, 1996; Therivel, 2004).

Although the SEA is already well established methodologically, internationally widespread and has proven effectiveness as a tool to support decision making (predominantly in Europe and North America), there is no consensus about its methodological adaptation to Latin America requirements and needs more systematization. Much of the experience developed depended on the obligation imposed by multilateral development agencies (Sánches, 2008). One of the few works, recently developed by Malvestio and Montaño (2012), concluded that the adoption is still fragile in Brazil and it indicates the need for methodology improvements.

The application of SEA in the areas of biofuels and forests is even more rare in Brazil. The understanding that the current model of planning in biofuel and forest sectors can not deal with problems of lack of integration of the environmental variable in their decision making processes opens up great perspectives for SEA. However, the context of inefficient instruments for land use planning in Brazil requires that the SEA discuss alternatives from environment and land use point of view, supplying the gap. Therefore, the SEA must simultaneously support the planning sector and support land use planning in the region, even if the competence of it belongs to another sphere of decision—the State Government.

The development of practical cases of SEA in biofuel and forest sectors and its appraisal is very useful for establishing methodologies adapted to the institutional context of each country. Research on timing and SEA procedures is required before the definition of its institutional structure. It is essential to stress the results that can be obtained with SEA, leveling the expectation about the limits of the tool (Sánches, 2008).

The aim of this paper is to present the main characteristics of the use of SEA to provide input for land-use planning process, incorporating socio-environmental and land-use aspects, while filling in the gaps of sectoral planning. It expects to be an input for discussions about SEA methodologies that can be adopted in future cases in Latin America. To do so, we present the case of the strategic environmental assessment of the plans to expand the silviculture of eucalyptus and biofuels in the Extreme South of Bahia, in the Northeast of Brazil.

According to the SEA report, the main problem of the Extreme South region of Bahia (ExS) is the widespread occupation of monocultures, which reinforces a process of land concentration and migration from the rural area to the city, as well as their pressure in local biodiversity. This is emphasized by the lack of government policy for the region, in a context of low governance.

The historical absence of land use regulations, despite the basic ownership rights and the deficient compliance of the environmental laws increase significantly the deforestation in the region. At the same time, it was transformed into an enormous eucalyptus monoculture, one of the largest eucalyptus spot in Brazil. This causes high levels of land concentration ownership and segregation of the small remaining family farmers, surrounded by big monoculture fields.

SEA was used specifically to provide input for the environmental licensing process for a new cycle of expanding eucalyptus and sugar cane cultures, with proposals intending to more than double the current eucalyptus planted area. To assess the sustainability of this expansion cycle, the SEA explored several scenarios based on socio-environmental criteria for land-use, given the specificities of each affected municipality.

This section 'Introduction' will provide a brief overview of the international experience in SEA, a summary of the evolution of environmental impact assessment (EIA) in Brazil, a background of strategic environmental assessment experience in Brazil, describing the efforts undertaken, as well as some opportunities for its application. Section 'Materials and methods' details the case of the strategic environmental assessment of the plans to expand the silviculture of eucalyptus and biofuels, its context, the main points of the methodology, the results obtained and some considerations about its replication. The conclusions refer to the opportunity of using the proposed methodology in similar situations.

The international SEA experience

Strategic environmental assessment is a tool for decision makers that aims to incorporate environmental values together with social and economic aspects in proposals for policies, plans and programs. SEA was first introduced by the US National Environmental Policy Act as a "Programmatic Environmental Impact Statement" (Dalal-Clayton and Sadler, 2005).

Among its various definitions (Therivel et al., 1992; Partidário and Clark, 2000), Sadler and Verheem (1996) defined it as: "a systematic process for evaluating the environmental consequences of proposed policy, plan or program initiatives in order to ensure they are fully included and appropriately addressed at the earliest appropriate stage of decision making on par with economic and social considerations". It is seen as a complement to the environmental impact assessment of projects, with the aim of connect the environmental limits in all levels of decision making (Dalal-Clayton and Sadler, 2005).

SEA has been used in several developed countries to promote more sustainable alternatives for policies, plans and programs (PPP), avoiding and mitigating their potential socio-environmental and economic impacts (João, 2007; Therivel, 2004). Given its great complexity and flexibility, there is no single approach for its application. Three distinct variations are most evident (Dalal-Clayton and Sadler, 2005): (a) a separate process, usually considered an extension of a project's EIA; (b) a system that acts within sectoral plans and programs separated from strategic policies; (c) incorporation of EIA in an integrated system of policy assessment in the context of land-use planning.

In this regard, published works (Buuren and Nooteboom, 2010; Chaker et al., 2006; Fischer, 2010; Gazzola, 2008; Jiricka and Pröbstl, 2008; Noble, 2009; Wang et al., 2009; Weiland, 2010) indicate the