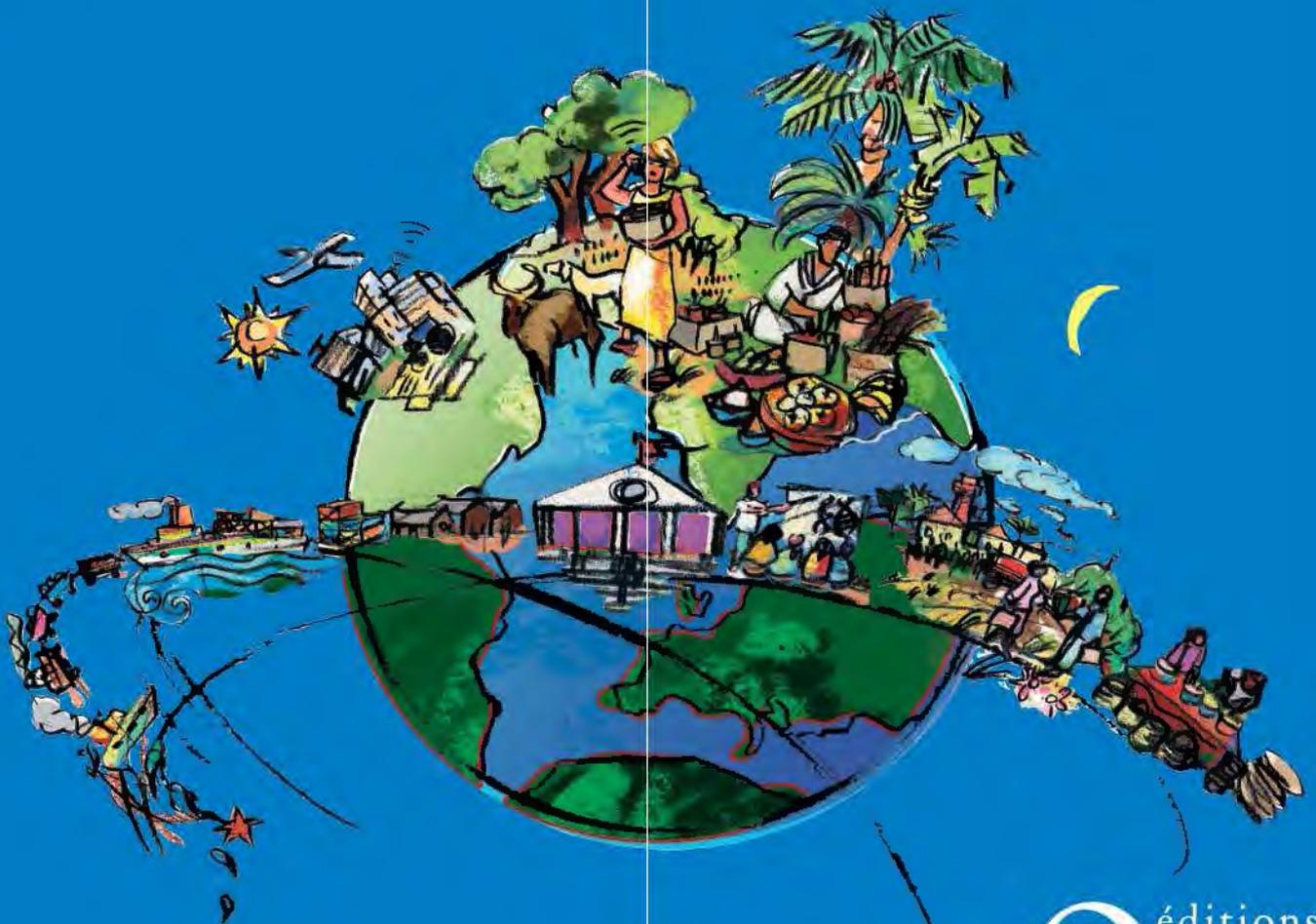




AGRICULTURES
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Living territories to transform the world

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T. Wassenaar,
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CHAPTER 7

‘Municípios Verdes’: from zero deforestation to the sustainable management of natural resources in the Brazilian Amazon

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The Brazilian federal government’s Action Plan to Prevent and Control Deforestation (PPCDAM) in the Brazilian Amazon¹, launched in 2004 and backed by commitments by the soya bean and beef sectors, has led to a considerable drop in the annual rate of deforestation. For territorial actors, it has been a matter of conceiving, planning and implementing a rapid agrarian transition, based on a more efficient management of their various natural resources, of appropriating a limited physical space, and of creating the institutional capacities required to manage it sustainably.

THE *MUNICÍPIO VERDE* INITIATIVE

Starting in 2008, the Brazilian federal government’s coercive measures against deforestation have targeted specific *municípios* (municipalities), on the basis of three indicators reflecting the intensity of deforestation. One of these targeted *municípios*, Paragominas, which covers an area of 20,000 km² in Pará State, launched the Município Verde (Green Municipality) initiative in 2009. Paragominas was previously known for widespread extractive and mining exploitation of its natural resources. Public- and private-sector actors of this municipality, supported by environmental NGOs and funds from large companies located in the region, proposed a territorial

1. This chapter is based on research carried out within the framework of the Ecotera project, funded by the French National Research Agency (ANR-13-AGRO-0003).

pact with key shared objectives: the end of deforestation; the registry of landholdings; incentives for restoration or reforestation of degraded soils; and the adoption of good agricultural, livestock and forestry practices. In two years, the rate of deforestation in Paragominas has fallen below 40 km²/year and the land registry has been completed for more than 95% of the territory, achievements that led to the suspension of federal punitive measures against the municipality. This emblematic success of the initiative inspired the Municípios Verdes Programme, launched by the government of Pará State. A total of 107 *municípios* (out of 144 for the whole state) have so far joined this programme. This programme has adopted the main objectives of the Paragominas initiative. However, it exhibits several limitations jeopardizing the sustainable management of natural resources in a zero-deforestation future.

A PACT AND ALTERNATIVES NOT ADAPTED TO FAMILY FARMING

In Paragominas, deforestation has decreased considerably in medium and large farms but much less so on family farming land (Piketty *et al.*, 2015). Not only does deforestation resulting from traditional slash-and-burn practices still persist, it has even increased for some cash crops. Alternatives (provision of a tractor to clear the plots without using fire) or measures to consolidate family farming have been proposed, but they still benefit only a small number of farmers close to the city (Viana *et al.*, 2016). Furthermore, a more efficient use of key natural resources, such as soil fertility and water resources, is not part of these measures and not actively advocated. Thus, soil conservation techniques are still rarely implemented, even though they are essential to the viability of agriculture that does not require forest clearing or the use of fire. In addition, the new, more demanding, environmental and health standards are tending to weaken family farming (Piraux *et al.*, 2015).

DISRUPTED FOREST FUNCTIONS

Different land uses in the territory of Paragominas since the 1960s have led to a mosaic of forests in very different states. Cleared but uncultivated areas have been replaced by so-called secondary forests of varying ages. Primary forests, which cover 54% of the territory, are, for the most part, degraded (Bourgoin *et al.*, 2016). Their structure, functions and ecological services are very different from those of mature forests (Berenguer *et al.*, 2014). It has now become necessary to manage these degraded forests because a zero-deforestation commitment makes them a permanent component of the territories. Reflection at the territorial scale is required to make agricultural production compatible and spatially complementary with forest production so that fragmentation can be limited as far as possible and a forest matrix can be maintained. Finally, there is very limited knowledge about the processes behind forest degradation, and research is needed to better characterize them, locate them in the landscapes, and identify land use plans that favour the conservation of the services that these forests can provide (Ferreira *et al.*, 2015). The dichotomy between forests and non-forests, which underpins deforestation monitoring systems, and measures focusing solely on zero-deforestation are clearly not sufficient to confront these challenges.

THE NEED FOR MORE EFFICIENT MANAGEMENT OF THE VARIOUS NATURAL RESOURCES

Farmers are all aware of the need to intensify land use and adopt practices that are less detrimental to natural resources. However, most available techniques aim to increase productivity per hectare without really considering the functioning of the agroecosystem as a whole. Furthermore, they often require the use of equipment or inputs that are too expensive or technical for most farmers (Cialdella *et al.*, 2015). These forms of intensification result from individual farmer strategies (Poccard-Chapuis *et al.*, 2015a) and are mainly found on the most fertile and accessible land (Piketty *et al.*, 2015). Agricultural practices that make better use of the functioning and complementarity of the different natural resources do exist and some are already being tested by innovative farmers. They are inspired by the principles of agroecology, with, in particular, the emergence of agroforestry systems or the spatial reorganization of the farm (rational management of pastures and reservation of areas far from buildings for forest regeneration on the basis of soil quality, topography, etc.). These various practices often take more time to start producing economic returns and they remain sensitive to the risk of accidental fires. Collective action and the mobilization of territorial actors (action research, technical support, communication) are thus necessary for their adaptation and dissemination (Poccard-Chapuis *et al.*, 2015b).

HOW TO PROCEED FURTHER?

In order to proceed further in the sustainable management of natural resources, a territorial development project has to emerge from a greater involvement of actors, especially those from family farming. The challenge is to 'make' the municipality of Paragominas a territory, i.e., the actors have to appropriate it (through a more detailed knowledge of its resources), organize it more (by establishing rules and creating suitable governance mechanisms), and then implement, in concertation, their territorial development project. Measures to accompany local experiments, the production of detailed cartographic data on the monitoring of practices and of their impacts on natural resources, and the prospective scenarios currently built with local stakeholders in Paragominas seek to help address this challenge.

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