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Abstracting Congolese forests: mappings, representational narratives, and the production of the plantation space under REDD+

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January 2020

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ABSTRACT

Inspired by Science and Technology Studies and using findings from a multi-level field research in the Democratic Republic of Congo (DRC), this paper analyses the construction and use of controlling geospatial-driven narratives and seemingly neutral cartographic representations of Congolese forests for producing green economic landscapes under REDD+ process. I first show how simplified satellite-based maps, in a messy socio-political context, perform as neutral actants for identifying culprits and assigning blame, leading to a uniform 'national consensus' on community-induced threats to nature while letting industrial extraction off the hook. This understanding says very little about socio-political and power relations that shape forest use and change, and virtually ignores local knowledge, thinking and living models. Local communities' subjectivities and livelihoods are carefully framed into homogeneous 'poor unproductive but harmful shifting cultivators', a figure rooted in colonial discourses which permeates people's imaginaries of forests and of what is possible, plausible and desirable. Despite purported inclusive REDD+ strategies, this framing legitimizes geospatial control over local socio-spatial practices and the production of a monoculture of productivity and bounded rationalized space, materialized in the privately-held and extractive plantation or concession to the detriment of communities' sovereignty. This model, I show, produces standardized subjectivities of the 'socially responsible green company' and the 'enviropreneurial commodity petty producer/labourer' integrated in international markets, leaving social and environmental injustices totally unaddressed. My findings emphasize the interlinkages between epistemic and material dispossession and shed light on ongoing processes of *slow violence* that have long term socio-ecological consequences.

1. INTRODUCTION

Now when I was a little chap I had a passion for maps. I would look for hours at South America, or Africa, or Australia, and lose myself in all the glories of exploration. At that time there were many blank spaces on the earth [...]. But there was one yet—the biggest, the most blank, so to speak—that I had a hankering after. [...] True, by this time it was not a blank space any more. It had got filled since my boyhood with rivers and lakes and names. It had ceased to be a blank space of delightful mystery—a white patch for a boy to dream gloriously over. It had become a place of darkness. But there was in it one river especially, a mighty big river, that you could see on the map, resembling an immense snake uncoiled, with its head in the sea, its body at rest curving afar over a vast country, and its tail lost in the depths of the land.

Joseph Conrad, *Heart of Darkness* (1899, Ch.1 p.8)

If one looks at Google Maps and Satellite views, the Democratic Republic of Congo (DRC) still appears as the “unmapped within the map” (Hiatt, 2002, p. 223), a huge ‘blank’ or, rather, green space with few depicted rivers, villages and roads even as one zooms in. Once depicted as impenetrable, a *terra incognita* for scientists, the dense Congolese rainforest –the second largest contiguous expanse of tropical forest in the world– has yet rarely been more scrutinized, visualized and mapped than over the last decade, since the DRC engaged in the *Reducing Emissions from Deforestation and Forest Degradation* (REDD+) process in 2009. As the story tells, very limited data on the country’s forest dynamics, annual gross deforestation rate and its drivers was then available and hence a “comprehensive forest management and zoning process” was nearly impossible (DRC-MECNT, 2008; Thompson, 2011, p. para. 6). *Geo-coding* spaces, to paraphrase Pickles (2004, pp. 4-5), has indeed been historically a key instrument in Western modernity projects for delimiting, ordering and controlling territories. One of the first major investments in the REDD+ readiness (preparation) phase was to produce such scientific geo-coded data –in particular geospatial analysis of satellite imagery– and maps of Congolese forests. On this basis, a ‘national consensus’ on an annual gross deforestation rate of 0,23%¹ and on the main drivers of deforestation was established and served as an input for building the country’s REDD+ strategy, for prioritizing actions and for monitoring forest landscapes.

On the basis of this consensus, the REDD+ strategy in DRC has largely evolved towards what is labelled as jurisdictional or integrated landscape approach² in policy discourses (McCall, 2016). The landscape approach broadens the climate-, forest-, carbon- and performance-based initial emphasis of REDD+ towards the integration of multiple stakeholders and multiple productive land-use types –such as agriculture and mining– with a larger range of environmental and developmental goals at a wider landscape scale. This new discourse purports to be a bottom-up management approach that can emerge from ongoing negotiation and reconciliation between competing land uses and objectives of various stakeholders –bureaucrats and experts within policy arenas, private actors, individual farmers and local communities in the Global South (Arora-Jonsson, Westholm, Temu, & Petitt, 2016; Nielsen, 2016; Sayer et al., 2013).

Emerging critics of the landscape approach have however questioned this all-inclusive discourse. McCall (2016, p. 59) argues that the ‘landscape’ conceptualization “focuses on the application of ‘landscape’ as a science-driven tool for analysing [and managing] ecosystem

[1] As this paper shows later, this figure is not definitive and still highly debated because various studies using different methods, different types of imagery and different definitions of forests/deforestation yield different estimates.

[2] In REDD+ literature, both terms are used and refer to the same model for aligning multiple land-use types with administrative jurisdictions and coordinate multiple goals, initiatives and stakeholders. In the remainder of the paper I only refer to ‘landscape approach’.

and inter-sectoral relationships” as if all stakeholders were equivalently empowered and so were their knowledge, representations and values about (desirable) landscapes and land uses. In his case study of a landscape conservation approach in Southeast Cameroon, Clay (2016) similarly notes that the project was largely premised on expert knowledge and authority, such as advanced statistics to calculate species richness or Geography Information Systems to analyse land-cover. The resulting overly spatialized interpretation reproduces uneven power relationships by promoting a particular vision of conservation coexisting with productive and extractive activities through the use of zone-based, static land use models that disregard local communities’ society-environment relationships and marginalize their livelihoods. The continuous emergence of such new models seems to be inherently linked to strategies of ‘rendering technical’, depoliticization and building consensus to distil complex realities and reinforce authoritative narratives that legitimize interventions while leaving previous conservation and development approaches’ challenges largely untouched (Lund, Sungusia, Mabele, & Scheba, 2017). The crucial issues arising from this emerging critical scholarship on ‘new’ landscape approaches are thus related to what are their dominant narratives, what and whose knowledge counts, how their framing is legitimized and implicitly or explicitly prioritizes competing stakeholders’ interests in these seemingly ‘all inclusive’, hybrid landscapes.

Political ecological scholarship on forest governance (e.g. Blaikie, 1999; Fairhead & Leach, 1996; Forsyth & Walker, 2008; McElwee, 2016; Robbins, 2001) has provided valuable insights into the ways in which Western techno-scientific knowledge often leads to simplistic and largely ‘misread’ narratives of deforestation that help constrain the livelihoods of local communities while availing space for more powerful capital interests. These narratives are based on long established representations of nature and some trace their origins back to the colonial period, at the beginning of the 20th century when issues such as deforestation and desertification entered policy debates for the Colonies (Blaikie, 1999). Complex society-environment relationships are distilled into seemingly apolitical abstract categories and reconfigured within a global environmental space and a unitary political-economic rationale. Igoe (2013) specifically emphasizes how scientific and aesthetical visual articulations of nature have contributed to its abstraction, unitarization and formation as a monolithic eco-functional object of intervention, optimization and commodification, while concealing and marginalizing alternatives and opposition to this vision. Similarly, Forsyth and Sikor (2013) warn that the use of remote-sensing data for defining and measuring global REDD+ objectives might encourage both large-scale reductions in deforestation rates and industrial selective logging rather than shifting cultivation and improvement in forest quality/biodiversity that could locally be more beneficial. The argument here is not that scientific explanations of deforestation are invalid but that the selectiveness of measurement methods, their take on these issues, what problems they highlight or obscure “are shaped by the imprint of dominant narratives from which they dr[a]w their intellectual inspiration and legitimacy” and by powerful international and national environmental policy-making institutions (Blaikie, 1999, p. 133).

This paper builds on these sets of critiques and insights from Science and Technology Studies and critical cartography to empirically analyze the controlling geospatial science-driven narratives and seemingly neutral cartographic representations of Congolese forested areas informing the genesis of a REDD+ landscape approach in DRC. I adopt a relational understanding of mapping (Kitchin & Dodge, 2007) to understand how maps within DRC’s REDD+ assemblage of human actors, interests, (historical) discourses, narratives and material phenomena contribute to reify and shape particular socio-spatial relations and identities, and in whose interests.

My analysis is about the politics of environmental knowledge and the perpetuation of discursive and epistemic dispossession that allow a transnational network of hybrid actors –acting as “interpretive communities” (Mosse, 2004, p. 646)– to impose their meanings of the landscape, and that underpin various accumulation strategies and the (re)production of inequalities (Igoe & Brockington, 2007; West, 2016). These “complex acts of dispossession” (West, 2016, p. 1), I show, start with the (almost) exclusive use of satellite data, mapping and visualizations at the cost of other epistemologies and with the misrecognition and subordination of local forest users who are cast as unproductive and environmental unfriendly, and are denied any control over the definition of their struggles, identities, social worlds and needs (Fraser, 2000; West, 2016). To paraphrase Fraser (2000) issues of epistemic (mis)recognition are here fundamentally intertwined with social and distributive (in)justice, and material (dis)possession. Supposedly objective cartographic, semiotic, verbal and visual production of Congolese forests and their users in fact legitimize old discourses of ecological modernization and spatial control, and help to produce desirable ‘integrated’ green economic landscapes eligible to more powerful external actors. These discourses, I argue, are rooted in what some critical scholars (Haraway, 2015; Haraway et al., 2016; Haraway & Tsing, 2019) have recently termed the ‘Plantationocene’, that is an homogenization of ecologies into the system of extractive and enclosed plantations relying on forms of waged but alienated labor, that starts with the elimination of other agricultural and forest living practices. Epistemic injustice, I argue, thus contributes to restructure not only space and socio-ecological interactions but also socio-economic relations and individual subjectivities for the needs of the regeneration of capital; all are inextricably imbricated. More largely, my critique is concerned with “unveiling some of the epistemic silences of Western epistemology [...] to allow the silences to build arguments” (Mignolo, 2009, p. 162) and challenging hegemonic “rhetorics of representation” at the roots of all uneven development (West, 2016). This analysis is particularly important as, to my knowledge, few studies have taken a critical geography and political ecology perspective to analyse the discourses that underlie REDD+ strategies in DRC (but see Ehrenstein, 2013, 2014) –while the literature is more abundant for other countries like Indonesia. It also generally adds to the limited academic empirical material available on DRC’s REDD+ implementation (but see e.g. Aquino & Guay, 2013; Reyniers, Karsenty, & Vermeulen, 2015; Samdong, Bush, Vatn, & Chapman, 2018; Samdong & Kjosavik, 2017). In a country that is usually recounted for the militarization of conservation (e.g. Virunga National Park), its spectacular poverty, failing institutions and violent wars, I believe it is essential to reveal a less spectacular but enduring “slow violence” (Nixon, 2011) of environmental rule. In Nixon (2011, p. 2)’s terms, slow violence is “a violence that occurs gradually and out of sight, a violence of delayed destruction that is dispersed across time and space, an attritional violence that is typically not viewed as violence at all”.

The remainder of this paper is divided as follows. In section 2, I outline my theoretical and epistemological underpinnings –critical cartography, power/knowledge, assemblage and performativity. Section 3 briefly describes the methods and field sites. In the next two sections I develop my arguments by looking at the case of REDD+ in DRC. Section 4 shows how diverse geospatial imageries, maps, visual and discursive elements are drawn together to give authority to claims blaming local people’s livelihood practices for deforestation. It emphasizes the contingency of DRC’s REDD+ maps and narratives by highlighting their roots in colonial discourses and their function as a convenient reality in a socio-political context characterized by constant (re)negotiations. Section 5 analyses how these rhetorics of representation have led, in DRC’s strategy and investment plan, to a *monoculture* of bounded rationalized space managed through

privately-held plantation concessions to the detriment of communities. I further show how it recasts forest users' subjectivities into standardized categories of the 'socially responsible green company' and the 'enviropreneurial commodity petty producer/labourer' integrated in international markets while completely neglecting power inequalities between actors and complex issues of sovereignty over land and resources, their management and conservation. Section 6 summarizes the paper's findings and concludes by emphasizing the ongoing slow violence that treats both people and natural ecosystems as disposable and malleable to powerful economic interests.

2. INTERROGATING MAPS AND MAPPING: FROM HEGEMONIC REPRESENTATION TO PERFORMATIVITY

Anyway, we can say that, in the current era in which technical means allow fast realizations, even more so than in the past, it is economical and rational to start the equipment of new countries with the establishment of the map. [...] In a developing country, the map appears as a unifying factor, in the action of all those who are concerned with prospection and planning.

Albert Gilliard, Cartographie congolaise (1953, p.4)

Existing maps have been drawn in function of economic interests. Everyone had specific concerns and everyone has developed its own reference point. [...] Maps produced by NGOs today, that is not maps' production because they work out their maps for their own interests. That is why it is relative.³

Director of the Geographic Institute of Congo (IGC)⁴

2.1. Setting the stage: modern mapping and (colonial) power

That maps and cartographic visualizations⁵ are imbued with and have power has long been shown by critical cartography (e.g. Crampton, 2010; Crampton & Krygier, 2005; Harley, 1988; Lefebvre, 1991; Pickles, 2004; Sletto, 2002; Winichakul, 1994; Wood, 1992). They are an entire part of the *political economy of government* (Crampton, 2010, p. 63). Historically, and in particular since the early 19th century, mapping has been entangled with political decision making, administration (metropolitan and colonial) and monitoring of territories, resources and populations –that is 'geographic governance' (Crampton, 2004) or 'cartographical reason' (Olsson, 2007). Building on Foucault's concepts of governmentality and biopolitics –i.e. a type of political rationality concerned with the well-being of populations and used by different types of authorities and agencies to shape human conduct– Crampton (2004, 2007), Pickles (2004) and Rose-Redwood (2006) among others argue that the geo-coding of the world through mapping is in fact a fundamental requisite to this form of governance. As maps along with other statistical and census tools allowed to spatially track social, economic and environmental phenomena and other spatial patterns and processes, they became a vital instrument for states and new types of governing institutions to identify and address all types of societal problems (Kitchin, Dodge, & Perkins, 2011). Similarly, maps have played a key role in (geo)surveillance and probably even

[3] Both quotes are own translations from French.

[4] From 2 interviews 31-CSI-KIN-20160407, 48-CSI-KIN-20170531.

[5] Though I will provide a more complex understanding of 'maps' and 'mapping' later in this section, for the sake of clarity, please note that I use the term "map" as an englobing term for various conventionalized spatial visualizations that provide a bird's eye view –looking straight down from above– of a place, a landscape, a phenomenon or a process with "a consistently applied reduction in scale" (Dodge, Kitchin, & Perkins, 2011, p. x). They can be static, paper based or dynamic, interactive. They non exhaustively include: conventional maps, Geographic Information Systems (GIS) maps, satellite image maps, 3D maps, etc.. While, in this paper, I only look at 'expert' mapmaking, maps are also increasingly open-source and collaborative.

more so over the last few decades with the fast evolutions in mapping and algorithmic technologies that can track and profile individuals and groups/populations as a whole or in the case I am interested in, forest use (Crampton, 2010). Geospatial technologies and mapping can hence inform governance interventions, expose wrongdoings and “[re]order] lived lives into markets [or] potential profits” for capitalist accumulation (Kitchin et al., 2011, p. 391). In this way, ‘power through map’ is maybe more than ever, ubiquitous.

An essential aspect that makes geospatial mapping and representations so powerful and central to governance is the way they dematerialize and produce a ‘radical abstraction’ of space in points, lines, squares and surfaces (Lefebvre, 1991; Massey, 2005; Pickles, 2004). Maps, by de-socializing the landscape and rendering places, people, human and nonhuman things and complex lives and processes as mere dots or pixels, makes power at distance easier because it allows bureaucrats, developers or planners to take action on “bodies of unique places” without witness to human and social consequences (Harley, 1989, p. 14; Kitchin et al., 2011). Thus, next to a familiar sense of power in cartography, somehow ‘external’ to maps –or, power through maps– maps also have an ‘internal power’ (Harley, 1989). In other words, power is inherently constituted in the very design of maps, in the selectivity, inscriptions and silences they produce and in the very type of meanings and values they embody (Kitchin et al., 2011; Pickles, 2004). Even something as ‘benign’ as a mapped visualization of forests and population, as I explore in this paper, has a politics that expresses an embedded social vision (Harley, 1989) that typifies and structures certain ways of knowing, thinking, conceiving and being in space.

In two landmark works exploring the relationship between maps and nation states, Winichakul (1994) and Anderson (1983/2006) have shown the key role modern geography has played in the arbitrary and artificial construction of nationhood and the correlated European imperial and capitalism expansion; the specific purpose of modern nation-states being controlling and acquiring territory. In their argument, nationhood, since it is a spatial reality that “can never be experienced in its totality” needs the modern map as a mediator “in perceiving and conceptualizing such macrospace in its totality” (Winichakul, 1994, p. 55). The latitude-longitude grid and the bird’s-eye views convention of modern maps anticipated boundary lines and territorial units within a larger space on the Earth’s surface. It became the model for thinking, imagining and legitimizing a desired, projected socio-political realm and inscribing identities. Nations are thus *imagined communities* (Anderson, 1983/2006) whose origins, territories and indispensable boundaries, values and practices, i.e. their *geo-body* (Winichakul, 1994), are an effect of maps and cartographic technologies and representations.

Early modern maps, Winichakul (1994, p. 114) further argues, also contained an embedded desire of expansion as the latitude-longitude matrix covered the entire globe, “full of blank squares waiting to be filled in”; *blank* in terms of hegemonic Western representational science. Concurrently, colonial expansion contributed to raise the issue of unknown, blank spaces on the maps “to the forefront of geographical concerns” (Hiatt, 2002: 239) and allowed to fill in these spaces with the help of colonizers, surveyors and military forces (Anderson, 1983/2006; Winichakul, 1994). The blanks on the maps were of course analogous to the idea that these regions were empty, negating any forms of inhabitation and social formations, and simultaneously testifying to a lack of possession: “[they] signif[y] land, rather than territory, earth rather than ownership” (Hiatt, 2002, p. 248). Consequently these blank spaces on the map ‘invited’ exploration and legitimized political expansionism and acts of demarcation supported by European cartographic system of knowledge and perceptual framework (Anderson, 1983/2006; Hiatt, 2002). In other words, maps by making far-flung places knowable allowed European states to project

and assert their political and commercial power at a distance and thus ultimately contributed to both the brutal violence of colonialism and capitalism expansion (Kitchin et al., 2011). In this way, as early as the 15th century but more intensively from the 18th and 19th centuries, the development of and investment in foreign mapping coincided with territorial and commercial interests of European countries (Crampton, 2010; Hiatt, 2002).

For instance, Vandermotten (2008), shows that the founding of two Belgian Geography Societies was boosted by Leopold II and the maps they produced became key instruments of colonial propaganda for legitimizing and advertising the colonial project to the Belgian public opinion and business investors. As in other colonies, Belgians also exported this specific system of representation to arbitrarily trace and fix the borders of its Congolese colony so as to include Katanga's rich mineral reserves, and to repel the British and Germans (Turner, 2007). From 1925-1930, topographical, soil and geological mapping (**Figure 1**) was also initiated as it became increasingly useful to mining operations and industrial agriculture, the two main economic sectors at the time (Baert, Ranst, Ngongo, & Verdoodt, 2012; Gilliard, 1953). It hence facilitated large-scale accumulation strategies (Peluso, 1995). Congolese nature's and land's transformation into extractive and agricultural resources was also soon made visible on maps; conveying a powerful idea of a re-ordered space into uniform areas of production (**Figure 2**). For governance, ethno-linguistic maps which were supposedly based on historical territorial occupation were also largely used by the Belgian colonial administration to govern a very diverse population of hundreds of different groups with long-term consequences on local inter-ethnic and tenure dynamics (Huggins, 2010).

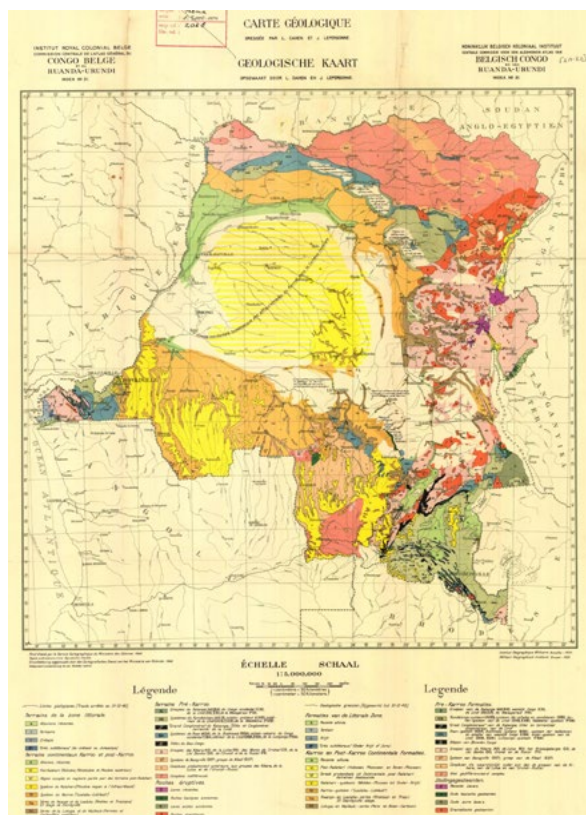


Figure 1. Geological map of the Belgian Congo. 1949. (Cahen & Lepersonne, 1949)

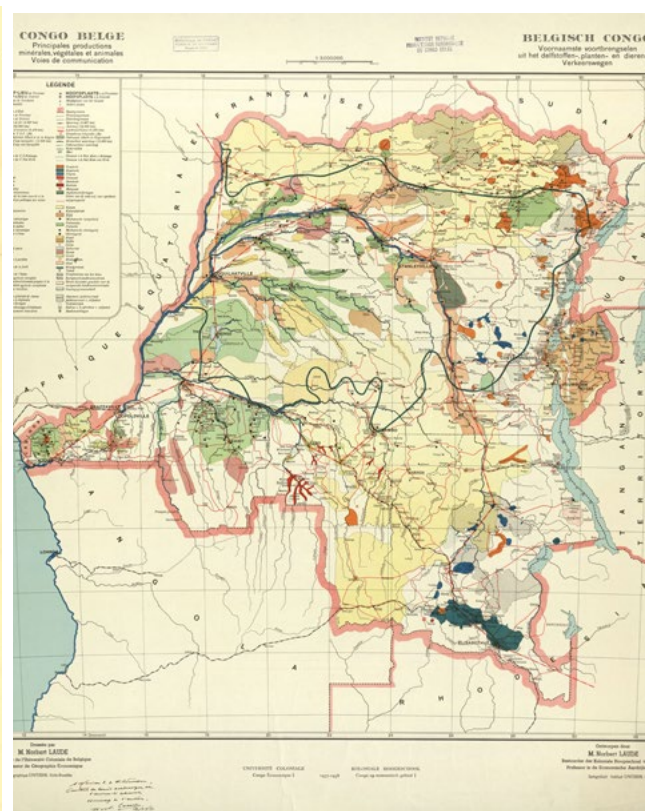


Figure 2. Map of main types of mineral, plant and animal production in the Belgian Congo. 1937-1938. (Laude, 1938)

While maps' power are used to (re)produce specific power relations for states and

dominant institutions their inherent power has also offered new ways to resist for oppressed and marginalized groups, or for social causes. Anderson (1983/2006, p. 175) shows that paradoxically, in European colonies, maps were at the heart of anticolonial nationalisms as the “logo-map penetrated deep into popular imagination” to create a feeling of membership and to unify and organize hundreds of different ethnic groups –some of them not even being aware of one another’s existence before. The interests expressed in colonial maps could in this way be made to work for the dominated, marginalized whose resistance somehow emerged from maps (Crampton, 2010). The movement of counter-mapping has generally allowed a myriad of groups to claim and delineate territories and resources they have long managed, in response to state’s or private land grabs and to industrial exploitation (Peluso, 1995). Maps’ sovereignty is also increasingly challenged by participatory mapping and the emergence of a new ‘populist cartography’ in which non expert mapmakers have gained (some) access to public geospatial data and the production of maps (Crampton, 2010; Crampton & Krygier, 2005). These evolutions, while they could be seen as weakening the power of the map, in fact “take up maps and politics in an explicit manner to provide alternative mappings of space not represented by official state agencies” and make other equally powerful claims (Crampton & Krygier, 2005, p. 25). In this way, despite first appearances, maps have never become post-political (Crampton, 2010). A power that is not only exerted on the map by the institutions within which it is produced and disseminated but that also comes from the map. A power that is not only political but also symbolic, ideological and epistemological.

2.2. **Unfolding the concepts: performativity and relational mapping, tools for (re)thinking about maps in environmental governance**

As such the map does not represent the world or make the world: it is a co-constitutive production between inscription, individual and world; a production that is constantly in motion, always seeking to appear ontologically secure.

Kitchin, Perkins, and Dodge (2009, p. 21)

What emerges from the detour in the entangled history of modern mapping with political economy I outlined above, is that maps are rather propositions about the world and ‘ontogenetic’ in nature (Kitchin, Gleeson, & Dodge, 2013). In other words, there is a two-way traffic between material realities and the practices for representing and understanding them. From this post-representational, actor-network theory perspective, scientific method is not a set of purely technical and innocent procedures for reporting on reality (Law, 2004). Rather, it is an *assemblage* of contingent, provisional unity between heterogeneous human and non-human components that include material, discursive and social artifacts (Anderson & McFarlane, 2011). It is the assembling processes of these components, in specific time and place, that are performative, i.e. they contribute to enact pre-existing social and material contexts (Callon, 2006; Law, 2004; Yeow & Faraj, 2014). Reassembling can hence produce different ontologies (cfr. counter-maps) and often follow unintended routes as they are contingent on the fostering of new relations and the entrance of new elements (Anderson and McFarlane, 2011, p. 126).

Western modern mapping however tends to disentangle itself from such multiplicity, indefiniteness and complexity. Especially when they are associated with planning, modern maps appear as the default comprehensive view of the disposition of things in space and of a static “world ready-made for life to occupy”, from “a mind that is situated above and beyond it”

(Ingold, 2000, p. 235 & 241). Satellite-based maps, even more so, convey an idea of accuracy and total vision and total knowledge of the planet through a non-human, transcendent bird's-eye view (Kwan, 2007). However, with an alternative non-representational understanding, maps should be understood as a set of unfolding practices enacted to solve relational problems (e.g. spatial distribution of deforestation drivers). They are constantly *in the making*, contingent, relational and ontologically unstable; they are always *mappings*, coming together in particular times and places (Kitchin et al., 2013). The issue here then becomes one of looking at the interplay between the map and the social world. It means connecting the material product of mapping, i.e. the map, back up with wider assemblages of power/knowledge (e.g. REDD+) and “discursive and material practices shaped by personal, social, embodied, political and economic relations”; and “how they perform as actants in the world shaping knowledge and actions” (Kitchin et al., 2013, p. 15). The power of maps is relational rather than fixed and complete.

Moreover, if mapping is about crafting and bundling, and thus only makes some constituents of ‘the world’ *present*, it necessarily and simultaneously produces *manifest absence* and *Otherness* (Law, 2004). The other leading question of this paper is hence: what silences do the maps within the REDD+ assemblage produce and how do these silences and otherness continuously emerge? My point of entry will be the cartographic products themselves. As Wood and Fels (2008) argue, key in this inquiry is the articulation of the *map* and the *paramap*, i.e. the verbal and nonverbal discourses that surround the map to position it and through which argument and authority are conveyed. The *paramap*, in turn, consists of the *perimap* and the *epimap*. The former refers to the physical map: title, legend, colours, graphs, etc. The latter refers to the discourse surrounding the map, that shapes reading and perception of the map. Our adopted approach thus refocuses (critical) cartographic research as “sciences of practices, not [(un)truthful] representations” (Kitchin & Dodge, 2007, p. 342). Such conceptual insights allow to deconstruct the apparent objectivity and neutrality of maps to highlight their sociality, i.e. how mappings differently affect various actors and social relations such that technoscience and crucial issues of environmental justice are and should be woven together. The question in this paper thus becomes what kind of space, socio-spatial relationships and subjectivities are activated (or not) through mappings’ genesis and unfolding in the wider DRC’s REDD+ assemblage of people, (historical) discourses, narratives and material things? And who are the ‘winners’ and the ‘losers’ in this process?

3. METHODS AND RESEARCH SITES

The empirical data for this contribution draws on a field research carried out between May 2015 and June 2019 in DRC during a total period of 7 months combined with a desk study of REDD+ policy documents. To better grasp the ‘politics of knowledge’ embodied in REDD+, a total of 85 semi-structured expert/institutional interviews and conversations were conducted with international and national forest experts, technical advisers and consultants from REDD+ and conservation projects’ lead implementing organizations, with government agencies and state actors as well as with representatives of international and national environmental NGOs (ENGOS), Civil Society Organizations (CSOs) plus private actors (some of them engaged in REDD+ discussions). Some of these interviews were held specifically with DRC’s mapping agency’s directors at national and provincial levels, and with GIS specialists working on DRC’s forest monitoring, and land and country planning. Most interviews and conversations took place in Kinshasa –where most of REDD+ is in fact happening at the moment– and

in Kisangani; and seven of them through Skype. In addition, I also participated as a participant observer, in a three-day round table of CSOs on forestry reforms and REDD+ in DRC, in Kinshasa, that allowed to delve into the conversations, debates and contestations around these processes. For the desk study, reports and accounts on REDD+ (from international organizations, government agencies, NGOs, consultancies, advocacy groups, news reports) were either directly accessed on the internet or obtained from organizations' representatives when documents were less accessible or unshared/private. As in some interviews references to agricultural practices and policies during the Belgian colonial period were made, I also consulted some colonial archives dealing with (indigenous) agriculture and rural economy in the Belgian Congo to compare it with present day REDD+ discourses on deforestation and agriculture. The documents were collected at the Library of the Africa Museum in Tervuren (Belgium) and on online archives databases that include digitalized historical documents (e.g. <https://archives.africamuseum.be/>, <http://arch.arch.be>).

Complementary qualitative fieldwork was undertaken in the priority zone of four REDD+ programs in the hinterland of Kisangani, i.e. within a radius of 150km around the city that is the city's supply area. Kisangani is located at the heart of the Congolese rainforest, contrarily to other large cities such as Kinshasa or Goma that are at the forest edge. Kisangani is also unique for its location on the Congo River which makes it an important commercial and transport hub. At the time of the study, the REDD+ geographically integrated pilot project in Isangi (PPRGII) was ending (2016) and another private REDD+ initiative (JADORA) was and is still ongoing. The two other REDD+ integrated projects were (slowly) starting although activities not yet concretely implemented. The field research included a total of 111 semi-structured (mainly), unstructured, in-depth and informal interviews, and 10 focus group discussions, all aimed at understanding local processes and meanings of land tenure and resource use, socio-spatial identities, and local perceptions of environmental change. In villages targeted by PPRGII and JADORA projects, interviews also dug into the perceptions of REDD+. Conscious that my position as a Western researcher might influence the respondents' answers to these sets of issues –e.g. respondents' desire to provide the “right answer” on environmental change– I have interviewed communities and households included in REDD+ projects as much as those who were not. Similarly, I have triangulated my methods by not relying on formal semi-structured interviews alone –see above and below. As in any field research, (participant) observation, informal conversations and daily life in Kisangani have all contributed to enrich my data analysis.

In order to deepen my understanding of socio-spatial relations, 6 low-tech participatory mapping exercises combined with focus group discussions were carried out. Far from using maps from a positivist/realist epistemological stance that emphasizes the ontological security of maps, I envisaged these *mappings* as a contingent, relational discursive practice that can produce different ontologies (see section 2). Maps in this view are “merely a reflection of land use [and tenure] at a particular time under a particular set of circumstances” (Roth, 2009, p. 222) and a product of specific negotiations. In fact, when presented with a topographic map at 1: 200 000 scale produced in 2011 by the Catholic University of Louvain, that includes rivers, main infrastructures, protected areas, cities and some villages' names, communities asserted that it contained omissions and mistakes; namely that lots of smaller rivers and roads were missing and that the position of some villages was wrong as were some villages' and rivers' names. During participatory mapping sessions, positions of things were the object of lively debates among communities. In addition to the participatory mappings, I asked 4 land users to draw individual sketch maps –hand-drawn cognitive maps– of their land use spaces. Although

(counter-)maps were seen by communities as a powerful way to claim land rights, both low-tech mapping exercises revealed their limitations in understanding a complex and dynamic tempo-spatiality. Indeed, participants seemed to not always feel comfortable with the act of mapping partly because it did not correspond to their ways of knowing and dwelling in space. Inspired by Roth (2009), I thus complemented the counter-maps with 4 transect walks through different land-use areas guided by the 4 above land users, allowing me to highlight movement and flexibility.

For my field visits to villages, I worked with the help of a Kisangani-based research assistant who mainly acted as a translator from Lingala/Swahili (and sometimes local languages) to French –i.e. I conducted all the interviews myself– but who also helped me to decode some socio-cultural practices and meanings. It is worth noting that during my first fieldwork in 2015, I was accompanied for 4 days by one of the PPRGII REDD+ project managers. I quickly felt monitored and realized that it influenced the answers given by my respondents. I thus decided to work independently for the rest of my field research that year and over the next 4 ones, and I specifically chose an assistant who had no personal links with, nor research experience in the villages I investigated.

In the paper, quotes from respondents are anonymized as much as possible through a coding system available in appendix 1.

4. REPRESENTING FORESTS AND POPULATION: A CONTINGENT ASSEMBLAGE

The ones who destroy the forest are the peasants. Industrial logging does not destroy it. Peasants finish the job. The other big problem is that they burn [trees] to make charcoal.⁶

One international REDD+ Technical Advisor⁷

DRC's REDD+ assemblage has given primacy to remote-sensing satellite mapping –largely seen by policy makers in this context from a positivist perspective as detached global knowledge par excellence– as an entryway to solve the problem of deforestation. In DRC, three interrelated, American-based initiatives producing geospatial data based on Landsat satellite imagery have been highly reinvested by REDD+ and forestry practitioners for forest and policy monitoring. Among these initiatives 'Global Forest Watch' (GFW), a 'near-real time' online forest monitoring system initiated by the World Resource Institute (WRI) with 40+ partners, is praised as 'the' technical feat finally offering reliable, objective forest data. The assemblage of GFW partners – whether users or funders is never made clear by WRI– comprises conservation non-profits, major environmental organizations supporting and employing ecosystem/landscape approaches, and multilateral cooperation agencies funding REDD+ programs as well as blue-chip private corporations which include two of the world's largest agribusiness industries/palm oil buyers. As WRI's CEO asserted, thanks to GFW '[f]rom now on, the bad guys cannot hide and the good guys will be recognized for their stewardship' (WRI, 2014, p. para.2). However, GFW does not mention who the 'bad' and 'good' guys are; this is left to each user, as GFW presents itself as a neutral actor, supporting sustainable management of human-environment relationships.

In this section I provide a detailed analysis of the relational crafting and use of remote-sensing mapping and geovisualizations within the DRC's REDD+ assemblage of forest experts, REDD+ consultants, state actors and CSOs, and of other material, discursive and his-

[6] Quotes from interviews have been translated from French as literally as possible by the author.

[7] Interview 44-RCS-KIN-20170529.

torical elements. I show how this assemblage has contributed to enact a single abstract story of community-induced deforestation that says very little about socio-political and power relations that shape forest use and change, and that virtually ignores local knowledge, thinking and living models.

4.1. **Creating consensus on contested data**

In 2008, when DRC became one of the first countries to apply for the World Bank and UN REDD+ readiness funds, the country’s proposal indicated an annual 0,20% to 0,25% gross deforestation rate for the 1990-2000 period (DRC-MECNT, 2008). However, there was no definitive estimate as very few satellite remote-sensing-based were available. Between 2008 and 2014, at least 10 remote-sensing studies were carried out (Ickowitz, Slayback, Asanzi, & Nasi, 2015). Yet there is still no definitive estimate –neither in terms of forest cover nor deforestation– largely because these studies use different methods, periods of observation and definitions of forest and deforestation (Ickowitz et al., 2015). Depending of the study, gross deforestation rates vary from 0,15% to 0,25% for the 1990-2000. Despite these data discrepancies, the overall picture is of some forest loss, especially of secondary forest and particularly concentrated in peri-urban areas and the densely populated Eastern part of the country (Ickowitz et al., 2015). As for estimations, most official REDD+ programs’ documents, working papers and reports produced by international organizations (e.g. Aquino & Guay, 2013; DRC-MECNT et al., 2015) use the annual gross deforestation rate of 0,22% or 0,23% for the 2000-2010 period, and on this basis, a projected rate of 0,41% for the 2010-2035 period. This rate is substantially lower (fifth to half) than the rates of Malaysia, Indonesia or Brazil but the highest and most increasing within the Congo Basin, which justified DRC’s inclusion within the REDD+ international program (Aquino & Guay, 2013; DRC-MECNT, 2008; Ehrenstein, 2013).

In the same way, no recent specific study on deforestation drivers in DRC was then available –only few cross-national, regional and local studies existed (DRC-MECNT, 2008; Ickowitz et al., 2015). One of the first major goals of the REDD+ readiness phase was to gather scientific data to inform a ‘national consensus’ –between international development partners, state actors, the private sector and civil society all engaged in the REDD+ process (**Table 1**)– on the main drivers of deforestation. The expert-based ‘national consensus’ was grounded almost exclusively in the use of Landsat remote sensing satellite maps and geospatial expertise. Although the studies’ synthesis acknowledges variabilities between provinces, the ‘national consensus’ posits shifting cultivation and population growth as the main direct and underlying drivers of forest loss, with industrial logging and mining activities having only limited impacts, though they are recognized as potential (but inevitable) future threats to forests (DRC-MECNT et al., 2015; UN-REDD & DRC-MECNT, 2012). In this way, right from the first pages of the 142-page long strategy, after announcing that DRC is a “threatened forest giant” –by rural communities’ activities as we learn a couple of pages later– the text goes on to describe the country as a “potential minerals, agriculture and energy giant” with “a largely untapped potential” (DRC-MECNT et al., 2015, p. 12, own translation). “Rural communities’ activities [are] at the heart of current processes of deforestation and degradation” while, for instance, “large-scale agriculture, whose expansion is necessary to the country’s development, will certainly become in the upcoming years the major deforestation driver in DRC” (DRC-MECNT et al., 2015, pp. 25-26, own translation).

Type	Role	Stakeholders
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Government Entities	Overall coordination of REDD+ process and programs	National REDD+ Fund (FONAREDD), National Coordination REDD+ (CN-REDD), Ministry of Environment and Sustainable Development (MECNT), Direction of Inventories and Forest Improvement (DIAF), Ministry of Finance, Committee for Technical Reform, Province of Mai Ndombe–Ministry of environment.
Donor and Technical Partners	Provide technical and financial support for REDD+ activities and projects	Central African Forest Initiative facilitates (CAFI), World Bank (Forest Carbon Partnership Facility), UN-REDD program of the United Nations (FAO, PNUD, PNUE), African Development Bank (Congo Basin Forest Fund / Forest Investment Program). Governments of Norway (NORAD) –biggest donor country–USA (USAID/CARPE), Japan (JICA), France (AFD), UK (DFID), Germany (GIZ), European Union. CAFI acts as the coordinator for aligning bilateral and multilateral assistance.
Private actors	Invest and implement REDD+, agriculture, logging, conservation and other projects	Federation of Wood Industries (FIB), Forest Resources Management (FRM), Wildlife Works Carbon (WWC), NOVACEL ⁸ , SOGENAC ⁹
Civil Society Organizations and International NGOs	Implement projects, provide technical support and ensure civil society participation in REDD+ process	Climate and REDD+ Working Group (GTCR) –a coalition of Congolese environmental CSOs, World Wild Fund for Nature (WWF), Wildlife Conservation Society (WCS), Conservation International (CI), World Resource Institute (WRI), CIRAD, National university institutions, Forest Governance Observatory (OGF), Satellite Observatory of Central Africa Forests (OSFAC)

Table 1. Key stakeholders involved in the REDD+ process in DRC.

Adapted from Fobissie, Alemagi, and Minang (2014) and Mpoyi, Nyamwoga, Kabamba, and Assembe-Mvondo (2013)

A range of critiques on the quality, validity and reliability of the data yielded in four REDD+-sponsored studies has been formulated by some scholars (e.g. Ickowitz et al., 2015; Moonen et al., 2016). Similarly, the absence of local populations' voice –interviews were carried out almost exclusively with experts and forest administration officials (UN-REDD & DRC-MECNT, 2012)– and of on-the-ground research has been denounced by several international activist NGOs¹⁰ (e.g. Rainforest Foundation UK¹¹ –RFUK, Global Witness, Greenpeace). While the pilot projects during REDD+ readiness phase were supposed to confirm the studies' results through assessments on the ground so as to better inform the National Strategy, most projects were delayed and just started when the REDD+ framework strategy was first validated in 2012 (Kipalu & Mukungu, 2013; Reyniers et al., 2015). In legitimizing this narrative, an assemblage of selective geospatial data, maps, cartographic, graphic and discursive (expert) representations

[8] Congolese company that owns large plots of land in the Northwest of DRC. It used to be a commercial cattle ranch but has now moved into the carbon credit business, and planted 4200ha of acacia trees.

[9] Congolese cattle and meat company present in the Mai Ndombe Province where the first REDD+ jurisdictional program has been implemented.

[10] International environmental NGOs (like Greenpeace, Rainforest Foundation UK (RFUK) or Global Witness) much more than Congolese environmental CSOs are contesting these studies and the framing of the REDD+ program in DRC. While a detailed analysis of the heterogeneity of opinions among NGOs/CSOs would exceed the scope of this paper, it is important to note that their views on the REDD+ process, forestry reforms and industrial logging are sometimes divergent.

[11] Interview 50-INGO-SKY-2018o423.

of land cover change has hence become the unique “neutral language of science”, seemingly extracted from the messiness of the socio-political world (Li, 2007, p. 7). Present in REDD+ official documents and communication mediums, they simplify perceptive judgements and act as reference objects to assign blame and spatially plan REDD+ actions (Ehrenstein, 2014; Wood & Fels, 2008).

4.2. Threatened carbon stocks: a seemingly neutral and disconnected representation

In the official synthesis of the four studies on deforestation and degradation drivers used by REDD+ policy makers in DRC, what first attracts the reader’s eye is the geospatial illustration of the “consensual opinion of experts” (UN-REDD & DRC-MECNT, 2012, p. 13, own translation) on deforestation drivers on a map of DRC’s ten provinces (**Figure 3**). It is the only map in the synthesis. It lacks any geographical precision and immediately gives an overwhelming impression that the story is extremely simple. Catching the eye of the reader, the dark grey color –red in the paper version of the report– renders particularly visible and *dramatizes* deforestation driven by swidden slash and burn agriculture and fuelwood collection/harvesting overall the country. On the other hand, the map omits and silences the considerable variations within smaller scale levels. In fact, as a GFW expert told me¹², because current Landsat satellite resolution does not allow to differentiate between different type of land use activities in the absence of land use maps, quantitative geospatial models in DRC are only based on explanatory variables identified by experts and meta-analyses of drivers of tropical deforestation. Besides this map, in the *paramap*, five tables and nine charts order the results from the different studies in terms of direct and underlying deforestation drivers. From one table/charts to another, the weight of the various drivers in terms of their impact on deforestation varies. Yet, the end of the synthesis proposes a “quick reading of the main conclusions of the synthesis’ work” (UN-REDD & DRC-MECNT, 2012, pp. 28, own translation) through two last concluding figures (**Figure 4 & Figure 5**) and a short verbal explanation to confirm the threat. As it would be difficult to get out of the facts and outshine variations in studies completely, these two last charts appear however rather obscure. **Figure 4** –which is largely taken up in REDD+ official documents– lists a series of direct and underlying deforestation drivers as well as ‘important variables’ without giving any weighted shares nor estimations. The repetition of certain drivers under more than one column, with slightly different labels, obscures the understanding. The short explanation below the chart indicates however that it clearly shows that rural population’s activities are the main drivers of deforestation. **Figure 5** takes up the drivers presented in **figure 4** and gives some weight to each of them. This chart suggests (causal?) correlations between drivers based on experts’ observations. However, no clarification of which factors are correlated to each other, no causal direction nor further verbal explanations are provided. While the two charts might bear witness to the complexity of deforestation drivers in DRC, their conclusion yet goes back to the initial story provided in the introductory map (**Figure 3**): rural population’s activities, and in particular slash-and-burn (shifting) agriculture and fuelwood exploitation, as well as population growth are the main drivers of deforestation.

[12] Interview 85-ITSP-SKY-20191011.

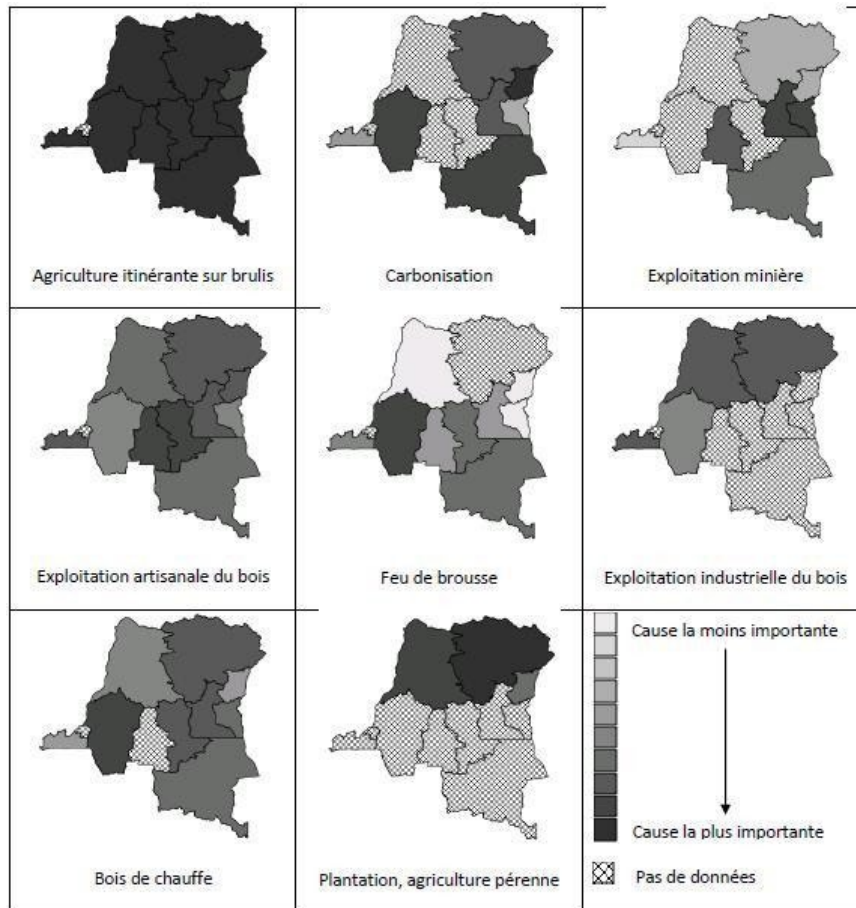


Figure 3. Graphic presentation of the relative importance of expert-perceived direct deforestation drivers at provincial level (UN-REDD & DRC-MECNT, 2012). It immediately establishes the initial focus and viewpoint: rural population's activities are threatening DRC's forests.

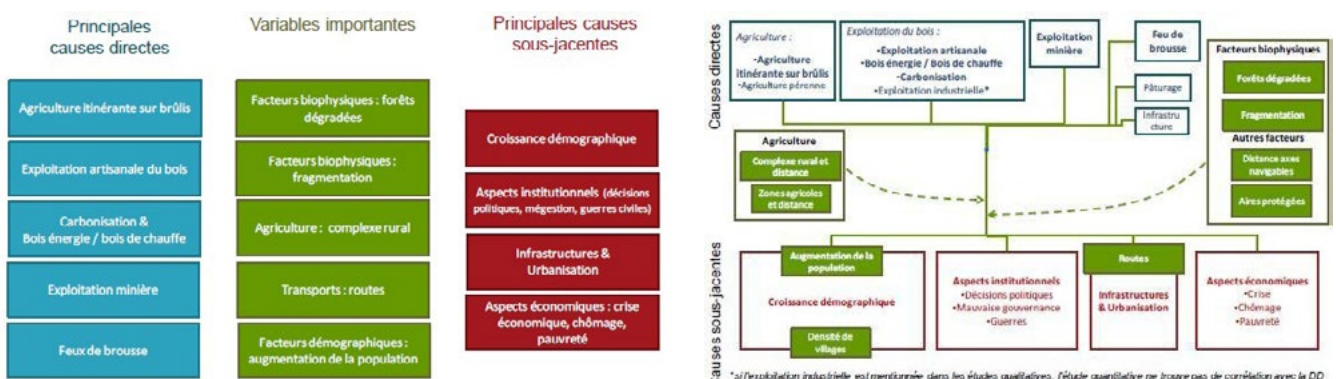


Figure 4. “Synthetic representation of main direct and underlying deforestation drivers and important explanatory variables” (DRC-MECNT, FCPF, & UN-REDD, 2015; UN-REDD & DRC-MECNT, 2012, p. 28). It includes neither figures nor estimations.

Figure 5. “Updated synthetic representation of main direct and underlying deforestation drivers and important explanatory variables” (UN-REDD & DRC-MECNT, 2012, p. 29). The more the driver is perceived as important, the bigger the rectangle's size.

I now turn to the website of the main REDD+ investment program CAFI-DRC¹³ (CAFI-DRC, 2017b), which serves as the main communication medium for the latest information on REDD+ progress in Congo Basin countries. The website contains an extensive section with 29 Frequently Asked Questions (FAQ) about “CAFI and the forestry sector in DRC” (CAFI-DRC, 2017a). On all of the three FAQs’ subpages dealing with deforestation drivers appears a more recent map–*paramap* assemblage points back again to the same direction (**Figure 6**), acting as a *reference object* that gives an authority to the CAFI REDD+ strategy (Wood & Fels, 2008). One question/subpage claims that it seeks to provide ‘proven’, evidence-based facts on the main drivers of deforestation and land degradation. The subpage starts with a short and straightforward text –the *epimap*– stating and emphasizing in bold script that the expansion of subsistence activities (slash-and-burn agriculture, and fuelwood collection and harvesting) is the main cause of deforestation and forest degradation and is hence closely correlated to the spatial distribution of population. The text also highlights –as the other 28 FAQs uniformly do– that “contrarily to popular belief, [industrial] forest exploitation is not systematically a driver of deforestation and degradation” (CAFI, 2017b, para. 2, own translation). As such, the FAQs seem to largely defend and legitimize the highly contested¹⁴ *Sustainable Forest Management Program* (PGDF) that supports logging companies in developing their forest management plans. Yet, as explained below, the extent to which shifting agriculture represents permanent deforestation and the role of industrial logging in deforestation are both very much debated issues, and often involve much more complex socio-ecological dynamics.

Then comes the map and its *perimap* (**Figure 6**). The map displays four carefully chosen human and non-human elements: forest cover loss, population distribution, roads and ‘forest’ concessions. It draws on three spatial data sources: GFW (forests), WorldPop (population) and DRC’s Common Geographic Reference System (roads and administrative limits). The map highlights forest cover loss for the period 2000–2014 in an eye-catch bright red colour and superimposes it on population density explicitly suggesting a direct causal link. In fact, ‘population’ and ‘forest cover loss’ are completely intertwined on the map, making it difficult to distinguish one from the other. Logging concessions –framed as ‘forest concessions’– are represented in non-threatening green, the traditional colour of trees and forests, suggesting the absence of deforestation in those spaces. The (para)map design, with its particular use of map colours and bold characters in the text, distracts the reader from the forest fragmentation that appears within these concessions. It also conceals which concessions are actually active and which ones are not. Since the 2002 logging moratorium, only 10 logging companies are authorized to officially harvest 12 million hectares –a tenth of DRC’s forests (Karsenty & Ferron, 2017; Lawson, 2014). The actual volume of wood produced has historically never exceeded 400 000 m³ per year since 1990, 5 times less than Cameroon’s 2.2 million m³/year –where the impact share of industrial logging on deforestation is much higher than in DRC– and only 4% of Central African countries’ total production (FCPF, 2016; Karsenty, 2016a). A large volume of actual industrial logging production however stays under the radar as lots of artisanal logging permits “have been issued illegally to industrial logging companies and used for industrial-scale logging” and

[13] CAFI (Central African Forest Initiative) and its related fund FONAREDD (Fonds National REDD+) is a partnership between the DRC, multilateral and bilateral donors, for the implementation of the REDD+ investment phase. It acts as a coordinating body of the REDD+ process in DRC. Its website has become the main reference regarding the REDD+ overall strategy and programs in DRC.

[14] PGDF was and still is contested by some international activist ENGOs and some Congolese CSOs as I describe later in this paper.

as some other companies sub-contract part of their exploitation to smaller –‘artisanal’– loggers who then resell their volume to the concession owner (Karsenty, 2018; Lawson, 2014, p. 6).

In the same way, the map in **figure 7** justifies priority zones of the CAFI REDD+ *Programme Intégré Oriental* by framing areas of supposedly community activities as deforestation “hotspots”, a.k.a. “zones with high population density” (FONAREDD RDC & UNDP, n.d., p. 13). The legend points out that the hotspots correspond to livelihood activities, i.e. slash and burn agriculture (in red circles), fuelwood production, artisanal logging and mining. Industrial activities in the area are not identified, e.g. in the Tshopo province, 16 logging concessions (occupying 21,5% of the province’s territory) and 2 oil-palm plantations; neither are protected areas (4% of the Tshopo Province; 31% of Bas-Uélé Province). Similarly, smaller private plantations and former colonial plantations are not mapped as cadastral data is practically inexistent¹⁵. In fact, except for **figure 6** in which logging concessions’ presence is carefully rendered insignificant, both maps totally omit to show the importance of this territorial organization and fragmentation. While these logging and agricultural concessions are not all active or exploited at the moment, their bounded perimeter still engenders particular socio-ecological dynamics and forces an increasing number of peasants to encroach other forests for their livelihood activities¹⁶.

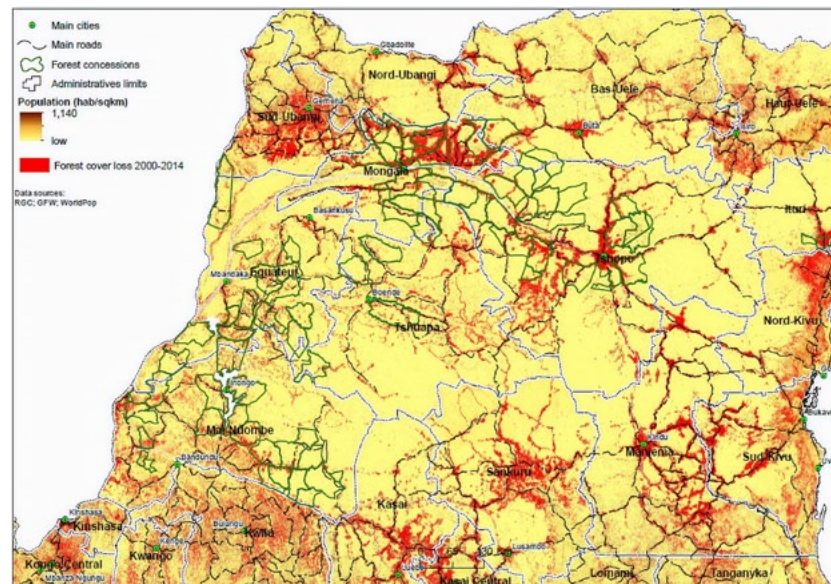


Figure 6. DRC’s forests under threat. Main map on the CAFI REDD+ investment’s program website (CAFI-DRC, 2017b). In this static map, the causal link between population and forest cover loss is made explicit through its dramatic representation in bright red while logging concessions (identified as forest concessions) are presented in a non-threatening green.

[15] Interview 29-CSI-KIN-20160407.

[16] Interviews 15-CCSO-KIS-20160229, 17-CSI-KIS-20160301.

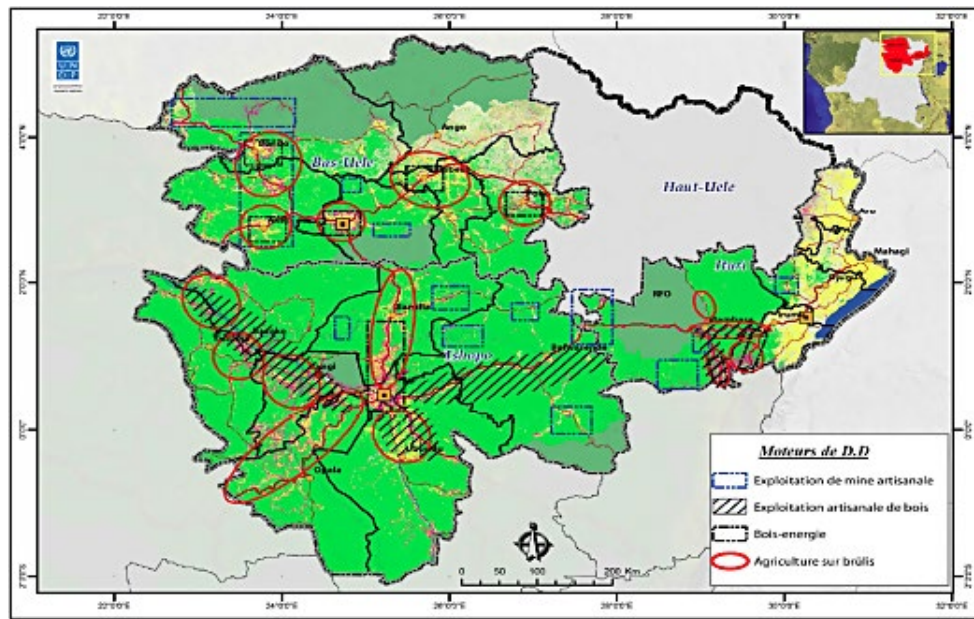


Figure 7. Priority zones of the CAFI Programme Intégré Oriental, determined on the basis of “deforestation hotspots” framed as community-induced (FONAREDD RDC & UNDP, n.d.).

Also smaller logging roads, whether they are still used or not by the company, are invisible on the map (**figure 6**). Yet they explain both logging exploitation patterns and the encroachment of what is seen through a satellite bird’s eye view as a road infrastructure vacuum, showing much more complex –partly indirect– links between industrial forest exploitation and deforestation. In 2018, I carried out a participatory historical mapping exercise (**Figure 8**) with communities inhabiting the perimeter of a logging concession –a perimeter that is in fact often pointed out by REDD+ practitioners as a strong example of forests’ destruction by shifting cultivators– whose main entrance is situated at about 40km of Kisangani. It tells a particular story about the evolution of the company’s exploitation activities in space and time and how it has attracted all sorts of local livelihood and commercial activities. In fact, land and forest use patterns are very diverse. Before the arrival of the logging concession only a few villages and artisanal small scale diamond mines (see orange diamonds on the map) were present in the zone. The map represents main logging roads in red and skid trails –*bretelles d’exploitation**– in yellow. Zones of industrial exploitation are identified in yellow dots around skid trails and periods of exploitation are in black.¹⁷ Exploitation, according to participants, started in 1994 near Alibuku which has since become a secondary commercial centre for charcoal –*makala** in Lingala. The largest part of *makala** production is controlled by urban elites from Kisangani who employ local labour. The zone around Alibuku is very much decimated of trees, thus mainly due to charcoal production and a particularly easy access as the main logging road (in red) is still maintained and used by the company’s trucks; trucks that are also being used by some producers for the transport of charcoal to Kisangani. Over time, and with the progression of logging exploitation and of main and secondary skid trails, ‘migrant’ families attracted by easier market access have settled there; a few houses progressively growing into villages. Their main activity is agriculture

[17] Note that the name of the company has shifted from Amex-Bois to Trans-M, then Cotrefor and now IFCO due to numerous accusations of illegality and links with Hezbollah. It seems however that the very secretive owner has always remained the same despite assertions to the contrary. A study of these issues would be out of the scope of this paper but Global Witness and The Sentry have both written reports on the topic (Global Witness, 2019; The Sentry, 2018).

which is facilitated by the previous clearance of some areas for opening skid trails. After the company has (temporarily) left the area, these families and villages usually remain, sporadically maintaining roads and skid trails so as to access markets with a (motor)bike. The closest one is to Alibuku and thus to Kisangani, the more one finds private concessions acquired by urban elites to develop commercial cocoa plantations along the skid trails and sometime as far as 5 or 7km from the main logging road. Artisanal loggers (see dark brown spikes on the map), who are often powerful political and military elites also take advantage of the company’s logging roads to carry out their own activities. In fact, as several informants in the area told us, some of these artisanal loggers sell their timber back to the industrial logging company; an information that is corroborated by reports from Global Witness (Global Witness, 2012). Roads, villages and multiple types of land use by different kinds of actors have thus followed the extension of the industrial companies’ activities inside the dense forest. Yet, REDD+ maps render these processes invisible and rather identify tree cover loss in these types of zones as ‘primary forest perforation’ by shifting cultivators pushed away by population growth.

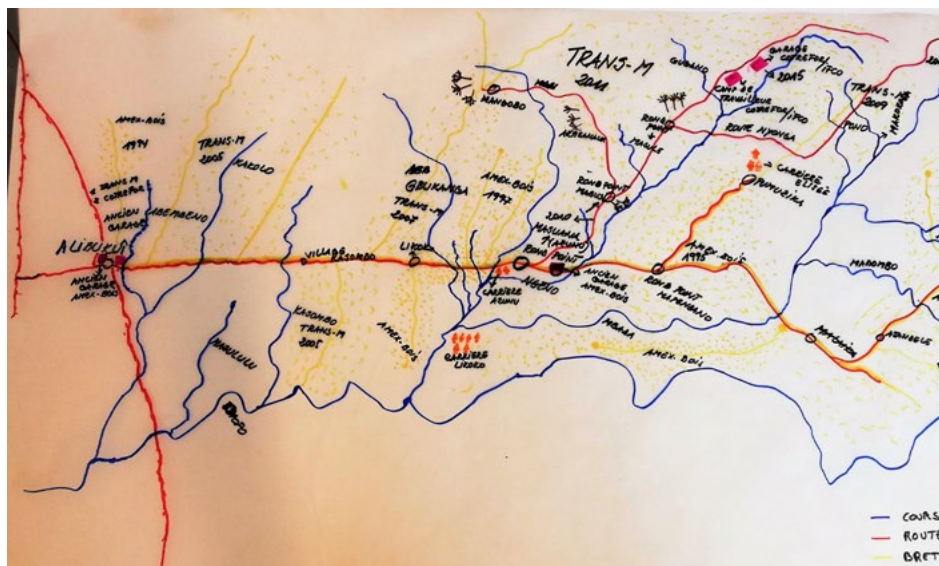


Figure 8. Participatory map carried out with communities inhabiting the perimeter of a logging concession in the hinterland of Kisangani (11/05/2018). It highlights the progression of the company’s logging activities across space and time, and the diverse land and forest use patterns it generates.

4.3. What (non-)forests? Which people?

The static maps used directly for policy purposes give us in fact much less information on *what* is really happening with the *forest*. They omit and silence the *forest* itself. None do actually mention actual forest cover nor the exact period and type of forest loss that happened. The various (para)maps only refer to undefined forest cover loss and silence different categories of forests and deforestation. It also does not refer to forest degradation –an explicit REDD+ concern regarding forest quality– nor to biodiversity or any alternative local definitions of forest (use). Yet, if we focus on cover loss, some GIS scholars (e.g. Ickowitz, 2006; Ickowitz et al., 2015; Molinario, Hansen, & Potapov, 2015; Samndong et al., 2018) –among whom some contribute to GFW– have shown that shifting cultivation has varying impacts on DRC’s forest ecosystem. Some of them in fact argue that “the majority of tree cover loss [...] is accounted for by shifting cultivation onto previously farmed lands rather than new deforestation” (de Araujo Barbosa, Maschler, Bonfils, & Molinario, 2018, p. para. 5), hence showing different interpretations of land use change. Therefore, they specifically refer to the impact of shifting agriculture on forests as

“forest disturbance” as its impact is not always permanent. In the same way, the generic definition of forest in DRC’s REDD+ official documents is an adaption from the definition provided by FAO and the Clean Development Mechanism, that is a minimum area of land of 0,5ha with a tree crown cover of minimum 30% with trees attaining a minimum height of 3m or trees with the potential to reach this height at maturity in situ. It can include (industrial) tree crop plantations like acacia, cacao, rubber tree plantations (GDRC, 2018; UN-REDD & DRC-MECNT, 2012); the differentiation between these types of ‘forests’ is in fact not possible with Landsat remote-sensing technologies used for DRC’s forest monitoring¹⁸ (GFW, n.d.). GFW geospatial experts told me¹⁹ that they are therefore very careful with terminologies and use “tree cover loss” –instead of forests or deforestation– precisely because GFW/Landsat geospatial technologies and models –which are used by DRC’s REDD+ practitioners– are not able to differentiate between plantations and other types of forest areas. Interestingly, when CAFI stands for industrial logging and its low impact on forest landscapes, it is strangely much more careful with terminologies and highlights that “the loss of intact forest landscapes should be minimized for the reasons cited in the article but this should not be confused with deforestation” (CAFI-DRC, 2017c, p. para.1). Local understandings are, unsurprisingly, totally absent in any document.

Despite various understandings of (non-)forests, in DRC’s REDD+ discourse, forest is understood as a unified category of carbon stock, as is also made clear by another map (Figure 9) –the only one in the REDD+ national investment plan. In figure 9, remote-sensing maps are transformed into a rough cartographic representation that performs the forest as scarce carbon stocks, i.e. simultaneously as a threatened and a possessable resource (Wood & Fels, 2008), while rendering all other elements invisible.

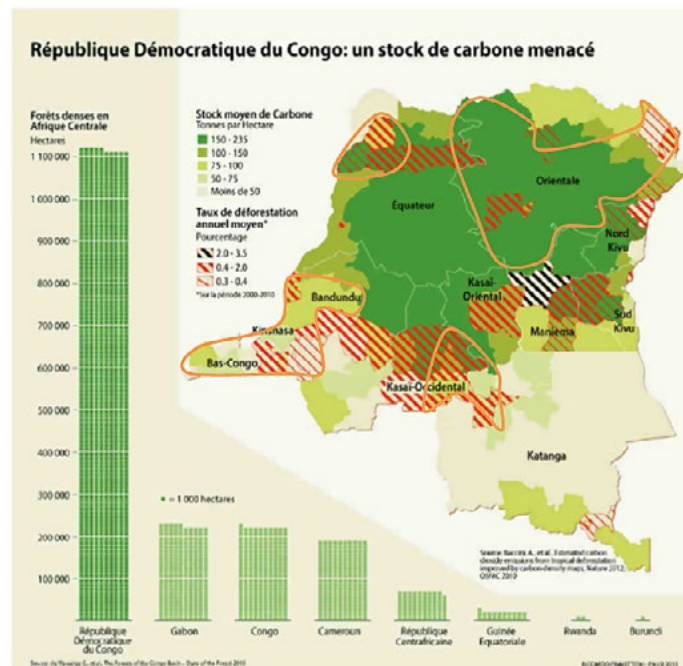


Figure 9. “Democratic Republic of Congo: a threatened carbon stock” (CAFI-DRC, 2015). Remote-sensed maps were transformed into a rough cartographic representation to render ‘carbon stocks’ and ‘threatened carbon stocks’ visible while making all other elements and nuances invisible.

[18] However, there are increasing investments in the analysis of high-resolution satellite imagery to better detect tree plantations from natural forests. However, these efforts do not include DRC at the moment and have been concentrated on Brazil, Indonesia, Malaysia, Cambodia, Peru, Colombia, and Liberia (GFW, n.d.).

[19] Interviews 83-ISTP-SKY-20190806, 85-ITSP-SKY-20191011.

Population is neither qualified. Returning to **figure 6**, the (para)map refers both to ‘population density’ and ‘spatial distribution of population’, (unsurprisingly) telling us that human presence and forest cover loss are correlated. Focused on Tshopo province, **Figure 7**’s *epi-map* refers to “high population density” (FONAREDD RDC & UNDP, n.d., p. 13). Yet, as the document recognizes, densities largely differ from one zone to another: from more than 400 people/km² in Kisangani to 3 people/km² in more remote regions (FONAREDD RDC & UNDP, n.d.). The underlying narrative here is that shifting cultivation is in itself sustainable but became *unsustainable* because of a shortening of fallow periods in zones with strong demographic pressure. As in all REDD+ documents, no figures comparing past and current fallow lengths, nor ideal length are ever provided; a fact that corroborates Ickowitz (2006) critical reflections on shifting cultivation and deforestation in Tropical Africa. Then, adding to the confusion some other parts of the CAFI website –on which **figure 6** appears– as well as the REDD+ studies on deforestation drivers and strategy documents use the term ‘population growth’. These concepts have very different meanings and implications. The REDD+ strategy makes things clearer: the lack of family planning and education leads to uncontrolled population growth that “poses huge problems in terms of environmental and natural resources preservation, for forestry ecosystems among others” (DRC-MECNT et al., 2015, pp. 77, own translation). The strategy does not provide a further explanation for this causality. No political-economic or historical contextualization is provided regarding the resettlement of population around roads during colonial times, or conflicts forcing relocation, or about unequal access to resources, distribution of wealth or market access. Heterogeneous dynamics of resource use among a seemingly homogeneous ‘population’ remain hidden. Yet, as I show in section 5.2, such information could lead to very different understandings of deforestation drivers. However, REDD+ synthesis of deforestation drivers in DRC supports that defining underlying drivers is very complicated and direct observation of these underlying drivers is impossible (UN-REDD & DRC-MECNT, 2012, p. 25); meaning in the document’s vocabulary, that it is impossible to observe/represent them with geospatial technology, from an office in Kinshasa or from elsewhere in the world. ‘Population’ is the exception: it appears to be easily represented (geo)spatially, and is largely depicted as a technically manageable matter of family planning.

So, REDD+ (para)maps through data aggregation simultaneously co-produce homogeneous and radically abstract categories of ‘forests’ and ‘population’. A pixelated forest carbon stock threatened by a growing population is all that remains. The ‘blank’ Congolese forest spaces are filled in with particular meanings and simultaneously erase both local understandings of forests and the complex spatiality of everyday life, i.e. daily life practices embedded in particular places that define specific resource use patterns, forcing a new sense of what forests could become through REDD+. Of course, these maps’ and visual representations’ symbolic power is the conjugation of several discourses. Historical and socio-political affairs, as I show in the following section, permeate the representation of distant forest places. The cartographer cannot be (solely) held accountable that the maps are reshaped and reused far beyond his/her control.

4.4. A well-oiled discourse

The (para)maps’ propositional logic of a community-induced deforestation was continuously restated – especially at central level in Kinshasa – during our interviews with national and international REDD+ consultants in DRC and with various other state and non-state actors involved in or targeted by the program. In analogy to the maps and their distant gaze, the REDD+ process is very centralized in Kinshasa –“REDD+ is only Kinshasa” as an expert for the

CAFI *Programme Intégré Oriental* told me²⁰. Yet, the narrative on deforestation has already trickled down. Shifting agriculture is seen as irrational both for economic growth and for forests protection; as being previously ecologically sustainable and an anchored tradition as opposed to modernity²¹. Its continuation is very much painted as the result of economic insecurity, a lack of alternatives and a lack of know-how to do better, coupled with increasing demography – “3,03% every year!”, one REDD+ Provincial Coordinator insisted²². The idea which often came up in my interviews, that without economic security it is not possible to stop slash-and-burn agriculture very much resonated with WWF’s report on the Mai Ndombe REDD+ ‘green development’ project (WWF Forest and Climate Programme, 2016, p. 8):

“Communities in Mai Ndombe face profound poverty, insecure land tenure, and lack of economic opportunity, all of which encourages the rapid exploitation of resources and discourages sustainable land use practices.”

On numerous occasions during (informal) conversations with international (White) consultants, the discourse of local peasants as victims of their lack of economic opportunity easily switched to a blatant blaming discourse that portrays ‘Congolese’ as only having a utilitarian vision of the environment in which forests have no intrinsic value and are only used to fulfil human needs. The communication/awareness manager of a REDD+-like conservation project – a white Belgian born and raised in DRC – who organizes environmental education programs told me²³: “Children still have innocence and curiosity, and they see the intrinsic value of the environment but adults... they just have a materialistic vision”. In this narrative, local communities’ dependence on forests for their livelihoods is tainted with moral and racial patronizing claims representing a historically dominant mode of thinking conservation in which local communities simply do not understand the importance of nature and need to be educated about it (e.g. increasingly through targeted environmental awareness plans –see below) or kept away from it (e.g. protected areas).

Such stereotypical image of conservative and lazy peasants shone through the discourses of some Congolese state actors and REDD+ programs’ coordinators. They frame the persistence of shifting cultivation as a matter of “people [...] just being conservative” and simply reproducing what their ancestors did as they have “very hard to change mentalities”.²⁴ Or in a similar fashion: “it’s just easier to burn than to stay in one place”²⁵, and using primary forests also allows peasants to avoid the difficult task of weeding in fallows and of constructing fences to protect fields closer to the village from free rambling small farm animals.²⁶ Villagers, in this way, just “do not understand that it is for their own good to do intensive monocultural agriculture” as asserted by a REDD+ project assistant.²⁷ In the villages around Kisangani already targeted by REDD+ activities, this well-oiled discourse of communities’ “behavioral problems” was also repeated by local opinion and civil society leaders who are selected and trained within REDD+ project activities, and by some villagers informed through REDD+ communication and awareness plans, including radio announcements (Kamanda Mangamfu, Mumponga, & Lisingo, 2013,

[20] Interview 56-RCS-KIS-20180515.

[21] Interviews 14-RCS-KIN-20160225, 17-CSI-KIS-20160301, 28-PA-KIN-20160406, 63-ITSP-KIN-20180529.

[22] Interview 72-CSI-KIS-20190520.

[23] Interview 82-ITSP-YAN-20190530.

[24] Interview 16-CSI-KIS-20160301.

[25] Interview 71-CSI-KIS-20190518.

[26] Interview 21-PA-YAF-20160328.

[27] Interview 8-CTSP-KIS-20150516.

p. 18). The cited culprits were systematically “the fields, *makala* and wood sticks²⁸ collection”²⁹ or population growth –although exact figures on shortening fallow durations were not once provided³⁰– as well as their lack of environmental awareness before REDD+ arrived. One of this REDD+ village opinion leader stated³¹:

“there will be consequences if we cultivate large plots of lands. We will finish the forest and be like in the desert. And then we will feel the consequences of climate change in our region [...]. They say we need to save the forest, they gave us an earbashing: if you want to do a field in the primary forest, don’t go over one hectare.”

In a village targeted by the Isangi REDD+ Pilot project, another one said in the same blaming line³²: “what pushes us to destroy the forest is that we do not have the right agricultural method. [...] We did not pay attention to the forest. It is for our children that we are now interested in REDD”. While before “they lacked wisdom”, REDD+, some of these communities’ members told me³³, came to enlighten them on the importance of forests, how they put them at risk with their daily activities and how they should behave in the future. “We heard on the radio that the forest is disappearing because of population growth”³⁴. The particular carbon value of forests emphasized by REDD+ also started to permeate people’s understandings: forests are sources of “oxygen [...] of a good air”³⁵ and converting a forest area into a field “will release like an atmosphere”³⁶. On the contrary, the impact on deforestation of industrial companies in the zone of Isangi REDD+ project (PPRGII) was rarely mentioned except when the president of the local Agricultural Administration Council asserted that “even if an agricultural plantation deforests, it stays in a limited space while [local] population, they, are always on the move”³⁷. Yet, a 8874ha oil palm plantation –of which only a part is currently harvested– and two logging concessions –one of which stopped its activities in 2009– are established in the project’s intervention zone. Villagers who were not “opinion leaders” for REDD+ were more likely to mention the destruction of their forests by industrial logging companies, comparing the large amount of trees these companies log to the limited amount they are able to cut due to lack of means to do so and poor access to the timber market. These sets of discourses, I believe, emphasize REDD+ “work of propaganda” on deforestation more than in-depth forests values people hold. In fact, understandings I collected on forest-related issues with communities outside REDD+ projects’ particular intervention zones were different and much more diverse as some people had simply never heard of REDD+, the terms ‘climate change’ nor ‘deforestation’ in certain cases.

A detour through colonial archives shows that this discourse was already developed under the Belgian colonial administration. As early as 1908, the colonial administration was indeed preoccupied with modifying indigenous farming practices that were seen as unproductive and destructive of the environment, including as from the late 1930s a particular concern for

[28] Wood sticks are used mainly for house construction.

[29] Interview 20-CCSO-ISA-20160321.

[30] As an anecdote, a Provincial REDD+ *Focal Point* mentioned that at a time “one would leave the fallow for a very long time, 50 years even” [17-CSI-KIS-20160301]; a fallow duration that seems very unlikely. Some other people mentioned historical fallow durations of 10 years, without clarifying which exact period they refer to.

[31] Interview 47-I-YAF-20160329.

[32] Interview 2-IFG-YAE-20150520.

[33] Interview 29-I-YALO-20160322.

[34] Interview 10-I-RBU-20160307.

[35] Interview 31-I-YALO-20160323.

[36] Interview 41-I-BU-20160326.

[37] Interview 20-CCSO-ISA-20160321.

shortening fallow periods³⁸ and its consequences on soil fertility due to an increasing population density around urban centres and increasing export agriculture (e.g. Clement, 1952; Malengreau, 1949). Colonial agricultural policies³⁹ shifted from resettlement schemes and system of compulsory cash crop cultivations to the late-colonial *Paysannat Indigène** –usually translated in English as ‘Indigenous Peasantry’⁴⁰– supported by the *Fonds du Bien-Être Indigène**⁴¹ that was concerned with the “moral and material raising of the natives” (De Wildeman, 1940; Malengreau, 1949; Moeller, 1936, p. 235). “Active propaganda”, notably through community leaders (*notables*), was recommended to convince peasants of the positive effects of changing their traditional agricultural modes (Clement, 1952, p. 142). This excerpt from a publication of the Belgian Ministry of Colonies that looks at the “problem of indigenous rural economy” (Dubois, 1952, p. 29, own translation) is a striking illustration of the similarity between REDD+ claims and colonial ones:

“Whoever knows the customary agricultural methods applied by indigenous peoples since many years knows that those ones, while they were of much use to ensure the food subsistence of their producers, or even of those who live in industrial and extra-customary centres, do not meet anymore the ceaselessly increasing present needs and that besides, they lead to a threatening destruction of natural resources. [...] The protection of soil capital as well as improvement in productivity have appeared as an inescapable necessity.”

In section 5.2, I come back to some historical underpinnings of REDD+ approach to the control of local agricultural practices.

4-5- A convenient reality in a political ‘messiness’

The geospatial narratives of the forests threatened by peasants are not only historically embedded but should also be understood contingently in the current political context of DRC. These narratives appear as a convenient, apolitical and stable point of consensus for all actors in a political context characterized by constant reshuffle, contestation and (re)negotiations that often hinders policy implementation (Englebort & Tull, 2013). While bad/weak governance, corruption, lack of government accountability and institutional issues are often raised as drivers of deforestation –and often as justification for non-state control/hybrid governance, see section 5– these are first and foremost political matters which are by definition much less consensual. In this way, there is a strong lack of intersectoral and interministerial collaboration and coordination that, for instance, leads to the overlapping of different types of land-use concessions –e.g. mining or logging attributed in protected areas. However, this incoherence and uncoordinated situation guarantees “the power and the sources of income of individual ministries” (Wehkamp, Aquino, Fuss, & Reed, 2015).

In a typical instance, in 2017, GFW alerted that an area of 300ha had been cleared in the concession of a foreign logging company located close to Kisangani. It appeared that an influential Congolese businessman from Kinshasa and apparently close ally to the then country’s president Mr. Joseph Kabila, was developing a large-scale industrial oil palm plantation

[38] Again, in the colonial archives I collected, the historical average fallow period is never mentioned. However, ideal fallow period in the colonial *Paysannat Indigène** system varies from 15 to 21 years (e.g. Clement, 1952; Malengreau, 1949).

[39] See Clement (2014) for a summary of the evolution of agricultural policies in the Belgian Congo from 1885 to 1960.

[40] In the remainder of this paper, I keep to the French term ‘Paysannat Indigène’ to mark a clear distinction between this particular colonial system and the general ‘indigenous peasantry’.

[41] Funds for Indigenous Well-Being.

in an area whose access has been facilitated by logging roads⁴². When I visited the agricultural concession in 2019 –with the authorization of one of the owners⁴³– a well-informed manager in the concession told me⁴⁴ it had been enlarged to 1000ha and was aimed to be enlarged by another 3000ha by the end of 2020. The concession’s development, he continued, benefitted from foreign investments and more particularly, from the secretive American Blattner family’s Congolese business empire.⁴⁵ The owner I met admitted his agricultural plantation is inside the perimeter of a logging concession but said that his own company would be much more beneficial to communities. This is a well-known case among REDD+ stakeholders in Kinshasa who have clearly expressed their frustration. However, no legal action was and can be taken –which the manager of the logging company confirmed during an informal conversation in May 2019. Yet it does not inflect REDD+ mainstream discourse on deforestation nor the appropriateness of REDD+ strategies and collaborations in DRC. Rather, this case as others is often used to explain how difficult it is for foreign logging companies to work in such a political environment and therefore to legitimize REDD+ investments in these logging companies and in increased spatial (and in fact political) control (see section 5).

Similarly, there have been important tensions between international donor and technical stakeholders, some CSOs and the DRC government regarding logging concessions and the lifting of the 2002 forest moratorium which prevents the attribution of new concessions. International stakeholders and some CSOs⁴⁶ oppose the immediate and unconditional lifting of the moratorium that the government is pushing, arguing that the necessary conditions of good governance are not yet reached. REDD+ and its investments in Sustainable Forest Management for operating logging companies –I talk about this program in section 5.3– are meant to lead to the lifting of the moratorium. REDD+ has indeed been strongly tied to the vast reform of the forestry sector in DRC that has been undergoing since 2002, with the drawing up and promulgation of a national Forest Code. This reform has largely been pushed and financed by the World Bank who counted on the formalization of the forestry sector to reflate the country’s (green) economy (Mpoyi et al., 2013; Trefon, 2008). As in other Congo Basin countries, the reform already laid out a decentralized and participative forest management and required companies “to submit management plans that specify socially and environmentally sustainable practices” (Clay, 2016, p. 134). While the application of the Forestry Code has for long been largely inexistent, REDD+ is a way to reactivate it and further revive the sector. In this way, “the main private sector interest in REDD+ discussion has been from two industrial corporations in the wood sector: the *Fédération des Industriels du Bois* (FIB) and the *Fédération des Entreprises du Congo* (FEC)” (Mpoyi et al., 2013, p. 43), who according to RFUK⁴⁷ were also interviewed as ‘experts’ for the REDD+-sponsored studies on deforestation drivers. Similarly, the Ministry in charge of forestry is also in charge of REDD+ along the Ministry of Finance.

[42] Interviews 59-PA-KIS-20180521, 63-ITSP-KIN-20180529.

[43] Interview 70-PA-KIS-20190518.

[44] Interview 74-PA-RIT-20190524.

[45] It is difficult to assess the real extent of the Blattner’s family business and control of the Congolese economy. They own at least two groups: Groupe Blattner Elwyn and Safricas. Groupe Blattner Elwyn’s website mentions activities in the agroindustry, logging sector, logistics (transport) and telecommunication. However, a quick search on Google rapidly shows that Elwyn Blattner also owns or used to own (majority) shares in other companies such as the former BIAC –a bank that went bankrupt in 2017, for which Elwyn Blattner briefly went to prison– and the mining company Sodexmines. Elwyn Blattner’s brother and his group Safricas-Congo S.A. is similarly involved in various sectors of the economy (construction, transport, agriculture) and owns, among other businesses, the airline company CAA. Some of the information I display in this paper were, however, obtained through my interviews. Due to this fuzziness, I refer to the “Blattner Conglomerate” in the remainder of this paper.

[46] Among ‘the’ Congolese civil society there is, however, a specific coalition of CSOs supporting the immediate lifting of the moratorium (*Coalition de la Société Civile pour la Levée du Moratoire**).

[47] Interview 50-INGO-SKY-20180423.

While the discussions regarding the moratorium have been tensed, the point all parties at central level agree on and legitimize with the above maps and geospatial visualizations, is thus that industrial logging does not lead to deforestation and if and when it encourages conversion to agricultural land, “it is true only locally”⁴⁸. For ministers at central level, assigning logging concessions can represent much larger financial interests (rent-seeking behaviors) than supporting local livelihoods and artisanal logging, as a high-ranked official at the Tshopo Provincial Ministry of Environment told me⁴⁹. Inversely, at Provincial level, artisanal logging can be much more profitable as cutting permits are delivered by Provincial Governors and as legal and illegal taxes can be directly collected at this level. In such a context, while Congolese CSOs constantly challenge state institutions’ legitimacy to make decisions regarding forest policies and REDD+, the large majority of them never put into question the simple mainstream narrative of deforestation precisely because it appears as depoliticized. Focusing on communities’ practices appears as an easy way to move REDD+ forward while insisting to tackle problems of governance in priority, both at government and corporate levels, would be a much more tedious and longer path. CSOs strongly support the REDD+ process partly because their emergence as much as their survival depends on it: the REDD+ coalition of Congolese CSOs (GTCR) has been directly created and financed through REDD+ programs.⁵⁰ Conversely, the participation of Congolese CSOs –as ‘experts’ who, typically, are urban elites– in one of the REDD+ studies on deforestation drivers is often brought up in conversations by both Congolese forest state administration and REDD+ practitioners to legitimize the orientation of the programs. The involvement of civil society and resource (expert) informants in the production of the REDD+ study and strategy serves as a powerful justification to refute alternative understandings of deforestation and to implement programs. Geospatial expert-based studies and satellite maps were thus almost systematically called upon as a neutrality label, normatively superior to the socio-political discussions I just described. Greenpeace DRC and other international NGOs like Global Witness or RFUK who, as mentioned earlier, are the only ones contesting the narrative of community-induced deforestation and strongly oppose the lifting of the moratorium are inversely perceived as “blocking the country’s [REDD+] progress”.⁵¹

4.6. Logoization

Local communities are in this way simultaneously portrayed as easy apolitical culprits and victims that are desperately in need of a REDD+ green development intervention while past, present and future industrial exploitation and real governance are largely let off the hook. This narrative, I have shown, has emerged from a mutual co-constitution of remote sensing data, maps and a whole regimes of (expert) claims tied to a particular socio-political and historical genealogy. What I aimed at showing here is not whether the representations contained in REDD+ policy maps are fundamentally true or untrue –they activate one in multiple realities. Rather, I emphasized how maps and REDD+ discourses mutually and contingently unfold in context to make a single coherent reality of deforestation emerge, which allows not only to plan certain actions of population control and modernization but to solve other relational problems between stakeholders with different interests. In actor-network theoretical terms, this fact is highly networked and therefore *real* and authoritative, i.e. *successful*, while effectively refuting other alternative interpretations (Callon, 2006; Latour, 1987; Law, 2004). REDD+ assemblage

[48] Interview 28-PA-KIN-20160406.

[49] Interview 53-CSI-KIS-20180430.

[50] For an account of the emergence and role of Congolese CSOs see Ehrenstein (2014).

[51] Interview 61-CCSO-KIN-20180528.

of visual representations and maps impose an homogeneity or “unified spatial ontology (*this is there*)” (Kitchin et al., 2009, p. 13) of people and forests in a political economic context characterized by contestation, to facilitate governance and control, and (unconsciously) reinforce a discourse born and propagated during the colonial period. As Wood and Fels (2008, p. 7) assert, “insisting that something is *there* is a uniquely powerful way of insisting that something *is*”, in the same way that silences and omissions of maps represent a deliberate and political choice rather than an innocent one. In this sense, REDD+ maps of Congolese forests emerge as quasi “logos” –“map-as-logo”– (Anderson, 1983/2006, p. 175) that secure an appearance of purity with all socio-political and geographic features and heterogeneity removed from it and, that are disseminated in different forms through various mediums –e.g. policy documents, online platforms or awareness-raising programs. As I have demonstrated, it guides how people see, understand and act in the world (West, 2016).

In this set of both conscious and unconscious ideologically grounded ‘rhetorics of representation’ (West, 2016) and totalizing logics, it appears very clear that local communities’ understandings of forest use and change, and of socio-political space has been completely ignored. As I discuss in the next section, geographical knowledge and planning is the mediator (Winichakul, 1994) behind every stage of conceiving and implementing DRC’s REDD+ strategy, of thinking, projecting and concretizing particular conceptions of a green development space that reshape local socio-spatial and socio-ecological identities, political and material sovereignty. As the *logoization* of forest socio-political space in REDD+ policy maps suggests emptiness and incompleteness –lived experiences and (more complex) socio-ecological identities are not acknowledged, people and forests are detached from their local geographical contexts–, these ‘blanks’ become the material for refilling the map, that is recharting and reorganizing the territory at distance (Hiatt, 2002). In a country where industrial exploitation of resources is still largely limited to extractive mining and logging –the latter remains a small sector in comparison with other tropical countries– and therefore more prospective than actual, the filling of these ‘blank spaces’ take on an even greater importance. The REDD+ single story of deforestation, I show in the next section, pushes a monoculture of eco-modernization, homogeneity, and control rooted in the (colonial) system of plantations –what Haraway (2015) has referred to as *Plantationocene*– to the detriment of communities’ authority over land and their particular socio-ecological relationships but to the economic benefits of powerful actors.

5. SPATIALIZING THE ECO-FUNCTIONAL PLANTATIONS

“[...] the development of various productive sectors of the economy (agriculture and cattle breeding, extractive industries, logging, etc.) in DRC is capital. The challenge consists of reaching economic and social objectives while controlling forest loss. In a context of acute pressure tied to the expansion needs of these various sectors and to population growth, spatial planning is a key tool. It will allow to define a process of optimal, rational and coherent use of space and resources, in particular forest resources”

FONAREDD RDC and UNDP (2016, p. 8, own translation)

As repeatedly asserted in the DRC’s National REDD+ Strategy and Investment Plan, and in my interviews the ‘national consensus’ on deforestation drivers served as the basis to establish the country’s REDD+ overall direction. Direct and underlying deforestation drivers (see **Figure 4**, blue and red columns) have been plainly translated into eight pillars for interventions or “outcomes [...] aimed at generating emissions reduction and development co-benefits” (CAFI-DRC, 2015, p. 26, own translation). There are four sectoral pillars supported by four transversal ‘enabling’ ones. The sectoral pillars include: 1) sustainable agriculture –i.e. settle and intensify agriculture; 2) sustainable wood energy production and development of alternative sources of energy; 3) sustainable forest management –i.e. formalization and development of sustainable production forests for a green socioeconomic development and; 4) mines and hydrocarbons exploitation. The transversal pillars include: 1) improved governance; control of population growth; 2) land use planning and; 3) and land tenure securitization (CAFI-DRC, 2015; DRC-MECNT et al., 2015). The rationale is to facilitate DRC’s forest transition by combining the implementation of major structural reforms in terms of spatial land-use planning and land tenure and, the development of multi-sectorial, industrial and economic activities and the promotions of public and private investments (CAFI-DRC, 2015; DRC-MECNT et al., 2015; FONAREDD RDC & UNDP, 2016).

5.1. Geospatial planning as governance

DRC’s national REDD+ strategy goes thus beyond conserving, capturing and enhancing carbon stocks in trees and rather represent an evolution towards a landscape approach that presents itself as a tool for spatial planning necessary for piloting a green development combining “Congolese forest preservation, economic growth and the development of the Congolese people” (DRC-MECNT et al., 2015, p. 36). The CAFI program, as one of its stakeholders told me⁵² is “really a rational approach, to reinforce control”, it is a “big zoning and land use plan for development”, a vision that was often repeated in my interactions with other stakeholders. While in Latin American and Southeast Asia –where the expansion of commodity-driven intensive/ industrial agriculture, cattle ranching and logging are the most significant deforestation drivers– the landscape approach to REDD+ has been developed out of a need to incentivize agribusiness and logging companies to reduce their impacts on forest, in DRC the rationale appears to be at the opposite (Turnhout et al., 2017; Weatherley-Singh & Gupta, 2017). Here, since the main identified deforestation driver deforestation is shifting subsistence agriculture, the goal is to supervise and incentivize local rural communities to settle their activities and maintain forest cover in order for DRC to be able to respond to the increasing private and international demand for commercial and industrial agricultural land, timber and ores (DRC-MECNT et al., 2015). The particular focus is on forestry and agriculture, i.e. sectors that are for now far less developed than the extraction of mineral resources (which, in DRC’s REDD+ documents, is barely men-

[52] Interview 49-PA-SKY-2018o419.

tioned and investigated for its impact on deforestation). My interviews with REDD+ stakeholders in Kinshasa and my analysis of REDD+ documents certainly revealed their awareness of the impact large-scale exploitation, oil palm in particular, will have on deforestation in the future. However, they also frame these activities as the only rational use of resources that can enable the country's green development, contrarily to Congolese people's "anarchic use of space and resources" (FONAREDD RDC & UNDP, n.d., p. 28) or "irrational exploitation of natural resources" in one CSO's representative's terms.⁵³

The references to irrationality and the need for geographic planning, in a more implicit way, also point at Congolese bad state governance. Geographic programming and the creation of bounded spaces would in theory prevent the overlapping of different types of land-use concessions granted by different ministries (see section 4.4) and allow for better monitoring. The outsourcing of the planning and monitoring functions of the state to non-governmental agencies –such as WRI– and private actors –e.g. logging concessions– in cooperation with decentralized entities whose interests are often divergent from the ones of the central state, appears to be a way of circumventing the state.⁵⁴ Efforts to establish top-down but non-state led micro-zoning plans at landscape levels (in REDD+ integrated programs) in fact shifts to a certain extent the responsibility of surveilling and maintaining carbon stocks from the state to decentralized entities, local communities and private actors –see below. In a country where, in 2018, the state 'illegally' reinstated three logging concessions (650 000 ha) to Chinese companies and is likely to lift the moratorium in the next couple of years despite the non-compliance with sustainable forest governance agreements signed with international donors, this strategy seems to aim at reaching (speculative) carbon emissions reduction targets without relying on improvements in state governance. My interviews with several high-ranked officials at the Ministry of Environment showed that lifting the moratorium was a priority and was strongly tied to both a political will to assert State's sovereignty over international actors like CAFI, and rent-seeking behaviours –as one of them said, "a man has got to seek to live".⁵⁵ REDD+ process in DRC is in fact particularly donor-driven while state and national ownership is very weak (also see Fobissie et al. (2014)). Accusations of 'bad governance' typically justify the hybrid governance framework (see **Table 1**) developed by REDD+ donors and partners, and the top-down socio-spatial engineering of this landscape approach to REDD+. While REDD+ programs somehow function at the margin of the Congolese state, they allow international demand –even more so, Euro-American demand– for Congolese carbon, certified timber, 'green' cash crops to be satisfied in the future through *ad hoc* spatial control in specific landscapes. The involvement of the private sector has indeed increased gradually as the perspectives of REDD+ in DRC entering in its investment phase became clearer (DRC-MECNT et al., 2015). Certainly, DRC's REDD+ strategy is also about investing and developing rural communities but it fundamentally sees their socio-spatial activities and identities as an hindrance that needs to be reconfigured so as to become merely enablers –rather than producers– of green economic development, through their waged labour or as 'enviropreneurial citizens' (Baldwin & Meltzer, 2012) conserving forests and carbon for the sake of the global planet and humanity.

5.1.1. **Controlling categorization**

In the creation of a bounded economic space, the constant use of essentializing discursive binaries such as *artisanal* versus *industrial*, *artisanal* versus *formal*, *subsistence* versus

[53] Round table CSOs: 1-PO-CCSO-KIN-20180423.

[54] Round table CSOs: 1-PO-CCSO-KIN-20180423.

[55] Interview 66-CSI-KIN-20180529.

productive, slash-and-burn versus intensive, collective versus individual, revealed in my analysis of interviews with REDD+ implementers and of programs' documents and legitimized by the mainstream narrative of DRC's deforestation, seems particularly key. "We have never seen that the collective can manage anything correctly", one (international) REDD+ main Technical Advisors said.⁵⁶ In an attempt to explain the reliance on traditional subsistence agriculture rather than on cash crop/productive agriculture in the hinterland of Kisangani, a Provincial Coordinator of REDD+ programs told me⁵⁷: "here people are passive [...] they are less dynamic, entrepreneurial than in other regions". The program document of the *Programme Intégré Oriental* implemented, among other regions, in the Tshopo Province similarly calls "the province's economic model, just like the one of the rest of the country [...] an economy of extractive rent rather than productive" that leads to significant forest loss (FONAREDD RDC & UNDP, n.d., p. 28).

In this way, in REDD+ integrated schemes, the creation of carbon value functions through land use zoning plans in which the fixed localization of perennial cash crop plantations and planned industrial logging is combined with the reduction and intensification of subsistence shifting agriculture and agroforestry carbon sinks (CAFI-DRC, 2015; FONAREDD RDC & UNDP, n.d.). Geographic planning at landscape and local levels is thus at the forefront of integrated programs. The demarcation of land-use zones (e.g. permanent production forests, conservation zones, subsistence agriculture zone, agroforestry plantations, large-scale agricultural land), advocated by the REDD+ spatial-based approach to landscape operates with the same practices of extractive industries, for delimitating territory and resources and negotiating the circumstances of extraction, production and social benefits' distribution (Clay, 2016). Looking at the preliminary land-use plan of the 'flagship' Maï Ndombe REDD+ integrated landscape program –which is at the moment, by far the most advanced one in DRC– illustrates particularly well the eco-functional spatial model REDD+ has adopted (**Figure 10**). As in the colonial maps in **Figure 1** and **Figure 2**, spaces are abstracted into categories of land cover –note, again, the dark green color to represent logging concessions– and organized into uniform areas of production and homogeneous groups.

In what is in fact a very complex plan that tackles 7 of the 8 pillars of REDD+ strategy, private conservation concessions operated by both a conservation company (Wildlife Works Carbon) and three logging companies operating in the area, are 'integrated' with logging exploitation, industrial agroforestry plantations operated by a private actor and, small-scale agro-systems managed by individual small farmers and in which perennial cash crops (oil palm, coffee, cocoa, rubber) are developed. Such map of an integrated landscape neglects power inequalities between actors and does not make any distinctions between what place belongs to whom and it was accessed which makes lands grabbed for green or extractive purposes justifiable, as part of a unified landscape (Anderson, 1983/2006). In the next two sections I unpack this socio-political space. I first focus on communities and the reconfiguration of their socio-spatial relations into 'enviropreneurial' (Baldwin & Meltzer, 2012) commodity producers/labourers, and then on private actors –in particular logging companies– and their representation as green social agents.

[56] Interview 14-RCS-KIN-20160225.

[57] Interview 16-CSI-KIS-20160301.

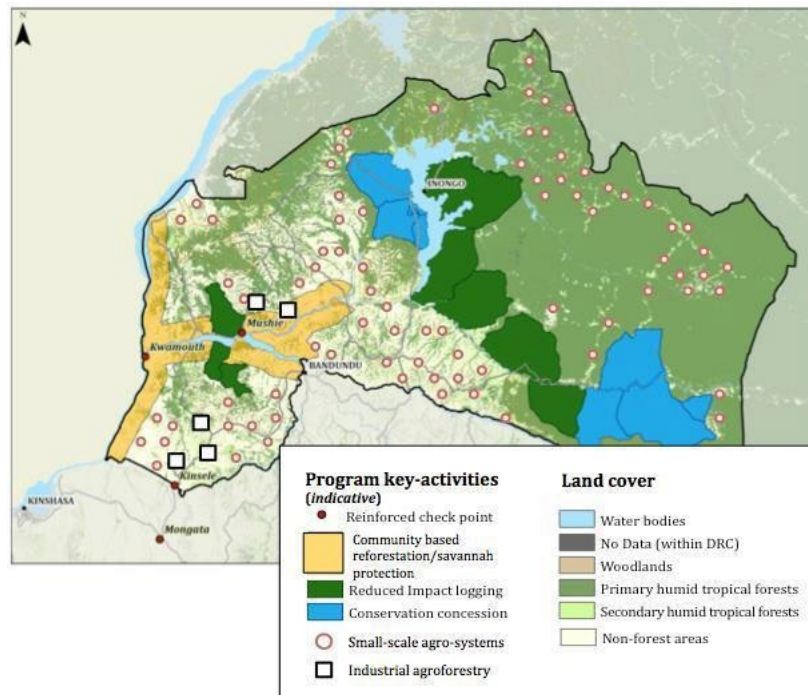


Figure 10. Preliminary land-use plan and key REDD+ program activities in the Mai Ndombe province (FCPF, 2016).

5.2. (Re)creating the enviropreneurial commodity labourer

The focus of REDD+ integrated programs on perennial cash crops, and in particular oil palm, cocoa, coffee and rubber tree (*hevea*) stems from the claim that “their development is in practice inescapable in front of the continuously growing world demand” (CAFI-DRC, 2015, p. 131). Typically, the rationale is here double. First, it claims that perennial cash crop agriculture requires 5 to 8 times smaller land areas compared to short cycle shifting agriculture –again, no figures with actual and ideal fallow lengths are ever provided– while also absorbing part of the workforce which would normally turn to subsistence shifting agriculture. Second, for equal labour, a household which cultivates one hectare of perennial crops on its land would earn 1500 to 2000 dollars a year compared to 400 to 700 dollars a year with subsistence crops (CAFI-DRC, 2015). Cash crop plantations are to be associated with agroforestry systems that combine intensified subsistence agriculture –rendered possible by appropriate rotations of monoculture and organic and chemical agricultural inputs– with fast growing acacia trees (used for charcoal production), as well as with afforestation/reforestation areas of fast growing tree species, in particular acacias (DRC-MECNT et al., 2015). This agricultural system differs from common agricultural methods practiced by local peasants in the hinterland of Kisangani as they plant *pêle-mêle**, that is several types of crops on the same plot of land, without organizing them in rows nor blocs. They partly do so because of remaining tree trunks that render the organization in straight lines quite complicated. According to REDD+ logic, a monocultural, intensified rotational system would be better able to provide income to farmers who sell their surplus on local and urban markets and would thus contribute to naturally convince farmers to stabilize their practices in addition to the small incentives they receive by planting acacia and respecting a land zoning plan. In other projects (e.g. REDD+ Novacel Sud Kwamouth) the aim is for farmers to sell their production to a (usually monopolistic) industrial agricultural actor in the area,

the latter hence being able to increase its production capacity without much investments while ensuring income for local farmers (DRC-MECNT et al., 2015; FCPF, 2016). Except for the result-based payments typical of REDD+, this scheme blatantly resembles the *Paysannat Indigène** system implemented by the Belgian colonial administration in the 1940s and 1950s, after decades of compulsory cultivation schemes⁵⁸ –*cultures obligatoires** (Clement, 2014). In fact, several state actors and REDD+ stakeholders referred to *Paysannat Indigène**.⁵⁹

*Paysannat Indigène** was an integrated rural development scheme that grouped farmers together along delimited (uniform) cultivation blocs, and monitored production and fallow periods according to scientifically pre-defined agricultural cycles. It was a blueprint model characterized by homogeneity, rationality and uniformity. Subsistence crops were associated with cash crops. As I alluded to in section 4.3, this system had various related goals. From an economic perspective, it aimed at increasing productivity and channeling agricultural production, not only for peasants wellbeing but also to provide food supply for cities and for the paid workforce working in extractive and agricultural industries, as well as to ensure the export production volume (coffee, cotton etc.) (Clement, 1952). From an imbricated socio-environmental perspective, this model of (semi-)settled monocultural agriculture was seen as the solution “to ward off the dreadful consequences of nomadism –translated into the destruction of forest resources reserves and soil erosion– and to gradually and as quickly as possible shift from an ill-defined collective property to an individual property protected by the State” (De Wildeman, 1940, p. 4). As Clement (2014) shows in his analysis of the implementation of the *Paysannat Indigène** system in the Equateur Province in the 1950s, while participation in the scheme was in theory voluntary, it remained imposed on villages from above. Farmers did not participate in its design, and in practice it became a more or less coercive system despite its branding as “‘education’ in colonial new-speak” (Clement, 2014, p. 271). Ultimately, economic incentives for Congolese producers were also limited as they sold their production “to monopolistic traders and European agricultural companies at prices that were fixed between the state and these companies” and that were largely to the disadvantage of the farmers (Clement, 2014, p. 276). Finally, *Paysannat Indigène** interfered with customary land tenure rights through the imposed demarcation of cultivation blocs and allocation of fields to individual farmers. In this sense, it accentuated a process already long set in motion, of forcing farmer communities to remain in a bounded space, while many of them used to be itinerant with land tenure rights that were not static.⁶⁰ The lack of knowledge and willingness to engage with the complexity of customary tenure fueled an increase in land conflicts.⁶¹

As in the colonial *Paysannat Indigène**, REDD+ integrated programs are pragmatic calls for shifting cultivators to catch up with Western agricultural standards and expert-driven alternative agroforestry that claims to be based on traditional agricultural practices. Both schemes invoke and perform the figure of the entrepreneurial commodity smallholder tied to his land, free from any imposed scheme while simultaneously using a discourse of participation and collective benefits. The two systems also seem to bear the same fundamental issues, stripping off the social and political content of agricultural systems. Typically, in participatory micro-zoning plans, zones are bounded into categories of use in spaces that were characterized

[58] In reality, compulsory cultivation was never totally abolished and was upheld until the very end of colonialism, with just a mere reduction of days devoted to compulsory cultivation from 60 to 45 per year (P. Clement, 2014).

[59] Interviews 14-RCS-KIN-20160225, 44-RCS-KIN-20170529, 53-CSI-KIS-20180430, 71-CSI-KIS-20190518.

[60] Interestingly, today’s deforestation hotspots targeted by REDD+ are often along the roads around which communities were forcibly resettled.

[61] As my research revealed, the impact of *Paysannat Indigène** on land conflicts and a deregulation of customary tenure systems can still be observed today in numerous land conflicts.

by periodicity, extension and movement, and communities are categorized into strikingly homogenous tenure groups (e.g. **Figure 11**) ignoring both heterogeneity within so-called ‘communities’ and fluidity and complexity of ownership and authority in such spaces (see Windey and Van Hecken (2019)). The distribution of REDD+ investments and result-based payments are supposedly based on the respect of these micro land use plans and rules (FCPF, 2016; FONAREDD RDC & UNDP, n.d.). On the one hand, such community boundaries might allow the securitization of their land rights against (further) land grabs; a point that is often invoked by REDD+ stakeholders to justify their interventions. Participatory maps have in fact already been used by communities in DRC, supported by international environmental NGOs, to reclaim their rights against logging companies, for instance in the Safbois concession in Isangi territory where part of my fieldwork took place. On the other hand, local peasants lose the freedom to cultivate what and where they want. Moreover, they trigger conflict and, marginalize and render invisible the numerous ‘migrants’ –among which some have created villages in spaces that were considered vacant– who negotiate their access in time and space, often in an *ad hoc* manner (again, see Windey and Van Hecken (2019) for an example).

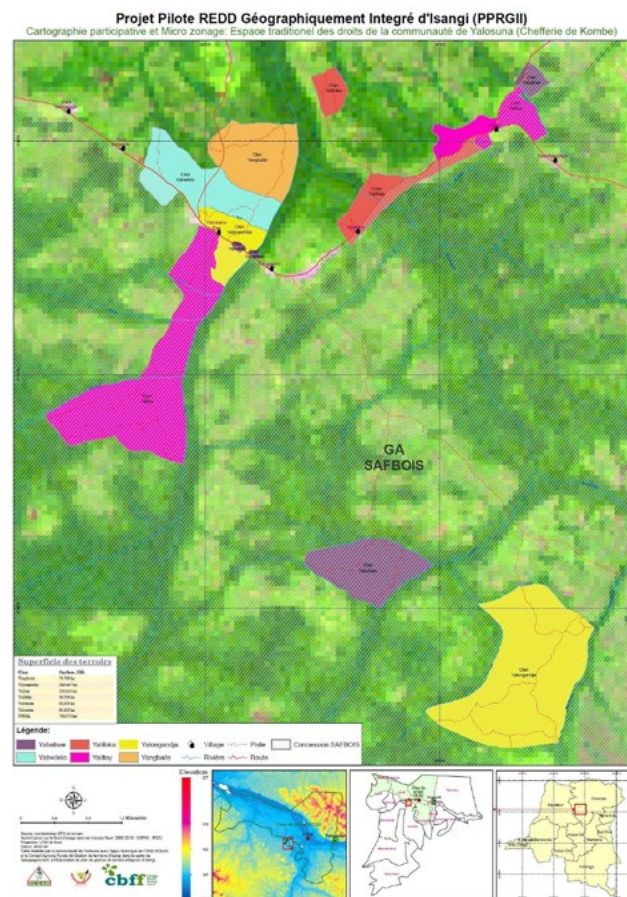


Figure 11. Participatory tenure map of the intervention zone of the PPRGII Pilot Project in Isangi, Tshopo Province (OCEAN ONG, n.d.).

However, except for such maps, REDD+ programs in the hinterland of Kisangani have yet to prove that they (will) work with whole community groups. In the case of the PPRGII pilot project, only a few households were selected to develop monocultural plantations. Informants repeatedly asserted that individual household heads participating in the agricultural program –local elites, i.e. *notables**– had been chosen simply because of their close relationships with the implementing NGO’s program managers –themselves elites from Kisangani– or due to their affiliation to the dominant clan, which created disappointment and conflict in several communities.⁶² One of the dangers here lies in the contradiction between theory-propaganda and practice. Under the cover of participation and inclusion, REDD+ projects as in the case of PPRGII usually create participatory land tenure maps (e.g. **Figure 11**) that raise expectations that REDD+ will be implemented for the collectivity and benefits be shared equally. Participatory land use maps are also supposedly created to manage communities around agreed-on land use goals. However, these maps rather appear as ‘maps-as-logo’ (Anderson, 1983/2006) in the context of information/awareness-raising campaigns (see section 4.3) and of the UN-REDD safeguard of Free, Prior and Informed Consent (FPIC) or, as Ehrenstein (2014) similarly notices, as a rhetorical exercise to meet the request of some international environmental NGOs for the systematic use of participatory tenure maps. In practice, projects advance a system of private property rights that aligns with the settlement and intensification of agriculture, cash crop and carbon production pushed by REDD+ –it also facilitates control and accumulation.

Both the CAFI and FIP *PIREDD* integrated programs in Tshopo have similarly focused their primary efforts on identifying former –i.e. colonial– cash crop plantations that can be restored as well as ‘private’ smallholder farmers who already planted cocoa plants, coffee or oil palm trees or are interested to do so⁶³, so as to support them technically and financially to develop green business models and transform them into a “professional class of small farmers” (FCPF, 2016, p. 54). These actors have already formal –rather than customary– individual land titles and the programs claim they will support those who do not, to access such individual land property (FONAREDD RDC & UNDP, n.d.). In the absence of land registers and a strong opacity regarding any information on land ownership, identifying plantations and private landowners turns out to be complicated as it likewise was when I asked the programs’ managers to provide the list of private landowners that will be supported by the CAFI and FIP integrated programs. However, my on-the-ground research shows that most actors detaining land titles are urban (military, political and intellectual) elites from Kisangani and Kinshasa, and the *Nande*, an ethnic group from North Kivu whose members have escaped conflicts but have a major commercial power in Kisangani –they own most of shops and businesses. These elites easily gain access to land by offering villages’ chiefs very low prices or compensations like some chickens or a goat. Chiefs often agree without consulting the larger clan or village as the customary tenure law would normally require. With the agreement of the local chief, titles are then attributed by the cadastral administration.⁶⁴ In some other cases, powerful militaries or politicians take over pieces of land by force.

Typically, these actors acquire land to develop cash crop agriculture, to produce charcoal and/or, in some cases, for artisanal logging; often combining all these activities. The size of land can vary from ten hectares to several hundreds of hectares, e.g. 700ha for the concession of a general in the Congolese army. In lots of cases, these lands are not yet exploited

[62] E.g. interviews 30-I-YALO-20160323, 31-I-YALO-20160323, 33-I-YALO-20160324.

[63] Interviews 38-CSI-KIS-20170505, 54-CSI-KIS-20180430, 72-CSI-KIS-20190520.

[64] Therefore, conflicts over land are extremely frequent in DRC, both because customary law and positive law are often at odds and because of communities’ internal power struggles.

and are acquired for speculation, awaiting for more financing to develop a plantation or to sell them later –e.g. to agribusinesses– when prices go up as a result of the city’s and infrastructures’ expansion.⁶⁵ However, since a couple of years, *Nande* people have heavily invested in large cocoa plantations and, to a lesser extent, oil palm plantations, with the ambition of controlling these markets in the Province as they easily sell their product at very low price to the only cocoa trader in the area, ESCO-Kivu⁶⁶. ESCO-Kivu (Edmond Schlüter & Compagnie), a Swiss-registered agribusiness company –the quasi monopolistic cocoa trader in Eastern DRC– has boosted the revival of cocoa in North Kivu and Ituri by directing farmers towards its production, and now became the official partner of REDD+ programs in Tshopo Province (ASSECCAF, 2016; FONAREDD RDC & UNDP, n.d.). What is not mentioned in any documents though is that the coffee supplier Schlüter SA, of which ESCO-Kivu is a (discrete) subsidiary, has been acquired in 2016 by OLAM –the giant Singaporean agri-commodity group. OLAM, through the established networks of Schlüter, ambitions to develop its market share of speciality coffee from East Africa in both Europe and the United States (Terazono, 2016).

For private urban elites converted into plantation owners and for ESCO-Kivu/OLAM, REDD+ could hence become an opportunity to enhance or start intensive cash crop production on currently unexploited lands for supposedly helping protect DRC’s carbon sinks. While this could be positive for Congolese national GDP –assuming the tax system would function– and for creating revenues and employment, this quite contrasts with CAFI and FONAREDD discourse of community involvement and participation and tenure securitization, but in fact also of forests’ protection. REDD+ programs do not engage with the complexity and fluidity of local land tenure systems. Moreover, in practice, local peasant communities –shifting farmers– do not have legal rights on land and their access is now subordinated to the interests of the global economy, in terms of its demand for cocoa, palm oil and carbon. Lots of local peasants in the hinterland of Kisangani indeed ‘rent’ their land to the community that is deemed to be the first occupant, and have no prospect of any securitization. Finally, because of food insecurity and limited means to pay labourers to help maintain the plantation, local peasants are largely prevented from investing in cocoa plantations, lots of them told me.⁶⁷ As I heard from several bigger producers⁶⁸, local purchase prices for cocoa produced in the region of Kisangani remain volatile, from 0,9\$ to 1,5\$ per kilo depending of the harvest season. It thus adds a layer of risk for local farmers and communities to invest in cocoa. In this way, at the moment, the main cocoa producers in the hinterland of Kisangani are rarely the same shifting farmers REDD+ programs are supposedly supporting. While REDD+ programs claim to aim at strengthening existing channels and value chains, their partner ESCO-Kivu/OLAM is the same (quasi-) monopolistic company that buys all cocoa production in the targeted areas in the Tshopo Province. The fact that some more powerful operators with large plantations already provide cocoa at current market prices set by ESCO-Kivu/OLAM might complicate this objective and concretely block local peasants to enter the market, or just force them to sell at low prices to bigger actors. For instance, in the area of Alibuku, 36km away from Kisangani, one important *Nande* producer already supports some local peasants to engage in very small-scale cacao production and sell their production back to him both to ensure social peace –i.e. “avoid local peasants to steal the production” –

[65] Interview 56-RCS-KIS-20180515.

[66] Interviews 88-I-RAB-20180516, 99-I-KIS-20190517.

[67] Informal focus groups 15-IFG-ARBU-20190522, 16-IFG-RAB-20190522.

[68] Interviews 88-I-RAB-20180516, 92-I-ARBU-20180519, 99-I-KIS-20190517.

and to increase his market share.⁶⁹ Alternatively, in zones of dense cash crop exploitation, local peasants –in particular ‘migrants’ who have to negotiate their land access with local chiefs as it is the case now– might just have to become (occasional) labourers in private plantations for maximum 1,5 to 2\$ a day.⁷⁰

Regarding the risk cash crop plantations present for forests, the impact of the plantations I visited are already visible on the ground and on GFW tool, in the “hotspots” identified by REDD+. Some large areas of secondary forests have been cleared for these monocultural plantations installed by more powerful urban elites, the *Nande* and others. In fact, exploitation surface areas tend to increase with people’s growing financial means and an easy access to individual property rights. Some plantations are growing fast –over 200ha for one I visited– and are planned to increase as land is still easily (and cheaply) granted by local communities. The number of *Nande* starting new concessions also constantly increases as in North Kivu and Ituri, competition for land is stark and prices are high.⁷¹ In correlation with this movement, poorer local cultivators often seek new cultivation area further away in the forests as they sell their lands closer to road infrastructures.

REDD+ rationale with its essentialising images of ‘population’ and ‘shifting agriculture’ thus not only purposely overlooks the diversity of the Congolese socio-political landscape but also performs particular landscapes of commodity production that affect socio-spatial relations and identities. Local shifting peasants are now providing the world with commodities (carbon and cash crops) through the reconfiguration of their socio-spatial relationships within the dynamics of globalization and its economic relations (Arora-Jonsson et al., 2016). My point is of course not to dismiss the importance of thinking of various strategies that can reduce rural poverty and deforestation –changes in agricultural systems appear as a necessity for local Congolese farmers. Rather, it is to point out how ‘geographic programming’ and rationalisation as it is conceived now discards the full complexity of social identities and of people’s lives which ironically serves as a vehicle for their misrecognition, and dismisses crucial power differences between actors and between different access to resources in the landscape (Fraser, 2000). In REDD+ projects, the entangled push for the ‘stabilization’ and rationalization of agriculture and for international market integration perpetuates colonial logics of concentration and exclusion through status and social subordination; with a class of restructured and formalized private urban landowners and giant commodity traders (e.g. ESCO-Kivu/OLAM, Blattner Conglomerate) controlling the production, and another class of smaller stigmatized ‘shifting cultivators’ becoming dependent casual labour reserves or petty commodity producers at the margin of (industrial) plantations (Fraser, 2000; Mosse, 2010). Perhaps even more worrisome than the growing inequalities between these groups, is how REDD+ reinforces processes of land/green grabbing and accumulation to the advantage of bigger, international industrial companies in this new green economic landscapes.

[69] Interview 88-I-RAB-20180516.

[70] Interviews 88-I-RAB-20180516, 92-I-ARBU-20180519.

[71] Interview 99-I-KIS-20190517.

5-3. Advancing the (speculative) socially responsible and green company

“Nowhere else in the world could I have been able to do what I’ve done, at 33 years of age. That’s why I call this the wild west. If you’re willing to put yourself on the line, it’s wide open out here.”

Elwyn Blattner, 20 December 1989, in an interview for The New York Times article “Getting Rich in Zaire: An American, 33, Tells How” (Noble, 1989)

In DRC’s REDD+ strategy industrial actors’ role in ‘carbon sinks’ management is put at the forefront, raising real concerns about social and environmental justice as local communities become only peripheral to the dominant industrial economy in integrated landscapes. The example of OLAM/ESCO-Kivu I mentioned in the previous section is particularly representative of how DRC’s REDD+ investment plan supports powerful agri-commodity companies to gain market shares through organic/responsible commodities (e.g. cocoa) labels of which consumers in Europe and the US are increasingly fond. In the same way and as I have shown earlier, the logging sector has also been particularly involved in REDD+ discussions and has become a privileged actor for investments and result-based payments. Industrial forestry and REDD+ are in fact so entangled that there are serious conflicts of interests for forest engineering consulting cabinets who provide technical assistance to both industrial logging companies and international forest governance programs like REDD+, as well as to the Congolese forest administration. A major French cabinet I interviewed on several occasions, which provides services to logging companies to develop their forest management plans has openly lobbied for the integration of logging concessions in the REDD+ program so as to allow logging companies to financially benefit from REDD+ investments for their forest management plans and their ‘conservation zones’.⁷² This cabinet has been involved in the design of DRC’s REDD+ strategy and investment plan and has now become one of the executive agencies for the Mai Ndombe REDD+ integrated/jurisdictional program in the Western part of the country.

In this context, a US\$18 million *Sustainable Forest Management Program* (PGDF) of the French Agency for Development (AFD) has been approved within the REDD+ investment plan. The overall objective of the program is to develop a legal, formal and sustainable logging sector by backing different actors (industrial, artisanal and community forests) in adopting the Sustainable Management Method and supporting the elaboration and application of a forestry policy (FONAREDD RDC, 2016). PGDF is in fact the continuation and extension of the AGEDUFOR program that was already financed by the AFD for five years to support forest governance and the formalization of the industrial logging sector. Both programs can be understood in the larger framework of the *Forest Law Enforcement, Governance and Trade* (FLEGT) action plan of the European Union that aims at halting trade in illegal timber and thus reinforce control, and of other environmental labels such as the Forest Stewardship Council (FSC). Due to frequent campaigning actions, the industrial logging sector in the Congo Basin suffers from a negative image that has induced a drop in European/US demand for African timber, and in particular DRC (Karsenty, 2016a). Cleaning up DRC’s industrial logging sector is a necessity. Yet, it raises issues in terms of fairness of competition, and social and environmental justice. Both the obtention of labels and the adoption of the FLEGT scheme by DRC supported by REDD+ would make it easier for industrial companies operating in DRC to win or extend their market share on the EU market.⁷³ But the overall reinforcement of forest governance in DRC would also allow interna-

[72] Interviews 28-PA-KIN-20160406, 30-PA-KIN-20160407, 46-PA-KIN-20170529.

[73] Most DRC’s industrial export of logs is currently destined to China, while Europe remains for now the main mar-

tional logging industries to increase their market share on the large domestic market. As the PGDF program's document asserts, at the moment, industrial logging companies are subjected to both formal and informal taxes that hinder their competitiveness against artisanal logging which is only subjected to informal taxes (FONAREDD RDC, 2017). With the formalization of the artisanal logging sector, the latter would also become subjected to formal taxes and thus give a better competitive advantage to the industrial sector. Finally, at the level of concessions, REDD+ offers the possibility for logging companies already advanced in their forest management plan (FMP) to be compensated for their effort in (supposedly) reduced impact logging or the extension of their conservation areas (FCPF, 2016). The establishment of FMPs spatially organizes and rationalizes production through inventories, geolocalization of high-value timber and optimization of harvest schedules. It also organizes different bounded land use zones for regulating communities' access and resource use, and for ensuring the delimitation of conservation zones. It also allows to define levels of socio-economic compensations for communities. Production zones are, in this way, theoretically 'protected' from communities' and other artisanal activities' encroachments. Geospatial planning, again, is at the forefront, getting rid of wider spatial and socio-economic dynamics.

As denounced by a coalition of international NGOs –in particular Greenpeace and Rainforest Foundation UK– and to a certain extent Congolese CSOs (see below), the ecological, economic and social impact of an expansion of industrial logging is highly debatable (Bouessel du Bourg, 2017; Caramel, 2017a, 2017b; Greenpeace et al., 2017). By law, logging concessions have to draw up social responsibility contracts with communities that plans socio-economic compensations for the communities installed within the perimeter of the concession; i.e. a corporate-centred model that replaces the state in providing social services. Typically, the PGDF celebrates this model and legitimizes logging companies' activities by emphasizing its role in community development, as opposed to failed state governance. In line with some arguments of this coalition of NGOs, my inquiry in one logging concession showed that small healthcare centres or schools had been built but that because the operational costs such as teachers, health workers or maintenance are not taken in charge, these buildings often remain empty or are abandoned after a few months or years. The few ten-thousand dollars offered by the logging company as compensation can indeed not replace proper state investments in social services. It also obscures wider structures of inequalities. In some cases, direct arrangements between the company and the local chief and elites have not benefited the rest of the community. Wages and living conditions for the few company's workers remain also particularly low. Finally, in terms of its ecological impact, as already touched upon in section 4, industrial logging is very controversial in DRC, and acknowledgedly operates illegally for a large part. Yet CAFI still supports the program by advancing the argument that studies on deforestation drivers have shown the little role of industrial logging concessions on deforestation –especially if they have forest management plans as REDD+ promotes⁷⁴– contrarily to communities' land use practices and 'illegal' artisanal logging (CAFI-DRC, 2017a). In fact, my interviews and participant observation at the round table of the civil society on forest policies in April 2018, show that over time most Congolese CSOs have also validated the general objectives of the program on the same basis.⁷⁵ The well-found-

ket for processed products (Karsenty, 2016a). Asian markets for DRC timber exports will likely exceed the European market in a couple of years.

[74] There is however an ongoing debate about the impact forest management plans on deforestation, see (Brandt, Nolte, & Agrawal, 2016) The response: (Karsenty, 2016b) And counter response: (Brandt, Nolte, & Agrawal, 2018), as well as: (Cerutti et al., 2017)

[75] As I show in section 4.3, Congolese CSOs' position in the REDD+ process is generally not one of resistance and opposition.

ing of the program is thus not, and even cannot be, put into question and is seen as absolutely necessary for the country's economic growth.⁷⁶

The PGDF and forest management plans are not the only means through which some powerful industrial (logging) actors benefit from REDD+ strategies. For instance, in 'integrated' landscapes, logging concessions and industrial agricultural concessions are adjacent to conservation concessions –see **Figure 9**. While to an external eye they might appear as disconnected, most of them are in fact owned and managed by the same actors as logging companies have simply transformed some of their production concessions into conservation concessions. In Mai Ndombe, for instance, the country's largest operating timber company SODEFOR⁷⁷ –a subsidiary of the giant NordSud Timber mainly held by Swiss and Portuguese capital and based in Lichtenstein– has 11 concessions that represent more than 2 million hectares of forests (Global Witness, 2018; WRI & DRC-MECNT, 2010). Under the REDD+ program, 4 of these concessions are to be converted into conservation concessions for which SODEFOR can be financially rewarded for its carbon performance, counting as avoided deforestation. In the same way, one of the major commercial and industrial actors in DRC, the Blattner Conglomerate, that has been running businesses in diverse sectors including timber exploitation, agriculture –it is the biggest palm oil producer in DRC– and mining since right after independence, has increasingly shown its interest in REDD+. Since 2009, it has converted its 348 000ha logging concession, Safbois, into a conservation concession, Jadora – of which 187 000ha are primary forest– in the Isangi territory where (one of) its 8874ha palm oil tree plantation, Busira Lomami, is also established.⁷⁸ The conservation concession is now a private REDD+ project co-owned by Jadora LLC, an American, privately held company selling carbon credits. While it is difficult to precisely define what are logging actors' exact interests in converting their concessions besides speculation –at the moment logging seems more profitable than carbon selling– there are some potential lines of explanations. Going into WRI's Forest Atlas of the DRC and one Global Witness' report shows that some of SODEFOR's concessions had no declared production or showed no sign of activity (through satellite imagery) since several years before their conversion (Global Witness, 2018; WRI & DRC-MECNT, 2010). In the case of Jadora/Safbois, the conversion from an exploitation to a conservation concession was strongly criticized by civil society and several non-governmental organizations. They contested the legality of the conversion and suspected it had been done to avoid the increasing scrutiny of and revolt against its illegal logging activities and the non-compliance with the social responsibility contract Safbois had with local communities (see e.g. Parenti (2007) who shows the extent of the discontent just a couple of years before the conversion).⁷⁹ Some other critics claim that Safbois had been converted just because the company realized there were much less prime high value timber species than expected or that it had already harvested all of them, hence strongly decreasing the company's revenues or even forcing its activities to stop.

In the meantime the Jadora/Safbois REDD+ project has obtained the Verified Carbon Standard (VCS) and Climate, Community & Biodiversity Standards (CCBA) certifica-

[76] Interviews 51-CSI-KIN-20180424, 60-RCS-SKY-20180523, 61-CCSO-KIN-20180528.

[77] The forestry sector in DRC is an oligopolistic sector and largely controlled by foreign capital. Two companies –SODEFOR and one owned by the Blattner family conglomerate– are responsible for more than half of the total declared production and export volumes (Lawson, 2014).

[78] Blattner Conglomerate is also involved in the establishment of a new oil palm plantations in the CFT logging concession, as developed in section 4.1.2. It has also, in a quite opaque manner, sold five of its logging concessions (previously SIFORCO) to the Chinese company Booming Green.

[79] In fact, the accusations of non-compliance with CSR contracts are rife in DRC (other concessions owned by SODEFOR and Blattner Conglomerate have been accused). The logging sector is also largely operating illegally, as regularly denounced by Global Witness and Greenpeace, and as I mentioned earlier.

tions, and is advertising its environmental and socio-economic accomplishments on the web since a few years.⁸⁰ Yet, in the name of conservation and protection, local people have been further evicted from shaping their own landscapes and benefitting from any potential wealth carbon sinks could produce. In villages situated around the Jadora/Safbois concession people told me that while they have received some short trainings on the objectives of the conservation concession to sequester carbon and on alternative agricultural practices (rotational monoculture), they have barely received any compensation in the first 7 years of Jadora concession's existence despite being counted as beneficiaries in official evaluation reports.⁸¹ When I visited the area, there were indeed some demo fields and demo fish farming but they were used by Jadora's two permanent workers. Communities' access to the concession are nevertheless officially further restricted through the conversion from a logging to a conservation concession, e.g. hunting or cultivating.⁸² No socio-economic compensation contract or other form of agreement seems to have been signed between Jadora and local communities while they existed when it was still a logging concession.⁸³ Communities often brought up the opacity of Jadora's statues and activities that is related to carbon's invisibility, as exemplified by this quote⁸⁴:

“Safbois, we saw how they cut down our trees and took it on their boats to sell it in Kinshasa or abroad. That we could clearly see. But for the carbon gas, it is not visible. [...] Why are some Jadora's workers paid, on which basis? They do not produce anything, but they are regularly paid at the end of each month and they sell the gas at the level of the World Bank; that is where they get their benefits from. But here, we do not see it. [...] So we cannot react because we do not know what they take away from us. If carbon gas was clearly visible or so we could protest, but we do not see it. How can we claim it?”

The only thing they saw, as other villagers told me, is that “when White people came, they entered in the forest to look at the game animals, to look at the water, to look at the trees [...] and put some devices there”⁸⁵; “they put some red signs [on the trees] that say we cannot touch and if we touch America will get angry”.⁸⁶ “Is Jadora a logger, is Jadora an NGO, so who is Jadora?”⁸⁷ asked another one. Yes, as they rightly point out, industrial actors can now cash-in on REDD+ to carry on and even bolster their business-as-usual extractive activities –e.g. through PGDF's supported forest management plans– and engage in speculative (invisible) carbon trading through the conversion of concessions that were anyway not viable economically, simultaneously appearing as economic and environmental saviors. And yes, in DRC's overly spatial approach, ‘landscapes of [capitalist] production’, ‘landscapes for speculation’ (the carbon stocks valorized by REDD+) and ‘landscapes for contemplation’ (e.g. protected areas) can coexist while leaving local communities who dwell in them at the margin (Igoe, 2013).

[80] E.g. <https://www.jadora.co/what-we-do>, <http://www.coderedd.org/members-partners/jadora/> or <https://standfortrees.org/en/protect-a-forest/isangi-congo-rainforest-conservation-project>

[81] Interviews 42-I-YAF-20160328, 45-I-YAF-20160329, 46-I-YAF-20160329.

[82] Interview 43-I-YAF-20160328.

[83] Interview 42-I-YAF-20160328.

[84] Interview 43-I-YAF-20160328.

[85] Interview 47-I-YAF-20160329.

[86] Interview 45-I-YAF-20160329.

[87] Interview 46-I-YAF-20160329.

6. CONCLUSIONS

By adopting a relational understanding of mapping and geospatial planning that reconnects them to wider systems of power/knowledge and the social-material world, this paper has demonstrated how historically hegemonic ‘rhetorics of representation’ (West, 2016) continuously reproduce a monoculture of productivity (de Sousa Santos, 2014) and bounded space materialized in privately-held plantations, through seemingly new and more inclusive environmental programs. I have argued that the idea of Congolese rainforests as ‘blank spaces’, i.e. not scientifically mapped (Hiatt, 2002), and the corresponding heavy REDD+ investments in and diffusion of expert geospatial analyses and representations has pushed western scientific interpretations while excluding local knowledge, struggles around resources and people’s definition of their own identities and social reproduction. In multiple ways, cutting edge geospatial data, technologies and planning and the eviction of other epistemologies have become the first mediator to think, legitimize and re-order landscapes and lived lives into global ‘green’ commodity markets (e.g. carbon, cash crops), and for inscribing people’s subjectivities as (underpaid) plantation labourers or petty commodity producers at the margin of the dominant economy ruled by more powerful actors (Haraway, 2015; Lefebvre, 1991; Mosse, 2010; Winichakul, 1994). Landscapes are rewritten in a regulatory and extraction-driven manner.

Empirically, I have shown that satellite-based maps perform as neutral reference actants –secure representations within an epistemic regime of claims and meanings– to control people and space at distance, seemingly out of the Congolese socio-political ‘messy’ world (Anderson, 1983/2006; Harley, 1989; Kitchin et al., 2013). Through a careful crafting that creates presences and absences, dominant mappings and representations in REDD+ assemblage contribute to produce a unified spatial ontology (*this is there*) (Wood & Fels, 2008) of ‘deforestation’ that blames the livelihood practices of a seemingly homogeneous category of ‘local population’. Local communities’ subjectivities are uniformly framed as *the poor but harmful shifting cultivators*, a first step to justify control over their socio-spatial practices. Simultaneously the complexity of land use and power struggles over resources are obscured, and past, present and future industrial exploitation are mostly let off the hook. These knowledge claims, I have demonstrated, are embedded contingently within colonial discourses that stigmatized indigenous peasants in the exact same ways, and within the political context of DRC and of REDD+ negotiations. The figure of the harmful shifting cultivator and its neutrality label –it is proven with geospatial data– helps solving relational problems between stakeholders engaged in REDD+ discussions with different interests. The contingent maps, in this context, emerge as *logos*, from which socio-political heterogeneity and inequality is removed, and that permeate people’s imaginaries of forests and of what is possible, plausible and desirable (Anderson, 1983/2006; Igoe, 2013).

Fundamentally, as the second part of the paper has shown, this monoculture of knowledge is intertwined with a monoculture of socio-tempo-spatiality (de Sousa Santos, 2014) that privileges a linear, sequenced and bounded time-space associated with the *rationality* of formal industrial and commercial activities. It corresponds to what is seen as a *productive time-space* that is legitimized in REDD+ discourses through its economic significance for the country’s green growth and its insertion into global economic relations. This uniform discourse simultaneously creates the non-existence of periodic, discontinuous and unbounded time-space associated with the *irrationality* of informal artisanal and subsistence activities. It is perceived as an *incidental time-space* in a double sense: as unproductive, backward and secondary for national growth, and as unplanned, disordered and uncontained in relation to the natural environment.

On this basis, rights to land and forest resources and legitimacy to deforest (or not) are distributed. Clearing trees is acceptable as long as it is planned and bounded in space and time, like continuous and linearly growing industrial exploitation, something one international REDD+ Technical Advisor referred to as “accompanying deforestation”⁸⁸, that is, a regulated or planned deforestation as opposed to communities’ unplanned deforestation (FCPF, 2016). As he further added, “cash crops plantations like oil palm or cocoa destroy the forest; but they do it once and for all while subsistence agriculture, that one, is insatiable”. Thus, it is also about the kind of crops that *really* count, which is intimately tied to the valued tempo-spatiality and socio-economic relations of rational modernity and the global economy. Current communities activities are seen as problematic because of their ever-expanding and disordered movements in an uncontained space while the intensive, continuous but linearly growing exploitation in a bounded space –that can be as big as a 250 000ha logging concession or a 9000 ha oil palm plantation– is legitimate. In fact, the technicity of REDD+ for measuring and monitoring forest areas, carbon stocks and emissions, which heavily relies on satellite remote-sensing technologies, inventory data and management plans, seem to directly privilege private gridded concessions with their homogeneous and planned activities. Surveillance of dynamic socio-ecologies through satellite imageries is much more difficult. Through these processes, the REDD+ landscape approach, despite its purported holistic way of looking at land use with special attention given to local, native and marginalized groups, continues to push Western techno-scientific knowledge to arbitrarily create green economic and ‘rational’ socio-spatial identities and practices.

By rendering local socio-ecological practices insignificant, *blank* in terms of their economic importance, places can be filled with other models. The particular valued productive, rational time-space promoted by REDD+ also produces standardized subjectivities and relationships. We have seen two figures emerging: the *socially responsible green company* and the *enviropreneurial commodity producer/labourer*. In DR Congo’s REDD+ imaginary, logging or agribusiness companies emerge as agents that are more capable than the *irrational* Congolese state and local peasants to protect carbon stocks and provide socio-economic wellbeing. This justifies investments in management plans and conservation concessions that allow companies to win or extend into new markets while restricting ‘the harmful shifting cultivators’ access to land and resources. Simultaneously, a class of private landowners and commodity traders is supported and further integrated in international markets (e.g. cocoa) while cultivators with now stabilized farming practices become labour reserves or petty producers of both cash crops and carbon. As such, REDD+ presents opportunities to rethink agricultural systems and for some to escape from poverty traps. But past and ongoing injustices are left totally unaddressed, as are the risks of agricultural and extractive activities expansion.

I believe that this analysis is important, as it sheds light on various processes of “slow violence” of environmental rule, which causes delayed destruction and is dispersed across times and space (Nixon, 2011). It first manifests in the systematic absence of other (complex) modes of knowing, being and inhabiting the world. Local forest users never speak of and for themselves and are hence denied their ‘intellectual sovereignty’ and ‘representational sovereignty’ that is “the ability for a group of people to depict [and making meaning of and by] themselves with their own ambitions at heart” (Lewis in Raheja, 2010, p. 30; West, 2016). These forms of epistemic dispossession are closely imbricated with further material dispossession by elites or corporate forces and to “the subjection to capitalist law of the value of common goods and resources” (de Sousa Santos, 2014, p. 45). As people are treated as disposable and malle-

[88] Interview 14-RCS-KIN-20160225.

able, so are natural ecosystems. They are homogenized, rationalized and reorganized to enhance efficiency (e.g. of carbon production, of timber extraction etc.), with long term ongoing socioecological consequences. Highlighting such slow violence is of uttermost importance in a country like DRC. First because its (almost uniform) portrayal as a place of failure and dysfunction (Ferguson, 2006) legitimizes external top-down green economic interventions and control. Second because, while there is a growing attention to commodity-driven deforestation in the Amazon, risks of displacement of commodity production in this (for now) more discrete landscapes are real.

Finally, to be clear, and as I have argued elsewhere (Windey & Van Hecken, 2019), I am not advocating against any use of geospatial knowledge in REDD+ environmental governance. I rather argue that if we understand the power of maps as relational rather than inevitable, cartography can start to bring in socio-environmental justice concerns to enact what was rendered invisible or marginalised by dominant representations of the world. To take up Mignolo (2009, p. 177)'s call, if knowledge-making is really concerned with people and environment well-being rather than control for imperial interests, it should start "from local experiences and needs rather than from local imperial experiences and needs projected to the globe".

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APPENDIX 1: CODING SYSTEM TO ANONYMIZE INTERVIEWS

A) Expert interviews

E.g.: 1-RCS-KIN-20150508

1) Interview number

2) Category of actors

CSI	Congolese State Institutions
CCSO	Congolese Civil Society Organizations (some of them manage REDD+ projects, e.g. OCEAN)
CTSP	Congolese Technical & Scientific Partners
INGO	International Non-Governmental Organizations
ITSP	International Technical & Scientific Partners
PA	Private Actors
RCS	REDD+ Coordination Structures (special government entities including international consultants from multilateral funding organizations)

3) Location of interview

ISA	Isangi
KIN	Kinshasa
KIS	Kisangani
RAB	Route Amex-Bois
RIT	Route Ituri
YAF	Yafunga
YAN	Yangambi
SKY	Skype

4) Date of Interview (yearmonthday)

B) Interviews, informal focus groups and participatory mapping in villages

E.g.: 45-I-YAF-20160329

1) Interview, informal focus group or participatory mapping number

2) Type of method

I	Interview
IFG	Informal focus group
PM	Participatory mapping

3) Location of interview

ARAB	Ancienne Route Amex-Bois
ARBU	Ancienne Route Buta
BU	Bula
ISA	Isangi
KIS	Kisangani
MAS	Masako
RAB	Route Amex-Bois
RBU	Route Buta
RIT	Route Ituri
YAF	Yafunga
YALI	Yaliaboga
YALO	Yalosuna
YAN	Yangambi

4) Date of Interview (yearmonthday)





IOB

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