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From a Threat to an Opportunity: Climate Change as the New Frontier of Accumulation

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From a Threat to an Opportunity: Climate Change as the New Frontier of Accumulation

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Abstract

Amidst the intensification of the global environmental crisis, the new scramble for Africa has become 'greener' than ever. Investments, projects and policies to mitigate and adapt to climate change have become a top priority especially in biodiversity-rich countries such as Mozambique and with profound implications to rural livelihoods. This paper aims to understand, under a political economy and ecology lens, the implications to global processes of accumulation and rural livelihoods. It explores different variations in which climate change is used to facilitate capital accumulation either through legitimation of resource grabbing or by the creation of new spaces for accumulation by further commodifying nature. A closer examination of these processes shows that climate change, and the policies and schemes to address it, which were initially perceived as threats to accumulation, have been co-opted by global capital and integrated in the global processes of accumulation, with the aid of the state. Hence, a new frontier of accumulation arises, as climate change is further augmenting new forms of primitive accumulation (with and without land expropriation), creating new commodities and new opportunities for accumulation by expanded reproduction (legitimised by mitigation and adaptation policies).

Keywords: climate change; capital accumulation; REDD+; Climate-smart agriculture; primitive accumulation; accumulation by expanded reproduction; rural livelihoods; Mozambique

Introduction

Contextualisation: "Green is the new black"[1]

The intensification of the global environmental crisis puts climate change at the centre of the international community agenda/debates and has been shaping policies, investments, markets, aid and finance all over the world. Africa has been identified both as being very vulnerable to climate change as well as being a potential solution for the current crisis. Africa is thus one of

[1] "Green is the new black" is the name of "a lifestyle media and events platform on a mission to make sustainability mainstream, accessible and sexy" by connecting brands with people (https://greenisthenewblack.com/about-us/). The "green" brands promoted include food, fashion, beauty products and other services. The expression "Green is the new black", coming from the fashion industry, implicitly points out that being "green" or "environmentally friendly" has become the new trend. "Green is the new black" is a slogan that characterises the global environmental concern hype which is heavily transforming value chains, production systems and markets; hence, it is well-fitted as the current slogan of capitalism.

the main targets of climate change mitigation and adaptation policies. According to the World Bank (2010a), Mozambique in particular presents the following risks: (a) 2–4% potential decrease in yield of major crops; (b) risk of sea-level rise on coastal populations (60% of the population highly vulnerable to seawater inundation) and loss of approximately 0.6% of national land area; (c) 25% of the population is at risk from natural hazard and extreme weather events such as droughts, floods and tropical cyclones; and (d) its geographic location makes it one of the most vulnerable countries to natural disasters.

On the other hand, Mozambique's biodiversity potential is internationally acknowledged. Around 25% of the national territory has conservation potential (ANAC, 2015). The crucial combination of the 'need to adapt' and biodiversity potential, positioned it as a great receiver of climate funds and a strategic destination of climate change adaptation and mitigation projects. Consequently, a national public entity aiming at the administration of conservation areas (*Administração Nacional das Áreas de Conservação* – ANAC) was established with the direct support of the World Bank, along with many other projects aiming at the support and administration of climate change-related projects. Strategies such as the Reducing Emissions from Deforestation and forest Degradation (REDD+) and Climate-Smart Agriculture (CSA) emerged as the main priorities of the two ministries in charge of agricultural, land and environmental issues in the country.

The REDD+ strategy in Mozambique aims to reduce carbon emissions based on multi-sectoral integrated landscape interventions. It integrates the promotion of rural development as a main pillar while attracting green investments in agriculture, forest, energy and infrastructure sector (MITADER, 2016). It also reinforces and appoints conservation areas and claims that the community should use the land in a way that is compatible to conservation and tourism based on nature. By analysing the effectiveness of the implementation of REDD+ on rural livelihoods in Gilé National Reserve, implications such as diminished access to resources (including fertile land and water) and consequently, diminished household ability of producing food and cash crops, were identified. As an integral part of REDD+ in Mozambique, CSA is directly concerned with adaptation as well as mitigation of climate change in the agricultural sector. The FAO (2013) and the World Bank (2011) consider CSA a way to strengthen food security and still provide environmental benefits by increasing productivity in a sustainable way, strengthening farmers' resilience and reducing agriculture's greenhouse gas (GHG) emissions. However, the experience of implementing CSA in the Central region of Mozambique, showed a poorly and ineffectively implemented policy.

Environmental policies and projects, specifically big conservation projects, have been linked to new forms of seeking capital accumulation (Benjaminsen and Bryceson, 2012; Brockington and Duffy, 2010; Büscher et al., 2012). These scholars underline the role of neoliberal conservation issues and converging interests that sustain alliances among corporations, non-governmental organisations (NGOs) and philanthropic organisations, which result in intensified dispossession and legitimation of capital accumulation. Nevertheless, climate change narratives and concerns intensified the enforcement of a 'climate-smart world', resulting in the emergence of a carbon imperative in the global processes of accumulation. However, imposing more limits to accumulation did not stop capitalism's forces from seizing business opportunities within its own contradiction – referred to as the second contradiction of capitalism by O'Connor (1998).

Research Objective and Methods

The link and intersections of climate change policies, resource grabbing and global processes of accumulation have not yet been fully tackled. The processes through which environmental policies, as a response to climate change concerns, are facilitating, legitimating and fuelling capital accumulation are still to be explored and further understood. That said, the paper seeks to understand, under a political economy and ecology lens, the new patterns of agrarian change under these new rural dynamics and what implications there will be for the global processes of accumulation. Additionally, the role of the environmental destruction, the finiteness of nature and its implications for global dynamics of accumulation and for rural livelihoods ought to be further explored.

To that end, a combination of data collection methods was used during fieldwork conducted intermittently between 2018 and 2019 in Maputo, Ile, Pebane and Gilé Districts. Fieldwork included data collection through: (a) semi-structured interviews with stakeholders including smallholders (focus groups and individual), NGO representatives, government representatives, corporate actors, Reserve administration staff and grassroot social movements' representatives; (b) participant observation; and (c) document analysis of multiple sources: national government strategies; reports of international organisations, corporate companies, NGOs and philanthropic organisations; and socio-environmental impact assessments.

The process of primary data analysis followed Boeije's (2002) insights to conduct a purposeful approach of constant comparison. The process involved open coding, axial coding and selective coding. Through a political economy and ecology lens, these codes were ultimately used to trace processes, build storylines, identify causality and links between processes and outcomes that offered insights that answered directly to the research objective.

From Political Economy to Political Ecology: Accumulation, Nature and State

Primitive accumulation and accumulation by expanded reproduction

In *Capital*, Marx (1889) critically analyses the development of capitalism in England during the Industrial Revolution and his insights point out that primitive accumulation was the starting point of the capitalist mode of production and "is nothing else than the historical process of divorcing the producer from the means of production" (Marx, 1889: 738). For Marx, the process of dispossession and expropriation of an agricultural population from the land is seen as a necessary condition for proletarianization, as long as the processes of industrialisation absorb the population that is "free" of land, in other words, that they are not reduced to what he calls "relative surplus population" (Marx, 1889).

In this context, Shivji (2009) identifies two tendencies of capital accumulation that are still unfolding and co-exist: (a) primitive accumulation, which is the one that occurs when there is appropriation of values from outside the capitalist production process by extra economic force; and (b) accumulation by expanded reproduction, that is, the accumulation of surplus value produced in the process of production by economic means. Shivji (1987) explored the degree of exploitation of the peasantry, which he classifies as very high, because the appropriation of surplus is not only through labour ("low rate of surplus labour"), but also through the appropriation of their necessary consumption ("high degree of exploitation") through super-human labour and sub-human existence: inadequate and coarse diet, precarious or inexistent education and health care and putting their whole family to work in the service of capitalism.

Nature and accumulation

With the emergence of the environmental concerns in the late 1980s and the current climate crisis in the 2000s, many advances were made to this day in Marxist critical agrarian studies, related to capital accumulation, the agrarian question and nature, and environmental issues (Amin, 2012; Borras and Franco, 2018; Fairhead et al., 2012; Moyo et al., 2012; O'Connor, 1998). Fairhead et al., (2012) engage in the discussion of the emerging appropriation of nature, "green grabbing" – the appropriation of land and resources for environmental ends. The implications of this type of resource grabbing involve the prevention of livelihood practice and resource uses and restructuring of labour relations (Fairhead et al., 2012; Seagle, 2012).

Looking specifically to climate change politics, Borras and Franco (2018: 1319) analyse the implications for land politics and observe the emergence of what they call "climate-smart land politics" which consists of the combined processes of incorporating the twin objectives of purportedly combatting inefficient and destructive use of natural resources, especially on the Global South, where land control is the common denominator of these policies that can range from biofuel production, conservation, REDD+, CSA and other land-based policies. They define climate-smart land politics as the "neoliberal land politics sensitised to the recent corporate rediscovery of agriculture and market-based climate change mitigation/adaptation initiatives" (Borras and Franco, 2018: 1319), ultimately seeking or resulting in the intensification of capital accumulation.

A much more focused discussion in relation to nature/environment and its connection with accumulation has been done using distinct, and in a way, complementary approaches. Building on Marx's "metabolic rift", Foster et al. (2010: 18) centre planetary boundaries in the debate, and put forward the notion of "global ecological rift" that they defined as the "overall break in human relation to nature arising from an alienated system of capital accumulation without end". These scholars raise the notion of converting ecological values into economic values and potentially threatening future generations' well-being (Foster et al., 2009).

Taking a different perspective, focusing on capital accumulation and environmental degradation, O'Connor (1998) suggests a fusion between ecology and Marxism and deeply explores humankind's interactions with nature and introduces the second contradiction of capitalism. According to him, Marx did not pay sufficient attention to energy and its determining role in capitalist production, hence, degradation of the environment, undermining its own ability to accumulate, as "nature is a point of departure for capital but typically not a point of return" (O'Connor, 1998: 185).

Nevertheless, Moore (2011) criticises O'Connor's theory, stating that it does not consider natural scarcity as the prime mover. Interestingly, Arsel (2019: 10) points out a problematic aspect of the second contradiction of capitalism that relies on "its failure to anticipate that capital (with the assistance of the state) could convert its own crisis into a new accumulation strategy". In sum, political ecologists offer useful theoretical frameworks to look at such problematiques. For instance, Robbins (2012) suggests that such lens would be useful to assess the constraints of these policies, focusing not only on the role of the state, but also on how these policies do not challenge the regime of accumulation that indeed caused the current environmental crisis.

The role of the state

Both political economy and political ecology overlap in terms of having to address the role of the state and its two basic, and often contradictory, functions – accumulation and legitimation (O'Connor, 1998). Fox (1993) presents a more interactive view of the state's action, not as society-centred as O'Connor's as he claims, but in a way that both society and the intrinsic structure and actors of the state itself, interactively shape and determine state actions. So, according to Fox (1993), in a continuum interactive process and varying degrees, the state's autonomy (ability to set their own goals) and capacity (ability to effectively carry out those goals) are essential factors that determine how the state exercises its power. Fox (1993) underlines the essential role of capitalists and their investments in the state's ability to function.

Nevertheless, in non-Western-centric and more aid-dependent contexts such as Mozambique, external actors (e.g. Bretton Woods Institutions which impose their economic, financial and fiscal guidelines) and international organisations (health, education and more recently environmental which are pursuing their interests in a global scale) play a fundamental role in how the state's action unfolds. The state must be able to accommodate current demands of these two sets of actors that jointly are highly essential to its functioning and economic sufficiency.

Climate Change Policy in Mozambique: REDD+ and CSA

Climate change policy and land

The IPCC (2007) report states that Africa is the most vulnerable continent regarding climate change and that by 2050, millions of Africans (350 to 600 million) will be at risk. In Mozambique, a huge concern relates to the ability of the rural population to secure food production and availability in the context of rain-fed systems of production. Because of changes in rainfall and in the temperature, it is expected that the production of rural staple food crops such as maize, peanuts, cassava and sorghum will drop considerably (Brito and Holman, 2012; Joala et al., 2019). So, a call for a "climate-smart" world is put forward by the World Bank, in other words, the so-called climate-smart policies should be implemented: "those that enhance development, reduce vulnerability, and finance the transition to low-carbon growth paths" (World Bank, 2010: xx).

Mainstream institutions (World Bank, Food and Agriculture Organization (FAO), United Nations (UN), International Panel of Climate Change (IPCC)) claim that climate vulnerability in African countries calls for urgent measures to mitigate and adapt. Consequently, increased levels of aid and funds are directed to biodiversity-rich countries. These measures mostly involve integrated land-based projects to lower emissions but most importantly to sequestrate carbon. These measures are in line with the IPCC (2019) land-based solutions to climate change.

Following the guidelines of main funders and donors, in 2012, the Mozambican Government approved the National Strategy for Climate Change Adaptation and Mitigation for the period 2013–2025 with the vision, "Prosperous and climate change resilient Mozambique, with green economy in all social and economic sectors" MITADER (2017). So, environmentally friendly policies are prioritised over what is generally assumed 'high GHG emission agricultural practices' by smallholders. This, despite the fact that Mozambique's CO_2 emissions per capita are among the lowest in the world and in sub-Saharan Africa – around 0.1 metric tons against

the average of 0.7 of sub-Saharan Africa, 0.8 of low income countries and 3.5 of middle-income countries (World Bank, 2008).

The Government of Mozambique received around USD 8.8 million just to prepare the National Strategy of REDD+ and legal/administrative instruments to operationalise it (MITADER, 2017). The Mozambican REDD+ National Strategy aims to reduce emissions and increase carbon reserves by focusing on three main sectors: agriculture, forest, and energy, (MITADER, 2016). Among other goals, it aims *to enforce sustainable agricultural practices* among small scale producers, promote alternative energy use, *strengthen conservation* and enforce sustainable forest management including *creating a favourable operational environment for forest plantation companies* (MITADER, 2016; 2017).

The Gorongosa National Park Buffering Zone was one of the first targets of such policies. Many studies were conducted to grasp the impacts of REDD+ projects in poverty alleviation and livelihoods in the region. This project consists of carbon sequestration by reforestation (planting trees) and 'community development' (such as the implementation of microenterprises and promoting sustainable cash crops) through the Payment for Environmental Services scheme (Groom and Palmer, 2012; Jindal et al., 2012). The results indicated that development activities unrelated to carbon sequestration, such as getting employed in those microenterprises, had a much bigger impact on poverty alleviation, but just for a minor share of households. For this paper, two variants of mitigation/adaptation projects are brought to attention: (a) REDD+ and the Gilé National Reserve; and (b) the forest plantations area by the Portuguese company, Portucel Moçambique.

The Gilé National Reserve: REDD+ and CSA

After the launch of the World Bank's Forest Carbon Partnership Facility (FCPF) in 2008, 47 developing countries joined this global partnership of governments, businesses, civil society, and indigenous people's organisations, whose main goal, among others, is reducing emissions and stocking carbon through conservation, commonly referred to as REDD+, funded by 17 donors that have made contributions and commitments totalling $1.3 billion.[2] Under this partnership, the first conservation area to be appointed in Mozambique was the Gilé National Reserve.

Previously established as a hunting area, the reserve is located in the centre of Mozambique in Zambézia province, covering an area of 2.860 km^2 in the districts of Pebane and Gilé and its buffering zone (BZ) is the residence place of fourteen communities. The area was identified as one of the first target areas for the implementation of the REDD+ programme in Mozambique, as part of the Mozambique Forest Investment Project (MozFIP), supported by the World Bank. As an integrated landscape management project MozFIP combines funds of multiple funders to put into practice REDD+'s activities.

In Zambézia province, the Gilé National Reserve is a target to maintain biodiversity levels and sequestrate carbon, a true sink. The World Bank funded (USD46 million) two conservation areas that were earmarked to be part of REDD+, including Gilé, with the aim of financing conservation, rural development (promote environmentally friendly rural livelihoods through sustainable resource management) and tourism based on nature (MITADER, 2016).

[2] See https://www.forestcarbonpartnership.org/about (Accessed 11 June 2020).

Identified as a high rural poverty area, the Gilé National Reserve has been the source of livelihoods for the households living in the neighbouring areas – the reserve's buffering zone. Reports from the Ministry of Land and Rural Development ensure that local public consultations are conducted in order to inform the inhabitants of the role of the different actors and to establish mechanisms to ensure conservation and protection of the targeted area. Although the National REDD+ strategy claimed to be implemented through a participatory process (MITADER, 2016), this has not been confirmed on the ground. On the contrary, as a smallholder stated:

> We heard they were going to close the reserve. Sometimes a team would come and warn us that this reserve is going to close and this is the buffering zone. We got to know that we can't enter because of these teams.

The lack of participation and consultation is evident from how respondents expressed their knowledge about the proposed goal, ownership and the financial and ecological benefits of the reserve at a global scale. Additionally, intimidation and coercive forces seemed to be the essence of the implementation of such projects:

> Well, there was a meeting, a warning that no one can enter the reserve anymore; there would be a team forbidding any entrance. It is closed. No one can enter the reserve. It has an owner, and now the reserve is being controlled. It's already been bought. It belongs to the whites. Uh. We accept it, because they came with a team, inspectors and "troops" (interview with smallholder, Pebane).

Many smallholders claim that this policy was imposed by the government regardless of their opinion. Smallholders were informed, in a top-down manner, that they would no longer be allowed to use the reserve's resources, that they should change their production techniques in order to protect the biodiversity of the reserve. In return, both the Reserve Administration and an NGO would design and implement 'community development projects'.

So, 'community development' projects are taking place in order to 'compensate' for the loss of forest resources, including: (a) training of 14 groups (one per community) aimed at the implementation of sustainable agricultural techniques and their commercialisation following the climate-smart agriculture techniques; (b) distribution of agricultural inputs and livestock; (3) environmental education; and (c) promotion of value chains based on sustainable use of forest resources: mushrooms, honey, charcoal, cashew nuts, and so forth. These projects are implemented by the MozFIP (Gilé National Reserve) and by an NGO which is responsible for the implementation of CSA. Nevertheless, these initiatives are far from compensating the loss that rural households suffered:

> I am alone with my wife [working at the farm]. I don't have the possibility to hire someone, because when you hire someone, you should pay. Only there [Reserve] we could get *caril* [meat/protein]. The men would go in there, and hunt animals – gazelle, rats, and also fish, because there are rivers that have a lot of fish. Now we can't. Now we have to buy fish; before I didn't buy any; many of us did not buy [fish] (interview with beneficiary smallholder, Pebane)

In this context, Fusari and Carpaneto (2006) conducted a study and concluded that hunting is an important livelihood strategy of the local inhabitants and represents the major source of animal protein supply. Additionally, they concluded that,

> … a mere increase of crop production in the study area (pursued by many conservation projects as a strategy to diminish the impact of subsistence hunting) would not produce an effective decrease of bushmeat exploitation (Fusari and Carpaneto, 2006: 2493).

This major source of animal protein was not, by any chance, compensated by those projects. Additionally, those 'community development' projects did not cover the entire population living in the BZ. But even the few who 'benefitted' from it, still struggle to maintain their livelihoods.

Many argue that REDD+'s projects and related policy programmes have the potential to reinforce existing inequities and social exclusions (Corbera, 2012; Hunsberger et al., 2017; Phelps et al., 2010). Regarding rural livelihoods implications, Hunsberger et al. (2017) summarise the risks in REDD+'s design and implementation, as including the disregard of rural communities' views, local communities losing access to and use of forest resources and potential deepening of existing inequalities. The scenario becomes even worse for the ones who are not eligible for those 'community development' projects:

> We don't go inside the reserve anymore, but we don't see the benefit in doing so. Because they don't keep their promises. Those who were selected by COSV [NGO] see the benefits. While we who are outside COSV, no benefits that we have. The ones outside COSV receive nothing in exchange (interview with non-beneficiary smallholder, Pebane).

Smallholders living in the BZ of the reserve experienced both resource grabbing and dispossession, facilitated by the promise of receiving agricultural inputs and technical assistance (in other words, CSA), which were the main aspects of the 'community development' projects. So, besides CSA being used as a tool to facilitate the process of resource grabbing, it became a mechanism through which land control was transferred from smallholders to external actors. In other words, this case of land grabbing does not involve the direct expulsion of people from their land, but they lose control over the resources, including the way they use their own land – which is forced to be 'sustainable' according to the guidelines set by international institutions.

Portucel Moçambique: Forest plantations, REDD+ and CSA

We have seen a global rise in the promotion of forest plantations as part of a climate change mitigation strategy, particularly designed to sequestrate carbon, which however is ultimately linked with the intensification of dispossession and land grabbing (Scheidel and Work, 2018). Also, these processes result in multiple directions land use change that signifies loss of land control from smallholders (Xu, 2019). The Mozambican national strategy of reforestation foresees the intensification of tree plantations as a synergistic way to respond to REDD+'s demands and stimulate economic growth. It was in this regard, that Portucel Moçambique, one of the largest Megaprojects in Mozambique and the largest in the agricultural sector, acquired over 350,000 hectares in Mozambique. The World Bank is both an investor (through the World Bank branch International Finance Corporation that holds 20% of shares – USD30 million) and also a technical advisor of the project.

In Zambézia province, the company operationalised its activities in two districts, Ile and Namarroi, in a total of 173,327 hectares, predicting the planting of approximately 120,000 hectares of eucalyptus trees. Portucel's land occupation model does not comply with the

Mozambican Land Law, which enforces identification and resettlement of any household that went through expropriation of land.

Following an agreement with the Council of Ministers, the company's model of land occupation does not involve resettlement. Instead of resettling rural households, the company would ensure that each household would retain 2.9 hectares for their own subsistence. Additionally, in exchange for transferring their land, the households would 'benefit' from agricultural inputs and technical assistance to produce more sustainably, following the CSA principles. In this regard, the company is working with NGOs as a way to provide extension services that are claimed to be aligned with agroecology principles. All of this is part of the seven years and USD40 million plan, the so-called Portucel's Sustainable Development Plan (PDSP – *Plano de Desenvolvimento Sustentável da Portucel*) that aims to: (a) improve rural livelihoods though sustainable mechanisms; (b) develop economic growth opportunities; and (c) improve the quality of life.

Additionally, they promised the creation of around 7,500 jobs – both rural and urban. Most interviewees claimed to have transferred land for the company expecting to get permanent employment, or a fixed source of income and agricultural inputs. The company was not able to provide enough permanent employment for the huge number of households that were dispossessed. The company was not even able to provide seasonal employment for the surplus population that was created during the process of land expropriation. This investment did not absorb the same proportion of free labour that it generated, instead, it created a massive rural surplus population that was left with diminished or no land.

To make matters worse, the few who got the opportunity to be employed, claimed to be badly paid for the burden of work. After years of working for the company, workers still struggle to improve their livelihoods and still consider farming (done mostly by women) as the primary provider of household food needs. After working for the company for seven years, a plantation worker said that he was not able to achieve substantial improvement in his life, claiming that the salary was enough "just to survive" while his wife worked on the farm to provide food for the household.

It is important to highlight the discourse of CSA being a way of 'compensating' rural households for the loss of land incurred and directly supporting law deviation. It was by designing a PDSP (including the CSA) and presenting an environmentally/climate friendly investment project, backed by the World Bank, that the company was supported by the state and got a green light even with a land occupation model that contradicts the Mozambican Land Law.

In the end, Portucel Moçambique accessed cheap land, cheap labour and gained control over smallholders' production systems. Besides being ineffectively and poorly implemented, the PDSP did not compensate people for the household's loss of resources and land. Overall, the implementation of the claim to be based on 'sustainable agricultural practices' in the form of CSA was a way to legitimise the process of expropriation of land (primitive accumulation) and further facilitate accumulation by expanded reproduction by the company releasing resources at very low costs (land and labour). These processes were supported by the state for two main reasons: first, because Portucel did not comply with the national regulations regarding land occupation; second, because no action from the state was put in place in order to prioritise households' needs and interests even when the national legislation protected them.

Primitive Accumulation and Accumulation by Expanded Reproduction in a Carbon Imperative

REDD+, CSA and accumulation

Climate change is the unfolding of the second contradiction of capitalism put forward by O'Connor (1998) and the evidence that the impediments of this contradiction are sources of new forms of accumulation, as stated by Brockington and Duffy (2010) or even the proof that capitalism is able to convert its own crisis into new accumulation strategies (Arsel, 2019). But, in which ways do these strategies and new forms of accumulation unfold on the ground? Besides the explicit cases of implementing tourism based in nature investments in conservation areas or investing in agri-businesses aiming at the production of biofuel (anchored in the environmentally friendly discourse of alternative energy sources), a whole new space and possibilities of accumulation arise as capitalism co-opts climate change policies.

Based on the two study sites analysed throughout this paper, REDD+ and CSA are being implemented in an integrated way and promoted by the same group of institutions. Both projects rely on guidelines of CSA to 'compensate' people for the loss of forest resources and land. Critiques and questionable agendas are put forward regarding CSA and its 'triple-win objectives'. For instance, Taylor (2018) points out the significant backing from the private sector and ways to strongly link farmers to markets and its implications, which ultimately do not answer to the needs of local producers.

Besides the fairness of this compensation being highly debatable, it does not even achieve the goals that were set in the first place. First, because not everyone who was directly or indirectly dispossessed, received this compensation scheme. Second, not everyone who got the compensation scheme felt that the loss of land was fully compensated. So, besides experiencing the direct impacts of climate change, rural livelihoods are also being jeopardised by the implementation of policies and schemes to address climate change, especially regarding food security.

When asked about her worries regarding the implications of the forest plantations, a head of a household in Ile district replied: "I don't have food. I don't understand why it does not grow next to it [eucalyptus plantation]. Not cassava, not beans, nothing grows!" After almost all her land was transferred to the company and currently having a full eucalyptus plantation next to her house, she said: "Life got worse. Before, we were able to produce food. Now, we can't even get money".

On the other hand, the REDD+ policy aims to reduce emissions and sequestrate carbon. But at what cost? And for whose economic benefit? As we know, carbon (emissions and sequestration) is at the core of the global environmental crisis and related policy enforcement. The World Bank's marketing for carbon sequestration relies on showing potential revenues that biodiversity-rich countries would have. It stated that by assuming a price of $10 a tonne, African countries' revenue from carbon sequestration would be as high as Africa's development assistance (World Bank, 2010b).

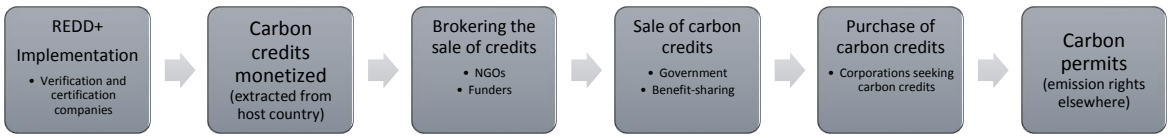
On the one hand, there is the demand for carbon rights from industrialised (or semi-industrialised) development poles and, on the other hand, the existence of a potential carbon supplier, particularly in the Global South, induces carbon transactions; consequently, the 'carbon market' is born and carbon has become a commodity. Descheneau (2012: 604) states that "the tonne of carbon is first invented and abstracted, secondly it is monetised into

something sellable, and thirdly it is financialised, transformed into a financial standardised product".

MacKenzie (2009) carried out a thorough analysis of carbon markets, stating that the goal of carbon markets is to give a price to emissions, which can be purchased or earned. This implies that a credit earned somewhere in the Global South can be transformed into a permit to emit in the Global North. The emergence of carbon markets has sparked debates in the technocrat arena regarding the processes and conditions in which they were created and established, the role of institutions, investors and banks, but also in terms of its efficiency, but little around the social justice dimension. Other scholars (Descheneau, 2012; Paterson and Stripple, 2012; Stephan, 2012; Stephan and Paterson, 2012) tried to get a grasp of the political and social dimension of carbon markets, the practices and mechanisms, but their analysis lacks a further push on the politics of climate change within a historical and political economy framework within the global dynamics of accumulation.

Investment in the sequestration of carbon constitutes a rather convenient solution because it can be less expensive than actually reducing fossil fuel emissions or paying carbon taxes (MacKenzie, 2009; Tienhaara, 2012). Nevertheless, the burden is directly transferred to the rural poor who are being expropriated of their right to emit ('carbon permits'). Based on the implementation of REDD+, particularly focusing in the Gilé National Reserve case, a tentative representation of a carbon commodity chain is put presented in Figure 1 below.

Figure 1: Carbon commodity chain – expropriation of emission rights



Source: Author.

Table 1: Gilé National Reserve commodity chain actors

Phase	Stakeholders	Role/objective
Implementation	IGF (International Foundation for the Conservation of Wildlife)	Technical and financial support to the establishment and functioning of the Reserve Administration – it is effectively part of the Reserve Administration.
	FFEM/AFD (*Fond Français Pour L'Environnement Mondial/Agence Française de Developpement*)	Financing REDD+ project in the Reserve: REDD+ certification, pilot activities for community development and reserve management.
	COSV	Italian NGO aiming to implement community development projects.

	Government	Represented by various national public institutions such as the Reserve Administration, FNDS, MITADER, MASA, ANAC.
	MozFIP/BIOFUND	The World Bank-funded projects aiming to support functioning of the Reserve Administration and the REDD+ project.
	Private sector service suppliers	Biotope (French company selected by FFEM/AFD to evaluate the project); EcoCert (Certification company aimed to do the off-set carbon valuation process); and more.
Brokering	Etc Terra	Responsible for brokering the credits susceptible of receiving a brokerage fee in return.
	AFD - FFEM	Support Etc Terra in finding potential buyers through its network of private companies.
Sale and benefit sharing	FNDS/Government	Although the brokering is made by Etc Terra, the sale should be made by the Government to avoid fiscal obligations and guarantee a higher benefit.
	Etc Terra and IGF	Recommend benefit-sharing of carbon revenues among Government, Reserve Administration and rural households.
	Reserve Administration	Share benefits guaranteeing the priority of maintaining the functioning of the reserve; provide community support, particularly through implementing conservation agriculture.

Source: Author – based on stakeholder's report review and empirical data.

After almost a decade since the REDD+ was initiated, rural households have not yet received the benefits of the sale of carbon credits. Some have only received insufficient trade-offs that do not compensate for the loss of forest resources, as it was explained previously. Even though carbon sales are expected to be shared with the community, according to the FFEM (2017) Report, the most appropriate manner to share the benefits would be to distribute them in the following manner: (a) 20% for the Central Government; (b) 64% for the Reserve Administration and (c) 16% for community support in implementing conservation agriculture. In other words, the carbon sales share for rural households is meant to make sure that they are farming by following CSA principles, ultimately in order to protect the biodiversity of the reserve, but, not at all aiming at improving their livelihoods nor compensating them for the loss

of forest resources. According to a head of a household who resides in the buffer zone of the reserve:

> Before, many benefitted from the reserve. Sometimes wood, mushrooms. So as soon as they closed, "Hey, we're sorry." We have no benefit to live here in the buffer zone. In the past we benefitted from there [reserve], but now there is no benefit. We accept that yes, we cannot go to the reserve. We will stay here in the buffer zone. So, lately a person leaving here to go cut a stick and boil it for the construction of his house, is caught and is beaten. We cannot take medication from there to benefit our bodies. Now, we feed on vegetables only: beans, sweet potatoes ...

By cutting into the necessary consumption of these households and by expropriating their right of emission, a new commodity was created and placed into global markets. This not only constitutes an accumulation opportunity for many actors throughout the carbon value chain, but also presents an opportunity to fossil fuel capitalists elsewhere to guarantee their operationalisation and maintain their patterns of accumulation by expanded reproduction. It is evident that carbon markets create new vehicles and opportunities of accumulation by, first, opening up channels to intensify global fossil-fuels-based accumulation processes at the cost of rural populations' livelihoods. Second, these markets build up entire value chains (from investors, banks, to certification institutions to the buyers) and economic processes in which intermediaries and many actors accumulate.

Accumulation in a carbon imperative: The green frontier of accumulation

The links between nature and capitalism call for greater understanding of the dynamics of accumulation amidst environmental degradation and planetary boundaries. Brockington and Duffy (2010) analyse the link between conservation and capitalism, underlining the role of alliances between NGOs, philanthropic organisations and the corporate sector and show how conservation is seen as a business opportunity and an instrument to capitalism's growth and reproduction.
Also regarding conservation, Benjaminsen and Bryceson (2012) identified three groups of actors that accumulate capital in the context of big conservation projects: (a) rent-seeking officials and politicians who benefit directly from the land deals or those who own tourism facilities; (b) large transnational conservation organisations that get more and more funding through portraying 'successful' conservation projects; and (c) tourist companies (safari, hunting, accommodation, and so on). This process of capital accumulation is sustained by the loss of livelihood of the rural population who was dispossessed or those whose subsistence relied mainly on forest resources.

By focusing mainly on conservation projects, scholars have explored its link with accumulation. However, climate change and the schemes and policies to address it constitute the new priority of powerful financial institutions and international organisations. As a result, climate change narratives are shaping economic policies, legislation, aid patterns, financial assets, markets, production processes, and many more factors, enforcing the 'greenization' of the global processes of accumulation. The call for a climate-smart world resulted in the emergence of climate-smart land politics (Borras and Franco, 2018) with huge implications for global processes of accumulation, resource grabbing and rural livelihoods.

As Arsel (2019) points out, capitalism converted its own crisis into a new accumulation strategy. In fact, it went further – it designed the many mechanisms to address climate change to establish a whole new arena of possibilities of accumulation. It did this through, (a) creating

innovative factors, for example, the creation and expropriation of a new commodity – 'carbon permits' and the creation of new markets and new financial assets through primitive accumulation; and through (b) legitimizing processes of accumulation that facilitate resource grabbing, for example, using environmental discourses to further accumulate through accumulation by expanded reproduction. Both processes were accomplished with the aid of the state. Hence, a new frontier of accumulation emerged: the *green frontier of accumulation*.

Conclusion

The mainstream call for a climate-smart world has given rise to layers, convergent or not, of economic/environmental policies, schemes and mechanisms to address climate change. As a result, climate-smart land politics (Borras and Franco, 2018) is prevailing, mostly, in developing countries and is sustained by alliances among the state, corporations and external actors, such as philanthropic organisations, NGOs and financial institutions. Countries such as Mozambique became targets of green-oriented projects and investments claimed to be part of climate change mitigation and adaptation policies, including diversified land-based initiatives (e.g., REDD+, CSA, biofuel production).

These 'solutions', operationalised and sustained by these mainstream institutions, do not challenge the regime of accumulation that caused the environmental crisis in the first place (Robbins, 2012). They are, in fact, further working in favour of that same regime of accumulation that triggered and deepened the crisis. As the paper shows, climate change mitigation and adaptation policies have been co-opted by global capital and have been integrated in the global processes of accumulation with the aid of the state. In its turn, the state's position and action is a clear manifestation of its dependence on external financial resources and aid. Resultantly, the state ought to accommodate their demands that are, jointly, highly essential to its functioning and its economic sufficiency. These demands have recently become more coherently unified in relation to climate concerns and schemes aimed at solving the environmental crisis.

This is what set the stage for the constitution of the green frontier of accumulation that embraces both new forms of primitive accumulation and facilitates accumulation by expanded reproduction. This is done through the expropriation of newly-created commodities (such as 'carbon permits'), and through schemes to legitimise resource grabbing (land and forest resources); all anchored in the discourse around the achievement of global climate change goals and solving the global environmental crisis. In sum, the establishment of a new frontier of accumulation was supported by the unified and coherent discourses, policies and practices that are claimed to either be tackling the current environmental crisis or mitigating its intensification and aiming at improving adaptation of the vulnerable ones around the globe.

Overall, this new frontier of accumulation involves either changing the interaction of humans and nature, or using nature as a legitimation strategy – both with the ultimate goal of overcoming its own crisis while augmenting accumulation. All of that is integrated in the global system of accumulation through schemes and policies to address climate change, through the further exploitation of rural livelihoods. In other words, this emerging process of commodification brings along new waves of expropriation that further cuts into the necessary consumption of rural livelihoods. From now on, the future of small-holders and rural livelihoods could be highly reliant on the carbon/profit nexus of capitalism, as the "future land use depends, in part, on the desired climate outcome and the portfolio of response options deployed" (IPCC, 2019: 4).

Besides the questionability of these schemes' effectiveness in solving the crisis, they were ultimately converted into an opportunity to accumulate further, either by legitimising existing vehicles of accumulation or by the creation and marketisation of new commodities. As a result of the intrinsic exploitative nature of capitalism, this comes at the cost of specific social classes. However, it is important to clarify that environmental policies and investments that go beyond the climate change agenda, e.g., circular economy, green economy, and so on, could also be triggers, part of and/or intersect with the green frontier of accumulation. Further research is required to understand how these green projects and investments can be interlinked or build synergies among them, while shaping new forms of accumulation or generating new powerful legitimation strategies.

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