




A climate-smart world and the rise of Green Extractivism

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ABSTRACT

Climate change policies' implications for the capitalist system call for us to go beyond efficiency-driven extractivism and further analyse the outcomes of green policies. The implementation of Mozambique's climate change policy resulted in the emergence of green extractivism, a variation of extractivism that is based on the extraction, expropriation and transfer of emissions rights from rural poor, in favor of external accumulation. Emission rights are one's ability to rightfully use and benefit from ecological assets. Thus, under green extractivism, rural households are not only being deprived of resources determinant for their social reproduction, but also of their right to emit.

KEYWORDS

climate-smart policies; extractivism; REDD+; rural livelihoods; Mozambique

Introduction

From efficiency-driven asymmetric and exploitative exchange relations to green-driven extractivism

Extractive activities can be traced back to the 1500s, embedded 'into a historical perspective of "continuity and change" in the evolution of world capitalism and imperialism' (Veltmeyer 2013, 80). Efficiency-driven extractivism is one of the central strategies of imperialism, colonialism and neoliberalism's exchange relations, thus leading to accumulation. It focuses mainly on economic efficiency goals rather than environmental goals, as is the case for mining and energy extractivism and the more recently academically explored agrarian extractivism (Alonso-Fradejas 2021; Gudynas 2021; McKay 2017; Petras and Veltmeyer 2014). Historical exchange relations, based on efficiency-driven extractivism, are at the core of today's globally uneven and disproportional economic development and global division of labour (Acosta 2013; Amin 1977; Bebbington 2015; Shivji 2019).

Nowadays, the current scramble still targets African countries for the development of extractive activities (Bryceson 2002; Moyo, Yeros, and Jha 2012). Ye et al. (2020, 163) see extractivism as 'a main feature of global capitalism as a whole. More and more economic sectors are (re-)constructed in extractivist ways'. Extractive activities have been framed as an opportunity for development and poverty reduction while the real implications are left unaccounted. By following this framing, the new institutional approach to development of the national government, over the last 20 years, made Mozambique one of the most

pursued destinations for investments (mainly foreign direct investment – FDI) seeking the extraction of natural resources. Consequently, the country has become an extractive hub, feeding other regions' industrialization with energy and primary commodities, while intensifying imports of manufactured goods and food. Although rates of economic growth are a result of the high inflow of FDI (Castel-Branco 2014; Mosca 2005), the economy does not accomplish the goals of poverty reduction and broadening of the social and economic basis for development (Castel-Branco 2014). These extractive activities have, rather, become a major driver of social exclusion and negative implications for rural livelihoods.

There is a distinct feature of today's scramble and resource grabbing, brought up by the current global environmental crisis, which is vastly transforming the global economy. The green economy and climate change policies (and their implications for rural development) call for us to go beyond the agrarian question's focus on 'classes of landed property, capital and labour in the countryside' (Bernstein 2010, 301) by integrating more of a political ecology lens. Additionally, Borras et al. (2021) state that because climate change and contemporary capitalism are entwined, this relationship requires deeper analysis, particularly regarding how it is shaping the rural world. By answering these calls, this research aims to explore and strengthen, theoretically and empirically, the existing literature in critical agrarian studies in understanding the new dynamics of extractivism in the context of its intersection with climate change policies and how these emerging ecological relations unfold; and, ultimately to grasp the implications for global accumulation and rural livelihoods.

This call rests on the fact that mainstream institutions (the World Bank, the United Nations Food and Agriculture Organization [FAO], the United Nations generally, the Intergovernmental Panel for Climate Change, and so forth) promote urgent measures to mitigate and adapt to climate change, focusing mainly on controlling greenhouse gas (GHG) emissions, with direct impacts on land use and rural areas and population. To facilitate the goal of overcoming climate vulnerability and solving this urgent global matter, increased levels of aid and funds are being directed to climate projects aiming to both reduce emissions and maximize carbon sequestration (FAO 2013; IPCC 2019; The World Bank 2010a, 2010b), which constitutes the essence of enforcing a 'climate-smart world'. In other words, those institutions are promoting and financing the implementation of 'climate-smart policies', defined as 'those that enhance development, reduce vulnerability, and finance the transition to low-carbon growth paths' (The World Bank 2010a, xx). Thus, efficiency and environmental goals are the central combination of contemporary global processes of accumulation (Franco and Borras 2019).

Among many others, 'climate-smart policies' include Reducing Emissions from Deforestation and Forest Degradation (REDD+), Climate-Smart Agriculture (CSA) and promotion of 'green' investments such as tree plantations, biofuel production and renewable energy. This paper focuses mainly on the implementation of REDD+ and CSA. CSA is considered, by both the World Bank and FAO, to be one of the essential tools for achieving sustainable development; the FAO claims that 'CSA meets these expectations by improving productivity, enhancing resilience and reducing GHG emissions' (FAO 2013, 357). In line with FAO's concept, The World Bank (2011) considers CSA a way to strengthen food security and provide environmental benefits. CSA in Mozambique is actually implemented under the umbrella of REDD+, the main national policy for climate change mitigation and adaptation. The Mozambican REDD+ national strategy

aims 'to reduce emissions from deforestation and forest degradation, forest conservation, sustainable management and increase of carbon reserves through planted forests' (MITADER 2016, 41) by focusing on three main sectors: agriculture, forest and energy. It is within the scope of these two policies that this paper aims to understand the intersections between extractivism and climate change policies.

Methods and theoretical framework

This study aims to answer the question 'How does the intersection of extractivism and green policies shape resource grabbing and what are the implications for accumulation and rural livelihoods?' To answer the research question, it is important to start with a consolidation of the existing literature on extractivism to further understand the different ways in which it manifests on the ground. Based on that, we can understand how this intersection (extractivism and green policies) is positioned within the consolidated framework.

Fieldwork was conducted intermittently between 2015 and 2019, through qualitative methods including participant observation, document analysis, more than 80 semi-structured interviews (households, non-governmental organization [NGO] representatives, local government officials, reserve administration staff and representatives of grassroots social movements) and focus groups discussions (with expropriated households and rural workers). Primary data was analysed against the background of secondary data at the national level, including quantitative macroeconomic indicators to further understand the structure and performance of an extractive economy. Qualitative data was analysed through a purposeful approach of constant comparison (Boeije 2002), based on a process of open, axial and selective coding, to be able to trace processes, build storylines, and identify causality and links between processes and outcomes.

The theoretical framework combines concepts from political economy and ecology; land and resource grabbing (Borras and Franco 2013; Hall et al. 2015; White et al. 2012; Zoomers 2010); extractivism(s) and appropriation of nature (Acosta 2013; Arsel and Büscher 2012; Fairhead, Leach, and Scoones 2012; Gudynas 2021); the role of nature in wealth production (Bunker 1984); uneven relations between peripheries and centres that feed globally uneven development, and their implications for rural livelihoods and the agrarian question (Amin 2012; Bernstein 2010; Shivji 2019); the second contradiction of capitalism and ecological crisis (Moore 2017; O'Connor 1998); and the ability of capitalism to convert its own crisis into a new accumulation strategy (Arsel 2019). It also explores more recent literature on green extractivism as complementary inputs to the current analysis (Bruna 2021; Dunlap and Brock 2021; Voskoboynik and Andreucci 2021). It is important to underline that political ecology offers adequate analytical tools to explore biophysical issues and injustices within ecological exchange relations by shedding light on the importance of ecological assets both to local reproduction and national reproduction. These frameworks allow the further understanding of the regional and global flows of what is being extracted/appropriated and the local implications for social reproduction as a result of ecological loss.

Intersection of extractivism and green policies

By analysing the intersection of extractivism and green policies, through the experience of Mozambique, this study shows that green policies imply, beyond resource grabbing, the

expropriation of emission rights from rural poor. Emission rights, particularly in the case of rural households, are the ability to rightfully use and benefit from ecological assets. Examples include using and benefiting from forest resources for one's livelihood, practising agriculture without imposed restrictions, and so on. By using the extractivism framework, one is able to grasp how emission rights are expropriated, transformed into carbon permits and transferred in favour of external accumulation (accumulation based on selling carbon permits or even by using them). This gives rise to a new variation of extractivism that I propose to call 'green extractivism', which serves as a handy analytical tool in today's focus on reducing emissions or compensating for emissions (the era of 'emissions imperative'). Green extractivism arises as an innovative way in which capitalist production, reproduction, consumption and accumulation unfolds.

By exploring green extractivism, further steps into the theoretical and empirical understanding of extractivism are taken. The first is in terms of tackling the differentiated processes in which extractivism unfolds as a function of nature appropriation and labour exploitation, which I call 'variations of extractivism'. The second is in terms of further understanding how accumulation is realized throughout the commodity circuit (from extraction to consumption) and the implications for the host country in terms of economic production and development. And, third, it allows the tackling of 'invisible' or 'intangible' key resources (emission rights) that are actually expropriated from the rural poor, which undermines social reproduction and places an additional burden on the working people, especially rural women. This is carried out through the analysis of three study sites that provide empirical data to tackle different variations of extractivism: (1) mining extractivism in the case of the South African company SASOL and natural gas extraction in Southern Mozambique; (2) agrarian extractivism based on the case of Portucel Moçambique and its eucalyptus tree plantation project; and (3) green extractivism in the case of the Gilé National Reserve and a combination of REDD+ and CSA implementation.

Towards a consolidated theoretical framework for extractivism

Extractivism's theoretical foundations

Classic theories (Ricardo 1919; Smith 1976) underline the importance of extractive activities and their role in nations' wealth creation, failing to address the unwanted economic and social implications for the host countries as well as the unbalanced distribution of gains and losses within processes of exchange of commodities among regions. On the other side, resource curse theorists (Auty 1995; Badeeb, Lean, and Clark 2017; di John 2011) are too centred in the resources and the implications for the host country, 'blaming' mostly the abundance of resources for the negative macro and micro implications. However, they miss the inherent flaws and injustices within the capitalist system itself and how accumulation is realized through asymmetric exchange relations.

Development studies and Marxist scholars have been profoundly researching and exploring the causes of poverty and underdevelopment, but generally missing important issues regarding nature appropriation (ecological exchange relations), the role of raw material in the creation of surplus and the ecological implications of such processes. As useful as these theories are, most of them are still leaning towards western and Eurocentric economic and social dynamics. Dependency theory arises as a crucial tool for

understanding power relations and capitalism in a globalized world and its implications regarding the underdevelopment of peripheries (Amin 1977; Frank 1970; Furtado 1964). To answer to those gaps in this set of conceptual frameworks, the extractivism framework aims to look at the roots of underdevelopment in a context of global relations of exchange of commodities, centring not only labour exploitation but also nature appropriation. This framework interconnects global flows and circuits of commodities with local implications – especially as an attempt to grasp the economic, social and ecological framing of extractive economies to hold the relevant parties accountable for the costs incurred and to better understand the development paths of the countries involved.

Without explicitly calling it ‘extractivism’, Bunker (1984) underlined the differences between extractive economies and productive economies. He argued that extractive activities would have adverse implications for the economy and on the ‘the subsequent developmental potential of the affected regions’ (1017). For Bunker (1984), theories (growth, development, labour and so on) based on experiences of productive economies will not accurately explain the dynamics and development path of extractive economies ‘because the exploitation of natural resources uses and destroys values which cannot be calculated in terms of labor or capital’ (Bunker 1984, 1019). This is at the core of extractivism as a theoretical framework. It goes beyond ‘blaming’ the abundance of resources; it tackles the process, terms and conditions, proceedings and power relations through which actors extract, drain and exchange natural resources based in an uneven process of wealth creation and distribution.

Extractivism as a theoretical framework

Extractivism is not only about what is taken, nor what is left, but is, in the same proportion, about what was lost and can’t be recovered – loss of the ability for social reproduction along with the perpetuation of underdevelopment.

Extractivism or extractivism(s) and even global extractivism(s) (highly debated on the The Global Extractivisms and Alternatives Initiative (EXALT) initiative – Helsinki University) are conceptual frameworks that are being studied and debated across disciplines. Heterodox economists, political economists, political ecologists, geographers, anthropologists and so on have been profoundly discussing the theoretical and empirical foundations of extractivisms. For this paper and for research in general, extractivism will be further explored in a context of production, accumulation and appropriation of nature.

The term ‘extractivism’ became highly debated by many scholars in the Latin America context. Acosta (2013) understands it as a ‘mode of accumulation’ based on the removal of natural resources for export, whereas Gudynas (2021) describe it as ‘different ways of organizing the appropriation of natural resources (such as matter, energy or ecological processes) to serve human purposes in their social and environmental contexts’ (Gudynas 2021). Petras and Veltmeyer (2014, 252) define extractivism as ‘the appropriation of large volumes of natural resources’ aiming to be ‘exported as raw materials to global markets’, including the exploitative relation of waged labour.

Ye et al. (2020) revived the theoretical grounds of extractivism, without explicitly challenging labour theory. They focus their argument mainly on control over resources, flows and networks of commodities, without developing productive forces (Ye et al. 2020). So, in the context of a globalized economy, flows of commodities to and from extractive

cores, and to and from productive cores, are 'big businesses' involving multiple channels of accumulation throughout the whole value chain until it reaches the final consumer. Big shipping, freight, logistics and transport companies accumulate throughout this process that are part of the scheme of extracting, transferring and exchanging raw materials. In this context, Andrade (2022, 2) underlines the fact that extractivism is a phenomenon that is 'constituted and simultaneously conditioned within the totality of the social organization of production and the dynamics of capital accumulation, social, and power relations at the country level'.

Extractive cores are ecologically exploited, economically structured and socially organized to accommodate extraction and draining of commodities. Peripheries such as Mozambique ought to become extractive economies with strategic circuits to drain commodities to international markets with underdeveloped productive forces. Public financial and social resources are transferred from priority sectors such as agriculture to the extractive sector and infrastructures. This confirms a particular insight of Bunker (1984), who underlines how these dynamics of extractivism shaped class structures, environments, organization of labour, systems of property, states, and many other economic and social framings of extractive hubs.

Economic dependence, deterioration of social conditions, income concentration, unequal distribution of extractivism's benefits, displacement of local population with negative implications for livelihoods, resource (land) dispossession and concentration, and marginalization of local or national priorities are amongst the most commonly identified and explored ills of extractive capital (Acosta 2013; Arsel 2012; Arsel, Hogenboom, and Pellegrini 2016; Gudynas 2010; North and Grinspun 2016; Nygren, Kröger, and Gill 2022; Petras and Veltmeyer 2014).

Other scholars underline the ecological implications of such modes of operation: degradation of the environment and the habitat of indigenous and peasant communities, pollution of water, global climate change, depletion of the soil, deforestation, decline of biodiversity and so on (Arsel 2012; Bunker 1984; Burchardt and Dietz 2014; Dunlap and Brock 2021; Petras and Veltmeyer 2014). On top of that, all extractive economies have one thing in common, the 'enclave logic': the lack of connections in their economic structures and the concentration of economic and productive forces in a few primary commodities and their respective economic sectors, which intensifies the vulnerability of the economy to global markets (Acosta 2013; Castel-Branco 2014), thus reproducing underdevelopment.

Recent theoretical contributions provide further understanding of extractivism – as an overextension of natural resource exploitation in which uneven access to resources and the differentiated distribution of its benefits and burdens are verified (Nygren, Kröger, and Gill 2022). On the other hand, financialization emerges as an important issue to be incorporated in the extractivism debates, as it is understood to be crucial to the creation of new frontiers of exploitation and appropriation and the production of extractive space (de los Reyes 2022). Higher costs, usually left unaccounted, such as disruption of social and economic organization, productive forces and ecological degradation, are left to extractive cores. This research aims to underline and tackle the ecological relations, giving higher importance to ecological assets and their role in current dynamics of accumulation and as determinants of rural livelihoods.

The emergence of green extractivism: greenization of extraction versus extracting emission rights

In the context of enforcing a climate-smart world and with the emergence of the green economy, many scholars are paying attention to and exploring different mechanisms through which capitalism is responding and extractivism is unfolding. This started a hype in academic work relating extraction and green economy, or resource extraction and climate change, as well as the intensification of renewable energy and conservation projects around the world. Many scholars aim to answer the question of what the greening of the economy and productive forces means in terms of effectively fighting climate change, but also what the social, economic and environmental implications are of the so called 'greener' alternatives. Some of these dynamics and processes have been referred to as 'green extractivism', with all the implied differences in meaning, description or analytical power. Some authors use the term Dunlap and Brock 2021; Kingsbury 2021; Verweijen and Dunlap 2021); other use 'greening' extractivism (Voskoboynik and Andreucci 2021) or even 'plant extractivism' (Homma 2012) and 'eco-extractivism' (Núñez et al. 2020).

These debates put forward relevant insights and analytical issues that need to be followed up on. For instance, Homma (2012) analysed the case of the Brazilian Amazon and the dynamics of extractivism in the region and brought up the idea of 'plant extractivism', basically to refer to the process of extraction of forest resources (with the exception of timber logs). However, in more recent debates, scholars have explored how the emergence of green economy induced the greenization of extraction. Brock and Dunlap (2018) came up with the notion of counterinsurgency, which involves different corporate mechanisms to legitimize the extraction of fossil fuels, particularly coal, mainly in response to activist resistance movements. These mechanisms included 'hard' and 'soft' approaches – in other words, repression, political violence and military force on one side and widening corporate social responsibility and green initiatives on the other side – to persuade the public that resistance is pointless, but also to legitimize their extraction operations (Dunlap 2018a; Dunlap and Brock 2021).

The same approach has been used to analyse the intensification of renewable energy production in the name of mitigating climate change. Dunlap (2018a) focuses on wind energy development and explores how hard and soft counterinsurgency techniques unfold in Mexico. Other authors also discuss how the solutions to climate change (mitigation and adaptation policies including REDD+, CSA, promotion of biofuels and renewable energy, and so on) actually constitute a legitimization tool for extraction, accumulation and resource grabbing (Bruna 2021; Dunlap 2018b).

Still on the matter of greening the extraction process, some scholars have recently explored the role of 'transition minerals', those minerals assumed to be greener and strategic to the low-carbon transition; some explored the case of lithium and how its extraction actually entails high ecological costs and undermines the sustainability of the energy transition (Kingsbury 2021; Voskoboynik and Andreucci 2021). These notions underline the emergence of climate-friendly extraction and directly connect green extractivism to cases where 'intensive resource exploitation is framed not only as compatible with climate change, but indeed as necessary to its mitigation' (Voskoboynik and Andreucci 2021, 1).

Generally, the concept of green extractivism has been discussed in the context of green economy and climate change mitigation and adaptation policies, mainly positioned in the approach of being a set of 'forms of resource extraction linked to or justified by the "green" economy' (Verweijen and Dunlap 2021, 5), including energetic extraction from renewable resources (wind, solar, hydrological and bioenergy) and all the extractive operations that are needed to produce renewable energy, such as extraction of minerals and hydrocarbons used to produce wind turbines and other equipment (Dunlap and Jakobsen 2020; Verweijen and Dunlap 2021).

However, it is becoming common to use the term 'green extractivism', sometimes stripped of its theoretical foundations, to describe processes through which extraction is turned 'greener' or when green policies and discourses are used to legitimize efficiency-driven extractivism processes, aiming ultimately at making the process of resource extraction and exploitation acceptable (Voskoboynik and Andreucci 2021). Green discourses, policies and economy indeed constitute mechanisms of greening efficiency-driven extractivism or at least greening specific phases of the whole process that constitutes extractivism (i.e. the extraction phase).

But this paper explores, theoretically and empirically, the concept of green extractivism grounded in the extractivism theoretical framework. Of course, most of the approaches mentioned above are significantly interrelated and considerably relevant to the distinct approach that this paper adopts. But there is a distinction that ought to be put forward: 'the greening of extraction' versus the extraction of 'emission rights'. Those are two different but complementary conversations. In sum, the current paper looks at green extractivism beyond the greening of other variations of extractivism; it focuses the analysis on the extraction of emission rights. In other words, the process of extracting emissions/ecological assets (and its respective mechanisms of legitimation) is indeed at the core of green extractivism when understood as a variation of extractivism.

Differentiated processes of resource appropriation and extraction: variations of extractivism

Within a productivist lens, extractivism can be understood as a process that feeds accumulation based on differentiated ways of removing and appropriating nature (natural resources) through differentiated levels of labour exploitation. The extracted commodity is transferred from region A to region B and accumulation is materialized throughout all levels of the commodity chain, circulating and flowing until it reaches region B. Region A is generally a peripheral or extractive economy, and region B is usually a productive core or industrialized region where transformation, consumption and maximized accumulation happen. So extractivism implies the appropriation of labour and nature from the extractive cores through asymmetric and exploitative social, economic and ecological relations. Higher costs, such as disruption of social and economic organization, productive forces and ecological degradation, are left to extractive cores, whereas economic gains and profits are concentrated in productive/industrial regions and actors.

But one of the central arguments of this paper is that resource grabbing, through extractivist schemes, can be carried out through differentiated mechanisms of resource appropriation and extraction. Two main patterns of extractivism were identified, namely: (1)

efficiency-driven extractivism and (2) green-driven extractivism. Thus, there is not a single unique way of appropriating and extracting commodities based on natural resources. 'Variations of extractivism' is an attempt to reflect, across economic sectors, on the many different mechanisms through which resources/commodities are extracted and transferred from extractive hubs to industrialized centres. It is an attempt to consider different models in which resource grabbing takes place under extractivist schemes, and how it changes social relations considering the different patterns of expropriation and exploitation and their potential outcomes.

Each variation of extractivism is based in distinct processes of appropriating nature and differentiated levels of labour exploitation. For instance, the classic mining and energy extractivism usually implies much less labour exploitation in relation to agrarian extractivism, which relies heavily on labour exploitation. Figure 1 depicts an attempt to kickstart the understanding of the different manifestations of extractivism and the differentiated injustices it reproduces, although it may not exhaust all of extractivism's variations. It is important to underline that this schema constitutes a heuristic tool to reflect and examine reality, with the acknowledgement that reality does not fit fully into any typology nor into the boundaries within the typology.

Variations of extractivism: from efficiency-driven to green-driven extractivism

Efficiency-driven extractivism in Mozambique

According to the Mozambican Central Bank (Banco de Moçambique 2019) report, FDI inflow in 2018 was approximately USD 2.7 billion, and 77 percent of total investment was directed to extractive industry (and 80 percent of that into natural gas and mineral coal in particular; Banco de Moçambique 2019). FDI reached a maximum in 2013, of around USD 6697 million; among other factors, the amount was directed to the extension

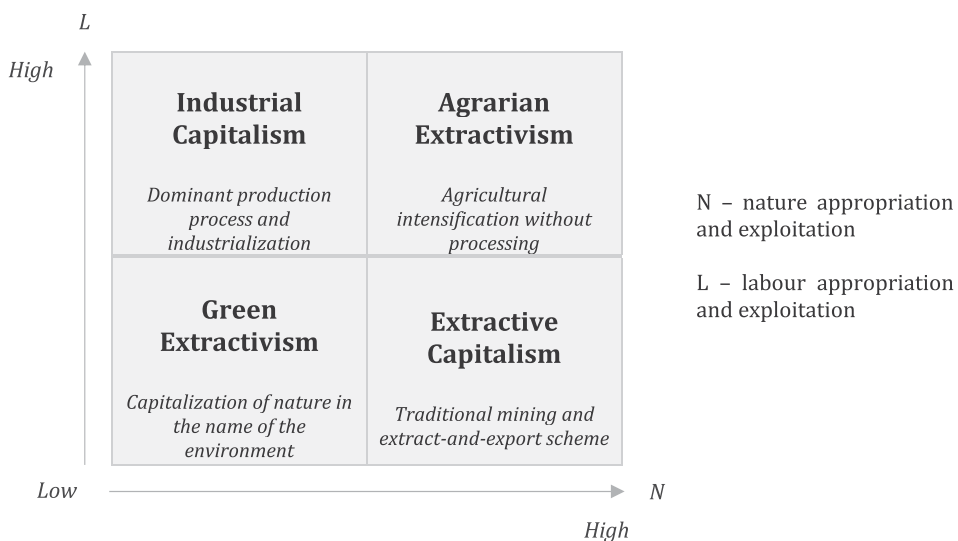


Figure 1. Variations of extractivism and its relation with nature and labour. Source: author.

of their productive capacity and capacity to drain commodities for exports (Banco de Moçambique 2019). Thus, extractive capital is among the main drivers of economic growth.

Extractive industry became the fastest growing sector and went from the lowest to the second largest sector of the economy, while the agricultural sector and manufacturing industry¹ diminished in importance, percentage-wise. Castel-Branco (2014, S26) explains that despite the high rates of growth, the economy 'has been ineffective and inefficient at reducing poverty and providing a broader social and economic basis for development'. All of this is justified by the fact that investment, public spending and the political efforts of the country are being directed more and more to extractive activities, particularly extractive industry, including infrastructures and services to support them.

But the result of more than two decades of efficiency-driven foreign investment consolidated the colonial extractivist economic framing, leading to augmented negative implications of the population's well-being. The country was ranked in 180th position in the Human Development Report (out of 189 countries in 2019), positioning it in the low human development category. The Multidimensional Poverty Index shows that, based on 2011 statistical data, 72.5 percent of the population is multidimensionally poor and 13.6 percent are classified as vulnerable to multidimensional poverty (UNDP 2019). Overall, poverty is still a predominant issue; approximately 50 percent of the population lives below the poverty line, despite the 'macroeconomic successes'.

While socioeconomic indicators reflect the reproduction of underdevelopment in Mozambique, Mozambican exports are peaking. The structure of the Mozambican balance of trade shows the poor capacity of the country to industrialize or the unwillingness of investors to invest in processing of commodities. It also shows that the majority of these commodities are exported to the Brazil, Russia, India, China and South Africa. Even though the BRICS account for 21 percent of the FDI, 35 percent of total exports were directed to them, reaching a peak in 2018 (51 percent of the total exports from Mozambique); this implies that more than half of the exports from Mozambique are feeding BRICS' demands and industrialization by supplying relatively low-priced raw materials and low-priced energy.

Moreover, the structure of exports clearly shows the concentration of economic power in a few megaprojects and a few economic sectors (energy and extractive industry). For instance, 30 percent of the exports in the last 15 years belong to only one company, Mozal, with a 'transit commodity' – aluminium. In 2019, 70 percent of total exports of the country belonged to megaprojects (multinationals operating in the energy and extractive industry): predominantly Vale and Jindal (coal), Sasol (natural gas), Mozal (aluminium) and Kenmare (heavy sands). All of them are highly vulnerable to international market price volatility – which says a lot about Mozambican economic vulnerability and external dependence.

While Mozambique is exporting raw material, energy and primary commodities to fuel other countries' industrialization and accumulation, it has become a net importer of

¹The manufacturing industry in Mozambique is vastly dominated by one megaproject that aims to transform aluminium. It is considered an atypical case of commodity trade in which aluminium is imported as raw material (from the Netherlands) and imported back to productive cores as aluminium bars. This multinational is believed to have settled in Mozambique, among other claims, because of the ease in environmental policies of the country and the fiscal benefits acquired.

manufactured goods to feed the country's internal needs but also the demands of extractive foreign capital – that is, multinationals operating in extractive industries. Almost half of the total imports from 2009 and 2015 were supplied by the BRICS, with China and India becoming increasingly important.

Besides supplying the domestic market with food and other goods, an important share of imports is mainly feeding FDI, and particularly FDI in the extractive sector. According to a Central Bank report (BdeM 2019), around USD 1365 million was transformed into machinery and infrastructure for gas exploration activities in the north (areas 1 and 4 of the Rovuma Basin). The structure of imports shows that the domestic market needs external aid to supply food and processed goods (machinery, capital goods and so on). It does not have a high enough level of industrialization to answer to domestic needs, nor does it have the ability to produce enough food for internal needs, as private and public resources are employed directly to answer to international market interests.

Overall, the inflows of foreign extractive capital and their extract-drain-and-export scheme are operationalized in distinct ways and sectors. Each of these processes of extracting natural resources requires a different combination of labour exploitation and nature appropriation. The two most prominent efficiency-driven methods of extractivism are explored in the following sections.

Mining and energy extractivism: extractive industry, energy and appropriation of nature

One of the main pillars of Mozambique's economic policy is the intensification of natural resource exploitation in the name of development and economic growth. The energy–mineral complex has been a priority of the Mozambican government since the post-socialist period (Castel-Branco 2014; Mosca, Abbas, and Bruna 2013). SASOL is the oldest megaproject of the extractive industry and its exports represents, on average, 5–8 percent of total national exports, since the operationalization of the pipeline in 2004. The project comprised the extraction of approximately 122 million gigajoules of natural gas per annum and its transportation through an underground pipeline (of more than 800 km) to South Africa (Secunda, Mpumalanga). The area in question (Temane and Pande) is considered one of the top natural gas reserves of Africa, containing an estimated 2.5 trillion cubic feet (TCF) or 2.7 million gigajoules, with an estimated potential of 3.2 TCF. The first area to be drilled would be Temane, with the capacity to produce 20–40 million cubic feet per day (AfDB 2002).

Social, economic and environmental implications must be taken into account. It was clear from SASOL's environmental impact assessment that the multiple risks and hazards of such a project should be carefully taken into consideration. These included worries about hazardous and non-hazardous waste management and other major concerns regarding their operations, such as the release of mercury to the atmosphere, the need to control high nitrogen oxide (NO_x) emissions, incineration of medical wastes, and the resulting release of dioxins or the treatment of stormwater or firewater with high levels of organic contaminants (PDA 2001).

Although the real environmental impact of Sasol is still not clear today, the local population, who are agriculturally based, claim that the company's operations are negatively impacting agricultural production and have been causing ruptures in their livelihoods. Besides going through a process of land expropriation, smallholders who live in the

surroundings of the drilling areas complain about changes that have occurred in the environment and ecosystems that negatively affect their economic life and health. They report tremors, changes in rain patterns, decreased soil quality and productivity and bitterness in food crops produced close to SASOL's areas. Health-related issues have also been reported. Consequently, adverse implications for the social reproduction of the local population were verified.

After Sasol arrived, rainwater no longer could be drunk. Pumpkin leaves, cassava leaves and other plant leaves could no longer be eaten ... They tested the rainwater and there were problems with that water, [it] is poisoned ... You can get sick. We saw that the leaves from our *machambas* [plots] changed colours and flavours ... Sasol is bringing poverty, is increasing poverty. They keep destroying what the community is trying to build. (Resettled smallholder, Inhassoro)

From a more macro perspective, not many benefits are promoted by the implementation of Sasol's extractivist project. The Mozambican government, whether it is justified by the lower bargaining power, or by the low levels of transparency in contract and concession negotiations, or corruption claims, has set a five percent royalty rate. Additionally, it provided huge fiscal benefits to SASOL – including exemption from Value-added tax and import taxes. Castel-Branco (2014) analysed three major megaprojects in the energy–mineral complex in Mozambique: Mozal, Kenmare and Sasol. He showed the fiscal benefits (corporate tax incentives and free repatriation of capital) that they received in the first four years of generating taxable profits; between 2008 and 2012 these three companies contributed more than 20 percent of Mozambique's gross domestic product but less than two percent of the total tax revenue of the government (Castel-Branco 2014). All of their tax contributions combined (including corporate and workers' income tax) corresponds only to three percent of their total sales, and he underlined that revenue from workers' income exceeds corporate tax (Castel-Branco 2014). Overall, the combination of tax incentives, free repatriation of capital and low profit re-investment rate is at the core of external accumulation and low wealth retention in the country.

A study conducted by Centro de Integridade Pública (2013) shows that very low revenues are collected by the government compared with expectations, not only because of the low royalty rate but also because the pricing agreement does not benefit the country. According to the study, Sasol purchases natural gas in Mozambique for one-fifth of the price at which it sells it in South African market. Mondliwa and Roberts (2018) concluded that the biggest winners of the SASOL project and of gas extraction in Mozambique are (1) Sasol, through the removal of production sharing, profit margins based on price differences and large deductions related to capital overspend; and (2) the South African government, through taxes paid by Sasol in South Africa. And South Africa is achieving their goals of reducing emissions through – as it claims – the diversification of energy sources (from coal to natural gas) while feeding its industrialization needs.

Distinctively, Mozambique ends up in a structural and economic framing of extract–drain–export, as well as being left with disrupted ecosystems, ecological degradation and degradation of productive forces. Consequently, it loses the ability to generate a social and economic basis or organization to achieve progress and sustainable development, as depicted by Amin, Bunker and other scholars focusing on uneven relations among Global South and North countries.

In this variation of extractivism the resources are, as Ye et al. (2020) put it, actually 'mined'. This means that natural resources are 'extracted by mining' or are literally 'mined' from the earth and become commodities to be drained/transported and sold in the international markets where they are further transformed into final products or used as energy to feed industrial/productive cores. Overall, the distortion of economic dynamics (macroeconomic and dependency intensification) and the disruption of local social reproduction processes, and all of the extractivism ills discussed in the previous sections, are among the implications of Sasol's gas extraction. However, it is important to underline the ecological implications also: (1) depletion of resources of the country that are asymmetrically and unevenly benefiting domestic capital classes and elites and mostly benefiting the South African economy, industrialization and the state; and (2) ecological and ecosystem destruction in the form of air pollution, less fertile soils, possible disruption of rain cycles, contamination of food crops, etc. – that impact negatively on a household's health and ability to produce food.

Agrarian extractivism: appropriation and exploitation of land, labour and nature

Many scholars have been extending the concept of 'extractivism' beyond the traditional dynamics of 'mining' commodities from the ground. For instance, Ye et al. (2020) argue that agriculture, forestry and fishing can also be part of the extractivist scheme of production; they state that those commodities can also be 'mined', figuratively. This is the arena of the rising concept of agro-extractivism or agrarian extractivism. 'Agro-extractivism' or 'agrarian extractivism' (Alonso-Fradejas 2015; McKay 2017; Petras and Veltmeyer 2014), considered to be the agrarian question of the twenty-first century (Petras and Veltmeyer 2014), is an emerging variation of extractivism in which the removal of unprocessed natural resources is done in the agricultural sector. Alonso-Fradejas (2021) calls attention to the interrelation of agrarian extractivism and the fight against the current ecological and social crisis. He argues that biofuel and tree plantations are praised as climate stewards and vehicles of sustainable development, but in reality, they are actually a predatory form of agrarian extractivism that results in processes of 'impairing destruction' that affect everyone, but working families are hit harder, and especially women.

Mozambique is an area with potential for the development of agrarian extractivism. The government has been actively promoting the existence of idle land and incentivizing foreign investors to dynamize the agricultural sector, following the World Bank (2007) 'campaign' since the 2008 report. Along this line, and also as part of the national climate change strategy, Portucel Moçambique arises as a 'very promising investment' with the potential to promote economic growth, rural and social development, and employment generation. Portucel Moçambique was created in 2009 by The Navigator Company (formerly Portucel Soporcel group), to implement the largest integrated forestry project in the country for the production of paper pulp for export.

Initially the company expected exports of paper pulp production estimated at around USD 1000 million per year. The company's main markets were the Asian market (80 percent) and the European market (20 percent). However, according to the company, it became economically unsustainable (unprofitable) to export pulp. According to the company representative (interviewed in Maputo), Portucel dropped industrialization plans and decided to export woodchips (earlier in the value chain) instead, at approximately one million tons per year. However, a eucalyptus woodchip production unit

has not been built, and they are already cutting down grown eucalyptus to pilot the export route.

The 2015 Portucel Report presents the risks (social and environmental) of implementing the project that were identified by the environmental impact study: (1) fragmentation, alteration and/or loss of habitats; (2) loss of biodiversity; (3) water absorption by plantations; (4) increased risk of forest fires; (5) conflicts in access to land; (6) loss of agricultural areas; (7) risk of malnutrition; and (8) loss of ecosystem services for communities. But still, the company was authorized to acquire 356,000 hectares of land for 50 renewable years. It was estimated that around 25,000 families were residing in Portucel's area in both affected provinces. Around 3500 families have had their land transferred to Portucel. So far, 13,500 hectares of eucalyptus have been planted in both provinces. According to the company, they employed 251 permanent workers and have paid 3.6 million in daily remunerations (equivalent to 2000–3000 seasonal workers) from 2013 to 2018.

Land grabs, rural exclusion, disruption of ecosystems and negative developmental outcomes (local and national) have been acknowledged as major implications of monoculture tree plantations (Ehrnström-Fuentes and Kröger 2018; Kröger 2014; Overbeek, Kröger, and Gerber 2012; Wolford 2021; Xu 2019). With the state as a supporter or even a 'promoter' of such projects, these projects usually overlap with climate change mitigation and adaptation projects such as the REDD+ and CSA. This is actually the case for Portucel Moçambique and its tree plantation project, which are operationalized under the REDD+ National Strategy. A lot of changes were identified regarding land use and ownership in the areas occupied by Portucel. Overall, agro-extractivism in particular is more land-consuming and with more exploitative labour relations. The intensification of the mono-crop model of production also presents ecological implications in terms of water availability and levels of soil fertility. At the household level, the crucial factor was the decrease in food produced per household.

An interview-based study (Bruna 2017) showed that there was a significant decrease in the quantity of food produced, when comparing production before and after the transfer of land to Portucel Mozambique. There was, on average, a decrease in production of approximately 100 kg per crop in maize, beans and cassava, which indicates a possible food deficit for the households that had their land transferred to Portucel Mozambique. Additionally, there were also changes in the production structure. Because of the decrease in land and income, households produced less variety of food crops than they did before, which may indicate a lesser variety of foods available per household.

Attention should be given to labour relations in this case. Not all labour released from the expropriation of land process was needed, but some labour was needed, especially in the initial phases of the plantation process. Two main types of labour relations could be identified in this case. The first was a large (unstable) demand for seasonal workers to clean, plough and sow vast portions of land. They were paid on a daily basis and with very low daily wages. The second was basically a small proportion of permanently employed workers in low-level positions such as guards and cleaners. Both groups claim to be badly paid for the burden of work and classify the salary as a 'survival' salary:

... the amount [salary] is small for the work here. We work from 7 h to 14h30 to receive 170 Mt [equivalent to a bit less than USD 3 a day] ... if at least we got 200, it will be normal. I have been working for the company for seven years now and I got nothing. It is just enough for survival. (Portucel Worker, Ile District)

Seasonal workers were also needed when rehabilitating the infrastructure to support and accommodate Portucel's operations. Roads (more than 1000 km), bridges and so on, connecting plantations, the company's offices and the nearest port city, were financed by Portucel. Distinct from the traditional mining extractivism, higher levels of labour exploitation and land appropriation are usually verified in this variant of extractivism. Nevertheless, disruption of local social, economic and ecological framing is equally verified in this case.

Overall, the different variations of extractivism explored in this section (but not limited to them) can combine different and varying degrees of labour exploitation and nature appropriation. The two most prominent efficiency-driven methods of extractivism were identified and explored in this section, whereas in the next section we will explore the emergence of a third variation of extractivism under a productivist lens: the rise of green extractivism.

The global environmental crisis and the rise of green extractivism

Climate change, extractivism and the green frontier of accumulation

This section explores the dynamics of green-driven extractivism in the context of climate change mitigation and the implementation of adaptation policies. Nature has always been a fuel for the capitalist mode of production. Polanyi (2001) showed how the market would turn nature's gifts into fictitious commodities, from which O'Connor built the argument of the second contradiction of capitalism. Climate change is the unfolding of the second contradiction of capitalism put forward by O'Connor (1998), evidence that the impediments of this contradiction are the source of new forms of accumulation, as stated by Brockington and Duffy (2010), or proof that capitalism is able to convert its own crisis into new accumulation strategies (Arsel 2019). Mainstream solutions to climate change, such as technical fixes highly associated with economic growth objectives, market mechanisms and financial tools, have been questioned (Asefi-Najafabady, Villegas-Ortiz, and Morgan 2020; Gills and Morgan 2020). However, they are continuously being implemented.

Commodification of nature is nothing new. What is new is that in the midst of the current global environmental crisis, climate change policies are further changing human relations with nature and shaping and transforming the global economy and accumulation strategies, especially for the most vulnerable countries. Arsel and Büscher (2012) and Büscher and Arsel (2012) importantly underline the geographically uneven relations between dominant economic actors and poor populations. This calls attention to the fact that the climate crisis could 'offer' opportunities for capital accumulation embedded in asymmetric and exploitative exchange relations.

In a climate-smart world, mainstream institutions are aiming urgent climate measures straight to biodiversity-rich African countries and other regions of the Global South. These sets of measures mostly involve integrated land-based projects to lower emissions, but most importantly aim at carbon sequestration in poor countries to overcome industrialization damage from developed or emerging economies. Rural Mozambique has been penetrated by multiple 'green' investments and projects, including the approval of several tree plantation projects such as Portucel Moçambique (356,000 hectares), Chikweti Forest (63,040 hectares) and Green Resources (133,000 hectares); these green projects also include biofuel production investments (such as ProCana: 30,000 hectares)

and the re-establishment of many conservation areas (Limpopo National Park with 1,123,316 hectares, Gilé National Reserve with 286,000, Niassa Reserve with 4,200,000 and Quirimbas National Park with 750,000 – the Gilé National Reserve is one of the only conservation areas without rural population living inside) (ANAC 2015).²

Studies reveal how wildlife, marine and biodiversity conservation can be categorized as commodification of nature and primitive accumulation, although it does not take the usual form of privatization of land (Benjaminsen and Bryceson 2012; Bruna 2019; Kelly 2011). However, all of them underline resource grabbing implications such as loss of land rights, loss of access to forest resources, food insecurity and conflicts. How do these sets of 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.

Both Portucel Moçambique and Gilé National Reserve (discussed in the next section)'s CSA and REDD+ are policies that are synergistically merged with profit-making projects/ investments in agriculture, energy, the extractive sector and beyond. For instance, the tree plantation project operationalized by the company Portucel Moçambique is part of the REDD+ National Strategy and was only permitted to acquire 356,000 hectares of land if the company implemented a social development plan that included providing inputs and technical assistance that enforce the implementation of CSA in smallholders' farms.

So, agro-extractivist projects with high profit margins are justified and legitimized by green discourses, particularly claimed to be strategies to mitigate and adapt to climate change. On the other hand, discourses around the need to intensify the so called 'clean energy' investments as a way to combat climate change are predominant globally. The construction of dams, eolic energy projects and solar energy projects, and even the prioritization of natural gas over fossil fuels, are also large-scale projects and investments that are legitimized by the fight against climate change, but are in fact profit-making opportunities subsidized by cutting into the necessary consumption of rural populations. This goes in line with what is argued by wind energy projects and extraction of transition minerals explored in the current green extractivism literature (Bruna 2021; Dunlap and Brock 2021; Voskoboynik and Andreucci 2021) and how they constitute a 'driver of extractive frontier expansion'.

Overall, an emerging restructuring of the global economy leaning towards the 'greenization of the economy' throughout all levels of the value chain is observed. This means that investment portfolios, production processes, packaging, distribution, markets and consumption are all following the emission imperative, reducing emissions or turning greener – or, at least, that is what they claim to be doing. However, in reality these green policies and discourses are actually creating new spaces, opportunities and even commodities that ultimately aim to increase accumulation in the name of the fight against climate change, which constitutes a new frontier of accumulation legitimized by green discourses (Bruna 2021). Thus, again, poorer Global South countries will have

²Additionally, 25 percent of national territory was appointed to be reestablished as conservation areas, whether as reserves or national parks.

their resources extracted as a way to respond to environmental global (and especially industrialized countries') demands and interests. Differently from past centuries in which efficiency-driven extractivism dominated, emission rights and carbon permits constitute the new commodities being extracted and central to accumulation. The next section will explore these dynamics through the lens of the REDD+ implementation.

Green extractivism in Gilé National Reserve and REDD+

With the intensification of climate change policies and the emergence of the green frontier of accumulation, the 'new scramble for Africa' (Moyo, Yeros, and Jha 2012) has become 'greener' than ever and the dominant issue when designing policies and investments projects – similarly to other African countries, Land Matrix data for Mozambique shows an increase in land deals to produce biofuel, for forest plantations, for conservation (REDD+) and for renewable energy.³ And these projects or investments seek the appropriation and extraction of resources to feed their accumulation goals, whether it is land, minerals, water, biodiversity and so on. Some even engage in the same extractivist scheme of extracting–draining–export as in the case of Portugal Moçambique. But a closer look at these processes tells us that those 'tangible' resources are not the only type of resource that is being expropriated and extracted. In a world where 'emissions' have become a top priority and monetized, these processes require additional attention. It was with the intention of capturing carbon offsets that the Gilé National Reserve (GNR) was reestablished.

The GNR covers an area of 2860 km² in the districts of Pebane and Gilé in Zambézia province. In 1932 an area of 5000 km² was appointed as a hunting reserve; however, in 1960 it was reduced to 2800 km². With the emergence of environmental concerns and external interest in funding conservation areas, institutional and legislative instruments were put in place to manage and protect this conservation area. In 2011, the buffering zone was officially appointed; it stretches for 1671 km², forming a strip of variable width that completely surrounds the reserve.

The reserve area was identified as one of the first target areas for the implementation of the REDD+ programme in Mozambique, which aims at 'promoting community-based forest management, agro-forestry, sustainable charcoal making and reforestation to restore degraded areas' (World Bank 2017) throughout 163,000 households in the targeted districts (MITADER 2016). Scholars have been questioning the effectiveness and studying the implications of REDD+. These include reinforcing existing inequities and social exclusions (Corbera 2012; Corbera, Hunsberger, and Vaddhanaphuti 2017; Phelps, Webb, and Agrawal 2010). Hunsberger et al. (2017) summarize the risks in REDD+ design and implementation: (1) disregard of rural communities' views while failing to address causes of deforestation; (2) local communities losing access to and use of forest resources; (3) deepening of existing inequalities if elites capture the policy's benefits; (4) reducing the forest to a single commodity value by assigning a price to it; and (5) uncoincidental layers of interest among actors: international, national and local institutions.

Even so, this REDD+ project has been up and running for almost a decade and it affects about 14 communities (around 15,000 families) that live in the buffering zone of the

³https://landmatrix.org/charts/country_profiles

reserve. These families are predominantly small-scale farmers who practise subsistence agriculture, and they rely heavily on forest resources from the reserve and its water sources. They are highly dependent on forest resources for their subsistence and their livelihoods are structured as follows: 52 percent forest resources (firewood, hunting, fishing, and others); 32 percent agriculture; 9 percent domestic animals (pigeons, chickens, pigs); and 7 percent alternative strategies. With the implementation of REDD+, smallholders' livelihoods went through a shocking rupture, and now they struggle to obtain food and income.

The REDD+ policy states that the households should be compensated for the loss of forest resources and livelihoods by 'benefitting' from the implementation of CSA (learning new agricultural techniques, with inputs provided). Not all were selected to be beneficiaries. Only around 8000 were selected to be part of these community development projects directly provided by the Reserve Administration, which include agricultural input packages, kits for producing honey, processing of mushrooms and other small livelihood alternatives – all embedded in CSA schemes. Even the beneficiaries went through a shocking rupture of their livelihoods, and now they struggle to get food and income:

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 at least pay. Only there [the GNR] 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. Many of us did not buy. I would go once a week. When the man goes there to hunt, the woman stayed at the *machamba* [small farm]. From there we took [money] and used for our children's clothes. (Interview smallholder Pebane, November 2019)

Last year we produced peanuts, and the NGO told us to do so in our fields, but we couldn't find buyers. The product just stayed there. We are eating one share, but the other share is just rotting. (Interviewee, Gilé, November 2019)

Overall, data collected in the field indicates that implementing CSA did not compensate for the loss of livelihoods. It is ultimately a strategy to protect the biodiversity of the reserve, as the main goal here is carbon sequestration and sale, rather than improving livelihoods. The scenario becomes even worse for the ones that are not benefiting from the compensation mechanism projects because they did not get any of the 'benefits' described above, although the investments/projects promised they would. Much was taken, but they received nothing in exchange. And this group constitutes the majority of the expropriated and affected.

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. Some were selected and see the benefits. While us, who are outside, we have no benefits at all. We receive nothing in exchange. (Non-beneficiary smallholder, Gilé, November 2019)

Besides not receiving any benefits, the feeling of worsening livelihoods and subsistence is clearly exacerbated in this particular group. They lost access to forest resources that were determinant for their livelihoods, not only for the supply of protein and other foods, but also to support small businesses within the community. What is happening here is that a new commodity is born – carbon permits – and it is born by cutting into the necessary consumption of rural households and a diminished household ability to produce food

and cash crops. Besides implementing these projects, a percentage of the sales of carbon permits are supposed to be channelled to the benefit of these communities; however, after 10 years of REDD+ none of those financial benefits have reached them.

The GNR has the potential to produce around 330,000 verified carbon units (VCUs) within five to six years' time, which would be confirmed by the verification process (FFEM 2017). The process of extracting carbon permits ('emission rights') includes different stages, since carbon offset valuation processes occur all the way to sales. The structure of the value chain shows how different actors accumulate in different stages of the value chain that is controlled by a group of stakeholders (see Figure 2). Thus, similarly to efficiency-driven extractivism, the flows and circuits of commodities in green extractivism should be taken into account. As the carbon commodity chain shows, the flow of carbon permits, from production to consumption, imply profit and gains from multiple actors in different phases of the chain.

In the context of carbon markets, Bridge (2011, 824–825) calls attention to the rise of the hydrocarbon commodity chain, in which

the acts of enclosure and commodification through which carbon economies are constituted are at the same time processes of dispossession: resource making, then, is a form of taking or theft in which the material and cultural attachments of existing resource users are alienated.

The way this commodity is created, produced and sold implies processes of removing/denying the ability of the local population (and countries) to exercise their emission rights and to benefit from the ecological assets that the reserve area contains. In analysing the effects of the implementation of REDD+ on rural livelihoods, it became clear that there was a cut in smallholders' necessary consumption. And although CSA was used to compensate for the loss of forest resources, it actually forced them to change their traditional ways of farming and adopt new techniques that are, according to the implementing actors, lower in emissions. So besides being expropriated of forest resources for the sake of carbon sequestration, smallholders are being expropriated of their emission rights in their own farms as well.

So, green extractivism implies the appropriation, extraction and transfer of emission rights where the expropriated are being deprived of resources determinant for their social reproduction as well as their right to emit. Green extractivism, in the case of conservation areas, distinctively from other cases and variations of extractivism, does not necessarily imply (direct) localized negative environmental implications (pollution, loss of biodiversity, etc). However, it grabs the ability of the local population to reproduce themselves by using or benefiting from their ecological assets (biodiversity, forest resources, emission rights and so on).

It implies limitations for the social productive forces of the region – protecting biodiversity at the cost of rural livelihoods. Nevertheless, it can imply (indirect) external



Figure 2. Carbon commodity chain – expropriation of emission rights. NGOs: non-governmental organizations; REDD+: Reducing Emissions from Deforestation and Forest Degradation. Source: author.

degradation of the environment elsewhere by opening up spaces and opportunities to further pollute elsewhere by the buyers of carbon permits. Besides supplying raw materials or energy, the extraction and transfer of emission rights (from rural poor to polluters) is another way through which extractive cores can feed industrialization elsewhere. What is being 'mined' is carbon credits (emission rights) that result in the rupture of rural livelihoods: through forest resource grabbing ('green grabbing'), control of land and expropriation of emission rights. This case shows how global policies to overcome climate change are actually creating local adversities, feeding external industrialization and accumulation.

But REDD+ is not the only case through which green extractivism can unfold. This new (green) frontier of accumulation created by global concerns around climate change comes with extractivist mechanisms that support processes of uneven distribution of gains and losses based on varying processes of appropriation of natural resources and labour exploitation. For instance, the case of Portucel Moçambique would fit in the green extractivism framework as its strategies of accumulation go beyond appropriation of land, but it also goes hand in hand with climate change mitigation policy as tree plantations are part of the Mozambican REDD+ National Strategy. Besides being integrated into the REDD+ National Strategy, the case of Portucel goes further in the greening of its capital accumulation insofar as it is enforcing CSA to smallholders. Consequently, smallholders' farming emissions are reduced by expropriating them from their emission rights. Again, emission rights are being grabbed from smallholders as they adopt these new techniques promoted by the company and the international finance corporation. Similar to the Gilé case, Portucel's resource grabbing is being facilitated and legitimized by green discourses. But distinct from green extractivism happening in Gilé, the case of Portucel implies direct local adverse consequences to the environment and destruction of biodiversity and ecosystems. Many other policies, financing and investments promoting biofuel production, renewable energy projects (based on water, solar and wind energy) legitimized by climate change narratives and green discourses can be based on the expropriation of emission rights, and thus represent other mechanisms through which green extractivism may happen.

Conclusion

Looking at Mozambique as the empirical case, it became clear that by specializing in the supply of energy and raw materials, Mozambique feeds external industrialization while undermining both its internal capacity to industrialize and its ecological wealth. Consequently, the country feeds from imports to satisfy internal market needs for food, fuel and capital goods. The result of more than three decades of efficiency-driven, foreign investment and extractive framing of the economy led to negative implications for the population's well-being. Based on 2011 statistical data, 72.5 percent of the population is multidimensionally poor and 13.6 percent are classified as vulnerable to multidimensional poverty (UNDP 2019).

As the paper showed, the extractivism framework is embedded in intertwined dynamics of global and local scales. The development of capitalism in industrial and productive cores, realized through asymmetric and exploitative economic, social and ecological relations, implied costs to local populations and societies in extractive cores. Moreover,

extractive regions are left with an economic, social and ecological framing that undermines and inhibits social reproduction and progress, locally, regionally and nationally. Mozambique now presents an economic framing that was actually created to accommodate an extract–drain–export scheme of commodities to external markets.

By exploring and unpacking variations of extractivism under and beyond green policies, the paper puts forward an emerging green-driven variation of extractivism that goes beyond the historical and classic patterns on this matter. With the emergence of the green new frontier of accumulation, the rush for resources is changing in its nature but not in its essence; appropriation and exploitation are still necessary conditions, but the discourse around it has changed. It is all about emissions now. This paper showed how global processes and policies can impact local rural societies through exploitation and appropriation. It became clear how localized injustices are subsidizing global environmental and capital accumulation goals. Green-driven extractivism only intensified the economic and social framing of the country as an extractive hub. With the creation and extraction of a new commodity – emission rights – green extractivism is feeding international market and environmental demands at the cost of rural population's livelihoods and rights to emit.

Grounded in the new frontier of accumulation, green extractivism underlines injustices of ecological exchange relations between regions and actors. It thus constitutes both an important tool for agrarian/climate social movements and a relevant input to be considered in the debates and action towards climate justice. Expropriating emission rights is going to be the basis of the current and future scramble as a climate-smart world is installed. This will unfold in many ways, such as the following: (1) climate-smart policies that impose changing traditional farming systems into labour-intensive CSA techniques in order to reduce emissions from smallholders and the agricultural sector; (2) expropriating emissions rights by restricting access to forest resources in order to maximize carbon sequestration in the context of conservation-based climate-smart policies; (3) enforcing 'green' investments (biofuel production or tree plantations) and using climate-smart projects to compensate for the loss of livelihoods, while synergistically transforming rural livelihoods into 'more environmentally friendly' livelihoods, but ultimately aiming at emission reduction. All of these imply extracting and transferring emission rights from the rural poor to capitalist classes in different regions of the world.

One important factor to be underlined here is the fact that the weight of climate crisis resolution might be falling on the shoulders of actors who did not contribute significantly to the current global environmental crisis – that is, the local population where such projects are implemented and the country where such policies are enforced. It is unfairly falling on them to accommodate the demands, ways of life and production processes of industrialized and richer countries. Consequently, countries like Mozambique are constrained from using their resources (raw materials, energy, emission rights and so on) for their own good, to meet their domestic needs and goals and fuel their own growth and development.

Overall, this research offers insights into climate justice debates and reinforces the need to further explore this concept. This study reveals the importance and need to incorporate notions of ecological injustices in designing, making and implementing global climate change policies. It also reveals the need to ensure the participation of the populations that are directly affected by the implementation of such projects. Nevertheless,

future research should further explore the conceptualization of climate justice, the role of historical ecological footprints and the role of emerging 'green' financialization, and identify emerging alternatives to mainstream climate change solutions.

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