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The making of resource frontier spaces in the Congo Basin and Southeast Asia: A critical analysis of narratives, actors and drivers in the scientific literature

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ABSTRACT

Forest frontiers are rapidly changing to sites of commodity agriculture throughout the tropics, with far-reaching transformations in landscapes and livelihoods. Many of the dynamics that drive frontier commodification are well-rehearsed since colonial times. Policies to deregulate markets, privatize or formalize land tenure and open borders to trade have stimulated resource exploitation. The accompanying territorial interventions such as new enclosures, reconfigured property regimes and claims are purposefully employed to create space and labor, and have radically reconfigured the relationships of millions of people to land and rule. Narratives of what is an opportunity for whom, who should benefit from these spaces, and what is a problem in need of a solution have shaped policies and development choices in frontiers over time.

Science plays a critical role, by putting forward particular knowledge and understandings, contributing to problematisations and promoting or legitimating certain solutions. In this paper, we review how science has portrayed forest frontiers in the Congo Basin and Southeast Asia. We analyse storylines put forward in the scientific literature and find three dominant narratives that intersect and reinforce each other to legitimate colonial exploitation of forest and land resources, and the enactment of colonial forest and land codes that have laid a deep-seated path in post-colonial policies. The narratives focus on imaginings of frontier regions as spaces that are “idle” or “empty”, and where possibilities for extraction, conservation and development appear unlimited; the problematization of smallholder and shifting cultivation farming as practices in need of change; and the legitimization of capitalist and market-based rationales as solutions. We find these narratives to be largely similar across both the Congo Basin and Southeast Asia and persistent in contemporary policies and global development strategies. This analysis allows for a deeper understanding of how commodification of frontiers came about, and what role science can play for a more just development.

1. Introduction, scope and main objectives

Frontiers are places of resource extraction and production (Cons & Eilenberg, 2019). Frontiers are also places where zones of conservation, production and sacrifice overlap (Tsing, 2005), and where competing claims, narratives and worldviews are often expressed through territoriality, institutional norms, and forms of violence (Dancer, 2021; Tsing, 2003).

The colonial scientific gaze on resource frontiers focused on the exploration of resources and was linked to the colonial enterprise, often legitimated as a “*mission civilisatrice*” (civilizing mission) (Petitjean,

2005). More recent studies have highlighted forest frontiers as spaces for monoculture plantations and crop booms, the discovery of minerals and the exploitation of forest resources, and these activities have rapidly reconfigured land tenure systems, social-political structures and the environment (Hall et al. 2011; Li, 2018; Bryant, 1996). While intensification of land use in frontiers is often imbued with narratives of promised win-win outcomes put forth in science and popular media (Liu et al., 2020), other studies have shown that these are often difficult to come by and win-lose trade-offs or lose-lose outcomes are more common (Dawson et al., 2016; Nanthavong, 2021; Rasmussen et al., 2018). The forest frontiers and borderlands of mainland Southeast Asia are, for

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example, experiencing a sustained economic boom as swathes of forests are cleared for rubber and banana plantations, and smallholders plunge headlong into new boom crops enabled by traders and promoted by the state (Taylor, 2016). On the other hand, the frontiers of Malaysia Borneo are transformed by the State's territorialization of customary land for large-scale oil palm plantations in the name of 'progress' and 'development' (Cramb, 2013; Majid Cooke, 2006, 2013). In the Congo Basin, expansion of commodity crops for global and domestic markets have been increasing in the past two decades (Ordway et al., 2017), with more recent large-scale enclosures or 'land grabbing' seen as re-instituting the old colonial offensive against smallholder farmers (Peemans, 2014).

Underlying the construction of resource frontiers – and their active transformation into commodity frontiers – are the various actors, scientific, state and market forces and processes that “collude” to reinvent these spaces as zones of economic opportunity (Cons and Eilenberg, 2019; Kröger and Nygren, 2020; Li, 2014). Many of the dynamics that drive frontier commoditization are well-rehearsed. Policies to deregulate markets, formalize land tenure, and open borders to trade and foreign investments have stimulated resource exploitation in mainland Southeast Asia (Barney, 2009; Taylor, 2016) and sub-Saharan Africa (Oyono, 2013; Pemunta, 2014). The narratives and accompanying territorial interventions such as new enclosures, property regimes and claims are purposefully employed both in contemporary times and across colonial histories and sciences to radically reconfigure the relationships of millions of people to land and rule (Kelly and Peluso, 2015; Peluso and Lund, 2011). This body of critical literature identifies three key dynamics underlying the making of resource and commodity frontiers in forest regions: 1) the use of narratives to create space for resource exploitation and commodification, 2) territoriality to govern and control resources, and 3) use of normative orders or institutional norms to manage local people and their agency.

While these dynamics are interlinked, for the purpose of this paper we focus on the first dynamic, by investigating the scientific literature and identifying the dominant narratives that underlie the 'making' of resource and commodity frontiers; and to critically analyze how problems in forest frontiers are framed, what are proposed as solutions, and who are depicted as villains or beneficiaries. We draw on this review for insights on the processes of territoriality in frontiers, and examine how the literature has portrayed local people and their engagement in frontier processes and how this continues to be reflected in contemporary policies and global development strategies.

2. Methodology/approach

This literature review focuses on two major tropical forest biomes, the Congo Basin and South East Asia, both of which are sites of multiple interests ranging from local needs to global commodities. The review of narratives in articles published in scientific journals is part of two ongoing research projects, FairFrontiers¹ and ForEqual² which aim to examine processes of inequalities in forest frontiers and forest and land use in Malaysia Borneo, Laos and Myanmar in mainland Southeast Asia and Cameroon and the Democratic Republic of Congo in the Congo Basin. As such, these were the focus countries of this review. Three separate and inter-related literature searches on forest frontiers in the Congo Basin (on English and French scientific literature) and Southeast

Asia form the data corpus that is the basis of this paper (see details in Fig. 1). We used Scopus databases to identify literature in English, complemented by Google Scholar and Web of Science for the French-language literature. In all the three literature searches, the databases were first accessed in November 2020, supplemented by further searches through April 2021. The timeframe of the papers in the review were determined by the papers identified in the search, dating back to 1911 for the French and 1950 for the English literature. The literature searches were aimed to generate an understanding of how forest frontiers have been framed within science, and in the broader drivers and processes actively constructing and transforming into resource and commodity frontiers.

The literature is identified through a set of keywords related to the focal topics, processes, drivers in the selected geographical regions and countries (see Fig. 1). The searches produced 1677 papers and after iterative screenings of the papers' keywords and abstracts, the final sample was refined to 296 articles. Papers were selected for the analysis if they include at least one or more of the following criteria: 1) changes and reforms of forest, land and agrarian policies, market reforms, changing access and rights; 2) perspectives of, or interests in frontier change, e.g. development, resource extraction, conservation or agrarian change; 3) representation of actors and agents driving frontier change and deforestation; 4) gendered or indigenous or local perspectives, reactions and impacts; 5) colonial histories and legacies affecting forest and land governance. Articles were not included if the analyses were out of the geographic scope of interest, were not peer-reviewed science articles, and/or if they focused solely on the biophysical aspects of frontier regions.

Three Master's researchers carried out a qualitative text analysis using both Atlas.ti and NVivo software and coded the papers inductively using open coding technique, where codes are theoretical constructs attached to every quotation or text segments highlighted for their importance in the elucidation of the research inquiry at hand. The team then collaboratively carried out a critical analysis to identify the different narratives of the frontier, and particularly on how the problem of deforestation is framed and how local people are portrayed. The open codes were clustered into three broad categories of narratives and 15 categories of problematizations and deforestation drivers. We also examined the articles' identification of the solutions that are proposed to counter or mitigate deforestation drivers. To examine their persistence, we carried out a focused review of grey literature and media to trace how the main narratives are reflected in contemporary national policies of the case study regions and in the practices and strategies of a global development institution, such as the World Bank. The World Bank was chosen for its powerful influence on national economies and development, and for its financing across multiple sectors (including forest, agriculture and land).

3. Results

A critical review of the literature in our sample highlights three dominant and interconnected narratives in forest frontiers: first, in the imagining of frontier regions as spaces that are “yet to be managed” and “idle”, and where possibilities for extraction, conservation and development appear unlimited. A second set of narratives relate to the problematization of deforestation as an effect of the smallholder and shifting cultivation practices. Closely connected, the third set of narratives relate to how narrowly defined market-based solutions to the imaginings of the frontier are rationalised and legitimated. We find these narratives to be largely similar across both the Congo Basin and Southeast Asia.

The earliest narratives attached to frontiers date back to the colonial-era and romanticize the faraway tropical forest as seemingly vast “empty” and “idle” land that could be controlled and converted into productive resources or rationally exploited through sound legislative frameworks and appropriate social and cultural transformations (Cleary,

¹ FairFrontiers - “Fair for whom? Politics, Power and Precarity in Transformations of Tropical Forest-agriculture Frontiers” - is funded by the Research Institute for Humanity and Nature, Japan from 2020 to 2026 (project no. 14200149).

² ForEqual - “The Forestry Sector as an Inequality Machine? Agents, Agreements and Global Politics of Trade and Investment in the Congo Basin” - is funded by the Volkswagen Foundation through the program “Social Inequality as a Global Challenge” from 2020-2024 (project 96064).

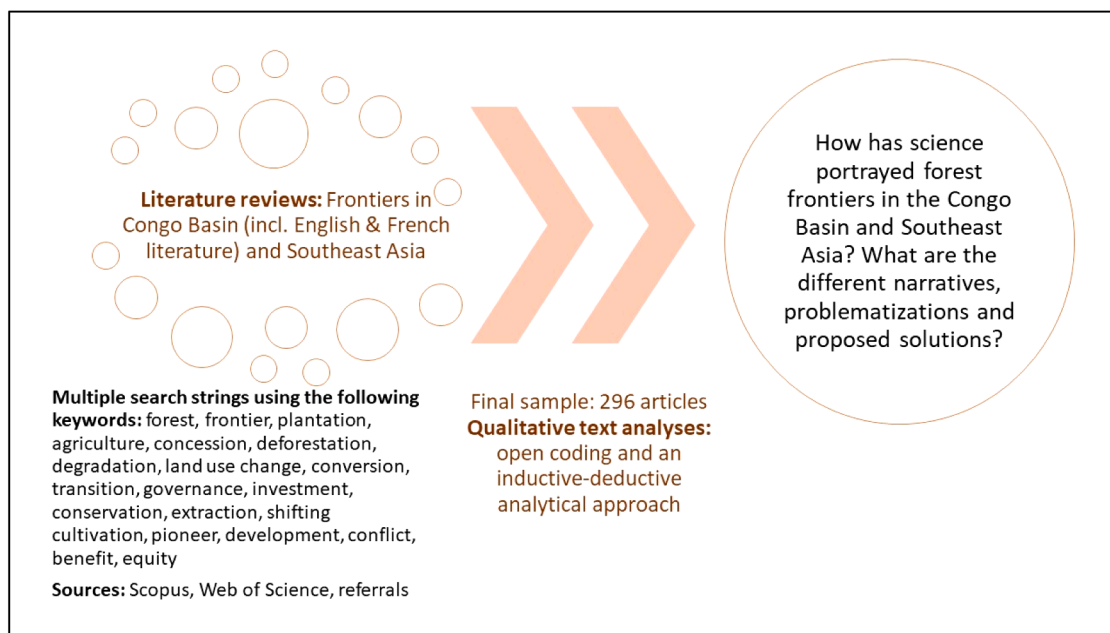


Fig. 1. Illustration of the method and approach used.

2002). First accounts of the Congo Basin tropical forests as spaces of untouched wilderness date back to the 15th century (Aubréville, 1947), and which were widely associated as being “vacant”, “ungoverned” and “masterless” (Rasmussen and Lund, 2018; Coquery-Vidrovitch, 1972). Similarly, Southeast Asia was seen as a region rich with natural resources “supposedly lying wasted and unclaimed, available to the rest of the world” (Doolittle, 2004, p.824). Table 1 provides additional details of how this narrative unfolds in the Congo Basin and Southeast Asia, highlights where it is criticized or contradicted and/or how it is intertwined within specific policies and development practice.

The narrative of forest frontiers as empty or idle is often used in tandem with negative viewpoints about rural societies and their land use practices. Rural societies are either ignored, i.e. absent from the “empty” frontier regions, or alternatively considered as the problem of deforestation and forest degradation (see Table 2). In particular, smallholders practicing shifting cultivation, perhaps the most common form of agriculture, are routinely identified as the driver of deforestation and environmental degradation across both Congo Basin and Southeast Asia, exacerbated by population growth and migration. Even though other drivers such as roads, commodity agriculture, mining and illegal logging are also discussed, the representation of shifting cultivation has been consistently dominant in both the English and French scientific literature since the 1950s (Tematio et al., 2001; Evans, 1950; Bandy et al., 1993). The problematization of shifting cultivation is also adopted and advanced by global institutions such as the Forest and Agriculture Organization of the United Nations (FAO) (FAO, 1957).

Both narratives have been employed by colonial and post-colonial governments to justify land appropriation in frontiers. Proposed solutions to the problem of shifting cultivation have revolved around the establishment of formal land and forest codes and development of intensified agriculture systems, the latter curiously not considered as a driver of deforestation but rather as a form of rational land use and a driver towards modernization and progress (Table 3). Cocoa-agroforestry is often promoted as a sustainable option with its purported biodiversity and carbon benefits and income earning possibilities throughout the Congo Basin (Bisiaux et al., 2009; Kotto-Same et al., 1997) and state-sponsored allocation of ‘available lands’ to foreign and domestic investors for large-scale plantations of timber, biofuels or food is often accompanied with narratives of scarcity (Borras and Franco, 2018; Pemunta, 2014; Scoones et al., 2019).

4. Discussion

Our critical review of the literature on forest frontiers in the Congo Basin and Southeast Asia highlight how dominant narratives intersect and reinforce each other to legitimate colonial exploitation of forest and land resources, and the enactment of colonial forest and land codes that have laid a deep-seated path in post-colonial policies. While there were considerable diversity in the rational practices of scientific forestry and territoriality across the colonial empires, these institutions “were not only ideational and practical, but that they enabled governments and private interests to accumulate huge amounts of capital at the time of and since their creation” (Vandergeest and Peluso, 2006, p. 32), thus generating power for the persistence and the *stickiness* of such institutions and interests till present day (Brockhaus et al., 2021).

4.1. Persistence of narratives of what to do, whom to blame, and who will solve it within contemporary science and policies at all scales

We also find that the identified narratives (see Tables 1–3, the understanding of frontiers as spaces of opportunity, local practices and people in need of change, and with market-based rationales as solutions) remain very much alive in contemporary times and are employed by various actors to justify policies for conservation, the expansion of intensive agriculture or extensive plantations, and other social development plans. The problematization of shifting cultivators and smallholders as “environmentally destructive” was taken up by the FAO post WW2, leading to a proliferation of scientific knowledge and policies aimed to “solving the problem” (Vandergeest and Peluso, 2006; FAO, 1957; FAO, 1974). In present day, this rhetoric still dominates official assessments of deforestation drivers and proposed policy solutions, despite available evidence of more prominent large-scale drivers such as commodity agriculture and global trade networks (Pendrill et al., 2019; DeFries et al., 2010; Lambin et al., 2001).

This problematization persists in national REDD + policy documents where despite acknowledgement of the impact of larger-scale drivers, the focus of most strategies and interventions to reduce deforestation and forest degradation was solely at national and more often, at local levels (Kissinger et al., 2012). In their review of Emission Reduction Program Documents (ER-PDs) from 12 countries submitted to the Forest Carbon Partnership Facility as of 2018, Skutsch and Turnhout (2020)

Table 1
Narratives used in the imagining of frontiers as “spaces of opportunity”.

Narratives	Cases from the literature	References	Criticisms, implications, causations and feedbacks
The frontier as empty land with vast resources for exploitation	The literature on Congo Basin presents a colonial narrative of “inexhaustible supply” of forests that justified imposition of regimes and land legislation that enabled extraction by colonial settlers and companies.	Coquery-Vidrovitch, 1972; Ndami, 2017; Oyono, 2013; Puyo, 2005; Rossi, 1999	Colonial expeditions were followed by private companies vying to extract timber, rubber, and ivory. In exchange for extraction rights, companies built and maintained infrastructure and transportation networks, which Coquery-Vidrovitch (1972) argued gave these industries considerable jurisdiction over future development trajectories and resource governance. The same discourse of massively available ‘vacant land’ is repeated in the land grabbing of DR Congo since the early 2000 s. Peemans (2014) argues that the deliberately repeated invocation that only 6.7 million hectares (or 3 % of DR Congo area) are currently cultivated, falsely gives the impression that the peasants will not be threatened by the 11 million ha of concessions lined up by the State for investments.
	In mainland Southeast Asia, the borderland regions of Laos, Cambodia and Vietnam was seen as an “unsettled” or unpopulated frontier in the colonial conflicts between Siamese (Thai) and French.	Barney, 2009; Cleary, 2003; Einzenberger, 2016	France’s trade and capitalist interests were integral to its Indochinese colonization project and the borderland frontiers is a space characterized by the assembling of institutions around particular resources, e.g. to extract rent from existing agriculture (rice), to enable exploitation of valuable resources (timber), and to create available land for commodity agriculture production (rubber, tea, coffee) (Mahanty, 2022). Yet, frontiers are continually in

Table 1 (continued)

Narratives	Cases from the literature	References	Criticisms, implications, causations and feedbacks
			formation – the 21st century frontier neoliberalism of Laos is driven by new corporate capital to exploit natural resources and a supporting array of land reform programs that create new enclosures and marginalization of rural populations and farmers under the state’s Turning Land into Capital policy since 2006 (Barney, 2009; Kenney-Lazar et al., 2018).
The frontier as a “waste land” to productively cultivated	The British North Borneo Chartered Company introduced a land code in what is now Sabah state in Malaysia, where lands classified as “waste” or “uncultivated” are granted to British and European companies for “mise en valeur” plantation development. One of the first acts of James Brooke in what is now Sarawak Malaysia was to seek a codification of land tenure. The 1863 Land Regulations gave the Brooke regime rights over all ‘unoccupied and waste lands’ which the Brooke administration could then lease out to individuals and companies.	Cleary, 2002, 2005b, Doolittle, 2004 Cleary and Eaton, 1996; Majid Cooke, 2002	The British colonial land code of 1883 defined “customary” tenure as the possession of land by “natives” by continuous residence or cultivation for 3 or more consecutive years, or otherwise considered as abandonment or “waste”. This interpretation excluded indigenous communities practicing extensive shifting cultivation or grazing – and enabled colonial use of the land for tobacco plantations, which was actually even more environmentally degrading (Doolittle, 2004). This narrative is reflected in contemporary revisions to colonial-era legislation in Sabah (2009 Amendment to the 1930 Sabah Land Ordinance), where the issuance of communal titles to indigenous communities for lands on which they have established customary rights were granted on the condition that the lands are to be used for large-scale cultivation of commercial crops, like oil palm (

(continued on next page)

Table 1 (continued)

Narratives	Cases from the literature	References	Criticisms, implications, causations and feedbacks
	The German colonial administration laid claim on all unoccupied parcels of land which ere unilaterally declared as <i>terra nullius</i> (as belonging to no one and therefore in need of reclamation). Post-colonial Cameroon’s 1974 Land Ordinance reinstated the concept of “vacant and ownerless land” to be claimed as national lands for development.	Pemunta, 2013, 2014; Kelly and Peluso, 2015; Njoh, 2000	Lunkapis, 2013; Majid Cooke, 2013). The postcolonial Cameroon state has appropriated the discourse of <i>terra nullius</i> through its creation of agricultural frontiers as governable spaces (Pemunta, 2014). The 1974 Land Ordinance (which still remains in practice in 2022) stipulates that all land that is untitled and lacking physical signs of ownership such as permanent cultivation was “National Lands” – allowing the State control to “ensure rational use of land in the ... imperative interest of defense or the economic policies of the nation” (Njoh, 2000, p. 255). The discourses of vacancy have enabled state-run companies to take over former colonial plantations (Gerber and Veuthey, 2011), which was then later transferred to private companies during the structural reforms of the 1990s and early 2000s, processes that have repeatedly led to the displacement and dispossession of smallholders and indigenous hunter-gatherers without formal titles (Oyono, 2005; Pemunta, 2013).
	The concept of vacant and wastelands allowed colonial and postcolonial states to claim lands for <i>mise en valeur</i> (to put into production). British institution of land laws into Myanmar (circa 1839) aimed to convert waste lands into productive cultivation as part	Ferguson, 2014; Kusakabe and Myae, 2019; Kenney-Lazar and Mark, 2021	Pemunta (2014) argued that ‘new enclosures’ to enable <i>mise en valeur</i> in Cameroon during the structural adjustment period of the 1990 s took place at the very sites of the former colonial frontiers. This time however, foreign investments and land grabs are facilitated and financed by global actors such as the World Bank, EU and

Table 1 (continued)

Narratives	Cases from the literature	References	Criticisms, implications, causations and feedbacks
	of its revenue model.		foreign governments (France, China, the US) through privatization and trade liberalization (Oakland Institute 2011). Waste Lands in Myanmar under British colonial rule often included communal areas used for livestock grazing and by nomadic tribes and lands left in fallow from shifting cultivation practices. The concept of wasteland was persistent throughout the different governments of post-colonial Myanmar – the Army Government established a Central Committee for Management of Cultivable Land, Fallow Land and Waste Land in 1991, and this was then reframed by the democratic Government as Vacant, Fallow and Virgin Land Management Law in 2012 – both with the same aims to control indigenous peoples’ claims and allocate land holdings for state enterprises and international investors. French colonial policy in Cochinchina (modern day southern Vietnam) was rooted in the exercise of power over land, resources and people as its “mission civilisatrice”. Cleary’s (2003, 2005b) examination of archival material indicated forced use of the Land Code to replace communal forms fo tenure and secure colonial rights, which could be used as collateral for the <i>mise en valeur</i> of the territory for colonial enterprises

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Table 1 (continued)

Narratives	Cases from the literature	References	Criticisms, implications, causations and feedbacks
			in the plantation sector. This practice was later extended to the French colonies in Annan (Cambodia) and Tonkin (Laos).

astutely observed that the while shifting cultivators and smallholders are not necessarily 'blamed' in REDD + national policy documents, this narrative is more subtly reflected in the very prominent position that local communities and indigenous peoples have been given in REDD +. This position reflected arguments about their needs for livelihood co-benefits and protection via safeguards, and more fundamentally, with policy actions or 'equity solutions' directed towards shifting cultivators and smallholders, the pivotal role or 'burden' that is envisaged for them in carrying out REDD + activities to reduce deforestation and forest degradation (Wong et al., 2019). Skutsch and Turnhout (2020) analysis showed that Laos was only one of three countries in their sample that identified large-scale and industrial actors as directly responsible for over 50 % of deforestation. Further, the country has linked the challenges of harmonizing land tenure security with unfulfilled opportunities for land investment for economic growth "resulting in the wasting use of land, illegal possession of public land-forest, unlawful granting of land use rights over state land to individuals" (Party Resolution on Land August 2017, cited in Laos ER-PD (FCPF (Forest Carbon Partnership Facility), 2018, p. 9)). Yet, it is curious that Laos has directed the bulk of REDD + projects and financing since 2009 not to addressing the large-scale drivers, but instead towards protected areas and to the Northern provinces that is largely characterized by its mountaineous topography and remoteness, ethnic diversity and persistent poverty (Dwyer & Ingalls, 2015). This has prompted many observers and scholars to conclude that REDD + is yet another tool of territorialization employed by the State to legitimate their long-held targets to 'stabilize' shifting cultivation, and to protect the State's political and development interests that emphasize large-scale land, infrastructure and hydropower investments (Cole et al., 2017; Ingalls and Dwyer, 2016; Kenney-Lazar et al., 2018; Ramcilovic-Suominen, 2019).

Some institutions have shifted narratives. The FAO's infamous appeal to governments, research centers, associations and private persons to help in the campaign to overcome shifting cultivation in 1957 has influenced generations of research and mindset, supported by allocation of global funding and technical assistance (Bryant, 1996), in the thinking of shifting cultivation as the "greatest obstacle to ... immediate agriculture production" (Fao, 1957). 'Shifting cultivation problems' were discussed at length at numerous FAO conferences on soil fertility and fertilizer use in Ibadan in 1962 and 1973, Dakar in 1965, and Addis Ababa in 1970 (FAO, 1974). More recently however, FAO recognized that "shifting cultivation is in ecological balance with the environment and does not irreversibly degrade the soil resource, provided a sufficient length of fallow is allowed for soil restoration" (FAO, 2015) and acknowledged that shifting cultivation is an important livelihood and food security system for the indigenous communities (FAO and Alliance of Bioversity International and CIAT, 2021). However, these latter publications are produced by the FAO's Indigenous Peoples Unit and it is unclear to which extent this represents an actual paradigm shift that would lead to changes in long-held policies and interests. As of today, it appears that the well-trodden narrative of equating productivity with progress and modernity continues to dominate mindsets in policy and practice.

Table 2

Narratives of rural societies and local practices in need of change in frontier regions.

Narratives	Cases from the literature	References	Criticisms, implications, causations and feedbacks
Shifting cultivators as a driver of deforestation and degradation	Alongside roads and population growth, shifting cultivation and small-scale farming is consistently identified as the main driver of deforestation in the Congo Basin. More recent literature highlights agro-industrial plantations. Similarly, literature from Southeast Asia highlight how governments often ignore - and protect - deforestation by capital-intensive and state-sponsored forms of development.	Global studies: Bryant, 1996 Congo Basin: Duguma et al., 2014; Saha et al., 2014; Gillet et al., 2016; Saha, 2019; Southeast Asia: Andersen, 2016; Broegaard et al., 2017; Woods, 2015	The focus of scientific research on shifting cultivation as a driver of deforestation persists throughout colonial and contemporary literature, despite a growing body of literature that provide more nuanced and contradictory, or point to insufficient, evidence to the claims (Fox, 2009; Mertz et al., 2009; Ickowitz, 2006). Similarly, emphasis on the negative environmental effects of shifting cultivation (FAO, 1974) is increasingly countered with evidence that presents more nuanced findings (Lestrelin, 2012; Rerkasem et al., 2009). However, the simplistic problematization continues to be prominent not only among government officers but is also reproduced by many international and domestic organisations and consultants and civil society organisations in their financing decisions and in their conservation-development initiatives till today (Cole et al., 2017; Oakland Institute 2011, 2020, Ramcilovic-Suominen, 2019; Sato, 2000). This problematization is reinforced through policy solutions that emphasize responsibilities of forest-dependent communities and smallholders to protect and conserve forests, as in the case of REDD + strategies (Skutsch and Turnhout, 2020).
Shifting cultivators as backwards and poor	In the Congo Basin, shifting cultivation was seen as a "kind of	Aubréville, 1947, p.21 Aiken and	This narrative is still echoed today within the Congo Basin (Tematio et al., 2001;

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Table 2 (continued)

Narratives	Cases from the literature	References	Criticisms, implications, causations and feedbacks
	fatality seems to doom the countries ... to eternal physical and intellectual stagnation.” The same narrative was prominent in Southeast Asia, where swidden cultivators are regarded as “lower quality people” in Southwest China to “isolated backward populations” in Indonesia, and positioned as the “other” to the government and society.	Leigh, 2011; Fox, 2009	Bweya et al., 2019) and instrumentalized in current conservationist developmental policies (Camara et al., 2012; Pemunta, 2013). Shifting cultivation is seen as irrational or unproductive, the literature is filled with ‘rational’ land management solutions to increase yield and integrate farmers to local and global markets (Kotto-Same et al., 1997). In Southeast Asia, this narrative is used to justify long-standing policies to resettle shifting cultivators (considered as the driver of deforestation and forest degradation) and facilitate intensive agriculture and plantations (see for example, McAllister (2015), Kenney-Lazar (2013) and Evrard and Goudineau (2004) for case of Laos, and Andersen (2016) for Sarawak). Borras and Franco (2018) noted that the same narratives are repeated in more recent climate change and green economy movements and used to justify market-based underpinnings of such movements – “many (if not most) of which are attempts at commodifying nature” (p.1309). There are far-reaching consequences as the narratives’ problematizations have racial consequences in their proposed solutions. Woods and Naimark (2020) highlight how international conservationist organisations specifically target the Karen people in Myanmar against swidden and betel nut cultivation, and global environmental discourses were used to legitimate forced
	FAO (1957) appeal to “governments, research centers, associations and private persons who are in a position to help” was aimed to stimulate research to address the “problem” of shifting cultivation, deemed as “a backward type of agriculture practice” and “a backward stage of culture in general”.	Mertz et al., 2009, p.259, FAO, 1957	

Table 2 (continued)

Narratives	Cases from the literature	References	Criticisms, implications, causations and feedbacks
			displacements of Karen civilians during the military government.

Pemunta (2014) argues that the old colonial discursive repertoire of *terra nullius* (as belonging to no one and therefore in need of reclamation) has been used by the post-colonial state of Cameroon “to figuratively nullify space, enclose it”, and then hand it over to foreign entrepreneurs for ‘development’ (p. 40). This framing gives capitalist development a redemptive character: “the antidote to a condition of emptiness” (Makki and Geisler, 2011, p.7), without acknowledgment of the lives and livelihoods of forest hunter-gatherer groups and small-holders with customary rights. The Cameroon state’s embrace of the capitalist development model and “Western protectionism and nature aesthetics” are enabled by portrayals of Baka and Bagyeli indigenous knowledge system and land use practices as irrational (Clay, 2016; Pemunta, 2013), and thus, legitimating their exclusion from the development process (Oyono, 2005).

Narratives of liberating capitalist development are facilitated and conditioned by powerful global development agencies such as the World Bank, which has been instrumental in the persistence and appropriation of the *terra nullius* narrative today (Oakland Institute, 2011). In its report entitled *Awakening Africa’s Sleeping Giants*, the Bank painted a picture of ‘the world’s largest underused agricultural land reserve’ in West, Central, East and Southern Africa (World Bank, 2009, p.2) and proposed capitalist exploitation of this supposed empty land through intensive agricultural mechanization as “...in this region, low population densities and low mobility prevail, which suggests that agricultural intensification will require larger farm sizes” (World Bank, 2010, p.64). The Bank also provides direct financing of agribusiness firms and shapes client government’s investment climates through its Enabling the Business of Agriculture (EBA) initiative³ which “presents globally comparable data on regulations that are conducive to local, regional, and international business in agriculture” (World Bank, 2017, p.ix). The removal of regulations, or “reforms”, were lauded as successes to “help farmers grow their business” (World Bank, 2019), though the types of reforms promoted are likely to only benefit large-scale agri-businesses and foreign investments (Oakland Institute, 2020).

4.2. Territorialization as state control

Colonial territorialization processes that were in part meant to control shifting cultivation and other traditional land use practices have led to these practices being relegated as ‘residual land use’ that is either classified as degraded forest by the forestry sector or as idle wastelands by the agriculture sector (Padoch et al., 2007), and embedded within policies to be allocated for agriculture concessions throughout Southeast Asia (Thein et al., 2018; Lestrelin, 2012; Majid Cooke, 2006; Mertz and Bruun, 2017). The literature highlights how subsequent zoning of agriculture lands and forests has led to indigenous and local peoples’ customary lands redesignated for industrial tree plantations, state parks

³ The ‘Our Land Our Business’ coalition of 280 NGOs, farmer groups, grass-roots organizations, and trade unions (<https://ourlandourbusiness.org/>) has been lobbying for an end to the EBA since 2015, arguing that the ranking systems create a race-to-the-bottom between countries in terms of labor and environmental standards and land access protections, as the countries clamor for World Bank investment dollars.

Table 3
Narratives promoting rational ‘solutions’ in frontier regions.

Narratives	Cases from the literature	References	Criticisms, implications, causations and feedbacks
Scientific forestry as ‘progress’	The relationship between scientific forestry and colonial policy in Britain, France and Germany grew from its critique of indigenous practices and shifting cultivation. Shifting cultivation agriculture was seen as a practice to be “disciplined”.	Cleary, 2005a, cited in Cleary, 2005a	The mission of colonial forest engineers was the valorization of export commodities, and the protection of ‘endangered’ forests against the perceived ignorant and destructive local populations (Bryant, 1996; Cleary, 2005a). French legal frameworks were enacted over land and forest in Laos and Vietnam (Cleary, 2003, 2005a), in West Africa (Ballet et al., 2009); British land codes and forest institutions in North Borneo and Myanmar (Bryant, 1996; Cleary, 2002); Dutch forest laws in Indonesia (Vandergeest and Peluso, 2006); and the complexity of German, French and British land codes in Cameroon (Kelly and Peluso, 2015; Pemunta, 2014). Territoriality became an increasing priority for fledgling colonial Forest and Agriculture agencies and their work to delineate ‘neat’ administrative and territorial boundaries to manage forest and farm lands, and, by extension, practices within those zones (Vandergeest and Peluso, 2006).
Large-scale market development is still considered as the solution to chronic poverty and low productivity in frontiers in contemporary policies	The Malaysian Sarawak government argues that large-scale projects will “bring development to the people” by simultaneously using “idle lands” and “creating employment” to lift them out of poverty.	Andersen, 2016, Cramb, 2013	Forest fallow land was perceived as ‘idle’ or ‘empty’, and construed as a poverty trap and thus, should be developed for commercial plantations. Under the Sarawak state’s <i>Konsep Baru</i> land development program introduced in the

Table 3 (continued)

Narratives	Cases from the literature	References	Criticisms, implications, causations and feedbacks
	Cocoa and agroforestry is heavily promoted throughout the Congo Basin as a sustainable option to shifting cultivation.	Bisiaux et al., 2009	mid 1990s, only the private sector is permitted to develop these land resources under Joint Venture agreements, with native traditional rights and interests dismantled in the rush to establish oil palm commercial plantations (Ngidang, 2002). Majid Cooke (2006) argued that <i>Konsep Baru</i> is an expansion of state spaces into Native customary land and viewed by forest and agriculture officials as promoting Dayak indigenous people into the ‘mainstream’ of economic development, while keeping check on their potential for political organization. This racialized perspective of development can be traced to the colonial Brooke Administration over land and their own view as benevolent protectors of native law and welfare (Porter, 1967; in Majid Cooke, 2002). Studies highlight how liberalization of the cacao sector and subsequent price fluctuations lock farmers into a dependence on these production systems (Jagoret et al., 2009). Moreover, agroforests are often established by large multinational companies and aimed at export commodities (coffee, cacao and oil palm) with few benefits for the local population (Nasser et al., 2020).

and forest reserves for conservation, timber production or large-scale commercial plantations. In modern Malaysia Sabah, the process of issuing communal titles to indigenous communities for lands on which they have established customary rights has been an important enabling mechanism for control (Majid Cooke, 2013; Lunkapis, 2013). The Sabah Development Corridor Blueprint 2008–2035 envisioned oil palm as the main driver to alleviate rural poverty (IDS (Institute for Development Studies), 2007). On this basis, in 2009, the Sabah state government amended the 1930 Land Ordinance with a revision to Section 76, where communal titles are granted only on condition that such lands are to be used for productive cultivation of commercial crops, such as oil palm. Majid Cooke (2013) and Lunkapis (2013) suggested that Sabah state officials have revived colonial arguments of indigenous “backwardness”, and replaced this with a new object of intervention, i.e. “the vulnerable and the poor”, to allow for a type of development intervention that enables the state to exercise control over vast areas of land claimed under customary rights. Majid Cooke (2013) called this “deterritorialization” where forests cleared for plantations flatten ancestral memories of land, and options for future land use are lost. This mechanism of control required concerted alliances with different sectoral agencies within the State government, and private and state-owned companies willing to step in as joint venture partners with indigenous communities. International and national NGO actors such as WWF Malaysia and Forever Sabah were later engaged to support the certification of oil palm production as part of the Sabah ambition to be “the world’s first green oil palm state” by 2025 (Reuters, 2020).

The same practices are also in current conservation practices. Dominguez and Luoma (2020) equated modern conservation as similar to colonialism, where indigenous peoples are separated from their natural environments in order to “conserve” the land more productively. As Democratic Republic of Congo (DRC) holds one of the largest remaining areas of tropical forests, the country is expected to manage their resource for global biodiversity, climate change mitigation and carbon benefits. This narrative often juxtaposes traditional land uses and farming practices as unproductive and environmentally destructive, and devaluing traditional and indigenous knowledge system as irrational (Clay, 2016). Such narratives are often backed up by evidence from remote sensing studies which show forest loss caused by smallholder agricultural expansion (shifting cultivation) and resulting calculations of GHG stocks and emissions (Kotto-Same et al., 1997; Duguma et al., 2001; Moonen et al., 2019). These notions remain prominent in policy and political mindsets, despite uncertainties in the technology that has “...resulted in low model accuracy for the commodity-driven deforestation class in Africa; much of the commodity-driven deforestation was misclassified as shifting agriculture” (Curtis et al., 2018, p. 362).

The literature provides many cases of transnational investments in timber extraction and commodity plantations for the global market, and the state policies that create enclosures to facilitate exploitation of these ‘resource frontiers’, which often enable governments and business elites to capture the vast majority of benefits (Jayne, 2014; Ngidang, 2002; Singh, 2020; Woods, 2015). Kelly and Peluso (2015) argued that “today’s frontiers of capitalism are not remote or ‘newly discovered’ spaces. Instead, these frontiers are new commodity forms within the confines of already formalized state lands ... some of which were a product of capital’s working through the state to dispossess competing land claimants” (p. 475). One such example is the state of Sabah’s controversial Nature Conservation Agreement (NCA) unveiled at the Glasgow Climate Conference of Parties in 2021. The NCA is a profit-sharing deal between the State government and a private company, Hoch Standard, to market carbon and other ecosystem services from over two million hectares of protected forests for the next 100–200 years (Mongabay, 2021a). Hoch Standard stands to gain 30 % of all future revenues from carbon credit sales and sees this as an opportunity to unlock Sabah’s “lazy assets” (The Vibes, 2022). With regards to the lack of consultation with local and indigenous communities, Sabah’s Deputy Chief Minister Kitingan said that they had already been consulted when the forests were classified as

protected areas and as such, “there was no obligation to include these groups in working out the deal”, implying the absence of rights (Mongabay, 2021b). State lands thus become frontiers when changes in broader (and global) political economy, logics of economic development and flows of new discourses re-arrange the relationships between capital, society, and state authorities, often creating new forms of marginalizations and peripheries (Barney, 2009; Mahanty, 2022).

5. Conclusions

While colonial narratives of frontiers have focused on extraction of natural resources and expropriation of land for plantations for colonial profits, a similar pattern in twenty-first century occurs across Congo Basin and Southeast Asia with colonial powers replaced by new transnational corporate investments, supported by an array of post-colonial land reform and agrarian development programmes. The ever-increasing demand for forest resources, land for agro-commodity regimes and industrial biofuel energy is built on old narratives of available excess, empty or idle land and justified by crisis narratives of scarcity (Scoones et al., 2019; White et al., 2012). This form of hyper “neoliberalist-frontiers” (Barney, 2009) will likely continue to drive dramatic changes in socio-ecological landscapes, as well as new and old patterns of marginalisation and livelihood insecurity among rural populations. Our review reinforces previous findings where (to paraphrase Doolittle, 2004) both colonial and postcolonial governments and science have systematically portrayed rural people’s needs for natural resources as unacceptable, merely for subsistence and in need of state intervention, while extra-local exploitation of natural resources have been protected for its efficiency and productivity.

Critical studies of frontiers examine how resource-rich spaces have been, and are continuing to be incorporated into global markets and trade networks (Cons and Eilenberg, 2019), and as ongoing projects of territoriality, market formation and state making (Kelly and Peluso, 2015; Peluso and Lund, 2011; Rasmussen and Lund, 2018). This literature has moved beyond the colonial notion of frontiers as borders or edge of empires, and beyond ideas of frontiers as wilderness, wastelands or resources waiting to be developed. However, much of the literature do not provide adequate space to the diverse experiences of local people (mentioned in our review as smallholders, shifting cultivators, peasants, traders, migrants, indigenous communities, forest-dependent peoples, hunter-gatherers, laborers), their negotiated responses, struggles, contestations and resistance to transformations in the frontier, with few exceptions (e.g. Barney, 2009; Mahanty, 2022; Pemunta, 2014; Tsing, 2005). While this gap can, in part, also be attributed to our choice of search terms in the identification of the literature for this review, we believe that an ethnography of frontier change will be a rich area for future studies, particularly to examine intersectional and gendered perspectives (and their embedded power relations), and everyday politics in changing frontiers.

More comprehensive understandings of the role of science in the legitimization of frontier change and commodification will be needed to inform a new research agenda that is open to alternative framings of the frontier problem. While it is a challenge to be able to draw direct causalities between science and policy within this review, our findings suggest that there are links between global and national finance and political interests in the frontiers and science that supports and legitimates such interests. Contradictory evidence tends to be overlooked and do not appear to affect policy change, at least in the short- to mid-term. We argue that new research should actively recognize entrenched narratives, and is sensitized to more just alternatives to frontier development beyond entrenched interests and capitalist state and corporate land accumulation and territorialization for large-scale industrial farming in the name of “progress”.

CRedit authorship contribution statement

Grace Y. Wong: Conceptualization, Methodology, Investigation, Writing – original draft, Supervision, Funding acquisition. **Minda Holm:** Data curation. **Niina Pietarinen:** Data curation. **Alizee Ville:** Data curation. **Maria Brockhaus:** Conceptualization, Methodology, Writing – review & editing, Supervision, Funding acquisition.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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