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## Remaking of Wetlands and Coping with Vulnerabilities in Mexico and Indonesia

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**ABSTRACT:** This article analyses people's water-land relations in transformed wetlands through a lens that conceptualises aquatic and terrestrial aspects in wetland-dwellers' living spaces as blurred and shifting. By drawing on empirical research in Tabasco, Mexico, and Central Kalimantan, Indonesia, we examine how wetlands have been recurrently remade amidst multifaceted development interventions and how local people perceive and experience waterscape changes in their lives and livelihoods. There has been a strong emphasis on wetness and fluidity in research on riverine, deltaic, and other amphibious environments; however, we argue that privileging water as an analytical concept makes it hard to understand changing water-land fluctuations in wetlands as *wet-lands*. By combining ideas from political ecology, critical geography, and anthropology of water, our analysis shows how local people engage in making watery areas more solid in order to get their land rights recognised and to cope with socially differentiated vulnerabilities within multifaceted state territorialisations and corporate resource-makings.

**KEYWORDS:** Development interventions, political ecology, vulnerability, water, wetlands, Indonesia, Mexico

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### INTRODUCTION

*Earlier the floods didn't affect us so much. People had houses that were adapted to water. On the second floor, there was a tapanco [store] to cook during a creciente [water rise] ... We ate much fish; there was mojarra, castarica, pejelagarte ... All this has begun to change since the irrigation and the oil boom (Sergio, Las Maravillas, Tabasco, Mexico, September 2016).*

*There was plenty of fish in the beje [fishpond] ... There were rarely forest fires as it was still a natural forest. It was the corporation that destroyed the forest ... Thereafter the Mega Rice Project excavated waterways and land became increasingly dry (Anter, Sei Tobun, Indonesia, February 2019).<sup>1</sup>*

These kinds of narratives of change, frequently heard in our fieldwork sites in Tabasco, southeastern Mexico, and in Central Kalimantan, Indonesia, raised our interest in understanding how people inhabiting drastically altered wetlands perceive and cope with the environmental changes and cognate vulnerabilities entangled with their lives. This article focuses on how Tabascan and Central Kalimantan wetlands have been transformed through recurrent remakings and how residents experience and give meanings to waterscape changes affected by multifaceted interventions. By juxtaposing people's views

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<sup>1</sup> All the names of the informants and the villages have been pseudonymised to protect people's privacy.

of living in the wetlands' fluctuating milieus with an analysis of how these environments have changed since the 1950s, we provide insights into the processes that shape people's lives in wetlands and into the vulnerabilities these transformations entail.

According to Ramsar's (1971) definition, the term 'wetland' refers to "areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six metres". Globally, millions of people inhabit or depend on such areas for their livelihoods (CIFOR, 2021; Ramsar, 2018). Although human living conditions in wetlands are shaped by prevailing hydroecologies, population density, infrastructure, socioeconomic circumstances, and cultural practices, dynamic water-land interactions and people's close involvement with them compose a key characteristic of wetland life. For decades, state authorities and political decision-makers have considered wetlands as obstacles to development, disease-ridden places of mud, and cradles of flood hazards, which have been dried, drained, and dredged to transform the chaotic, muddy waterscapes into modern, systematic fields of production (McLean, 2011). In recent years, however, conservation scientists have advocated wetland restoration for biodiversity conservation, carbon storage, water filtering, and flood protection (Giosan et al., 2014; Moreno-Mateos and Comin, 2010; Zedler and Kercher, 2005); meanwhile, landscape planners have become interested in traditional wetland habitations for the insights they may provide into how to live with water and cope with floods (da Cunha, 2018).

To analyse the recurrent remakings of wetlands, we engage in recent debates concerning state territorialisations, corporate resource-makings, infrastructural interventions, and changing environmental-social relations (Boelens et al., 2018; Goh, 2019; Harris, 2017; Li and Semedi, 2021; Lund, 2016; Scaramelli, 2018; Vandergeest and Peluso, 1995). We analyse the remakings of Tabascan and Central Kalimantan wetlands through what we call a 'political ecology of wetlands', drawing inspiration from discussions of shifting water-land interactions in human geography, global development studies, and anthropology of water (Ballesteros, 2019; Boelens et al., 2016; Hastrup and Hastrup, 2016; Krause, 2017; Linton and Budds, 2014; Nygren, 2021; Richardson, 2018; Swyngedouw, 2015).

We argue that privileging water as an analytical concept makes it hard to grasp local people's perceptions of their surroundings in Tabascan and Central Kalimantan wetlands and their involvement in the remaking of these environments by filling watery places with mud and preventing silting of waterways through vegetation clearing and dredging. Drawing on the ideas of Krause (2017, 2021) and Richardson (2018), we suggest that paying attention to water-land fluctuations in wetlands as *wet-lands* reveals how societal valuations of wet and dry change over time based on new inventions and new interventions. While wetlands were in earlier times seen as wastelands of mud, now these 'lands of mud' – a mixture of sediment and water – are envisioned as having an important role in combatting climate change and pollution due to the role of mud bacteria in recycling carbon, nitrogen, and phosphorus (Pennisi, 2020). Rather than placing an overwhelming focus on either wetness or solidity, liquid and solid need to be analysed in wetlands in relation to particular activities (Krause, 2017: 406). River dredging or draining cannot be reduced as either aqueous or terrestrial; they have tight linkages to shifting water-land interactions and related politics.

In both Tabasco and Central Kalimantan, hydroecological conditions and local livelihoods have undergone drastic changes since the 1950s. In Tabasco, modernisation projects by the federal government, the World Bank, and the Rockefeller Foundation have transformed the wetlands of Chontalpa region into fields for irrigated agriculture, cattle raising, and sites of extensive oil and natural gas extraction. Large hydropower dams were built on the upper Grijalva River and flood-prevention infrastructure in the lower course (Tudela, 1989). Recently, there have been calls for wetland restoration based on wetlands' role in climate change mitigation, biodiversity protection, freshwater storage, and human recreation (SEMARNAP, 2000). In Central Kalimantan, irrigation and transmigration programmes expanded the Dutch colonial projects of swampland drainage and canal building since the 1950s (Sulaiman et al., 2019). In the 1990s, extensive logging and the Mega Rice Project turned 1 million

hectares of forests into peatlands, while state-led restoration projects are now seeking to return drained areas to wetlands through village-based initiatives (BRG, 2019).

With these two cases, we seek to provide insights into how recurrent remaking of wetlands and associated processes of dredging, draining, drying, sedimentation, salinisation, and soil contamination expose local residents to multifarious vulnerabilities. In Tabasco, people cope with devastating floods and contaminating hydrocarbons; in Central Kalimantan, they struggle with mercurial droughts, floods, and forest fires. To understand people's altered livelihoods and lifeworlds, we have drawn upon archival and ethnographic-oriented research conducted in Tabasco and Central Kalimantan between 2011 and 2019, examining negotiations and contestations between state authorities, private companies, and local residents over the kinds of environments wetlands should be, whose uses they should serve, and by whose authority they are to be governed.

In the following section, we present recent theorisations on watery environments and formulate an approach for studying wetland changes as processes wherein sociopolitical arrangements shape water-land interactions and vice versa. The third section presents our research contexts and methods, while the fourth examines interventions implemented in Tabascan and Central Kalimantan wetlands, along with the multifaceted politics involved. In the fifth, we analyse how local residents reconfigure their livelihoods and give new meanings to water and land in altered waterscapes and differentiated power relationships. We conclude by suggesting that empirically grounded, comparative analyses of how wetlands are reproduced amidst recurrent state territorialisations and corporate resource-makings provide insights into how drastic changes in waterscapes affect people's forms of living, senses of security, and feelings of justice.

## THE POLITICAL ECOLOGY OF WETLANDS

There has been an increased interest in watery environments in political ecology, human geography, and environmental anthropology based on efforts at challenging modern nature/culture and water/society dichotomies (Krause, 2017; Perreault et al., 2018; Rasmussen, 2015; Scaramelli, 2018; Swyngedouw, 2009, 2015). This has promoted a rich body of literature on waterworlds (Bakker, 2012; Barnes and Alatout, 2012; Hastrup and Hastrup, 2016) and "thinking relationships through water" (Krause and Strang, 2016; Reinert, 2016). Special attention has been paid to life in amphibious environments – referring to riverine and coastal areas, wetlands, and other milieus where categories between wet and dry are fluctuating and transitional (Ballester, 2019). In amphibious anthropology, there has been interest in exploring "the production of place at the confluence of land and water" (Gagné and Rasmussen, 2016: 136), and how people perceive the intermingling of land and water in their amphibious lifeworlds (Pauwelussen and Verschoor, 2017).

Here, we propose a political ecology of wetlands to overcome a tendency to prioritise wetness and watery lifeworlds in research on amphibious environments. As Ballester (2019: 406) and Richardson (2018: 12) note, we should be cautious of categorically conceptualising watery environments around circulation and fluidity, as such views can strengthen land/water dichotomies. This trend becomes clear in the statements that people living in amphibious environments have, by definition, a distinct relationship with water and that their life is organised predominantly around water (Morita and Jensen, 2017). In our view, to subvert the essential categories of land *versus* water prevalent in mainstream water-management plans, land-use policies, map-makings, and landscape imaginaries, careful analyses of shifting *water-land interactions* are needed (da Cunha, 2018).

Challenging such views requires an empirically grounded comparative approach if we are to understand what landscape fluctuations indicate – conceptually and materially – in variegated environments and for different people (Boelens et al., 2018; Lahiri-Dutt and Samanta, 2013). While recent research on amphibious environments helps displace the terracentrism characteristic of modern landscape planning, local experiences of wetland life remind us that the amphibious should not be

equated only with water and its encirclement (Richardson, 2018: 6). The political ecology of wetlands provides opportunities for understanding that local people have often been actively engaged in the (re)making of wetlands from wet areas to more solid lands amidst prevailing policies and development interventions. Although traditional wetland-dwellers allowed temporary water flows in their fields and living places to practise flood recession agriculture and fishing (Peraza-Villarreal, 2019), the requisite for these residents to get their usufruct rights institutionally recognised has for decades been to make watery places more fixed and to terrestrialise their living through formal settlements and sedentary agriculture.

Political-ecological perspectives challenge terracentric frameworks by highlighting the tight interweaving of the hydrological with the social, and the ecological with the political in environmental changes (Linton and Budds, 2014; Nygren, 2021; Swyngedouw, 2015) and by showing how the management of wetlands includes politics that inscribe shifting values on landscapes (Boelens et al., 2018; Lounela, 2021a; Perreault, 2014). These politics have close connections to state-making, wherein governmental authorities seek to legitimise their authority in resource-rich peripheries (Folch, 2013; Lund and Rachman, 2018; Mathevet et al., 2015). Our study builds upon anthropological and political-ecological literature related to people's efforts to cope with drastic changes in their lived environments and the vulnerabilities created by state territorialisations (Broad and Cavanagh, 2021; Lahiri-Dutt and Samanta, 2013; Nygren, 2018; Richardson, 2018; Scaramelli, 2018). We contribute to this literature by showing how residents' experiences of 'stateness' emerge as an effect of development interventions (Harris, 2012; Gupta, 2012; Rasmussen and Lund, 2018; Stensrud, 2019) and how residents' struggles to adjust to, deflect, cope with, and contest the multifaceted interventions are linked to recurrent agendas of state-making and corporate resource-making.

Beyond official regulations and formal hierarchies, politics also work through invisible norms and shadow practices, producing institutional pluralism (Boelens et al., 2018; Cleaver and de Koning, 2015; Roth et al., 2015; Sud, 2017). Therefore, attention needs to be directed beyond overt strategies to unofficial forms of governance and subtle tactics of control, in order to understand the ways in which power relations interweave with the modalities through which wetlands become enrolled in state-making and capital accumulation, generating profit for some and impoverishment for others (Swyngedouw, 2015: 34). Understanding livelihood changes in wetlands requires consideration of multi-scalar politics.

Development interventions are tightly interwoven with various kinds of infrastructural projects, which in turn influence the forms certain landscapes acquire and the meanings they are given (Appel et al., 2018; Käkönen and Nygren, 2022; Salas Landa, 2016; Shah et al., 2021). Infrastructure does not simply operate 'out there'; it produces prospects that sometimes take fetish-like forms (De Boeck, 2011; Kaika, 2006; Schindler, 2019). Yet, many infrastructural projects fail to fulfil the promises given to the targeted populations and thus need to be repeatedly regenerated, often with symbolic meaning-making, in order to reinforce institutional authority through clientelist arrangements (Coates and Nygren, 2020; Gupta, 2012). Political ecology provides enriched understanding of how political-economic interventions, associated infrastructure, and related rationalities of governance are formulated through the dynamic interplay of the material and metaphorical (Boelens et al., 2018; Hommes et al., 2020).

Recent approaches of political ecology and anthropology of water also emphasise how attempts to bring water's unruliness under human control often fail due to water's ability to disrupt human-imposed water/land divides and socio-spatial orders (Goh, 2019; Linton and Budds, 2014). While conventional political ecology has mainly focused on the effects of development interventions on humans, our analysis attends to dynamic human-nonhuman interactions by considering how the environmental transformations produced by development interventions further remodify the wetland circumstances (Collard et al., 2018; Krause, 2021; Lounela, 2021b; Tsing, 2017). This requires sensitivity to the environmental hazards and harms produced by interventions. Yet, we are cautious of arguments that propose that natural forces have an intentional agency, as such conceptualisations risk concealing human responsibility in environmental change (Castellanos-Navarrete, 2021; Nygren, 2021). Many wetlands with

volatile hydrologies are also sites of volatile politics, which together produce waterscape changes and cognate vulnerabilities.

This indicates that environmental governance needs to be examined not only as "governance of nature" but also as "governance through nature" (Boelens et al., 2018: 4), acknowledging the role of wider political-economic forces in producing particular socio-natural configurations. Such interventions are articulated not only around the "conquest of nature" but, as Swyngedouw (2015: 2) emphasises, around "the will to transform nature", both materially and symbolically. The production of new landscapes through these kinds of nature commodifications often implies spaces of privilege and marginality, as well as socially differentiated exposure to hazards and harms. In many wetlands, local residents have been actively involved in the remaking of their surroundings amidst shifting policies and rationalities of governance, although not necessarily in ways they foresee or desire (Cleaver, 2018; Lounela, 2021b; Lund, 2016; Nielsen, 2011; Nygren, 2016).

## CONTEXTS AND METHODS

Both Tabascan and Central Kalimantan waterscapes are dominated by large rivers and extensive wetlands (Figures 1 and 2). The wetlands cover 985,000 hectares or 40% of the territory of the State of Tabasco (CIFOR, 2021), containing *popales* (marshes dominated by *Thalia geniculata* L.), *tulares* (marshes dominated by *Typha domingensis* Pers.), mangrove swamps, and hundreds of permanent and temporary lagoons. The Grijalva and Usumacinta rivers with their 46 tributaries begin in Guatemala and traverse the mountains of Chiapas to the Tabascan wetlands, producing discharges of 31% of the surface runoff in Mexico (Horton et al., 2021a).

Recently, the Grijalva has been classified as the eighteenth riskiest deltaic river in the world (Tessler et al., 2015). During heavy rains, the water level can rise 3 metres in 12 hours, and serious inundations, recorded since the early 1800s, are becoming more devastating. The 2007 flood affected 1.5 million people and caused damage of 3 billion USD (Aparicio et al., 2009); the 2020 flood had equally devastating effects (*El País*, 23 November 2020; *Tabasco Hoy*, 26 November 2020). For thousands of years, indigenous Chontal-Maya made their living in these wetlands. The population centres were located along the rivers used for transport until the 1950s, and residents focused on fishing, flood-adjusted agriculture, and itinerant trading as sources of living (García García, 2013).

In Central Kalimantan, on the island of Borneo in Indonesia, the wetlands cover 4,232,500 hectares or 28% of the region's land area (CIFOR, 2021). The Kahayan River, along which the studied Ngaju Dayak communities are located, is the second largest river in the province. Since 1997, fires have caused widespread damage to swamplands, with the most recent crisis occurring in 2019 (*BBC News Indonesia*, 24 August 2019).

Ngaju Dayak have lived in these swamplands for centuries, practising shifting cultivation, rubber and rattan collection, horticulture, fishing, and cash cropping of cassava and pepper (Scheer, 2016). Dayak is a generic name for these indigenous groups. However, earlier residents named themselves after the rivers; for instance, people in the village of Sei Tobun (pseudonym), where the second author conducted fieldwork, called themselves *uluh Kahayan* after the Kahayan River. In the late 19<sup>th</sup> and early 20<sup>th</sup> centuries, when the Dutch pushed people to give up their mobile lifeways and settle down, the Ngaju extended their land rights by digging small channels to swamp forests (Lounela, 2021a).

Figure 1. Landscape of Tabasco (Centro Documental de Estudios sobre el Agua, CDEA, Tabasco, Mexico, 2018, with permission).



Figure 2. Swamp landscape of Central Kalimantan (Rifky with permission from Rekam Nusantara, 2021).



Since the 1950s, both Tabascan and Central Kalimantan wetlands have experienced massive development interventions. In Tabasco, the government has invested in large hydropower dams, irrigated agriculture, extensive oil and natural-gas extraction, and flood-prevention infrastructure. These environmental engineering schemes have increased the socially differentiated distribution of vulnerabilities and led to forced relocations of people categorised as living in flood-risk zones. In recent years, however, the state has sought a shift towards wetland restoration and integrated 'room-for-river' flood protection management. A biosphere reserve called 'Reserva de la Biosfera Pantanos de Centla', containing 3027 km<sup>2</sup> of wetlands, was established in northeastern Tabasco in 1992, and in 1995, it was joined to the Ramsar Convention, an intergovernmental framework for conservation and the sustainable use of wetlands (Ramsar, 2022).

In Central Kalimantan, a water management system called *polder* was initiated in the 1950s (*Jave Bode*, 17 March 1952), with links to wetland drainage and canal building. The Mega Rice Project, initiated in the mid-1990s with the aim of making Indonesia self-sufficient in rice production, built huge canal infrastructure and drained one million ha of peatlands; however, the project failed due to the unsuitability of peat soil for rice cultivation (Galudra et al., 2011). Thereafter, extensive oil-palm and industrial tree plantations have been established in Kalimantan (*Lensa Kalteng*, 9 November 2016, Sumarga and Hein, 2016). However, the state here is also aiming to return drained lands to wetlands based on new policies of wetland restoration. In 2016, Indonesian President Joko Widodo (2014-present) established a Peatland Restoration Agency (BRG) to restore peatlands in seven provinces in Indonesia over an area of 2 million ha, with Central Kalimantan being a priority. In Central Kalimantan, the activities covered ten villages, including the village researched for this study (BRG, 2019).

Our analysis of Tabascan and Central Kalimantan cases relies on data gathered through interviews, participant observation, archival research, and document analysis. Data concerning Tabasco are drawn from the first author's 86 open-ended interviews and participant observation among residents in the floodplain communities of Chontalpa and resettlement sites around the city of Villahermosa. These interviews were complemented by 60 semi-structured interviews with federal, state, and municipal-level authorities, land-use planners, flood-risk consultants, and representatives of extractive industries and civil society between 2011 and 2019. The timelines of environmental changes were explored through archival sources, media reports, and policy documents.

The Central Kalimantan research material draws on the second author's 54 open-ended interviews and informal discussions among the Ngaju Dayak living along the Kahayan River during fieldwork in January-February and September-October 2019 and during three periods of fieldwork between 2014 and 2016. The second author also conducted two fieldwork periods along the Kapuas River between 2012 and 2013. In addition, the data include 38 interviews carried out with state officials at central, regional, and district levels; representatives of development agencies; customary authorities; representatives of NGOs; and local researchers. Information gathering through participant observation included engagement with the Ngaju's everyday activities. These data were augmented by media news and policy documents on infrastructural development and disasters.

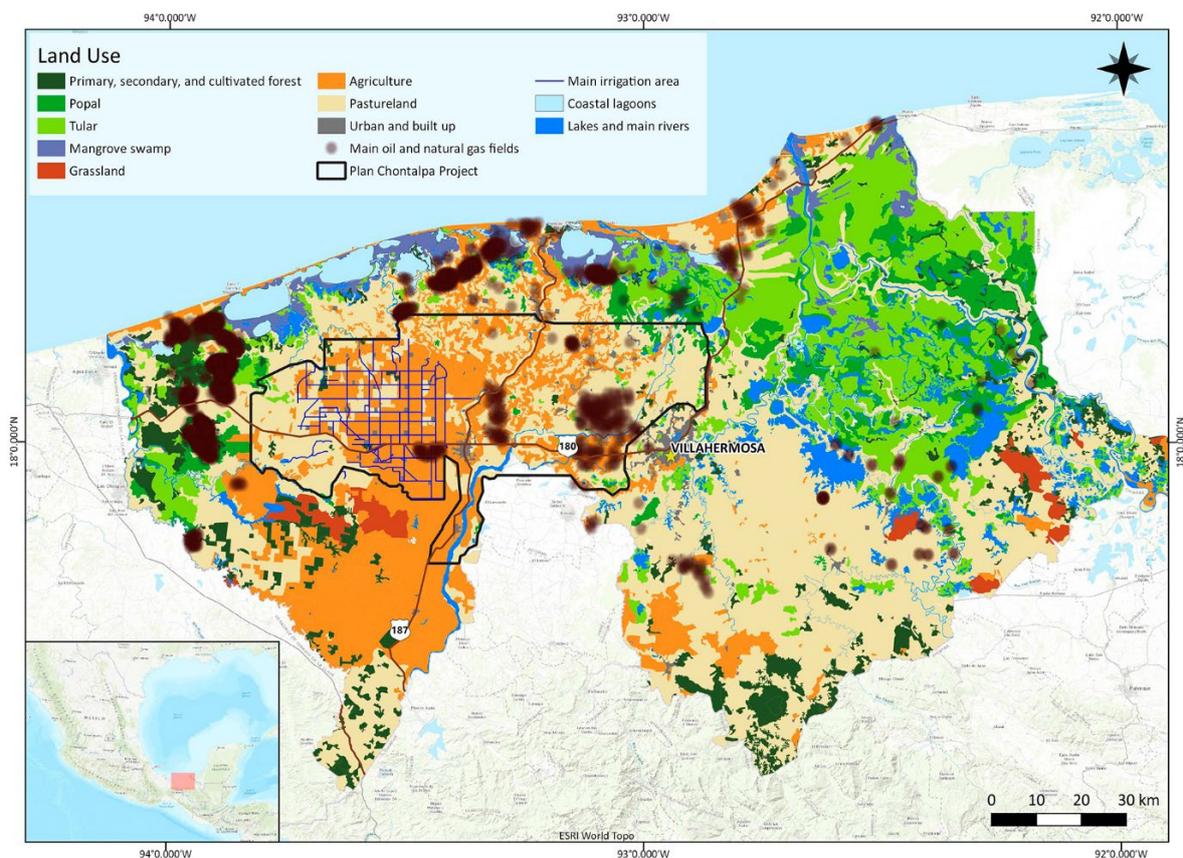
Interviews with local inhabitants cast light on what landscape changes mean to residents and how social memories engage with views of current conditions and future desires, while interviews with institutional actors illuminate the multifaceted politics of interventions. We also organised policy-dialogue workshops with governmental, private, and NGO actors both in Tabasco and in Central Kalimantan in 2019 to diversify our views with the perceptions of differently positioned actors and their power relations. By documenting multiple layers, we show how shifting water-land interactions resonate with state territorialisations and corporate resource-makings, with changes in societal valuations of wetlands, and with residents' reinvented ways of living in volatile environments.

## RECURRENT REMAKINGS OF WETLANDS AND STATE TERRITORIALISATIONS

### Agricultural modernisation and environmental engineering

In this section, we analyse large-scale interventions carried out in Tabasco and Central Kalimantan through attention to wetlands as *wet-lands*, examining them as historically co-produced and contested, and in connection with changing notions of 'development'. In Tabasco, the federal government, together with the World Bank and the Rockefeller Foundation, began a giant project of agricultural modernisation based on the green-revolution ideology in the Chontalpa wetlands in the 1960s. The aim of this '*Plan Chontalpa*' was to transform 352,000 ha of wetlands into agricultural areas for maize, rice, sugar cane, and cattle raising through the construction of 2300 km of irrigation canals and the intensive use of agrochemicals (Figure 3). The state also extended its influence over the Chontalpa wetlands by instigating settlement projects. In the early 1960s, 4700 families lived in this area, practising fishing and flood-adjusted farming. These people were relocated to state-managed production units of 2400-5000 ha, each designed to hold 500 families, under a collective property regime called *ejidos* (Tudela, 1989: 206-207). Landscapes of fluvial mobility and seasonal fishing were converted to rice and sugar-cane plantations, and people were urged to move from isolated huts to formal settlements (Diaz Perera and de los Santos González, 2021: 43-47). Forests were seen as an obstacle to development; thus, Tabasco's area under forest cover was reduced from 49% to 8% between 1940 and 1980 (Flores, 1987). According to Luís Echeagaray (SRH, 1957: 538), a leading engineer at the Ministry of Hydraulic Resources, "By releasing Tabasco from the inundations, it will turn into one of the zones with the greatest agricultural potentiality in the world".

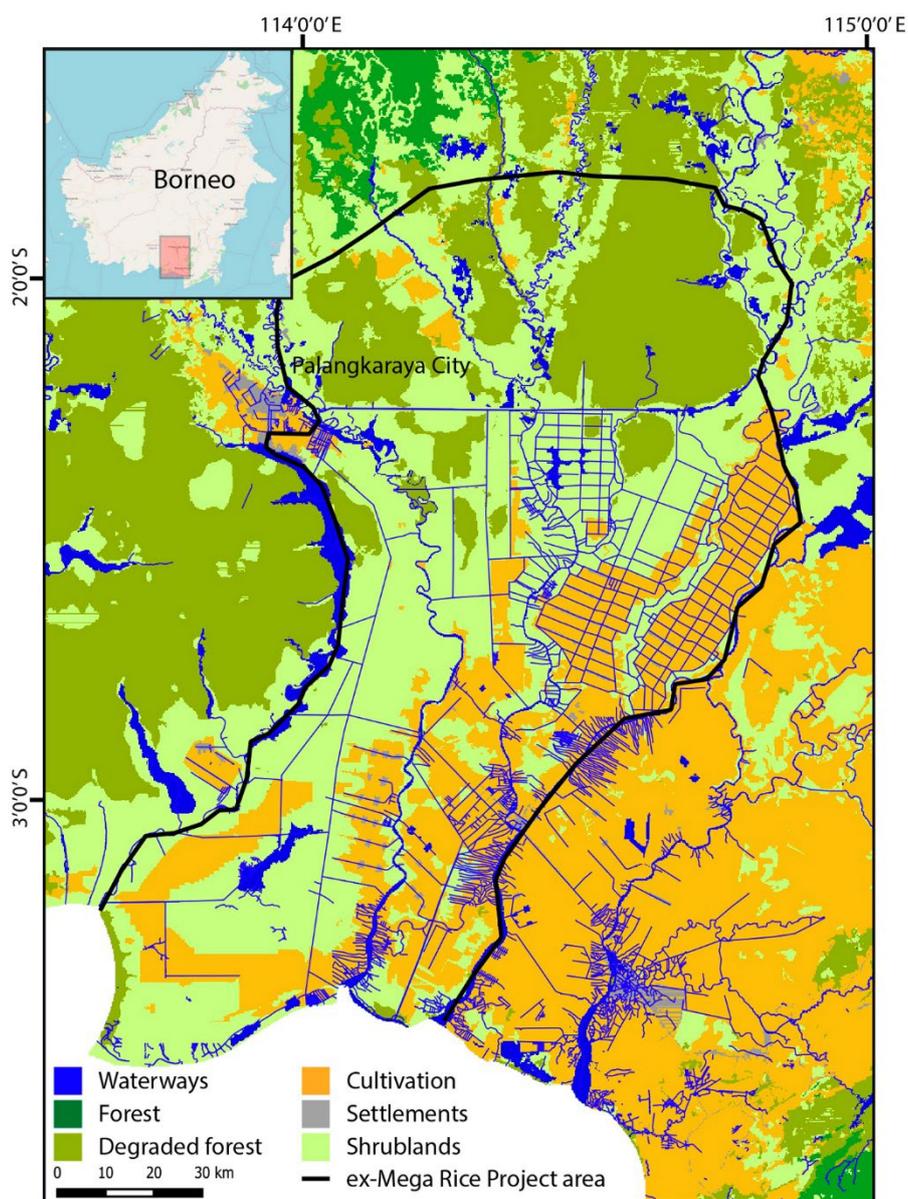
Figure 3. Land use in Tabascan wetlands.



Source: Databases of Instituto Nacional de Estadística y Geografía, INEGI, Mexico, 2022.

In Central Kalimantan, national development plans promoted corresponding projects of agriculture through swampland draining and canalisation (Figure 4). In the 1950s, the Dutch water expert H.J. Schophuys designed a *polder* system to include 7000 ha of lands in south Central Kalimantan and connect small channels to large canals. In the 1950s, the government constructed the Basarang Canal and distributed 2500 ha for rice cultivation near the village of Sei Tobun, and the agricultural development was linked to the resettlement of Javanese and Balinese transmigrants along the canal (Sulaiman et al., 2019: 6-8). According to an older resident in Sei Tobun, almost all the villagers went to cultivate rice along the Basarang due to the land distribution policies. Yet, the system failed, as the main canal silted up and the channels did not divert water to wet-rice fields (*Tempo*, 28 April 1979). In a final blow, the peatland became increasingly acidic and harvests declined; subsequently, people returned to rubber-tapping, rattan collection, fishing, and shifting cultivation around their villages.

Figure 4. Land use in the area of Mega Rice Project, Central Kalimantan.



Source: Horton et al., 2022b: 3, with permission.

The agricultural modernisation in Tabasco was accompanied by four large hydropower dams constructed on the Grijalva River. These dams were portrayed as icons of human mastery over nature; the displacement of several peasant and indigenous communities was justified as giving room for national development. The government also constructed roads to integrate the Tabascan 'hinterlands' to the capital and to replace transportation along 'volatile' rivers. The governor of Tabasco, Carlos A. Madrazo (1959-1964), pushing for works of progress, claimed that "the jungle, which in its primary condition is a chaotic force, should be ruled by man"; he was full of admiration for how the new roads "opened up the horizon" and conquered the "isolated jungle" (*Tabasco*, 1988: 112, 156-157).

These agendas of state territorialisation were linked to intensive resource-making when huge deposits of oil and natural gas were found in Tabascan wetlands in 1973, followed by the discovery of massive offshore deposits in Tabasco and Campeche in 1979. The oil boom prompted then-President José López Portillo (1976-1982) to announce that "we need to get used to managing the abundance" (Díaz Perera and de los Santos González, 2021: 90). By the mid-1980s, the state-owned company *Petróleos Mexicanos* (PEMEX) had established 110 oilfields and 3600 km of oil and gas pipelines in Tabasco, and Mexico was producing 1.9 million barrels of oil and 101 million m<sup>3</sup> of gas daily (Beltrán, 1988: 53-67). The budget for the State of Tabasco became the highest in the country, while local smallholders suffered from livelihood deterioration as irrigated agriculture largely failed. To alleviate these constraints, the government promoted oyster production in lagoons and fishing in the Gulf of Mexico, while urging fishers to return to being farmers some decades later due to escalating conflicts with the offshore oil industry (Quist and Nygren, 2015). Meanwhile, oil extraction, agrochemicals used by agribusiness, and wastewater discharge made the water quality in many rivers harmful to human health (Restrepo Fernández, 1993).

In Central Kalimantan, agricultural modernisation was accompanied by logging from Indonesian timber companies, which started with concessions near Sei Tobun in the 1960s. Several sawmills were established along the Kahayan, waterways were dug, and rails were constructed for log transportation (Jewitt et al., 2014; Lounela, 2019). During the Suharto period (1967-1998), the Ministry of Forestry granted 108 timber concessions in Central Kalimantan, which provided 40% of the national log supply, while the networks of concessionaries, politicians, army, state officials, and village elite blurred the state boundaries in the exploitation of swamp forests (McCarthy, 2007: 155-158). The Mega Rice Project, started in 1995, devastated huge areas of peatland, causing serious fire hazards for decades to come (Lounela, 2021a; McCarthy, 2013). As a state official noted in an interview: "The canals built through the Mega Rice Project facilitated the transportation of logs by illegal loggers, making logging very easy" (September 2019). In 2016, Joko Widodo inaugurated the Peat Restoration Project to build wells to prevent peatland fires; wooden dams with spillways in the village channels to allow water passage; and wooden, concrete, or mixed wooden and concrete structures in the large canals to raise the water level in the peat soil. In his speech, the President stressed the importance of restoring swamps ravaged by fires: "I task BRG to immediately create an action plan and implement it. By doing so, we can convince the international community that we are serious, very serious about tackling the destruction of forests and peatlands" (*Kompas*, 13 January 2016). The project was linked to the business-oriented social forestry programme and the plywood factory established in Sei Tobun by a Javanese entrepreneur (Mongabay, 2016). As a villager recounted in October 2019, "Everybody rushed to plant sengon trees because they would be easy to sell to the company".

In both Tabasco and Central Kalimantan, residents' interactions with water and land changed with policies that promoted conversion of wetlands to irrigated agriculture, and the 'fixing' of mobile livelihoods through projects of human settlement and environmental engineering. The state aimed to reinforce its authority in the resource-rich 'hinterlands' with sociospatial ordering; thus, stateness emerged partly as an effect of these interventions (Harris, 2017; Molle et al., 2009; Nygren, 2021; Scott, 1998). In both cases, authoritative decision-making and paternalist governance that portrayed smallholders as inefficient producers and their cultural beliefs as barriers to development ignored the plurality of resource rights and the diversity of the arenas in which their legitimacy was negotiated.

Equally scant attention was paid to the larger political economy within which smallholders strove to make their living (Brookfield et al., 1995; Tudela, 1989).

Several scholars have argued that infrastructures are invisible until they break down (Collier, 2011; Elyachar, 2010); however, as noted by Larkin (2013: 336), infrastructures involve a range of visibilities, from the unseen to grand spectacles. Hydropower dams on the Grijalva are highly visible symbols of state power, being named after influential politicians as a further reminder. Likewise, oil rigs and gas plants act as notable signs of state-corporate power in Tabasco, although local residents' visits to them are strictly prohibited and the oil industry seeks to hide the dense politics around them. In Central Kalimantan, the Mega Rice Project's 4000 km of 10-metre-wide canals represent the sweeping scope of state schemes that drastically transformed the swampland hydroecologies, promising to feed the whole nation and thus becoming a spectacular symbol of nation-wide food security.

With infrastructure projects, states portray visions of the "world-that-should-be" and ask people to take them as "facts" (Boelens et al., 2016: 3). However, interventions promoted in the name of improvements often fail, providing justification for further improvements (Li, 2007; Ranganathan, 2018), while issues of responsibility related to environmental-social harms are made to disappear by statements that such effects are temporary costs that must be paid to bring prosperity to the hinterlands. In Mexico, state authorities and the oil industry have for decades used shadow tactics of economic persuasion and violent forms of political repression to tame discontent and dissolve movements protesting against harmful effects of oil extraction (First author's interviews, 2012, 2013, 2016; Guzmán Ríos, 2009). In Indonesia, Suharto's military rule suppressed critical voices and oppressed civil-society actors who did not collaborate with the regime (Lounela, 2015). After Suharto's fall, decentralisation policies devolved financial decision-making to the district level, which increased illegal logging through crony networks of power and questionable concessions (Aspinall and Berenschot, 2019; McCarthy, 2007).

The recurrent interventions have multifaceted links to intensified hazards in both areas. In Tabasco, meteorological conditions cause periods of heavy rains and devastating floods, whose risks have intensified due to climate change. Flooding, however, is also an issue of governance related to water management, land use, and infrastructure (Figure 5). There has been heavy debate in Tabascan media about the role of dams in provoking devastating floods due to their operation logic based on the maximisation of electricity production and the diversion of high water through sluice-gates to low-lying indigenous communities to reduce flow through the city of Villahermosa (*Tabasco Hoy*, 8 November 2007; *Tabasco Hoy*, 9 November 2009; *Presente*, 29 September 2010; *El Universal*, 9 March 2021).<sup>2</sup> Thus, governance is also about who has priority during crises, with hydrosocial conditions in the lower basin depending on the water-management and land-use patterns in the upper basin. After the 2007 flood, consultants suggested an extensive system of levees, embankments, and floodwalls in Tabasco, while governmental institutions started the forceful relocation of 35,000 informal residents from Villahermosa to peri-urban areas to save the city from future disaster (ADPE, 2009; *Tabasco Hoy*, 26 July 2010; *Presente*, 25 June 2011). Calls for urgent action hid the links of these operations to segregated planning and ignored the role of governance in the residents' differentiated exposure to hazards. In the 2020 flood, the water broke many floodwalls and poured over levees, leading residents to claim that "the higher the floodwalls, the bigger the disaster".

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<sup>2</sup> For more about media discourses on flood governance in Tabasco, see Rinne and Nygren (2016).

Figure 5. Flood disaster in Tabasco in 2007.



Source: Huitzil, CC-BY 2.0 license.

In Central Kalimantan, decreased water levels linked to the Mega Rice canals have intensified fire disasters since 1997. Furthermore, after 2005, the regional government encouraged Sei Tobun residents to use excavators to extend waterways deeper to the forests in order to secure the Ngaju land rights from the nearby oil palm companies, as the residents narrated in the interviews (October 2019). The channels were to be joined with rubber tree planting – the tactic that the Dayak have used for decades to mark their land rights. The machines made it possible to build wider and longer channels; however, the channels further drained the peatbogs. Recently, devastating fires have burnt across the landscape, spreading rapidly through the air and underground (Figure 6).

Although it is difficult to know who or what exactly starts the fires, extensive draining, conversion of swamp forests to agricultural lands, and logging are the major drivers (Horton et al., 2021b). People have lost hundreds of hectares of gardens and trees, and their health has been threatened by smoke and haze (BRG, 2018). In the 2019 rainy season, the sengon trees that residents had planted through the social forestry programme suffered from heavy rains and rising water levels, which might be due to the wooden dams in the canals through which the water flowed to the Kahayan; in the dry season, they were destroyed by fire, as witnessed by the second author during the fieldwork. The plywood company started to buy wood from elsewhere, crushing residents' hopes for a new source of livelihood related to fast-growing sengon trees.

Figure 6. A newly lengthened channel on burnt peat soil (Lounela, 2019).



### Wetland restoration and neoliberal conservation

Due to intensified environmental hazards, both the Mexican and Indonesian governments have recently started to promote programmes of wetland restoration, many of which are based on neoliberal rationalities. In Tabasco, the core area of the biosphere reserve of Centla is targeted for "ecosystem preservation, scientific investigation, and environmental education, while all the activities that alter the ecosystem should be limited or prohibited" (SEMARNAP 2000: 12-13). Ironically, local smallholders' agricultural activities have been strictly regulated, while PEMEX has been authorised to continue hydrocarbon extraction in 68 oil wells and 30 natural gas wells within the reserve. In addition, three 96-km-long pipelines traverse the biosphere, transporting hydrocarbons from the giant oil complex of La Sonda in the Gulf of Mexico to the processing plant in Villahermosa (INE/SEMARNAP, 2000: 73-76).

In other areas of Tabasco, wetland conservation is promoted through market-based projects of ecosystem services and neoliberal policies of civic self-responsibilisation. Chontalpa marshes, previously seen as unutilised wastelands, are now considered places of ecological value at risk of disappearing due to agricultural, extractivist, and urban pressures, and local farmers are asked to take responsibility for their conservation. Based on new options for profit-making in ecosystem services and (eco)tourism, campaigns to revive the traditional Tabascan 'culture of water' have taken off (CONAGUA, 2022). In the first author's interviews, many water authorities presented portrayals of "native practices of living in harmony with nature" (October 2011, April 2016), with scant attention paid to smallholders' social displacement by decades of resource extractivism. These new agendas promote socioecological conviviality, presenting images of a Tabascan amphibious past as a way to "reconnect people and water" and "take care of sentient nonhuman beings", as several wetland consultants stated in the interviews (April 2016, January 2019). However, most of the wetlands are not uninhabited 'natural' areas, but landscapes where residents' experiences of injustice intersect with huge alterations and a socially differentiated distribution of benefits and burdens: in Tabasco, tight state-business relations and the neoliberal logic of profit-making advance massive hydrocarbon extraction and hydroelectricity generation, while smallholders are responsabilised to take care of wetland conservation.

In Central Kalimantan, the wetland restoration policies are likewise connected to neoliberal forms of governance. They promote wetland conservation in the name of climate change mitigation through neoliberal carbon trade (Galdura, et al., 2011; Lounela, 2015), social forestry programmes through which local communities conserve the state lands inside the village areas, and industrial tree plantations to reforest parts of peatlands with fast-growing trees (*Lensa Kalteng*, 9 November 2016; *Borneonews*, 26

August 2019). These ambiguous policies of wetland restoration and industrial tree plantations have been confusing for local people and led to their responsabilisation. Residents in Sei Tobun have been asked to reforest degraded peatlands and guard them against fires and illegal logging through social forestry schemes that invite them to manage large areas of state land as 'village forests' under government-authorized temporary permits (LPHD, 2019; Lounela 2019). Simultaneously, they have been asked to join another social forestry scheme to plant fast-growing sengon trees on the state lands (BRG, 2018), which residents consider to be their customary lands. Paradoxically, these reforestation projects failed because the trees were burnt in forest fires in 2019. Accordingly, many villagers found it difficult to dam canals and restore areas to waterlogged conditions.

The complex dynamics between intensified hazards and the ways to manage them require a multidimensional view of space and politics to capture the links between volatile hydrologies and shifting politics in the recurrent remaking of wetlands. As Goh (2019: 266) suggests, instead of delineating water/land dichotomies, water-land fluctuations need to be seen as a gradient in the wetlands, where water moves both horizontally and vertically and the ecological and political intertwine across time and scale amidst overlapping and sequential interventions. Careful attention to ambiguous projects of state-making and companies' intensive resource-making is needed in order to understand the politics wherein changing discourses and agendas of development are formulated and legitimised.

## REINTERPRETING SHIFTING WATERWORLDS

### Converting wet areas to solid land

In this section, we explore how local residents have sought to remodify their livelihood activities in their efforts to gain access to natural resources and to cope with the volatile environments and volatile politics in the recurrent remakings of wetlands. Inspired by rich literature in political ecology, anthropology, human geography, and global development studies on the impacts of projects of state-making on local people's livelihoods and lifeworlds (Lahiri-Dutt and Samanta, 2013; Rasmussen, 2015; Richardson, 2018; Scaramelli, 2018), our analysis here focuses on how residents perceive, act upon, reinterpret, and cope with changing environments and shifting politics of wetlands. People's everyday experiences of fluctuating water-land and human-nonhuman interactions are central to how the material and symbolic interconnect in environmental change (Hastrup and Hastrup, 2016).

Until the 1950s, livelihoods in Tabascan wetlands were based on small-scale agriculture, grazing, and riverine and lagoon fishing. As Díaz Perera and de los Santos González (2021) note, these areas were not uninhabited, although the opaque conditions of marshes and wet meadows helped residents avoid strict state control. People lived in stilt houses whose upper floor served for dwelling and storage during high-water periods, and their agriculture was adjusted to water-flow changes as it depended on seasonal flooding (Peraza-Villareal et al., 2019). The hydropower dams have radically changed local agroecologies, as the fertilising sediments that rivers temporarily deposited on the floodplains now remain in the reservoirs, making farmers highly dependent on agrochemicals (García García, 2013).

In the conversations, Tabascan interlocutors discussed the challenges of living in watery places and their efforts to build their homes and farms, grow crops, and raise animals in muddy environments (Figure 7). They emphasised how converting freshwater swamp forests to agricultural fields required much labour; however, such 'improvements' were a requirement to get their land rights institutionally legitimised. After fishing and water-adjusted grazing were classified as inefficient forms of production and customary resource rights were defined clandestine by the state, people began to convert wet areas to solid land, blocking streams and filling small lagoons with sand, mud, and waste to gain official recognition of their land ownership. As doña Nita explained, "Building farms here required much labour. In this abundance of water, you exhausted yourself. Little by little we got forward. We worked a lot" (April 2016).

Figure 7. Animal husbandry in Tabasco wetlands (Nygren, 2013).



In Central Kalimantan, Ngaju residents recalled that up until the 1950s, the villagers formed tiny settlements along the Kahayan tributaries in the swamp forests. "It was dark and spooky and so we welcomed new people to settle near us to make the place lively" (February 2019), an older resident recounted. People had mobile lifeways, hunting, fishing, and collecting forest products, and rivers were important for barter and trade. When pushed into permanent settlements, the Ngaju started to dig channels into swamp forests to expand their land rights through new cultivations (Figure 8). The channels required repeated cleaning as they became clogged with plants and mud. The work was hard and better-off Ngaju employed Madurese as debt-bond labour for digging and cleaning. In 2005, when the regional government encouraged people to use excavators to extend the waterways, villagers widened and lengthened the channels, as such acts enabled them to make more efficient use of waterways for transport, mark rights to land, and increase rubber cultivation when oil-palm companies were expanding into the surrounding areas.

Figure 8. Crossing the peatland channel, Central Kalimantan (Lounela, 2019).



Interestingly, most of the policy documents on wetland development in both Tabasco and Central Kalimantan erase the local people's huge investments of labour in converting the marshes to agricultural fields. Instead, the reports appraise the remarkable role of the state in modernising wetland livelihoods, hiding residents' hard work and suffering in the face of shifting policies and societal valuations (CDEA/SRH, 1961; SRH, 1957; Schophuys, 1953). Yet, in both cases, people have actively engaged in digging channels and filling watery places to create solid ground while being concerned when streams become overgrown and waterways silt up.

Although Steinberg and Peters (2015) call for "wet ontologies" to challenge terrestrial approaches with ideas of water-based fluidity, we suggest that instead of two distinct ontologies, the making of wetlands needs to be analysed as a relational process, co-produced by socially differentiated actors and multifaceted human-nonhuman interactions, which require perspectives beyond water/society binaries (Krause, 2017, Raffles, 2002: 59-62). Residents in the Chontalpa floodplains explained how their past life in the *popales* (marshes) included paddling across water and ploughing through mire, cutting reeds and filling the bogs. These activities remind us that the amphibious should not be considered only in relation to water and its flows. Maintaining fields in the Tabasco wetlands demands repeated reinvestment in labour, as floods wash land away in one place and add it in others, and the existence of a space as either land or water cannot be taken for granted.

Likewise, in Central Kalimantan, building waterways and maintaining fields required much work. When the government distributed land along the canals in the 1960s, the Kahayan Ngaju started to cultivate rice along the Basarang Canal on a seasonal basis, returning to their villages after the harvest to manage the rubber trees. When the state started to grant concessions on state-owned forests to timber companies, villagers, transmigrants, and Dayaks from elsewhere formed timber-cutting groups, digging channels for log transportation and selling timber to companies through brokers, often at uneven prices. In the 2000s, many returned to village-based livelihoods of rubber and rice cultivation and fishing or turned to gold mining as logging became difficult.

These transformations and flexibilities in local livelihoods indicate that, rather than passively accepting recurrent interventions, Tabascan and Central Kalimantan residents have remodified their activities in their efforts to maintain access to vital resources and to improve their position within shifting politics and asymmetrical power relations vis-à-vis the state and corporate actors. In Tabasco, people filled their plots with mud to gradually extend their usufruct rights over federally owned riverbanks. Through these informal acts of socio-spatial ordering they tried to demonstrate to officials that their houses and farms were above the flood-risk limits and in this way gain institutional recognition as 'proper' citizens. They welcomed development projects but criticised the uneven distribution of benefits and burdens and struggled to play a greater role in decision-making.

In Central Kalimantan, the Ngaju imitated the Dutch-promoted canal system, augmented by their own waterway-making knowledge, building channels to divert and drain water and constructing dikes for rubber cultivation. The diverse tactics of withdrawal, improvisation, and contestation demonstrate that people in both places have reinvented prevailing rules, albeit within differentiated opportunities to sidestep them. As residents relocated from risk-prone areas to peri-urban settlements in Tabasco commented, "We endure many troubles, but we also know how to manoeuvre" (August 2014), referencing the dynamic interplay of volatility and improvisation.

### **Coping with disasters and contesting injustices**

Wetland remakings have indicated many kinds of disasters for inhabitants of both places. In Tabasco, a 50-metre-wide opening was made in the coastline of the Gulf of Mexico in 1975 to increase oyster production in the coastal lagoons and to transport oil equipment to nearby wetlands. This intervention led to the salinisation of 80,000 hectares of land when a subsequent storm widened the opening to a kilometre (Tudela, 1989: 388). The devastating effects of these processes show how a minor human

intervention can suddenly generate uncontrollable water movements in deltaic wetland conditions, the effects of which are transmitted along the waterways to faraway places. While the state-owned oil company PEMEX has provided compensation for damage for particular cultivates to thousands of farmers, the farmers' claims of broader harms and injustices have never been recognised; instead, PEMEX has repeatedly argued that there is no evidence the company caused the salinisation (CNDH, 1992; Pemex, 1994).

In the interviews, both Tabasco and Central Kalimantan residents emphasised the unpredictability of their lives and their anxiety about changes whose impacts are not well known. In Tabasco, people considered water a powerful and unpredictable element, "a source of life which enables production", but also a "dangerous force, which takes revenge and requires a humble stance" (April 2013). According to them, living at the edge of land and water requires many kinds of skills and continuous vigilance (Figure 9). Devastating floods and toxic oil are strongly tied to these people's social imaginaries as the key concerns in their lives. Residents often explained that although engineers have tried to change river courses and straighten bends to prevent flood disasters, "the river has a memory, and it always seeks her course" (August 2011).

Figure 9. Living at the confluence of land and water in Tabasco (Nygren, 2011).



Likewise, in Central Kalimantan, the Ngaju consider rivers to have material and mythical powers that are difficult for humans to control (Figure 10). Although the Kahayan Ngaju are engaged in reconfiguring the locally modified channels and the drainage systems developed by water experts, they also recognise how difficult it is to divert waterways; as a villager explained, "If water does not flow well, there is no water entering the river from the inland, and there is no tidal water from the Kahayan River, there is not enough water in the bottom of the channel, and fire spreads rapidly" (October 2019). Given the drastic effects of the 2019 fires, many residents questioned whether they should cultivate the wetlands at all.

Figure 10. Fishing on the Kahayan River, Central Kalimantan (Lounela, 2015).



These examples indicate the inherent interplay of the hydroecological and sociopolitical in wetland transformations. While there have been recurrent attempts to bring nature's volatility under human control, the devastating floods in Tabasco and forest fires in Central Kalimantan illustrate nature's transformative power, which is difficult to harness through damming and draining. Simultaneously, state territorialisations and corporate resource-makings have resulted in a socially differentiated distribution of benefits and burdens. In Tabasco, these are exemplified by wetland residents suffering from salinisation and contamination by hydrocarbon extraction for global commodity markets, as well as by the Grijalva's role in producing hydroelectricity for cities and industrial hubs in central and northern Mexico while downriver residents in Tabasco lack well-maintained water and electricity networks, as "water flows increasingly in accordance with flows of capital" (Linton and Budds, 2014: 172). In Central Kalimantan, local livelihoods have been affected by commercial tree plantations, which promote a plantation livelihood model as a 'modern' way of farming, as well as by extensive logging for global markets through the concessions granted by the state with the recent establishment of a more export-oriented timber industry along the river, which will increase shipping traffic and probably water pollution. These changes, together with devastating fires, have tempered residents' visions of how to live in the wetlands in the future.

The fascination and fear associated with infrastructural interventions among Tabasco and Central Kalimantan inhabitants reflect the deeply affective impacts such works have on targeted populations (Barry et al., 2020; De Boeck, 2011). In Tabasco, residents regarded the hydropower dams and oil rigs with a sense of admiration and fear. According to Chontalpa smallholders, the politicians in Mexico City are ignorant of the deep vulnerabilities in local lives and leave promises unfulfilled. Many interviewees stated that because they do not have ties to influential politicians, they have not received any benefits, positioning themselves for "endless waiting" (Auyero and Swistun, 2009: 19) for compensation for affected harms. These views were fed by clientelist relations, whereby local leaders pressure politicians

to provide small favours for smallholders, receiving votes in return. Overall, Chontalpa residents demonstrated a mixture of adjustment, avoidance, resistance, and resignation in the face of the tactics of persuasion, intimidation, and co-opting used by state authorities and the oil industry. Differentiated access to resources provoked calculations of how to get recognised by officials, while comments such as "the person who doesn't cry doesn't get fed" (January 2019) revealed how stateness is experienced through everyday politics of authority and clientelist networking.

In Central Kalimantan, Joko Widodo's enthusiasm for large-scale infrastructure has materialised in new mega-projects, such as the food estate project in Central Kalimantan and the new capital city to be established in East Kalimantan (*Borneonews*, 17 June 2020). In Sei Tobun, linking the plywood factory to social forestry programmes responsabilises residents to cultivate fast-growing trees, with promises of employment and monetary flows stemming from the industry. However, many residents complained that jobs are low-paying and temporary, the factory does not buy wood from them, and the factory land – including 'their' road – was closed to villagers. "The company is stingy", a resident commented angrily. Although many young people wanted to work in the factory, the promises of politicians failed to satisfy residents, and there have been protests against the closing of the road and low salaries. People are rethinking what to plant on the peatlands and at what cost after the sengon trees did not grow well and were eventually destroyed by fire, even as the damage remained the villagers' responsibility. The damming of channels to raise water levels affects the ability of people to grow trees along them and changes the way they travel to their gardens. This is one of the reasons why channels have become sites of disputes.

In addition to flexible adjustments and everyday forms of resistance, devastating disasters have promoted large-scale mobilisations in Tabasco. The social movement Pacto Ribereño was created in 1975, involving 7000 farmers, fishers, and cattle raisers, along with their families, from 19 ejidos and 39 villages (Guzmán Ríos, 2009; Velázquez García, 2016). Multifaceted efforts by the oil industry and the state to tame the resistance have promoted decades-long struggles for justice involving huge demonstrations and the occasional closing of the valves of oil circulation (*Presente*, 17 March 1983; *Presente*, 6 April 1983; *Presente*, 17 April 1983; *Tabasco Hoy*, 16 November 1991; *Excélsior*, 16 July 2015). The hydropower dams and forced evictions from flood-risk zones have also galvanised protests (*Presente*, 29 September 2010; *Tabasco Hoy*, 7 August 2011; *El Heraldo de Chiapas*, 15 July 2019). As oil and hydropower conglomerates expand their resource extractions in these extractivist sacrifice zones, local people try to amplify their ties to human rights organisations and transnational social movements to reinforce their claims for fairer resource distribution and more just political representation, while at times evading repressive politics via informal networks and invisible undercurrents.

The official representation of oil as a national patrimony for the benefit of everyone in Mexico (Breglia, 2013: 239) stands in stark contrast to Chontalpa residents' environmental suffering due to long-term accumulation of oil residues in water and sediments. Heavy metals and metalloids have been recorded in lowland rivers and lagoons, yet it is difficult to show the oil industry's responsibility for them (Quist and Nygren, 2019). People recalled wistfully that before extraction, rivers were a source of drinking water, as "water was *dulce*" (sweet) while "now it's *salada*" (salty), with sweet and salty having the double meaning of clean and dirty in the local dialect. These narratives show how people interpret their past experiences to make sense of current conditions and to use collective memory as a means to advocate justice (Perreault, 2018). Referring to inequality in abundance, Simón, a resident involved in Pacto Ribereño movement, observed, "We struggled hard so that they would recognise these communities and us as deserving citizens. The harms by the oil [industry] are huge. These sufferings gave us the reason to struggle. For the children you strive for a better future" (February 2012).

In contrast to earlier policies of terracentric management, Mexican and Indonesian governments are now proposing wetland restoration and fluvial reconnection, whereby local people are charged with new responsibilities for biodiversity conservation. It is difficult for Tabascan smallholders to understand that lands which the state urged them to 'clean' from wetlands to agricultural fields are now part of

international conventions of wetland restoration, carbon storage, and climate change mitigation. In ambitious proposals for ecological restoration, scant attention is paid to social suffering and social recovery. Instead, people are asked to once again reframe their livelihoods and lifeworlds, now into neoliberal forms of adaptive agency and environmental responsibility, while the oil industry is allowed to continue hydrocarbon extraction in agricultural villages, indigenous communities, and protected wetlands with justifications of energy sovereignty. Simultaneously, the Mexican government is constructing new hydropower dams on the Grijalva in the name of 'green' energy. The same holds true in Central Kalimantan with large-scale extraction of biofuels and agrofuels from peatland tree and oil-palm plantations for green energy markets. At the same time, people are asked to dam the channels they were earlier urged to open for cultivating rubber trees. Although local residents in both cases strive to improve their positions through tactics of improvisation, reinterpretation, and contestation, their options to reinvent politics and find space for meaningful manoeuvring are in many ways conditioned by authoritative politics and massive resource-makings.

## CONCLUSION

This article has analysed people's shifting water-land relations in drastically transformed wetlands based on cases from Tabasco, Mexico, and Central Kalimantan, Indonesia. It has demonstrated the impact of development interventions on accelerated vulnerabilities in local lives, as well as the local tactics for coping with such vulnerabilities. By combining ideas from political ecology, critical geography, and anthropology of water, the study has shown how recurrent remakings in wetlands are linked to changing political-economic agendas and societal valuations. Ethnographic analyses of how residents cope with recurrent changes have illustrated landscape changes as lived processes rather than monolithically imposed interventions. Simultaneously, political-ecological perspectives have shown how the ecological and political, and the hydrological and social, constitute each other in landscape changes and in the negotiations and contestations over multifaceted politics.

The study contributes to the existing literature on the political ecology of wetlands and amphibious anthropology in several ways. First, it dismantles water/land and water/society binaries by showing how privileging water as an analytical concept makes it hard to grasp local people's involvement in the remaking of wetlands by draining and filling watery places to create more solid ground. By analysing porous water-land fluctuations in wetlands as *wet-lands*, the study illustrates the difficulty in holding the natural apart from the social and the human from the nonhuman in environmental changes. This indicates that landscapes are not only backgrounds for human interventions; they also shape political arrangements, social relations, and cultural meanings. Simultaneously, recurrent remakings of wetlands raise questions of human responsibility (Delgado, 2017; Nygren, 2021); development interventions are politically charged and have long-term environmental-social effects.

Second, our study shows that wetland livelihoods cannot be understood without analysing projects of state-making and socio-spatial ordering that aim to reinforce state authority through repeated interventions and symbolic meaning-making (Molle et al., 2009; McCulligh and Tetreault, 2017). Landscape alterations and infrastructural projects mould residents' perceptions of the state, indicating that stateness emerges partly as an effect of interventions (Lund, 2016). Since the 1950s, projects of drainage, irrigation, agricultural modernisation, water diversion, hydraulic infrastructure, and relocation of residents from risk-prone areas have provided strong markers of state power in Tabasco and Central Kalimantan, although dominant discourses tend to depoliticise them. Through hybrid forms of governance, the states have diffused questions of responsibility and fragmented social mobilisations. Recently, there has been a shift to proposals to restore wetlands as sites of biodiversity protection and climate change mitigation, with neoliberal agendas of self-responsibilisation thrusting an increasing role in conservation onto local inhabitants. Such agendas contrast with the views of wetland residents, who consider these areas vital to making a living. Our study reveals the political stakes and shifting values that

wetlands acquire over time, and the attendant decisions to be made about which land and water uses are to be prioritised and what types of livelihoods and economies they will support.

Third, our study offers insights into how interventions have reshaped wetland residents' water-land relations, terrestrialising their lives through drainage and irrigation-related infrastructure. The dynamics of interventions underline the connections between landscape changes, socially differentiated distribution of benefits and burdens, hierarchical power relations, and cross-scale contestations. Our analysis illustrates how everyday life and multi-scalar politics are tightly articulated in wetland alterations, giving insights into who has the authority to order remakings of wetlands and attach particular imaginaries to them. It shows how feverish commodification of nature links resource-rich peripheries to wider commodity networks, configurations of governance, and political-ecological dynamics.

Fourth, this article contributes to the understanding of how people accommodate, reconfigure, and contest the changes imposed alongside shifting policies and agendas of resource-making. In both cases, residents have been actively involved in the everyday production of their environments, albeit not necessarily in the ways they foresee or desire. They have worked hard to make wetlands cultivable and thus legitimise their land ownership through the 'improvements' required by official regulations. Local smallholders have used diverse tactics of improvisation, reinterpretation, and contestation in their efforts to improve their marginalised position within multifaceted policies and rationalities of governance. Yet, their opportunities for reinventing politics and finding space for large-scale contestations are conditioned by multifaceted politics and power. Emerging conditions, wherein volatile water-land interactions and associated vulnerabilities are increasing concerns among local populations, call for further research of translocal initiatives for more just and sustainable futures for drastically altered wetlands, floodplains, and deltaic environments.

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