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Mangroves voices. Where the Shrimp Swep and the Women Sing.

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Abstract

The habitability of mangroves has long been called into question due to their severe constraints. The disparaging accounts, originating from outsiders (16th–19th century), advocating for a radical transformation of these coastal marshes and their inhabitants, gave way, starting in the 1960s, to representations that idealized these environments and led to protectionist policies, which disregarded local contexts. Not only are mangroves inhabited, but they are among the environments that have been occupied for the longest time. They serve as a reservoir of a vast array of resources, essential for the food security of local populations and often the sole source of income for women who lack access to land. In this paper, giving voices to inhabitants—and more specifically, of women who live in and from the mangrove—the aim is to demonstrate their attachment to these environments, the way in which they sustainably inhabit the mangrove and are, in turn, shaped by it, as well as their strategies of resistance in the face of environmental violence. After highlighting the multiplicity of mangroves voices and claims, I draw on in-depth interviews conducted with women in India, Senegal, and Brazil, and pay particular attention to their knowledge, practices, and sensibilities, inviting us to re-enchant the mangrove.

Keywords: instrumental and relational values, small-scale fishing, gender, strategies to overcome globalization, violence, mangroves

Introduction

Most scientific articles on mangroves begin their introduction by highlighting, on the one hand, their multiple ecosystem services—including carbon sequestration to combat climate change—and, on the other hand, the threats they face and their irreversible decline (Leal & Spalding 2022; FAO 2023).

In this paper, I take the opposite view—or, at the very least, qualify it—by arguing that mangroves are not merely forests of mangrove trees but rather a coastal socio-ecosystem, a specifically tropical coastal wetland that lives in rhythm with the tides and encompasses all the spaces between land and sea, namely: the *tannes* or hypersaline zones behind the mangroves, the shallows, converted into rice paddies or aquaculture ponds, the tidal channels or *bolons*, the mangrove forest, including the Rhizophora species, where oysters cling, the mudflats, teeming with various species (mollusks, crabs), and finally, the coastlines with islands and shoals that serve as refuges for waterfowl.

From this broad definition of the mangrove socio-ecosystem (MSE) stems a wide variety of perspectives on their health, the main factors and actors driving their dynamics (not to mention their degradation), and the policies recommended for their conservation. Admittedly, between the 1960s and 1990s, mangroves experienced a drastic decline of approximately 35% due to the shrimp farming boom and drought; however, over the past two decades, this decline has been barely 1% on a global scale, and an increase in mangrove coverage has even been observed at the regional and local levels (Andrieu et al. 2020; Zhang et al 2026). The factors driving these changes are both environmental and anthropogenic, and they combine to explain their degradation, expansion, or stability. Furthermore, local stakeholders

or "users" are far from being the primary culprits behind their decline. Finally, protection or reforestation policies are not only often ineffective but also illegitimate, resulting in injustices against the most vulnerable populations, including women.

The central theme of this paper is the diversity of mangroves voices—some powerful, violent, and dominant; others discreet, inaudible, and suppressed— voices coming from outside or inside, from the past or the present. The main argument concerns the prolonged silence imposed on a number of actors—and particularly actresses—who are ignored and overlooked. The aim is to make their voices and their struggles recognized and heard beyond the local arena.

Drawing on my research on mangrove coastlines, particularly in West Africa but also more recently in India and Brazil, with a focus on women, I examine how they inhabit and are inhabited by the mangroves and their strategies for resisting environmental violence, whether hard or soft (Nixon, 2011).

After demonstrating the diversity of MSE perspectives (Ferretti 2023), I present my research approach and field data, then base my argument on three contextualized and situated life narratives of mangrove workers (Haraway 2023), and finally, discuss their room for maneuver and how they manage to live well and together in and from the mangrove.

1. Pluriversity of Mangroves Voices

The mangrove is a fascinating and complex socio-ecosystem, difficult to define and delimit given its spatial and socio-temporal fluidity. It lends itself to diverse voices and often conflicting projects, depending on the stakeholders and the geographical and historical contexts.

Colonial and neocolonial voices leading to injustices

The habitability of mangroves has long been questioned due to their severe constraints (swamp miasmas) and their exposure to climate risks (coastal erosion, storm surges, cyclones, and tsunamis, etc.). Derogatory narratives, originating from actors outside this environment, have led for centuries to a radical transformation of these coastal marshes, both the land and its inhabitants.

In this paper, drawing on previous work that has already been published (Cormier-Salem 2017a; 2017b), I highlight the impact of modernism and imperialism—whether colonial, green, or blue—as well as neoliberalism and neocapitalism, which have resulted in injustices against mangrove workers.

Colonial imperialism:

The "White Man's Grave" in West Africa (Carlson 1984), a "natural prison" in the Americas, a "green and humid hell" or a metaphorical and physical "quagmire" in Southeast Asia (Biggs 2012), the mangrove has long been perceived by outsiders (from the early Portuguese navigators during the Age of Discovery in the late 15th century to the missionaries and colonial agents of the late 19th century) as a putrid, barren, impenetrable, unsanitary, and dangerous swamp, inhabitable only by marginal and hostile populations (Cormier-Salem 1999).

In Western thought (Glacken 1967), these "bad" lands with their rebellious inhabitants must be converted for hygienic and productivist purposes: the goal is to reclaim the mangroves, clear them, drain them, and turn them into "good" lands, in the image of the fertile plains of the Beauce in France, open fields intended for intensive wheat cultivation. While the mangroves of the Caribbean were converted into sugarcane plantations, those of Guinea were destined to become the rice granary of French West Africa (AOF). Their inhabitants were turned into "good Christian workers" and, in the name of the Western civilizing mission, reduced to slavery.

This single-crop, extractive approach has persisted and has even been revitalized by the shrimp farming boom that began in the 1960s in Southeast Asia and Latin America. The conversion of mangroves into intensive shrimp farms is one of the main causes of their drastic decline (on average by more than 35%) between the 1970s and 1990s. The mangrove becomes "Where the Shrimps Weep" (Figure 1). The farms, run by private companies, use large amounts of inputs (antibiotics, pesticides, fishmeal, etc.); as soon as yields decline, new mangrove forests are cleared. The former farms are used to raise fish that are less demanding in terms of water and soil conditions, such as catfish. The frontier of shrimp

farming continues to advance at the expense of the mangroves, but also of local communities—who have been turned into wage laborers—and, more broadly, at the expense of coastal populations in the Global South who supply these farms with fishmeal and lose an essential source of animal protein (Stonich & Vandergeest 2001, Treviño & Murillo-Sandoval 2021). The fish of the rich (shrimp exported and consumed in the Global North) is thus fed with the fish of the poor (sardines and sardinellas) (Cormier-Salem 2023). This value chain is symptomatic of modernity, or "modern naturalism" to borrow Descola's (2005) ontologies—that is, modes of thought and action dominated by production, capitalism, liberalism, and extractivism. Environmental violence manifests itself on both local and global scales: this value chain—or more accurately, chain of oppression—which unites humans and non-humans, is neither good, nor sustainable, nor just, contributing to the commodification of nature, the degradation of biodiversity, poverty, food insecurity, and the marginalization of the poorest (Schlosberg 2007; Escobar 2020).

Green imperialism

The disparaging narratives of the colonial era—or those that oversimplified the complexity of the social-ecological systems—gave way, starting in the 1970s, to representations that idealized these environments, warned of their drastic and irreversible decline, and condemned local users, including women engaged in chaotic and destructive practices. Advances in knowledge—including the pioneering work of the Odum brothers (1995) on wetlands and the explosion of shrimp farms at the expense of mangrove coastlines—led to heritage preservation policies, most often of the sanctuary type, which disregarded local contexts just as much. In 1971, in Ramsar, the first environmental convention was signed, specifically dedicated to the protection of wetlands of international importance, including mangroves. The goal was now to protect mangroves from men… and women. This led to the creation of MPAs, national parks, or nature reserves, resulting in the enclosure of the commons, the displacement of villages, the prohibition of certain uses, and the marginalization of local users (Cormier-Salem 2017a, Blanc 2020). While new categories of MPAs emerged in the 1990s—less coercive and aimed at co-management with local communities—the fact remains that the appropriation of mangroves, much like that of the oceans (Bennett et al. 2015), continues (Fairhead et al., 2013; Kosoy & Corbera 2010; McAfee 2016).

Blue imperialism: blue carbon credit

In the face of the climate crisis and following the Kyoto Protocol in 1997 and the Paris Agreement in 2015—which aim to limit global warming to 1.5°C—mangroves have become a new gold rush for private companies, most often from the Global North, seeking to offset their greenhouse gas emissions and trade carbon credits. Under the REDD+ mechanism, starting in the 2000s, large-scale reforestation campaigns have been implemented in the Global South. The prevailing narrative highlights the capacity of marine and coastal ecosystems (mangroves, seagrass beds, salt marshes) to store organic carbon, known as "blue carbon." In addition to their multiple services (reducing the risks of coastal erosion, flooding, cyclones, and storm surges, as well as supporting economic infrastructure and value chains), mangroves are said to store up to three to five times the amount of carbon stored by an equivalent area of terrestrial tropical forests. In a policy brief ahead of the Dubai COP (Comte et al 2023), an international, interdisciplinary group of researchers has argued that mangrove reforestation is neither ecologically effective, nor sustainable, nor fair. Blue carbon ecosystems are complex: carbon fluxes and storage depend on local environmental conditions; the diversity of economic activities and land tenure arrangements makes the implementation of reforestation campaigns highly sensitive. Furthermore, blue carbon markets are standardized, global, and complex: standardized plantations rely on a single species (Rhizophora); the actors involved are international; value creation and benefit-sharing are opaque; and social and environmental safeguards are insufficient. Their implementation is often inappropriate, with unintended and unsustainable effects: women in particular suffer disadvantages in terms of redistribution (loss of access to mangrove forests and mudflats) and participation (they are not involved in the processes; they receive neither compensation nor recognition: local knowledge is ignored; they lose their rights and identities as mangrove workers (Cormier-Salem 2017b; 2018). Overall, a growing number of scientific experts are questioning the legitimacy of mangrove protection and reforestation policies, mechanisms for offsetting and commodifying biodiversity, and argue that rather than offsetting, it is better to limit GHG emissions; finally, they recommend the ecological restoration of

mangroves or Nature-Based Solutions, namely the restoration of conditions for spontaneous regeneration (Comte et al 2023, Gaedi et al 2026).

Between colonial, green, and blue imperialism, the logics and rationales are not the same—productivist, protectionist, and compensatory. Nevertheless, the same abuses are evident, namely: the essentialization of local communities (assumed to be homogeneous, united, stable, and insular); reductionism (the simplification of the complexity of both ecological and social systems, their interactions, and their dynamics: mangroves are not merely forests), and faith in the technical and normative expertise of experts (whereas, more often than not, the solution is less technical than institutional) (Ostrom, 1990; Agrawal & Redford 2009; Compagnon and Constantin 2000). They adopt the same mode of indirect governance and, in doing so, contribute to the weakening of local institutions (the undermining of customary practices), the withdrawal of states, and the growing influence of NGOs that act as intermediaries and environmental brokers, which ultimately end up indirectly controlling populations and land. They highlight our difficulties in breaking free from our established ways of thinking and acting (Larrère & Larrère 2009, Arora & Stirling 2023) and stem from dominant modern ideologies (neoliberalism and neocapitalism), which result in injustices against the most vulnerable, including women working in the mangroves.

Decolonizing Perspectives

In contrast to the accounts of foreign actors, the mangrove inhabitants view the mangroves as their larder, a reservoir of a vast array of resources (fish, crustaceans and shellfish, rice, honey, wood, etc.), essential for food security and very often the sole source of income for women who lack access to land (Cormier-Salem, 2017b; 2024). Not only are mangroves inhabited, but they are among the oldest environments to have been occupied, valued, developed, and conserved (Cormier-Salem 1999). They are therefore far from being extreme environments. Admittedly, women acknowledge the significant constraints they face: too much water (flooding, saltwater inundation, heavy rain) or insufficient water (in total volume but especially due to poor distribution, increasingly shorter rainy seasons). For the inhabitants who live in and off the mangrove, the mangrove is a living space, and their narratives highlight its multiple values, both instrumental and relational (Pascual et al 2022, Morre et al 2022). The main threats are not climate change (tsunamis, erratic rainfall, drought), but rather other external forces, such as private companies (shrimp farms, fishmeal factories) or public policies leading to environmental degradation (deforestation, pollution), land grabbing, food insecurity, and the marginalization of local communities, not to mention conflicts, war, oppression, and inequality (Ferdinand 2019, Castañeda Camey 2020).

2. Field Methods and Materials

Drawing on the narratives of local inhabitants—and, more specifically, women who live in and from the mangrove, the aim is to highlight their work and their attachment to these environments, the way in which they sustainably inhabit the mangrove and are, in turn, inhabited by it, as well as their strategies of resistance in the face of environmental violence—whether overt or more insidious—by drawing on Nixon's (2011) concept of "slow violence". Women are among the populations most affected both by the effects of climate change and biodiversity loss and by the international mechanisms designed to combat these changes and neoliberal policies, which result in increased inequality and their marginalization (Merchant 1983; Cruz-Torres & McElwee 2017).

I draw in particular on in-depth interviews conducted with women from the Irula tribe in the Pichavaram Delta in the Indian state of Tamil Nadu in 2023 (10), in Casamance, Senegal (40), and in the Santa Cruz estuary in Brazil (20) between 2024 and 2026[1]. The interviews focused on their life narratives, their identities, their family and social environments, significant events, their connections to the mangrove, their living conditions, recent or past changes, and their needs and aspirations for the future. The aim was to understand their life trajectories, including their turning points, and to grasp their perception of climate emergencies as well as other forms of environmental violence and their

[1] These inquiries are part of two programs, EESSEM (CNRS 2023–25) and SUFUMANG (ANR 2025–27), which follow several research programs conducted in these countries and supported by IRD.

capacity to overcome such violence.

In addition to these interviews, we conducted about thirty field trips to the mangrove with them to observe their movements, techniques, and practices, as well as their reactions and heightened senses, and to share in their emotions and the ways they express them—including their songs. The aim is thus to pay particular attention to their practices and knowledge—both practical and sensory—inviting us to re-enchant the mangrove and to highlight its evocative power and poetry, as well as the strategies they employ in a globalized and rapidly changing world.

Despite my limited knowledge of the Indian context and, more recently, that of Brazil, I find it interesting to consider them in order to examine the scope of action available to women and to discuss the factors driving it.

3. Empirical data: three life narratives of mangrove (women) workers

I chose to focus my study on three life narratives—three married women in their forties who live in and make their living from the mangrove. The interviews were conducted in their homes, supplemented by visits to the landing sites and trips into the mangrove with them at low tide. These trips were made on foot with Malini, an Irula woman, aboard a *busana* (a single-log canoe) with Seynabou in Casamance, and in a motorized canoe with Linda in Brazil.

Malini[2], a member of the Irula tribe who catches wild shrimp, MGR Nagar, South India

Malini lives with her parents in a brick house in the rebuilt village (MGR[3]) of Nagar. She is 36 years old; she is married and has a 7-year-old son; she is expecting her second child. Her husband is a fisherman and owns a motorized canoe that allows him to go out to sea and fish using various nets (drift or bottom-set nets, depending on the species, and purse seines). Malini did not attend school. At age 16, she began fishing in the river on foot. At age 20, she started accompanying her husband to fish at sea.

The interview with Malini continues with a walk to the landing stage and then into the river. Her main activity is gathering shrimp along the banks. She moves on foot, carrying a small basket called *pari*, made of woven palm leaves (collected by the women, woven by her husband) (Figure 2). She wades into the water up to her chest, holds the basket's string between her teeth, and uses her arms to gather the shrimp, which she places in the basket as she goes. The basket is half-submerged in the cool water, which helps preserve the catch. At low tide, she can sit on the mud; at high tide, only her head remains above water. She catches shrimp, but also crabs and fish fry. Sometimes she can't touch the bottom, but she manages to stay afloat. She knows the best fishing spots, among the mangrove roots, and the best times, in the summer, when there are plenty of shrimp. Other resources found in the mangrove include various types of mollusks, such as clams (which are very tasty and meant for eating) gathered from the mudflats, oysters (she has to dive to collect them, and this cuts her hands; moreover, the oysters open and "snap shut on her hair; some women have died from this"), mussels, barnacles (very tasty), and large green or red crabs ("the green ones are more valuable"). A row canoe[4] is needed to reach the fishing sites, which are more than a 30-minute walk away; fishing is done using a sort of trap, a net attached to a metal ring and suspended from a mangrove branch; a piece of fish meat attracts the crabs. It must be left in place for about thirty minutes. Malini then uses her family's motorless boat.

Before (i.e., before the Forest Department arrived), more than 20 years ago, she collected dead mangrove wood as fuel for cooking; sometimes she also cut branches, but she did so in moderation so as not to destroy the forest and only for domestic needs. Traditionally, the Irula hunted shorebirds, turtles (for their meat and eggs), and worms. Now, all gathering in the mangrove forest is prohibited by the FD.

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[2] The first names of the women interviewed have been changed.

[3] MGR: initials of Maruthur Gopalan Ramachandran, an Indian politician and philanthropist who served as Chief Minister of Tamil Nadu from 1977 until his death in 1987 and was responsible for the construction of model villages such as Nadar (known as MGR Nadar).

[4] Motorized canoes are permitted only at sea.

She is not allowed to enter it. However, there are no restrictions on catching fish from the rivers.

While her husband fishes at sea, she is the one who prepares the fish, cooking them in a sauce or drying them to be eaten by the family or sold. She can also sell them fresh at the market.

Her living conditions have changed significantly compared to those of her parents. Her parents came from Andhra Pradesh, where their Irula community led a semi-nomadic hunter-gatherer lifestyle, hunting snakes and selling their skins. They arrived in the Pichavaram Delta in the 1960s and settled in the mangrove forest, in makeshift camps and huts, with no access to land. They stayed there for two years, earning a living by catching rats in the rice fields or doing day labor in the rice fields and peanut crops. Her parents also fished but did not take their children with them, considering it slave labor that did not provide a wage. It should be noted that the Pichavaram mangroves were classified as "protected forests," exclusively owned by the state and managed by the Tamil Nadu Forest Department, with the highest level of protection under the Indian conservation system[5]. Nevertheless, in 1976, following severe flooding, the Irula received their first "MGR settlement"—a housing development with permanent homes. The former Chief Minister of Tamil Nadu, M.G. Ramachandran, donated one acre of land to 21 Irula families in the region. Subsequently, the government allocated additional land to allow for the settlement of several other families.

Malini mentions two other initiatives or events that completely transformed their living conditions: in 1997, the M. S. Swaminathan Research Foundation (MSSRF), in collaboration with the Tamil Nadu Forest Department, launched a program, "Joint Management and Conservation"[6] (JMM), to regenerate the Pichavaram mangrove forest. The MSSRF successfully lobbied the FD to secure fishing rights for the Irula tribe. In exchange for these rights, the Irula are responsible for planting and protecting the mangrove plantations, preventing livestock from straying, and stopping activities deemed illegal by the FD. For example, the Irula protect turtle nests from "poaching" and collect the eggs to hand them over to the FD.

But it was especially after the tsunami of December 26, 2004—once again thanks to the MSSRF—that the Irula gained new rights: the government added them to the list of "Scheduled Tribes" and issued certificates granting them access to social welfare programs (purchase of new fishing boats, access to primary school) and thus ensure their food security and livelihoods. The village, consisting of wooden huts with thatched roofs, was completely destroyed by the tsunami. The Swaminathan Foundation has rebuilt permanent homes. The one where Malini lives with her parents, her husband, and her son is a big permanent home, with an iron gate, well-equipped with a refrigerator, fans, and a TV (other signs of relative wealth: a motorcycle under the porch, her gold jewelry in her nose, around her arms, and on her ankles).

Thanks to the diversity of her fishing activities in the mangroves and her entry into "globalization"—that is, the market economy—Malini has managed to achieve a degree of financial independence and greater economic and social power. The sale of *polychaetes*—worms collected from mudflats—and, above all, of shrimp fry to shrimp farms are two examples of this. This balance is, however, fragile. For her children, she hopes they won't suffer as she has suffered. She will do everything she can to ensure they go to school, learn English, and have a good job. Long discriminated against and considered slaves, her community is now recognized as having rights. The village now has a community grocery store, an elementary school, and a health clinic with a doctor; the hospital is less than 20 minutes away, and there is an ambulance. She also hopes they will marry in the village and settle there to start a family and preserve their heritage.

Nevertheless, two major challenges remain: there is still no drinking water from the public tap: the

[5] Members of registered tribes (including the Irula of Pichavaram) must file applications to assert their rights to land and forest resources under the 2006 Tribal Forest Rights Act. The Irula have not filed such an application; as a result, they have been denied access to the forests and their resources.

[6] The Pichavaram Joint Mangrove Management (JMM) initiative was designed to grant significant access to certain resources within a specific area of the mangrove forest known as the "mangrove management unit." MGR Nagar was thus allocated 85 hectares.

water is too salty and is used only for washing; they must therefore buy water from the reservoir once a week, which is expensive and also places an extra burden on the women. The other challenge is their dependence on gas as fuel, since they are forbidden from entering the mangrove forest.

For FD agents, the main threat today is climate change. For the inhabitants, the mangrove belongs to the FD, with strict protection (Forest Protection, reserve), and despite the rights now recognized for them, they do not have access to many resources and areas (including the collection of *polychaete* worms, which used to bring them a lot of money and was abruptly banned by the FD in 2021). Their room for maneuver is thus limited, and the Irula community remains highly vulnerable, as all decisions are made by the government without consulting them.

Linda,* marisqueira[7] *from Itapissuma, Santa Cruz Estuary, Pernambuco, Brazil

I first met Linda at the meeting held in the Colônia[8] of Itapissuma to present the SUFUMANG program in October 2024. We met again a week later for a trip into the mangroves. I was accompanied by Katia, who served as our interpreter (Brazilian-English). Linda is waiting for us at the port, where she has a small shed to store her fishing gear (motor, buckets, oars, and equipment). She is getting changed (UV-protective T-shirt and leggings) and also gives us some gear: socks and old cloths for our feet, gloves for our hands. She has her own motorized canoe; she goes out with her husband, but she's the one who drives (Figure 3).

Linda, 48, learned to fish from her mother. In the past, only women fished oysters and shellfish[9]. Although some men worked in the sugarcane fields, few actually contributed to the household expenses. So, to survive, the women turned to the mangroves. Her father was a civil servant, but he spent all his money on other women. Her mother took all the children with her to fish, since she had no one to leave them with. Because of this, Linda often had to miss school when she was a child. By the age of nine, Linda was already independent and earning her own money to cover her expenses. At that time, since she was good at math, her mother sent her to sell shellfish and oysters in Boa Viagem and Pina, two neighborhoods in Recife, the capital of Pernambuco State. She went there to sell their catch because the prices were higher than at the markets in Itapissuma or Itamaraca. She sold oysters, peanuts, and fish fried in butter. The fish was also caught by her mother, who would sometimes go fishing using a *camboa* (a type of fence-like barrier).

When she first started fishing, there were plenty of fish and shrimp. She used to catch about 5 to 6 kilograms of shrimp by hand in the *camboa*, and just as many fish. Today, she can't even catch a kilogram. This is because the demand for fish has increased significantly and the fishing community has grown too large. People fish every day—some go out in the morning and return in the evening. When she goes fishing, she collects a maximum of 8 buckets of oysters[10]. This week, the fishermen caught a lot of *xaréu* (Caranx family), because in Itapissuma there is an estuary that flows into the sea, and the Santa Cruz channel is rich in food. That's why saltwater fish swim up the river to feed. The river is teeming with soft-shell crabs, shrimp, and small fish, and the saltwater fish love to feed on them. Once they enter the river, they don't leave, because there's so much food that they prefer to stay there. The water itself also attracts animals: unlike in Recife, the water in Itapissuma is clean. In contrast, the water in Recife is "dead." Linda is very afraid that Itapissuma will end up like Recife. For her, the major problem isn't drought or erosion, but pollution and destructive practices like poison fishing.

[7] A term commonly used in Brazil to refer to women who fish in the mangroves.

[8] It is a kind of union that defends its members' rights, handles administrative matters, and represents them. There is one Colônia per village. In Iapissuma, the Colônia consists entirely of women.

[9] I use the term "fisher" in accordance with the IPBES classification (Fromentin et al 2022), which states that any extraction of live animals from saltwater or freshwater falls under the practice of fishing. Other terms (gatherer, harvester, gleaner, etc.), used to describe women's work are often derogatory and fail to recognize their profession.

[10] 1 bucket = 35 kg of oysters in the shell, which yields about 0.5 kg once cooked. The same quantities are found in Casamance.

Linda fishes mussels only for her own consumption. They're heavy to carry, and the work of gathering and preparing them is time-consuming, even though their market price is lower than that of oysters.

The day we went to fish oysters, she chose a drier spot to make our task easier. The tide was already a bit too high. We only go out for three hours. When we find a spot with lots of beautiful, large oysters, we have to be careful: it could mean the mud is too deep and we won't be able to get off the boat. It's the moon that determines whether the fishing will be good or not. During the waning moon, the tide is low or "dead" (*morta*); during the full moon, the tide is high and "alive" (*viva*). At the full moon, there are more shellfish to catch.

Since it is difficult to pry open the oysters, she uses a machete and strikes the mangrove bark hard just above the cluster of oysters. The roots are never cut but marked by red gashes (Rhizophora trees are also called red mangroves).

Back home, she processes the oysters: she lays them out on dry straw. She usually buys this straw, but sometimes she gathers dry straw and burns it; it takes about ten minutes for the oysters to open; she shucks them ("*debulha*" which means opening the shells and removing the oyster meat). Then she weighs them and packs them into bags to sell to residents and tourists.

For Linda, a good day of fishing is when she collects 10 buckets of oysters. The last time that happened was in 2020, when her husband was sick. That situation motivated her: she had to bring money home, and she found a well-rested mangrove "*pegar o mangue descansado*" (meaning it hadn't been fished recently, and the oysters were large).

Linda explains that oysters grow quickly: in 15 days, they're already ready to be fished. In addition to oysters, shrimp, and mussels, she catches crabs; she also accompanies her husband to catch fish like the *budião* (parrotfish) and the *tainha* (mullet) with gaffs. For the rays, she uses a machete to strike them, as they lie flat on the sand. The rays are intended for home consumption—served with coconut—and for sale.

She goes fishing in both the Itapissuma and Igarassu areas; conversely, residents of Igarassu come to Itapissuma to fish. The sea and rivers are open to anyone who wants to fish. However, you have to keep an eye on your catch, as other fishermen might steal it.

I see Linda again a year later and have several conversations with her at her home. She has lost a lot of weight: her husband had been cheating on her for a year. They separated two months ago. She gave him everything; she stayed with him for 15 years. She has a son with him. She has a lot of problems to deal with: she is responsible for five children, including a disabled nephew who has just lost his mother and her own mother, who has heart problems. This morning, she went to sell oysters, but she can only go out once a week, given her family responsibilities.

She was able to pursue a university degree in water engineering: she advocates for the right to education and training for shellfish fishers. She is also a city council member. There are 12 council members. Linda is responsible for evaluating healthcare expenditures; she attends numerous meetings; she is not paid, and barely recoups her travel expenses for attending meetings.

The process for obtaining government assistance (for purchasing a boat or paying for fuel) is very cumbersome. However, Linda recently received a grant of 4,600 reais (890 $) as part of a public call for projects in which 50 women were selected to invest in equipment. With this money, she bought a scale and plans to buy a freezer.

She has taken on a new job selling secondhand clothes at local markets and in Recife. Five years ago, she formed a group of women (with her sister, her cousin, and neighbors). People say she's a "real economist," but she thinks she doesn't know how to save money. She also tells us about the competition—even conflicts—between the Colônia's shellfish fishers and the oyster farmers' cooperative (*Ostreiros*). Originally, she was part of that cooperative, and she was the one who came up with the idea. At the time, she held the position of secretary, but then the men excluded her because they don't like women who "think they know better than them" and who refuse to let them join the Colôonia on the grounds that they don't fish but raise oysters. This cooperative isn't open to everyone; it operates as a closed group. The oyster farmers are municipal employees. Linda believes there was

some form of favoritism on the part of local authorities.

Linda loves fishing; she makes the best *caldeirada*[11] in Itapissuma, and she's proud to be part of the Colônia. She used to go fishing two days a week, then spend two days at the beach selling her catch. With the passing of her aunts and her divorce, that's no longer possible. Buying a freezer and a scale is a way for her to start a business when she can't go fishing. This way, she can build up a stock of products and sell them based on demand. To store the oysters in the freezer, she simply divides them into bags and places them directly in the freezer; she doesn't wash them, because the seawater keeps them fresh. They can stay frozen for months.

Her dream was to become a police chief, because she finds it inspiring to see a woman in that role—fearless, independent, and strong. It's a source of inspiration for her. But since she had to start fishing from a young age, she wasn't able to pursue that dream. She blames her father for never helping to raise her and her siblings. She hopes that her two sons will grow up to be honest and respectful citizens. Her eldest son is 17 and is from her first marriage. He no longer lives with her; at age 13, he moved in with his father. Her youngest son is 10 and loves fishing. He wants to become a fisherman, but she says she wants him to go to school so he can become a fisheries engineer. He is her greatest pride. For Linda, the most important thing is having faith, regardless of religion. She is an Evangelical. The greatest wealth is family.

Seynabou, Joola, who fishes oysters in the mangroves of Casamance and works in the rice paddies during the rainy season

Seynabou was born in 1980 in Ourong, in the islands, at the mouth of the Casamance River, Senegal, and like all the women in her village, she knows the mangroves and oyster fishing well. Her grandmother taught her the trade (swimming, rowing, shucking, as well as understanding the tides, identifying good oysters, and so on); by the age of 16, she was already accompanying her. Together, they fished oysters and *pañe* (*Anadara senilis*); they would take the boat, the Diola, to sell the oysters in Dakar; they made money. She didn't go past fifth grade, which is why (she says) she doesn't speak French very well, but she gets by!

She got married in Mangagoulak; her husband is a mason, but right now he is sick. She has had 9 children, 6 girls and 3 boys. Her eldest son died at age 20 from asthma. Her second son is 25; he is in Touba studying the Quran in Arabic. Another is at the university in Dakar (studying French). All the other children are at home. One of her daughters, Fatou, works at the inn where we're staying; she helps with cleaning, washing dishes, cooking... Three of her daughters help her at the oysters processing site (called "chantier").

We've arranged to meet Seynabou at 7 a.m. to accompany her into the mangroves. She calls on Banna, who was spreading manure in the rice fields and with whom she usually goes out into the mangrove swamp. Banna is Seynabou's sister-in-law; she is from Mangagoulak, as is her husband, a carpenter; that is why she owns two canoes and has lent one to Seynabou because hers is damaged. Banna is not an expert in oyster fishing. Seynabou taught her, and it has been five years since she started this work. Now she goes out into the mangroves on her own; most of the women in the village of Mangagoulak are afraid of the river and the mangroves, which is why it is often their husbands who go fishing in the mangroves and the women who process their catch (drying, braising).

We meet up at the oyster processing site, where Seynabou has a shed for storing equipment and processing the oysters. We change into our work clothes: gloves reinforced with scraps of denim, boots or old socks, leggings, a T-shirt, and over that, an old hooded sweater to protect our heads from the mangrove branches. We set off in two *busana*[12]; Seynabou has her own *busana*, just like Banna. I'm going in Seynabou's (Figure 4).

[11] A culinary specialty of Pernambuco, this is a richly flavored stew made with various mangrove seafood (shrimp, oysters, mussels, cockles, crabs, stingrays, etc.) served with rice and piro, a type of tapioca cooked in the sauce.

[12] A small, single-plank canoe, usually rowed.

Seynabou chose the fishing site, near Elana, because she knows there are plenty of large oysters there. The river (called *bolon*) is part of the Kawawana ICCA[13]. Only residents of the Mangagoulak commune—which includes eight villages and a hamlet—are allowed to fish there. Both Seynabou and Banna are members of the Mangagoulak village oyster EIG[14]. There is also a cooperative at the Mangagoulak commune level, which coordinates all the oyster EIGs and sets the rules for access to and use of the *bolon*s. The oyster season runs from March 1 to June 1. We row for over two hours, then fish the oysters. The oysters are stuck together, and it's not easy to pry them apart. We have to hoist the oyster-laden roots into the *busana*, grasp the clusters of oysters in our hands to let them fall into the canoe, and use a machete or a stick to pry them loose. The roots are never cut. The oysters are sorted as we go: Seynabou discards any oysters that are too small or dead from the *bolon*. We walk along the banks of the *bolon*, looking for the roots with the most oysters. The roots are heavy; the oysters are sharp; the sun is starting to beat down. We keep going until the canoe is full and before the tide gets too high.

She loves the river; she knows it well; it's her pantry and her livelihood. But the work is hard; by evening, she aches all over: rowing is the hardest part. She shows me her innovations: the garlands and cups for catching the fry; the pouches for raising them. As she rows, she hums ("children mustn't waste money," "the mangroves are our livelihood and we must protect them"). All her work is for her family.

We arrive at the oysters processing site at 2:30 p.m. The women at the site are all part of her family; three of them are her daughters. They arrived this morning around 9 a.m. and are shucking yesterday's catch while looking after the young children.

Seynabou doesn't take a moment's rest; she unloads the *busana* full of oysters (about 35 kg) with her daughters: the oysters are poured into burlap sacks, then boiled in a large pot filled with salted water and covered with cloths to trap the steam. Cooking takes only a few minutes, after which the oysters are shucked and left to dry in the sun. Once dry, they are stored in airtight plastic buckets.

In the past, in her grandmother's day, she would grill the oysters and then dry them in a palm-fiber basket suspended over the hearth; the smoke from the hearth gave the oysters a good flavor and also protected them from insect infestation. Nowadays, given the large quantities of oysters to be processed, it is quicker and easier to open them by boiling them.

She took part in Oyster Day and would like to receive training in canning so she can start farming oysters.

Seynabou also grows vegetables and sells onions, tomatoes, green peppers, and chili peppers in Bignona. Work in the mangroves, as well as vegetable farming and trade, takes a back seat to rice farming, the foundation of Joola identity, which shapes the landscape and sets the schedule for all activities for both men and women. Rice farming, which is done by hand, depends entirely on the rains. Work in the rice fields—both on the plateaus and in the embanked and developed plots within the mangroves—requires a significant workforce, provided mainly by young people: burning rice straw and spreading manure starting in April, plowing and preparing the nursery in May–June, followed by transplanting, monitoring, and harvesting between October and December, depending on the rains. The droughts of the 1970s and 1980s, as well as the rural exodus of young people, accelerated the decline of mangrove rice farming. Despite the return of the rains over the past 10 to 15 years, many rice paddies remain abandoned[15].

[13] The Indigenous and Communautary Conservation Area (ICCA) has enabled local communities to reclaim their commons—and secure recognition of their traditional knowledge and rules governing access—in contrast to the MPAs, public lands, or reforestation projects orchestrated by the NGO Océanium and funded by the Livelihood consortium of private companies, areas that are now privatized.

[14] An Economic Interest Group (EIG) is a legal structure that allows several businesses—whether individuals or legal entities—to join forces and pool their resources in order to develop or facilitate their respective economic activities.

[15] The crisis in rural systems, particularly in rice farming, has been the subject of numerous studies that

4. Key Findings and Discussion

These three women's narratives share many similarities, but also differ, given their individual backgrounds—their personalities, family environments, and sociocultural status—and the specific contexts of each of the countries in question: Casamance in Senegal, the Santa Cruz Estuary in Brazil, and the Pichavaram Delta in India. Comparing these socio-ecosystems may seem risky[16]. Regarding the legal status of these areas, there is a stark contrast between a strictly protected forest reserve, which limits Malini's activities to the banks of the rivers; an ICCA with three zones featuring differentiated usage and access rights, managed by the municipality of Mangagoulak for the benefit of its residents, including Seynabou; and finally, a lack of official regulation, leaving Linda free to choose her fishing sites but subject to competition with other users (including fishermen and shrimp farmers).

Regarding their religion, Malini is Hindu, Linda is Evangelical, and Seynabou is Muslim[17]. These three women emphasize the importance of faith, regardless of religion, and share the same values, including a strong work ethic, respect for nature, mutual support, and prioritizing their families and communities. These women are not "ideal types" in Weber's sense (1949). Drawing on their narratives and those of other women interviewed and met during workshops, the aim is to highlight—beyond specific details—the constants and variations in their practices and relationships with the mangrove, as well as their ability to cope with global changes.

The value of work

The first key point emerging from these interviews is the women's pride in the work they do in the mangrove. From a very young age, they acquired knowledge (tidal patterns, the lunar cycle, the reproductive cycles of both animal and plant species, navigating the mangrove, etc.) and skills (fishing, processing, food preparation, etc.) from their mothers or other women. Once married, they became independent and changed their status thanks to their work in the mangrove: the mangrove is a larder, brimming with food resources; it is a nourishing biome. It is also their livelihood, and as such, it must be cared for. One must never take more than is necessary, must select target species, respect the seasons, and set aside certain areas as protected zones. Courage, intelligence, and endurance are virtues highlighted to describe a "good" worker. This notion of care applies both to their families and to the mangrove on which they depend for their livelihood and to which they are deeply attached (Lainé & Morand 2020; Cormier-Salem 2024). Linda, for example, is very concerned about issues of pollution, water quality (stagnant or flowing), and non-selective capture techniques such as the *camboa* or destructive methods like poison fishing. Tellingly, she is responsible for health issues on the Itapissuma City Council.

The three women are well aware that thanks to their work in the mangrove, they have been able to raise their children—that is, provide for their basic needs (including animal protein)—as well as cover all or part of the household expenses and secure their children's future by paying for their education. While they are proud of their work, they do not hide the fact that it is hard: the water is salty, even polluted, which causes itching; shucking oysters is long and tedious, and injuries and cuts are frequent; accidents in the rivers and bolons can happen quickly; the soft mud and tangled roots make some sites difficult to access. There is never a moment's rest: upon returning from fishing, they must prepare the catch, dry it, or cook it. They love their work but wish for a different future for their children—or, at the very least, that their education will allow them to choose their own profession. They envision a future where their children will have salaried jobs… while remaining connected to their home community and traditions. As a Joola proverb puts it, "Carp do not become mullet."

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go beyond the scope of this paper (Sané et al. 2018)

[16] A PhD thesis in Nice-Côte d'Azur University (France) is currently being written (JO Crook) to develop indicators of mangrove health in India and Brazil

[17] In Casamance, the spread of Islam in the region is a relatively recent phenomenon. Muslim Joola people remain deeply attached to their traditional religion and to ceremonies such as the *bukut* for men and the *balegha* for women

Their pride also stems from the fact that they have found fulfillment: the mangrove is a space of freedom and empowerment. Of course, their empowerment varies depending on their individual circumstances and context. Clearly, Linda is the head of her household, a feminist, and deeply committed; Seynabou is the pillar of her family; Malini has gained a degree of financial independence and recognition within her community. Each in her own way, these are women who are fighting to be valued for what they do and who they are, and to defend their identity, their living space, and, in short, their heritage despite significant constraints (Cormier-Salem 2024).

Risk management and strategies to combat global change

As noted above, the main constraints identified by women are less related to environmental conditions than to a lack of resources (no access to land, credit, or markets) or the pressure exerted on them by external actors, both public and private (merchants, oyster farmers, NGOs, government officials, etc.).

Climate disruption with extreme events such as the 2004 tsunami in India or drought cycles like those experienced by Senegal and northeastern Brazil in the 1970s and 1980s, is fully integrated into women's lives. The irregularity and unpredictability of rainfall—both its volume and distribution during the growing season—are central to production systems in West Africa as well as in northeastern Brazil. Numerous studies highlight how farmers manage risk and the need for systems that are as diversified as possible at all levels (from the genetic diversity of plants or species to landscapes and production systems) to overcome multifactor (climatic and non-climatic) crisis (among other references: Milleville 2007, Ribot 2020).

They are all well aware of how important the rains are for the mangroves to thrive, for there to be better and larger oysters, as well as an abundance of crabs, fish, and honey. Malini and Linda have no other sources of income besides fishing and trade; Seynabou, on the other hand, because of her rice farming, depends heavily on the rains. Nevertheless, she hardly highlights this risk. It turns out that, over the past decade, the rains have returned to Casamance and that the main cause of the decline in rice farming is the lack of labor, due to the exodus of young people (Sané et al 2018).

Their accounts reveal three main strategies common across the different sites. First, the diversification of target species, techniques, practices, and value chains is essential for the resilience of mangrove-use systems: women have become entrepreneurs, entering the trade of products from their own fishing or that of their husbands; the processing of other products—whether from their gardens or purchased at the local market—to be transformed and sold in external markets is also highlighted; for example, Malini dries the shrimp and other catches her husband brings home, Linda freezes crabs, and Seynabou makes hibiscus juice.

The second strategy for empowerment and capacity-building involves schooling or, failing that, training, experience in development and support projects, or even political engagement: Linda, for example, serves on the city council where she is responsible for evaluating health care expenditures.

The third strategy relies on community or local organization, mutual aid, and solidarity among women. The organization may be discreet within the family, the household, or the community, and informal, as is the case for Malini; or much more visible, through official institutions recognized beyond the local area, such as the Colônias in Brazil, of which Linda is an active member, or through the IEG and cooperatives in Senegal, or the Platform for Peace, which Seynabou has joined.

Their room for maneuver in the face of global change varies. Once again, Malini, an Irula woman, has very little room to maneuver, both at home and within her community; this is not the case for Linda and Seynabou, who manage to seize every opportunity: diversification, mutual aid, and even media exposure.

The accounts, however, highlight just how much their living conditions have changed compared to those of their grandmothers or mothers. They have improved significantly, even though there are stark disparities within Casamance itself between towns like Mangagoulak—which now has electricity and running water and is well-connected by roads—and isolated island villages that remain very cut off and poorly equipped. Their life narratives, dating back to when they were very young, highlight how, once married, they became working women who earn a living, often taking on responsibilities and securing

access for their children to schools, health clinics, and hospitals. All three are married and have children who are in school, well-educated, and in good health, thanks to their work and development programs.

The impact of development projects

Another common factor worth highlighting is the very important role played by development aid and mangrove conservation projects led by local or international NGOs, foundations, or government initiatives. Their impact is a double-edged sword.

In India, the traditional Irula village was completely razed, and another village was built and equipped with permanent houses, electricity, a health clinic, and a school—largely thanks to the Swaminathan Foundation. Manili can only be satisfied with these new living conditions, even though she still faces significant constraints as a member of a "tribe."

In Brazil, everything goes through the Colônia, a sort of women's union that defends their rights and secures their professional recognition. Women, who fish oysters and are not part of the Colônia, are not considered professionals, according to Linda.

In Senegal, all women belong to EIG organizations, cooperatives, and platforms. They know how to seek support from donors of various backgrounds (local or foreign, French-Canadian, Spanish, etc.). In Brazil, as in Senegal, they are also fighting against violence against women, for their emancipation and empowerment, and to strengthen their capacity. Here again, this is achieved through education and training, as well as traditional intergenerational support, which has now expanded thanks to social media. They all have cell phones, WhatsApp, and YouTube. They stay connected to the outside world through community radio and television. They often work on a made-to-order basis with a loyal customer base.

Mangroves sung and enchanted by women

Women's attachment to the mangroves stems from their instrumental value—all the resources they can derive from them (rice, honey, oysters, crabs, wood, etc.). Women draw on a variety of knowledge (practical, technical, ecological) to select the most suitable fishing sites and times for their purposes: the tide level (low or neap; high or spring) depending on the moon, water quality, mud consistency, and species' reproductive cycles. Their movements are precise when rowing or navigating, walking through the mud, moving from one mangrove root to another, prying open oysters, sorting their catch, processing their catch, etc.

The women also express their joy in living and working in the mangrove. The values associated with the mangrove are aesthetic, ethical, ritualistic, playful, and more. Malini explains how to carry the bet and laughs at her mother, who demonstrates it—a beautiful example of intergenerational transmission; Linda says that as soon as she gets on board, she leaves her worries behind; Seynabou jokes with her friends, with whom she usually goes out into the mangroves; they compete to see who can row the fastest and fill their basket first; they encourage each other by singing. The songs invite respect for the mangrove, to re-enchant it (Agrawal & Gibson 1999; Federici 2018), and showcase its evocative power and poetry.

Trips into the mangroves with the rhythm of the tides, most often at dawn, are a special time to appreciate the exposed mudflats. All the senses are awakened by the scurrying of crabs, the croaking of frogs, the cries and songs of ibises and other birds, and the rustling of insects. As the sun begins to rise, the landscape gradually reveals itself in a play of light and reflection between land and sea. The boat must be pushed into the tidal channel to reach deeper waters and set sail. Along the way, the fisherwomen spot crab holes to catch them until they reach spots suitable for shucking oysters, but also clean, spacious sites with a small sandy beach, where children can play soccer, mangroves with low-hanging branches that offer a perch from which to admire the landscape, the calm river where one can cool off—a "natural pool"—and the thick, heavy mud. What remains from these trips is a shared moment of silence, listening to the songs of the mangrove and letting oneself be enchanted by it (Descola & Ingold 2014; Ingold 2021).

The pride and joy of venturing out into the mangrove are also evident in the meetings and forums

where women gather to process their products, receive training, and secure institutional or financial support. The women never stop singing—to give themselves courage, strength, and wisdom, and to celebrate the benefits they derive from the mangrove. They sing of the value of work, the generosity of the mangrove that must be respected, and also their sisterhood and mutual support. Malini, Linda, and Seynabou, like the other women we met, care not only for their own children but also, quite often, for the children of their extended family (orphaned nephews, nieces, etc.) and defend the rights of their communities.

A few elements of conclusion

Mangrove socio-ecosystems provide fertile ground for understanding the dynamics and challenges surrounding the SDGs: they serve as carbon sinks to mitigate climate change, as breeding grounds and refuges for numerous fish and bird species, and as a reservoir of resources for coastal communities. Long undervalued, these mangrove socio-ecosystems have become a battleground among stakeholders (private, public, and community-based) with divergent—and often conflicting—visions and interests, spanning local and global scales, short- and long-term timeframes, and productivist, protectionist, and integrative approaches. Rarely are those who live and work in the mangroves given a voice. Rarely are the conditions for "living well and together" addressed[18]. This expression refers both to instrumental values associated with mangroves (direct or indirect uses of resources) and to relational values. And this is precisely what emerges from the in-depth interviews conducted with the women, from which I have selected three accounts. The three women, living in very different contexts—Malini in India, Linda in Brazil, and Seynabou in Senegal—have very similar life stories and largely share the same knowledge, needs, and aspirations.

For women fisherfolk, the mangrove is a larder, their livelihood, but above all a living space, which justifies its sustainable use. They adhere to the rules of use and access—whether formal or informal—to avoid depleting resources, to ensure their conservation, and to pass them on to future generations. All these forms of regulation are often very old, inherited from their mothers and grandmothers, and also renewed and reinvented to adapt to the new context. The innovations are not only technical or economic, but also institutional and relational. Social media, such as WhatsApp, are among the major changes: they all have cell phones and an extensive network of contacts. They are therefore stepping out of their homes or compounds and becoming increasingly visible and featured in the media, with some holding institutional leadership positions: President of the Platform for Peace in Casamance, first female president of the Colônia d'Itapussuma in Brazil. Committed women, even warriors, they are fighting in a disenchanted and globalized world; they know how to organize and seize opportunities. They work hard (they are workers), but are also "earners," having acquired economic power and negotiated a social status, and for some, becoming entrepreneurs. Nevertheless, they remain mothers who care for their children, daughters who care for their own mothers—now elderly—who have passed everything on to them. They take great pride in their work in the mangroves, a space of empowerment and freedom. Beyond the family home, they have a very strong sense of community, whether with other women in the Colônia, the village, or the municipality; some are more actively engaged in defending their interests and seeking outside support to combat violence—domestic, private, and public.

These women serve as role models, inviting us to mend the bonds between the living, recreate the commons, and re-enchant the world.

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[18] This expression was the translation chosen in Brazilian Portuguese, French, and Joola for "Sustainable and Fair Use of Mangroves" (ANR SUFUMANG program) during co-creation workshops with local users.

References

Agrawal, A., & Gibson, M. C. (1999). Enchantment and Disenchantment: The Role of Community in Natural Resource Conservation. *World Development, 27*(4), 629-649.

Agrawal, A., & Redford, K. (2009). Conservation and displacement: An overview. *Conservation and Society, 7*(1), 1. doi:10.4103/0972-4923.54790

Andrieu, J., Crook, O. J., Balasubramanian, D., Cormier-Salem, M. C., Muthusankar, G., Babu, D. S., & Vignal, M. (2025). Mangrove Social-Ecological dynamics analysis through the Adaptive Cycle and the Environmental Justice frameworks. *Water and Environmental Sustainability*.

Andrieu, J., Lombard, F., Fall, A., Thior, M., Ba, B. D., & Dieme, B. E. A. (2020). Botanical field-study and remote sensing to describe mangrove resilience in the Saloum Delta (Senegal) after 30 years of degradation narrative. *Forest Ecology and Management, 461*, 117963. doi:10.1016/j.foreco.2020.117963

Arora, S., & Stirling, A. (2023). Colonial modernity and sustainability transitions: A conceptualisation in six dimensions. *Environmental Innovation and Societal Transitions, 48*. doi:10.1016/j.eist.2023.100733

Balvanera, P., Pascual, U., Christie, M., & Gonzalez-Martinez, D. (2022). *Methodological assessment of the diverse values and valuation of nature of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services*.

Bennett, N. J., Govan, H., & Satterfield, T. (2015). Ocean grabbing. *Marine Policy, 57*(0), 61-68. doi:http://dx.doi.org/10.1016/j.marpol.2015.03.026

Biggs, D. A. (2012). *Quagmire: nation-building and nature in the Mekong Delta*: University of Washington Press.

Blanc, G. (2020). *L'invention du colonialisme vert*: Flammarion.

Carlson, D. G. (1984). *African fever: a study of British science, technology, and politics in West Africa, 1787-1864*. Watson (USA): Science History Pub.

Castañeda Camey, I., Sabater, L., Owren, C., & Boyer, A. E. (2020). *Gender-based violence and environment linkages. The violence of inequality*. Retrieved from Gland, Switzerland:

Compagnon, D., & Constantin, F. (2000). *Administrer l'environnement en Afrique. Gestion communautaire, conservation et développement durable*. Paris-Nairobi: Karthala – IFRA.

Comte, A., Cormier-Salem, M.-C., Guillotreau, P., Manouvrier, S., Proisy, C., Chabrol, Sakho, R., Soares, L.G., Agraz Hernández, C. M. (2023). *Blue carbon credits: a lot of promises but even more uncertainties for the Global South.*Paper presented at the COP28 Dubai.

Cormier -Salem, M.-C. (2017a). Mangrove grabbing. An exploration of changes in mangrove tenure from a political ecology perspective. In H. Artaud & A. Surallés (Eds.), *The Sea within. Marine Tenure and Cosmopolitical Debates* (pp. 143-162). Copenhagen: IWGIA.

Cormier-Salem, M.-C. (1999). *Rivières du sud, Sociétés et mangroves ouest-africaines*. Paris: IRD Editions.

Cormier-Salem, M.-C. (2017b). Let the Women Harvest the Mangrove. Carbon Policy, and Environmental Injustice. *Sustainability, 9*(8), 1485. doi:10.3390/su9081485

Cormier-Salem, M.-C. (2024). Desirable futures: Perspectives of Joola fisherwomen in Casamance, Senegal. *Futures, 162*. doi:10.1016/j.futures.2024.103435

Cruz-Torres, M., & McElwee, P. (2017). Gender, livelihoods, and sustainability : anthropological research. In S. MacGregor (Ed.), *Routledge handbook of gender and environment* (pp. 133-145). Abingdon, Oxon ; New York: Routledge.

Descola, P. (2005). *Beyond nature and culture.* . Chicago: University of Chicago Press.

Descola, P., & Ingold, T. (2014). *Être au monde. Quelle expérience commune?* : Lyon (Presses universitaires de).

Escobar, A. (2020). *Pluriversal politics: The real and the possible*: Duke University Press.

Fairhead, J. L., Leach, M., & Scoones, I. (2013). *Green Grabbing. A new appropriation of Nature*. London: Routledge.

FAO. (2023). *The world's mangroves 2000–2020.* Rome.

Federici, S. (2018). *Re-enchanting the World: Feminism and the Politics of the Commons*. pm Press.

Ferdinand, M. (2019). *Une écologie décoloniale-Penser l'écologie depuis le monde caribéen*: Média Diffusion.

Ferretti, F. (2023). Geography, pluriverse and 'Southern Thought': Engaging with decoloniality from the Mediterranean. *Political Geography, 107*. doi:10.1016/j.polgeo.2023.102990

Fromentin J.M., Emery, M., Donaldson, J., Kieling, D., Danner, M-C., and Hallosserie, A. (Ed.), (2022). *The Assessment Report on the Sustainable Use of Wild Species of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services*. Bonn, Germany, IPBES.

Ghaedi, Z., Santos, C., & Monteiro, C. (2026). Nature-Based Solutions, Climate Change, and Biodiversity: A systematic review of opportunities and risks. *Nature-Based Solutions*. doi:10.1016/j.nbsj.2026.100302

Glacken, C. J. (1967). *Traces on the Rhodian shore. Nature and culture in Western thought from ancient times to the end of the eighteenth century*. Berkeley: University of California Press.

Haraway, D. (2013). Situated knowledges: The science question in feminism and the privilege of partial perspective 1. In *Women, science, and technology* (pp. 455-472). Routledge.

Ingold, T. (2021). *Being alive: Essays on movement, knowledge and description*: Routledge.

Kosoy, N., & Corbera, E. (2010). Payment for ecosystem services as commodity fetishism. *Ecological Economics 69*, 1228-1236.

Lainé, N., & Morand, S. (2020). Linking humans, their animals, and the environment again: a decolonized and more-than-human approach to "One Health". *Parasite, 27*, 55.

Larrère, C. & Larrère, R., (2009). *Du bon usage de la nature : Pour une philosophie de l'environnement*. Paris, Flammarion, 350 p.

Leal, M., & Spalding, M. D. (Eds.). (2022). *The State of the World's Mangroves.* : Global Mangrove Alliance.

McAfee, K. (2016). Green economy and carbon markets for conservation and development: a critical view. *International Environmental Agreements: Politics, Law and Economics, 16*(3), 333-353.

Merchant, C. (1983). *The Death of Nature: Women, Ecology, and the Scientific Revolution*: Harper & Row.

Milleville P., 2007, *Une agronomie à l'oeuvre. Pratiques paysannes dans les campagnes du Sud.* Vol. 243. Paris, Arguments-Quae.

Moore, A. C., Hierro, L., Mir, N., & Stewart, T. (2022). Mangrove cultural services and values: Current status and knowledge gaps. *People and Nature, 4*(5), 1083-1097.

Nixon, R. (2011). *Slow Violence and the Environmentalism of the Poor*: Harvard University Press.

Odum, W. E., Odum, E. P., & Odum, H. T. (1995). Nature's pulsing paradigm. *Estuaries, 18*(4), 547-555.

Ostrom, E. (1990). *Governing the Commons : the Evolution of Institutions for Collective Action*. Cambridge: Cambridge University Press.

Ribot, J. (2022). Violent silence: framing out social causes of climate-related crises. *The Journal of Peasant Studies, 49*(4), 683-712. doi:10.1080/03066150.2022.2069016

Sané, T., Mering, C., Cormier-Salem, M.-C., Diédhiou, I., Ba, B. D., Diaw, A. T., & Tine, A. K. (2018). Permanences et mutations dans les terroirs rizicoles de Basse-Casamance (Sénégal). [Stability and change of rice land areas in Basse-Casamance (Senegal)]. *L'Espace géographique, 47*(3), 201-218. doi:10.3917/eg.473.0201

Schlosberg, D. (2007). *Defining Environmental Justice: Theories, Movements and Nature*. Oxford Oxford University Press.

Shiva, V., & Mies, M. (2014). *Ecofeminism*: Bloomsbury Publishing.

Stonich, S. C., & Vandergeest, P. (2001). Violence, Environment, and Industrial Shrimp Farming. In Nancy Lee Peluso & M. Watts (Eds.), *Violent Environments* (pp. 261-286). Ithaca: Cornell University press.

Treviño, M., & Murillo-Sandoval, P. J. (2021). Uneven consequences: Gendered impacts of shrimp aquaculture development on mangrove dependent communities. *Ocean & Coastal Management, 210*. doi:10.1016/j.ocecoaman.2021.105688

Weber, M. (1949) [1922]. "Objectivity in social science and social policy. The methodology of the social sciences". *EA Shils and HA Finch (ed.)*.

Zhang, Z., Murray, N. J., Song, X. P., Bunting, P., Worthington, T. A., Fatoyinbo, L., . . . Friess, D. A. (2026). Unexpected expansion and regrowth in Earth's mangrove forests over the past four decades. *Science, 392*(6802), 1082-1087. doi:10.1126/science.aec9773

Figures

Figure 1



Indian NGO logo (1980s): "where the shrimp swep"

Figure 2



Malini with *pari* to collect wild shrimps

Figure 3



Linda with her motorized boat, ready to go in the mangroves.

Figure 4



Seynabou in her *busana*