The Nature of Total Planning,
From Francoist Hydropolitics to Green Capitalism

Guillermo Collado Wilkins

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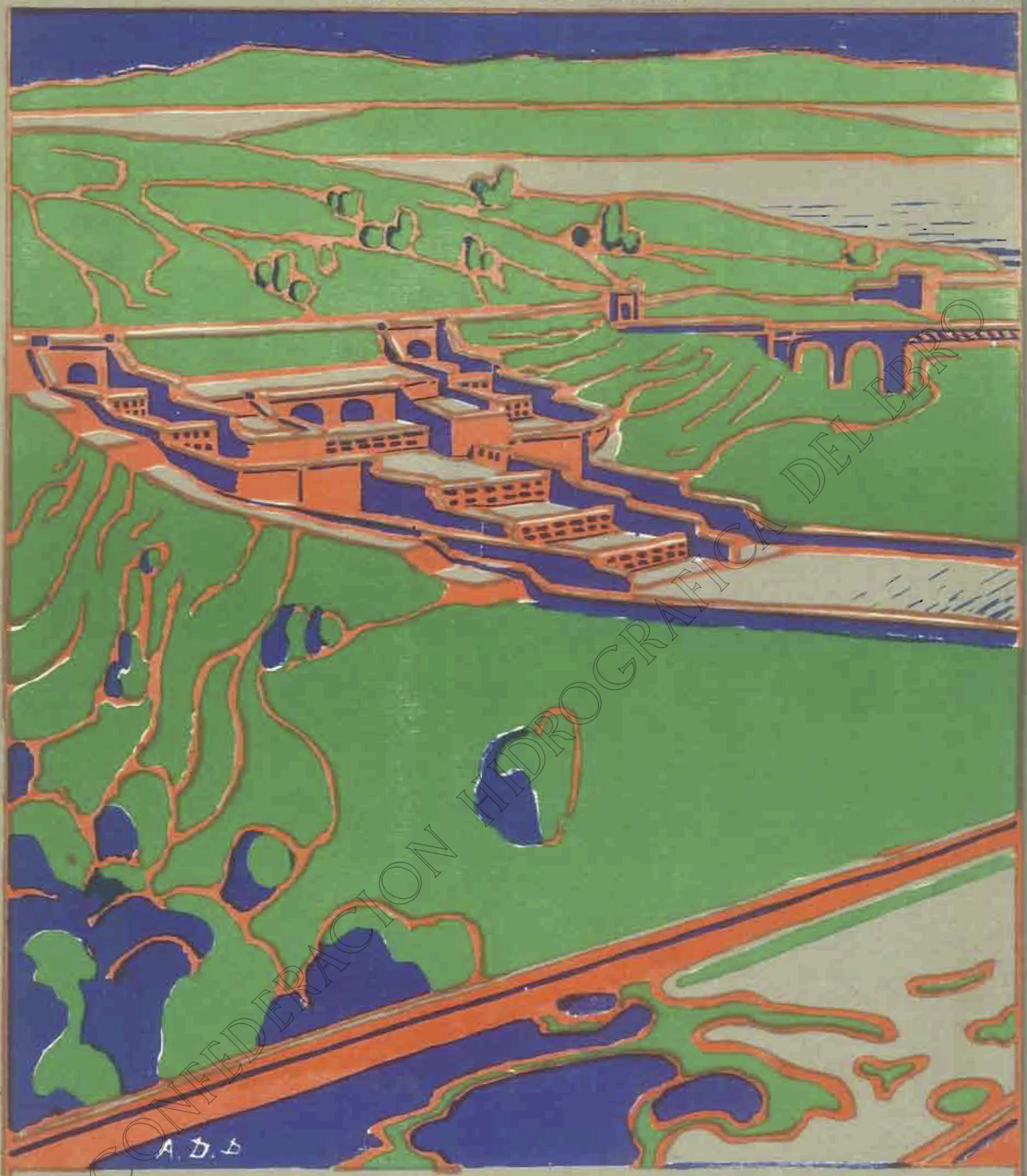

CONFEDERACION SINDICAL HIDROGRAFICA DEL EBRO

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Abstract

This paper provides a critical examination of ecological planning based on the continuities that it displays across seemingly disparate political projects and historical periods. In order to do so, it draws on the small rural valley of La Bizkaia in Navarre, Spain. It produces an environmental history of the valley through a detailed study of its hydro-forestry resources, periodising such history according to a materialist reading of its 'metabolic regimes'. That is to say, through the particular configurations between the natural and social orders that dictate life in La Bizkaia.

Initially, the study introduces the valley's natural characteristics and its property structure, laying the foundations upon which the rest of this paper sits. Subsequently, it undertakes a detailed investigation of Francoist interventions in the 1940s-60s; a massive monoculture of pine trees was planted by the Francoist Forestry Council, which radically undermined La Bizkaia's natural systems and depopulated it. This paper thus analyses the planning logic behind this natural intervention which, borrowing a term from one of its draftsmen, is named 'total planning'.

The thesis then explores contemporary management of the valley by the Government of Navarre, which has maintained ownership until this day, aligning its plans with the international protocols and standards characteristic of green capitalism. By looking at projects undertaken in the valley for nature conservation and climate change adaptation, which receive funding from the European Union, this research reveals the continuities between Francoist policies and green capitalism, and how both operate under the logic of Total Planning. Under this planning logic, they both fail to accommodate the unpredictability of political conflict and natural systems.

Planning thus serves as a lens to explore the political and epistemological dimensions of ecological thought, placing a materialist reading of a small case study into the broader context of contemporary ecological intervention.

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Introduction

— Structure
— Terminology
— Methodology

> The first initiative has been to defend soil conservation. Reforestation. To this end, pine has been the chosen tree. And the results have been magnificent. The land is fixed, secured, and wood offers the immediate prospect of considerable wealth. Timber is the future of this land. There was no other positive and efficient solution. Natural resources were not enough to sustain the inhabitants. Pastures for livestock would have disappeared completely with the erosion of a land devoid of any protection. Grain crops were insufficient to defend the population. Only the pine trees remain, pointing vigorously to the sky, as a message of hope for the future.[1]

So reads an article written in 1965 for a small tabloid from the Spanish region of Navarre. It describes the purchase of the valley of La Bizkaia by the dictatorial government of Francisco Franco, as well as the early stages of the pine tree monoculture that still dominates its landscape today. Its authors relay, in both content and form, the views that the Francoist regime held about natural planning and intervention.

The entire piece, and this quote in particular, is rich with information and ideological claims that are relevant to this project, and which I will slowly unravel in Chapters 1 and 2. For now, I simply want to point some of them out. Firstly, I want to note how morally and aesthetically charged the description of reforestation is. Secondly, how the negative outlook on the valley's inhabitants and their traditional ways of life contrasts with the optimistic account of the pine monoculture. Thirdly, how the long-term results of the plan's implementation, or lack thereof, are presented as certainties. Finally, and this is a crucial issue for my reflection, the quote above shows how politics, epistemology, and science were all articulated within this environmental plan. This is typical of the Francoist government's epistemic and political approach to

[1] Translated from Orzanco and Echaide, 'La Diputacion Ha Plantado 3000 Has. de Pinos', *Barldorba-Vizcaya*, 1965, 2–4, 538515, Archivo Contemporáneo de Navarra. Translations always my own, unless stated otherwise.

techno-science, which was seen as a means to achieve economic independence, this being a fundamental goal of its developmentalist project and its characteristic inmixing of fascism and 'National-Catholicism'.[2]

Such an articulation of techno-science, politics and epistemology is also the starting point of my work, which takes it as an axiom that a pine tree can be a technical tool for hydro-forestry management, while also helping the state to exert political power over a territory and depopulate it. It asserts that such a pine tree can be an asset to an extractivist economy and hold, in its growth, the illusion of predictability and control over nature, all while remaining relatively autonomous to all such uses of it. This understanding of nature and technics which informs my writing is also the reason that I have chosen to undertake a materialist reading of the environmental history of La Bizkaia. By looking at specific concepts, tools or institutions, seemingly separate historical periods and political projects display strong continuities.

The small rivers at La Bizkaia are tributaries to the Aragón, which is itself a tributary of the Ebro. Thus, in addition to La Bizkaia, which is the main focus throughout this essay, I use two additional case studies to look at the total planning of the Ebro.[3] The Mequinenza dam is the ultimate reason that La Bizkaia's ecosystem was radically disrupted by the Francoist monoculture of pine trees. The plantation's goal was to ensure water seepage and avoid silting, so that the downstream dams would keep high water levels, in order to produce hydroelectric energy. At the other end of this long river stands Delta de l'Ebre. The river meets the Mediterranean in a sizeable delta whose marshlands have been used as rice fields for centuries. From the delta, I can put the dam in perspective; looking back on this central feature of Francoist hydropolitics, the limits to the regime's political ecology become more visible.

In undertaking this movement, some idiosyncratic characteristics of Southern-European fascisms, and authoritarian regimes more generally, are revealed in other contemporary political projects as disparate as green capitalism or the eco-modernists advocating geoengineering. Such is the overarching rationale of this project, to demonstrate that these continuities point to a set of shared assumptions, which I locate at the epistemological level and characterise as Total

[2] Bolado, *El Experimento Del Nacional Catolicismo, 1939-1975*.
[3] The *Ebro* is the most important river in Spain in terms of length, spanning the north and north-eastern part of the Iberian Peninsula.

Planning. In examining the plan as an abstract form I am, again, situating my analysis at the articulation of technics, politics, and epistemology; for a plan is the enactment of a set of desires and assumptions, through the organisation of concrete technical and social means. A plan is the inscription of an episteme into the world by means of labour. After my characterisation of Total Planning, I propose a critique of it, which helps me sketch out the contours of an alternative, Vernacular Planning, built explicitly in opposition to Total Planning. This alternative model of human intervention in nature is anti-predictive and concerned with moving from the technocratic rule and securitisation of nature entailed by Total Planning into a framework of reparative justice.

Ultimately, my critique of total planning and the sketching of an alternative responds to a political project. One that tries to find the appropriate response to the breakdown of climate systems, in the face of our shared, yet uneven, vulnerability; in the face of capital's reaction to, and profit from, this breakdown. The project seeks an emancipatory ecology, one opposed to the enrolment of nature into a securitarian discourse that naturalises social exclusion. A political ecology that accepts our uneven responsibilities over this pressing matter, its long history and the suffering it creates; one that embraces anthropic agency, and sees it as a matter of social justice to act upon climate change, yet acknowledges the limits of our knowledge of, and capacity to act upon, natural systems.

Structure

	Object of study	Metabolic regime	Period	Structuring concept
Ch. 1	Env. history of La Bizkaia	Traditional farming	1100s – 1940s	Metabolic regimes, Structural poverty
Ch. 2	Francoist Hydropolitics	Autarchic extractivism	1940s – 1984	Total planning
Ch. 3		Total Planning as form and its limits		
Ch. 4	Green Capitalism	Sustainable development	1984–Today	Conservation–Adaptation

Figure 2: Structure and organisation of the *Magisterarbeit*.

This *Magisterarbeit* can be read in different ways. If the reader focuses on the main case study, that of La Bizkaia, then the text is closer to an environmental history of this small, rural territory in northern Spain. Alternatively, one can follow the basin of the Ebro river downstream to the dam and into its delta, where the other case studies are located. In the latter case, the text reads as a critique of the political ecology of the Francoist government, and Southern-European fascisms more generally. By connecting La Bizkaia and Delta de l'Ebre, some elements that are characteristic of these authoritarian regimes and their governance of nature can be traced to other political regimes, such as those noted above. The last way of reading this paper is by abstracting these ideological continuities and looking at which rationality they rest upon. In that case, the text is closer to the field of Science and Technology Studies, and constitutes a critique of the politics and epistemology of Total Planning.

These three readings are not just alternative or supplementary, but are meant to feed onto each other. In the main case study, I focus on La Bizkaia and its environmental history. I divide this history in three periods, corresponding to the three 'metabolic regimes' that have governed the relation between the natural and socio-economic dimensions of the valley. In doing so, I am able to characterise the overall metabolic regime established by Franco's dictatorship: 'autarchic extractivism', and the logic of total planning that underpins it. In the second chapter, I look at two other case studies. The aquifers at La Bizkaia feed the Aragón river, which is itself a tributary of the Ebro river. I follow the Ebro downstream, stopping at the Mequinenza dam, until it's very ending, where it meets the Mediterranean Sea in a delta. By connecting the Delta de l'Ebre case to that of La Bizkaia, I am able to look at the river basin as a whole. Through this geographical movement, I reveal how Francoist 'total planning' can only internalise as limits two realities that are common to every metabolic regime: political conflict and nature's unknowability.

Before moving to La Bizkaia's current metabolic regime, Chapter 3 builds an abstract model of Total Planning as form. This model I derive from the concrete failures of the total planning of the Ebro river described in Chapter 2; it will be useful to establish comparisons in subsequent chapters, in order to test the hypothesis that Total Planning underpins a multitude of political projects.

A temporal shift takes place in Chapter 4, finally arriving at La Bizkaia's current management, its third metabolic regime, sustainable development, characteristic of green capitalism. Sustainable development, that is to say, economic growth that does not compromise the environment, displays, through this temporal operation, the same limitations that characterise autarchic extractivism. These continuities are the inevitable consequence of their epistemic attitude towards nature, which they seek to control. To make this argument, I juxtapose two seemingly disparate right wing ecologies, and show how they in fact form a dialectical unit. The productive contradictions between 1) nature conservation and 2) adaptation to climate change, enable a new governance, that of disaster capitalism. Under the governance of conservation–adaptation, nature is recruited into a discourse of securitisation. On the one hand, nature must be protected from human activity, while on the other, humans need protection from the looming possibility of climate catastrophe. Securitising nature naturalises exclusion.

In the conclusions, I carry out a critique of Total Planning and sketch the contours of an alternative. Stemming from Chapter 3's abstract model, it criticises the relationship between Total Planning and the future, focusing on the notions of prediction and efficiency. Total planning, with its risk-oriented optimisation, articulates the constant management of crises that is characteristic of disaster capitalism. I conclude by suggesting an alternative to Total Planning and built in opposition to it, which would be explored in further work, Vernacular Planning, which tries to account for nature's supraliminality and political conflict as facts, not limits. In response to nature's non-linearity and complexity, and in opposition to predictive optimisation, it would be anti-predictive. In the face of the colonial history of natural intervention, and the neocolonial exposure to climate vulnerability, it supports the vernacular, against the higher reason of technocratic planning. Vernacular Planning advocates for a framework of reparative justice which places more responsibility on those that have it and sees climate reparations as a matter of social justice.

Terminology

Here I present a reduced list of terms that are of special importance for this text, and which I prefer to define beforehand for context and readability. Nonetheless, each of them merits further nuance and insight into why I choose to use them. Such details are provided in the appropriate sections.

Metabolic regime

Rooted in the eco-Marxist tradition, the term ‘metabolic regime’ extends from the broader ‘theory of the metabolic rift’, which analyses the disruption caused by capitalism in the relationship between human societies and nature. It appropriates ‘metabolism’ from biology, where it denotes the continuous interaction between living organisms and their environment necessary for maintaining life. By adding the term ‘regime’, the concept emphasises the deliberate and systematic nature of these interactions. Thus, ‘metabolic regime’ refers to the constant, systematic interaction and exchange between human societies and nature through labour, encompassing its economic and techno-scientific dimensions.

I have found it particularly useful to historicise the valley through its metabolic regimes, as these are fundamentally based on two elements: the relationship between natural and production systems, and the episteme underlying that relationship. Consequently, I use the former to trace the history of La Bizkaia and the latter to connect the valley to broader ecological discourse.

Autarchic extractivism

Autarchic extractivism is the term I have chosen to describe the metabolic regime that Francoism established in La Bizkaia, starting in the 1940s and lasting until the first half of the 1980s. The first part of the neologism, 'autarchic,' draws on the work of Tiago Saraiva and a self-definition by Francisco Franco himself, who summarised his political project with the line, 'there is no political independence without economic independence.' Saraiva argues that southern European fascisms linked the concepts of autarky (self-sufficiency) and autarchy (self-rule), making this pair their central objective. Given my focus on ecological planning, I add the second half, 'extractivism,' to refer to an economic model based on large-scale extraction of natural resources. This model typically prioritises immediate economic profit, leading to environmental and social

degradation, including displacement of people and depletion of resources. Because 'extractivism' encompasses the economic dimension, I retain the political aspect of 'autarchy.' Thus, 'autarchic extractivism' refers to both the political and economic spheres, defining the metabolic interaction that Francoism established in La Bizkaia.

Total Planning

My translation of *planificación totalitaria*, the planning framework characteristic of autarchic extractivism, as defined by Juan Antonio Suanzes, minister of Franco and a pivotal ideologue of Francoist 'total planning'.[4] The term 'total' encompasses both 'totalitarian' (its literal translation, referring to centralist, authoritarian politics) and 'totalising', an epistemological stance of comprehensive knowledge of nature for its control, which is characteristically modern. Initially contextualised historically as the planning rationale behind Francoist ecology, this concept is later abstracted into an ideal model employed for comparative analysis across diverse historical periods and political ideologies. In its historical manifestation within Francoism, it is termed 'total planning', whereas Total Planning denotes its abstract form.

La Bizkaia, Sabaiza, Ezprogui, *ezprogui*

These are not concepts, but toponyms pertaining to La Bizkaia. Because of its particular history, different names have historically been used to refer to the same things, while presently those same names may refer to different things. I opt for the Basque 'Bizkaia' over Spanish 'Vizcaya', just as I have chosen the Catalan 'Delta de l'Ebre' over the Spanish 'Delta del Ebro', to be sympathetic to the nuances of the local, in an effort for the form of my writing to be coherent with its content. Additionally, to avoid confusion with the Basque province 'Bizkaia', I have always used 'La Bizkaia' and often 'the valley of La Bizkaia'.

Nowadays, the valley is often referred to as Sabaiza or Ezprogui, for different reasons. Sabaiza is the name of one of La Bizkaia's villages, yet it typically stands in for the entire valley in official reports. This is because the Government of Navarre, which owns the entire valley and has turned it into a forestry estate, runs its operation from Sabaiza. Ezprogui, on the other hand, is the

[4] Gómez-Mendoza and San-Román, 'Competition between Private and Public Enterprise in Spain, 1939-1959: An Alternative View', 696–708.

preferred administrative name, referring to a municipality that encompasses all of La Bizkaia's villages (including Sabaiza), and three additional ones. Because the valley was completely deserted, it was administratively added to three small villages, and they all together form Ezprogui. I have chosen the historical name La Bizkaia over Ezprogui and Sabaiza to better differentiate between the territory and its property structure, or land uses.

To complicate things further, much of the research for this *Magisterarbeit* is intertwined with an artistic and curatorial endeavour named *ezprogui*. When referenced, I employ lowercase letters and italics. Further details on the project itself are provided in the methodology section below.

Methodology

While formally a case study on the environmental history of a valley, complemented by smaller case studies which expand the scope to the nature of Southern-European fascisms, this text can also be read as a warning of the perils of environmental interventionism at scale, and the fundamental ideas of nature and freedom underpinning it.[5] If that is the case, why select a minuscule region as a stand-in for world systems? Surely, this localist approach is riddled with shortcomings; natural systems which are inherently global, hypercomplex and interdependent cannot be modelled after such a small ecosystem. Nonetheless, the small scale and specificity of total planning in the Ebro river basin presents two crucial advantages for the purpose of this analysis. First, by focusing on an intervention that started over 80 years ago according to a well-documented plan, there is enough perspective to weigh in on its results. It facilitates a sound assessment of the technical adequacy, political results and discursive justifications of the natural intervention that the Francoist government undertook. Moreover, it enables a comparison between that intervention and the current management of the valley, still under ownership and administration by the government. Secondly, the small scale is better suited for a close, materialist reading within the scope of a *Magisterarbeit*. A materialist approach is well-equipped to trace continuities across different periods and epistemes, but it requires a level of detailed research that necessarily limits its temporal and geographic scope. These limits also explain the

[5] Charbonnier and Brown, *Affluence and Freedom*.

imbalance between the two case studies that comprise this paper: the rice fields in the marshlands of the Ebro river's delta, and the Dam further upstream whose construction warranted the reforestation of La Bizkaia. The latter is the main focus of my study, while the former is not fully developed and is present here as a privileged viewpoint from which to look backwards on La Bizkaia.

If the case study approach is to be of any help, it will only be insofar as it is able to provide detailed, contextualised information that is otherwise obscured via scale or abstraction. In keeping close to a small patch of land, its intricacies come to the fore, allowing for subtlety, moderation, and ambiguity. Such a level of detail immediately blurs the clear-cut lines of plans that come from above, and it demands a nuanced approach that responds better to the conflicting interests present down the basin of the Ebro river. Thus, I have complemented textual and academic research with work *in situ*, developed for over three years as part of *ezprogui*, an artistic project that I co-founded with Iñigo Villafranca Apesteguía.[6] During our regular visits, we have researched the valley by means of artistic residencies, interviews, field work, exhibitions, publications, archival research and other collective work. In doing so, we have encountered a territory, its local mythologies and oral tradition; we have encountered the relatives of the last inhabitants of this now abandoned valley, their songs, and stories. In such small places, insight often lies behind sarcasm and riddle. This deinstitutionalised knowledge is constitutive of my understanding of the valley and, even when I fail to unearth the richness of this popular wisdom, I make use of its dense testimony. `Fragments of informal conversations or popular culture are given equal legitimacy and appear in monospace characters,` in the hope of situating the reader. Finally, I have chosen to write in the first person in order to be coherent with my position in, and research of, the valley. Its environmental history constitutes the backbone of my broader analyses, which ultimately rest on the details observed in the untamed topography of La Bizkaia since my first visit in the summer of 2020.

Only a layered account of its complexities can underpin a reasonable attempt at intervening an ecosystem. Seeking for consistency between content and form, I have included a number of

[6] Iñigo Villafranca Apesteguia and Guillermo Collado Wilkins, 'Ezprogui', Curatorial project, 2023, https://ezprogui.com.

distinct voices into my account of the valley that try to represent the nuanced, often contradictory, breadth of interests that are present in it. In addition to popular knowledge and my own discoveries, the bureaucratic institutions of the state are represented through property titles, church registries, judicial dispatches and accounting ledgers; technical reason appears in agroforestry reports and ministerial dispatches from different periods, while its counterpart, pastoralist and popular-environmental movements, find space in later chapters.

To reiterate, the methodological approach of a case study is not born out of a particularist gesture. Much to the contrary, the materialist analysis that it enables by reducing the scope of study, allows for a progression from the immediate materiality at hand in the valley, to the national political ecology of Francoism, and further to its underlying epistemological assumptions, which are then brought into contact with contemporary ecological debates.

Chapter 1: An Environmental History of La Bizkaia.

— The History of La Bizkaia in Three Metabolic Regimes
— Traditional Farming
— La Bizkaia's First Transition: 'Seven Villages Drown Under a Sea of Pine Trees'

> When working the fields in the summer, we'd stop for lunch under a tree and drink from our wineskin. There wasn't always time for a 'siesta', but they weren't that pleasant anyway: we'd sleep face down on the floor, our kidneys exposed to the blazing August sun so they wouldn't cool down before the afternoon shift. Have you ever harvested with cold kidneys?

Life at La Bizkaia was always hard, rough like the ever-present brambles on the shepherd's sandals. In this section I introduce the valley, its environmental history and my periodisation of that history. After dating the three periods corresponding to the three metabolic regimes that have governed the valley, I focus on the first one, 'traditional farming'. This regime, which encompasses centuries, helps me establish certain facts that explain the structural poverty that always underpinned life in La Bizkaia. The final part of this section links said poverty with the purchase of the valley by the Francoist regime, which inaugurates the second metabolic regime, and the second chapter.

La Bizkaia is a small valley, it amounts to a mere 3,500 hectares, located in no man's land: 25 km away from the regional capital Pamplona, it is also slightly too far off the smaller, local capital, Sangüesa, in an area of no particular political or symbolic significance. Today, this godforsaken valley from the northern Spanish region of Navarre is essentially deserted, covered by an acid sea of pine trees. In and among them, nine villages that have all seen better days.

Arteta, Irangoiti, Julio, Loya and Usunbeltz are in ruins, camouflaged behind dense thicket. Even those remnants are in better shape than Usaregui, whose location is effaced from memory and its remains dispersed across the valley, unnoticed details of other villages. There is something kitsch about Sabaiza and Guetadar; the regional government, who owns the entire valley, wiped these two enclaves and rebuilt them. Dressed in their new gowns, they overlook the forestry estate as the technocrats oversee it. The single house standing in Guetadar acts as a government-owned youth centre for school visits and summer camps, the other

buildings swept away to make space for the refuge's gardens. From Sabaiza, the regional government runs its silvopasture operations. To the shock horror of these local technocrats, Gardalain was occupied by a self-governed community that has been slowly rebuilding the village according to its old urban plan, before the pine trees and shrubs defied and blurred it. In Ezprogui a single house defies the inevitable, proud and inadequate. The road to Moriones, which hardly exceeds a thousand metres, is guarded by two shepherd brothers, the two eldest neighbours of the old capital. None of the other six neighbours are below fifty years of age. Ten minutes by car, or about an hour and a half if you walk the old path with the shepherds, Ayesa, like all capitals, boasts its buoyancy: over 30 neighbours, a *frontón* for kids to play in and even an ethnographic museum in the making.[7] In its entirety, the twelve villages hold a mere 47 inhabitants, according to the last census.[8]

These figures are not surprising. La Bizkaia's topography makes for a rough living; isolated and poor throughout its history, the valley never amounted to much. The first records of settlement date back to the 12th century and their current ruined state comes as no surprise if you delve into the archives: in the 15th century two villages were left behind, followed by another six less than a hundred years later; only Sabaiza remained inhabited. During the next two hundred years, the area recovers: five villages were repopulated during the 17th century and eight by the 19th.[9] This constant flow of population in and out of the valley, coupled with frequent internal displacement, remained a constant until its demise; La Bizkaia never held sizeable populations. Take Julio as an example; at its peak, when the village was in all its glory, it amounted to a pair of houses and a pair of paddocks. Standing on the side of a cliff so inconvenient and ungiving, the produce so meagre, it could never feed as little as three families.

From their very founding until the 1940s and '60s, the villages remained the sole property of the *señores*, local nobility residing elsewhere, while the peasants, or *caseros*, struggled to survive from traditional farming, their population mobile and scarce.[10] Between 1944 and 1969, the Francoist regime bought the entire valley from the different *señores*. One village at a time, the regional council bought the land in the name of the national government, and planted in it a

[7] Zozaya, 'Ezprogui y Ayesa impulsan con un museo y una asociación'.
[8] Instituto Nacional de Estadística de España, 'Navarra'.
[9] Recalde, *La Bizkaia de Navarra*, 27–30.
[10] Ibid., 245.

monoculture of pine trees with a twofold goal of producing wood and feeding the underground aquifers.[11] Restoring the water tables would fill up the nearby dams, which was a precondition for producing hydroelectric energy, itself a key component of Franco's developmentalism.[12] The reforestation radically undermined traditional agricultural and grazing practices, further pushing the peasants to migrate, until the last inhabitant departed, leaving behind a valley exclusively devoted to the production of wood.

The extractivist regime established by Franco did not change after the dictator's passing in 1975, instead guiding reforestation until 1984.[13] Neither did land ownership. The entire valley still belongs to the government of Navarre, which has turned it into a prototype of green capitalism's governance of nature. Since '84, the forestry estate of Sabaiza has aligned itself with European guidelines, receiving funds from the European Union for different environmental programmes, ranging from nature conservation to climate change adaptation. The European Green New Deal, which has now matured into a transversal continental policy,[14] found its experimentation grounds for the technocratic governance of nature during the late 1990s and especially in the first two decades of the 21st century, in La Bizkaia and elsewhere.[15]

Its unique environmental history makes this enclave a privileged site for the analysis of the governance of nature; although, while not always as visible, these tensions are present in all ecosystems. Admittedly, a mere 3,500 hectares cannot constitute a global example, yet this no man's land does constitute a micro-representation of contemporary Southern-European rurality. Full of enriching contradictions despite its compact dimensions, the unique traits of La Bizkaia's history act as a magnifying glass over the problems it shares with the rest of the countryside in Southern Europe.

[11] Servicio forestal y cinegético del Gobierno de Navarra, 'Plan de Selvicultura Preventiva Montes de Sabaiza', 12–13.
[12] Camprubí, *Engineers and the Making of the Francoist Regime*, 22.
[13] Pemán García, Iriarte Goñi, and Lario Leza, *La restauración forestal de España*, 121.
[14] European Commission, 'The European Green Deal'.
[15] European Commission, 'Environmental Implementation Review 2022 Country Report: Spain'.

Three Metabolic Regimes

As I mentioned in the introduction, my periodisation of the environmental history of the valley is done in accordance with the three metabolic regimes that have governed it. To reiterate, this category is received from the ecomarxist tradition of 'the metabolic rift' and based on the physiological concept of metabolism; it refers to 'the interactive process of material exchange between humans and nature in the labour process'.[16] Hence, it is particularly well suited for a study on political ecology, for it articulates natural, social and economic processes. These processes, which are interactive and dynamic, do show a certain stability over time. Therefore, encompassing ten centuries in just three regimes is undoubtedly a very broad categorisation, which calls for further annotation and nuance. However, when studying the valley's natural, economic and sociopolitical systems, it becomes obvious that there is little variance within each regime, and therefore this periodisation is sufficient for my purposes. Whether one looks at the main fauna and flora of the valley,[17] at the type and volume of produce,[18] or the property structure of land,[19] the findings are coherent with the following metabolic regimes:

1. Traditional Farming, which spans from the 12th century until the 1940s and '60s.
2. Autarchic Extractivism, which characterises Francoist environmental planning and goes from the 1940s and '60s until the early 1980s.
3. Sustainable Development, which is idiosyncratic of Green Capitalism, started in 1982–1984 and still governs the valley to this day.

In what follows, I will characterise traditional farming as a way to establish certain basic facts that have always underpinned life in the valley and which help explain later developments. I leave the other metabolic regimes for Chapters 2 and 4, respectively. Before this historical reconstruction, I want to show how the current state of these villages still bears the traces of all three metabolic regimes, in an effort to underline the continuities that exist between them despite my periodisation.

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[16] Saitō, *Karl Marx's Ecosocialism*, 67.
[17] Servicio forestal y cinegético del Gobierno de Navarra, 'Plan de Selvicultura Preventiva Montes de Sabaiza', 46–49.
[18] Unknown, 'Cuentas Ezprogui'.
[19] Albani, 'Compraventa Ezprogui'.

Moriones and Ezprogui are two villages on the other side of a range of small cliffs, which do not strictly belong to La Bizkaia, but which are part of the same, homonymous, municipality, Ezprogui. The purchase by the Francoist government and the establishment of Autarchic Extractivism in the valley, never affected them and, as such, they retain some elements of Traditional Farming. Ezprogui's only house still standing, which comprises the entire village, belongs to two sisters who inherited it. The fields surrounding this lonely house are still devoted to row cropping, as they always were. In contrast, the two most notorious neighbours of Moriones are shepherds.[20] It is no coincidence, therefore, that it is still one of the few that has been able to anchor its population. Crops and cattle, *señoríos* and *vecindades*, the opposition between Ezprogui and Moriones today gives insight into historical life in La Bizkaia under Traditional Farming.

Both villages, precariously inhabited as they are, contrast with the deserted ruins of Arteta, Irangoiti, Julio, Loya and Usunbeltz. Together, they show the long-term effects of Franco's Autarchic Extractivism and its technocratic governance of nature. The use of homogeneous, totemic, solutions, of which monocultures are a prime example, undermines both biodiversity and local inhabitants. Deprived of their traditional practices, which sustained both the people and their ecosystem, these populations are forced to migrate. Their displacement, in turn, further destabilises the ecosystem, exacerbating biodiversity loss.[21]

Guetadar and Sabaiza are useful in characterising sustainable development, and Green Capitalism more broadly. Guetadar, and its ecotourist refuge for summer camps, represents the attempt to reconcile ecological management with capitalism in its most naive, greenwashing form. Nature neoprotectionism and ecotourism are the outward-facing proposals of green capitalism,[22] while Sabaiza's horse breeding operations represent the other side of the coin. In Sabaiza, the government breeds an equine race, the Jaca Navarra, which serves at once as technical solution, commodity and nationalist symbol. With the shepherds and their sheep flocks

[20] Notice the use of neighbours *(vecinos)*, as opposed to both *señores* and *caseros*, which points to the fact that Moriones was one of the few villages in which the inhabitants owned property. Recalde, *La Bizkaia de Navarra*, 335.
[21] Hautier et al., 'Anthropogenic Environmental Changes Affect Ecosystem Stability via Biodiversity'.
[22] 'Indeed, through ecotourism, nature documentaries, adventure sports and so forth, connection to nature to deal with modern-day alienation has become extremely profitable. The model of conservation that follows from this we have previously labelled "accumulation by conservation".' Büscher and Fletcher, *The Conservation Revolution*, 59.

gone, the Jaca is put to work by grazing the estate, controlling vegetable mass to help prevent wildfires. Further, they are a meat-producing breed, so they are slaughtered and transported to Sicily, where their meat is most appreciated. Ironically, since the Jaca is allochthonous to the valley, yet autochthonous to the broader region, it gets caught up in discourses of nature conservation and species protection with strong nationalist resonances.[23]

The self-governed community of Gardaláin settled into the ruins of Gardalain in 2010 and have been rebuilding this publicly-owned land ever since, according to its original urban plan. They did so of their own accord and with their own resources, their lack of land property consistent with the valley's history: 'Squatting? The land we live in is not ours, but that was always the case here. They manage land that they rarely set foot in'. In this village, we can see some key traces that all alternatives to total planning must contain, as well as the significant limits they still face today. The most important of those traits, as I will explain in more detail below, is their challenge to the structures of land property, which has achieved relative success. Despite a long-standing and still ongoing legal conflict with the local government, the first contemporary resident of Gardalain was registered as such in 2023, several decades after it was abandoned in 1964.[24] These special circumstances have created a mixed property regime. While the village itself is still owned by the government, the houses built by the neighbours belong to them, and the old church and other small patches of land are *de facto* communal. As will become clear in the next section, this conflict over land property and uses characterise La Bizkaia from the very beginning and underpin most of its later developments.

Traditional Farming

> Before the *siestas* in the blazing sun, two hours walking the trails and an entire shift. Afterwards, another shift and another two hours.

[23] In a forthcoming publication by ezprogui, Mariana Silva interviews Alberto Pérez de Muniáin and Martín Villanueva, the two people responsible for the management of the Jacas at La Bizkaia, ever since their establishment. Nature conservation is addressed more explicitly in Chapter 4, where the nationalist connotations of the Jaca play into my analysis. In the interview, Alberto and Martín explain how they were single-handedly responsible for the creation of the breed's standard: 'we played it by ear'. See their extensive work with the Jacas in Perez de Muniain, Villanueva Vergara, and Lecumberri, *Nuestros caballos - la Jaca Navarra y el burguete*.
[24] Servicio forestal y cinegético del Gobierno de Navarra, 'Plan de Selvicultura Preventiva Montes de Sabaiza', 12.

Bizkaínos would walk the trails for two or three hours every day to get to the fields, work two shifts, and then return along trails and footpaths. There were no other means of transport, since the first road was inaugurated in 1941, only a few years before the pine tree monoculture and total depopulation came hand in hand. In a cruel irony for the inhabitants, modernity peaked just before the final downfall of the valley; not a single village ever saw electricity, even over a hundred years after it was introduced in Spain. The backwardness of the valley's infrastructure is as steep as its slopes, some too sheer for animals to do the work. The soil was often ploughed by hand.

This hilly terrain, with its inadequate soil, also endures a harsh climate; frosty winters, hot summers with little rain and strong winds. Edaphological studies in the area show an abundance of impermeable clay, which is not suitable for plants, and only in areas that were cultivated for a long time are sandier soils found.[25] The prospects for produce are even bleaker when taking topography into account; the relatively high elevation (752m on average)[26] and its mountainous profile made for a pitiful life.

What I have named, for readability, Traditional Farming, is usually referred to as 'low intensity farming' in the technical literature.[27] These systems are common to all rural areas in southern-Europe, displaying low nutrient input, low stocking density, low yields, a focus on sustainability and multiple uses of land.[28] Low nutrient input refers to the minimal use of fertilisers and other external inputs, which fosters organic practices or self-reliance which was of special importance, given how inaccessible the valley was. The low yields do not support intensive agriculture, focusing on extensive grazing instead, for which polyculture systems are appropriate, promoting spatial fuzziness and the regeneration of soils. These systems are seldom mechanised and are therefore very labour-intensive. In La Bizkaia, as we have seen, most of that work was done directly by humans, with little animal labour. This, as it turns out, is not just the result of the natural conditions of the valley, such as the steep terrain. The structure of land, property, and its subsequent management, are as responsible as the steep, poor soils.

[25] Ibid., 43.
[26] Gobierno de Navarra and Sección de gestión forestal, 'Ordenación Montes Sabaiza', 14.
[27] Bignal and McCracken, 'Low-Intensity Farming Systems in the Conservation of the Countryside'.
[28] For a detailed characterisation of low intensity farming, see Plieninger, Höchtl, and Spek, 'Traditional Land-Use and Nature Conservation in European Rural Landscapes'.

Structural Poverty and Property Concentration

'This land has been described as the poorest, most desolate and barren of Navarre'.[29]

What would push the valley's inhabitants to further degrade the natural conditions of an already impoverished land? At the root of the valley's abandonment lie a material reality and a social relation; structural poverty in La Bizkaia is the result of harsh climatic conditions and property concentration. The feudal societies that founded these villages assigned land property to single owners, the *señores*, and that remained the case until the Francoist government bought the land.

Señores owned the land, infrastructure, animals, and machinery; theirs was the right to *el suelo* (the ground, and everything on it). Meanwhile, the inhabitants, the *caseros*, were entitled only to movable property, appropriately called *el vuelo* in reference to flight, or fleeing, which they often had to do. They owned `their own misery and a bit of furniture`. The señores were rentiers, typically visiting only for hunting, and were therefore not interested in the material or social development of their land.[30] Even governance was delegated to a single *diputado* of their choosing, who had authority over the *regidores*, elected by the neighbours and occupied only with the administration of everyday life.[31]

This vertical governance by a single owner with no stakes on the territory, sits opposite to traditional commons on the spectrum of land management models. Thus, it should come as no surprise that their results are also antithetical. Common ownership and use, public deliberation, layered analyses of conflicting interests and a focus on long-term sustainability[32] contrast with the *señoríos* at La Bizkaia. The results were hideous: up to the 1960s, people's beds would sometimes get wet in the winter because snow powder seeped in through the roof.[33] If this was the result of an infrastructure of property concentration and its vertical management, what effect did it have on the natural environment?

To address this question, I want to suggest a more convoluted, yet more specific name for Traditional Farming: Subsistence Agro-Silvo-Pastoralism. By separating horticulture, forestry

[29] Brach, 'Siete pueblos mueren bajo mar de pinos', 1.
[30] Diputación Foral de Navarra, 'Conde Aibar', 1.
[31] Recalde, *La Bizkaia de Navarra*, 25.
[32] Ostrom, 'Governing the Commons: The Evolution of Institutions for Collective Action', 4.
[33] Recalde, *La Bizkaia de Navarra*, 236.

and stockbreeding, it is easier to analyse precisely how the social organisation of property and labour metabolically changed the natural environment of La Bizkaia. While the grazing of sheep, hunting of birds, and, to some extent, extraction of wood, followed the traditional practices of the area, agriculture was heavily conditioned by the *señoríos* property regime. Minor hunting and grazing were not only harder to control, but also regarded by the *señores* as insignificant, so the sheep were free to make the most of the fine, green grass located in the higher pastures. On the other hand, cereal is more valuable, its cultivation comfortable to oversee, the grain easy to weigh, store, distribute, and sell. Grain was the material through which the señores extracted rent from the caseros.[34] This skewed cultivation towards increasing short-term yields at the expense of long-term sustainability, resulted in further soil erosion, water run-off and increased risk of pests and disease.

From their very founding, these villages were sold by the king to *hidalgos*, who sought to acquire a noble title with the purchase of a small patch of land and its derisory castle. The titles were not only a means to greater social status, but also exempted the *hidalgos* of significant taxes; ownership of these villages were a fiscal tool. Hence, the *hidalgos*, and later the *señores*, who never lived in the village, were content with extracting as much rent from it, without investment. Taxing in grain continued way into the 20th century, as did single ownership of the villages. Because property is a social relationship, not a material object, it also conditions the practices of the dispossessed. Whether locals or *colonos* (settlers) from other villages,[35] farmers knew that the likelihood of relocating was high. Their instability and frequent displacement further encouraged short-sighted cultivation that would increase the year's harvest at the expense of soil quality, in a desperate effort to meet the tributary pressure of the *señor*. In the long run, this exposed all *caseros* to seasonal variability, the will of the rentiers or even war,[36] putting them into a vicious cycle of increased dependency and dispossession.

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[34] The slender trees of La Bizkaia, with their ignoble wood, stood somewhere in between. Their futility as a commodity, made it so that the aristocrats living elsewhere allowed for its extraction. These aristocrat's keepers, on the contrary, understood the practical use of wood in the farmer's *oikonomia*, and used it to assert their *petit-pouvoir*, forbidding or limiting its extraction. Ibid., 244.

[35] The use of settler colonial language here is no coincidence. Chapter 2 looks at the Instituto Nacional de Colonización (INC, National Colonisation Institute) and its role in the delta's marshlands. There, I look at the Francoist colonisation of the Spanish countryside, and how constitutive the link is between the projects of colonisation of a land, its people and nature.

[36] When the lords went to war, peasants became recruits. Shorthanded, the families could not tend for the plantations and entire crops were ruined, resulting in starvation and death Recalde, *La Bizkaia de Navarra*, 372.

By recounting the environmental history of La Bizkaia I have been able, so far, to show how nature limited its inhabitants to the most frugal of lives. After inverting the terms, I have just specified the ways in which the social and technical components of human labour have, in turn, altered nature, impoverishing the soils and reducing the water tables. This dynamic co-constitution is precisely what defines a metabolic regime. To close this chapter, I take one step further in the following section. If nature conditions society and society conditions nature, I now want to take a moment to reflect on how society conditions society. This tautology enables me to study the evolution in time of the metabolic regime at La Bizkaia, whereby the cycle between nature and the social organisation of life takes a leap forward to a point of no return, spiralling into a new phase, or regime, that, while retaining elements from the previous, is substantially different.

La Bizkaia's First Transition: 'Seven Villages Drown Under a Sea of Pine Trees'

Two decades is as much as it took to leave behind centuries of Traditional Farming at La Bizkaia. The leap to Autarchic Extractivism took twenty years, from the purchase by the Francoist government, in 1944, of Arteta, Julio, Guetadar y Usunbeltz, until the last one, Sabaiza, was bought in 1965. To analyse this shift, I want to return to the quote with which I open the introduction and two other newspaper articles from the same period. The presentation of the valley and its structural poverty made by that opening piece is even more desolate than mine: 'natural resources were not enough to sustain the inhabitants. Pastures for livestock would have disappeared completely […] Grain crops were insufficient to defend the population'. Another passage from the same text reads: 'life is vanishing, and this destiny presents to us as fatal and inevitable.'[37]

These miserable conditions were the valley's norm for centuries, so why were they now acquiring this fatal tone? The article, from 1965, was written in the transitional period in which all villages were slowly but surely being bought, when the monoculture of pine trees had commenced and was establishing its roots, but had not yet taken over the entire area. The piece presents the natural intervention by the Francoist government as inevitable, in order to justify it,

[37] Orzanco and Echaide, 'La Diputacion Ha Plantado 3000 Has. de Pinos', 20.

but the metabolic conditions it describes were the defining feature of life in the valley for centuries. In fact, the difference is only a matter of perspective, of the gaze on the valley of its new master. The material difference had not taken place in nature, but in the economy: land had changed hands. The old masters, the *señores*, were focused solely on rent extraction, so the valley's underdevelopment did not appear to them as a problem to be solved, but as a natural condition of their land. On the contrary, the Francoist government and its bureaucrats were explicitly developmentalist; their goal was to expand productivity, achieving political independence through economic development. This change in the master of the valley, from the rentier individual to the technocratic government, explains my previous tautology: the extreme concentration of property in a single owner, facilitated the purchase of the villages by Franco, which was the springboard for the transition into the pine tree monoculture. The social (property concentration in the hand of single señores) conditions the social (its purchase by the Francoist government). This, in turn, inaugurates a new metabolic regime at La Bizkaia, Autarchic Extractivism, which radically changes its nature, and with which I deal at length in Chapter 2.

The article recognises, in passing, both the centrality of land property and the validity of traditional practices. In the neighbouring valley of La Valdorba 'three neighbours remain and will endure, because they are landowners'[38] and, while 'livestock could have provided some relief, there used to be a lot of sheep', with the pine plantations 'there is no more room for this kind of work'.[39] This last quote makes explicit how the state ownership of the valley, which was a necessary social condition for the establishment of the monoculture, institutes a new dichotomy with the peasants. Their practices are demonised as ignorant and malign, without taking into account their material entanglement in the lordship regime that I have explained in the previous section.

> The forestry approach is the emergency cure that tries to conserve the land, which is the only thing that can be conserved […] The pernicious desire to cultivate every hillside, making wheat fields out of poor land, condemned the people […] As in many other places, the collaboration of the woodland was always rejected. It had to be the Provincial Council who tried to restore the trees, in the face of the enmity and

[38] Ibid., 19.
[39] Ibid., 21.

> indifference of the farmers. The patches of pine that spread throughout La Vizcaya are now singing their lesson.[40]

Against the backwardness and ignorance of farmers, the superior rationality of the technocratic state, which is full of certainties ('there was no other positive and efficient solution') and full of itself; 'singing their lesson', 'only the pine trees remain, pointing vigorously to the sky, as a message of hope for the future'. The moral character with which the reforestation is tainted, specularly portrays a valley that is progressively emptied: 'life in these desolate and vacant landscapes',[41] 'multiplies its pathos, now that everything is deserted'.[42]

[40] Unknown, 'De Ayer a Hoy', 17.
[41] Brach, 'Siete pueblos mueren bajo mar de pinos', 14.
[42] Orzanco and Echaide, 'La Diputacion Ha Plantado 3000 Has. de Pinos', 21.

Chapter 2: The Dam and The Marsh. Franco's Hydropolitics

— Franco's Hydropolitics
— The Total Planning of the Ebro River
    — The Forest: La Bizkaia
    — The Dam: Mequinenza
    — The Marsh: Delta de l'Ebre

'There was no damming here, but we were made to leave as if one was built.'

This anonymous quote, taken from the ethnographic study by Juan José Recalde implicitly references the Itoiz dam, just north of La Bizkaia. Its construction, which implied the displacement of the Itoiz neighbours, and the flooding of their village, was successfully resisted for decades. Their popular struggle was vanquished in the 1990s, and the dam was built. The descendants of the last inhabitants of La Bizkaia often compare the displacement of Itoiz with that of their elders, pushed out by the pine trees whose monoculture disrupted their traditional metabolic practices. In this chapter, I contend, contrary to the quote above, that the displacement of La Bizkaia *is* in fact the result of a dam, the result of Franco's hydropolitics. More precisely, the monoculture of pine trees was part of the systematic engineering of the Ebro river basin, which revolved around the construction of dams. The primary goal of the valley's reforestation, which I analyse in detail in this chapter, was precisely to secure more water for the dams further downstream; the trees were to decrease water run-off and increase seepage into the underground aquifers, which would ensure a large flow of water throughout the entire river basin, in turn feeding the reservoirs. Hence, my contention that La Bizkaia is part of Franco's 'hydro-necro-assemblages'.[43]

If in the first chapter I used traditional farming as a way to thread the environmental history of La Bizkaia, in this second chapter I look at the second metabolic regime, autarchic extractivism, through Franco's hydropolitics. Central to the latter is the figure of the dam, which I use for two distinct purposes. Firstly, the dam connects the forest of La Bizkaia with the rice fields on the

[43] Frye, 'The Corpses of Itoiz: Mapping the Hydro-Necro Assemblage in Cavando El Agua by Iñigo Aranbarri'.

marshlands of Delta de l'Ebre, bringing La Bizkaia into contact with natural interventions at the scale of the national. This connection, which is both figurative and geographical, allows me to dissect the damaging consequences that these natural interventions have had. Secondly, the dam is the kernel of a synecdoche by which Franco's hydropolitics stand in for the entirety of his government's metabolic regime, which I have termed autarchic extractivism. As part of my characterisation of Franco's nature, I emphasise its planning and engineering of nature as a means of political intervention.

After analysing Franco's metabolic regime, the chapter returns to the case study approach for its two final sections, in which I analyse the total planning of the Ebro river basin, and its limits. Forest, dam and marsh are the three constitutive elements of the river's re-engineering, so I look at three specific examples: the reforestation of La Bizkaia, the construction of the Mequinenza dam, and the rice produced in the marshlands of the Ebro's delta. Taking these three logical steps with the help of three concrete examples reveals the two limits of total planning, namely nature's unknowability and political conflict. The Mequinenza dam, mediating between La Bizkaia's pine trees and the marshlands at Delta de l'Ebre, becomes the symbol for all the reservoirs built by the Ebro Hydrographic Confederation (CHE). La Bizkaia and the Delta, located in two extremes of the Ebro basin, make explicit the magnitude and systematicity of Franco's hydraulic works. Their failures also become more apparent: the marsh and the dam represent two major, competing programs of Franco's technocratic political ecology: the urbanisation and industrialisation of the nation through hydroelectric production, on the one hand, and, on the other, 'colonising the countryside' and modernising it through irrigation.[44]

The two governmental bodies represent two opposing projects of Spain's modernisation. Hydraulic works were undertaken by the Instituto Nacional de Industria (INI, National Industry

[44] The two governmental bodies represent two opposing projects of Spain's modernisation, whose recurring disputes I comment at the end of this chapter, when discussing political conflict as one of the limits of total planning. Hydraulic works were undertaken by the INI (National Industry Institute) Vicepresidencia Primera del Gobierno, 'Archivo INI y SEPI'; while the modernisation of Spanish agriculture was carried out by the INC (National Colonisation Institute), dependent on the Ministry of Agriculture. Ministerio de Agricultura, Pesca y Alimentación, 'INC' While the term 'colonialism' evokes a very particular kind of territorial domination, often with a sovereign state expanding its territorial grasp, here colonialism also describes a kind of expansionist programme within the nation's existing borders. It is useful to note the shared language in order to highlight just how constitutive a colonial history is to projects of natural planning. The colonial outlook is characteristic of technocratic regimes, such as Franco's, and will reappear in Chapter 3 when discussing the colonial origins of nature conservation.

Institute); while the modernisation of Spanish agriculture was carried out by the Instituto Nacional de Colonización (INC, National Colonisation Institute), dependent on the Ministry of Agriculture. I comment on their recurring disputes at the end of this chapter, when discussing political conflict as one of the limits of total planning. While the term 'colonialism' evokes a very particular kind of territorial domination, often with a sovereign state expanding its territorial grasp, here colonialism also describes a kind of expansionist programme within the nation's existing borders. This is useful to highlight, not only for clarity, but also to show how constitutive a colonial history is to all processes of natural planning. This kind of colonial outlook is characteristic of technocratic regimes, such as Franco's, and will reappear in Chapter 3 when discussing the colonial origins of nature conservation.

Franco's Hydropolitics

> On my shoulders rest all the problems of Spain: to forge the unity between the men and the lands of Spain, to bring water to the thirsty lands, […] social justice; in short, the responsibility to make a new Spain.[45]

In this speech , delivered in 1961 to the people of Granada, Franco ascribes the same value to water and national unity. To anyone familiar with the historical weight of regional conflicts in Spain, this should be enough to calibrate how central water was to Franco's government. For those who are not, it suffices to note that Spain is the country with the highest density of dams per million inhabitants, above any other, and that the vast majority of these were built during the dictatorship.[46] Hydraulic works started immediately after the civil war; in the twenty years that followed, their capacity quadrupled, producing 75% of the national energy pie.[47] All ten major continental river basins were completely re-engineered, enrolling 'every drop of water' into Franco's authoritarian technocracy.[48]

[45] A discourse given by Franco to the people of Granada on April 29, 1961, translated in Swyngedouw, *Liquid Power*, 99.
[46] With a density of 29 dams per million inhabitants. The United States is second with 23 dams per million inhabitants. Ibid., 100.
[47] Going from 1,400 Mw in 1939 to 5,200 Mw in 1959. Ibid., 112.
[48] Ibid., chap. 1.

In this section, I will seek to shed light on how a synecdoche can be drawn between Franco's hydropolitics and his general political administration. The latter has been thoroughly analysed and commented, with works that detail the dictatorship's violence and repression,[49] the economy and its development in different decades,[50] opposing factions within Francoist power and their internal disputes,[51] or the twists and turns of Franco's geopolitics.[52] An angle of analysis that has been historically overlooked, however, is to connect Franco's developmentalist goals with the technicians and engineers of the regime; to look at Francoism as a technocracy. More recently, this angle has picked up some steam, most notably in Lino Camprubí's 2014 *Engineers and the Making of the Francoist Regime* and Erik Swyngedow's 2015 *Liquid Power: Water and Contested Modernities in Spain, 1898-2010*. Their work sits at the basis of this chapter, helping me to frame Franco's political ecology in a way that addresses broader debates around ecological management as well as the hyper-local reality of La Bizkaia.

Nowhere is the technocracy of Francoism more visible than in the *Instituto Nacional de Industria* (National Industry Institute, or INI, its acronym in Spanish). Created in 1941, it was not hierarchically dependent on the Ministry of Industry, as one would imagine, but on the 'Government Presidency', directly under Franco's command.[53] The same can be said about the *Directorate General for Morocco and the Colonies*, which was under the Presidency rather than the Ministry of Foreign Affairs. The connection between industrial development and colonialism is not coincidental and will appear throughout this text in the historical ideas that underpin the political project of nature conservation, as well as in the epistemological assumptions of Total Planning. In the second half of this chapter, the pairing of industrial development and colonisation appear again, this time as opposing factions of the Francoist government; in Chapter 3 they resurface as 'a project of autarchic-war industrialisation',[54] during my brief overview of the African colonies during Francoism. The company that undertook the waterworks of the Ebro basin, ENHER, belonged to the INI, who's first president, Juan Antonio Suanzes, coined the term 'total planning', precisely referring to the systematisation of a river in the Ebro basin. In a

[49] Ortiz Heras, *La Violencia Política En La Dictadura Franquista, 1939-1977*; Rodrigo, *Hasta La Raíz*.
[50] González de Andrés, *La economía franquista y su evolución (1939 - 1977)*.
[51] Giménez Martínez, 'El Corpus Ideológico Del Franquismo'.
[52] Gil Pecharromán, *Estrategias de supervivencia*.
[53] Ministerio de Hacienda, 'Sociedad Estatal de Participaciones Industriales: Organismos'.
[54] Súarez Blanco, 'Las colonias españolas en África durante franquismo', 324.

later section, I analyse this approach to hydraulic planning of Suanzes and his INI, and keep the term Total Planning to describe a general approach to planning, beyond Franco's hydropolitics. The systematisation of the hydraulic landscape of Spain was the child of the fruitful marriage between water and concrete, whose virtues were celebrated as the redemption of a history of drought and thirst.

Autarchic Extractivism

> In the past, Spain tormented us with its drought, with its misery, with the needs of our villages and towns. That pain is now redeemed with these great national hydraulic works, with this Reservoir of the Ebro and all the others that will be built on every river basin, embellishing this once desolate landscape and producing a liquid gold that is the basis of our independence. Yes sirs, our independence; for there is no political independence without economic independence.[55]

This quote, taken from Franco's speech during the inauguration, in 1952, of a dam in the Ebro, fortuitously contains everything that I unravel in this section, which is entirely dedicated to its exegesis. Together with the quote with which I open this *Magisterarbeit*, from the local newspaper talking about La Bizkaia, the lines above help me outline the metabolic regime that Francoism established in La Bizkaia and beyond, in the entire country, which I have labelled 'autarchic extractivism'. These three sentences, which are mere propaganda on the one hand, are also a perfectly succinct account of Franco's aspirations for the total planning of the environment, and its enrolling into his political project.

The quote opens with an overblown justification of the dam's construction that stands in for a justification of Franco's entire political project: 'Spain tormented us with its misery […] that pain is now redeemed'. The closing sentence explicitly states how Franco's rule would redeem Spain of its past misery: by modernising the economy in order to build political independence. In between the two, Franco addresses the role of nature and socio-technics in his project; he summarises autarchic extractivism by providing its three outstanding characteristics:

[55] The translation is a composite between those found in Camprubí, *Engineers and the Making of the Francoist Regime*, 5; and Swyngedouw, *Liquid Power*, 106; They are both quoting Franco indirectly, through del Río Cisneros, *Pensamiento político de Franco. Antología.*

technocracy, National-Catholicism and the enrolment of nature into politics through techno-science. Let's briefly analyse each one.

Technocracy

The idea that 'these great hydraulic works' would redeem 'drought [and] misery' is not an evident one; it amounts to saying that natural and social problems can be solved by technics. This argument is not too far from my use of 'metabolic regime', but there is a crucial difference. Indeed, I have until now used this concept precisely because it links the social and the natural through labour (of which technics is a necessary part). Yet, the choice of 'metabolism' in particular highlights that such a link is dialectical and inextricable. To decouple either nature, society, or technics from their intrinsic entanglement is a dangerous affair which, more often than not, implies a rejection of one of the three.

Technocracy, which is simply the rule of the expert over the ignorant, necessarily implies a rejection of the masses, of politics. Expert's authority is precisely their superior knowledge of techno-science and governance. Hence, science and technology play a crucial role in technocratic systems, which usually err on the side of scientism and tecnofetishism.[56] Technocracies' compulsion to fetishise technology is perfectly consequential: they derive power from the constitutive split between technocrat and ignorant, which is predicated on techno-science, and maintain it by disavowing politics, which they do by proposing techno-fixes for social questions. Another particularity of the technocratic perspective is that, because of its scientism, it believes that most problems can be resolved. Consequently, the persistence of certain issues have to be blamed on someone or something, typically ignorance, laziness, or malice. As I analysed in the introduction, this was the case with La Bizkaia's monoculture, where 'it had to be the Provincial Council who tried to restore the trees, in the face of the enmity and indifference of the farmers'.[57]

Franco's hydropolitics are a prime example of technocratic governance, as both an actually existing rule and a techno-fetishistic utopia. Franco's quote above clearly manifests this excessive faith in technology, as do his hydraulic works more generally. Both Camprubí and Swyngedow explain how hydropolitics were central to Francosim, in the double sense that they

[56] Rendueles, *Sociofobia*, 41–71.
[57] Unknown, 'De Ayer a Hoy', 17.

drove its authoritarian utopia, while at the same time enacting it. The characteristically technocratic gesture of turning what was previously regarded as a given condition into a solvable problem, is also displayed in Franco's hydropolitics works; Spain's droughts ceased to be seen as a natural consequence of its climate and were, instead, regarded as being 'out of balance'.[58] To achieve equilibrium between the humid north and the arid south, the entire landscape of Spanish waterways would have to be re-engineered, as Franco notes in his speech: 'this Reservoir of the Ebro and all the others that will be built on every river basin'. Figure 2 shows a map taken from a memoir of the Ebro Hydrographic Confederation itself, which makes this imbalance explicit: the north is portrayed in green, while the south appears in an arid red.[59]

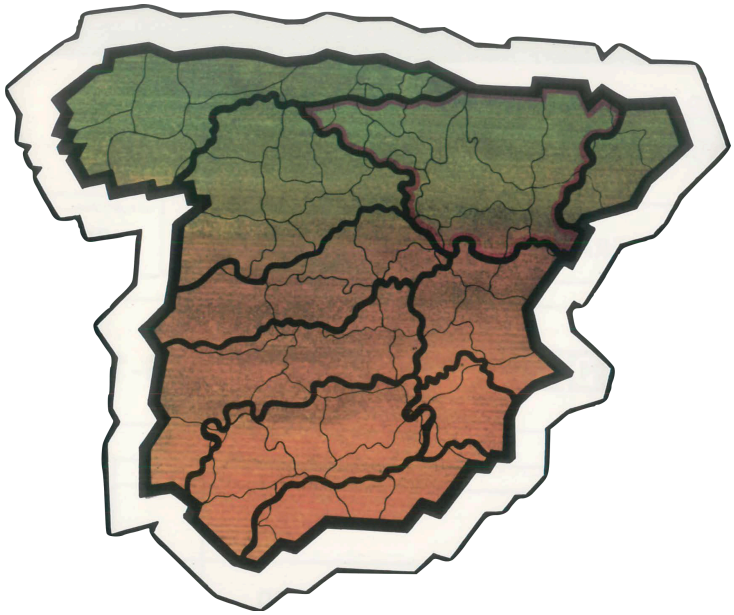

Figure 3: Spain's hydraulic imbalance.

Francoism, in classic technocratic fashion, conflated techno-fix and social justice. Drought and misery would turn into 'liquid gold', which would in turn redeem those injustices. Franco's hydropolitics, sought to 'balance hydrology with a discourse and vision of social justice', Swyngedow explains, conferring water a 'twin position as simultaneously the source of Spain's problems as well as the "thing" from which redemption and salvation could be wrought, the

[58] Swyngedouw, *Liquid Power*, 103.
[59] Barrera Giménez, 'Memoria de la Confederación Hidrográfica del Ebro 1946-1975', 0.

mythical harbinger of social justice'.[60] Water became a marker of past Republican incompetence, an obstacle to be overcome, the means to overcome it, and a project of social justice.

National Catholicism

Such was the extent of the conflation between social justice and hydraulic works, that discourse around the latter came into conflict with National Catholicism, the guiding ideological principle of the regime. The goal of Francoist hydropolitics was to rectify the natural injustice between the wet north and barren south, deepened by the historical injustice of past incompetence. State voluntarism would go as far as correcting God: 'Our treacherous torrential waters are the definitive image of a country in which the Creator has made a mistake'.[61] How can a regime that revolves around Catholicism question God? This contradiction is at the core of Camprubí's *Engineers and the Making of the Francoist Regime*, where he contradicts the mainstream idea that techno-science during Francoism amounted only to Catholic obscurantism. A crude factual observation negates that possibility: for forty years, Francoism modernised the Spanish state, which cannot happen without techno-science. Wonderfully thematised throughout his book is the complexity of the different Francoist factions, and their competing projects for the modernisation of Spain. We find this conflict again encapsulated in Franco's hydropolitics: the dispute between a modern, technocratic state and National Catholicism.

In *Archives de sciences sociales des religions*, Josep Miralles reviews the work of Jesuit historian Alfonso Álvarez Bolado, who was the first to develop the concept systematically. He defines National Catholicism as a State that was in charge of modernising Spain, 'without the political and cultural pluralism that characterised Western Europe'; central to Francoist modernisation was a process of territorial, cultural and material homogenisation. 'The Church, for its part, legitimised such a state, expecting it to reconstruct the plausible structure of a new, unanimous Christianity'.[62]

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[60] Swyngedouw, *Liquid Power*, 103–6.
[61] Swyngedouw, 107 quotes Martínez Gil, F.J. 1999. 'Nudos Gordianos de las Políticas del Agua en España.' In *El Agua a Debate desde la Universidad: Hacia una Nueva Cultura del Agua*, ed. P. Arrojo Agudo and F.J. Martínez Gil (Zaragoza: Institución Fernando el Católico, Excma. Diputación de Zaragoza), 103–143.
[62] Miralles, 'Alvarez Bolado (Alfonso) El Experimento Del Nacional-Catolicismo (1939-1975)', 247.

In agreement with Camprubí and his insistence on regarding Francoism as a technocracy, I do not highlight Catholicism because it informed and limited techno-scientific research. The answer is, once more, in the ever-giving speech by Franco during his inauguration of the dam: 'In the past, Spain tormented us with its drought, with its misery, with the needs of our villages and towns. That pain is now redeemed with these great national hydraulic works'. Both elements of National-Catholicism are contained in this phrase: first, the existence of something such as 'national engineering' is implied; second, the Catholic notion of redemption shines here in all its glory. The two notions, nationalism and redemptionism, appear again in later chapters, but I now want to focus solely on redemption for two reasons. Firstly, 'nationalist natures', while characteristic of right-wing ecologies, are rarely invoked in leftist or emancipatory ones. On the other hand, and despite rarely being recognised as characteristic of left-wing ecologies, redemption is featured in ecological projects across the ideological arch. Secondly, by focusing on redemption and its powerful connotations in such a deeply Catholic country as Spain under Franco's dictatorship, I highlight how Francoist hydropolitics aestheticised natural intervention. Aestheticising nature, or human intervention in it, is one of the most powerful discursive tools deployed by political projects of variegated ideologies, often in contradictory ways. This instrumentalisation of nature will also reappear in Chapter Three, where I look at an example of how nature is securitised in order to naturalise social exclusion.

The hydraulic works that Franco is inaugurating are already imbued with an ethical drive, for they would redeem Spaniards of their past misery, but the argument is hammered home: 'beautifying this once desolate landscape'. This machinic sublime, as T.J. Demos denounces in *Against the Anthropocene*, has important ethical consequences.[63] We have already seen that the same operation took place in La Bizkaia. In the press article that opens the introduction, the machinic element is substituted by the pine trees: 'only the pine trees remain, pointing vigorously to the sky, as a message of hope for the future'.[64] The trees here represent human control over nature and, more specifically, the efficient governance over the valley of the Francoist Provincial Council. The hyper-locality of La Bizkaia, once again, makes it easier to see what is taking place on a much broader scale. Namely, that redemptionism and technocracy often

[63] Demos, *Against the Anthropocene*; Cotton and Demos, Art In The Anthropocene.
[64] Orzanco and Echaide, 'La Diputacion Ha Plantado 3000 Has. de Pinos', 21.

join hands. More pointedly, that technocratic regimes sanction human control over nature by means of its aesthetic sublimation and, in doing so, imbue their technological interventions with a redemptive drive which, in turn, further justifies their rule. In La Bizkaia, 'it had to be the Provincial Council who tried to restore the trees, in the face of the enmity and indifference of the farmers. The patches of pine that spread throughout La Vizcaya are now singing their lesson'.[65] This redemptive quality of their intervention further entrenches the split between the ignorant and the technocrat; it does so by creating a *tabula rasa* between a past in which incompetence inscribed injustice into nature, and a present in which nature is reconciled with social justice by means of its efficient rule.

Enrolling Nature Into Politics

> 'We are prepared to make sure that not a single drop of water is lost and that not a single injustice remains'.[66]

To reconcile nature with social justice is to enrol nature into a specific political project. By virtue of this discursive operation, such a regime of governance is able to naturalise itself, or certain aspects of its rule. It occludes certain ideological claims by naturalising them. What was Franco's project, and what was he naturalising through speeches like the ones I have been analysing in this section?

A similar analysis could be done for his broader, national project but, because my focus is on Franco's hydropolitics, I will stay within the realm of his 'politics of nature'. I have characterised Franco's nature as 'autarchic extractivism', which is the second metabolic regime governing La Bizkaia. Once more, and for the last time, I come back to an exegesis of the initial speech, to its concluding sentence: 'Creating a liquid gold that is the foundation of our independence'. The autarchy–autarky conundrum that Camprubí and Saraiva extensively describe is immediately made explicit: 'Yes sirs, our independence; for there is no political independence without economic independence'. Franco's nature is a technocratic, extractivist regime that conflates nature with social justice. His enrolment of water into autarchic extractivism naturalises the

[65] Unknown, 'De Ayer a Hoy', 17.
[66] Franco, 'Speech of Chief of State in Medina del Campo'.

ecological and social consequences of building the dams: forced displacement, biodiversity loss, burned forest mass, and beyond.

In barely three sentences, Franco summarised his regime's approach to natural intervention. The quote is so condensed and pointed that it will help me trace the continuities of autarchic extractivism with green capitalism and the geoengineering left in coming chapters. In the first section of this chapter, I have introduced Francoist nature; given the centrality of water to the modernisation of Spain that Franco undertook, I have focused on hydropolitics. Through water, I have been able to define Franco's metabolic regime as autarchic extractivism, highlighting its three defining elements: technocracy, redemptive National-Catholicism, and the enrolment of nature into politics. This enrolment entails its subsumption, which I now turn to. In the second section of this chapter, I look more precisely at how the Ebro river basin was enrolled into Franco's technocracy.

The Total Planning of the Ebro River

In the second section of this chapter, I will follow an imagined river. This is, in order to look at specific examples of how Franco's hydropolitics were set in motion, I will presume the entire basin of the Ebro river to be a single stream.[67] I will follow this imagined river downstream; starting from its headwaters, as it meanders through valleys like La Bizkaia and jumps from one dam to the next, until it meets the Mediterranean Sea at the Ebro's Delta. This archetypal river allows me to then return to our main case study, the valley of La Bizkaia, but this time as part of a bigger whole. From its position upstream, I will follow the river until its very end, the marshlands that the Delta creates. In between the two stands a dam. From the pine tree forest to the rice fields, water is made to stop, gather and jump. Towards the end of this chapter, this imagined river will reveal the limitations of total planning.

To approach our imagined Ebro and how the Francoist regime undertook its systematic engineering, we must have a closer look at a key figure in Franco's hydropolitics whom I briefly introduced at the beginning of this chapter, Juan Antonio Suanzes. An engineer by training, he

[67] Aragón (Yesa, La Bizkaia and Gallipienzo), Noguera-Ribagorzana (Suanzes), Ebro (Mequinenza and Delta).

would go on to become Minister of Industry and Commerce for the Francoist government, twice. Importantly, he would be the first and most prominent president of the INI (National Industry Institute), responsible for directing hydraulic works in the Ebro Hydrographic Confederation. His influence goes beyond the *potestas* of his positions; Suanzes was a draftsperson of autarchic extractivism, and an ideologue of Franco's developmentalism more generally.[68] His main function was to create the conditions for economic independence (*autarky*) that would allow for political independence (*autarchy*). During a speech in 1943, he presented mining as the basis for the industrial development of the country, 'in it, he described "an industrialising trilogy" formed by coal, iron, and electricity'.[69] As I explained above, most of the demand for electricity would be met by the dams' hydroelectric power plants.

Our imagined river would become a paradigmatic example of the type of total control over nature that Suanzes promoted.[70] Once its 'integral regulation' was accomplished, 'it would produce 20 percent of the Spanish total demand'.[71] Such high expectations demanded the total transformation of the river. Suanzes 'insisted that the "systematization" of this basin entailed its "total control"'.[72] By this he meant 'both scientifically controlling the geological and hydrological characteristics of the basin as well as seizing political and legal power over the [Noguera's] waters'.[73] It is from Suanzes himself that I borrow the idea of 'total planning', which I nonetheless generalise to other political projects in subsequent chapters. The reason for my borrowing is the double sense in which Suanzes uses 'total', encapsulating both totalising and totalitarian. The 'total control' of our river demands that human control over nature be all-encompassing, and that politics be authoritarian; 'total planning' involves a totalitarian politics and a totalising epistemology.

[68] Gómez-Mendoza and San-Román, 'Competition between Private and Public Enterprise in Spain, 1939-1959: An Alternative View', 696–708.
[69] 'Camprubí - 2014 - Engineers and the Making of the Francoist Regime.Pdf', 22.
[70] The Noguera-Ribagorzana river runs south from the Pyrenees and for a long stretch constitutes the natural frontier between the Spanish regions of Aragón and Catalunya. It is tributary to the Segre, which is itself the main tributary of the Ebro, after joining the latter at the Mequinenza dam. It is the most paradigmatic case of the systematisation of an entire river for hydroelectric production. So much so that it merited the creation of ENHER, a company owned by the INI, for its systematic exploitation. [Victoriano Muñoz Oms headed ENHER]
[71] Camprubí, *Engineers and the Making of the Francoist Regime*, 109.
[72] Ibid.
[73] Ibid.

The engineer carrying out this deep transformation of our river, Victoriano Muñoz Oms, presented in 1950 ‘a detailed plan for the basin’s systematisation. In the name of efficiency, he emphasised that the goal was to make use of “every drop of water and every meter of level differential to extract all possible power from nature”’.[74] In order to fulfil Franco’s dream of balancing Spain’s hydrology, this systematic control of river basins would have to take place at a national scale. The magnitude of this engineering challenge had immediate political consequences: it would have to be carried by an organisation with enough financial muscle, prioritising the long-term, and able to concentrate information and decision-making. National scope, state control and vertical integration characterised Franco’s regime, but these are often found in other ecological interventions. Under Total Planning, totalitarian politics are justified by efficiency, which is demanded by totalising control. Once again, this idea is perfectly summarised by Francoists, this time by one of his Ministers, José Calvo Sotelo, who stressed ‘efficiency over liberty’.[75]

In the following sections, I follow one of Suanzes and Muñoz Oms’ drops of water through our imagined Ebro, looking at the different interventions that their total planning involved.

The Forest: La Bizkaia

Maximising water collection, and slowing down its descent to the sea is of utmost importance in order to extract all power from it, so waterworks always start at the highest terrain point. These were precisely the goals of La Bizkaia’s afforestation, and this is therefore where my trailing the drop of water begins. To protect the soil from erosion, and to regenerate the water tables that feed the dams downstream, pine trees were planted so that their roots decreased water run-off and increased seepage into the underground aquifers. In this section, I follow the drop as it meanders through a valley that was reforested in order to slow it down, by analysing the 1939 National Reforestation Plan.[76] The author’s scientific rigour is matched by their lack of resources, and by their honesty in recognising the latter. Complex and multi-faceted, yet nevertheless victim to the pitfalls of Total Planning. With the reforestation plan, I return to my main case study in La

[74] Ibid., 110.
[75] Ibid., 59.
[76] The reforestation plan can be found in the archives of the Ministry for the Ecologic Transition in Madrid Ximénez de Embún Oseñalde and Ceballos, *Plan General de Reforestación*.

Bizkaia, this time as the first logical step in the total planning of our river. As a reminder, it is worth reiterating that the Francoist government bought La Bizkaia's villages between the 1940s and '60s, establishing a monoculture of pine trees which forced a change in the metabolic regime of the valley from traditional farming to autarchic extractivism. The natural conditions of the valley, and property concentration in the hand of the *señores*, facilitated this disruption, 'catalysing depopulation'[77] and turning La Bizkaia into a 'dead zone'.[78]

If coal, iron, and electricity were Suanzes' trilogy for industrialisation, reforestation, dams, and irrigation could be considered the propaganda trilogy of Franco's ecology.[79] Forest restoration, despite the preeminence of dams, affected a bigger area than the latter and displaced more people.[80] A paradigmatic example of 'total planning', its goals were as megalomaniac as the political ambitions of Franco: to reforest six million hectares in one hundred years. This paces at 60,000 ha per year, above and beyond the most ambitious international efforts, such as the Acland Plan in England (10,000 ha per year) or the well-known reforestation plan at Landes, in France (6,000 ha per year).[81] Its importance, which can hardly be overstated, was as much technical as it was political; Francoism won the civil war in 1939 and the National Reforestation Plan was published that same year. This grandiose, long-term program conceived of the technological mediation of nature as a form of political intervention; worth millions of *pesetas* and employing day labourers by the thousands, the public works required to carry out the plan were of great help in preventing a popular uprising in areas like Andalucía, where unemployment reached 60%.[82] While its scientific goals were to protect the soils from erosion and ensure water infiltration, its political influence was such that it caused infighting between internal factions of the government.[83]

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[77] Tarazona, Carlos Tarazona.
[78] Cocker, 'The Dead Zone'.
[79] El País, 'Los bosques españoles, sometidos a una repoblación irracional'.
[80] Tarazona, Carlos Tarazona.
[81] Pemán García, Iriarte Goñi, and Lario Leza, *La restauración forestal de España*, 134.
[82] Tarazona, Carlos Tarazona.
[83] These rifts reappear later in my writing, when the drop of water that I am following down an imagined Ebro gets to the rice fields at its delta. It also makes an appearance in the plan itself. The authors write 'no se puede tolerar que, así como nosotros al enfocar el problema forestal comenzamos por declarar que a la nación le interesa obtener productos forestales, pero no sólo obtener productos forestales, sino éstos y los agrícolas y los pecuarios; en cambio, cuando se hable de ganadería, se haga en forma que parece como si todo hubiese de supeditarse a ella'. Cited in Pemán García, Iriarte Goñi, and Lario Leza, *La restauración forestal de España*, 126.

The plan is an impressive blend of technical prowess, political soundness and self-awareness, all while being drafted under extreme time pressure from the ministry. It rests on a silviculture that is 'very close to nature and uses the most contemporary concepts of vegetal sociology and dynamics'.[84] Its recommendations sound pertinent even with 85 years of hindsight, for example 'to respect those enclaves with broadleaved hardwoods and to try to expand them if environmental conditions allow'.[85] The authors, Ximénez de Embún and Ceballos, take into account social and economic factors, in ways that resonate with my explanation of La Bizkaia's structural poverty. Spain's deforestation started in the early Middle Ages but was severely aggravated by the *desamortizaciones* of the 19th century (the Spanish equivalent to the English enclosures).[86] When analysing its causes, the authors acknowledge the role of 'property and legal regimes […] of communal forests', and the 'incompatibility of reforestation' with traditional metabolic practices such as 'grazing, which are essential for the economic viability of the rural population'.[87] The multiple perspectives from which they look at reforestation draw them towards nuanced prescriptions, such as 'coordinating forestry repopulation, which they consider urgent, with agricultural and grazing improvements' and, in the meantime, 'to articulate this compatibility through the regulation of grazing and the establishment of [monetary] compensations'.[88] Still, the primary goal was to enact a fast, efficient repopulation, and their role in that project was to 'set the forestry optimum to which we should aspire and indicate the procedures to reach it'.[89]

The administration carrying out the reforestation was also highly competent and efficient; in the first forty years, the pace of planting exceeded the expected 60,000 hectares per year by a significant margin, with an average of 82,500 hectares. This would have seen the plan accomplished in just 73 years, instead of 100.[90] Despite this astonishing efficiency, and the authors' expertise, the forestry optimum was never reached. Again, Ximénez de Embún and Ceballos' prescience anticipated some reasons optimum efficiency was never reached, which can

[84] Ibid., 131.
[85] Ibid., 132.
[86] El País, 'Los bosques españoles, sometidos a una repoblación irracional'.
[87] Pemán García, Iriarte Goñi, and Lario Leza, *La restauración forestal de España*, 124.
[88] Ibid., 124–25.
[89] Note the use of 'forestry optimum', instead of 'natural optimum', or forest climax. Ximénez de Embún Oseñalde and Ceballos, *Plan General de Reforestación*, 256.
[90] Martínez Vicente et al., 'Política forestal en España', 24.

be summarised in two categories, urgency and simplification, which are indeed coherent with the technocratic cult of efficiency. They write: 'It's important to note that, having received the assignment to write this report on 23 June, we were at the same time reminded of the convenience of finishing it before the current year comes to an end'.[91] Urgency imposed the sole use of secondary and already existing material, 'without in any way being able to verify [existing bibliography], not even with a quick visit to the regions of Spain of which we have no first-hand knowledge whatsoever'.[92] Simplification would also impoverish their technical prescriptions, 'especially those concerning the choice of species and the afforestation method', which are the two most influential technical factors, and would mistakenly be made to 'remain almost the same everywhere'.[93]

Despite the far-sightedness and competence of its authors, the National Reforestation Plan shares several traits with other examples of total planning. On page 174, we find a statement that seems dissonant with the authors' complex understanding of nature. When prescribing how much land should be enlisted for reforestation, they say 'As much as it is possible, within patriotic resources, making it as big as the biggest sacrifices make possible'.[94] Notice the reference to patriotism and sacrifice that imbue this statement with a distinctive National-Catholic tone. Additionally, it reinforces this vast plan's lack of restraint and measure. The sheer magnitude of the programme, in the authors' opinion, requires its vertical integration, 'totalising in a single body the rights and duties of forest management'.[95] Finally, centralist tendencies surface in their analysis 'the biggest difficulty will be to obtain the land to be repopulated […] of which 50% is privately owned'.[96]

When water runs too fast, it carries with it the nutrients that turn sand into soil, leaving barren land behind. Fast water carries with it excessive sediment, which would reduce the capacity of dams downstream. To slow down a drop of water, a massive mediation of nature was set in motion, planting millions of hectares of fast-growing trees, mostly pine and eucalyptus. Entire

[91] Ximénez de Embún Oseñalde and Ceballos, *Plan General de Reforestación*, 9.
[92] Ibid.
[93] Ibid., 255.
[94] Ibid., 174.
[95] Pemán García, Iriarte Goñi, and Lario Leza, *La restauración forestal de España*, 134.
[96] Ibid., 127.

valleys were turned into forests in order to slow a drop of water, demanding 'the biggest sacrifices possible' from the greatest hindrance: people and their land, people *in* their land.

The Dam: Mequinenza

Fast water sweeps. Slow water seeps; it sinks. If, instead of running fast over the surface of fields and bare land, water runs lethargic, it percolates into the ground. Underground aquifers, made of sluggish water too slow to run off the sides of hills, feed our imagined river. Once it has been slowed down by the newly planted forest, once it has sunk, our drop of water needs to be gathered and made to jump. The next logical step, after reforesting to avoid silting, is damming. Having discussed the centrality of dams for Franco's hydropolitics, and autarchic extractivism more generally, I want to focus here on the damming of the Ebro river basin, which holds an astonishing 168 dams and reservoirs, which is 20% of the entire country;[97] half of those, 83, were built during Francoism.[98] More specifically, I will focus on the process of expropriation that paved the way for the radical transformation of the Ebro's waterscapes, emphasising once again the inextricable link between society, nature, and technics; the metabolic link between land property and the machinic sublime of reinforced concrete that captivated the hearts of Suanzes' INI and Muñoz Oms' ENHER.

In *Roots Under the Water*, Ana Fernández-Cebrián reads the Spanish 'dam novels' of the 1950s and '60s as a repository of the repressed collective memory of damming that took over the landscape in those years.[99] For the construction of reservoirs, 'more than 500 towns were flooded, forcing the displacement of some 50,000 people'.[100] To slow down and gather water, Ximénez de Embún and Ceballos were right, 'the biggest sacrifices' were necessary. Land expropriated, people moved, villages drowned and created anew a few miles away. In Jesús López Pacheco's novel *Central eléctrica* (Electric Power Plant), electricity 'was a kind of expected God who demanded the sacrifice of people and remained indifferent to the problems

[97] Swyngedouw, *Liquid Power*, 115.
[98] 'Ebro Dams'.
[99] Fernández-Cebrián, 'Roots Under the Water'.
[100] Ibid., 55.

that its arrival caused'.[101] The same indifference is displayed by the engineers of the novel, for whom 'nothing will be lost when these towns disappear under the waters of the reservoir'.[102]

Mequinenza is one of those villages whose loss is no loss. From atop its castle, three rivers can be seen converging, the Circa, Ebro and Segre. Standing halfway between the pine trees of La Bizkaia and the rice fields of Delta de l'Ebre, its homonymous dam is by far the biggest and most symbolic of the entire basin. Expanding over 7,500 hectares, more than five times the size of La Bizkaia, it was the biggest in the entire country at the time of its construction in 1966.[103] It 'constitutes a symbol of the darkest side of Francoism' for the expropriation process in charge of ENHER, and 'in terms of benefiting big capital without paying the slightest attention to the rights of the neighbours'.[104] The residents of Old Mequinenza 'never opposed the construction [of the dam], because they considered it to be in the general interest of the national economy', they simply compelled ENHER to offer 'appropriate compensation' and build a 'new village with irrigated lands'.[105] Instead, ENHER started a 'war of attrition' with the neighbours.[106] `ENHER wants two fifties not to make a hundred`.

'In 1964, coinciding with the celebration of the "Twenty-Five Years of Peace" campaign', a slogan appeared on the walls of the Mequinenza dam: '25 years of peace and 7 of war against EHNER'.[107] The war against Muñoz Oms' company was too one-sided for popular struggle to have any chance of winning. In fact, at the time of writing that slogan, the battle for the preservation of the Mequinenza village was already partially lost. A resolution by the Ministry of Public Works declared four years prior, in 1960, the forced expropriation of land for the construction works to begin.[108] Two years later, the Mequinenza town hall transferred some of its

[101] López-Pacheco, *Central Eléctrica*, 49.
[102] Ibid., 23.
[103] Ministerio de Agricultura, Pesca y Alimentación, 'Embalse de Mequinenza'.
[104] Ibarz, 'Fayon y Mequinenza', 8.
[105] Ibid.
[106] The most exemplary case is the alliance between ENHER and the archdiocese to illegally evict the local priest, Eduardo Royo, from the church of Mequinenza. Having bought nearly 50% of the village already, buying the shrine would tip that percentage over half, which would lawfully force ENHER to buy the entire village. The illegal eviction was meant to enforce the voluntary donation of the church to the company. To avoid incurring in costs, civil and ecclesiastical authorities colluded to break the law, since they couldn't break the will of the neighbours and their local priest. Ibid.
[107] Fernández-Cebrián, 'Roots Under the Water', 57.
[108] Franco, Mequinenza: Ocupación de fincas.

land to the County Forestry Council.[109] Similar decrees were published in 1963 (twice), 1965, 1966, 1967, 1968 (three times), 1969 (twice), 1973, 1974 and 1975.[110] Through these decrees, it is possible to paint a picture of an 'extractive economy that revolves around the (dis)possession of the territory and natural resources by the State and electricity companies' enacted by 'the "colonizers" of the Francoist administration (hydraulic engineers, government officials, companies, etc.)'.[111] Clearly visible in Figure 4, which shows a map of all the dams built in the Ebro's basin by 1975, are Swyngedow's remarks that 'a symbiotic relationship developed between the state and the energy producers', creating 'some of the largest energy oligopolies in Spain'.[112]

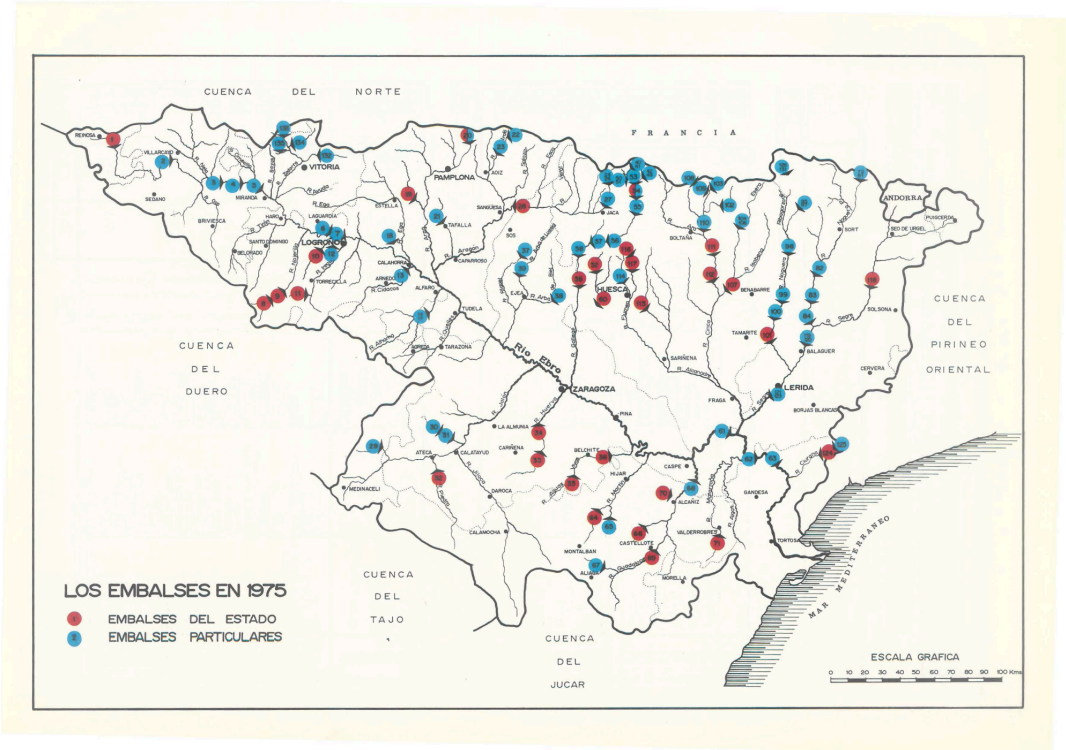

Figure 4: Dams in the Ebro, 1975. State dams in red, private dams in blue.

[109] Franco, Mequinenza: Patrimonio Forestal y Ayto.
[110] For clarity, I only cite here the decrees' reference numbers which are respectively: BOE-A-1963-5871, BOE-A-1963-6017, BOE-A-1965-21974, BOE-A-1966-11277, BOE-A-1967-7583, BOE-A-1968-35987, BOE-A-1968-46087, BOE-A-1968-50137, BOE-A-1969-39572, BOE-A-1969-50654, BOE-A-1973-43685, BOE-A-1974-50516 and BOE-A-1975-3824. All of them can be retrieved from the official website of the Spanish state bulletin (BOE). Ministerio de la presidencia, justicia y relaciones con las cortes, 'BOE.Es - Agencia Estatal Boletín Oficial Del Estado'.
[111] Fernández-Cebrián, 'Roots Under the Water', 56.
[112] Swyngedouw, *Liquid Power*, 115.

In this section, I have followed our imagined Ebro down to the Mequinenza dam, where the process of land expropriation is very well documented, as is popular resistance against it. This process, in which state technocrats establish themselves in Mequinenza is, according to Fernández-Cebrián, a process of 'Francoist colonisation'.[113] The parallelisms with La Bizkaia stand out after reading fifteen years of decrees published in the State Bulletin. First, in 1962, the forestry council was granted land in Mequinenza, then the paper industry in 1967, and in 1973 the Guardia Civil, a law enforcement body that is military in nature. The Francoist colonisation of Mequinenza does not only bear a strong resemblance to La Bizkaia, but to colonialism more broadly; the same state bodies are involved: the state, its military, its engineers, capitalist enterprises, and even the Catholic Church, who played an important role in pressuring the neighbours of Mequinenza to succumb to ENHER's demands. Yet, in this account of the Francoist conquer of nature, a figure is still missing that is quintessential to all settler colonial projects, *los colonos*, the families of settlers that are tasked with putting the confiscated land to work. While the residents of La Bizkaia were `pushed by the pine trees`, and those of Mequinenza forcefully displaced to make way for water to gather, others were settling into underutilised land and turning it into farming estates. When water is accumulated and made to jump, profit can be extracted from it. So our drop is made to jump again and again, one dam after the next, until, exhausted, it slows down as it approaches the Delta de l'Ebre. Here, canals and smaller waterways disperse it again. Drained, our drop pays its last tribute before joining the sea: it irrigates the rice fields standing in the marshlands that the Delta creates.

The Marsh: Delta de l'Ebre

My construction of an imagined Ebro has served the purpose of analysing, as succinctly as possible, the entirety of the basin and its baffling 85,000 square kilometres, which cover over 17% of Spanish peninsular territory.[114] As such , I have been able to explain La Bizkaia's afforestation as a precursor to the Mequinenza dam, which itself comes before the delta whose total planning under Francoism I now analyse. The historical, economic and environmental

[113] Fernández-Cebrián, 'Roots Under the Water', 56.
[114] Zografos, 'Flows of Sediment, Flows of Insecurity', 52.

importance of rice in the Delta cannot be overstated; together with 'the lower stretches of the Guadalquivir river in Andalucía', it is 'among Europe's greatest rice-producing regions'.[115] Rice fields cover some 21,000 hectares, approximately 65% of the Delta's surface, and are responsible for up to 98% of rice production in Catalonia.[116]

In many ways, the story of the Delta's rice fields and their expansion is that of the 'colonisation of the countryside' that took place under Franco. It is a complex and often contradictory story, its lines written at the same time by settler families and the National Unions. The latter were a strong centralising force, the state's institutional tool to vertically integrate rice production, distribution, and research. Additionally, it is a subplot of the broader script of Francoist hydropolitics that I have been describing in this chapter, and one that can be considered its obverse. On the one hand, because irrigation and hydroelectric production are two competing uses of a resource, water, which is scarce and, as we have seen, was very valuable to the Francoist regime. On the other hand, contrary to the depopulation that took place in La Bizkaia and Mequinenza, it involved a process of expansion and settlement. This much is also contradictory: while a significant segment of the rural population moved to big urban centres, thereby deserting the countryside, the latter was at the same time being urbanised and technified. Certain areas, historically underpopulated and underdeveloped, were treated by Francosim as a sort of internal *terra nullius* that had to be put to work for the new national economy. The investment in infrastructure was at the same time an economic necessity and a propagandistic campaign, ensuring support for Franco from a peasant population that had hitherto lived in miserable conditions.[117] During this time, many in the Spanish countryside hit the road and left to the urban centres, while at the same time new roads were built in places, like La Bizkaia, that had never seen one. Electrification and waterways for irrigation followed, and even entire villages made from scratch. The latter are an exemplary case of the modern, interventionist attitude of Francoism; 300 villages were created out of thin air, all according to the same urban

[115] Swyngedouw, *Liquid Power*, 5. In fact, the Guadalquivir fields are nowadays among the highest producers as the direct result of the importance of the Delta de l'Ebre: '[u]ntil the war's final stages, the Republican Army kept control of the territories that had traditionally produced rice in Spain, the Ebro Delta and Valencia', therefore 'turning the Guadalquivir marsh into a rice field' became 'a task of strategic military importance'. Camprubí, *Engineers and the Making of the Francoist Regime*, 77.
[116] Zografos, 'Flows of Sediment, Flows of Insecurity', 52.
[117] Cabana and Díaz, 'Agricultural Techniques and Modernization in Franco's Spain', 9.

plan, dominated by a central square and its church.[118] In some cases, like Mequinenza, *los pueblos nuevos* (the new villages) were created a few miles away from the old ones, which had been flooded or otherwise deserted. In others, they were located in places that had historically never been populated, giving the settlers the infrastructure to make more farmland productive for the autarchic, extractive economy.

The technocratic intervention of the countryside established a paradoxical regime of dispossession and abundance. Modernisation efforts did yield a very notable material affluence in the form of previously non-existent infrastructure, and 'an estimated total of 1.6 million hectares' were irrigated for the expansion of the national economy, yielding 'an estimated 1,200–2,000 percent improvement of their economic return'.[119] Most colonists were landless labourers, and some were given property rights over the newly irrigated land; 'the INC acquired only [150 thousand] hectares of irrigated land and settled [25 thousand] colonists on these lands between 1939 and 1975.[120] Yet, as the figures show, it was mostly 'a great propagandistic tool [which] achieved relatively little'.[121] This was an inevitable consequence of the Francoist model for agrarian modernisation, which substituted land redistribution (the Second Republic's goal) with a politics of colonisation. Hence, the investment in irrigation was always meant to estrange itself from the peasantry, and was instead directed towards landowners and large agricultural estates. With the material abundance of the countryside as a sector, came the further dispossession of the peasantry as a class: 'restoring the hegemony of the landowners while still paying lip service to considerations of social justice'.[122]

Franco's political project of 'accumulation by dispossession', and its enactment through natural interventions, are as visible in the Delta as they were in La Bizkaia and Mequinenza.[123] In a Herculean effort, spanning nine centuries and covering everything from the natural conditions of the Delta, its demographics and historical developments, to the seeding and production of rice, Emeteri Fabregat's doctoral thesis also addresses land property. In Figure 5, I have aggregated some of the data he presents, drawn from the Spanish Rice Growers Union Federation

[118] Lejeune, 'Built Utopias in the Countryside', 40.
[119] Swyngedouw, *Liquid Power*, 110–11.
[120] Ibid., 110.
[121] Ibid.
[122] Ibid.
[123] Harvey, *The New Imperialism*.

(*Federación Sindical de Arroceros de España*, FSAAE) for 1942-43, and the National Institute for Colonisation, for 1971.[124] The table shows the evolution of property of land in the Delta between 1942 and 1971; according to their size, it establishes three types of farms. For each size, it shows the percentage they represent in ownership, as well as in land total. In 1942, an astounding majority, over 98% of the farmers were small farmers, and their aggregated land represented approximately three quarters of the delta. On the other hand, large estate owners were a mere 0.1%, but amassed 11% of the land. In 1971, ownership remained relatively stable, with smaller farmers representing 96% and large ones around 0.5%, yet the percentage of land each group owned had changed drastically: despite their number remaining approximately the same, the total percentage of land owned by small farmers was cut in half. On the other hand, large estates had tripled in the same period.

Farm Size (hectares)	Owners (%)		Land (%)	
	1942	1971	1942	1971
Small (< 10 ha)	98.1	96.73	74.1	38.8
Medium (10-50 ha)	1.8	2.73	14.9	21.0
Big (> 50 ha)	0.1	0.53	11	40.12

Figure 5: Distribution of land property in Delta de l'Ebre, 1942-1943 to 1971.

Figure 5 shows the consequences of Franco's agrarian policy in the Delta in terms of its consolidation into property. While this is valuable, and similar results can be found all around the Spanish countryside, it does not explain how this change was enacted. The explanation involves, once again, the conundrum of politics, technoscience, and nature that I have been exploring in this paper. Before Francoism, the Delta and other marshlands had proven impossible to subdue; while Fabregat details how 'official plans for new settlements failed',[125] Camprubí focuses on the efforts of 'private companies [that] had attempted to turn what they deemed an "empty space" into productive land'.[126] Franco's efforts to 'colonise the countryside' were enacted in the Delta

[124] Fabregat, 'De La Sal a l'Arròs', 1244–47.
[125] Ibid., 13.
[126] Camprubí, *Engineers and the Making of the Francoist Regime*, 77.

by three main forces: 'the sector's mechanisation', which was 'decidedly imposed in the 1960s', rice genetics and vertical integration.[127] Franco's government established five *sindicatos verticales* (vertical unions) that, 'unlike trade unions, hierarchically unified the government with capital and labour, and thus were the backbone of the corporatist state'.[128] The National Union of Cereals was one of those five vertical unions, and the development of rice fields was at the centre of its activity. Rice producers were forced to unionise right after the civil war, vertically reorganising the sector, in an attempt 'to unify state politics, capital and labour issues, and scientific research'.[129] The latter, research, played a pivotal role; as Camprubí shows, 'agronomists devoted to rice genetics were able to use the vertical structure of the new regime to claim competences denied to commercial breeders (and thereby to gain control over them as well as over producers and their activities)'.[130] They 'not only certified the quality of seeds sold by others, but also produced their own seeds and distributed them by means of the Federation. Both activities made them key actors in rice standardization and homogenization in the service of autarky'.[131] The competitive advantages obtained by vertical integration over private producers, and the latter's forced enrolment into the national union, enabled the success of the Francoist colonisation of the marshlands, both in the Ebro's Delta and the Guadalquivir's basin. If 'rice genetics were at the center of internal colonization', the success of the colonisation was enabled by a natural intervention of 'national scope, state control and vertical integration'.[132]

The expansion and intensification of rice production in the Delta de l'Ebre marshlands was one of the successes of Franco's colonisation of the Spanish countryside. So much so, that rice became a monoculture in the Delta.[133] We see, in these rice fields, the same pattern that we saw in La Bizkaia's afforestation and the damming of Mequinenza: a totalitarian totalisation of an entire ecology. With the systematic engineering of its natural features, at a scale previously unheard of, the total planning of the Ebro's basin highlights the inextricable link between nature, technics, and politics. Through its examination, one of 'the disavowed but very real hard kernels'

[127] Fabregat, 'De La Sal a l'Arròs', 1248.
[128] Camprubí, *Engineers and the Making of the Francoist Regime*, 80.
[129] Ibid., 79.
[130] Ibid., 87.
[131] Ibid.
[132] Ibid., 110, 87.
[133] Fabregat, 'De La Sal a l'Arròs', 805.

reveals Francoist hydropolitics to be ‘a process that orchestrated extraordinary transfers of value to the landowners’.[134]

In this chapter, I have explored the politics of Francoist hydro-politics by examining them through La Bizkaia, Mequinenza and Delta de l’Ebre, as archetypes of the forest, the marsh, and the dam, respectively. In the next chapter, I come back to Francoist hydropolitics and the total planning of the Ebro’s basin to do two things. In the first part of the chapter, I will retrace my steps, following the river upstream from the Delta up to La Bizkaia, in order to look at the errors, failures, and limits of the river’s total planning. With the perspective given by this double movement along the river and its basin, first downstream to look at its systematisation as it took place; then upstream to look at the limits of that systematisation, I will turn to total planning itself. In the second half, I characterise the logic that underpins Francoist ecological interventions, in an effort to abstract the defining elements of total planning. With this abstract model of total planning, I hope to prove, in Chapter 3 , that Green Capitalist management shares in some fundamental aspects of authoritarian total planning; that, despite the change in political regime from a National Catholic dictatorship to a liberal democracy, present-day management of La Bizkaia operates under analogous political and epistemological assumptions.

[134] Swyngedouw, *Liquid Power*, 111.

Chapter 3: Total Planning and Its Limits

— The Limits of the Ebro's Total Planning
— The Limits of La Bizkaia's Total Planning
— The Constitutive Outside
— Total Planning as Form

In Chapters 1 and 2, I have introduced La Bizkaia, its environmental history and the two metabolic regimes that dictated life in the valley before the current one. After centuries of traditional farming, the Francoist government radically altered the relative stability of the valley, establishing a new regime that I have termed autarchic extractivism. The latter was explained in Chapter 2 using hydropolitics as a proxy, representative enough for the analogy to hold, yet smaller in scale to allow for a more detailed investigation. While recounting the technical mediation of nature that Francoism undertook, I have pointed out some of its characteristic elements. Borrowing the term from Franco's minister Antonio Suanzes, I have termed this technocratic approach to nature 'total planning'. Before continuing with La Bizkaia's environmental history into the present day, and inquiring into its current metabolic regime, I want to strip total planning from its Francoist context, and consider it as a form of ecological planning in and of itself. This chapter serves this purpose, with two distinct sections. First, it comes back to the total planning of Ebro's basin, through the three archetypal elements analysed in Chapter 2, to look at the limits and failures of the natural intervention undertaken by ENHER. After following one of Muñoz Oms' drops of water downstream from the forest to the dam and onto the delta, the first half of this chapter will go back to the dam as a vantage point from which to look onto the forest and the marsh, and the consequences the dam had on both. The second half takes these limits, together with the insights from Chapter 2, in order to build an abstraction that stands on its own, related but not dependent on its specific Francoist history. Lastly, an initial attempt at systematisation helps to simplify and organise the main elements of this abstraction, so that it will be easier to compare this ideal model with other metabolic regimes and their approach to ecological planning.

The Limits of the Ebro's Total Planning

In order to retrace my steps along the river beds of the 'imagined Ebro' in Chapter 2, I will make extensive use, again, of Lino Camprubí's work. I will start by reconstructing his own argument in Chapter 5 of *Engineers and the Making of the Francoist Regime*. There, he contends that the systematisation of the Noguera Ribagorzana river was never as 'total' as intended by Suanzes' INI and its child company ENHER. Political conflict and nature's complexity challenged the river's totalisation under hydroelectric production, and compromises had to be found. Subsequently, I will reconstruct those arguments from within La Bizkaia, looking for the specific tone they acquire when echoed by the walls of the valley's small canyons. Finally, after recounting his argument and looking for its vernacular translation in La Bizkaia, I will follow its own logic in order to extend it beyond where Camprubí takes it in his own book. As will become clear, this extension beyond Camprubí does not constitute a criticism of his work, but rather stems from a divergence in the central object of our studies; where he focuses on the role of engineers and technoscience in Francoism, I instead frame my own investigation around ecological intervention and planning.

Political Conflict: Industrial, or Agricultural Autarky?

> With mastery of the water comes the opportunity for conflict over it.[135]

The first limit to the total planning of our imagined Ebro was political conflict of different kinds and with different correlations of forces. Political opposition to hydraulic works can be seen as a set of concentric circles, with opposition coming from the outside (popular resistance), but over time increasingly internal to Francoism too and, even, to Francoist hydropower. Once again, nature and technoscience are weaponised in political battles, and political battles result from diverging conceptions of nature and its technical mediation. In Chapter 2, while following our drop of water to Mequinenza, and recounting the village's expropriation, hydraulic works were met with popular resistance, despite the brutal repression by Francoism of any and all political opposition. Private capital also presented minor challenges, litigating against the new state of affairs imposed with the sector's intervention by the INI, since up to that point hydropower had

[135] Blackbourn, *The Conquest of Nature*, 8.

been the affair of corporations only. The main challenges, and the ones Camprubí focuses on, came from the Ebro Hydrographic Confederation and the Ministry of Agriculture, both representing agricultural interests. Finally, even within INI, 'an intense argument unfolded between the civil engineers and the forestry engineers. While the former pursued enrolling water through reorganizing and reengineering Spain's rivers, the foresters argued for a solution that would, by means of reforestation, improve water capture'.[136]

Let's reconstruct Camprubí's argument in brief, which is ultimately 'a tale of two autarkies' with 'two different approaches to using rivers'.[137] As my section on Francoist hydropolitics in Chapter 2 explained at length, Suanzes' National Industry Institute, through Muñoz Oms' ENHER, advocated for a fast and strong industrialisation of Spain that would grant economic independence to the dictatorship, in turn garnering political independence. Suanzes' totalising aspirations were heavily influenced by 'a book published in 1943 by industrial engineer Antonio Robert, who argued that heavy industries should be prioritized above the satisfaction of immediate necessities'.[138] This industrial autarky, 'gradually became prevalent, but the process was not uncontested'.[139] Across the river in this tug of war stood an agricultural autarky represented by the National Institute of Colonisation (INC) and the Ebro Hydrographic Confederation (CHE). Their conception of national independence rested upon food sovereignty; in the words of one its main advocates, Fernández Fritschi, the primary goal of the dams was 'to feed Spaniards without depending on a possible friendly gesture from foreign lands'.[140] The Ebro's basin has historically been of great importance for Spanish agriculture, not least because of their 'established tradition of irrigation communities since the first canals were constructed there in the thirteenth century'.[141] Traditional production of vegetables and cereal had recently been complemented with rice production, a notoriously thirsty crop; hence, the CHE and INC sought to expand the network of waterways and canals. By ensuring that dam water was used for irrigation, they 'sought to resolve two issues of great importance to Spain's political economy:

[136] Swyngedouw, *Liquid Power*, 104.
[137] Camprubí, *Engineers and the Making of the Francoist Regime*, 105, 118.
[138] Ibid., 118.
[139] Ibid.
[140] Quoted in ibid.
[141] Ibid., 117.

the traditional unemployment affecting certain areas of rural Spain and the critical need Franco's regime faced to increase agricultural production'.[142]

Camprubí's detailed account of this dispute's technicalities is particularly useful for my investigation: '[t]wo groups of engineers coming from […] different traditions […] engaged in a fierce debate that was often expressed in technical terms regarding different interpretations of hydrological data […] and methods.'[143] As Matteo Pasquinelli reminds us in his work on political metrology, the creator of the discipline, economist Witold Kula, 'regarded the birth of modern metrology as a confrontation between social actors and a space of class struggle'.[144] The fact that the tools for this political confrontation were hydrological models highlights two important things. Firstly, an axiom sitting at the core of my research; namely, the inseparability of nature, politics, and technics as social relation. Secondly, and also already stated, that this was precisely how Francoism understood ecological intervention and, therefore, that ecological planning, whether 'total' or compromised, was always meant as an economic mediation of society. Fernández Fritschi's opposition was expressed in political and technical terms; denouncing Muñoz Oms, he said: 'the author of the study does not believe in irrigation's vital importance for the nation.'[145] Oms' study was attacked for exaggerating hydroelectric production and 'not allowing enough water for irrigation into its calculations for very dry years'.[146] Blackbourne summarises the two aspects of this engagement with nature: 'constructing the meaning of the landscape and reconstructing its material outlook are two closely related activities'.[147]

Ultimately, the INI was forced to 'give up its independent and totalitarian project', and a key milestone in that development is also of relevance here. '[T]he year 1948/1949 had half as much rainfall as any other previous recorded year. This forced a revision of the regulating reservoirs' capacity'.[148] Such an occurrence reinforces the other basic axiom of this investigation regarding nature and its metabolic relation with human societies: for any metabolism, the entanglement between a system and its environment is constitutive and inextricable, but never

[142] Ibid., 122.
[143] Ibid., 105.
[144] Pasquinelli, 'Labour, Energy, and Information as Historical Configurations', 8.
[145] Camprubí, *Engineers and the Making of the Francoist Regime*, 117.
[146] Ibid.
[147] Quoted in ibid., 120.
[148] Ibid., 123.

all-encompassing. There is no identity between the two, but a complex and dynamic co-constitution in which none of the two can ever over-determine its pair.

Nature's Complexity: A Crack in the Model

Rainfall and its effect on Muñoz Oms' calculations, and subsequently on his political disputes, leads to the second limit that total planning encountered: nature's complexity and recalcitrant autonomy. Camprubí addresses this limit via the construction of the Canelles dam. After a detailed reconstruction of the importance of physical models for the construction of arch dams, such as Canelles, he comes to the difficulties encountered during the latter's construction. In opposition to gravity dams, whose own weight is the force that counteracts that of water, arch dams use their curvature to push the water's force to the sides and against the mountainsides. If the mountain walls, which are much more massive than the front-facing concrete wall, are the ones carrying the load, then the concrete can be thinned out, saving a substantial volume of this precious material, which was scarce and expensive in Francoist Spain. At the Noguera dam, 'one of the mountain faces toward which the dam pushed the Noguera's waters did leak and had to be sealed with injected cement'. The process, 'took over fifteen years'; 'for a system that was designed to take advantage of "every drop of water", these leaks were acutely disruptive'.[149]

Camprubí's focus on these highly complex arch dams presents an opportunity and a disadvantage for my purposes. The benefit stems from the level of scientific and technical mastery required for their construction, which takes him on a long commentary of modelling. In particular, the importance and development of physical models, their historical relationship to dam construction, and, most importantly, their relation to scientific theory. Although these physical models are not themselves relevant to my analysis, they have the virtue of forcing Camprubí to go give an account of the relationship between models and the material reality that they model. His account is fortunate and highly informative, and I will come back to it in later sections. For now, it suffices to say that Camprubí proposes models as mediators, for 'they provided a common ground for the work being done at the laboratory and at the basin itself'.[150] I will come back to this relationship and expand on it, but for now I would like to point to the disadvantage

[149] Ibid., 133–34.
[150] Ibid., 125.

that Camprubí's selection of Canelles represents for my work. While the leaking wall of its mountain side clearly underlines nature's hyper-complexity, and how it inevitably challenges any totalising plan, the technical intricacy of arch dams could undersell this point. Other, equally valid, examples of faulty dams can be found in the Ebro's basin, whose structural simplicity helps underline the extent to which nature challenges its totalisation.

Barely fifteen miles from La Bizkaia sits the Yesa dam. Inaugurated in 1960, it is a gravity dam, structurally much simpler than arch dams. Its recent malfunctioning is only the last of a series of instabilities which, starting with the initial works in 1930, have occurred in 1957, 1960, 1964, 2003, 2004, 2006, 2008, 2012.[151] The 'continuous and persistent instabilities of the slopes of the Yesa dam' led in 2013 to what is known as 'the first catastrophe', by which two nearby residential areas were evacuated and a tier 1 emergency scenario was drawn up for the neighbouring city of Sangüesa.[152] Antonio Aretxabala, author of the report commissioned by the city, points to the worrying convergence of 'the highest seismic propensity of northern Iberia', with a 'disquieting lack of knowledge' of this seismic reality. Another gravity dam in the Ebro's basin which has displayed faulty behaviour is no other than Mequinenza, analysed in Chapter 2. Here, the instability of the mountain sides was not caused by seismic landslides, but by the tunnels of pre-existing mines. The most interesting aspect of Mequinenza's case is the relationship that a vertical, technocratic plan establishes with error. 'The existence of the old mining galleries was known to every Mequinenzano', so it is hard to imagine that the engineers were not aware of them.[153] Entertaining the possibility that the galleries could compromise the dam's stability would presumably be a fundamental task of the engineers; yet, again, the entanglement with politics complicates the matter. To avoid the dam from driving him out of business, Francisco Freixes, a local mine operator, 'wrote a letter to the Ministry of Public Works claiming that his mines would not threaten the statics of the dam'.[154] The engineers themselves were confronted with similar dilemmas, between the project and their own livelihoods or reputation for, while 'the technician's mistakes were many […] when the engineer in charge raised awareness, he was ousted'.[155]

[151] Laboratorio de Arquitectura de la Universidad de Navarra and Aretxabala, 'Estudio laderas Yesa', 17–22.
[152] Ibid., 2.
[153] Ibarz, 'Fayon y Mequinenza', 8.
[154] Brendel, 'Dam Construction in Francoist Spain in the 1950s and 1960s', 5.
[155] Ibarz, 'Fayon y Mequinenza', 9.

Up to this point, Camprubí's argument has led the way, but I now want to divert from that path, following the trail that goes from Canelles back to La Bizkaia. In the next epigraphs, I will look at political conflict and nature's complexity as they apply in the valley. Subsequently, I will expand Camprubí's reasoning into dimensions unexplored by him that are, nevertheless, relevant for ecological planning. After this double movement, first zooming into the valley, then zooming out, I will abstract 'total planning' from its historical, Francoist origins and develop it into a general model.

The Limits of La Bizkaia's Total Planning

As explained in Chapters 1 and 2, the villages in La Bizkaia were bought by the Francoist governments in the mid-20th century, turning the valley into a monoculture of pine trees. Here I will go through the limits to the valley's total planning. How did nature's complexity challenge its total subsumption; and how about political conflict, especially that between the two autarkies that Camprubí discusses? To answer these questions, in this section I summarise my findings in the General and Contemporary Archives of Navarre, holding the historical and contemporary documents concerning La Bizkaia respectively. In the Contemporary Archive, I sifted technical reports on silvopasture, while the documentation from the General Archives revolves around legal disputes and economic accounting.

Nature's Complexity: A Burning Forest

With 80 years hindsight since the National Reforestation Plan was enacted, I will now have a second look at the reforestation of La Bizkaia. The valley is still owned by the Navarre government to this day, the pines still managed by its forestry department; so what is their own assessment? Is it true, as the newspapers with which I opened the introduction predicted, that 'the pine trees chant their lesson, pointing vigorously towards the sky, a message of hope for the future'?[156]

[156] Orzanco and Echaide, 'La Diputacion Ha Plantado 3000 Has. de Pinos', 3.

For centuries, the forest of La Bizkaia was characteristic of its region. During the first metabolic regime, traditional farming, its hills were dominated by Portuguese oak (*Quercus faginea*) and European beech (*Fagus sylvatica*), with minimal presence of English, Pubescent and Evergreen oaks (*Quercus robur, Quercus pubescens, Quercus ilex*).[157] As predicted by Ximénez de Embún and Ceballos, the authors of the National Reforestation Plan, their two most important recommendations, 'regarding the choice of species and afforestation method' were not followed, and fast-growing trees were given absolute preference.[158] Today those same hills are saturated by a single species, *Pinus nigra*, 'that doesn't correspond to the territory' and takes over 85% of the entire valley. Moreover, the remaining 15% is primarily an immature shrubland, as proven by the predominance of Boxwood (*Buxus sempervirens*); the unlikely hardwood, primarily oaks, appear relegated, in slopes too steep for production.[159] The dominant pine is 'of bad quality for forestry exploitation' and shows 'no kind of silvicultural maintenance'.[160] Austrian *Pinus nigra* monopolises the landscape today, overwhelmingly more present than the second most numerous tree, the Corsican *Pinus nigra*.[161] The afforestation method is also poorly regarded today by these technical reports. Aerial photography shows the forest as a patchwork, each patch representing the purchase of a new village.[162] Yet, within these big patches, the pines were all planted simultaneously and using terraces.[163] Their shared age (and therefore height) and absurd density make for a silvopastoral nightmare, compounded by insufficient management after planting.

Even when measured against its own reductionist goals, the failure of La Bizkaia's afforestation is resounding. If the two main goals were to circumscribe erosion and produce wood for industrial purposes, neither can be considered to have succeeded. While soil erosion contention is contested, the low productivity of the forest's wood production is undeniable.[164] The afforestation method, with its excessive density, makes for thin trees whose suboptimal wood cannot be sold as poles, and are only suitable for lower-value cellulose mass.[165] Low value wood

[157] Servicio forestal y cinegético del Gobierno de Navarra, 'Plan de Selvicultura Preventiva Montes de Sabaiza', 31.
[158] Ximénez de Embún Oseñalde and Ceballos, *Plan General de Reforestación*, 255.
[159] Servicio forestal y cinegético del Gobierno de Navarra, 'Plan de Selvicultura Preventiva Montes de Sabaiza', 54–55.
[160] Gobierno de Navarra and Sección de gestión forestal, 'Ordenación Montes Sabaiza', 23, 50.
[161] Servicio forestal y cinegético del Gobierno de Navarra, 'Plan de Selvicultura Preventiva Montes de Sabaiza', 54.
[162] Ibid., 71.
[163] Ibid., 72.
[164] Tarazona, Carlos Tarazona.
[165] Servicio forestal y cinegético del Gobierno de Navarra, 'Plan de Selvicultura Preventiva Montes de Sabaiza', 77.

production, biodiversity loss and depopulation can already be counted among the utter failures of this technocratic intervention, with the looming risk of forest fires growing every year. If the choice of species entailed an immense loss of biodiversity, the methods only aggravate it; again because of the density and the equal height of the pines, the forest canopy is too thick, little light penetrates down to the forest floor and as a result herbs and shrubs cannot grow. The fauna that lives and thrives in these lower levels of the forest disappear and, with them, higher echelons in the trophic chain: the population of insects, rodents, and other small mammals, amphibians, and birds have decreased dramatically since the monoculture started.[166] Having discussed depopulation in previous chapters, I want to focus here on forest fires, establishing a parallel between them and Camprubí's example of the Canelles' dam.

La Bizkaia has not suffered any major forest fires, but this is only due to the winds' wilful whims, and the preferential attention that governmental property receives.[167] However, its afforestation followed the national model, whose data I use as a source for analysis, justifying the analogy. Conifers, as a plant class, are prone to fires.[168] Austrian pine is worse. In comparison to other subspecies, like Aleppo pine (*Pinus halepensis*), it displays poorer regeneration capabilities, since it 'only has important harvests every three to five years' and does not possess serotinous pine cones, which only open and release their seeds when exposed to high temperatures, in the aftermath of fires, helping the forest to recover after their occurrence.[169] The assessments at the national scale match perfectly with the mistakes made at La Bizkaia: monocultures; the use of exogenous and fire-prone trees; poor planning and maintenance; dismissing traditional land use; or strict, single-use zoning. The Spanish National Research Council, the country's scientific state agency, published a detailed study of wildfires in 1985. Segmenting by plant type, it was able to prove that the main cause of their rapid increase was the Francoist reforestation.[170] Austrian pine burns easily and regenerates poorly. The result is loss of forest mass at a rate superior to the technocratic reforestation. Despite afforesting three million hectares, the increase in wildfires resulted in net loss of forest mass.

[166] Gobierno de Navarra, 'Plan de Ordenación Sabaiza', 18–20.
[167] Gallipienzo (in front of La Bizkaia) and La Valdorba (behind it) both suffered wildfires in 2022.
[168] Powell and Forest Silviculturist Supervisor's Office of Pendleton, Oregon, 'White Paper F14-SO-WP-Silv-4 July 2011 Active Management of Dry Forests in the Blue Mountains'.
[169] Servicio forestal y cinegético del Gobierno de Navarra, 'Plan de Selvicultura Preventiva Montes de Sabaiza', 58–59.
[170] Martínez Vicente et al., 'Política forestal en España', 27–30.

Nature, its unyielding autonomy and overwhelming complexity, presented a challenge to Francoist technocratic interventions. Autarchic extractivism found insurmountable obstacles in leaking mountainsides and burning forests. In its own terms, it still fails today to provide profitable enough wood. Measured against a nuanced, contemporary ecologism, biodiversity plummeted, and the valley was completely deserted, the latter itself a springboard for further natural degradation. Reforestation entailed the loss of forest mass, biodiversity, and even entire villages. The social consequences are marked by a double sacrifice, the pitiful conditions of the labourers doing the work, and the fact that most of them were undermining their own livelihoods.[171] In a land that was always owned and managed from above, a monolithic environmental plan was carried out systematically, resulting in ruination, silence, and `a forest that looks like a car park for pine trees;` the reforestation of La Bizkaia is a story best told by the ruins and their silence.

Political Conflict: The Purchase of Sabaiza

The industrial autarky represented by the National Industry Institute, with its total planning of the Ebro's basin for hydroelectric production, encountered a second obstacle in its totalising aspirations. Other than nature's challenging complexity, political resistance and friction constituted a major hurdle. As Camprubí reminds us, the biggest opposition came from within Francoism, from the National Colonisation Institute and its agricultural autarky. If that conflict found a key battlefront in hydrological data and models, the legal front was equally important. As they always do, laws and bills acted as a crystallisation of the political conflict, reflecting the relative force of the two autarchic projects. Moreover, once a relative victory gets codified into law, the latter can be used to impose and further entrench the victory that originated it. In this section, I trace the conflict between INI and INC to La Bizkaia, by means of its legal embodiment.

Twelve days away from the new year, on 19 December 1951, a law was passed regulating 'afforestation and management of agricultural crops on land within the watersheds supplying [water] reservoirs'.[172] It represents a victory by Suanzes' industrial autarky, and facilitates the

[171] El País, 'Los bosques españoles, sometidos a una repoblación irracional'.
[172] BOE, Repoblación forestal de cuencas hidrográficas, 5774.

purchase, or expropriation, of land within river basins with dams. As Chapter 2 explains, to sustain sizable amounts of water in the dam, so that it can produce significant electricity, it is necessary for the entire basin to carry as much water as possible. For the underground water tables to be sufficiently full, water percolation into the underground aquifers is necessary and, for that to take place, soil erosion and water run-off must be minimised. This is the whole premise of the reforestation plan, and is of special relevance for hilly terrain with poor soil quality and low vegetation indexes. With this description in mind, it is not hard to picture La Bizkaia and to see why this legal bill is an appropriate means of tracing political conflict in the valley. The bill regulates the acquisition of land by the state, categorising parcels along two axes: property structure (private or public) and agricultural use (used for cropping or not), and stipulating the state's obligations for each case. This categorisation, a prerequisite for implementing afforestation, was enacted by the Ministry of Agriculture, through the National Colonisation Institute and Forestry Departments.[173] This bill therefore represents a victory for Suanzes' industrial hydropolitics but, even in victory, every dispute involves trade-offs. The sixth article of the bill is one of those necessary concessions, a legal trace of the conflict between INI and INC. It establishes that the Directorate-General for Hydraulic Works would reimburse the Ministry of Agriculture for half of the difference between the price paid for agricultural land, and the price that same land would have if it was barren.[174]

This bill, as the crystallisation of both Suanzes' victory and a necessary trade-off, regulated the purchase of the village of Sabaiza, in La Bizkaia. As such, it helps me contextualise the acquisition as part of the reforestation efforts, bridging hyper-local action with national ecological planning. The land targeted by the bill, which are described in its preamble, seem like a picture of La Bizkaia. Firstly, its rivers are tributaries of the Aragón, which is itself a tributary of the Ebro. Therefore, the valley's watersheds supply three dams, Ribarroja and Mequinenza, which were being built at the time, and Gallipienzo, which was planned but never took off. Secondly, its terrain is very hilly, has clay soil and was further eroded by row-cropping, favouring water run-off. Finally, as explained in Chapter 1, the concentration of property in the hands of single owners eased the purchase. And so, this bill both reinforces the metabolic role of

[173] Ibid.
[174] Ibid., 5775.

property structures in La Bizkaia and helps me trace autarchic extractivism back to the valley. The bill's sixth article is at the centre of an epistolary exchange dating to 1962 held at the General Archives of Navarre. Two opposing estimations of the economic compensation that it regulates appear side by side in a handwritten document at the end of this exchange. On the left column, the estimated figures of the Ministry of Agriculture. On the right, the figures by the Ministry of Public Works (just 65% of the requested amount) which finally prevailed. This handwritten ledger shows, once more, the political conflict between the industrial and agricultural autarkies.

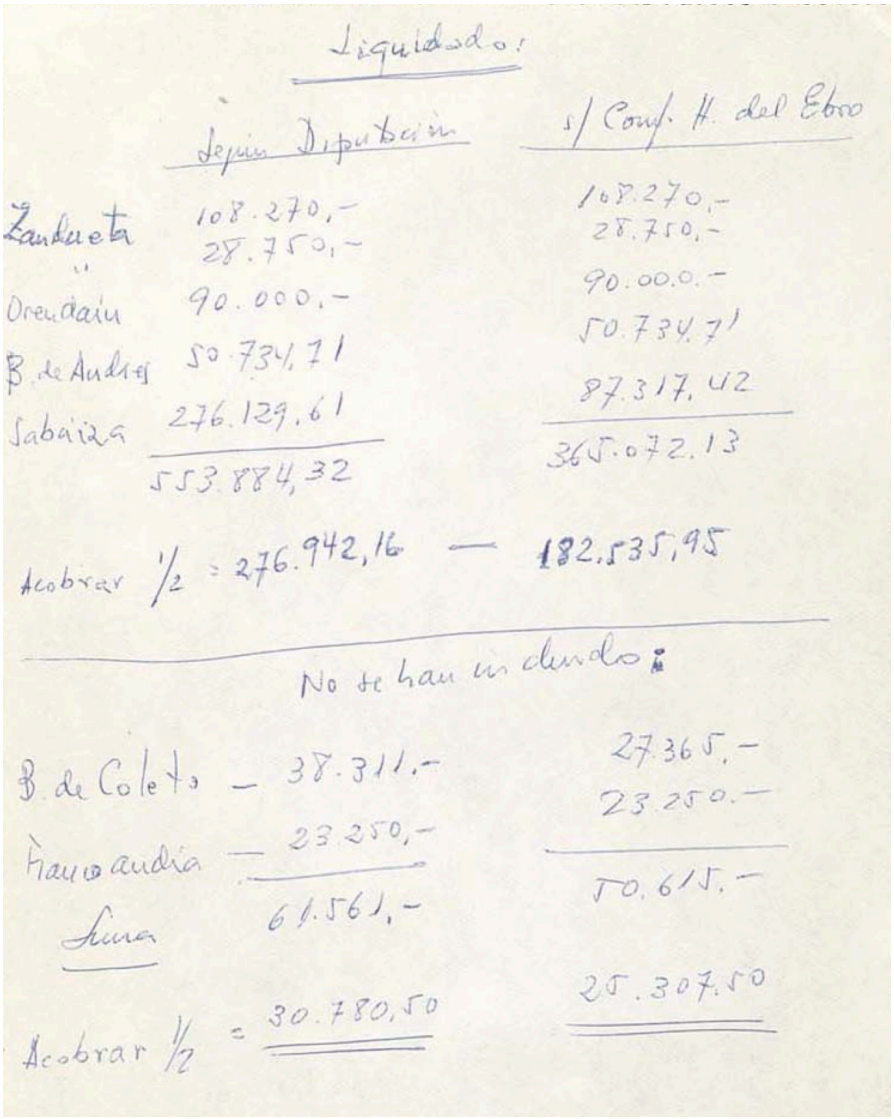

Figure 6: Handwritten ledger of Sabaiza's purchase deeds.

Together with the letters exchanged between the Navarre Forestry Department, Ebro Hydrographic Confederation and the Ministry of Public Works, the 1962 report includes a copy of Sabaiza's purchase deeds. Reading the deeds, together with the 1951 bill, against the background of Mequinenza's expropriation and the Delta's colonisation, makes La Bizkaia a paradigmatic case study of Francoist total planning. The bill's preamble, quoted below, contains all of total planning's elements, and the purchase deeds demonstrate that concrete, local action is the result of national policy and its underlying ethos of environmental intervention.

> The reduction of capacity of some dams due to solid run-off sediment, which is caused by the hills of their basins being […] completely stripped of trees and vegetation, commands for its reforesting by the Forestry Department. The possibility that these hillsides contain (unplanned) agricultural land commands the Institute of Colonisation to undertake their rationalisation.[175]

Sabaiza's purchase deeds open with yet another confirmation of the role that property concentration plays in La Bizkaia's environmental history: 'Doña María Natividad, don Jesús María and don Benigno Berrio Izco, neighbours of Tafalla, owners of the *señorío* (manor) of Sabaiza offer the estate for sale'.[176] Neighbours of Tafalla, a city outside the valley, the three siblings are the sole inheritors of the estate. Something else stands out: they 'offer the estate for sale', instead of receiving an offer by the government. Reading the deeds closely, the offers being sent back and forth tell a story of concealed expropriation, however. The señores plead 'not to be able to carry out the most rational and productive forestry operation in this land […] of which the government is the ideal owner, so it can carry its reforestation policy in it'.[177] The extent to which the wording corresponds to that of the 1951 law, rather suggests that it was, in fact, directly transcribed from the bill into the report, in order to match the former, thereby justifying Sabaiza's annexation to the Government's Forestry Estate. Furthermore, the final purchase price is almost 40% lower than the initial valuation. The reduced price is still presented as an offer by the owners, who literally 'beg the government to accept'.[178] This report tells a story of an authoritarian regime and its seemingly overwhelming power. One with the capacity for fast,

[175] Ibid., 5774.
[176] Ministerio de Obras Públicas, 'Escrituras de compraventa de Sabaiza', 4.
[177] Ibid., 1.
[178] Ibid., 7.

vertical decision-making; something that is often praised when environmental intervention is seen solely as an urgent, technological intervention. But total planning, even in an authoritarian state, has limits.

Total planning demonstrates that Francoism understood technics as a social relation: through it, political intervention is possible. Franco's aspiration of political sovereignty was inseparable from industrialising the country, for which the total planning of nature was necessary. It is not surprising for a dictatorship to have such totalising ambitions, but it is worth noting the extent to which they were sought via infrastructural and technological intervention. Suanzes' description of total planning as totalitarian and totalising already contains its basic limits; political conflict acted as an internal limit, while nature's autonomy presented itself as an external one. The very nature of technics as social relation involves political dispute, even under authoritarian regimes; hydroelectric power and irrigation were two inseparable parts of Francoist hydropolitics, a single yet contradictory project. When enacted, total planning radically disrupted La Bizkaia's metabolic regime, leaving behind a poor, fragile ecosystem and a valley in ruins. When, in 1965, the last inhabitant of Sabaiza moved to Pamplona, silence took over the valley. Today, that silence is disturbed only by the 4×4s and the machinery in charge of wood extraction.

The Constitutive Outside

Like all forms of planning, ecological planning must face uncertainty. In this chapter, I have been arguing, with Camprubí, that the concrete sources of uncertainty encountered by Francoist total planning were political conflict and nature's complexity. After a close reading of his framework as it applies to La Bizkaia, I now want to extend his line of argument further, in order to better adapt it to my object of study, ecological planning. As I note at the start of this chapter, the line that I develop here is therefore not a criticism of Camprubí, but seems to me to be its logical extension into a different domain. The first step in this movement is to rename the limits, to re-categorise them. While, for simplicity, I have used 'nature's complexity' to refer to one of the constraints that bound total planning, Camprubí does not use a consistent umbrella terminology,

instead describing situations ranging from 'the basin's geology' to the more precise 'field conditions and physical models'.[179] Even the latter, however, while implicitly pointing at it, doesn't name the core of the problem which is, of course, epistemology. In order to better reflect the epistemological challenge posed by natural systems, I will from now on refer to nature's supraliminality. I borrow Günther Anders' term for two fundamental reasons: its explicitly political dimension, and its original relation to the history and philosophy of technology. In *The Obsolescence of Humankind*, Anders is precisely addressing the gap between the techno-scientific power of contemporary human societies and our epistemic limitations.[180] The ethical disorientation that this gap produces seems acutely relevant for ecological thought.

Like all forms of planning, ecological planning faces uncertainty from within; certain variables of the plan bring a certain degree of unpredictability with them, because their future state cannot be determined *a priori*. However, all plans, by definition, are assailed by an even greater uncertainty: the outside, the unimaginable, the Event. Because planning is a concrete activity, made to intervene in the material world, it always juggles with finitude; from limited knowledge, to scarce resources or time pressure, the models and assumptions of a plan always leave something behind. This is what I call 'the constitutive outside', the exteriority of a system that, by defining its boundaries, defines the system itself. To extend Camprubí's work into my critique of ecological planning, I now analyse 'the constitutive outside' of Francoist total planning, in both its political and epistemological dimensions.

The Epistemological Outside: Of Sediment and Black Swans

Supraliminality, as opposed to just complexity, has the virtue of encapsulating different but related epistemic challenges posed by natural systems. Other than complexity, their stochastic character, non-linearity, and interconnectedness are other relevant challenges, which any alternative to total planning should pay attention to, both separately and systemically. Of these, the interconnectedness of nature seems best suited to explain how constitutive its externality is to any plan. Since it relates a given natural system, for instance the Ebro's Delta, to another, the Mequinenza dam, which is exterior to it and therefore relatively independent, but nonetheless

[179] Camprubí, *Engineers and the Making of the Francoist Regime*, 134, 124.
[180] Anders, *La obsolescencia del hombre*.

entangled with it, it seems the best candidate to discuss ecological planning. To think ecologically is precisely to situate a given system, here a plan, in 'a world inhabited by others that are connected to one another by complex causal circuits that exceed any single one of them'.[181] To explain the epistemic dimension of Francoist hydropolitics' constitutive outside, I now go back to my imagined Ebro. I follow that drop of water, again, from La Bizkaia down to Mequinenza and into the Delta, paying attention to the interconnectedness of these three enclaves.

From the forest, to the dam and into the marsh, I follow the drop of water and what it carries: the sediment that forms the marshlands downstream. During the initial twists and turns in the headwaters of the river, the drop comes into contact with soil and organic debris, whose particles remain suspended in the small liquid sphere. When it arrives at La Bizkaia, the drop is stalled by pine trees and their roots. As it slows down, water struggles to resist the pull of dry soil beneath it, and eventually sinks into the ground. Slowly, it penetrates further, until it lands in the underground aquifer, where it gets mineralised. Carrying mineral and silt, it emerges again further downstream, in an event known as groundwater discharge. Delta de l'Ebre is entirely grown out of this sediment washed downstream. The particles carried from the higher portions of the river, such as La Bizkaia, are deposited before the river meets the sea, creating the marshlands that are used as rice fields. Over long periods of time, the particles of sediment have significantly increased the size of the Delta, as attested by the town of Amposta; a seaport during the Roman settlement in the 4th century, it now sits 25 km inland.[182] Its growth is countered by the sea, and the erosion its waves produce on the embanked soil. The rounded shape of the Delta demonstrates the lasting equilibrium between these two forces. The construction of Mequinenza endangers this fragile, dynamic equilibrium. It interrupted the 'river flow and therefore sediments that arrive at the mouth';[183] The total planning of the Ebro amounts to the almost total reduction of sediment transport, '99% in relation to pre-dam conditions'.[184] With soil stuck at the dam, 'the salt water wedge to penetrate further and further',[185] and its intrusion through the

[181] Nunes, *Neither Vertical nor Horizontal*, 25.
[182] Ibáñez, Caiola, and Belmar, 'Environmental Flows in the Lower Ebro River and Delta', 13.
[183] Rodríguez Santalla, 'Eurosion Case Study: Ebro Delta (Spain)', 6.
[184] Ibáñez, Caiola, and Belmar, 'Environmental Flows in the Lower Ebro River and Delta', 12.
[185] Rodríguez Santalla, 'Eurosion Case Study: Ebro Delta (Spain)', 6.

estuary affects soil salinity and the productivity of the rice fields.[186] 'Hundreds of hectares of wetlands, coastal lagoons and beaches have [already] disappeared'; provided enough fields become barren, or simply unproductive enough to force the rice farmers out of the marshlands, the ecosystem would be thrown into a spiral of metabolic degradation.[187] The marsh is a very delicate ecosystem, and one that vitally depends on its careful, constant management, adapting to the dynamic flows of erosion and sediment deposition.

Standing atop the 79 metres of the Mequinenza dam, the sediment accumulating on the reservoir represents yet another challenge to the total planning of the river basin. While also an epistemic challenge posed by nature's supraliminality, like the leaking mountainside and the burning forest, it is substantially different to the other two. The leaking mountain is the direct result of an error in modelling and calculation; the burning forest is the result of a poor assessment: disregarding the advice of Ximénez de Embún and Ceballos regarding species selection, favouring a short-sighted cost-benefit analysis. However, the sediment mounting in the basin of Mequinenza, instead of the Delta, is a completely unexpected problem, outside all parameters and models considered in the plan. Sediment in the dam is a 'Black Swan'.[188] This concept, popularised by writer, trader, and former statistician Nassim Nicholas Taleb, refers to the idea that theories and models are often falsified by complete outlier events. It draws on the classic example that ancient Romans believed all swans to be white; their theory falsified only when in the 19th century black swans were observed in Australia. A similar notion that I find particularly useful, because it incorporates human labour and historicity, is Jean Paul Sartre's 'counterfinalities'. Sartre describes counterfinalities as the unforeseeable consequences of inscribing matter with human labour: 'Inert praxis which imbibes matter transforms natural, meaningless forces into quasi-human practices, that is to say, into passivised actions'.[189] I find this notion to be particularly useful in order to think how the mediation of human labour can imbue the natural world with agentic qualities (which Sartre calls 'the practico-inert') without anthropomorphising non-human life, or ascribing intentionality to non-living matter: 'we saw how things can absorb the whole of human activity, and then materialise and return it: it could not be otherwise'.[190] An

[186] Ibáñez, Caiola, and Belmar, 'Environmental Flows in the Lower Ebro River and Delta', 15.
[187] Ibid.
[188] Taleb, *The Black Swan*.
[189] Sartre, *Critique of Dialectical Reason, Vol. 1*, 161.
[190] Ibid., 182.

ecological critique of total planning, like the one I am fleshing out, must not only keep in mind the epistemic challenges posed by nature's supraliminality, but also that 'Black Swan effects are necessarily increasing, as a result of complexity, interdependence, globalization, and efficiency'.[191]

Suanzes' attempted total planning of the Ebro verifies the impossibility of totalising an ecology, whose agents and forces, interconnected yet relatively autonomous, act on one another through causal circuits so complex that they present themselves as counterfinalities. The Mequinenza dam is the constitutive outside the Delta's sinking marsh; without the bigger picture of the entire river's ecology, an observer in Delta de l'Ebre cannot explain an abrupt reduction of 99% in sediment deposit. To this observer, given no broader context, the sinking marsh cannot be explained as anything other than a Black Swan. The observer with a bird's eye view of the Ebro's entire basin confirms; indeed a swan, black with sediment, splashes around in the waters of the Mequinenza reservoir.

The Political Outside: Fascist Autarky and the African Colonies

The political 'constitutive outside' of Franco's autarchic extractivism is the African colonies. Camprubí included in the Spanish edition of his book a chapter on Western Sahara, but he focuses there on the role of phosphates in international geopolitics; the colonies' central role in a supposedly autarchic regime is not thematised.[192] By insisting on the centrality of the colonies to Francoism, I here challenge its autarchic discourse; as such I recognise the lineage of rich critiques to 'the rhetoric of European high-modernity through the lens of decolonial environmental history'.[193] To do so, I also rely on the work of Marco Armiero, Roberta Biasillo and Wilko Graf von Hardenberg in *Mussolini's Nature*, where they develop the concept of 'fascist autarky'. Their description of Italian fascist modernity is analogous to Camprubí's description of the Spanish one, in the same way that the latter is comparable to Tiago Saraiva's description of Salazar's Portugal.[194] Like Camprubí, they propose 'autarky and integral land reclamation' (their term for internal colonisation) as 'two faces of the same idea of national

[191] Taleb, *Antifragile*, 274.
[192] Camprubí Bueno, *Los ingenieros de Franco*.
[193] Corral-Broto and Ortega Santos, 'Simple Overflow?', 29.
[194] Saraiva, 'Fascist Modernist Landscapes'.

self-sufficiency pursued by fascism', which constitute '[Mussolini's] regime's most complete socioecological proposal'.[195] Yet, unlike Camprubí, they investigate the constitutive relation between autarky and the Italian colonies. Once more, this is probably the result of their differing objects of study: from techno-science and the role of the engineer in Francoism, to an ecological critique of Italian fascism; in this sense, the latter is closer to mine, and so is their analysis of 'fascist autarky' as 'a strange beast, which spoke of national autonomy while acquiring the territories of others'.[196]

After the independence of its overseas colonies in 1898, Spain focused its colonial expansion on northern Africa. During Francoism, there were three territories under Spanish occupation: what is now Equatorial Guinea, Western Sahara and the Morocco protectorate, the biggest and most important of all three for Franco's regime. Given the drastic reduction in imports, and Spain's meagre agricultural production, the regime sought to intensify the exploitation of its African colonies. 'Talk of "limited commerce" and "relative autarky" emerged in this period, and later gave way to ideas of Spain's Espacio Vital (Lebensraum), whereby the colonies became "a complement to autarky"'.[197] Put simply, 'in order to be self-sufficient, the fascists needed to expand'.[198] Morocco served primarily as a market for Spanish exports; from Guinea, Spain extracted tropical raw materials (coffee, coca, rubber); from the Sahara, Spain withdrew extremely valuable phosphates, used as fertiliser in agriculture.[199] The phosphates, extracted from the colonies yet indispensable for the internal colonisation of the countryside, underline the constitutive link between colonial expansion and internal colonisation, and help explain the former as 'the constitutive outside' of the latter. This fundamental link was highlighted by several environmental and radical Spanish thinkers during the 1970s, such as Mario Gaviria or Xosé Manuel Beiras. Gaviria argued that a new democratic society should overcome 'the internal and external imperialist aspect of Spanish capitalism'; Beiras, that 'the uneven development of [Spanish] capitalism gives rise to different forms of class exploitation with the phenomena of internal colonialism'.[200] As I mentioned in Chapter 2 when discussing Francoist hydropolitics,

[195] Armiero, Biasillo, and Hardenberg, *Mussolini's Nature*, 64.
[196] Ibid., 65.
[197] Súarez Blanco, 'Las colonias españolas en África durante franquismo', 323.
[198] Armiero, Biasillo, and Hardenberg, *Mussolini's Nature*, 66.
[199] Súarez Blanco, 'Las colonias españolas en África durante franquismo', 323–24.
[200] Quoted in Corral-Broto and Ortega Santos, 'Simple Overflow?', 37.

the link between the African colonies and the country's industrialisation is so strong, that only the INI and the Directorate General for Morocco and the Colonies were directly under Presidency; 'both industrial and colonial policy were of such importance to the regime that they had to be overseen by an administrative body close to Franco'.[201] The Spanish colonies in northern Africa, as the constitutive outside autarchic extractivism, were an inextricable part of Francoist modernity, which can be framed as an 'autarchic-war industrialisation'.[202]

In this chapter, I have revisited the total planning of the Ebro's basin in order to uncover the limits it confronted: political conflict and nature's complexity. First, by recounting Camprubí's work, and then by applying it to La Bizkaia. Finally, I have re-categorised the two problems as political and epistemological, and added a new dimension to both, 'the constitutive outside'. Following this sequence, I now attempt to define total planning as an abstract form. To build an abstract model out of an actually-existing case is always a delicate affair, and never totally successful. However, if partial success is achieved, it can be a powerful interpretative tool. The model's usefulness can only be judged after it is re-applied to another actually existing case, only through that exercise will it become clear whether the model is a helpful tool for mapping, or whether it obfuscates reality by over-determining its reading. In Chapter 3 I will attempt this operation, to map present day management of La Bizkaia with the help of the model I sketch below. In doing so, I will contend that this 'planning logic' can be traced across historical periods and across the political spectrum, including Green Capitalism and leftist Geo-Engineering.

Total Planning as Form

The idea to investigate La Bizkaia's environmental history was the result of my experience in the valley. As mentioned in the introduction, I have visited every summer since 2021 in order to work on *ezprogui*, a curatorial project that has La Bizkaia as its central object of investigation. As I listened to the stories of the Francoist intervention, these were always pitted against current ecological management. The overarching argument is that, while it is still owned and run by the government, La Bizkaia's governance is significantly different nowadays from the Francoist

[201] Súarez Blanco, 'Las colonias españolas en África durante franquismo', 324.
[202] Ibid.

times; the paradigm has changed, schools visit Guetadar's youth camp and an ethnographic museum in Ayesa pays homage to the valley's history. When I started reading more about autarchic extractivism, Francoist hydropolitics and reforestation, I could not shake the feeling that there was something more to the story than what I was hearing. The investigation that I am now writing starts from this intuition, and is predicated on the observation of continuities between Francoist and present day ecology in La Bizkaia.[203] Admittedly, over four decades of democratic government did have an obvious impact, visible at first sight; if not from the political regime, where do these similar gestures stem from? This section is my attempt at capturing those continuities, whose observation sprang my research. In order to do so, I will build a model out of Francoist 'total planning'; from its historical instantiation to the 'planning logic' of Total Planning. If this pursuit is in any way fruitful, it will guide Chapter 3, which is dedicated to La Bizkaia's current ecological management. After investigating the total planning of nature, I now examine the nature of Total Planning.

Prometheus and Nimrod

In the last section, I framed the limits of Total Planning as its modernist epistemology and colonial politics. I now want to further problematise this classification, and that the two are presented as separate problems. The first step in capturing the logic that underpins Total Planning is to account for the intrinsic link between the epistemic assumptions and the political project resulting from and upholding them. To better articulate this intimate relationship, I supplement the myth of Prometheus, which has by now become commonplace in the philosophy of technology, with the myth of Nimrod as it is recounted by Grégoire Chamayou in *Manhunts*.[204]Again, the goal of this brief account and liaison between the two myths is to underline that the domination of nature has always been, because it always is, the domination of humans.

Prometheus, as is well known, represents in Greek mythology the gift to humans of fore-thought, knowledge, and ingenuity. The technical aspect of the Titan's gift to humans, fire as a tool, is

[203] At the time, I was also reading terraforming literature and noticed the same gestures in it. In fiction (see Le Guin, *The Dispossessed*) and nonfiction alike (see; Bratton, *The Terraforming*).
[204] Chamayou, *Manhunts*.

especially relevant for the philosophy of technology, and has been commented extensively.[205] In terms of ecological thought, Prometheanism has been long associated with Marxist productivism, and with Hegel and John Locke before that.[206] Hegel's philosophy of nature revolved around the latter's 'humanisation'; that is, its appropriation and transformation for the benefit of humans. The mediation between humans and nature is in Hegel, as in Locke, a product of human labour, an eminently technical process. Combined with the modern mechanistic attitude towards knowledge and techno-science, it is not hard to see epistemic Prometheanism at the basis of Francoist 'total planning', and of Total Planning as form. By contrast, the myth of Nimrod is not nearly as explored. The grandson of Cham, first king of Babel, Nimrod is described in the Book of Genesis as a rebel against God and 'a mighty hunter'.[207] In *Manhunts*, Chamayou takes this myth as the starting point for an investigation of the violent, as the flip side of the pastoral foundations of politics. The hunting and enslavement of men is thus opposed to the political legitimacy of the shepherd that Foucault traces in the Abrahamic lineage.

Both myths represent, in different ways, a rebellion against the theology of power. Prometheus' gift is an explicit defiance of Zeus, while 'Nimrod is the first figure of the immanence of power […] his rationality is that of a physics rather than a theology'.[208] To assert the immanence of power is to assert human power; whether over nature (Prometheus), or over other humans (Nimrod), 'from the outset, domination is examined in a technological perspective'.[209] Another relevant aspect of Chamayou's reconstruction of 'the mighty hunter' is its territoriality, which describes hunting as a geography of accumulation. Not to forget, the hunter is also the King of Babel, a great urban power; his power 'takes place in the relationship between the city's territory and the space outside it', where the hunting takes place. The space outside the city is its constitutive outside: 'If Nimrod hunts and builds, that is because one is the condition of the other: he hunts in order to build'.[210] This logic of annexation and accumulation is reminiscent of Francoist 'total planning':

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[205] The myth of Prometheus figures most prominently in Bernard Stiegler's philosophy; it is central to his conception of the human as technically mediated, as an immanent being that externalises itself in the tools it creates. Stiegler, *The Fault of Epimetheus*.
[206] Moore and Roberts, *The Rise of Ecofascism*, 20.
[207] Quoted in Chamayou, *Manhunts*, 11.
[208] Ibid., 15.
[209] Ibid., 5.
[210] Ibid., 16.

> Cynegetic power gathers together what is scattered, centralizes and accumulates it in a limitless logic of annexation. That is the image of Babel: the hunter's accumulation is manifested by a vertical piling-up that will reach even the heavens. […] The dynamics of cynegetic power is oriented by these two vectors: centralization through the annexation of external resources, and verticalization through the accumulation of captives in the internal territory.

To summarise, these myths interest me because they speak of centralisation, verticalisation, and domination. But, most importantly, what interests me is their interlinking; at their core, they are both an attempt to overcome human immanence through technical mediation, and thus an attempt to assert human dominance over human/nature.

The Nature of Total Planning

The inextricable link between the domination of nature and the domination of humans is at the core of Total Planning. With this in mind, and my categorisation of the political and epistemological limits it confronts, I want to attempt to define the essential characteristics of Total Planning. I will start by making explicit the parallelisms between Chamayou's quote above, my prior description of La Bizkaia's environmental history, and Francoist 'total planning'. Centralisation, verticalisation, accumulation, and annexation appear throughout my text. In Chapter 1, property concentration is firmly lodged as a key to understanding the entire development of La Bizkaia's environmental history. Vertical management, on the other hand, is said to skew traditional farming towards unsustainable row-cropping. Both are predicated on, and entrench, the dispossession of the valley's inhabitants. In Chapter 2, these notions appear several times; first as defining Francoism, later in relation to the National Reforestation Plan and again for the 'colonisation of the countryside' in the section discussing the Delta's marshlands. The idea that the technical mediation of nature amounts to a political intervention, because technics is a social relation, is, to reiterate, an axiom of my investigation.

A different set of recurring concepts, that do not appear in Chamayou's quote above, to do with urgency, efficiency, and redemption also figure. Redemptionism appears in the newspaper articles describing La Bizkaia's afforestation, as a key component of National-Catholicism, and

again in Francoist hydraulic works rectifying the rivers and, with them, the historical injustice of Spain's hydraulic imbalance. Ximénez de Embún and Ceballos warn of the simplifying effects of urgency in their National Reforestation Plan. Finally, the advocates of the Francoist industrial utopia of hydroelectric power, demand efficiency. The sheer magnitude of their problem at hand, the rapid modernisation of Spain and the technical challenges posed by the construction of dams, demands that the enterprise is carried efficiently. This, in turn, calls for centralisation and verticalisation. In my attempt to characterise the nature of Total Planning, I want to go back to the original description by Suanzes, who conceived 'total planning' as both totalising and totalitarian. A totalising project demands efficiency, and the latter in turn justifies totalitarianism. With these floating concepts in mind, Suanzes definition, the myths of Prometheus and Nimrod, and my categorisation of Total Planning's limits, I have found four defining characteristics, which can be seen in Figure 6:

Domination of	Politics	Epistemology
Nature (Prometheus)	Technocratic	Reductionist
Humans (Nimrod)	Colonial	Securitarian

Figure 7: The four defining characteristics of Total Planning.

With these four characteristics in mind, I turn to La Bizkaia once more. In the next chapter, I will use this model of Total Planning to analyse the valley's current metabolic regime and explore its continuities with the previous one, Francoist autarchic extractivism.

Chapter 4: The Nature of Disaster Capitalism

— La Bizkaia's Second Transition: From Autarky to Integration
— Nature Conservation
— Climate Change Adaptation
— Green Capitalism is Disaster Capitalism

> The nature that capital conserves, in short, is natural capital. Natural capital is capital conserving itself.[211]

This final chapter returns to La Bizkaia, in order to examine its current regime of ecological governance. The environmental history sketched in Chapter 1 arrives at its third and last period, which continues until the present day. This chapter thus examines the third and last metabolic regime governing La Bizkaia, 'sustainable development', and compares it to its predecessor, autarchic extractivism. The ideal model of Total Planning built in Chapter 3 mediates this comparison between Francoist and contemporary ecological management. In order to flesh out this comparison, contemporary management of La Bizkaia is separated into its two essential components: nature conservation, and climate change adaptation. The Government of Navarre, still the sole proprietor of the entire valley, runs two main operations in it: the management of the pine trees, and the conservation of the Jaca Navarra, a regional breed of horses. By dividing the silvopastoralist regime into its two main components, it is easier to identify its consonance with Total Planning. The last section identifies sustainable development, whose emblematic projects are nature conservation and climate change adaptation, as the crux of Green Capitalism. Subsequently, by reading Green Capitalism through the lens of Total Planning, the last section identifies in Green Capitalist governance an intimate, dialectical link to risk, which it claims to mitigate but instead simply manages. Thus, prediction and management of crises are essential to Green Capitalism, which is therefore re-framed as Disaster Capitalism. Nonetheless, before proceeding with sustainable development and Green Capitalism, I must account for how the transition took place from Francoist autarchic extractivism.

[211] Büscher and Fletcher, *The Conservation Revolution*, 109.

La Bizkaia's Second Transition: From Autarky to Integration

According to my periodisation, what is commonly called sustainable development began in La Bizkaia in the early 1980s, yet the last inhabitant left the valley in 1965, Franco died in 1975 and the first constitution was voted in 1978. This chronology is, once more, the result of a materialist historicising that privileges metabolic regimes over political ones. Again, by following specific material processes or institutions, it is easier to trace the continuities between apparently disparate political regimes and ideologies. The first metabolic transition, from traditional farming to autarchic extractivism, began with the purchase of the villages and was only enacted thereafter by the monoculture of pines. This shift, which took place first in the legal order then in the natural one, represented the arrival of technocratic management to the valley. The second metabolic transition, as highlighted by my periodisation, was not drive by the transition from an authoritarian, military dictatorship to a liberal democracy. Borrowing Armiero's term, 'fascist autarky', one could say that it was not so much fascism that changed, but autarky. To be clear, the sociopolitical effects of the Spanish transition to democracy cannot be overstated, but I am referring here to the metabolic regime of a valley that was by then deserted, their inhabitants enjoying their new civil freedoms elsewhere. For La Bizkaia's ecological management, the key development that consolidated in the 1980s and inaugurated a new metabolic regime was the shift from autarky to integration; more specifically, from Francoist autarky to European integration.

Franco's autarchic extractivism was predicated on the idea of achieving economic independence in order to attain political independence. While the dictatorship had already sought to integrate into international circuits during *la apertura* (the opening), this integration only came into full effect through Spain's integration in the European Union (EU). The negotiations started in 1977 and culminated in 1986, when both Spain and Portugal officially joined the EU. European membership brought with it integration into international capital; that is to say, deindustrialising to adapt it to the international organisation of labour, turning Iberia into a provider of low-added value services. In terms of environmental policy, it meant the arrival of a new paradigm of ecological management, Green Capitalism, which is still in place in La Bizkaia today. The ideas

that are central to green capitalism today were first discussed in the late 1960s,[212] expanded in the '70s and by the 1980s had consolidated into the official reports of international bodies, such as The Limits to Growth, published by the Club of Rome in 1972 and The Brundtland Report, published in 1987 by the United Nations World Commission on Environment and Development.

Sustainable Development

The Brundtland Report was highly influential in expanding Green Capitalist ideas, which would subsequently be introduced into legal and policy frameworks worldwide, notably by the EU. While the term 'sustainable development' has long roots, perhaps unsurprisingly in 18th century forestry management,[213] the report popularised its use, defining it as 'ensuring that development meets the needs of the present without compromising the ability of future generations to meet their own needs'.[214] Encapsulating both the promise and limits of Green Capitalism, it is the perfect starting point for the analysis of La Bizkaia's contemporary management. While advancing honourable goals, such as sustainable development itself, or the principle to integrate environmentalism across all policy, it also contained the basic internal, insurmountable contradiction of Green Capitalism. Focusing on three thematic fields, the environmental, social and economic dimensions of development, it does not address the intrinsic incompatibility between capitalist economic development and nature, which James O'Connor theorised as 'the second contradiction of capital'.[215] This incompatibility has been further developed by the theorists of 'the metabolic rift', such as John Bellamy Foster[216] or, more recently, Kohei Saitō, who places the contradiction in the relationship between value and abstract labour.[217] Here lies another reason why I have chosen to historicise the valley through its metabolic regimes: not only does it allow for a materialist reading, but it also presupposes capitalism's 'second

[212] Its most prominent, early proponents were Garrett Hardin (Hardin, 'The Tragedy of the Commons'); and his collaborator John Baden, founder of several eco-capitalist organisations, claiming to improve environmental quality through property rights and markets (Baden and Stroup, *Property Rights and Natural Resource Management*).
[213] Grober, *Sustainability*, 80.
[214] United Nations, 'The Brundtland Report', 15.
[215] O'Connor, 'Capitalism, Nature, Socialism a Theoretical Introduction'.
[216] Foster, 'Marx's Theory of Metabolic Rift'.
[217] While value is a purely social category that exists only in unconscious forms of production, as a mediator of labour carried out in private, abstract labour, insofar as it is transhistorical, is also physiological. Under capitalism, abstract labour, which is physiological and therefore cannot ignore material limits, is subordinated to value, which is purely social and does not contemplate biophysical confines. On such grounds, capital radically alters the metabolic relationship between humans and nature, giving raise to an inescapable contradiction. Saitō, *Karl Marx's Ecosocialism*, 108.

contradiction' and its disruption of the metabolism between society and nature. By not problematising this contradiction, the Brundtland Report epitomises the limits of Green Capitalism itself. Subsequent models have since been proposed that attempt to integrate nature, society and economy, such as 'the triple bottom line'.[218] As inheritors of The Brundtland Report, they share both its goals and its limits, constrained by the second contradiction of capitalism, and the metabolic rift that it creates.

Thirty-seven Jacas, a local equine breed, were moved to Sabaiza from Urbasa in 1982,[219] and a new National Forestry Plan was published in 1984.[220] These two events mark the establishment of La Bizkaia's third metabolic regime, sustainable development, which still governs over the valley today. Its two defining programs are the conservation of the horses and research for adapting Mediterranean forests to climate change. Both are paradigmatic of Green Capitalism and epitomise Brundtland's tripartite development (environmental, social, economic) with direct financial support from the European Union. Their economic goals are meat and wood production, respectively. Social goals involve preserving cultural patrimony and ecotourism, and, finally, the environmental ones are promoting genetic diversity, and generating research towards climate change adaptation. In the remaining sections to come, I will study these two programs further with a double goal. Firstly, to better understand both La Bizkaia and sustainable development, by zooming into a concrete case of its governance. Secondly, to facilitate the comparison between sustainable development and autarchic extractivism; only after studying the conservation and adaptation programmes will my model of Total Planning be useful for the analogy.

Nature Conservation

> Indeed, conservationist ideas developed almost in tandem with the growth of the material demands of nascent capitalism.[221]

[218] The Triple Bottom Line (TBL or 3BL) is a framework that tries to overcome the inability of capitalism to account for its 'externalities', by integrating the social and natural into accounting systems. It does not confront the fact that these values are both conflictive and incommensurable, adopting a deceiving innocence that is characteristic of Green Capitalism.
[219] Perez de Muniain, Villanueva Vergara, and Lecumberri, *Nuestros caballos - la Jaca Navarra y el burguete*, 69.
[220] Pemán García, Iriarte Goñi, and Lario Leza, *La restauración forestal de España*, 121.
[221] Grove, *Ecology, Climate, and Empire*, 27.

One of the central policies of sustainable development, going back to the Brundtland Report, is the conservation of nature and its biodiversity, however mainstream developmentalism fails to account for the origins of conservationism.[222] While critical scholarship usually situates its origins in the creation of national reserves in North America during the 19th century, the genealogy of conservationism is a much older one, and it is deeply entangled with colonialism at every step. After the colonisation of the Canary Islands and Madeira by Spain and Portugal, respectively, the swift degradation of the islands' soils prompted the first, early modern reflections on 'desiccation'.[223] These ideas gathered strength and would later be explored by the English and French naturalists during their colonisation of the Caribbean, further suggesting that 'the essential precepts of modern conservation actually arose from the conditions of colonial rule'.[224] In each of these cases, the primary concern was soil erosion caused by deforestation, linking the latter to climate change and fall reduction. Even earlier concerns, like those of classical naturalist Theophrastus, who worried about the desiccation of forests around ancient Greek city-states, relate deforestation with territorial expansion, conservationism with colonialism.[225] The link between soil erosion and climate change 'laid the basis for the proliferation of colonial forest protection systems'.[226] Nature and its conservation has always been deeply involved in questions of state formation, at once cause and consequence of imperial expansion.[227] Much like Francoism did for La Bizkaia's afforestation, early colonial expropriation of land was justified by its 'rationalisation'. Indigenous land was allegedly *terra nullius* (nobody's land), because the Indigenous people had 'not yet mixed their labour with the earth in any permanent way'.[228] An interesting movement took place, in the relationship between nature and property. Initially, an unruly nature, not yet domesticated, was used to justify expropriation; in the words of John Locke: '[w]hatsoever man removes out of the state that Nature hath provided and left it in, he hath mixed his labour with it, and joined to it something that is his own, and thereby makes it his property'.[229] Later, during the creation of national parks

[222] United Nations, 'The Brundtland Report', 38.
[223] Grove, *Ecology, Climate, and Empire*, 6.
[224] Ibid., 27.
[225] Glacken, *Traces on the Rhodian Shore*, 270.
[226] Grove, *Ecology, Climate, and Empire*, 10.
[227] Büscher and Fletcher, *The Conservation Revolution*, 102.
[228] Moore and Roberts, *The Rise of Ecofascism*, 20.
[229] Cited in Vettese and Pendergrass, *Half-Earth Socialism*, 89.

and nature reserves in North America, it was not 'putting the land to work', but 'protecting nature' that justified yet another expropriation from Indigenous peoples. Throughout this back and forth, however, the constant is the invisibilisation of the Indigenous inhabitants of these natures. If, for Locke and his contemporaries, the land was ripe for appropriation, because it was nobody's, the American wilderness 'was given the appearance of unpopulated pristineness by evicting the former inhabitants out of these areas through violent acts of displacement'.[230]

The creation of nature reserves, of fortress protected areas, brings to mind the emergence of capitalism in the European countryside, where 'the original capitalist process of wresting people from the land through acts of often violent enclosure, forcing them to move across the metabolic rift from country to town in search of urban wage employment'.[231] As Sam Moore and Alex Roberts write, 'Sometimes, in enclosing land that had been held in common, ecological justifications were used. Temporary measures to combat soil erosion turned into permanent enclosures'.[232] The genealogy of nature conservation thus extends beyond not just 19th century nature reserves, but also beyond the colonisation of the Caribbean, and the early colonisation of the Canary Islands and Madeira before that, into the colonisation of the European countryside by which capitalism itself emerged.[233] In The Conservation Revolution, Bram Brüscher and Robert Fletcher note yet another aspect of the origin of conservationism that is relevant in the context of my discussion of sustainable development: the relationship between capitalist property and enclosures, both agricultural and for nature conservation. Development, in the capitalist context from which it emerges, is often used as a synonym for improvement. Quoting the work of Ellen Meiksins, who studied how the notion of improvement itself was related to 'new conceptions of […] capitalist property – not only as "private" but as exclusive', they rightfully conclude that 'this exclusion necessarily entails enclosure'.[234] Enclosures, which abound in La Bizkaia, encapsulate the complex interrelations between capitalism, colonialism, nature conservation, control of land use, and sustainable development.

[230] Büscher and Fletcher, *The Conservation Revolution*, 59.
[231] Ibid., 74.
[232] Moore and Roberts, *The Rise of Ecofascism*, 17.
[233] Malm, 'The Origins of Fossil Capital'.
[234] Büscher and Fletcher, *The Conservation Revolution*, 98.

La Jaca Navarra

When the initial control group of 37 Jacas was introduced in Sabaiza in 1982, there were a mere total of 200 left. Today, the control group itself counts 230 individuals, and the breed's population is over 2,000; the biopolitical management of the Jacas is a successful story, managing to keep an autochthonous breed from extinction through the decided, technocratic, intervention of the Government. In this section, I comment on the conservation programme with ambivalence. On the one hand, there is no question about the value of genetic diversity, if for no other reason at least against the genetic uniformity of industrial food production, as a measure against disease and to ensure food sovereignty. On the other hand, I question the need for this diversity to express itself in terms of purity and race, especially in the face of the colonial history commented above that did not only institute particular extractive relationships to the land but also established hierarchies of domination along racialised lines. This need, I argue, is artificial; both inherited from this colonial history, and imposed by the metabolic rift that capitalism introduces in animal food production. In order to analyse and contextualise the Jaca's conservation programme, I will break the programme down into sustainable development's three dimensions: social, environmental, and economic, using interviews with its managers and official documentation from the Government of Navarre.

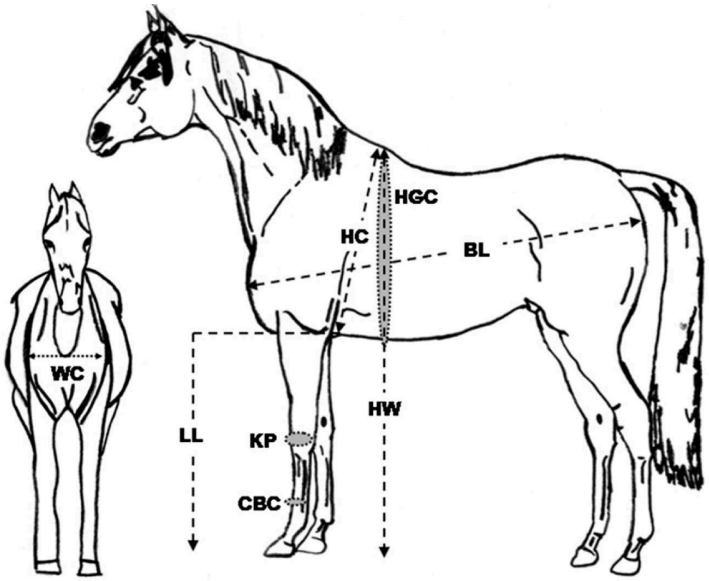

Figure 8: Equine Zoometry.

‘I think they do it because they are fond of them, of their traditions, of their grandparents’ horses’ For María Mercedes Valera Córdoba, a leading researcher of horse genetics in Spain in charge of the genetic studies of the Jaca, ethnographic, cultural and historical reasons are the primary driver of their preservation.[235] There is a nationalist undertone to the programme as well; in the only existing book about the Jacas (*Nuestros caballos*, our horses), and in the original study of their zootechnics on which it is based (*Caballos Navarros*, Navarran horses), unscientific claims about the breed’s long-history are sprinkled through an otherwise commendable scientific work. For all the talk about an autochthonous breed, the Jacas were moved to Sabaiza from the Pre-Pyrenean region further north.

> In his work [on the Jaca Navarra], Javier Donézar states that, considering its ‘shaping and savagery’, and with a little imaginative effort, we can go back centuries, and we would find it unchanged in Medieval times, even in prehistoric times.[236]

However it may be, Valera Córdoba’s intuition is not necessarily confirmed by the official sources. While ‘cultural and farming heritage’ appear in passing, ‘genetic wealth and productive reasons’ prevail.[237] Other than the preservation of their genetic pool, the environmental benefits listed by the government and its reports include a particularly interesting one: as they graze, the Jacas reduce the risk of wildfires.[238] This technique of forest management, which was characteristic of traditional farming and ended during Francoism, has been reintroduced to the valley. Despite similar capacity to clear the pastures of excess vegetation, traditional sheep shepherding gives way to an equine horse breed with high symbolic-nationalistic value, in typical technocratic fashion.[239] But above all this new technique of forest management requires the division of La Bizkaia, its gating, its enclosure.

> Plain, precise descriptions full of figures: 165,399 km of tracks, gates, and enclosures ‘servicing the forest’. We cross several cattle grids. They are wide open and yet they stop

[235] Valera Córdoba, Genética y conservación de la Jaca Navarra, 1.
[236] Perez de Muniain, Villanueva Vergara, and Lecumberri, *Nuestros caballos - la Jaca Navarra y el burguete*, 59.
[237] Ibid., 73.
[238] Ibid., 74, 221.
[239] Villanueva Vergara and Perez de Muniain, INTIA y las Jacas de Sabaiza.

> the passing of cattle. A Jaca, perhaps sad, perhaps relieved, looks at us through an open door that it can't cross.[240]

The entire estate of La Bizkaia has been fenced since 1996, with numerous additional internal divisions.[241] Doors placed in narrow passes, cattle grids, fences and barbed wire carefully demarcate 118 cantons, each categorised according to two axes: protection and production.[242] Kilometres of fence kept visitors away from La Bizkaia until recently; the valley is owned by the government, but it was only very recently recorded as a public good.[243] Enclosures are the paradigmatic technocratic tool, a biopolitical membrane that excludes, mediating between inside and outside, and an internal organiser, rationalising the Jaca's grazing.[244] If enclosures remind us of the colonial roots of conservation, the idea itself that there is something like a breed, literally a standard of genetic purity, links this practice with the most brutally violent racist practices of colonialism, such as phrenology and eugenesia. The standard of the Jaca, based on zoometry and lineage, is just as arbitrary, created out of thin air according to conventions as much as commercial interest. In a forthcoming interview with Mariana Silva, the creators of the breed and authors of *Nuestros caballos* explain the process: after reading through existing bibliography and searching for specimens in the area, they set out to note down zoometric indices.[245] 'We each had a piece of paper with the different indices; we would go around the horse, scoring it one to a hundred for each characteristic. At the end we compared scores and reached an agreement'.[246] Once the standard is set, it is used to measure each newborn horse against it, in order to decide whether it enters the genealogical book of the breed. 'At the beginning we were too strict', they admit, 'we were putting too much selection pressure'; 'we've discarded a light-coloured stallion, morphologically and genealogically better to another, chestnut stallion, because the standard is chestnut'.[247] The interviewer innocently asks 'why chestnut?' and their answer goes straight to

[240] Collado Wilkins and Villafranca Apesteguia, *ezprogui, libro primero*, 1:80–81.
[241] Gobierno de Navarra, 'Plan de Ordenación Sabaiza', 55.
[242] Gobierno de Navarra and Sección de gestión forestal, 'Ordenación Montes Sabaiza'.
[243] Gobierno de Navarra, Propuesta de modificación del catálogo de Montes de Utilidad Pública 1912.
[244] The technification of the valley includes the use of Digitanimal, a GPS necklace which tracks the Jacas. Tests are being carried out to 'digitalise enclosures', 'guiding cattle towards the barn from home'. New necklaces, powered by solar panels, include small metallic spines that give the horses an electric discharge. Software allows the farmers to 'draw red lines on the map', beyond which the animal receives the electric shock, preceded by an acoustic warning. Villanueva Vergara and Perez de Muniain, INTIA y las Jacas de Sabaiza.
[245] Perez de Muniain, Villanueva Vergara, and Lecumberri, *Nuestros caballos - la Jaca Navarra y el burguete*, 134.
[246] Villanueva Vergara and Perez de Muniain, INTIA y las Jacas de Sabaiza.
[247] Ibid.

the heart of the conservation programme, linking its colonial history with the Green Capitalist present. ‘Breeds are trends, commercial interests. They are made by humans, and we make mistakes; I know I did’.[248]

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It’s black, what a drag! I need the subsidy!
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The European Union finances programmes for the conservation of endangered autochthonous species, so the standard has very tangible consequences over the livelihoods of farmers.[249] Furthermore, because these subsidies are directed to endangered species, the associations managing them often prefer to stay below the threshold of 5,000 specimens to continue receiving financial support. If they do well, like the Burguete, another horse from Navarre, the standard is made stricter to ensure that the number of specimens officially recognised remains below the threshold.[250] Because the margins are tight and the variability so high (a farmer sees a newborn with a black, instead of chestnut, coat and has to discard it), other economic niches have to be found for each breed, to ensure their economic viability. Traditionally used for agriculture, and highly appreciated for rice production because of their high traction to size ratio, the Jacas have now found a new niche in the meat industry. ‘The older generations associated it with the stiff meat of horses used for war, so we created a brand, Potro Navarro’.[251] ‘We’re going through a sweet moment in horse meat prices right now […] there is high demand coming from athletes too, it is high in iron and low in fat’.[252]

After looking at the economic (meat, subsidies), environmental (gene diversity, grazing) and social (heritage, nationalism) dimensions of the Jacas conservation programme, I now turn to forestry management. As I explained in Chapter 2, protecting the soil from erosion was the main justification for the monoculture of pine trees and just like ‘in colonialism’s later stages’, it ‘became a highly bureaucratised justification for state control of land use’.[253] Following the same logic that I have applied for the conservation programme, in the following section I analyse

[248] They add a tragically comic anecdote: ‘when we were young there was an advert on TV, starring a beautiful Bo Derek on horseback, galloping the beaches of Jerez in slow motion, both their hairs in the wind. The horse was black with white spots. Those years, that was the trend; black with white spots.’ Ibid.
[249] Perez de Muniain, Villanueva Vergara, and Lecumberri, *Nuestros caballos - la Jaca Navarra y el burguete*, 146.
[250] Ibid., 223.
[251] Villanueva Vergara and Perez de Muniain, INTIA y las Jacas de Sabaiza.
[252] Ibid.
[253] Moore and Roberts, *The Rise of Ecofascism*, 20.

contemporary forestry management using the three dimensions of sustainable development: environmental, social and economic.

Climate Change Adaptation

Not all nature can be preserved, some must change. With climate breakdown firmly lodged in the social psyche comes the need to preemptively adapt to it, to be prepared. While the necessity of climate change adaptation has surely surged in recent years, it would be short-sighted not to see in this idea the flip side of nature conservation; they are and have always been intertwined. Further, the pair conservation-adaptation has invariably been concerned with forest management since its earliest forms. Whether Theophrastus' treatises on desiccation due to excessive deforestation, or during the colonisation of the Caribbean in the 17th century, forestry, and soil erosion have always been a central concern of conservation-adaptation. 'Soil erosion control, for example, was developed [in the Caribbean], but the colonists were more concerned with the longevity of the plantation than the survival of the forest; climate change, after all, represented a potential threat to colonial economic projects'.[254] Adaptation is the necessary companion to conservation, interwoven and central to projects of expansion through human/nature domination.

Despite their long, shared history, it does seem like conservation was discussed more heavily during the 19th and 20th centuries, while adaptation surged with the turn of the century. While both have been part of the framework of sustainable development since the beginning, their relative weight seems to have shifted as environmental discourse has focused more and more on climate change. For example, the Brundtland Report, published in 1987, mentions 'conservation' almost 150 times, while 'adapt', 'adaptation', 'resilient' and 'resilience' combine for a mere 24.[255] In contrast, the reports published by the same international institutions after the 2000s invert the equation, focusing on climate change adaptation. For instance, the United Nations, World Bank and World Resources Institute published *Roots of Resilience. Growing the Wealth of the Poor* in 2008; in it, 'conservation' features only 57 times (half as much as in 1987), while the

[254] Ibid., 17–18.
[255] United Nations, 'The Brundtland Report'.

same derivatives of adaptation show a fourfold increase.[256] As Sofie Hellberg explains in *The Biopolitics of Water*, resilience is a central concept of contemporary sustainable development, in particular with respect to climate change adaptation. Simply put, 'a focus on resilience emphasizes uncertainty'. To regard the environment as uncertain and risky 'entails a change in terms of the ontologies of both the environment and human subjects, […] humans must become adaptive and self-reliant in relation to these risks'.[257] The report's definition of resilience does indeed stress uncertainty and, at the same time, places it in the framework and tradition of green capitalist sustainable development that I have been analysing until now:

> Resilience is the capacity to adapt and to thrive in the face of challenge. This report contends that when the poor successfully (and sustainably) scale up ecosystem-based enterprises, their resilience can increase in three dimensions: They can become more economically resilient – better able to face economic risks. They – and their communities – can become more socially resilient – better able to work together for mutual benefit. And the ecosystems they live in can become more biologically resilient – more productive and stable.[258]

The three pillars of sustainable development appear again, and so does economic reductionism: 'the poor's resilience' is ultimately predicated on 'scaling up ecosystem-based enterprises'; resilient communities and ecosystems append from enterprises. Resilience becomes a key word for 'pushing even more strongly for neoliberal governance reforms', because 'the market, and its production of economic diversity, becomes a core constituent of the resilience that is to be created'.[259] For green capitalism, operating under the mantra of sustainable development, 'human resilience' and climate change adaptation are central. Within this framework, adaptation shows the same limits as conservation does; insofar as capitalism's metabolic rift remains unquestioned, sustainable development amounts to a discursive justification ('the economic empowerment of the poor', 'resilient communities') for capital valorisation ('ecosystem-based enterprises', 'support responsible industrial development that generates jobs').[260] La Bizkaia presents itself as

[256] Bapna et al., *World Resources 2008*.
[257] Hellberg, *The Biopolitics of Water*, 51.
[258] Bapna et al., *World Resources 2008*, ix.
[259] Hellberg, *The Biopolitics of Water*, 51.
[260] Bapna et al., *World Resources 2008*, viii–ix.

a privileged site for the analysis of climate adaptation frameworks, for historical and contemporary reasons. Firstly, ever since the Francoist regime started the pine trees monoculture, La Bizkaia's predominant activity is forestry, which is precisely the original concern of the pair conservation-adaptation. Additionally, the European Union's LIFE programme funds the valley's forestry estate through a research project for 'an integrated, coherent and inclusive implementation of Climate Change Adaptation policy in […] Navarre'.[261]

Climate Adaptation Measures in the Forest of La Bizkaia

By analogy, the purposeful blindness of green capitalism towards its second contradiction can be expressed, in the lexicon of contemporary ecology, as the disavowal of climate change mitigation. It is well known that mitigation targets cannot be met without fast, deep cuts to the profits of carbon and financial capital, which is why mitigation, the real alternative to the pair conservation-adaptation, figures only discursively.[262] Targets set by the International Panel on Climate Change (IPCC), which are insufficient to begin with, are never met.[263] The United Nation's last climate change *Conference of the Parties* (COP28) was the final, ironic confirmation of the incompatibility between mitigation and sustainable development. Held in the United Arab Emirates, the apotheosis of fossil capital, its *Oil and Gas Decarbonization Charter* is a handful of 'voluntary and broadly repeat[ed] pledges', lacking in details for implementation.[264] The rhetoric of mitigation and its vacuity are equally present in the plans of the Government of Navarre, laid out in the *KLINa Roadmap*. A strategic plan for integral climate change policy (2017-2030-2050), the section concerning mitigation is, again, a collection of targets, with no *actual* roadmap on how to meet them.[265] Focusing almost exclusively on emission cuts, it does not specify how these will take place, putting forward generic formulas for the electrification of transport, investment in renewables and vague incentive schemes which are themselves not defined.[266] In contrast, the documents discussing climate change adaptation show great level of detail and technical prowess; highly operational, they include specific

[261] European Union LIFE, Towards an integrated, coherent and inclusive implementation of Climate Change Adaptation policy in a region: Navarre.
[262] Malm and Carton, 'Seize the Means of Carbon Removal'.
[263] Le Quéré et al., 'Fossil CO2 Emissions in the Post-COVID-19 Era'.
[264] Weise and Cooper, 'Climate Action or Distraction?'
[265] Gobierno de Navarra, 'KLINa Roadmap', 64–68.
[266] Ibid., 84–87.

recommendations for different time frames, accounting for local variability yet preserving consistency and coherence.[267] Official governmental reports like these draw on the framework of sustainable development, as it trickles from international institutions like the UN or the World Bank down to the EU, further down to the Governments of Spain and Navarre, and ultimately to the forestry engineers managing the estate. The link between the hyper-local reality of the valley and international institutions is both monetary and conceptual, and this helps me to trace in those reports key ideological claims that characterise green capitalism. In reviewing these official documents, two things become clear: firstly how deep the engineers' knowledge is of the natural systems of La Bizkaia, and secondly, how their nuanced ecology ultimately collides with capital valorisation and the metabolic rift it creates. La Bizkaia's forestry estate is an exemplary case of the governance that climate adaptation enables. Such governance is defined in a deliverable for the European Union's LIFE program:

> Adaptive management refers to the dynamic and iterative process of planning, implementing and modifying management strategies; in a context of uncertainty and constant change. It must be based on sustainable forestry management principles, in a way that is economically operational, socially beneficial and environmentally coherent. It must thereby preserve the structures of ecosystems and the services they provide in the long term. Therefore, in order to achieve the ultimate goal of adaptation, which is the long-term conservation of natural processes and ecosystem services, adaptation measures must be framed within a sustainable, predictive and adaptive management framework.[268]

This definition contains, again, the main elements of sustainable development; the three dimensions, repeated *ad nauseam*, the interrelation between conservation and adaptation and, as Hellberg points out, an emphasis on uncertainty: 'the dynamic and iterative process of planning', 'in a context of uncertainty and constant change', 'a sustainable, predictive and adaptive management framework'. Building on Hellberg's insight, I will enquire further into the role of uncertainty and its relationship with prediction and planning in a later section of this Chapter. For now, I simply want to lay out the basic characteristics of La Bizkaia's sustainable development

[267] Gobierno de Navarra, 'Adaptive Management Guidelines for Mediterranean Agroforestry Systems'.
[268] Ibid., 12.

and its three axes. The environmental goal of the forest is to control soil erosion, as I have recounted in detail in previous chapters. The village of Guetadar was completely demolished, except for a single building, which acts today as a youth hostel, owned by the government and privately run. It forms the core of La Bizkaia's modest ecotourism and eco-friendly leisure, which several official sources highlight as the social benefit of the forest's sustainable development.[269] Profit is extracted from the forest by selling wood for cellulose production to the local paper industry, as well as through the research program for climate adaptation which has so far granted the Government of Navarre 9.34 million euros of European funding.[270] Once more, the capital valorisation is the prerequisite for social and environmental development; this time made explicit by the forestry department itself: 'productive use becomes the tool for the forestry system's permanence'.[271] More importantly, this principle translates into the concrete, technical proposals that the engineers make for the management of the forest. To this day, production is by far the main goal of the estate, with 75% of the total surface of the valley dedicated exclusively to producing wood. Hardwoods and autochthonous species are pushed to the margins, to areas of low productivity or too hard to access for commercial exploitation. Four different technical reports analysed for this section agree on the recommendations below. While, in them, the forest is a complex, interrelated whole that must be preserved in the long term, capital valorisation imposes economic reductionism and profit becomes the precondition and outcome of sustainable development:

1. Reduce the density of pine trees, so that these grow stronger and thicker and can be sold as posts instead of lower value cellulose mass.
2. To protect the most productive areas from pest and disease, promote the cohabitation of different generations at different development stages by cutting down some pines.

[269] Trails for bicycles and hiking in (Servicio forestal y cinegético del Gobierno de Navarra, 'Plan de Selvicultura Preventiva Montes de Sabaiza'); mushroom foraging in (Gobierno de Navarra, 'Plan de Ordenación Sabaiza'); or spotting the Jacas in (Perez de Muniain, Villanueva Vergara, and Lecumberri, *Nuestros caballos - la Jaca Navarra y el burguete*).
[270] European Union LIFE, Towards an integrated, coherent and inclusive implementation of Climate Change Adaptation policy in a region: Navarre.
[271] Gobierno de Navarra and Sección de gestión forestal, 'Ordenación Montes Sabaiza', 2:10.

3. Promote biodiversity in areas of low productivity for increased protection against disease, drought and fire, by inmixing with local companion species. In areas of high productivity, biodiversity is only marginally allowed.
4. Increase fire protection by including hydrophilic species in river beds and the sides of roads.
5. Increase fire protection through the Jacas' grazing, ensuring lower volumes of shrubs and excess vegetable mass.

I would like to direct my attention to this last recommendation, which highlights the nexus between conservation and adaptation. If in the previous section I commented on the colonial legacy of conservation through the preservation of the Jacas, their use for climate adaptation is an example of technocratic rule. The sheep flocks characteristic of La Bizkaia's traditional farming were pushed away by the pine trees, and their grazing lost, maligned by the Francoist technocrats for damaging the soil. In 1978, Mario Gaviria wrote an article entitled *The Shepherd, Thermodynamic Hero*, in praise of their role for traditional metabolic regimes:

> Energetically, the shepherd is the most productive worker of society. With a stick, a dog and a radio or a can of sardines, using some three thousand calories a day, he goes out into the field with 500 sheep and returns every night with 50 kg more meat, calories and healthy proteins taken from pastures and waste that society would not have used without the shepherd.[272]

The flocks' removal resulted in depopulation and excess growth of shrubs, which competes with pines for water, reduces their rate of natural reproduction and increases exposure to wildfires. After decades of neglect, the estate's technocrats came around to grazing, only this time the flocks that sustained the life of La Bizkaia's peasants were substituted by the Jaca, a horse breed with nationalist symbolic value, creating enclosures for their controlled grazing. This exemplary case shows how climate change adaptation is used to further entrench the gap between the expert and the ignorant which constitutes technocracy, even when La Bizkaia's experience concretely falsifies it. Like the newspaper articles that opened the introduction, which praised the monoculture against the ignorant practices of farmers which erode the soil, discourse on

[272] Gaviria, 'El pastor, héroe termodinámico'.

adaptation and resilience targets the poor and their alleged ecological ignorance. As Hellberg points out, this 'particular form of moralism towards the poor has been a central theme in environment discourse ever since Malthus'.[273] Green capitalism, for all its efforts to 'increase the wealth of the poor',[274] inherits this Malthusian distaste for the over-breeding poor from its first ideologues, such as Garret Hardin in *The Tragedy of the Commons* declares that 'freedom to breed is intolerable'.[275] This Malthusian authoritarianism makes its way into the present: 'In 2015, Jørgen Randers, one of the authors of the 1972 Club of Rome report *The Limits to Growth*, proposed an 'enlightened dictatorship' in certain areas of policy to enact authoritarian measures that democratic electorates are unwilling to countenance'.[276]

The Malthusian contempt for the poor, characterised by its reductionism as much as by its misanthropy, is another gesture shared across historical periods and different ideologies. In its current form, it can mask behind sustainable development's purposeful naivety, or express itself transparently in praise of technocracy. Whether it is directed against the poor or the rich, it remains a challenge to popular democratic rule: 'environmentalist David Shearman in his *The Climate Challenge and the Failure of Democracy*, advocated for an "eco-elite" empowered to circumvent corporate interests'.[277] In all cases, it remains a reductionist, excluding argument; in this sense, it sits at the core of sustainable development as I have been dissecting it in this chapter. Throughout the chapter, I have unpacked La Bizkaia's sustainable development in a way that allows me to compare it to my model of Total Planning. Through the history of nature conservation and the Jacas programme, I have highlighted sustainable development's colonial politics. Through the EU-funded research for climate adaptation in the forest, I highlighted technocratic rule. Throughout my account of sustainable development, economic reductionism sits at the core of its disavowal of capital's second contradiction. In these last paragraphs another reductionism appears, the Malthusian contempt for the popular. In the following section, I want to uncover in sustainable development a securitarian epistemology, which constitutes the fourth dimension of Total Planning. In order to do so, I will focus on the relationship between conservation-adaptation and uncertainty. As hinted by both Hellberg and the Navarre

[273] Hellberg, *The Biopolitics of Water*, 52.
[274] United Nations Development Programme et al., *World Resources 2005: The Wealth of the Poor*.
[275] Hardin, 'The Tragedy of the Commons', 1246.
[276] Moore and Roberts, *The Rise of Ecofascism*, 65.
[277] Ibid., 66.

Government itself, resilience and predictive planning enact an ideological movement, whereby the future is presented as risk. By relating to the future as risk, a new governance is inaugurated that is founded on the idea of risk itself. Thus, despite claiming to eliminate risk, this new governance simply manages it. Modelling and predictive planning become key technologies of power for green capitalism, whose governance entails the constant management of crises.

Green Capitalism Is Disaster Capitalism

> The green neoliberal reforms can coexist with […] the neonationalist politics of the border, with the institutionalisation of racialised minorities and with homophobic violence. Racism can be green as well.[278]

In order to uncover sustainable development's tendency to securitise nature, I would like to go back to the myth of Nimrod in Chamayou's *Manhunts*. In Chapter 3 I focused on the opposition between the mighty hunter and the pastoral tradition inaugurated by the Abrahamic religions: 'a protective power versus a predatory power: that was the line of opposition'.[279] I used the figure of Nimrod to explain the inextricable link between the domination of nature and that of humans; in the section above about nature conservation, I have traced its colonial origins, which tie it directly to the cynegetic power of Nimrod. In this section I want to make explicit the securitarian character of sustainable development, and in order to do so, I will go back to Chamayou and his account of pastoral hunts. As opposed to the hunter, which accumulates power through forced inclusion (capture), the pastor's power lies in excommunication. In Chapter 3 of his book, Chamayou cites trials from early modernity, in which heretics are declared 'diseased sheep' and must 'be driven far from the fold, for fear that […] the whole flock might be invaded [infected]'.[280] 'The history of man-hunting is thus a history not only of the techniques of tracking and capture but also of procedures of exclusion, of lines of demarcation'.[281] Despite having traced Nimrod's cynegetic governance to nature conservation, and in turn nature conservation to

[278] Preciado, *Dysphoria mundi*, 55–56.
[279] Chamayou, *Manhunts*, 20.
[280] St. Jerome's commentaries on the Galatians, cited in Ibid.
[281] Chamayou, *Manhunts*, 2.

sustainable development, I would now like to argue that sustainable development is itself a re-framing of the pastoral mode of governance, albeit in the lexicon of contemporary ecology. This apparent contradiction is not such, for I have insisted throughout this chapter that conservation and adaptation form an inseparable pair, and that it is not either, but both of them together, that define green capitalism. The pastoral tone stands out in the reports that define green capitalism, such as those by the United Nations analysed above. Their paternalism aside, it is clear that they portray adaptation as a positive biopolitics, inclusive towards the poor, whose wealth they address. Using Chamayou's chapter *Diseased Sheep and Wolf-Men*, I hope to examine the consequences of this pastoral ecology, proving that it securitises nature.

Every act of inclusion is an act of exclusion, after all. Every enclosure is an exclosure; the difference lies in the regime of governance that each opens up. Just like the opposition between the hunter and the pastor, so do conservation and adaptation form a dialectical unit, two contradictory yet productive poles of a single logic. Nimrod, the hunter, is also the king of Babel; he accumulates through capture, bringing prey and trophies within the confines of his walled city. Capture, accumulation, and enclosure are his techniques of power. In my commentary on nature conservation above, I explain how it, and the origins of capitalism, are inextricably linked to violent acts of enclosure. By contrast, the pastor's authority resides in the power to exclude from the flock. In this tradition, expulsion from the community is rationalised as a 'beneficent exclusion', in the name of the flock's protection; 'sometimes one has to hunt down certain sheep, to sacrifice a few to save all the others'.[282] Illness and contagion are thus the preferred metaphor for pastoral governance; the ill sheep must be cast aside, leaving it outside the protection of the flock, in the hands of wolves. The pastoral technique of power is immunitary exclosure, as opposed to enclosure. Immunitary metaphors, if pushed to the extreme, always border on the idea of animality, of a non-human otherness.[283] The line between humans and other animals is 'one of the, if not the, most important division in the biopolitical terrain', Hellberg remarks.[284] Indeed, 'one of the central features of neoliberal biopolitics is that it distinguishes and makes

[282] Ibid., 20.
[283] Much of Paul B. Preciado's work hinges on these ideas, perhaps most beautifully expressed when commenting on artist Carol Rama's last years, and her obsession with the mad cow disease. Preciado, 'Animalismo, ¡yo Soy La Vaca Loca!'
[284] Hellberg, *The Biopolitics of Water*, 33.

divisions between forms of lives, between humans and other animals'.[285] In fact, this transmutation of the diseased into an animal-other is brought up again and again in the Christian pastoralist tradition. Outlaws were portrayed as both diseased sheep but also wolves because, like wolves, they are doomed to live as bandits, as wild beasts in the forests. Chamayou quotes philosopher Giorgio Agamben: 'this lupinization of man and humanization of the wolf is at every moment possible in the *dissolutio civitatis* inaugurated by the state of exception'.[286] In his *Decolonial Ecology*, Malcom Ferdinand picks up on the same act of exclusion, as it pertains to 'the Negro', which 'no longer designates a skin color, a phenotype; it does not even refer to an ethnic origin or specific geography. It refers to all those who were and are in the hold of the modern world: the off-world'.[287]

> The Negro is White, the Negro is Red, the Negro is Yellow, the Negro is Brown, the Negro is Black. The Negro is young, the Negro is old, the Negro is a woman, the Negro is a man. The Negro is poor, the Negro is a worker, the Negro is a prisoner. The Negro is brown-forest, the Negro is greenplant, the Negro is blue-ocean, the Negro is red-earth, the Negro is gray-whale, the Negro is black-fossil. Negroes are the many (human and non-human) off-worlders whose vital energy is forcibly dedicated to fuel the lifestyles and ways of inhabiting the Earth of a minority while being denied an existence of their own in the world.[288]

Made other, the diseased sheep, the outcast wolf, the Negro, can now be hunted 'as if they were wild beasts'.[289]

The Jungle and the Garden

> Yes, Europe is a garden. We have built a garden. Everything works.[290]

Spanish technocrats seem to have a keen ability to summarise and make explicit the kernel of their ideology. Just like Franco's quote in Chapter 2 contained the basic tenets of his ecology,

[285] Ibid., 34.
[286] Chamayou, *Manhunts*, 26–27.
[287] Ferdinand, *Decolonial Ecology*, 60.
[288] Ibid.
[289] Chamayou, *Manhunts*, 26.
[290] Borrell, 'European Diplomatic Academy Inaugural Speech'.

expressed through water, so does Josep Borrell's speech, quoted above, summarise the pastoral ecology of green capitalism. Green capitalism transposes the opposition between the wolf and the sheep into the opposition between the jungle and the garden: 'the rest of the world is not exactly a garden. Most of the rest of the world is a jungle'.[291] Borrell, the High Representative for Foreign Affairs and Security Policy, further reinforces the obvious colonial implications of his statement; in his speech during the inauguration of the European Diplomacy Academy he addressed the students, the future diplomats of the EU: 'keep the garden, be good gardeners. But your duty will not be to take care of the garden itself, but [of] the jungle outside'.[292]

When Borrell insists that 'high walls in order to prevent the jungle from coming in is not going to be a solution' he, of course, does not mean that 'Border Europe' should not further entrench itself,[293] but rather that 'the wall will never be high enough in order to protect the garden', and so walls must be complemented by interventionism outside, a new civilising mission. As it turns out, the pastoral ecology of green capitalism has already created, through exclusion, a jungle inside the garden's walls. For decades now, migrants hoping to cross into the United Kingdom have camped around Calais, a port city on the French side of the Canal. In 2015, the City Council began the forced relocation of at least 2,000 of them into an area that came to be known as The Jungle. When, two years later, French Minister of Interior Bruno Le Roux visited the site, he proclaimed:

> I wanted to be in Calais today with the elected officials and the mayor to see that the dismantling [of 'The Jungle'] was a successful operation and that it will now continue with an ambitious project to return this territory to nature. To ensure that it benefits the environment, and especially to make sure that there will be no new encampments in Calais.[294]

Le Lande, the site of the migrant camp, was set to become part of Fort Vert, a neighbouring nature reserve. Its 'renaturing', a joint proposal by the UK Border Force and *Conservatoire du Littoral* (a regional environmental organisation), had a twofold goal. On the one hand,

[291] Ibid.
[292] Ibid.
[293] The new European pact on migration and asylum makes clear that Europe is decidedly investing in its own bunkerisation. European Commission, 'Pact on Migration and Asylum'.
[294] Border Ecologies Network, 'Fort Vert'.

'constructing sandbanks, lakes, and ditches to prevent access and thus new migrant encampments'; on the other 'attracting migrant birds' and promoting 'the reappearance of the highly protected fen orchid (*Liparis loeselii*)'.[295] In Calais we find the epitome of green capitalism's 'pastoral hunts': turning a migrant camp into a nature reserve. The Jungle was developed (literally land development, but also sustainable development) into Fort Vert, French for Green Fortress. A joint effort by the border force and an environmental organisation turned the jungle into a garden; green capitalism, with its 'positive biopolitics' and pastoral ecology, securitises nature: the jungle could invade the garden […] The gardeners have to go to the jungle. Otherwise, the rest of the world will invade us'.[296]

The Nature of Disaster Capitalism

> Disasters are always co-productions in which natural forces such as plate tectonics and weather systems work together with social, political, and economic forces.[297]

Renaturing, climate restoration; a rare flower justifies forced displacement. Resilience, adaptation, coping strategies; some pine trees suffer better than others. The pair conservation-adaptation forms, in fact, a single dialectical unit, whose productive contradictions enable a new governance; the rule of green capitalism is defined by securitising nature. That is, the securitisation discourse that dictates much of contemporary governance today, is transposed onto nature, for nature needs protecting as well. To conclude this chapter, I briefly explore green capitalism's relationship with the future. I argue that, through notions like uncertainty and resilience, green capitalism relates to the future as risk. It is precisely this uncertain, risky future that justifies green capitalism's securitarian drive. In this light, green capitalism, which claims to mitigate future crises, defines a new governance, that of disaster capitalism, which turns those crises chronic, managing them in order to valorise, and normalising states of exception. I borrow the term from Naomi Klein's *The Shock Doctrine*[298] and Anthony Loewenstein's *Disaster Capitalism*;[299] both investigative books which, through numerous case studies, paint the picture of a network of companies that profit from disasters. I argue that, due to the breakdown of

[295] Ibid.
[296] Borrell, 'European Diplomatic Academy Inaugural Speech'.
[297] Out of the Woods Collective, 'The Uses of Disaster'.
[298] Klein, *The Shock Doctrine*.
[299] Loewenstein, *Disaster Capitalism*.

climate systems, what Klein calls the 'Disaster Capitalism Complex', will increasingly come to represent green capitalism as a whole.[300]

> The permanent state of crisis that characterizes most contemporary discourses in virtually every field, from politics to economics, from medicine to culture, embodies exactly this aspect. By maintaining its relationship with its own limit as a state of endless crisis, Technic is able to freeze it into a suspended condition.[301]

Through this productive conflict with its own limits, green capitalism 'deploy[s] a logic of containment' whose 'built-in features' allow it to profit from environmental crises.[302] Stephen Collier and Andrew Lakoff illuminate this logic of contention in their examination of 'vital systems security', whose emergence they see as 'a significant mutation in biopolitical modernity'.[303] Vital systems security names a concept, and a set of protocols and techniques, that emerged during the first half of the 20th century. During the Cold War, 'planners and policy-makers recognized that collective life had become dependent upon interlinked systems such as transportation, electricity, and water'.[304] The traditional instruments of biopolitical government came to be seen as a source of vulnerability. Their work contains four structural insights into the governance of disaster capitalism: reflexive biopolitics, risk management, the effects on political subjectivity and the normalisation of exception.

First is their notion of 'reflexive biopolitics', which explains in which way vital systems security represents a mutation of biopolitics. In contrast to 'first modernity', in which the risks addressed (unemployment, endemic disease) 'were distributed over populations in regular and predictable ways', the risks addressed by 'reflexive modernity' (read green capitalism) are 'unprecedented and therefore impossible to calculate based on historical patterns of incidence, and they are potentially unbounded in temporal and geographic scope'.[305] These two forms of biopolitical security differ in their objects of concern and thus in their practices, 'vital systems security deals with events whose probability cannot be precisely calculated, but whose consequences are

[300] Klein, *The Shock Doctrine*, 299.
[301] Campagna, *Technic and Magic*, 142.
[302] Moore and Roberts, *The Rise of Ecofascism*, 49.
[303] Collier and Lakoff, 'Vital Systems Security', 3.
[304] Ibid.
[305] Ibid., 4.

potentially catastrophic'.[306] Vital systems security deals, in other words, with Black Swans, and thus cannot rely on statistical analyses of the past, but on prediction and simulation of potential futures. Because it relates to the future as uncertain, it 'seeks to increase the resilience of critical systems and to bolster preparedness for future emergencies'.[307] And here lies the second insight: because an uncertain future calls for pre-emptive preparation, vital systems security, or disaster capitalism, place themselves in the position of the manager of risk. 'Institutions of reflexive biopolitics', explains Nick Dyer-Witheford in his reading of Collier and Lakoff, manage risks that arise 'from within the capitalist modernity they defend'.[308] It is in this sense that tools of planning become central to the governance of disaster capitalism. Modelling, prediction and strategic planning are instruments allegedly deployed for crisis prevention or mitigation but, because risk management constitutes the *raison d'être* of disaster capitalism, they instead make those crises chronic.

The third insight that can be derived from their work is to investigate the consequence for political subjectivity of vital systems security, which were 'designed, in whole or part, to control civil disorders'.[309] To gauge the consequences, I would like to go back to Hellberg's work on resilience; she writes:

> The resilient subject is a subject which must permanently struggle to accommodate itself to the world. Not a political subject which can conceive of changing the world, its structure and conditions of possibility … [b]ut a subject which accepts the disastrousness of the world it lives in as a condition for partaking of that world and which accepts the necessity of the injunction to change itself in correspondence with the threats and dangers now presupposed as endemic.[310]

The fourth and key insight of Collier Lakoff's work lies precisely in exceptionality. Contrary to most literature on the matter and its emphasis on states of exception, their analysis emphasises vital systems security 'as a normal part of constitutional government'.[311] Under disaster

[306] Ibid.
[307] Ibid.
[308] Dyer-Witheford, 'Biocommie', 5.
[309] Ibid.
[310] Hellberg, *The Biopolitics of Water*, 52.
[311] Collier and Lakoff, 'Vital Systems Security', 7.

capitalism, political subjectivity adopts the mantra of adaptation, ready to accommodate to exception, which it sees as inevitable. On the other hand, the governance of exception is normalised. ‘As an anticipatory technology for mitigating vulnerabilities and closing gaps in preparedness’, disaster capitalism normalises crises, states of exception.[312] A new biopolitical governance is inaugurated, kickstarted by the prediction and simulation of catastrophes of extraordinary magnitude. Against this uncertain future, extraordinary measures are mobilised. Nature presents itself as fatality; risk must be eliminated, justifying the bunkerisation and Total Planning of (certain) natures. Green capitalism establishes a relationship of risk with the future. Claiming to eliminate, or mitigate, it, disaster capitalism constitutively depends on risk, its governance suspended exception, a technocratic management of always ongoing crises through which to valorise. Green capitalism’s techniques of power, conservation-adaptation, justify the Total Planning of nature. In this light, green capitalism itself amounts to a technique of power, a discursive justification, a set of techno-scientific instruments and institutional frameworks for the inauguration of a new governance: disaster capitalism.

In this final chapter, I have studied green capitalism and how its metabolic regime, sustainable development, governs La Bizkaia. By looking at the pair conservation-adaptation, and their respective programs for the Jaca horses and for forestry management, I have been able to trace the main characteristics of Total Planning within green capitalism. Nature conservation’s historical origins are deeply rooted in colonial politics, while technocratic management and economic reductionism plague climate change adaptation. By putting conservation together with adaptation, I have shown that they form a single, dialectical unit, whose productive contradictions enable the securitisation of nature. The epistemological kernel of this securitarian drive lies in green capitalism’s relation to the future as uncertain and potentially catastrophic. By applying my model of Total Planning to green capitalism, I have been able to trace elements of the former in La Bizkaia and, further, to reframe the latter as disaster capitalism. This research, beyond its critique of existing programmes and systems, opens the door to a broader study of 'planning' as a political and epistemological form. Any subsequent research on the topic would therefore aim to go beyond critique, and sketch the contours of an alternative to Total Planning.

[312] Ibid.

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