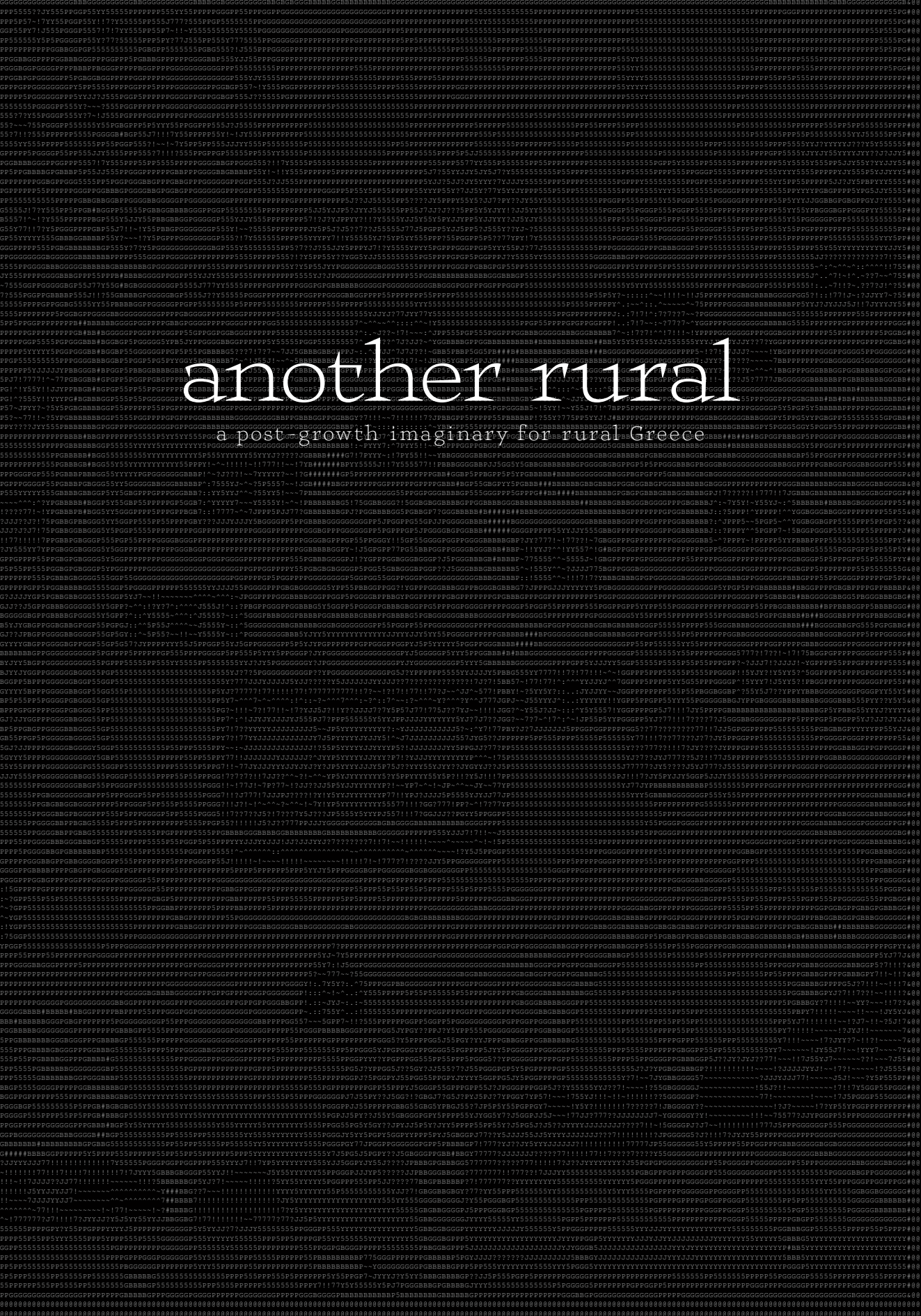
another rural
a post-growth imaginary for rural Greece

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Finally, I want to thank my grandma Eleni for everything.

This thesis is for her, from her, through her.

abstract

In Greece, the prevailing growth-paradigm has been manifested in the commodification of rural areas through tourism, and the continuous neglect and abandonment of the non-touristic territories. This has resulted in their societal and environmental degradation, exemplified through the recent devastating floods and wildfires, that also stem from the pressures of climate change. Within a context of intense political corruption and tardy governmental response, the nuanced topic of rurality is failing to be addressed adequately. We cannot continue business-as-usual, but should aim instead towards transitioning to a post-growth society. However, there are significant barriers present, like the limited societal acceptance, lack of alternative spatial imaginaries and intense bureaucracy. To bypass such hurdles, bioregionalism proposes the formation of a place-based administrative body - researched here through the case-study of the Spercheios river basin. Considering the overwhelming and ambitious nature of the post-growth agenda, in combination with the lack of adequate communication tools to engage disinterested stakeholders that are locked-in-growth, traditional planning approaches would not suffice. Alternatively, after the exploration of the site-specific conditions and a tracing of growth in the landscape itself, a contextual spatial imaginary is formed, conducted through a combination of fiction writing, speculative design interventions and physical artefacts. This narrative is explored through the perspective of a rural dweller of the bioregion of Spercheios, who meanders along the region in the scope of one day. They explore the adaptation to energy and water sufficiency from the scale of one individual house, to the neighbourhood, to the village, and reckon with food production through extensive agroforestry practices. They engage with bioregional decision-making processes in a weekly meeting, and observe nature-based solutions along the river as they commute towards the coast. There, they explore the restoration of the wetlands and the adaptation towards living with more water in the lowlands. Finally, they end their day back at the square of the village, reflecting, sharing stories and bonding with others. Through this narrative, implications, opportunities and limitations of the post-growth approach are investigated, while also exploring experimental methods of communication and engagement - ultimately attempting to imagine the post-growth future tangible, within grasp.

περίληψη

Η εμμονική εστίαση της Ελλάδας στην ανάπτυξη έχει εκδηλωθεί μέσω της εμπορευματοποίησης των αγροτικών (rural) περιοχών από τον τουρισμό, οδηγώντας στη συνεχή παραμέληση και εγκατάλειψη των μη τουριστικών περιοχών. Ως αποτέλεσμα οι περιοχές αυτές έχουν υποβαθμιστεί τόσο κοινωνικά όσο και περιβαντολλογικά, γεγονός που επιβεβαιώνεται από τις πρόσφατες καταστροφικές πλημμύρες και πυρκαγιές. Ταυτόχρονα, η χώρα βρισκόμενη ενός πλαισίου έντονης πολιτικής διαφθοράς και υστερημένων αντιδράσεων από τις κυβερνήσεις, δεν είναι σε θέση να αντιμετωπίσει με επάρκεια το πολυσύνθετο θέμα της αγροτικής ζωής (rurality). Αυτή η συνθήκη δε μπορεί να συνεχιστεί, αντίθετα, πρέπει να στοχεύσουμε σε μια κοινωνία μετα-ανάπτυξης (post-growth). Παρατηρούνται ωστόσο σημαντικά εμπόδια όπως η περιορισμένη αποδοχή του κινήματος, η έλλειψη εναλλακτικών χωρικών οραμάτων και η έντονη γραφειοκρατία. Για την παράκαμψη αυτών των εμποδίων, προτείνεται η δημιουργία ενός νέου διοικητικού σώματος βασισμένο στον ίδιο τον τόπο, βάση του όρου βιο-περιφέρεια (bioregionalism). Στην εργασία αυτή εξετάζεται μέσω της περίπτωσης της λεκάνης απορροής του Σπερχειού ποταμού. Λαμβάνοντας υπόψη τους ιδιαίτερα φιλόδοξους στόχους του μετα-αναπτυξιακού κινήματος (post-growth movement), σε συνδυασμό με την έλλειψη των κατάλληλων επικοινωνιακών εργαλείων για την εμπλοκή της κοινότητας, δε θα ήταν επαρκής μια τυπική προσέγγιση χωροταξικού σχεδιασμού. Έτσι, μετά από την εξερεύνηση των τοποειδών χαρακτηριστικών της περιοχής και της χαρτογράφησης των διαφόρων εκφάνσεων της εμμονικές ανάπτυξης στο τοπίο, διαμορφώθηκε ένα χωρικό όραμα μέσω ενός μυθοπλαστικού αφηγήματος, τη εικαστικών σχεδιαστικών παρεμβάσεων και τη δημιουργία φυσικών αντικειμένων. Το αφήγημα διαμορφώνεται από την οπτική ενός κατοίκου που περιπλανιέται στην περιοχής του Σπερχειού, στο πέρας μια τυπικής ημέρας. Ο ήρωας εξερευνά την προσαρμογή σε συνθήκες επάρκειας ενέργειας και νερού, από την κλίμακα της μεμονωμένης κατοικίας, στη γειτονιά και του οικισμού, και μετά ασχολείται με την παραγωγή φαγητού μέσω πρακτικών αγροδασοκομίας. Έπειτα συμμετέχει στις διαδικασίες λήψης αποφάσεων της βιοπεριφέρειας (bioregion) στο εβδομαδιαίο συμβούλιο, και παρατηρεί λύσεις για θέματα πλημμυρών και ξηρασίας που βασίζονται στη φύση (nature-based solutions) καθώς μετακινείται στην ακτή με το τρένο. Εκεί εξερευνα την αποκατάσταση των υγροτόπων και την προσαρμογή της παράκτιας περιοχής με την παρουσία περισσότερου νερού. Τέλος, ολοκληρώνει την ημέρα πίσω στην πλατεία του χωριού, αναλογιζόμενος, μοιράζεται ιστορίες και συνδέεται με τους συνανθρώπους του. Μέσα από αυτό το αφήγημα διερευνώνται οι επιπτώσεις, οι ευκαιρίες και οι περιορισμοί της μετα-αναπτυξιακής (post-growth) προσέγγισης, όπως επίσης και πειραματικές μέθοδοι σχεδιασμού (design) και εμπλοκής (engagement), έχοντας ως απώτερος στόχο τη σύλληψη ενός απτού, υλικού οράματος.

motivation

interests

Looking into the rural issues of Greece was a decision formed during the summer of 2023, while I was brainstorming about potential thesis topics. Among them were issues of water infrastructure or opportunities for new housing in Athens, or the ongoing refugee crisis and its position in public perception in Greece. However, it slowly became evident that the territory that requires re-examination to address both urban pressures of overpopulation and the humanitarian crisis, is the realm of the almost forgotten rural. I initiated my graduation year with this intuitive notion in mind, which became concrete as the devastating wildfires and floods of later summer unfolded.

confessions of a city person

On a more personal level, I grew up in Athens - a huge city of more than 3 million people, with very few public green spaces. Admittedly, my connection to nature has been quite limited. My childhood house was next to the river of Ilissos in Kallithea - something that I never quite understood as a child. Like most of the Athenian rivers, Ilissos' banks became concrete in the 1950s, with the majority of the river hidden under parking lots and a small linear park. It is there that my sister and I played as children - at "the River". Reckoning with rivers as part of my thesis work made me realise that I have never actually been to a real river. Almost all of my work as an architect so far has been within an urban or suburban setting. This project is also a call for myself to discover my connection to nature and rurality.

grandma eleni

However, I also grew up listening to stories from my grandmother Eleni about her rural life. She often reminisced about the difficulty and harshness of rurality, but always with a fondness that I couldn't grasp. She would use words and concepts that were completely foreign to me - an entirely different world than the one I saw around me. But she would also paint. In her depictions of rural life I saw a comforting image, a nostalgia for a simple and humble life. Such rural knowledge and wisdom will soon be lost, if not documented and practised again.

A lot is at stake. This shallow and disengaged connection to nature is a reality for many Greek people living in urban centres. In order to go against the current state of affairs, an awareness and deeper connection to nature is required - a practised ecocentrism. If we are to truly commit to ensuring a future for us and the future generations then it is imperative to reckon with rurality, to imagine different ways of living and to urgently act upon them.

Painting by my grandmother Eleni. ♡

In this introductory chapter, the complex issue of rural neglect within the Greek context will be explored, through the lenses of societal, ecological and political neglect. The phenomena of population shrinkage and ageing are well documented, showing clear trends towards a troubling future for rural areas. Such a rural neglect poses immense implications towards the natural world - and will be exemplified through the severe cases of floods and wildfires of 2023. The political response is rather lacking - and will be briefly explored. Within this socio-political context, the lack of action is traced back to the prevailing growth paradigm. In Greece this has manifested as development through tourism, invading all aspects of understanding of progress and public discourse. Thus, a shift to a post-growth approach is required.

defining the problem

rural abandonment

Rural depopulation is an intensely investigated topic, as it has been an ongoing trend for many European countries. In Greece, for more than half a century, the outflow of mostly young people has resulted in rural areas becoming increasingly more abandoned and neglected, in favour of living in urban contexts. Numerically, while in 1960 just a little over half of the Greek population, at 56 percent, was residing in urban areas, in 2022 this has changed to more than 80 percent (World Bank, 2024). Many settlements that were once vibrant small-scale communities of a couple thousands people are now mostly vacant, with as few as five permanent residents for many cases.

ageing population

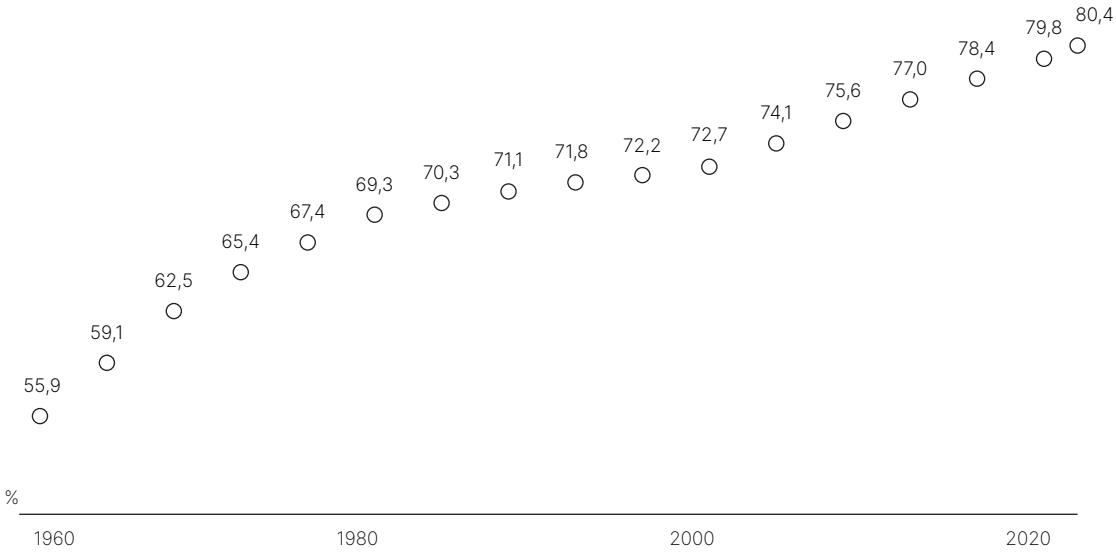
This has also coincided with an ageing of the Greek population. Examining the population over 65 years old, the 2001 figure of 16 percent of the total population had already risen to 21 percent in 2020. Even more alarming, the percentage of people over 80 years old has almost doubled, from 3,5 percent in 2001 to 6 percent in 2020 (Eurostat, 2023). A report forecasts that people over 65 years old will account for almost one third of the total population by 2050, while the working-age population will shrink to 5,7 million (Manifava, 2023). Another report focuses on the territorial aspects of rural depopulation, and illustrates that especially "mountain municipalities in mainland Greece and the Peloponnese, as well as municipalities in the northern border areas, show a very significant increase in the elderly population" (Papadopoulos and Baltas, 2024, p. 11). They also project this data to 2050, showing how people over 65 years of age would make up 40 percent of the population for almost the entirety of the Greek territory.

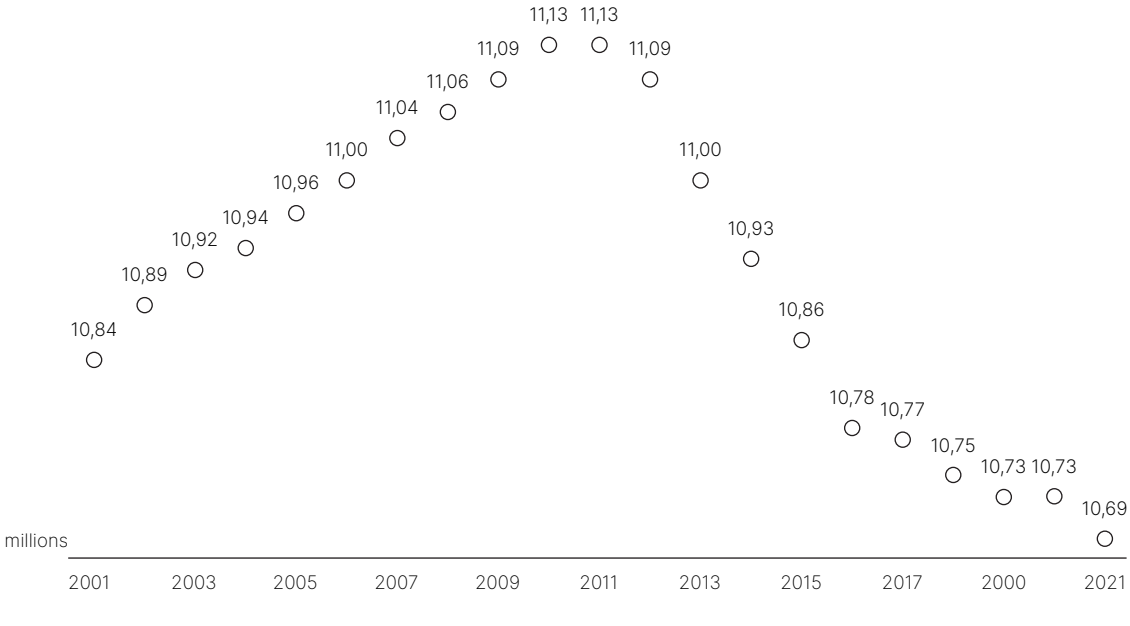
agriculture

The gradual abandonment of rural life has coincided with the decline of the agriculture sector. In 1991 almost every Greek region's population was mainly occupied in the agricultural sector - aside from the bigger urban centres like Attica, Thessaloniki and Chania. Over two decades later this has changed dramatically. The 604 million people employed in the agriculture sector in 2001 were reduced to 387 million in 2011 (Papadopoulos and Baltas, 2024, p. 13). "This decline in the number of people employed in agriculture follows the general trend of "deagriculturalisation" of rural areas caused, on the one hand, by the intensification of agricultural production and increasing competition among farmers, and on the other hand, by the expansion of non-agricultural sectors (e.g., construction, tourism, and other services) in rural areas" (Papadopoulos and Baltas, 2024, p. 13). As of 2023, arable land in Greece amounts to more than 45.000km2, however a big part of it is reported to be non- and under-cultivated, or used for solar farms, urban or touristic uses (Galani, 2023).

Such an extreme exodus from an agricultural, rural lifestyle has resulted in a myriad of implications. Access to services in rural areas has always been inadequate, but only worsened over time. The ageing population in rural areas experience poor access to healthcare and other public services, which only further stigmatises a return to the rural - a cycle of perpetual neglect. The remaining older people can no longer manage the land properly, again resulting in crucial biodiversity and heritage loss.

Above : Urban population in % of total population for Greece. Diagram by the author.
Data from https://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS?locations=GR





Below : Population in millions, showing a dip in 2011.
Diagram adapted from (Ioannou, 2022) by the author.

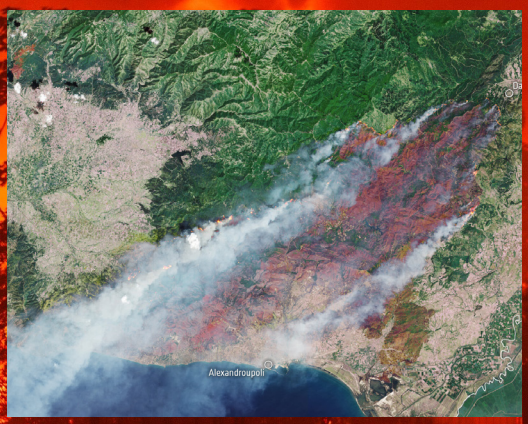
climate crisis

To expand on the last claim, having less people present in rural areas and no adequate governmental plan in place means that a large part of the Greek territory remains unmanaged. This land abandonment has a consequential accumulation of biomass in progressively less managed forests and natural land (Colantoni et al., 2020, p. 1). For example, trash along highways or forested areas is a common occurrence in peri-urban and rural areas of Greece. Such transformations in land use from pastoral and agrarian to urbanised or abandoned, with the simultaneous pressures of climate change through record-high temperatures and unpredictable rainfall, facilitate the spread of wildfires and extreme floods (Colantoni et al., 2020, p. 11).

recent events

Just recently, in the summer of 2023, the largest wildfire ever recorded in the EU took place in the northern region of Evros. It destroyed more than 96,6 thousand hectares of forests, including the Evros delta national park - a very important area for biodiversity. However, this represents only 55 of the total 355 forest fires experienced all over Greece (Fallon et al., 2023). Less than a month later, in early September parts of the region of Thessaly experienced more rainfall in 20 hours than the amount London experiences in a whole year (Stamataki, 2023). This resulted in the flooding of more than 150 square kilometres, causing immense damages to the crop production, as well as the death of more than 200 thousand animals. The money needed to repair such destruction has been reported to exceed 3 billion euros (Kouremenos, 2023).

Despite the unpredictability and severity of these events, the inadequacy of existing infrastructure, planning and governmental action is clearly illustrated. Extreme weather phenomena like this are expected to become more frequent and intense in the future and “mediterranean countries are the countries most threatened by wildfires in Europe” (Colantoni et al., 2020, p. 2), urging towards immediate action.



Images from https://www.thenationalherald.com/greeces-deadly-floods-wildfires-showed-world-whats-coming-next/
& https://www.esa.int/ESA_Multimedia/Images/2023/08/Wildfires_continue_to_rage_in_Greece

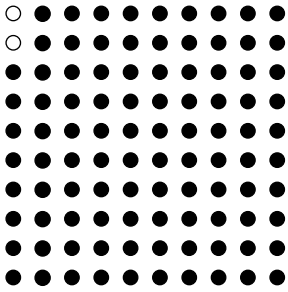
political neglect and corruption

The magnitude of the previously examined events has forced public discourse about rural issues and governmental tardiness again into the forefront. However, this is not a new phenomenon. There are wildfires every summer and floods every rainy period, disrupting daily life briefly but are soon phased out and forgotten. Without ever having a proper formal governmental response, this has gradually resulted in a desensitisation towards ecological destruction and an overall sense of futility. Such issues have deeper, institutional roots that need to be considered when thinking about the future.

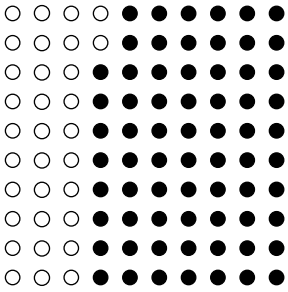
"If anything, I would argue that climate change is an opportunity for us to expand our tourism season"

political response

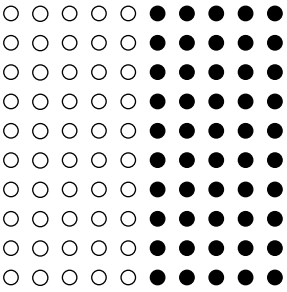
Characteristically, in a Bloomberg interview in 2023, just a few days after the destructive floods, when asked how the rising temperatures and wildfires during summertime will affect tourism, the Greek prime minister Kyriakos Mitsotakis responded that "climate change is an opportunity to expand the tourism season". (Nikas & Tugwell, 2023) Such a stance exemplifies the overall failure of the Greek government, present and past, to adequately respond to imminent challenges. Long-term consequences are almost always overlooked in the face of short-term economic gain, showing the extent of political corruption in the Greek context. One only needs to briefly read through newspaper articles about the myriad of economic scandals being reported, and suspect about the ones unreported, to grasp the context. A Eurobarometer report shows that Greece has the highest rate of perceived corruption in Europe, with 98 percent of Greek citizens believing corruption to be "widespread" in



98% GR



68% EU



50% NL

Attitude towards corruption - Perception of corruption to be widespread.
Data from (Friedman, 2022).

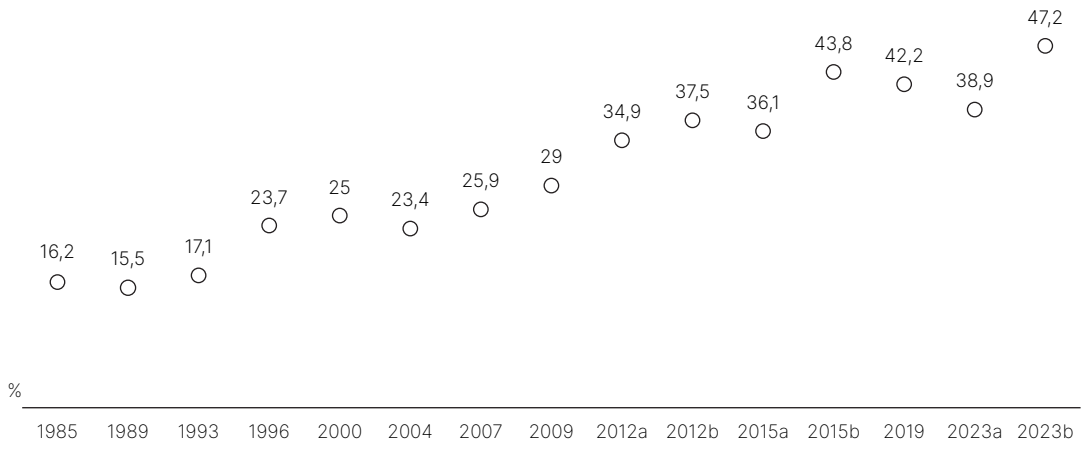
their country - and with more than 90 percent agreeing that corruption is present in not only national, but also regional and local institutions. This is far higher from the 68 percent average of all EU 27 members, and of the 50 percent reported for the Netherlands (Friedman, 2022). An older study reported that Greece is perceived to have the most corrupt public sector of all EU 27 countries ('Greece "most Corrupt" EU Country, New Survey Reveals', 2012).

climate crisis adaptation

This of course extends to climate crisis response. A report in July of 2023 showed that less than 0,5 percent of funds allocated to climate change adaptation measures have been disbursed from the Ministry of Climate Crisis and Civil Protection, towards only 14 projects related to "green transition" and "private investments towards economic redefinition". Numerically, it is only 940 thousand euros from a total budget of 187 million (Rousos, 2023). This was forcibly changed due to the necessary reparations that had to be paid: more than 140 million euros were allocated to 40 thousand flood victims, as reported by the Ministry of Civic Protection in December of 2023. (https://civilprotection.gov.gr/) Such figures help illustrate how a lack of action towards climate change mitigation or adaptation is myopic, and can lead to even higher costs in the long term. Overall, they also highlight the negligence of high-level government agents to adequately respond to the climate crisis.

disengagement

The tardiness in governmental action - exemplified through the lack of transparency, implementation and evaluation in the top-down planning approaches - is failing to address the nuanced topic of rurality and population shrinkage. This has resulted in a deep feeling of pessimism in Greek people, hampering participation and engagement towards meaningful change. This is quite evident from the incredibly high voting abstention rates, as some Greek analysts note that "many citizens distrust the country's political system to the point that they don't even want to vote". Specifically, the 2023 elections had a "new historic low" rate of 38,9 percent during the first round and 47,2 percent in the second. This accounts for more than 4 million people (Adamopoulos, 2015).



Abstention rate from national elections in Greece.
Data from (Adamopoulos, 2015) and ('Εκλογές 2023', 2023) https://www.imerisia.gr/

growth & tourism

Such political corruption is not borne from nothing - but it can rather be traced back and linked to the prevailing growth paradigm, with many problematic manifestations. One of such is the advent of (over) tourism.

advent of tourism

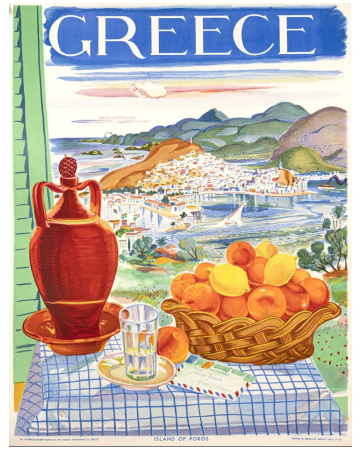
From the beginning of the 20th century, tourism-dependent growth has slowly become the norm, infiltrating all aspects of public perception of what constitutes "development". Not unlike how a fossil-fuel-dependant lifestyle infiltrated public perception and metastasized into what constitutes the "good life" through an immensely funded advertising campaign, a similar growth-through-tourism project was taking place in Greece. This is exemplified through the many posters designed by EOT that started circulating from the beginning of the 20th century. These posters were usually idyllic depictions of an island or coastal rurality, romanticising the rich heritage of antiquity or the beauty of the Greek landscape. Such imagery is now commonplace in advertisement - the Greek landscape has become a commodity.

This long process of commodification has deeply influenced the perception of progress. In the promise of fast and easy accumulation of wealth through tourism many other sectors were abandoned, like agriculture and crafts. This was only further intensified through the advent of Airbnb and other booking services, allowing people that had abandoned rural life, but still had property, to turn to the hospitality sector as a means of income. While this brought many people back to specific rural areas, like the Aegean and Ionian islands, the majority of the Greek mainland did not see a noticeable difference as these areas are deemed non-touristic and thus unpopular. Hence, other than political corruption (but not unrelated to), the perception of growth within the Greek context is recognised as the main barrier towards any deep transition.

language as understanding

This can be also seen in the language used when referring to rural areas. Many "development plans" (αναπτυξιακά σχέδια) for non-urban areas are mostly concerned with economic growth through tourism. The terms used when referring to future goals are the *speculation of the natural landscape* (εκμετάλλευση του φυσικού τοπίου), or the *showcasing of our destinations* (ανάδειξη των προορισμών). Over time *place* has been reduced to *destination*.

The many issues examined throughout this chapter illustrate how tourism as the main driver has failed to offer a meaningful solution for most rural areas. Additionally, even the touristic and popular ones are experiencing overpopulation, lack of services outside the tourist season and an alienation of non-wealthy or land-owning people from the sector. Of course, the whole system is subject to change due to the imminent pressures of global warming, which would make many of the Mediterranean regions unfavourable to tourism. Within this context a counter narrative is needed - one that can present new opportunities of living in the rural.



Vintage EOT posters from https://www.athensvoice.gr/politismos/eikastika/758910/oi-aythentikes-afises-toy-eot-kai-i-diahroniki-goiteia-toys/ and https://www.athensvoice.gr/politismos/design-arhitektoniki/43900/live-your-myth-i-ellada-mesa-apo-tis-afises-toy/

problem statement

For more than half a century, rural areas of Greece have been becoming increasingly more abandoned and neglected, in favour of living in urban centres. Many settlements that were once vibrant small-scale communities of a couple thousands people are now vacant, with as few as five permanent residents for many cases. Rural abandonment from both people and government has led to a myriad of issues: the ageing population in the rural areas experiences poor access to public services, infrastructure, resulting in lack of appropriate land management, biodiversity and heritage loss.

Simultaneously, the pressures of climate change have become painfully apparent, through recent devastating floods and wildfires. Weather phenomena like this are expected to become more frequent and intense in the future, however the response from high-level govern-

Photo from https://www.ekathimerini.com/news/233794/greek-population-may-shrink-by-1-4-mln-by-2035-report-says/

ment agents is either poor or absent. This has forced public discourse about rural issues into the forefront, presenting an important moment in time - an opportunity for change. The tardiness in governmental action - exemplified through the lack of transparency, implementation and evaluation in the top-down planning approaches - is failing to address the nuanced topic of rurality. Here, the perception of growth within the Greek context is recognised as the main barrier towards meaningful change. Tourism-dependent growth has slowly become the norm, infiltrating all aspects of public perception of what constitutes “development”, reducing place to destination. Within this context a counter narrative is needed - one that can present new opportunities of living in the rural beyond the confines of growth dependency.

Photo from https://www.tovima.gr/print/society/zontas-crsta-xoriacr-tis-megalis-cr-fygis/

With a concise understanding of the problem field, the methodological approach of the thesis will be defined in this chapter. Firstly, an initial hypothesis is formed regarding the extent of bioregionalism in providing spatiality and operationalisation qualities to the post-growth approach, which also informs the formation of the conceptual framework. This claim will be examined through three research and design sub-questions, each with their own methods, resources used and expected results. Finally, having the end-goal of the formation of a spatial imaginary, its key elements will be defined and explored.

2

specifying the approach

research aims

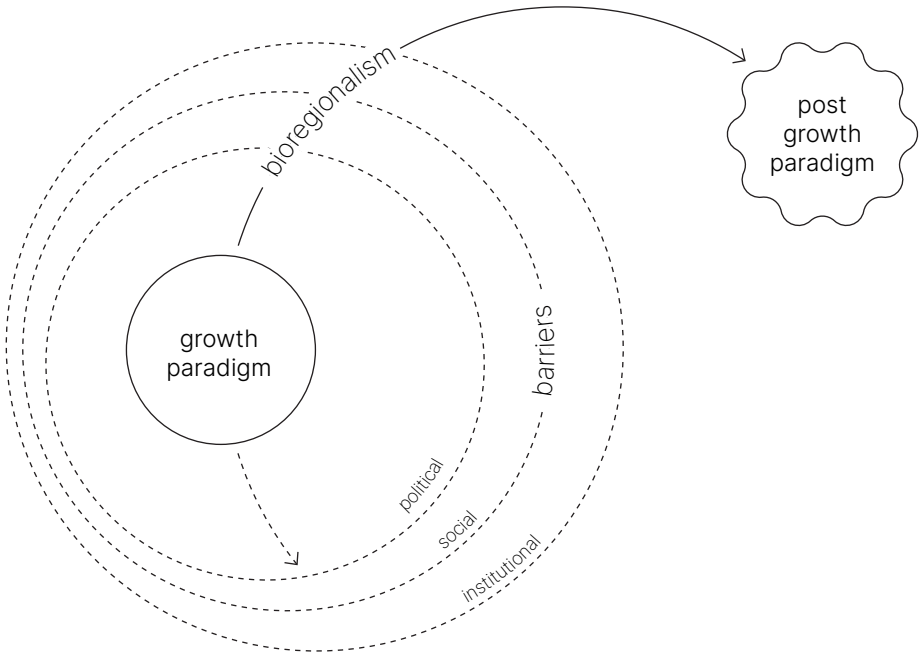
The problem field definition has thus far exemplified the implication of the prevailing growth-paradigm - we cannot continue business as usual. Through this project I aim to explore a counter narrative through the examination of a post-growth paradigm, but also to bring attention to the importance of rurality in the Greek context, against the perception of rural living as backwards and unattractive. The overall goal is to envision another rural, a different way of habitating beyond the constraints of growth-obsession in general, and tourism development specifically. In regards to spatial planning, the project aims to promote cooperation and resource-sharing in a translocal, regional scale, investigating the capacity of an ecocentric regional approach to inform current planning practises. An overall goal is also to engage disinterested citizens, marginalised and under-represented groups, especially women, queer people and the elderly.

forming a hypothesis

Urgent climate action is necessary to achieve the goals set for carbon neutrality and transition to green energy, but the prevailing paradigm of endless growth is failing to address such issues. In the case of Greece, the pursuit of “development” and “progress” has resulted in a neglected rural environment, the overexploitation of land through tourism and many ecological implications. In this context, post-growth theory and practices have been gaining increasingly more traction in academic fields, urging towards political, social and spatial changes that decouple economic measures from the perception of growth, shifting it instead to social and ecological welfare.

However, the post-growth paradigm has inherent difficulties in becoming operationalisσed, like the lack of societal acceptance of the movement, the reliance on small-scale networks and personal engagement. In order for the post-growth paradigm to be able to compete with the prevailing growth-fixation paradigm, which has a global reach, it needs to be up-scaled and operationalisσed - thus a different approach is required. To aid in this, bioregionalism has elements that are both compatible with the post-growth vision, and also has the capacity to assist in the scaling-up towards territorial and trans-territorial levels.

Bioregionalism is closely related to the post-growth paradigm and vision, as it is often cited within post-growth theory. However, its ability to result in spatial interventions that would assist in the operationalisation of the post-growth approach has not yet been explored - especially within a context of political uncertainty. In the present paper it will be argued that it is crucial towards the advancement of the post-growth movement.



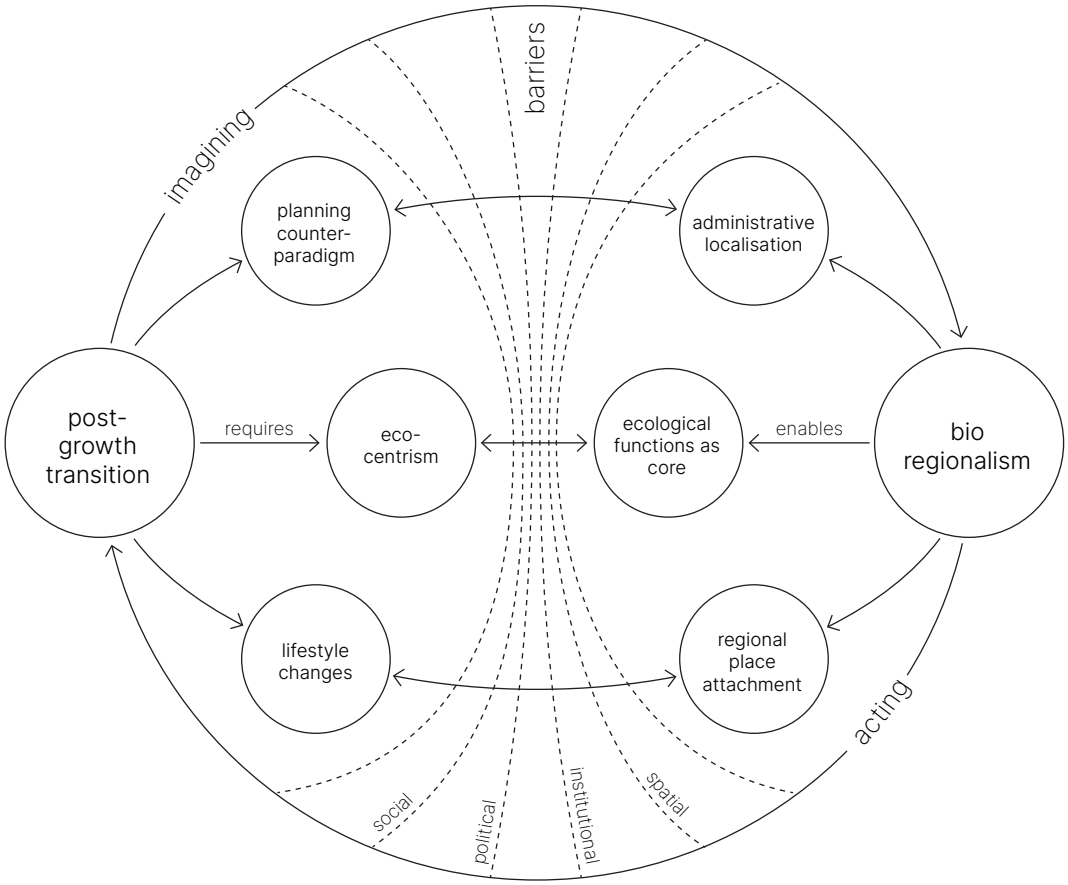
The capacity of bioregionalism to assist the post-growth transition, by bypassing specific barriers.
Diagram by the author.

conceptual framework

The hypothetical claim informs the conceptual framework that will be used in this paper. The post-growth transition has specific requirements to be realised, but has shortcomings and meets certain social, political, institutional and spatial barriers. It will be argued that bioregionalism can assist the post-growth vision to bypass these barriers.

Transitioning to a post-growth way of living requires changes to our lifestyles - to limit consumption, to limit far-away travel, to engage and care more deeply about local politics. Bioregionalism has the capacity to enhance place attachment for the region, which could enable a sense of belonging and caring that would assist in committing to these changes. In order to make the post-growth transition actionable there need to be radical changes to spatial planning - a new planning paradigm, as analysed by Savini in the theoretical framework. In turn, bioregionalism reconsiders administrative boundaries and imbues decision-making power to the relevant territory, providing democratic legitimacy towards the formation of the new paradigm. Finally, all post-growth aspects require a deep ecocentric thinking from both citizens, politicians and policy-makers. In this regard, bioregionalism is compatible and able to offer such ecocentrism through the positioning of ecological nodes and functions to the core of decision-making.

In and beyond the context of this paper, the power of a spatial imaginary should not be understated. For all of these changes to happen there needs to be a constant process of imagining alternative ways of living, of going beyond normative or pessimistic view towards the future, combined with a tracing-back towards reality and making these visions actionable.



Conceptual framework.
Diagram by the author.

research questions

This paper will explore the operationalisation of the post-growth paradigm, structured through the following research questions. The methods deployed and intended results of each are further detailed in the third chapter.

main research question

To what extent can a bioregional approach to territorial planning result in spatial interventions that are compatible with a post-growth transition?

sub-question 1

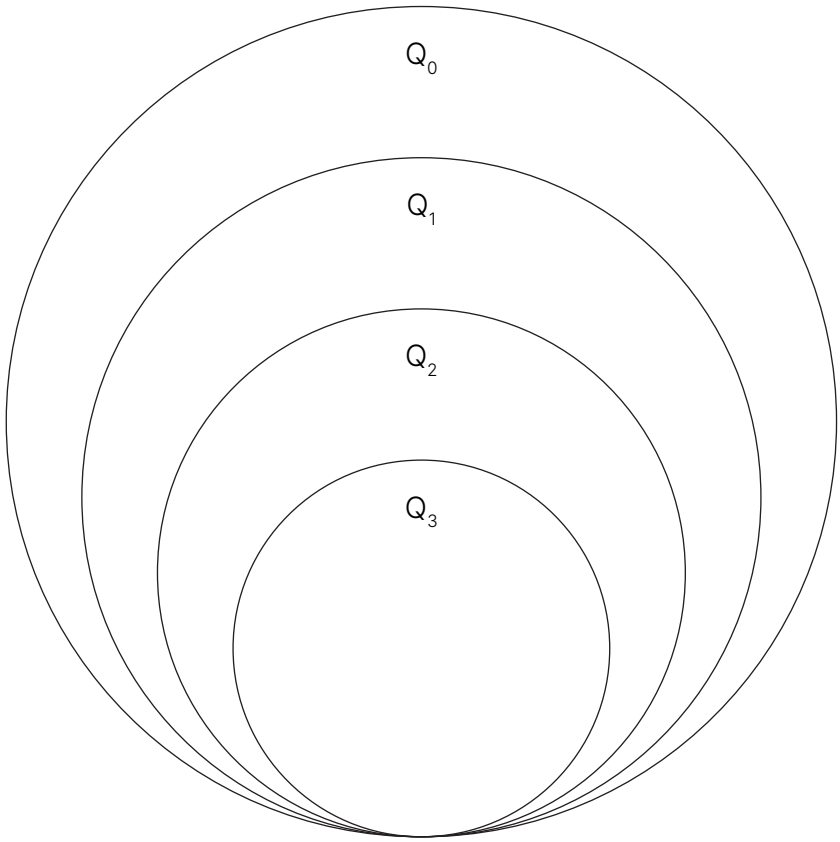
What are the barriers of the post-growth approach and to what extent could bioregionalism address them?

sub-question 2

What does a post-growth imaginary in the context of the selected key-region consist of?

sub-question 3

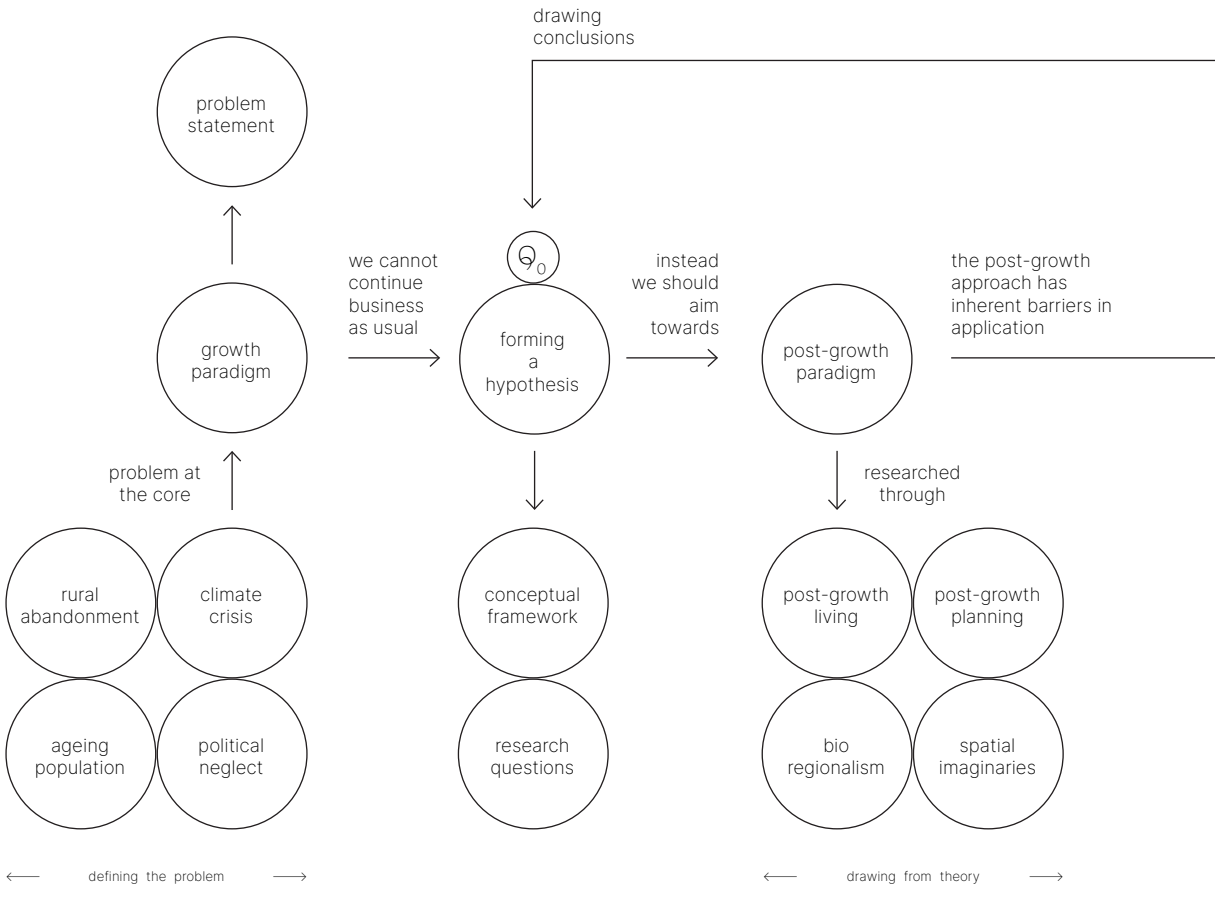
What are the necessary spatial interventions that outline a post-growth imaginary?



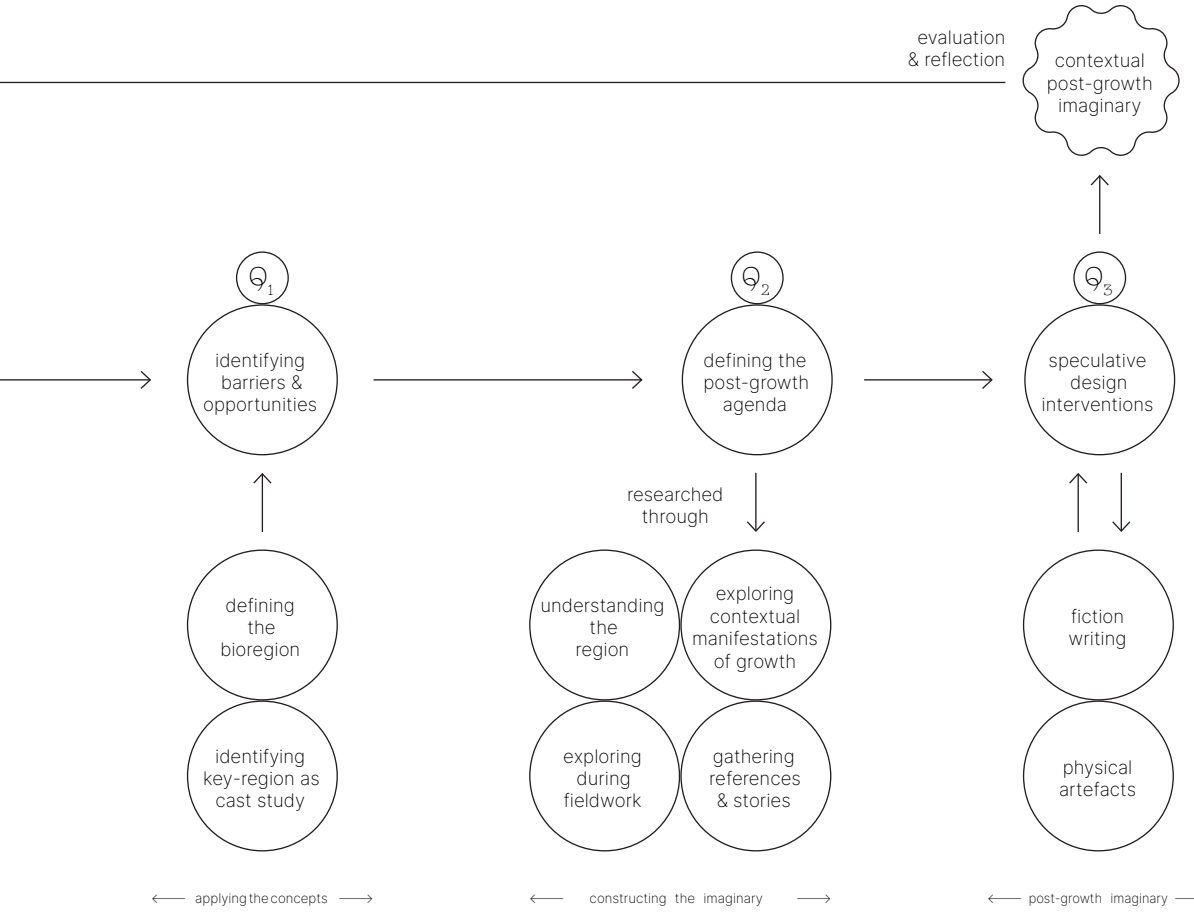
Sequential research questions.
Diagram by the author.

methodological framework

To examine the hypothetical claims and to work towards the formation of a post-growth imaginary, the methodological framework is defined. The first chapter is an investigation of the problem field and has illustrated a multidimensional crisis profile and exemplified the growth paradigm at the core, leading to the formation of an initial problem statement about the current issues of rurality in Greece. The methodological approach is of the thesis is detailed, with the notion that "we cannot continue business as usual" and considering the problematic context. Forming a hypothesis, the post-growth approach is presented as the alternative goal, in which I propose bioregionalism as a compatible operationalisation means. This informs my conceptual framework and my subsequent research questions. Each research question is connected to specific methods deployed, processes followed and expected results. The third chapter defines



the theoretical framework of this approach, through the examination of key concepts and theories, resulting in an understanding of the post-growth principles. The fourth chapter explores the first research question, namely the formation of the bioregions and the initial testing of the bioregional approach through identification of relevant barriers and opportunities. This is followed by an exploration of the specific key-region and its contextual issues and manifestations of growth. With this understanding, an bioregional post-growth agenda is formed. Through a process of fiction writing, speculating and constructing physical artefacts and exploring speculative design interventions, the post-growth imaginary is formed. In the end, the findings and whole process will be evaluated, resulting in the formation of conclusions, responding to the initial research question and hypothesis.



Methodological framework.
Diagram by the author.

detailing the process

main research question

To what extent can a bioregional approach to territorial planning result in spatial interventions that are compatible with a post-growth transition?

detailed method description

Responding to the hypothetical claim, the extent of the bioregional approach in resulting to an operational post-growth vision will be tested in Greece. This main research question will be approached through three sub-questions, by experimenting with ways of defining the bioregion, by investigating general & site-specific barriers and testing the compatibility of the bioregional opportunities through a specified key-region, by envisioning a contextual imaginary and by experimenting on spatial intervention which help achieve it. In the end, the process and results will be evaluated to clarify the initial claim.

questions

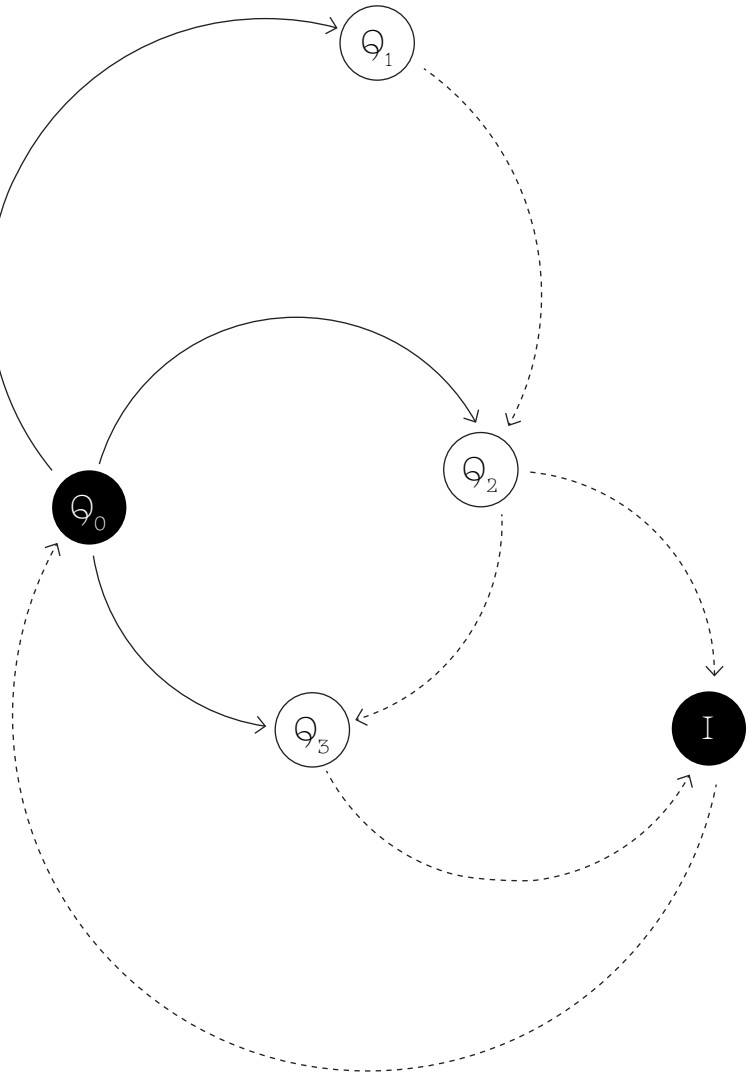
Q_0 To what extent can a bioregional approach to territorial planning result in spatial interventions that are compatible with a post-growth transition?

Q_1 What are the barriers of the post-growth approach and to what extent could bioregionalism address them?

Q_2 What does a post-growth imaginary in the context of the selected key-region consist of?

Q_3 What are the necessary spatial interventions that outline a post-growth imaginary?

I Imaginary



Relational process of research questions and main expected results.
Diagram by the author.

Q_1

research subquestion 1

What are the barriers of the post-growth approach and to what extent could bioregionalism address them?

methods employed

1 Examination of post-growth literature
2 Examination of relevant local media about key-region.
3 Spatial analysis through mapping.
4 Discussing with locals and municipality representatives.

intended outcomes

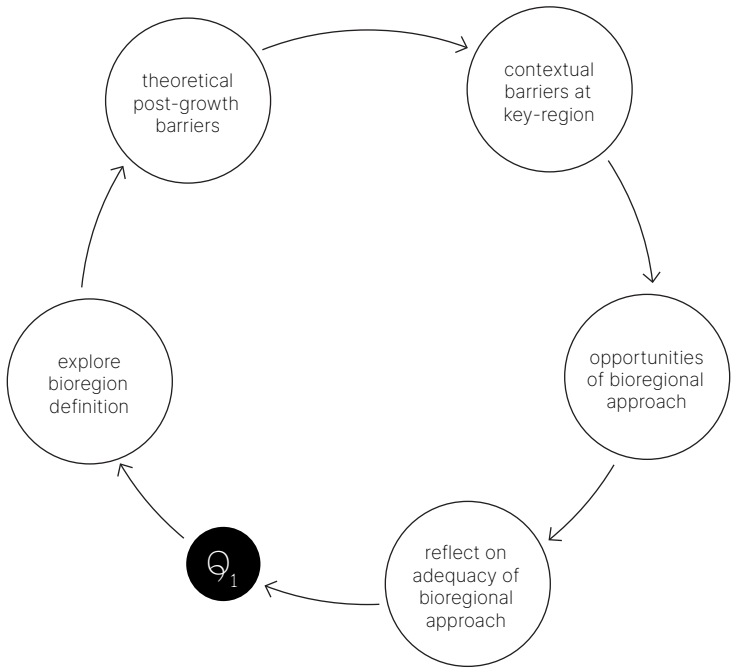
1 Table of post-growth barriers and corresponding opportunities of bioregionalism.
2 Selection of key-region as case study for the imaginary
3 Initial understanding of the adequacy of bioregionalism to address a post-growth transition, and of potential spatial conflicts.

detailed method description

After the examination of relevant post-growth theory, an initial examination is required, in understanding the potential of bioregionalism to assist the post-growth approach in becoming operationalised. A set of barriers will be identified through examination of post-growth literature and media relevant to the context. Discussing with locals during fieldwork is also a valuable source of information. For each barrier the opportunity of bioregionalism will be examined, resulting in a concise table of interrelated barrier and opportunity.

process

1 Gather and examine post-growth literature, bioregionalism and their related concepts.
2 Explore means of defining a bioregion through literature and decide on the thesis' approach.
3 Select location to be examined as a bioregional case study.
4 Explore general and context-specific barriers of the post-growth approach.
5 Examine opportunities of bioregionalism in each specific barrier.
6 Organise findings in a table format.
7 Reflect on the initial adequacy of bioregionalism.



Relational process of first research sub-question.
Diagram by the author.

Q_2

research subquestion 2

What does a post-growth imaginary in the context of the selected key-region consist of?

methods employed

1 Examination of site-specific academic literature
2 On-site exploration and discussing with locals.
3 Examination of pre-growth history
4 Analysis and mapping.

intended outcomes

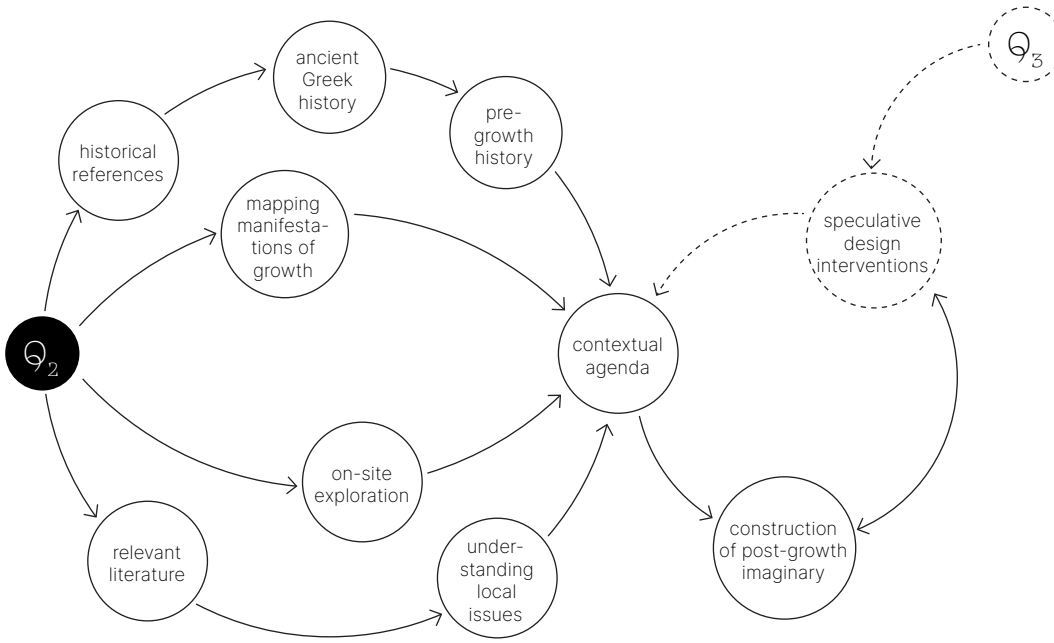
1 Forming a visual essay that explores the context of the selected region.
2 Defining the post-growth agenda.

detailed method description

In order to prepare the background needed for a narrative, a mixture of methods is employed. On site-exploration and discussions with locals is crucial in understanding the region. This is aided by relevant report findings about contextual issues. After having located these, a process of analysis and mapping illustrates site-specific manifestations of the growth paradigm in the landscape itself. With this knowledge, the bioregional post-growth agenda is defined, through the dimensions of institutional, ecological, economic, infrastructural and social changes required.

process

1 Conduct fieldwork, exploring the region and talking with locals.
2 Brief examination pre-growth history.
3 Locate reports about water basin management on selected key-region.
4 Summarise key contextual issues and their perceived causes in table format.
5 Analysis and mapping of these issues
6 Reflect on required items of the bioregional post-growth agenda and smmarise items in a table format.
7 Reflection on spatial imaginary.



Relational process of second research sub-question.
Diagram by the author.

Q_3

research subquestion 3

What are the necessary spatial interventions that outline a post-growth imaginary?

methods employed

1. Speculative design exercises.
2. Fiction writing.
3. On-site exploration.
4. Constructing physical artefacts.

intended outcomes

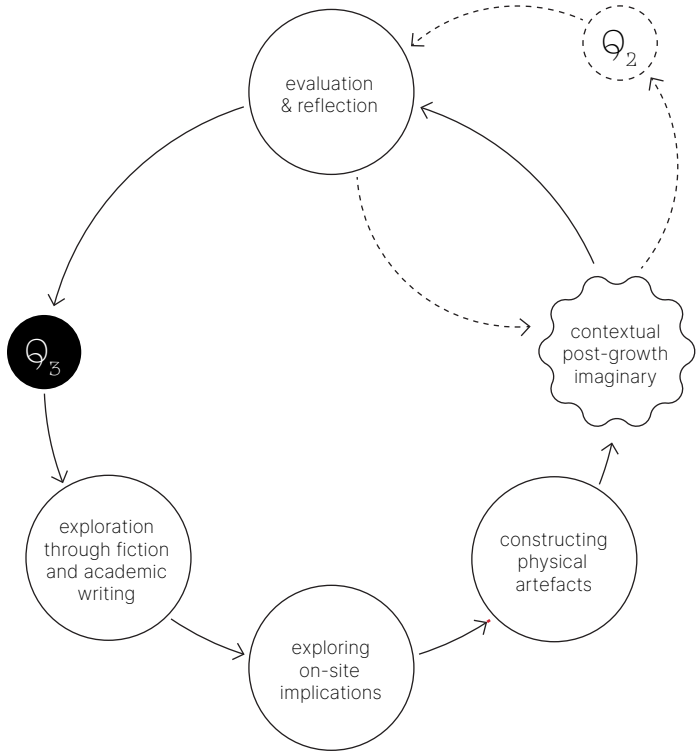
1. Post-growth vision in the form of fictional novelette.
2. Academic text that accompanies the fiction narrative.
3. Trans-scalar understanding of post-growth bioregion functions.
4. Collection of speculative design interventions.
5. Collection of physical artefacts.

detailed method description

This research question works in parallel to the previous one. After having an adequate understanding and defined the bioregional post-growth agenda in a theoretical level, an application will be explored. This is done through an interchanging process of fiction writing, speculative design, on-site exploration, collection of stories and myths, and finally of constructing physical artefacts. Through this mix-technique method, a post-growth narrative will be constructed, that examines that physical manifestations of the post-growth agenda within the bioregion of Greece.

process

1. Defining the structure and content of the narrative in chapters.
2. Conduct fieldwork, exploring the region and gathering material for visualisations.
3. Spatialisation of described events through speculative design.
4. Explain relations or lessons learned in relation to the text and the post-growth agenda.
5. Construction of physical artefacts and integration into the narrative.
6. Evaluation of defined spatial interventions.



Relational process of third research sub-question.
Diagram by the author.

elements of the imaginary

This subchapter is intended to further define the deliverable of my thesis project - the formation of a post-growth imaginary, or to envision an alternative way of rural living, another rural.

format

Firstly, conventional planning media like structure maps and policy guidelines are not recognised as sufficient in this regard. As was briefly mentioned in the problem field definition, planning processes in Greece are notoriously un-spatialised and vague, making the level of familiarity with such media rather low. In this context, even if a formal proposal was drafted and communicated to the planning officials of the suggested key-region, the long bureaucratic procedures would halt any significant change. I believe that in such a context a different approach is needed, in order to gain public acceptance - one that has the capacity to inspire and engage people. To approach this, story-telling is chosen as the main method. The chosen format for the imaginary is an illustrated narrative, combining fiction and academic writing, and visualisations of the speculative design interventions through sketches, diagrams and maps.

setting

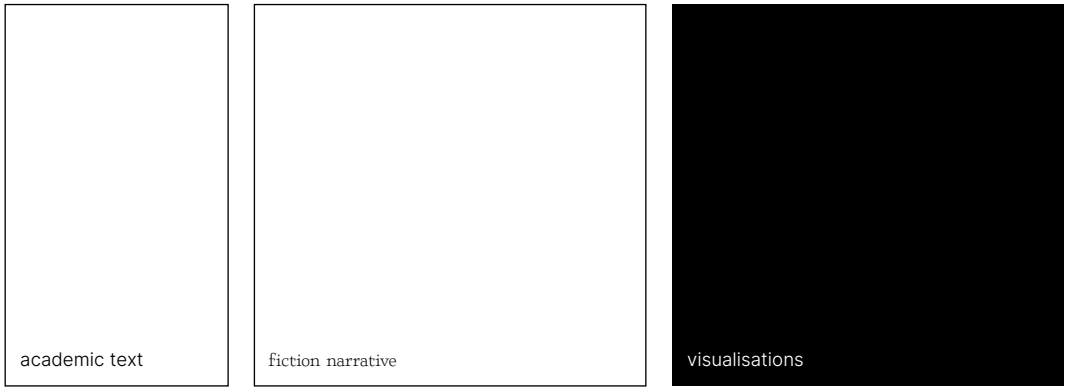
A far-in-the-future imaginary that does not relate to the present could easily be disregarded as mere fantasy or science fiction, while a short-term vision could not convey the ambition agenda of the post-growth approach. In an attempt to temporarily disengage from the complex and problematic context, but not disconnect from current perception of Greek people, the narrative's timeline is set on the not-so-distant future, loosely 50 or so years from now. The narrative goal is to produce a story that is simultaneously tangible and just-out-of-reach.

perspective

There were discussions whether it would be beneficial to explain the story through the perspective of the river, as would be perhaps best suited for the river bioregion. In the end, it is recognised that it is humans that will have to act and change their perception and lifestyle, rather than other non-human actors. Thus, the imaginary should have an anthropocentric approach. Here, the narrative is envisioned through the perspective of a rural dweller in such a post-growth society, who moves throughout the bioregion within one single day. It will be narrated through a combination of visuals and speculative mapping of the spatial aspects.

themes

The examination of the post-growth literature provides an overwhelming amount of interrelated topics. Instead of defining a hierarchy, the narrative approach allows for a meandering between a wide array of themes. However, this is organised through the exploration of four main themes. Firstly, this future society would have already established a ecocentric approach in all aspects of decision making, thus providing the freedom to envision different manifestations of environmentally regenerative practices beyond the constraining nature of our current politics. Secondly, all described phenomena would be borne out of climate necessity, highlighting how the changing climate conditions would alter our lifestyle. Thirdly, the balance of old and new will be explored; in highlighting the importance of rural knowledge that is being lost now, as well as their synergies with adaptation technologies. Finally, it is important to highlight the pleasures of such a post-growth rural lifestyle, despite the difficulties present.



Above: Layout structure of the imaginary. Left: Used methods for forming the imaginary.
Right: Elements or themes of the post-growth imaginary. Diagrams by the author.

This chapter functions as the theoretical framework of my thesis. Drawing mainly from the writings of Soper (2020) and Savini (2021), the post-growth approach will be defined and explored through the lenses of lifestyle and spatial planning. Bioregionalism is closely related to this approach, as it is also often cited within post-growth scholars, while the linking concept of place attachment will be defined. Finally, setting the theoretical basis for the design aspects of my thesis, the importance of imaginaries in spatial planning will be detailed. In all steps, the relevance to the Greek context will be investigated and exemplified.

3

drawing from theory

beyond growth

More than 40 years ago, the report "Limits to Growth" explored the impossibility of perpetual population and economic growth, and urged immediate research on our economic model, but was constrained mostly within academic circles. More recently, Kate Raworth's idea for a "Doughnut Economics" (2017) has managed to gain popularity in public perception. There she illustrated in a smart way the need to find a balance in between overshooting above the ecological ceiling represented by the planetary boundaries, and a shortfall below the social foundation, leading to social collapse. Both approaches are related to a necessary halting of growth, a conscious transitioning towards a post-growth society.

post-growth definition

The post-growth approach is "understood as a voluntary, democratically negotiated, equitable downscaling of societies' physical throughput until it reaches a sustainable steady-state" (Büchs and Koch, 2019, p. 155). It is a critique towards capitalism's obsession with endless growth beyond planetary or social capacity, and thus aims to decouple economic growth from the perception of human advancement. In essence, it is a "project of transitioning systematically toward a new society" (Savini, 2021, p. 1077). According to Strunz and Schindler (2018, p. 70), the economy of such a post-growth society has three features or conditions:

conditions

1 that material throughput is in line with ecological limits, meaning the limit of industrial production for the sake of capital accumulation

2 that GDP will no longer inform major policy decisions, shifting it rather to other measures and indices which focus on human and ecological welfare

3 that resource and energy productivity gains are translated into decreasing the material throughput, labour productivity gains into more leisure until the first condition is satisfied.

way of living

public acceptance

Manifestations of the post-growth approach hitherto have limited reach and public acceptance - and for clear reasons. Firstly, the term itself sparks questioning, as it invokes an end to growth that for most people is still an intrinsic factor of societal progress. “Degrowth” is often used to refer to the same approach, however in this paper such a term is deemed unproductive towards gaining the necessary societal and political acceptance, because it emphasises an overall downsizing rather than an economical reorganisation. While still questionable, the term post-growth will be used here as it has a more positive connotation, through the use of the post- prefix which can indicate an “aim of going beyond the current paradigm” (Strunz and Schindler, 2018, p. 70). Beyond linguistics and the “marketing” of post-growth, the understanding that the pursuit of endless growth cannot be supported within a finite planet is still hard to grasp. Most people would perceive a voluntary denial of growth to be coupled with an undesirable, frugal and pleasureless lifestyle. A way of living that does not depend on economic growth, continuous production and fast-paced consumption is almost inconceivable.

post-growth living

In the book “Post-growth Living: For an Alternative Hedonism” Kate Soper (2020) stresses that the benefits of such a post-growth vision need to be emphasised, instead of the negative connotations that arise from the perceived absence of growth. Here she supports that purely calling for change from the few large-scale corporations that are responsible for the majority of emissions is not productive, unless it is coupled with a re-examination of our own consuming habits. She argues that while “climate scientists and campaigners may put forward ambitious and innovative plans for rewilding, tree-planting, reductions in energy consumption, car-free cities, transition to a largely vegan diet...these contributions will remain theoretical in the absence of the powers and pressures required to translate them into effective practice - which means attention must also be paid to the possible agents and processes of transformation.” (p. 162) Thus, Soper calls for a more radical re-examination of what constitutes the “good life” - or how we perceive the elements of a desirable lifestyle, calling for an “alternative politics of prosperity”. She refers to a politics that challenge the idea that “consumer culture delivers the good life even to those with the means to buy its goods, that undermines attempts to maintain the hegemony of work over our lives and value system, and that highlights the pleasures for everyone of a less speed-driven, time-scarce, acquisitive way of living” (p. 33).

on work

Redefinition of work is a key-element in the post-growth vision. While many authors remain divided on whether a reduction of work is actually possible in a sustainable future, post-growth supporters criticise "the ideology of competition that pervades society, forcing companies, states, and humans into an unending pursuit of increased productivity and the exploitation of material resources, land, and labour" (Savini, 2021, p. 1077). At the same time, it is generally accepted that a contrasting economy is expected to need less labour on highly skilled sectors and a larger labour input in the agricultural and manufacturing sectors (Crownshaw et al., 2019, p. 130). The post-growth approach to working as part of our lifestyle, as followed by Soper, is simple: consuming less, thus producing less, thus working less. She argues that being dominated by the continuous demands of work means having "less time to envisage, let alone act on, alternative ways of living, or to acquire insight upon or formulate political resistance to the existing system" (Soper, 2020, p. 83). In this way, the overall aim is to "replace a work-centred understanding of prosperity and individual worth with one centred on engagement in intrinsically valuable activities that have no economic purpose, measure or outcome." (Soper, 2020, p. 87) Thus, reduction of work is as much an aim towards a post-growth society, as it is an outcome of the economic reconfiguration.

As an aim, it is also one of the main positive traits of the post-growth approach, as a lot of people can relate to a need for working less and having more free time. Specifically, Soper mentions the dissatisfaction of many people working today in "bullshit jobs" - a term borrowed from the anthropologist David Graeber in his 2018 homonymous book. This refers to usually mind-numbing, often pointless and incredibly boring corporate jobs, in which a big part of people are working on today, mostly in finance, business administration, marketing, insurance. Antithetically, in a post-growth world people would be able to explore different modes of work, outside of the endless pursuit of capital gain. For example, instead of alienating labour, "in a slower paced society, in which people had more time to provide for themselves, artisan production could expand and many more could benefit from the skills, the mental concentration and the satisfaction it can provide" (Soper, 2020, p. 101) In this way, the post-growth future could be a "synthesis of the pre- and postmodern", combining both artisanal work and advanced technology (Soper, 2020, p. 106), while also shifting towards "more informal and less monetized alongside changing values relating to work and social support" (Crownshaw et al., 2019, p. 128).

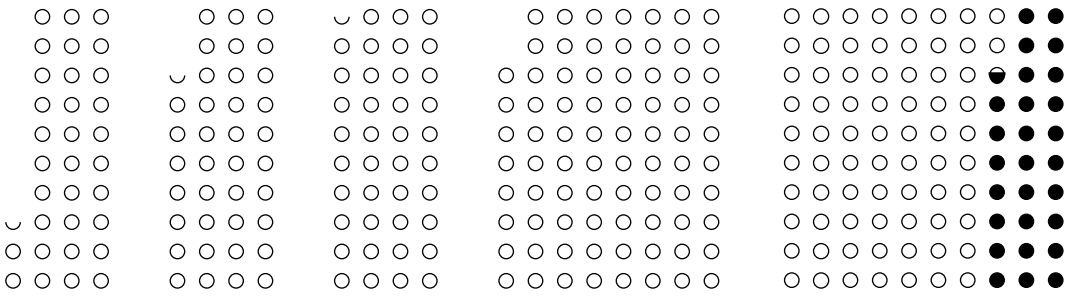
relevance to Greece

Such a vision is especially relevant for Greece. While more affluent countries within the European Union, like the Netherlands, have managed to reduce the working hours to less than the EU average of 36.4 hours per week, countries of the European East have struggled to keep up. As reported for 2022, while the average number of weekly working hours in a main job was as low as 32,4 hours in the Netherlands, Greece, Romania and Poland have an average of 39,7 (Yanatma, Euronews, 2023). Taking into consideration Greece's history of unreported employment, either for tax evasion purposes or of working pensioners struggling to make ends meet, these figures would be much higher.

To make matters worse, in September of 2023 the Greek parliament approved a new labour law, which under the guise of working flexibility, allows full-time workers to have another part-time job, legalising a total of 13 working hours per day. As labour inspections are “practically non-existent” and under the previously examined topic of political corruption, this could mean having a 6-day working week or a total of 78 hours of work per week. Other than this, the legislation also introduces large fines towards “those who prevent workers from going to work”, mostly aimed towards strikers and unions (Kokkinidis, 2023). The effects of this legislation have not yet been documented in practice, but caused an uproar upon approval sparking many protests and public discourse.

unemployment

At the same time, many people in Greece struggle to find a job in the first place. As of 2023, Greece shows the second to highest unemployment rate in Europe at 10,9 percent, whereas the EU 27 average is much lower at 5,9 percent. The data is much worse regarding youth unemployment with a figure as high as 27,7 percent, again being the second highest rate in Europe, only second to Spain’s 27,9 percent. The EU average is 13,9 percent (Eurostat, 2023). From the beginning of the financial crisis around 500 thousand people are estimated to have migrated elsewhere to seek better working opportunities - as reported by ReBrain, a new program that offers a state-subsidised high salary to returnees (Stamouli, POLITICO, 2020). Overall, such a problematic context has disillusioned many people from the promises of urban living, and thus could be contributory to a repopulation of rural areas if coupled with an overall redefinition of work, as well as the promotion of a pleasurable rural imaginary.



Weekly working hours & allowed working hours from new legislation. Data from Yanatma, Euronews, 2023. Unemployment data from Eurostat, 2023. Diagram by the author.

on travel

Aiming to limit rising average temperatures below 1,5 degrees, the post-growth approach also calls for a redefinition of travel. The self-sufficiency associated with a post-growth society is extended beyond services and food, but also to pleasure. This would require a more local way of living and having access to a fulfilling and pleasurable lifestyle within one's region. In such a future, far-away travel via aeroplanes would be limited and discouraged, rather opting towards more green ways of moving like trains and bikes. A slower society would offer more free time and less stress, thus also being physically slower. Related to air travel, Soper mentions that overall "we have come to associate speed with efficiency, and it remains as the core of our understanding of progress." (Soper, 2020, p. 110) Currently, through fast travel nature is "something primarily seen - this marginalises sounds and cuts out the contribution of smell and touch altogether" (Soper, 2020, p. 116).

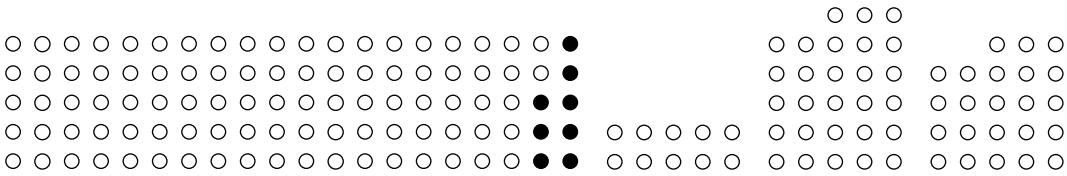
post-growth & tourism

Naturally, the existing model of mass tourism would be under scrutiny within a post-growth future. While tourism is often believed to be a low-impact sector and a viable development option, a research conducted in 2018 showed that, for the period between 2009 to 2013, tourism contributed 8 percent of global emissions. (Lenzen et al., 2018, p. 522) Taking into consideration the immense growth of the industry since then, this figure could be much higher today. The researchers conclude that "such a pursuit of economic growth comes with a significant carbon burden, as tourism is significantly more carbon-intensive than other potential areas of economic development" (Lenzen et al., 2018, p. 526). For Greece, in 2023, a total of 27,8 million tourists arrived in the country, even showing an immense 17,3 percent increase compared to 2022. Specifically related to air travel, more than 23 million air arrivals were recorded (Chrysopoulos, 2023). These figures are more than double the population of Greece itself.

Thus, the redefinition of growth-through-tourism should be on the agenda, by consciously limiting the scale of this sector. This is not an alarmist approach but rather a proactive one, as Mediterranean regions will be affected much faster from climate change than other European regions. As examined before, the post-growth approach has an integral goal of decoupling purely economic measures from decision making. However, if proven productive as a means to convince people to change their customs, the long-term economic unviability of the tourism model in the case of Greece could be used as an argument, as so many environmental factors stand against it.

on actions

The majority of actions and guidelines advocated by post-growth supporters are usually limited to the urban context: they call for more access to parks, the walkability and greening of car-free streets, collaborative hubs for mending, and more recycling. Access to nature is highly important, especially for children and future generations, as "the loss of access to enjoyment of nature is one that you might not be aware of, the heart does not grieve over that which it has not experienced. However, it's a spiritual loss for children who ought to be able to play freely in green spaces" (Soper, 2023) However, in general, the role of rurality remains mostly undefined.



The tourism sector contributes 8% to global emissions.

GR population
10,3 million

Tourists
27,8 million

Air arrivals
23 million

Tourism and global emissions diagram, data from (Lenzen et al., 2018, p. 522)
Greek population, tourists and air arrivals in2023. Data from (Chrysopoulos, 2023)

changes to planning

Regarding the realm of Urbanism and Spatial Planning, Federico Savini (2021) explores such a "degrowth paradigm" of spatial planning. For Savini, existing post-growth approaches of a "de-commodified eco-living, symbiotic urbanisation and political autonomy within regional territories" provide an adequate basis for further research and action, however, they still miss a "a critique of the institutions, regulations and governing approaches that anchor city-regional development to perpetual economic growth" (Savini, 2021, p. 1080) To aid in this regard, he recognises three main mechanisms that bind urban development to economic growth, and proposes a counter-paradigm for each.

from functional polycentrism to polycentric autonomism

Firstly, *functional polycentrism* is the prevailing practice of viewing regions through a set of specialised zones with different functions, in a constant state of competition. They "compete to attract highly skilled human capital, jobs, and green spaces (...) strive to displace or prevent less beneficial or negative functions, such as waste facilities, landfills, heavy industry, and large social-housing estates" (p. 1081). However, such a pressure "traps them in permanent dependence on the overall region's economic performance and resource imports" (p. 1081).

As a counter-paradigm, *polycentric autonomism* is proposed. Autonomy is understood as a "community's capacity to independently provide biophysical, material, and social resources for its survival and prosperity" (p. 1085). Differing from purely isolationism, it refers to "a coordinated network of commoning practices, (...) a democratic confederation of local associations that prevent enclosure and ensure autonomy" (p. 1086) In this way, the role of spatial planning would be to rebalance "existing hierarchies in urban systems, putting the self-sufficient survival of localities at the forefront", with the economic growth of the region no longer being the driver, but the coordination between the different localities and the preservation of their autonomy. (p. 1087) This is closely related to the concept of bioregionalism, which will also be examined in this theoretical framework.

from scarcity to finity

Secondly, tracing the nature of the competition itself, Savini attributes the intrinsic nature of economic activity in our planning system to real estate. This is attempted through "the maximization of land values, the process of value capturing, and the regulation of land *scarcity*", only further strengthened through equating the market return of a development to the obtained public gain. (p. 1082) For example, the construction of pavements, water services or quality public spaces are done to "stimulate development", with the municipalities expecting a return through taxation of the higher land-value businesses and residents. However, such a system must be permanently managed or restored and is highly unstable.

To counteract this, the concept of *finity* is proposed - or a paradigm that is "oriented to "decelerate the forces of land development inscribed in value capturing mechanisms" (p. 1087). This encompasses mostly regulations and policies that aim to set "absolute limits", for example setting "maximum development volumes in an area, maximum housing rents, a maximum number of transactions for single real estate properties in a given period, a maximum number of second homes, or a maximum amount of floor space that can be owned" (p. 1087). In order to avoid creating a stricter environment and further scarcity, such measures need to be coupled with a more equitable distribution of resources.

from euclidean zoning to habitability

Thirdly, the mechanism of land zoning provides the conditions for scarcity and competition to be spatialized. This is done through dividing land to units with a specific use and ownership - in other words

dimension of focus	growth paradigm	post-growth paradigm
territorial organization	functional polycentrism	polycentric autonomism
development paradigm	scarcity	finity
approach to land use organization	euclidean zoning	habitability

Spatial planning mechanisms from the growth paradigm to the post-growth paradigm.
Table from Savini (2023, p. 1085)

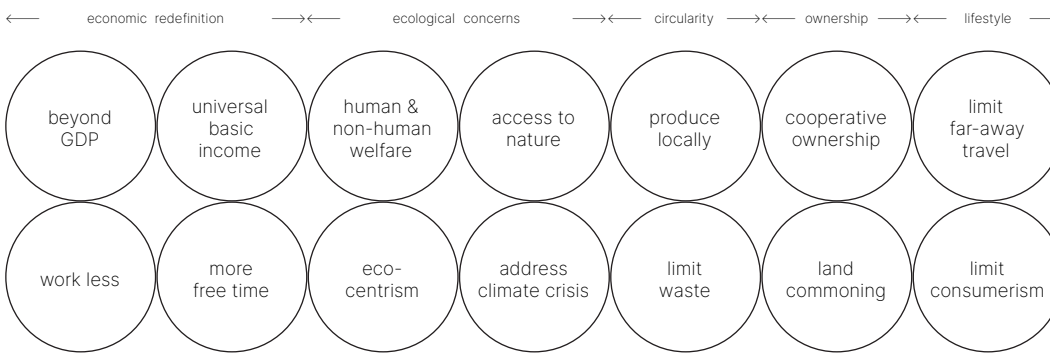
parcellation. While it has been recognised through many instances that such a system places an immense constraint to a community's ability to regulate and self-organise, it has become almost a matter of fact. So much that even "the World Bank is advocating it worldwide as a prerequisite for development, even in countries whose land markets work pretty well already on a trans-legal basis without formal zoning" (p. 1084) Here the ambition is to "reimagine normative conceptions of 'good land use', beyond property values" (p. 1085).

Another approach to land use organisation is needed - one that is able to enable a multiplicity of uses and an exploration to different forms of property allocation. Here, Savini proposes the concept of *habitability* - or "the right to a habitat" (p. 1089). Rather than focusing on land rights as a relationship between individuals, it is a shift to the relationship between humans and their environments. Drawing from examples of indigenous land management, "the target of a zoning approach becomes to identify, maintain and restore the social and ecological qualities of this area, which result from the contextually specific way in which different uses interact with each other" (p. 1089). This is quite hard to grasp, as the paradigm of zoning for specific functions is intrinsically ingrained to contemporary planning. Regardless, in its essence, it is a call to more context-specificness in land-use organisation, where the "know-how and direct involvement of local communities becomes crucial" (p. 1090).

<u>relevance to Greece</u>

Attempting to relate this to the Greek context, a comparison with tourism is rather obvious. As was explored in the problem field, development through tourism is the main driver for the majority of rural areas, many times regardless if they are touristic on not. This has resulted in a continuous state of competition between them, in which every area is attempting to attract tourists through private investments and renovations, or public works like squares. Thus, oftentimes connecting infrastructure like roads in between said areas or energy lines have not been a priority. This is deemed unproductive and too susceptible to external, dynamic factors like climate change or fashion.

Also, a very problematic manifestation of such mechanisms that perpetuate scarcity through zoning and land rights is the advent of Golden Visa. Briefly, it is an immigration program geared towards wealthy individuals who are seeking a residence permit in the EU, and can in return invest a certain amount of money to acquire it. There have been intense pressures from the EU to discontinue such programs, as it is quite clearly an "undemocratic" process with immense "risks to security, permitting money laundering, tax evasion, terrorist financing, corruption and infiltration by organised crime that is incompatible with EU norms" (Rodriguez, 2023). Greece is among the most popular in acquiring Golden Visas, with as little as 250 thousand euros required as investment from 2013 till 2022 - with the figure being upped to 500 thousand in August of 2023. A total of 7,6 billion euros in foreign investments to real estate are reported for the 2014 to 2022 period, with the data showing a significant upward curve from 2018. (Gounari, 2023) While this of course is extremely successful when examined through economic measures like GDP, the benefits to social welfare are not so apparent. Taking into consideration the ongoing housing crisis in Athens, and in general the limited real estate stock in Greek cities, the effects that such a program could have in the rural areas should be investigated further. Creating an environment of land scarcity and competition, disallowing for potential emergence of co-ownership schemes. Thus, such programs are completely contradictory to the post-growth vision, and should be actively legislated against.



Principles of the post-growth paradigm.
Diagram by the author.

bioregionalism

A related key-concept that is often cited within post-growth literature is that of bioregionalism. Administrative boundaries are often quite arbitrary and do not correspond to a physical reality, but rather stem from demographic criteria. Thus, oftentimes they are not intrinsically geared towards addressing contextual ecological pressures, as natural processes and ecological services transcend man-made boundaries. Bioregionalism can be regarded as a response to this alienation of nature from planning. It was formulated during the 1970s, however the concept it represents is anything but new. "Bioregionalism acknowledges that we not only live in cities, towns, villages or 'the countryside'; we also live in watersheds, ecosystems, and eco-regions" (Wahl, 2018). Thus, it is an environmentalism that strives for the preservation and enhancement of ecosystem services being at the core of human affairs.

Bioregionalism is a deeply local practice. It "champions learning and extending the lore of local cultures, including their customs, myths, and rituals." (Evanoff, 2017, p. 60) The bioregional approach mandates that "power would flow not from the global to the local, but from the local to the global." (Evanoff, 2017, p. 60) In this regard, according to Savini (2021) "a bioregion is conceived as a confederation of municipal settlements whose subsistence depends on the same living ecosystem, but which have a degree of material and political autonomy" (p. 1086). While bioregionalism advocates for a degree of self-sustaining, it goes against hyper-localism by stressing the importance of "coordination processes across localities for co-managing essential common services" (Savini, 2023, p. 6). Thus it is closely related to the principle of subsidiarity, allowing for decision making to take place at the "smallest possible level while still permitting cooperative action at larger scales when necessary, particularly through confederal institutions" (Evanoff, 2017, p. 61-2).

While the concept of bioregionalism is often cited in post-growth literature, spatialisation and operationalisation are still lacking. It is often connected with adjacent movements which "promote permaculture and community agriculture, worker and consumer cooperatives, community finance and local currencies, ecovillages and transition towns, among others" (Evanoff, 2017, p. 62) Also, few writers believe that the bioregional approach has "less interest in protesting against the state, reforming laws and institutions, or taking control of the government than in acting directly to create practical alternatives to ecological devastation and social disintegration" (Evanoff, 2017, p. 60). However, I believe that it could be an influential concept in a more formal way than just informal small-scale practices. Especially for the Greek context, which has a notorious history with immense bureaucracy and incredibly slow decision-making processes, it could prove a very beneficial approach that localises decision-making and problem-solving, aiding in an overall decentralisation effort.

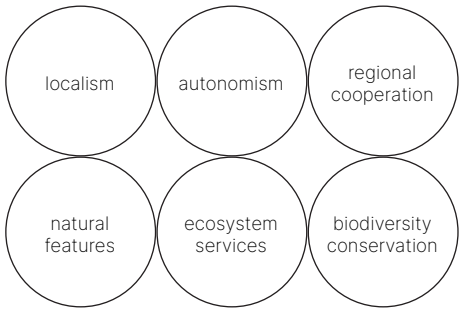
Critiques of bioregionalism

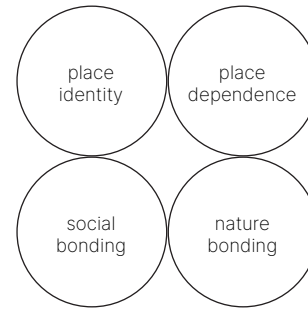
However, no movement comes without criticism. Such an emphasis on localism can easily be linked to "economic autarky, political isolationism, and cultural parochialism, with a corresponding inability to effectively address global environmental problems" (Evanoff, 2017, p. 61). Similar critiques view bioregionalism as an enabler of xenophobia, nativism and racism. While these critiques hold validity in their concern of upholding democratic procedures, they are misinterpreting the overall aim of the approach. For example - going back to the Greek context - a large part of political corruption and inability to respond to the climate crisis is borne and perpetuated from the administrative structure itself. Bioregionalism could be a solution to legitimising the local concerns and providing adequate infrastructure power to local agents to address them.

place attachment

Another important concept is place attachment. It is understood as a "positive affective bond between an individual and a specific place, the main characteristic of which is the tendency of the individual to maintain closeness to such a place." (Hidalgo and Hernández, 2001, p. 274) Simply put, it is an observation on the connection that many people feel with the place they inhabit, or the place they were born at. Thus, it is deeply personal and fluid, making it often hard to quantify. There is a connection to the spanish concept of querencia, which is the "propensity of human beings and other animals to seek out the place where they were born or and a place in which they feel comfortable and secure" (Hidalgo and Hernández, 2001, p. 274). Understanding this can be a powerful tool towards transitioning to a post-growth and bioregional way of living, as both aspects require a lot of personal involvement.

From a brief examination of adjacent literature, the study of place attachment has oftentimes been "reduced almost exclusively to studying neighbourhood attachment" (Hidalgo and Hernández, 2001, p. 274), despite having finding that show attachment to the region prevailing over attachment to one's house or one's community. (p. 275) In the current paper I argue that understanding what can drive place attachment at a regional level can prove very beneficial in bringing people together towards the common goal of protecting the bioregion.





Left : Principles of the bioregional approach. Diagram by the author.
Right : Elements of place attachment. Diagram by the author.

spatial imaginaries

The previous examination of the post-growth paradigm and its adjacent concepts has illustrated that it is a deeply ambitious project. Despite the out-of-the-norm approaches that it requires, it is not out-of-reach. It requires the formation of a counter narrative, one with imagery capable of exposing the problematic nature of the growth paradigm and introducing an alternative imaginary - in the present case, *another rural*.

Simin Davoudi (2018) writes on the importance of such spatial imaginaries, as they are "that which produces a community, holds it together by giving it temporary coherence and identity, and subjects it to change" (Davoudi, 2018, p. 100). They are "deeply held, collective understandings of socio-spatial relations that are performed by, give sense to, make possible and change collective socio-spatial practices. They are produced through political struggles over the conceptions, perceptions and lived experiences of place. They are circulated and propagated through images, stories, texts, data, algorithms and performances. They are infused by relations of power in which contestation and resistance are ever-present." (p. 101) Such spatial orders are often unexamined, taken for granted - they are "so weightless and invisible that we hardly even think about them, let alone have to justify them." (p. 102)

However, on such imaginaries Soper recalls characteristically that "until cigarette advertisements were finally banned, their imagery was rarely connected with the act of smoking. Car advertisements often rely on implausible depictions of the vehicle as a 'solitary' amidst nature" (Soper, 2020, p. 159). To move forward and gain the necessary social awareness and drive, "commodities and services and forms of life once perceived as enticingly glamorous [have to] gradually be seen instead as cumbersome, ugly and retrograde, thanks to their association with unsustainable resource use, noise, toxicity, or their legacy of unrecyclable waste and waste exports" (p. 158).

Thus, although such imaginaries "exert a strong hold on our imagination, [they] are not immune to change; there are always cracks in the concrete, rooms for interrogating taken-for-granted assumptions, and space for the emergence of alternative imaginaries." (p. 105) On the institutional power of spatial imaginaries she credits the Randstad idea of Albert Plesman on having been able to connect disparate communities of people into one unity, which enabled the legitimisation and further operationalisation of it. "Planning tools such as maps, images, diagrams and scenarios do not simply represent an urban future. They also perform the future in the present, and by doing so they essentialise a specific imaginary of urban futures which has material consequences" (Davoudi, 2018, p. 103)

Currently, there is no such vision in Greece - let alone spatial imaginary. The extreme lack of spatialisation in planning processes was already examined briefly in the problem field. From a formal perspective, ideas for the future have been exclusively reduced to long and incoherent speeches about sustainability and green transition - which most people have become desensitised to. If we are to achieve such a future then there is an immediate need for alternative narratives, which could inspire and drive people towards action.

"The greatest work of imagination is its ability to imagine how we might be otherwise"

Painting by my grandmother Eleni. ♡
Quote by (Yusoff and Gabrys, 2011, p. 517)

This chapter explores an initial application of the previously defined concepts. In order to provide a framework for such application, different ways of defining the bioregion will be explored specifically for the context of Greece, resulting in the definition of a key-region as a case-study. Tackling the first research sub-question, the main post-growth barriers will be examined, both contextual and general, in the application of the post-growth approach. For each, the extent to which bioregionalism could prove beneficial towards a post-growth transition will be tested, through mapping and spatial analysis, while determining potential gaps.

4

applying the concepts

defining the bioregion

Moving towards the application of the bioregional approach to Greece, the current administration system is briefly defined. It consists of 13 Regions (Περιφέρειες) and 332 Municipalities (Δήμοι), further subdivided into Municipal Communities (Δημοτικές Κοινότητες). Also, 7 decentralised administrations (αποκεντρωμένες διοικήσεις) are overseeing the regions as part of the Ministry of Interior, but do not pertain to local governance. These are similar to the French "'préfet" system, which can be traced back to the inception of the Greek state in 1830. The administrative organisation and legislation that were drafted were heavily based on the European powers that had sided with Greece during the War of Independence against the Ottoman Empire (Sotiropoulos, 2018, p. 397). There any many similar instances beyond the Regions - particularly evident in the building code (NOK). For example, the widely used Erker (usually rectangular volume that protrudes from the mass of a building) was borrowed from German building regulations and is quite typical in colder climates, but not necessarily relevant in the Greek context. It can be argued that even from the beginning of the Greek state, there has not been a truly contextual approach to spatial planning, leading to the myriad of issues.

Greece is "one of the least decentralised administrative systems of the EU". More than three quarters of government employees (at 77,08 percent) work for the central government, and in 2015 local government expenditure accounted only for 6,6 percent of the total (Sotiropoulos, 2018, p. 393). At the same time, the administrative capacity is distributed very unevenly within regional and local government bodies, with the majority of "civil servants working in regional and local government are not as skilled as civil servants working in central government". This has resulted in "inadequate policy implementation" due to this problematic distribution of administrative power and resources, like personnel, funds and digital infrastructure (p. 400).

To counteract that a merging of municipalities occurred in 2011, to create larger "economies of scale, decrease local government expenditure and establish local government units sizeable enough to marshal resources and skills useful for the absorption of EU funding" (p. 396). However, this did not necessarily produce better results, since the lack of education and skills needed at the local level still lagged behind. This was also pointed out by a more recent research on local governance in Greece which also concluded that the significant shortage of personnel with expert knowledge in local administration, especially in financial services, make it very difficult for them to operate effectively and efficiently (diaNEOsis, 2023).

In such a context, it seems unlikely that the existing governance scheme can efficiently implement meaningful change in the scale of the region. Based on all of the above, the bioregionalist approach could be highly relevant for Greece. As examined in the theoretical framework, both post-growth planning and bioregionalism propose a redefinition of governance towards radical localism, instead of arbitrarily defined, uncoordinated administrative bodies. The first order of business in exploring the extent of bioregionalism is to define the territory that the approach will be tested on - the bioregional unit. In this sense, a few ways of defining bioregions will be explored in this chapter, looking at topography and natural morphological features, biology, conservation and environmental studies.

Decentralised Administrations
Αποκεντρωμένες Διοικήσεις

1 Macedonia & Thrace
2 Epirus & West Macedonia
3 Thessaly & Sterea Hellas
4 Peloponnese, Western Greece & Ionian
5 Attica
6 Aegean
7 Crete

Regions (NUTS2)
Περιφέρειες

1 East Macedonia
2 Central Macedonia
3 West Macedonia
4 Thessaly
5 Epirus
6 Sterea Hellas
7 West Greece
8 Ionian Islands
9 Peloponnese
10 Attica
11 North Aegean
12 South Aegean
13 Crete

Municipalities
Δήμοι

Municipal communities
Δημοτικές κοινότητες

Administrative system of Greece.
Drawings by the author with spatial data from http://geoportal.ypen.gr/

200 km

N

floristic regions

The floristic regions of Greece. Adapted by (Dimopoulos et al., 2016).

Floristic or phytogeographical regions are areas recognised by plant geographers and botanists for their distinctive plant life. Globally, there are four floristic regions: Boreal (North America, Europe, northern and central Asia, and North Africa), Palaeotropical (including African, Indo-Malaysian, and Polynesian subregions), Neotropical (South and Central America), South African, Australian, and Antarctic (Britannica, 2017). Generally, they describe areas of relatively uniform composition of plant species. Specifically for the Greek territory, four phytogeographical delineations were first defined in 1929 by botanist Turrill W.B., and later by Rechinger K.H. in 1943, addressing the phytogeographical peculiarities between the European and Asian Aegean. The more recent delineation was mapped by Strid A. in 1996 in 13 regions, which remains unchallenged and used till today (Zogaris and Economou, 2017, p. 6).

The regions somewhat echo current administrative boundaries, like the Peloponnese, Sterea Hellas or Crete, thus they could inform the formation of a bioregional unit, especially for conservation of biodiversity in flora.

1 Northern Pindos
2 Southern Pindos
3 North Central
4 East Central
5 North East Islands
6 North Aegean Islands
7 West Aegean
8 Sterea Hellas
9 Ionian Islands
10 Peloponnese
11 Kiklades
12 East Aegean Islands
13 Crete and Karpathos

freshwater ecoregions

The freshwater ecoregions of Greece. Adapted by (Zogaris and Economou, 2017)

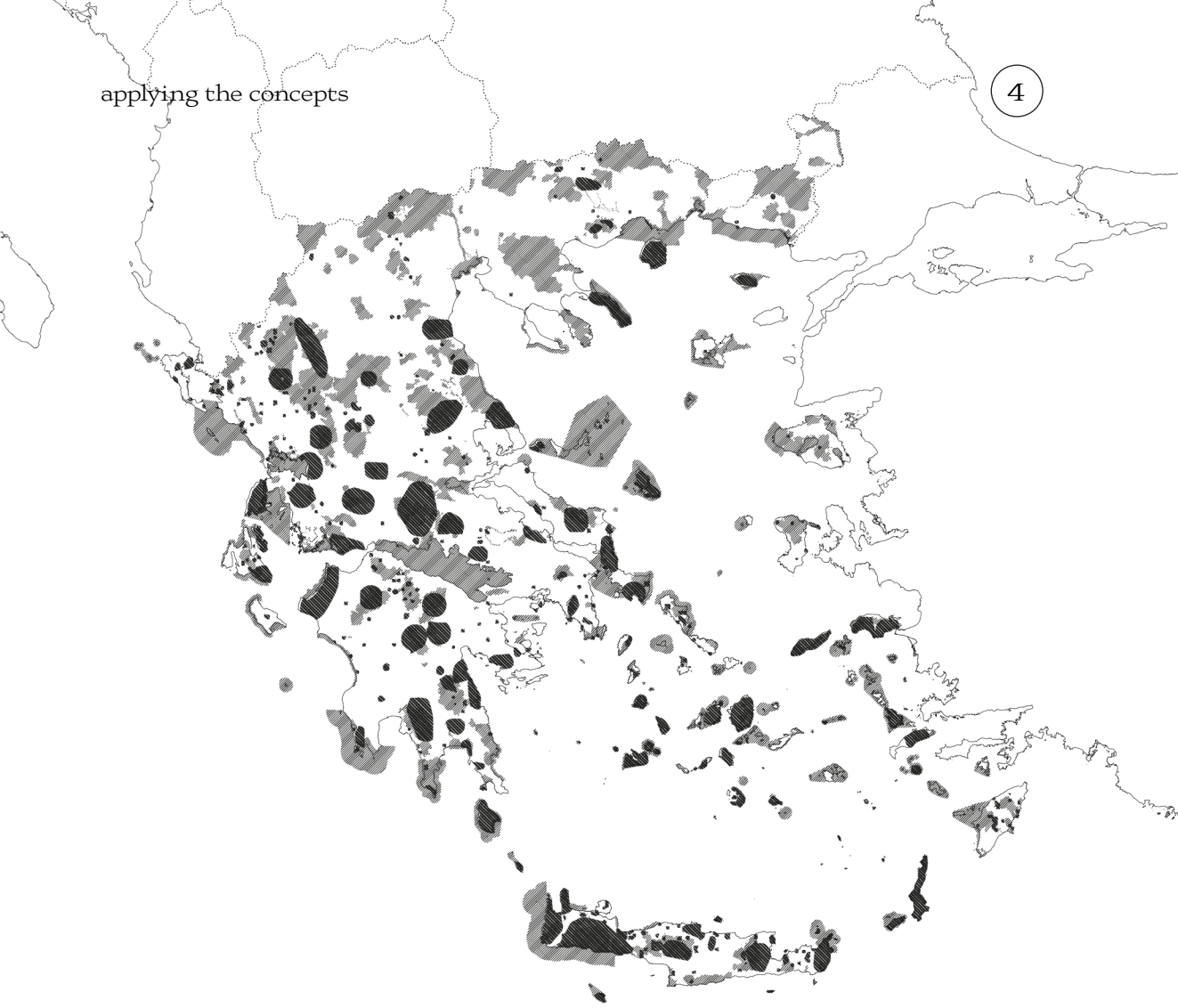
The global project Freshwater Ecoregions of the World (FEOW) has defined a set of zones that show a particular homogeneity in aquatic ecosystem structures, defined by watershed lines and deep marine waters and considering "freshwater species' phylogenetic history, paleogeography, and ecosystem distribution patterns" (Zogaris and Economou, 2017, p. 4). Greece, due to its exceptional geographical position on a "biogeographical crossroads" has the largest number of ecoregions in the EU.

While ecoregions are a controversial delineation and there are disagreements regarding the accuracy of the proposed boundaries, the ecoregional map can provide a "a holistic regionalization framework, grouping river basins based on major biotic similarities and relevant geological and climatic attributes." (Zogaris and Economou, 2017, p. 33) Currently, the research on freshwater species taxonomy and precise taxonomy is "particularly poorly developed" in Greece. Bioregionalism places high importance on conservation, thus attributing administrative qualities to these boundaries could be highly beneficial to organise further research.

1 Thrace
2 Macedonia-Thessaly
3 Southeastern Adriatic
4 Western Aegean
5 Ionian
6 Crete
7 Eastern Aegean

100 km

N



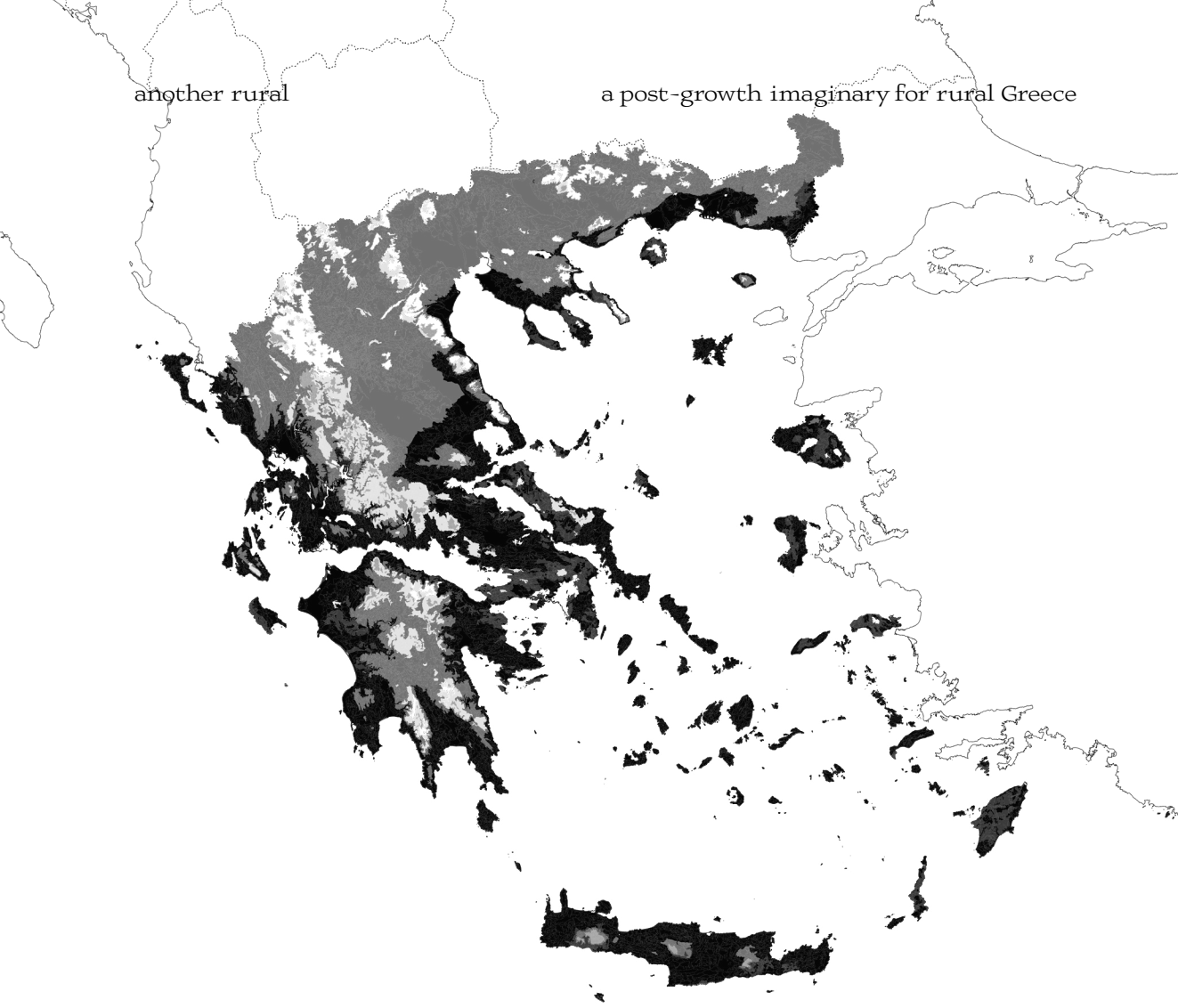
protected zones

Natura 2000 network with KBAs proposed by (Spiliopoulou, 2022)

Protected zones like the Natura 2000 are crucial in safeguarding biodiversity, and are to be expanded by at least 30 percent, as mandated by the EU Biodiversity Strategy for 2030. However, their formation is oftentimes dependent on reaching a specified target of percentage coverage, rather than actually protecting areas of particular importance for biodiversity. Spiliopoulou Konstantina (2022) identifies potential Key Biodiversity Areas (KBA) in Greece through the examination of terrestrial species, which show an overlap of 44 percent to the Natura 2000 network, and a total coverage of 15 percent in the Greek territory.

The combination of these zones could present an opportunity in localising and territorialising decision-making, by considering the anthropogenic environment within and around them. Almost the entirety of these patches have some form of urbanisation and human presence in close proximity. New administrative boundaries could be formed through them, but also through the connecting corridors within them. This would result in territories that could make use of existing EU-level legislation to influence an local governance and climate crisis adaptation measures.

Key biodiversity areas Natura 2000



forest
climate zones

Forest Climate Zones of Greece.
Drawing by the author with spatial data from http://geoportal.ypen.gr/

Looking to older literature about climate zones in Greece, a relational categorisation of prevailing climate and flora conditions categorises the Greek territory into 7 Forest Climate Zones (Δασικές Κλιματικές Ζώνες - ΔΚΖ). These are the warmer and drier zone of broadleaves (ΔΚΖ1), the wetter zone of broadleaves (ΔΚΖ2), the colder zone of broadleaves(ΔΚΖ3), the warmer zones of deciduous broadleaves (ΔΚΖ4), the coniferous mountain zone (ΔΚΖ5), the colder zone of deciduous broadleaves (ΔΚΖ6), the cold coniferous zone (ΔΚΖ7) and the alpine & pseudo-alpine zone (ΔΚΖ8). However, the literature does point out that in reality the flora species overlap, but the most relevant and prevailing type was chosen to represent the region (Gouvas & N., 2011).

Recognising this categorisation in local governance and spatial planning could be beneficial in dealing with forest fires, as they are expected to be much more frequent in the future due to climate change. A re-examination and update of these zones, along with an inter-relation to areas generally at most in risk of wildfires, could inform a bioregional unit that is geared towards both prevention and protection.

ΔΚΖ1 & ΔΚΖ3 (G)
ΔΚΖ4 (D)
ΔΚΖ5 (E)
ΔΚΖ3 (GX)
ΔΚΖ8 (Y)

100 km

N

through water

The previous attempts of defining a bioregional unit have useful elements, but result in zones that are either too large or too arbitrary to relate specifically to spatial planning and governance, thus incompatible with the localism approach of bioregionalism. Rather than using purely morphological or geographical data to define the bioregion, an approach which looks towards the future is needed, which would consider existing risks and challenges related to ecological structures - thus a more anthropocentric approach.

freshwater ecosystems

In general, the freshwater ecosystems of Greece are "considered as biodiversity hotspots at a regional and global scale" (Stefanidis et al., 2021, p. 4) due to their unique position within the continents. Rivers, as natural features, are inherently defiant of man-made borders and often transcend administrative boundaries of the Greek territory. For example the river Aoos or Vjosa (6) flows from the mountains of Pindus in Greece towards the Albanian coast, or the river Evros is in-between Greece and Turkey. In addition, the areas that are at most risk in flooding are always related to a river structure. Defining the bioregions along them would present opportunities for better cooperation and coordination between governing boundaries in a trans-local, trans-municipal and even trans-national level. In this way, an approach that looks towards water management through major rivers and their basins is deemed the most productive. Such an approach also excludes the many islands and rather focuses on the mainland. This is quite beneficial since the islands are small bioregions in their own regard and should be granted a degree of autonomy. The examination of this is beyond the scope of this paper.

status of environmental protection

Also, as discussed before in defining bioregions through protected zones, existing EU legislation and funding could be used to inform local governance. A recent study (Stefanidis et al., 2021) showed that despite recent efforts to monitor the freshwater ecosystems, there was no distinguishable difference between the ecological quality of freshwaters within Natura 2000 protected areas and sites not protected by the Habitats Directives. They conclude that there is a significant gap in coordination and synergy in implementing EU regulations in Greece and urge policy makers to "revisit the river basin management planning and place special emphasis on protected areas to resolve any conflicts or lack of compliance between the EU directives" (p. 16). This further solidifies the relevance of river basins in the bioregional approach.

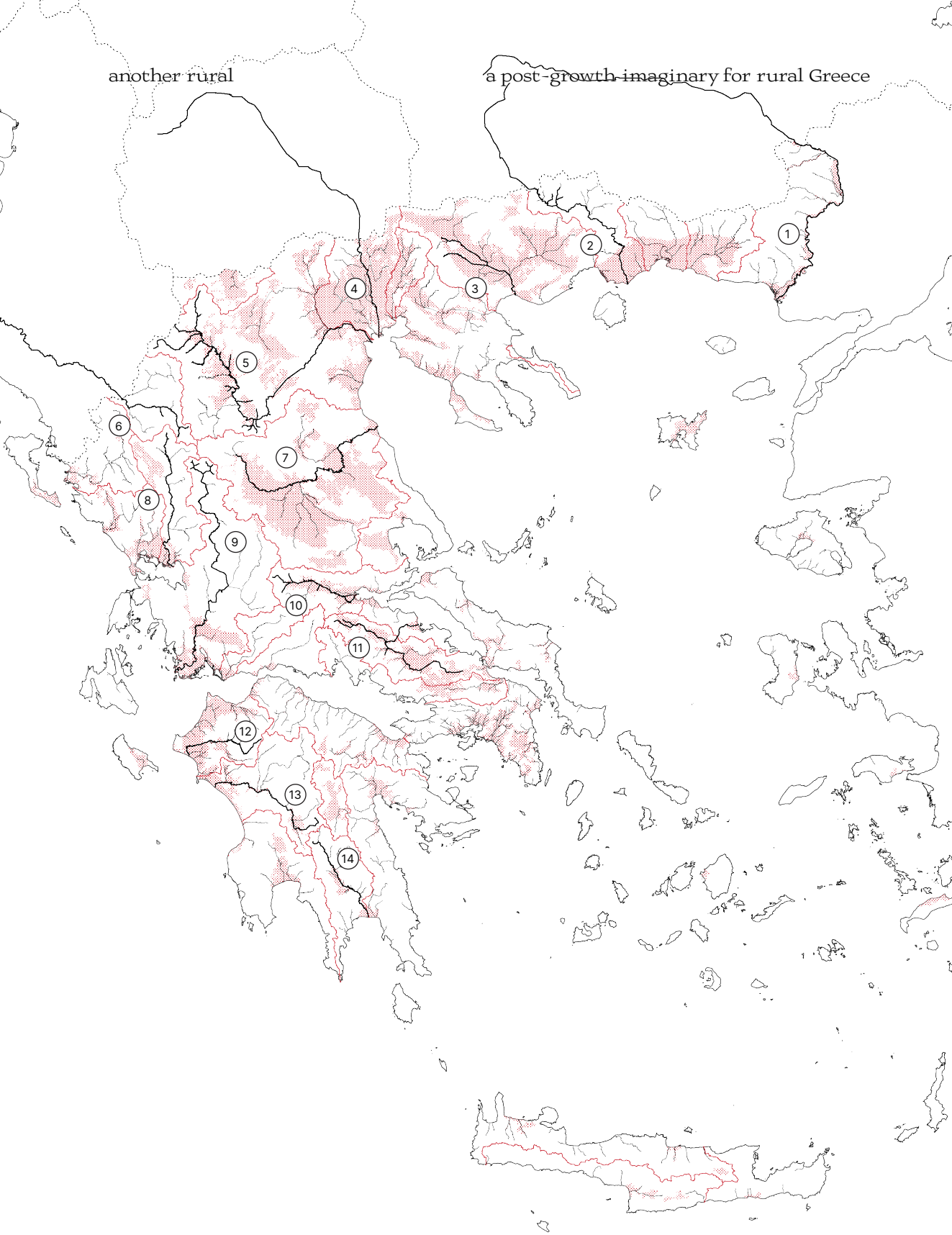
reflection

While a conscious effort has been placed in defining a specific bioregional unit in order to compare it to the existing administrative scheme, I do not necessarily believe that a singular approach is appropriate or relevant for different contexts. In this paper it is argued that it is best to deal with most issues in the bio-regional scale, but there are others which require trans-regional cooperation, like processing electronic waste or certain plastics. It is imperative, however, that bioregions should strive towards breaking global chains and instead localising them to a more manageable state, as well as reducing waste throughput.

River basins as bioregions. Drawing by the author with spatial data from http://geoportal.ypen.gr/

Main rivers
Flood risk areas
River basins

a post-~~growth imaginary~~ for rural Greece



1 Evros
2 Nestos
3 Strimonas
4 Axios
5 Aliakmonas
6 Aoos
7 Pineios
8 Arachthos
9 Achelooos
10 Spercheios
11 Kifisos
12 Pineios
13 Alpheios
14 Evrotas

100 km

N

the case-study

In order to further examine the bioregional approach of river basins in a regional and local scale, one specific key-region needs to be selected. While the region of Thessaly is the most current in media, as was explored in the first chapter, due to the immense flooding, for the context of this paper it is not selected as the way forward. Information on the state of infrastructure is very limited and it would involve focusing heavily on rehabilitation and repairing of damages. Thus in the end, it is deemed too problematic to pursue, as well as lacking in transferability since it would not be as relevant of an examination for other river bioregions. However, there is a group of experts in Dutch water management that have been assigned to investigate the situation and their findings will be taken into account.

Instead, the adjacent basin to the south is chosen, the basin of the river Spercheios. It is among the shortest of the major rivers of Greece, making it easier to explore and understand during the project timeline. Also, it is mostly a non-touristic region due to the lack of accessible coastline of the delta wetland landscape - also a very different landscape than the traditional Greek beachfront. Thus, a spatial imaginary that does not depend on tourism could be formed easier, making also the post-growth approach more relevant for the region.

There are also personal reasons for choosing this site. My ancestors lived in the mountainous area of Roumeli, between the mountains Oxia and Vardousia and migrated to the foothills of the Spercheios basin during World War II. While I may not be very familiar with the area, the descriptions and stories from my family can assist in understanding the site towards a contextual imaginary.

The region of Spercheios.
Drawing by the author with GoogleEarth.

The central segment of the Spercheios river valley. Almost the entirety of the region is dominated by agriculture, with the meandering river structure cutting through the rectilinear allotments. Photo by the author. (38.87365291564974, 22.249118050411838)

identifying barriers and opportunities

Within the context of the chosen key-bioregion, the river basin of Spercheios, potential barriers to the post-growth transition will be explored - both generally, drawing from the theory presented previously, and specifically, through examination of the context at hand.

limited societal acceptance

Perhaps the most important barrier is the limited acceptance of the post-growth movement. As Büchs and Koch (2019) point out, "economic growth is not only at the core of various socio-economic institutions but is also very deeply anchored in people's minds, bodies and identities, (...) shaped by ideas of social progress, personal status and success through careers, rising income and consumption" (p. 160). Such embeddedness of growth into our institutions makes the transition to a post-growth economy very difficult. It requires very fundamental social, economic, political, cultural and technological changes. It would also need to happen very fast in order to be able to adequately respond to the imminent climate crisis (p. 159). In the Greek context this embeddedness could be located in two interrelated manifestations. Firstly, through the growth-fixation even within the effort to transition to more sustainable practices, examined here for energy production, and secondly through the interweaving of tourism-dependance with the perception of growth.

A part of the current government's agenda was that Greece could become "a battery for Europe", in turn accelerating investment projects on green energy. Specifically, wind energy capacity has increased threefold since 2010, with many turbines in mountainous and coastal areas. The installed capacity for onshore wind energy has been steadily increasing for the last few years, with an even more significant boom in installed annual photovoltaic installations in 2020 (see graphs). At the same time, wind farms that have applied for and completed the first stage of their licensing process, in

Wind turbines in Evia. Photo from https://www.reuters.com/business/environment/greek-environmentalists-fear-windfarm-scars-mountain-forests-2021-05-26/

Protests in Oiti. The poster reads "No to the destruction of Oiti".
Photo from https://lamianow.gr/fthiotida-o-anemogennitries-stin-oiti-poreia-allileggyis-gia-tin-prostasia-to-erchomeno-savvato/

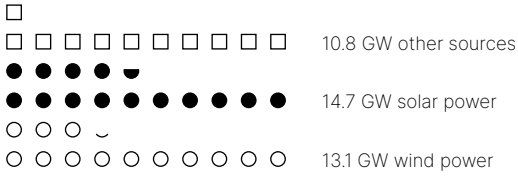
order to gain a construction and operation permit, would account for over thirty gigawatts per year. This would be an overshoot of more than four times the required output compared to the 2030 scenario dictated by the National Energy and Climate Plan (NECP) (Bersi, 2021), shedding light to the absence of a strategic planning framework for the Greek government.

As the Greek government has pushed to increase its clean energy resources against the previously prevailing brown coal or lignite, there have been many concerns and oppositions. Many local authorities highlight that while they are not in opposition to investment in green energy, they condemn current actions as "too fast and without community support" (Koutantou, Reuters, 2021). In the Karystia district in southern Evia, residents are worried that the presence of the turbines means turning the region from agriculture into an industrial zone, making it unattractive for tourists and nature lovers (Koutantou, Reuters, 2021). In the examined key-region of Spercheios there was also quite a big uproar related to an energy infrastructure project in the mountain of Oiti, located to the south of the water basin. The protesting group writes specifically that they oppose the construction of a wind farm in the mountaintops, as it is a protected Natura 2000 area, important for biodiversity and crucial to bird migration routes. They also mention how such energy infrastructure would "violate the landscape", in turn undermining opportunities for "alternative tourism" and "sustainable future development" (Lamianow.gr, 2021). Despite the perhaps misplaced motives, which further exemplify the embeddedness of growth and tourism-dependency, such testimonies also illustrate an innate connection to nature and an honest effort to protect her - an attachment to place. Many such protests are dispersed events and usually go unnoticed, without being taken into consideration in decision-making and planning.

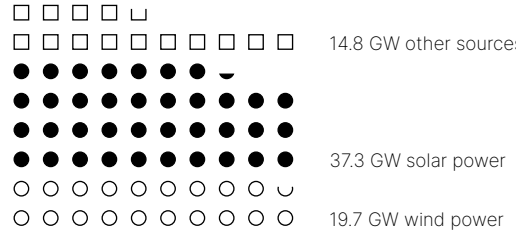
Even in the relatively non-touristic case study of the Spercheios region, it is still embedded in public discourse and institutional goals. However, despite the embeddedness of growth and tourism, there is a strong attachment to one's place. Many Greek people that live in urban areas go back to their "village" during holidays, or for specific celebrations. Such attachment is also evident through the many protests when it comes to environmental issues.

Bioregionalism could assist in uniting this inherent place-attachment of people towards their immediate surroundings or to nature, through empowering and localising decision-making processes to the scale of the bioregion. United by the common appreciation of the natural land and the need to protect it, as well as through the sharing of common risks and opportunities related to living in a water basin, this attachment could be upscaled into a regional place-attachment, in turn making it productive and actionable. This would aid the ecocentrism required for a post-growth transition.

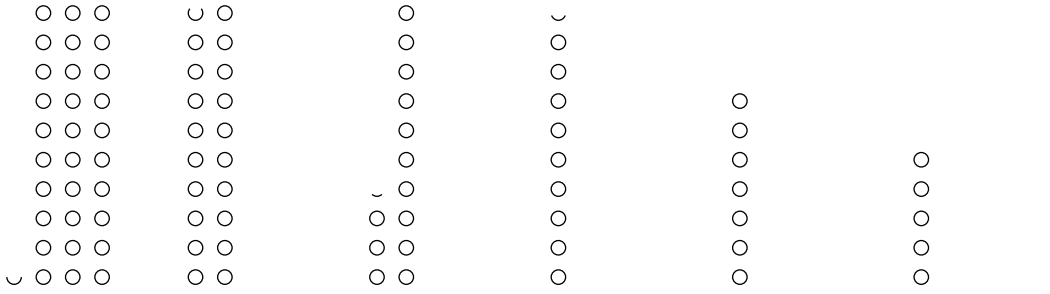
Onshore wind energy installed capacity (left) and annual solar photovoltaic installations in MW (right) in Greece. Data from https://www.mordorintelligence.com/industry-reports/greece-wind-energy-market



Efficiency and Electrification 1,5˚C scenario
38,6 GW total installed power required



New Carriers 1,5˚C scenario
71,8 GW total installed power required



Permit
30,5 GW

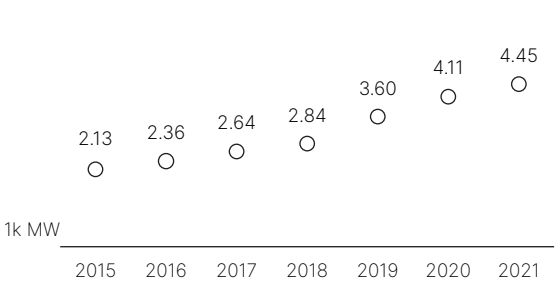
2050 NC 1,5˚C
19,7 GW

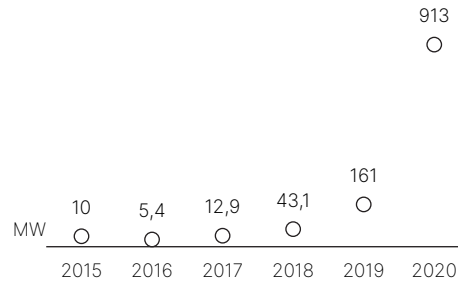
2050 EC 1,5˚C
13,1 GW

2030 goal
9,3 GW

2030 NECP
7 GW

Existing capacity
5 GW





Wind farms that have completed the first stage of licensing process in 2021 (permit) far overshoot the targets for both 2030 and 2050. Data from https://www.reportersunited.gr/en/6557/too-much-of-a-good-thing-wind-power-and-the-battle-for-greeces-wild-heart/

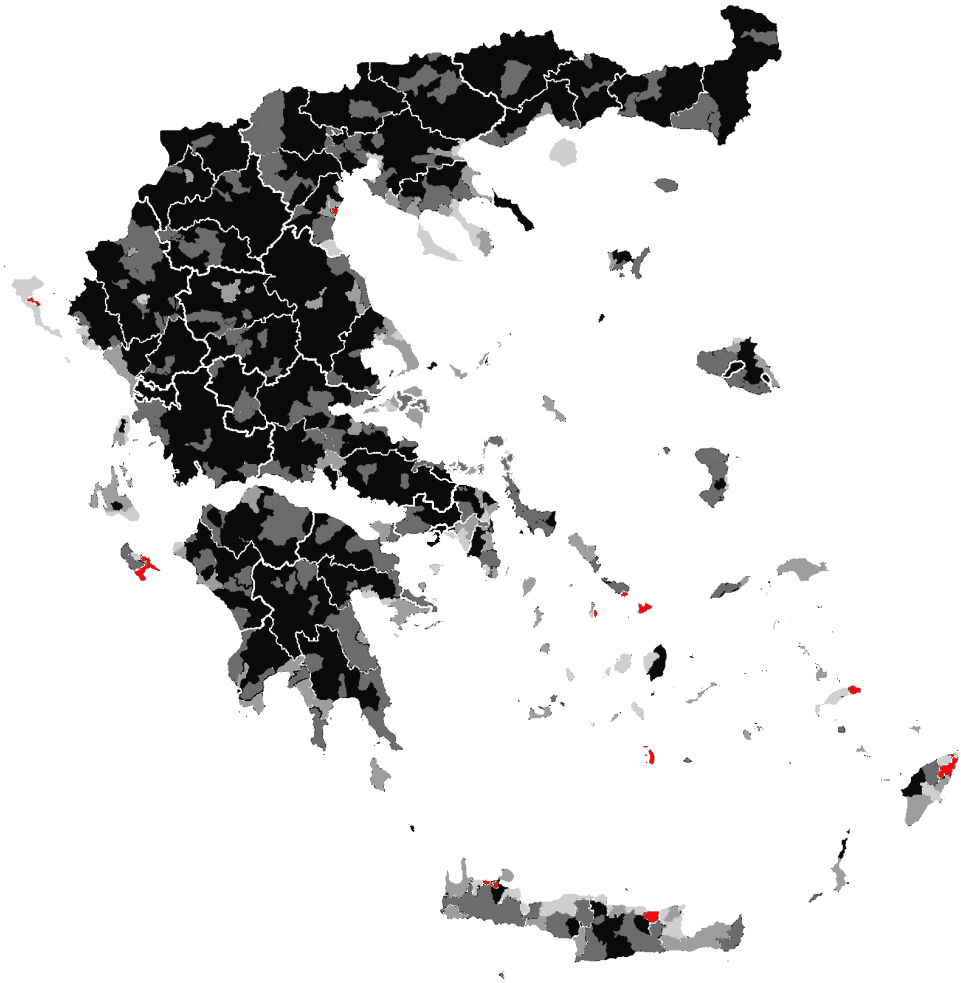
lack of imaginaries

Related both to the barrier of limited societal acceptance and to the energy transitions that were cited, is also the lack of spatial visions. The post-growth approach has remained mostly within academic circles, only recently gaining more traction. As it is quite a broad field of ideas, there has not been much research specifically about the spatial concepts and operationalisation of the post-growth approach. However, if there isn't a sufficient spatial imaginary available, then people cannot relate to the approach and understand what the transition would entail. I believe such spatialisation is necessary to propel the movement forward.

Such lack of spatialisation is especially problematic in the Greek context as well. An instance that can highlight it is the new "Special Framework for Spatial Planning and Sustainable Development for Tourism" (Ειδικό Πλαίσιο Χωροταξικού Σχεδιασμού και Αειφόρου Ανάπτυξης για τον Τουρισμό) which was recently published, in December of 2023. It categorises the Greek territory to 5 classes, regarding the level of current "tourism capacity": controlled areas (that have reached capacity), developed, developing, areas with potential development and areas with potential of light development. The categorisation is done in the level of local governance organisations (OTA), thus quite detailed compared to other "development" plans that are usually only in the periphery or municipality level. However, overall it does not really place any significant barriers to over-tourism nor provide an adequate framework for the "non-developed areas". It promotes and incentivises the reuse of listed buildings or of "abandoned settlements of architectural interest" as tourist or hotel accommodation, along with the the demolition of neglected buildings and tourist accommodation infrastructure that "insult the landscape" (προσβάλλουν το τοπίο) in areas of the first category. It also legalises the construction of tourist infrastructure in non-inhabited islands. It is the first time that the climate crisis is mentioned in such measures, with limiting the further construction in coastal areas that are at risk of flooding due to sea level rise and soil erosion (Lialas, 2023 and Tratsa, 2023). While the criteria for the characterisation are unclear beyond considering "the total number of beds in tourist accommodations", the region of Spercheios is mostly within the last category, with only the coastal part listed as areas with potential development. It could be related to thermal-spring related tourism, as the area has a lot of springs present and was in the past known for them. Such shallow spatial visions are the norm in Greek spatial planning, and are always coupled with lengthy legislation packages, equally vague and space-less.

Bioregionalism suggests major spatial changes in the bioregional scale and thus an opportunity for a spatially tangible vision, which could unite and engage otherwise disinterested people. Instead of interpreting EU goals about development into arbitrary percentages in a periphery or municipality level, each bioregion could construct their own spatial vision based on contextual pressures and opportunities. This could entail more participatory and co-design processes, focusing on equitable participation.

Special Framework for Spatial Planning and Sustainable Development for Tourism. Map adapted from https://www.kathimerini.gr/society/562785667/airbnb-eos-60-imeres-ton-chrono/



controlled zone
developing zone
potential light development zone
developed zone
potential development zone

Bureaucracy

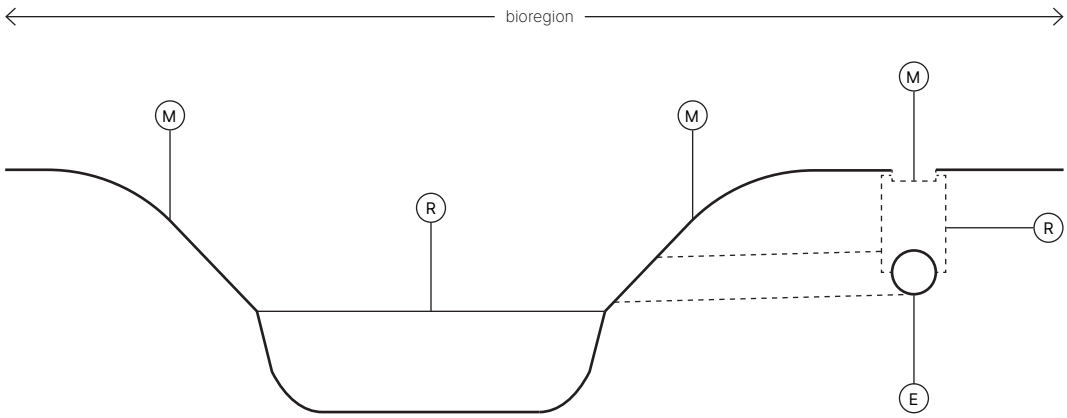
The post-growth vision mandates urgent actions in order to meet the environmental goals, thus fast processes in decision-making are required. However, even if such imaginaries compatible with the post-growth transition were to be drawn up and spatialised, they would be hampered in application from an environment of intense bureaucracy, something that is common knowledge among Greek people.

For example, as of January 2024, the latest plan for climate crisis measures was published back in 2008, from a research conducted in 2006 and based on data from 2000. Initiatives to draft an updated plan only started in 2020, and despite being completed a year after it has been "going back and forth between government services for micro-adjustments" (Lialos, 2023). Another article reports that while it was supposed to be published before the summer of 2023, it received a year-long extension. One of the reasons stated for this delay is to take into consideration new EU goals for renewable energy that were published after its drafting (Aposporis, 2023). As of January 2024, it remains unpublished. This exemplifies the inexcusable tardiness of governmental processes in Greece, even for such important matters like climate crisis measures.

More related to the key-region at hand is the common anecdote of responsibility regarding water management. The representative of all Local Governance Organisations (OTA) mentions: "The example of manholes on the national road network is well known. The municipality has to clean the grate, the Periphery the barrel, and the Water Supply & Sewerage Company (EYDAP) the actual pipelines. This problem is even more difficult in cleaning the river streams. The Periphery has jurisdiction over the river bed, the municipality over the river slopes. These are things that at some point we will have to regulate holistically" (Dandogloy, 2023). Such distribution of responsibilities among many governing bodies is unfortunately too common. The extent of the ecological destruction mentioned in the problem field illustrate the implications of such a dysfunctional system in applying climate crisis mitigation measures.

A study on local governance in Greece (Reported by Stamoulis, 2023, research by diaNEOsis, 2023) reports that it is ranked incredibly low in the degree of economic independence compared to other EU countries, as well as local governance having the fewest responsibilities. The researches point towards "understaffing, problematic or non-existent digitisation, the fragmentation of procurement management, overlapping responsibilities between different services or legal entities of the same municipality, as well as the strong dependence on the political leadership of the municipality". They also highlight the incredibly bureaucratic procedures necessary for relatively simple procedures needing an excessive number of signatures needed. Reform attempts have hitherto been limited to redistribution of administrative responsibilities rather than emphasising participatory governance. Overall, this has resulted in a "climate of complacency and disengagement" in the municipalities, as they expect other levels of government to take decisions for them.

Bioregionalism offers the opportunity to limit bureaucracy through localising decision-making and focusing on immediate and efficient communication. Local issues would be examined directly in the scale of the bioregion, and action plans would be drafted by experts present, instead of the today's typical trickle-down approach which lags behind. This approach also makes it easier to both implement actions, evaluate the performance and involve citizens directly in decision-making processes, as it would pertain to their immediate surroundings.



Administrative jurisdiction in water management.
Diagram by the author.

M Municipality (Δήμος)
R Region (Περιφέρεια)
E Water Supply & Sewerage Company (ΕΥΔΑΠ)

individual network reliance

Beyond the national or site-specific context, there are also barriers inherent to the post-growth vision. There are many actions suggested regarding the operationalisation within post-growth literature, like "worker-owned and managed businesses" (Büchs and Koch, 2019, p. 160) or "cohousing, farmer's markets, self-sufficient housing, non-commercial sharing, and urban gardening" (Savini, 2021, p. 1077). So far, such alternative practices "continue to face considerable obstacles in influencing either policy or popular opinion, and their development remains dependent on a relatively small, geographically dispersed, and highly intellectually diverse research community" (Crownshaw et al., 2019, p. 118). This could be attributed to their requirement of the investment of a lot of personal time and a strong small-scale network of people in order to be executed within the existing system of ownership and cooperation. Here, bioregionalism as a deeply local practice could enable the institutionalisation of local initiatives and practices, in an environment of regional cooperation.

politico-economic barriers

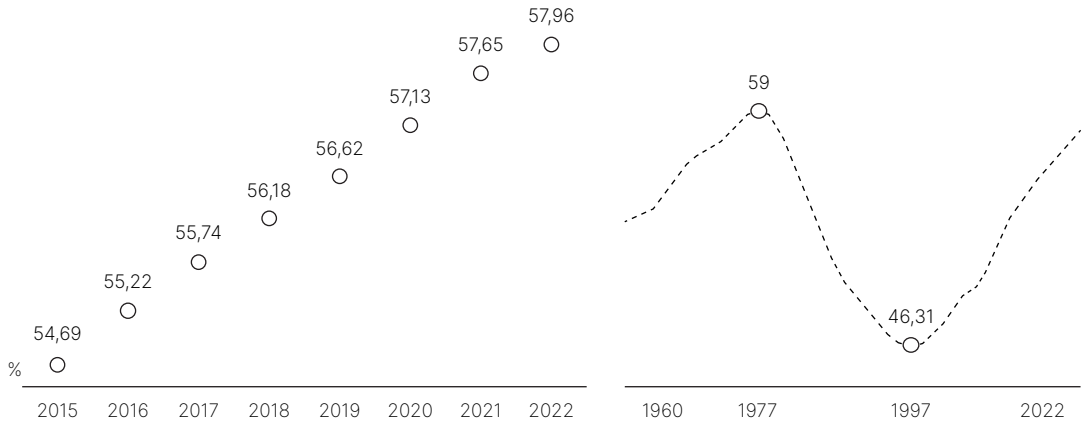
Strunz and Schindler (2018) quote three specific transition politico-economic barriers that hinder the post-growth transition (p. 69). First, unemployment represents "the most commonly cited reason why economic growth is considered indispensable, as a conscious exodus from growth of economic output might increase unemployment. They speculate that "shifting labour to low productivity sectors e.g personal services like nursing" could be a measure to combat rising unemployment in a post-growth society, as well as increasing public employment or environmental fiscal reform (p. 72). An opportunity presented by bioregionalism could be more jobs in agriculture, the craft or energy production sector. In general, an approach that focuses on the sufficiency of the bioregional unit would result in a decentralised system, which would probably need much more labour input.

Second, the lack of alternatives to GDP is a major barrier towards the post-growth transition, as so far other indices have not "succeeded in replacing [it] as a standard metric of welfare". There have been many recent articles praising the rapid growth of the Greek economy and its GDP, but as the researchers point out, if "environmental and other neglected welfare aspects" were taken into account, the national welfare would yield "far less favourable results than GDP often does and sometimes even indicate decreasing wealth in comprehensive terms" (p. 72). They also attribute such political concerns to the lack of exploration and adoption of other measures, as politicians might have to face a "critical re-evaluation of their current performance", thus damaging their chances of re-election. Given the context of political corruption in Greece, this is a barrier that would be incredibly difficult to overcome. However, a bioregional approach could promote other indices related specifically to the status of environmental protection, social welfare or waste production within the bioregional boundaries and not necessarily within national boundaries. EU funding could be allocated based on the performance of such indices as part of rural policies that are already in place. In this way, rather than abstract measures that relate to a global market and hold a lot of influence on a national level, localised indices would be more relevant to the scale of the bioregion.

The third hindrance that the researchers recognise is pension schemes. Pointing to the current ageing of the population, they argue that pensions schemes "rely on economic growth to offset demographic change" (p. 73). Basically, in pay-as-you-go schemes, like the ones in Greece, the currently working younger generations finance the pensions of current retirees, as well as pensioners relying on the goods and services provided by them. Considering the declining number of working-age people and the rise of over 65-year old people, the implications are self-evident. Thus, economic growth is necessary to counteract these effects. A post-growth future that would thus not rely

on such growth would mean either immense reduction to pensions or/and the over-working of younger generations, as well as raising the working-age years. This means that older voters would not be inclined to support a politics of degrowth - especially in Greece, where pensions have already been reduced tremendously as part of the economic austerity measures imposed by the EU.

A bioregionalist approach of local, radical sharing would provide more equitable access to services for residents of the bioregion. Taking care of the elderly could be a core goal, while it is also compatible with predictions about post-growth working conditions, which would involve more low-productivity jobs, like nursing.



Recent age dependency ratio in Greece (right) and through history (left). Diagram by the author.
Calculated as: (people younger than 15 and older than 64) / (working age people ages 15-64)
Data from https://www.theglobaleconomy.com/Greece/Age_dependency_ratio/

political polarisation

To expand on the previous barrier, political polarisation poses a significant obstacle towards providing democratic legitimacy to the post-growth movement through voting. Soper highlights that such a "radical programme" as post-growth would be best advocated by an alliance of Labour parties with Green parties than any other parties (Soper, 2020, p. 164).

Investigating these requirements in the Greek context, Sotiropoulos (2018) writes specifically how "the permeation of local politics by the nationwide political party competition and the replication of national political feuds at the subnational level, a result of Greece's polarised party system, did not allow for the full exploitation of any new administrative capacities" (p. 396). Such party polarisation has a deep history in Greece, "exacerbated by its civil war (1945-49) ... and of the military dictatorship that followed in 1967-74" (Andreadis & Stavrakakis, 2019, p. 158). Today, it has resulted an environment characterised by "the lack of a political culture that values environmental issues and the presence of antagonistic political trends", which along with "internal skirmishes" have disallowed the Green party in gaining any significant political force (van Versendaal, 2023). To bypass these barriers, a different approach is crucial.

In its essence, bioregionalism is a non-ideological approach - it is rather more of a matter-of-fact way of operating in the region, as it is based on morphological characteristics and not political ones. In this way it could enable cooperation within a polarised political setting and transcend the left-right divide, by focusing on the climate issues at hand, like the flooding and wildfires, and in general the shared risks and benefits of the bioregion. Such politics could be adapted by the Green party in order to establish an operational framework that is lacking from current parties, thus furthering the post-growth agenda.

public debt

The last barrier examined is a much broader and complicated hurdle to overcome. Debt is a structural impediment that prevents any implementation of non-economic-growth measures of progress. So long as a country is bound by debt, its performance can only be examined mainly through GDP and economic output. Greece has experienced "one of the deepest recessions in advanced capitalist countries since the Great Depression" (Sakellaridis, 2019), which has resulted in a deep social crisis as well. A 2022 report by the Bank of Greece forecasts that Greece's public debt will "continue to be sustainable up to 2060", based on an assumption of GDP increase by 2025 and permanently remaining at this level ('Greece's Public Debt to Be Sustainable in Years up to 2060', 2022). This informs the goal of pursued policies - maintaining a growing-enough trajectory to be able to respond to debt payments, and therefore lowers the consideration of "environmental standards" (Sakellaridis, 2019). For these reasons, some scholars support the idea of debt absolution as a way to decouple from the constraints of economic growth.

While I do not believe that bioregionalism can assist directly with this, it is extremely relevant for the Greek context. Generally, adopting bioregional values and acting upon them through a radical redefinition towards locality could influence the perception of national performance through other measures than GDP.

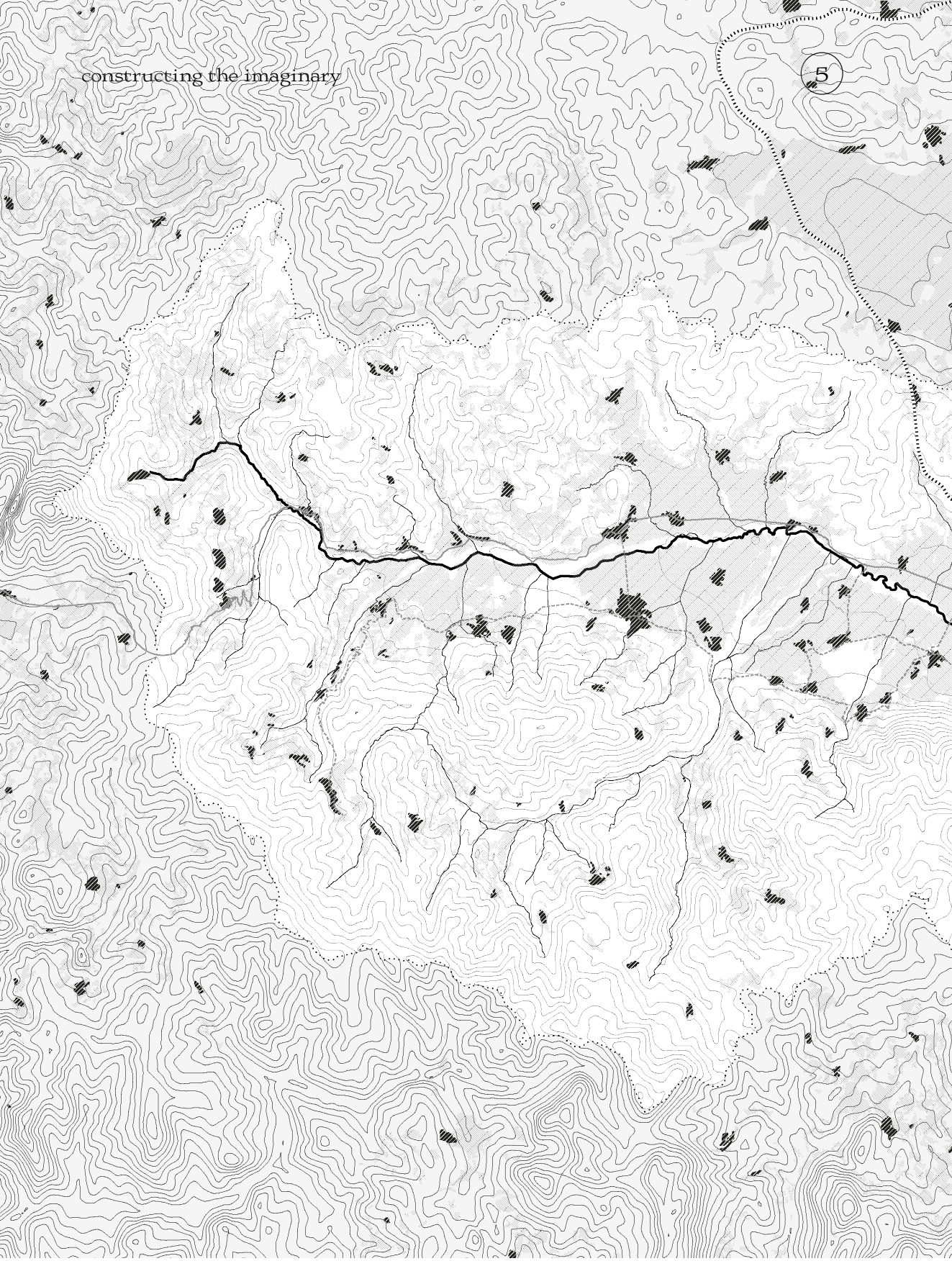
dimension	barrier to post-growth transition	opportunity of bioregionalism
operational	limited societal acceptance	territorial place-attachment
	individual network reliance	regional cooperation
institutional	bureaucracy	redefinition of administrative boundaries
politico -economic	unemployment	agriculture, craft and energy sector employment
	alternatives to GDP	bioregional indices
	pension schemes	radical sharing for the elderly
	political polarisation	matter-of-fact approach empowering Green parties
	public debt	non-economic performance

Barriers of post-growth transition and opportunities offered by bioregionalism.
Table by the author.

Through this chapter I will attempt to provide the necessary framework for the formation of the spatial imaginary, responding to the second research sub-question. Firstly, a visual essay explores the region's characteristics, resulting in an understanding of the contextual problems and their perceived causes. These will be further investigates through site-specific manifestations of growth, through analysis and mapping. With this understanding of the region, the rural post-growth agenda will be drafted, for the region of Spercheios.

5

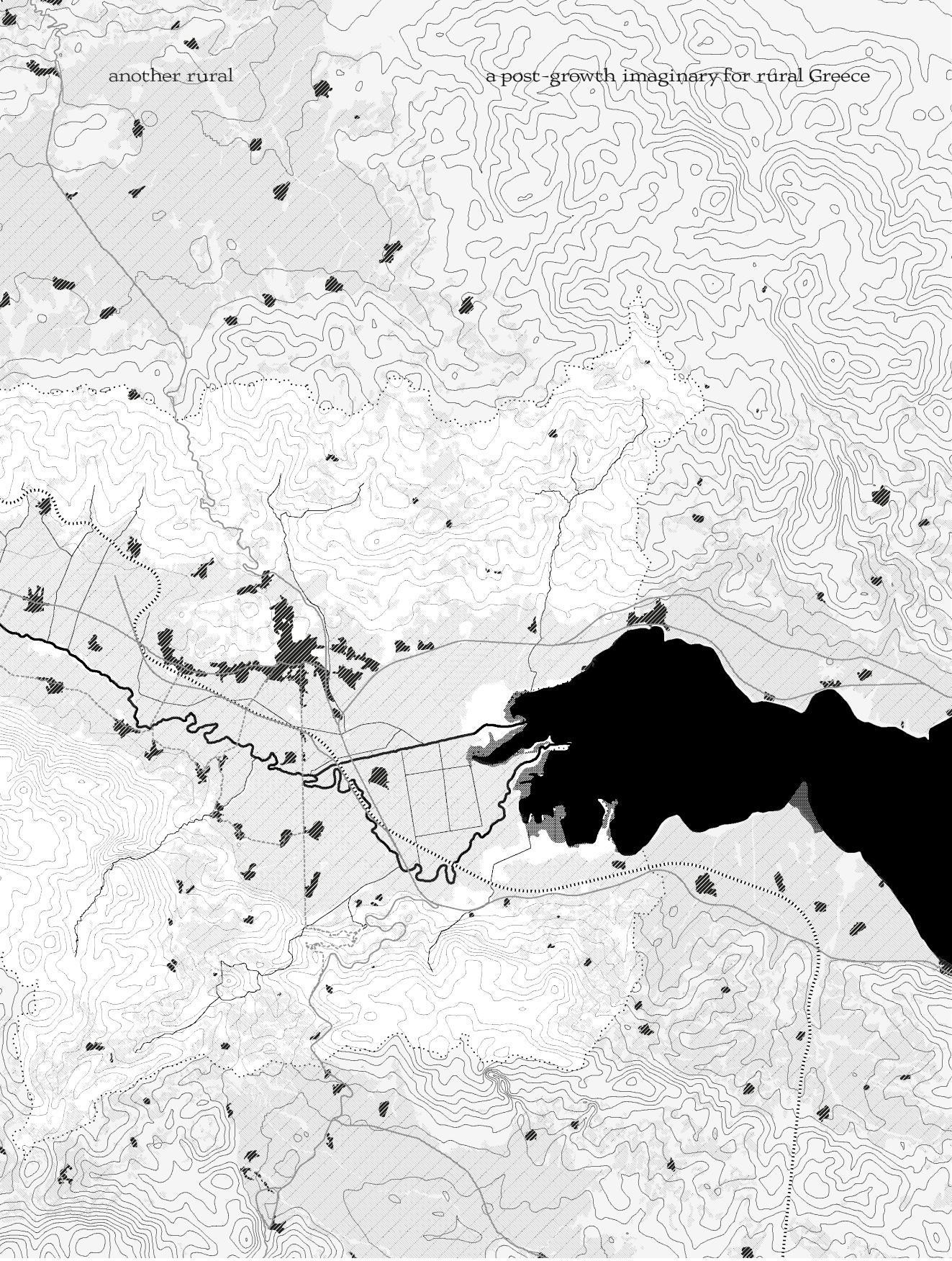
constructing the imaginary



Agriculture dominates the land uses in the valley of the river Sperchei-
os, while small settlements are scattered throughout the basin.
Drawing by the author with spatial data from http://geoportal.ypen.gr/

another rural

a post-growth imaginary for rural Greece



the region of Spercheios

morphology

The hydrological basin of the river Spercheios spans about eighty kilometres, covers an area of 2116 square kilometres and has an average altitude of eight hundred metres. The elongated valley is bordered by the mountain of Tymfristos to the west, Oiti and Kalidromo to the south and Orthris to the north. Many streams of permanent or periodic flow recharge the main river body, discharging in the Maliakos Gulf. Of these, the main tributaries are the rivers Asopos, Xerias, Gorgopotamos, Vistriza and Kraniorrema (Mentzafou et al., 2020, p. 5). Due to the region's mountainous and steep geomorphology, an intense sediment yield is carried through the river (Stathopoulos et al., 2017, p. 780). Lamia is the largest city present in the region of Spercheios with about 58 thousand inhabitants, while many smaller settlements are present throughout the entire valley - mostly along the base of the mountains.

The river flowing underneath the Vistriza bridge.
The natural landscape of the river is juxtaposed with concrete infrastructure.
Photo by the author. (38.882999317334935, 22.163470107140906)

The river flowing underneath the Lianokladi bridge, making little waterfalls in the conrete terraces. The banks of the river were reinforced with stones and nets.
Photo by the author. (38.90775878275621, 22.284344000564197)

economy

The valley of Spercheios has been cultivated since its first traces of human presence, almost eight thousand years ago, during the Early Neolithic period. Due to its strategic location, the area has been relatively prosperous ever since (Mentzafou et al., 2020, p. 8, 9). Agriculture continues to be the main occupation in the region today, with cultivation of olive trees being the most prevalent, along with fruit trees, rice cultivation in the coastal lowlands and some livestock. However, a large amount of land currently is unmanaged and uncultivated, due to people having moved away from the rural lifestyle.

an empty region

Rural depopulation is a painful reality that seems to permeate throughout the entire region of Spercheios. Two separate one-day field-work trips were conducted during the making of this thesis - one close to the Christmas holiday break on the 21st of December, and another later in early spring on the 14th of april. Despite the shortness of the trips, it was clear how emptied the region was. It was hard locating more than a few people walking outside, no matter the time of day. There were some villages that had a few lively spots, like a restaurant or cafe close to a main square, and of course the larger city of Lamia was much busier.

Talking with locals and looking through old archival photos shows how in the past almost every settlement would have a school of its own, as the villages were full of families with children. The majority of these buildings are now unused, or have turned into culture or community spaces. In general, the lack of people in the region has had a significant impact on the provision of services. This has not only affected education but also healthcare and mobility.

Elderly woman sweeping in front of her house at Loutra Ipatis.
Photo from the author. (38.89456471878215, 22.2759918470334)

Above: Grandma Eleni looking at our family's house in Palaiovraha during the April fieldwork trip. (38.89712434857155, 22.060583488467532)
Below: Class photos from various schools of the region. Archival photos from the author.

built environment

Such rural abandonment also has had an impact on infrastructure and the built environment. In almost all the villages that were visited or researched, the majority of the buildings did not seem occupied. These showed varying degrees of neglect. Some were left completely as ruins, with roofs and walls in a state of disrepair, while others looked in relatively good condition, showing that they are probably used mostly during holidays when the owners visit. There were however some that looked recently renovated and were kept in good condition, showing few instances of people perhaps moving back to rural life. Finding accommodation in the region as a visitor is quite hard as it is non-touristic - excluding here the major city of Lamia, which has a few hotels. More worrisome than this was the state of the infrastructure. Roads and bridges showed significant damages, making traversing through the region a dangerous experience. The most intense was the bridge that crosses the stream of Vistriza. It is an important node for trans-local car mobility within the southern villages, but looked like it could collapse at any time. Municipalities or administrative bodies seem to be unable to deal with these challenges, most likely due to lack of funding for such costly repairs and the lack of staffing.

The old railway line that used to traverse the mountains, currently disused. Photo by the author. (38.89956465715921, 22.35957723296781)

Damages at the Vistriza bridge (38.882999317334935, 22.163470107140906) and the spillway bridge built during the war (38.862440814381046, 22.501383158544893).
Photos by the author.

public opinion

While attempting to reach the delta through the lowland fields, Nikos showed up and gave us directions. After a discussion about the issues of the area, he highlighted the mismanagement of the water affairs, pollution of the river from agriculture production, lack of financial help for farmers and an intense state of political inertia and corruption of the local government. At the end he exclaimed: “if you ever see the waters of Spercheios flowing up the stream, then Greece would become a proper state again”. From the brief discussions with locals, dissatisfaction with the living conditions and the inadequate response from the elected officials seems to be a constant. To move forward it is important to understand the problems from the viewpoint of the region’s residents and local stakeholders, as well as briefly examine the response from the administrative officials.

Meeting Nikos "the Vlach of Anthilé" with his herd.
Photos by the author. (38.854884986893204, 22.49163913473977)

If you ever see the waters of Spercheios flowing up the stream, then Greece would become a proper state again.

Original quote in Greek: "Αμα δεις εσύ ποτέ τα νερά του Σπερχειού και πάρουν τον ανήφορο, τότε θα ξαναγίνει η Ελλάδα κράτος" by Nikos at the end of our discussion.

through people

A 2015 comprehensive report examined how different stakeholders involved in river basin management perceive local issues and their causes (see Economou et al., 2015). While the report was conducted in 2015 it can be argued that due to the lack of actions, the same issues persists. Regardless, this research is used as a one of the means to understanding the issues at stake, but is not regarded as the sole indicator of them.

The stakeholder groups were divided into two groups: the "societal" group, which consisted of environmental organisations and the various producers and users of water like farmers, and the "public service" group of administrative and local governance officials. The first part of the methodology involved the identification of the most important management issues, according to the stakeholders, the extent to which their activities are affected by them, and the pin-pointing of their perceived causes. Then, for the second part, the stakeholders were called to describe the official processes, mechanisms and administrative bodies that are involved in water management, and to point out potential deficiencies and dysfunctions.

environmental groups

Firstly, environmental groups or NGOs were approached. Unsurprisingly, as main issues they reported the degradation of wetlands, the significant pollution, especially from the local paper industry, and the over-irrigation of surface and underground water. They also report the excessive destruction of riparian forests, as agricultural or other land uses encroach on the riparian zone. Lastly, they recognise the disturbance of the coastal and marine ecosystems through overfishing.

farmers

The local farmer associations also recognised pollution as a main problem in the region, as well as the continuous danger of flooding. The farmers of the downstream region face problems of water shortage, which they attribute to the lack of an equitable and efficient system of water distribution for irrigation purposes. According to them, the overuse of water in some parts of the river causes implications elsewhere, usually downstream. Regarding large infrastructure projects, like the railway line, the E-65 highway and flood-prevention infrastructure, different opinions emerged. The ones in the downstream area perceived them as positive, as they have lessened the flooding phenomena, but the ones midstream showed a completely different opinion. However, both groups agree that damages to irrigation networks and poor drainage have been caused due to poor design and construction of the infrastructure. Such mismanagement has only been further highlighted, considering the more recent floods of 2020-2023.

fishermen

Fishermen of the coastal areas highlighted pollution of the water through mostly agrochemical contamination. The reduction of fish stock was attributed to overfishing due to illegal activities and excessive recreational fishing. The port authority is understaffed and underfunded, thus unable to regulate such activities.

Throughout all stakeholder groups, there seemed to be a convergence regarding the ultimate cause of the persistence of all the reported issues. They characterise the administrative mechanisms as complex, inefficient and rigid, while many of them felt that there is a great lack of communication and distance between public and decision-making

administrative bodies.

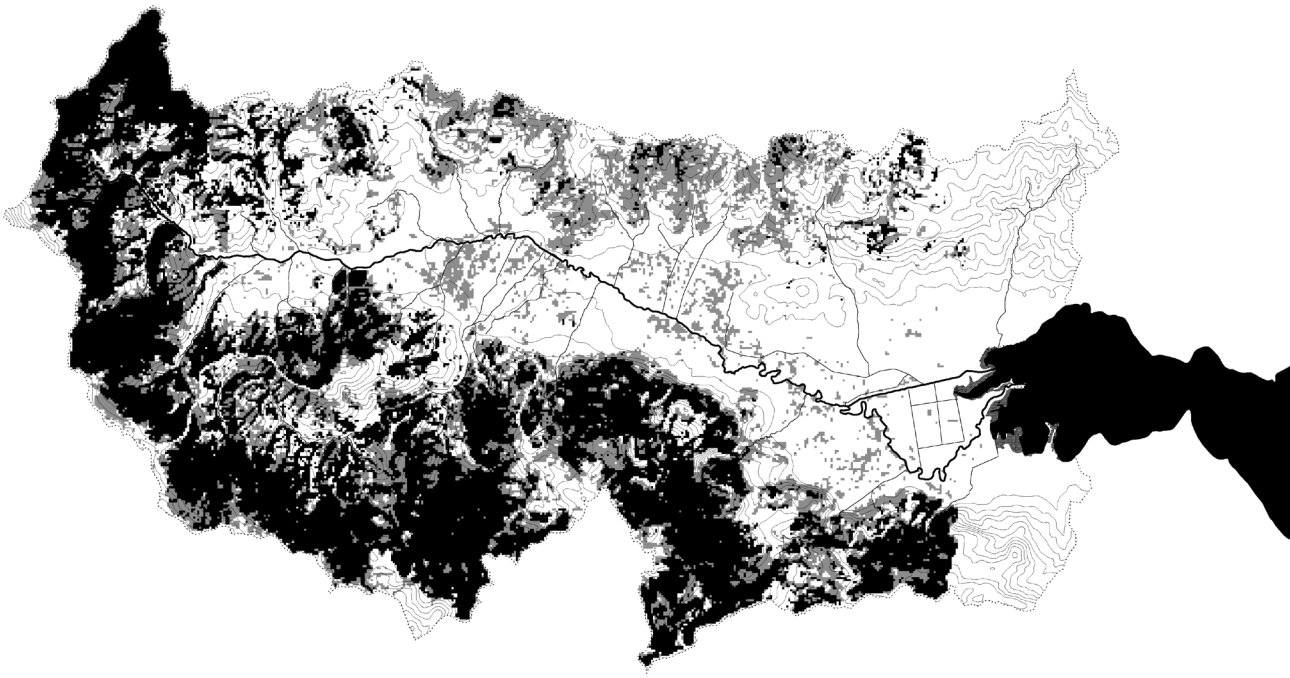
The described issues from the "societal" group were brought to the attention of the municipalities and regions, which for the stakeholder group of government officials. The majority agreed with them, verifying the presence of serious dysfunctions of the administrative mechanism, in regards to water basin management. They responded with two key causes for this. First, they point to the lack of funding and adequate staffing, which means that they do not have the required equipment or technical know-how to respond. Secondly, they point to structural issues of the administrative mechanism, as they often receive unclear provisions from the central government, as well as experience difficulties in communication with relevant services.

government officials

These main findings are summarised in a table format, linking together the perceived issue and cause from the stakeholder groups that were examined.

sub-group	perceived issues	perceived causes
environmental NGOs	degradation of wetlands	lack of implementation of nature protection policies
	pollution	industries along the riparian zone discharge their waste into the river
	destruction of riparian forest	
	overfishing	
farmer associations	pollution	lack of waste treatment for olive oil production and urban waste
	water shortage for irrigation	lack of fair and efficient system for distribution of water for irrigation purposes
	frequent flooding	
fishermen	pollution of coastal waters	illegal overfishing
	reduction of fish stock	excessive recreational fishing
	invasive species	lack of regulation from understaffed port authority
		complex, inefficient and rigid bureaucratic procedures
		lack of public participation in decision-making
government officials		limited funding
		limited staffing
		unclear provisions and guidelines from central government
		dysfunctional communication between relevant public services

Table of findings by the author, as report in (Economou et al., 2015)



tracing manifestations of growth

With an understanding of the region and of the main issues experienced by stakeholders and inhabitants, this subchapter will trace the spatial manifestations of the growth-paradigm in the Spercheios territory.

forest cover

As a predominantly agricultural region, growth-fixation was expressed through the intensification of farming practices during the last century. Firstly, looking at the scale of the entire river region, the forest cover has decreased significantly in the past fifty years, as agriculture practices started becoming increasingly more intensive. This is an obvious loss of important space for habitats, especially for the northern part of the region, where now it is predominantly characterised by shrub vegetation or heathland. These intense changes to land cover and use also have significant effects on the annual evapotranspiration, average river discharge, which increase the vulnerability to floods and droughts (Mentzafou et al., 2020, p. 8).

Forest cover has gradually reduced significantly over the past half century, especially at the northern part of the region. Adapted from (Mentzafou et al., 2020, p. 8)

forest cover 2013

forest cover lost from 1972

Prevailing plant types throughout the Spercheios bioregion. Drawing by the author with data from http://geoportal.ypen.gr/

oak forest

fir forest

shrub vegetation

10 km

N

agriculture landscape

The above series of aerial photos highlights the formalisation process of the agriculture landscape. The zone along the mountain base or at the most western part of the region has remained largely untouched, with small plots and a lot of forest cover through hedgerows and forested patches. These plots of land usually belonged to residents from the local villages, but as they moved away and lost connection with farming practices, the land also was left unmanaged. This pattern of landscape is not only more beautiful in experiential terms, but also ideal for combining farming with ecological functions, as the small plots result in more diverse crops and ensuring biodiversity.

As agriculture started becoming more intensified over time, farmers were incentivised to remove trees from their plots in order to increase their yield. Eventually, a grid was imposed on the landscape, merging the smaller plots of land into larger, more productive ones. This resulted not only in a loss of character, of the cultural landscape, but also resulted in weaker soil due to the monocultural nature of production, while providing no space for habitats, let alone stepping stones between the protected nature zones. In terms of experience, it also resulted in a mundane landscape of production, a far-cry from the beautiful cultural landscape that was once there.

Different patterns of agricultural landscapes throughout the region of Spercheios. Aerial images from Google Earth.

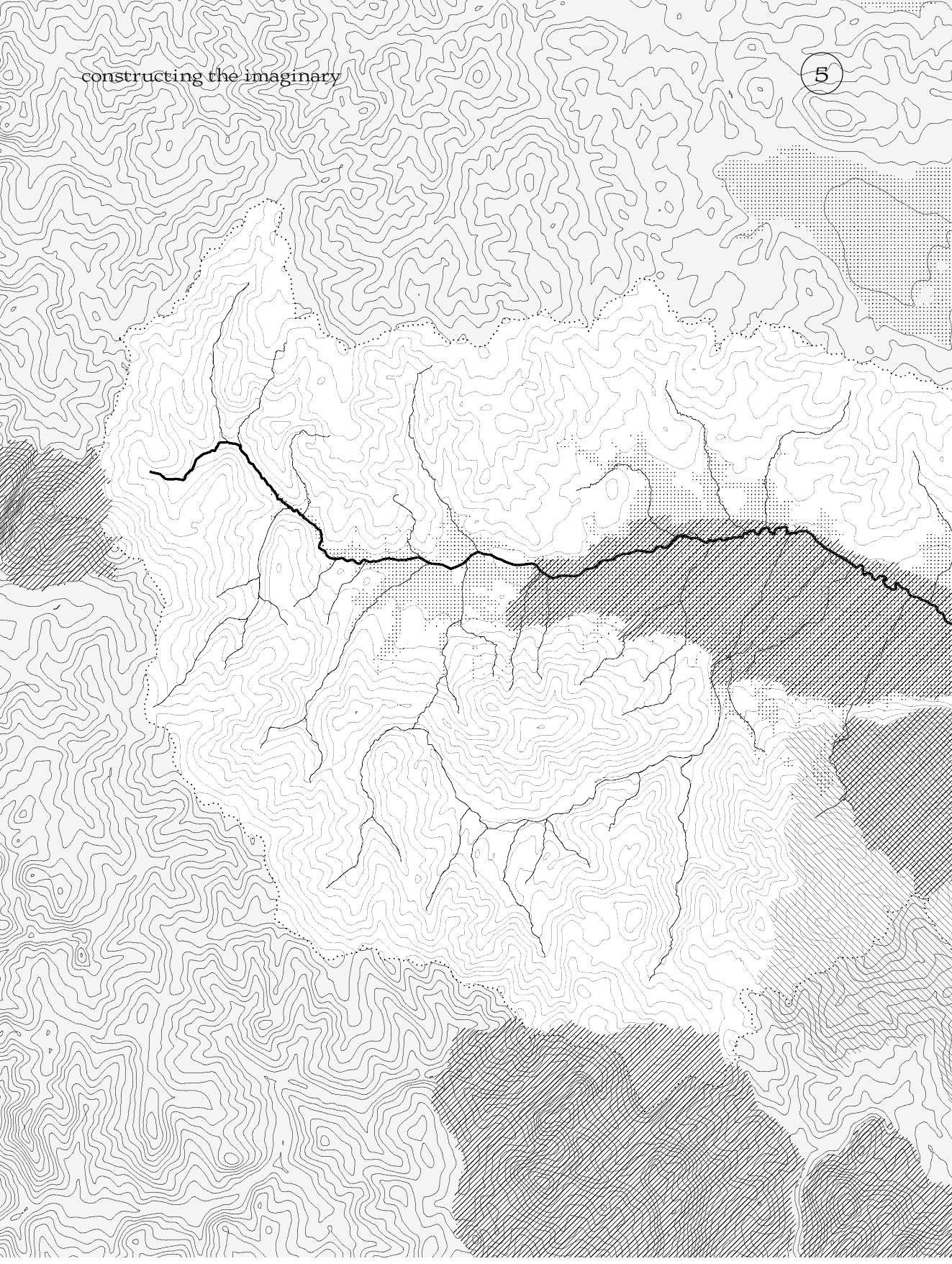
Left: traditional agriculture lanscape around the village of Agia Triada (38.909630316538916, 22.03584740455541)

Middle: process of agriculture land formalisation around the village of Karya (38.91335223087789, 22.215454813007458)

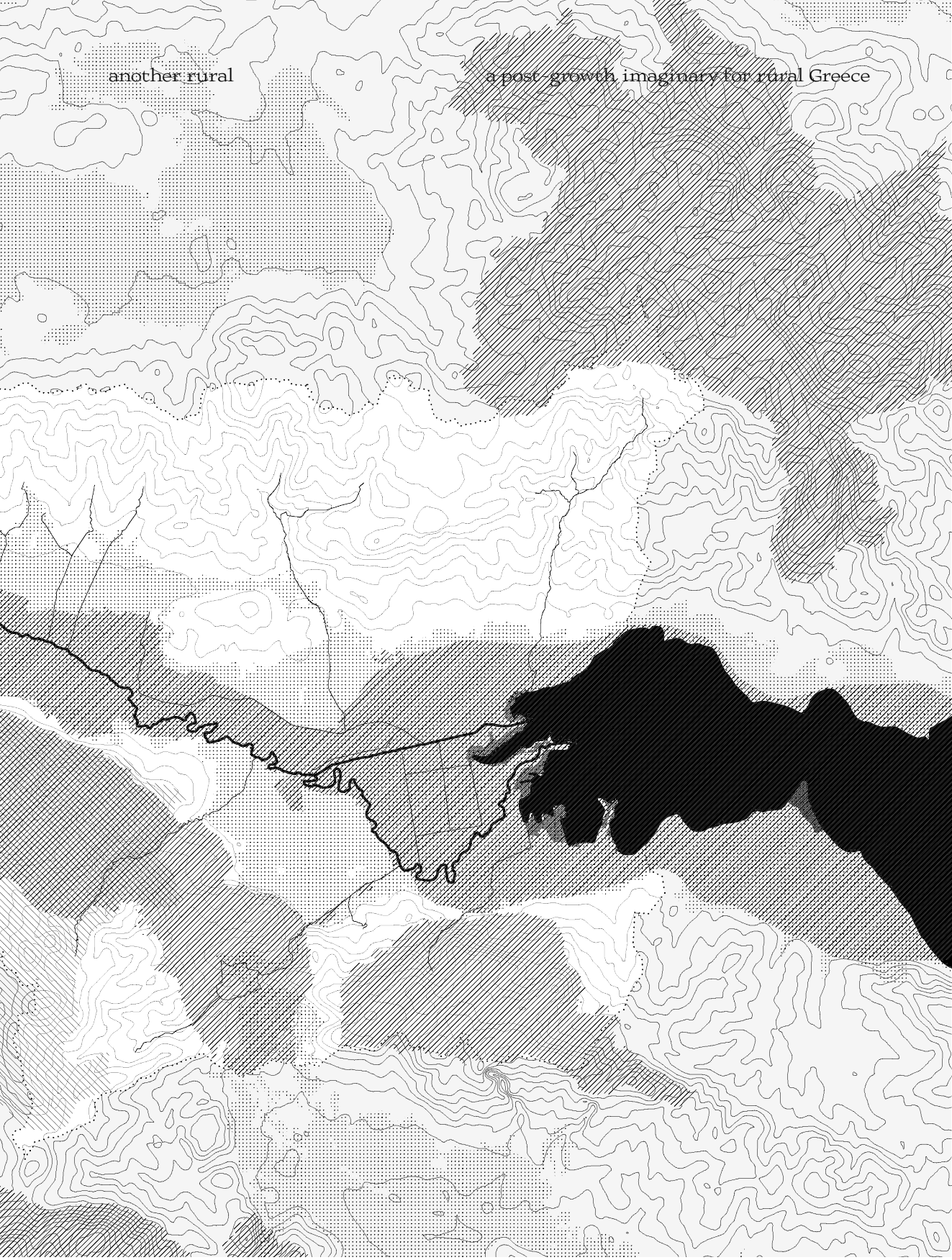
Right: monocultural agriculture landscape around the settlement of Spercheiada (38.920813971375885, 22.133978959503086)

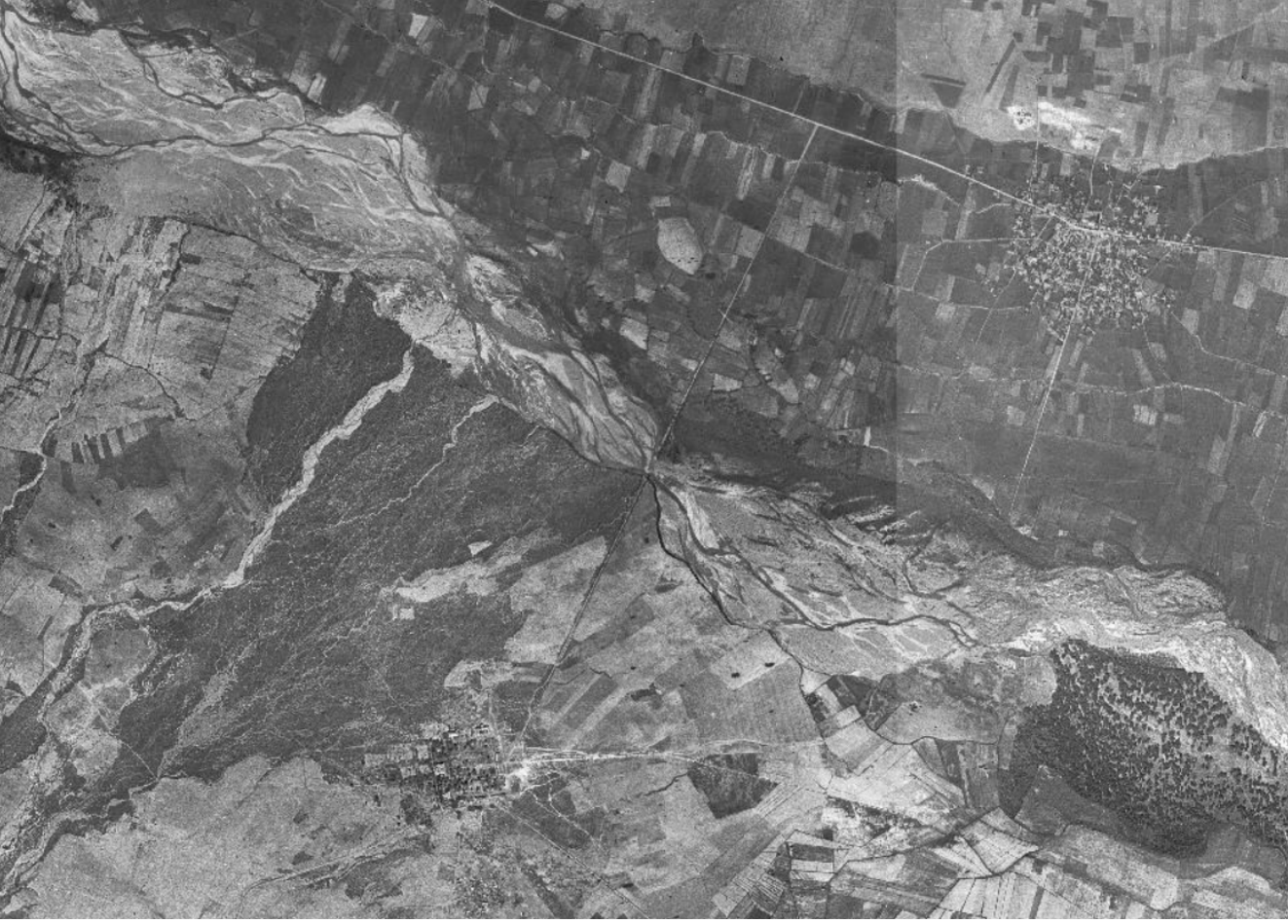
400 m

N



The basin of Spercheios is both in high risk of flooding, but also protected as part of the Natura 2000 network. Drawing by the author with spatial data from http://geoportal.ypen.gr/


another rural
a post-growth imaginary for rural Greece
natura 2000
national forest
flood risk zone
5 km
N



space for water

This intensification of the agricultural landscape has also coincided with the shrinkage of the riparian zone, leaving very little space for water to flow and the river to meander. One such instance can be seen close to the village of Loutra Ipatis - seen in the aerial photo above. In the middle of the twentieth century, the riparian zone was wide, with many sub-streams and meandering formations. A “choke-point” can be noted between the two larger river patches, which was probably done in order to provide the conditions for the construction of the bridge that connects Loutra Ipatis with Lianokladi.

In contrast, the width of the riparian zone has been significantly reduced, as seen in the most recent aerial photo to the right. The invasion of the formalised agricultural land is evident around the entire river. Remarkably, a stream that used to recharge the river (seen at the left of both aerial photos) seems to have disappeared almost entirely and the land use changed to fruit tree cultivation. Also, another thing that can be noted is the presence of much more forest cover along the river. While this could be interpreted as a positive outcome for local biodiversity, it is a likely result of the poor management of the riparian zone. Without proper care and clearing of the forested area from time to time, the fallen tree trunks have ended up blocking the water flow during advents of high rainfall and resulting in floods that endanger the locals and cause damages to the riparian cultivated land.

Significant shrinkage of the riparian zone. Retrieved from the cadastral map service Ktimatologio https://gis.ktimanet.gr/gis/apr/ and Google Earth (38.90722412094756, 22.28394875252905).

This is not an isolated phenomenon - it is evident throughout the entire region. While almost the entirety of the Spercheios valley and the riparian zone are part of the Natura 2000 network, such intense changes to the natural landscape expose the dubious state of environmental protection.

500 m

N

engineered nature

During the late nineteen sixties, a linear spillway was constructed in the northern part of the basin, as part of the national effort to modernise the water basin management. During this period, riparian zones and wetlands were seen as unhealthy areas that would be a breeding ground for mosquitoes; hence requiring drainage projects. This can be attributed to various cultural and historical reasons, with the most important being Greece having the highest prevalence of malaria in Europe at the beginning of the twentieth century (Zogaris et al., 2018, p. 405). Aside from being a flood-prevention project, the spillway provided easier irrigation to the expanding agricultural coastal zone. When visiting this area, very little water could be noticed flowing in the actual river after the diversion point, while the spillway was full. Also, the area proved incredibly hard to access, even via car. The environment around the spillway has a vastly different character, as not many plants or animals could be noticed there - much different to the forested parts of the river.

The man-made linear spillway throughout the last seventy years.
Retrieved from the cadastral map service Ktimatologio https://gis.ktimanet.gr/gis/apr/ and Google Earth. (38.84968411080656, 22.44553579268925)

1957
construction of
diverter

2020
cleaning of
emergent ripari-
an forest

2024
current situation

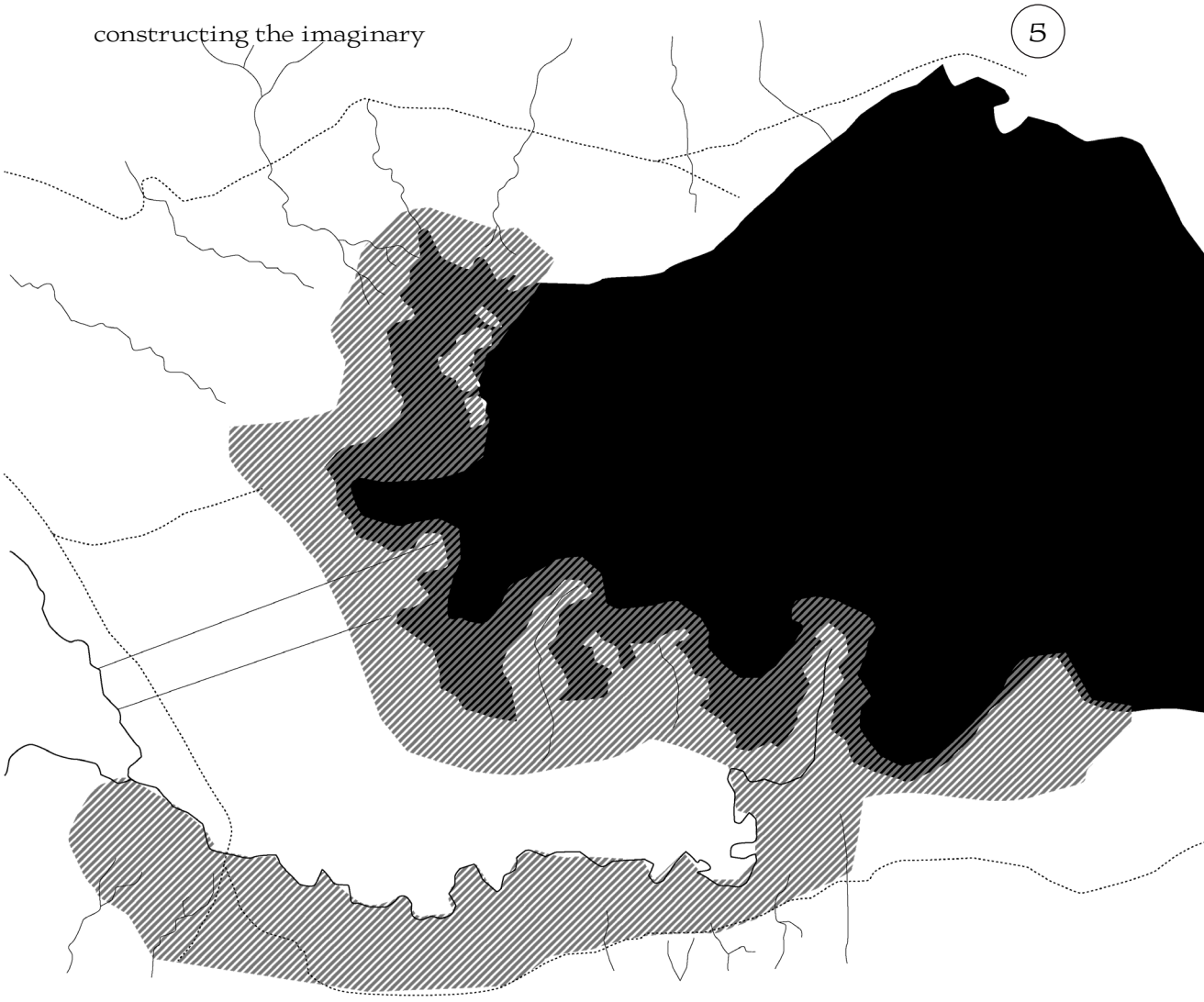
100 m

N

engineered nature

When visiting this area, very little water could be noticed flowing in the actual river after the diversion point, while the spillway was full. Also, the area proved incredibly hard to access, even via car. The environment around the spillway has a vastly different character, as not many plants or animals could be noticed there - much different to the forested parts of the river.

The linear spillway leading immense amounts of water towards the delta.
Photo by the author. (38.862440814381046, 22.501383158544893)



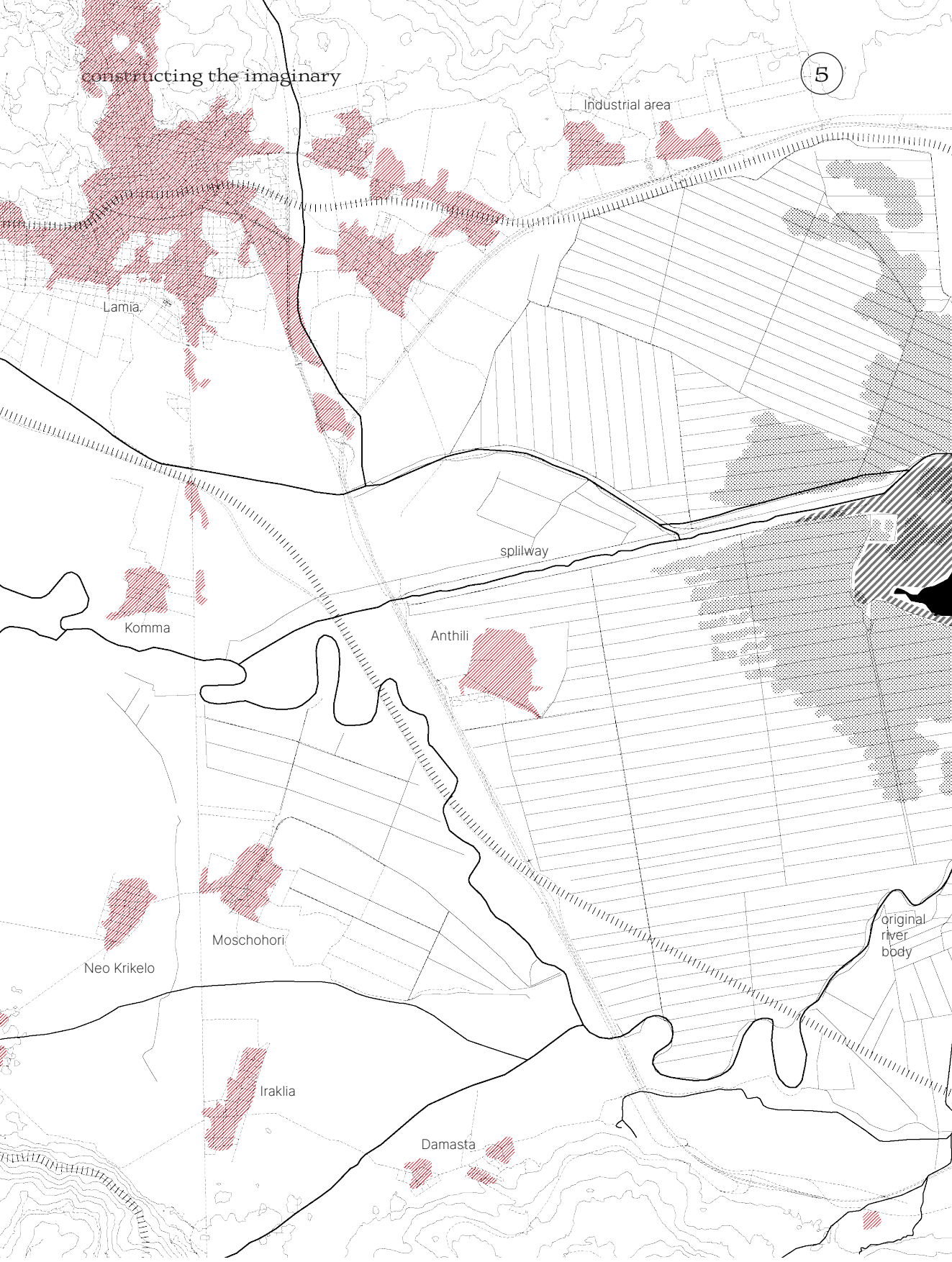
through history

To understand the significance of this change, a brief exploration of the history regarding the Spercheios region can reveal the dynamic character of the coastal area. The landscape surrounding the Maliakos Gulf has experienced many changes throughout time. Six different rivers discharged separately into the Gulf in antiquity, while the coastline was about eight kilometres further back to where it is today. This is a testament to the material discharge from the river system, which continuously moves the coastland towards the Gulf. Much more recently, during the start of the eighteenth century, Spercheios met the Gulf at the northern part of the basin, but the course changed to the south possibly due to an earthquake that took place around 1740 (Mentzafou et al., 2020, p.6).

During the nineteenth century, few irrigation works can be noted, with small linear streams discharging from the river towards the gulf, while the marshland is still present throughout the coast and riparian zone. However, the course of the river changed again towards the centre

The changes to the delta of river Spercheios over time. Left: 19th century. Right: 1944
Drawing by the author, adapted from (Mentzafou et al., 2020).

of the Gulf. The source of this change is also not confirmed, and could be connected to a great flood, an earthquake or due to the land reclamation projects (Mentzafou et al., 2020, p.6). At the midpoint of the twentieth century, the landscape has already changed drastically. The majority of the existing wetland has been claimed for agricultural uses, while a more complex system of channels has been set in place.



Current water management at the coastal area of the Spercheios river basin.
Drawing by the author, adapted from (Mentzafou et al., 2020).

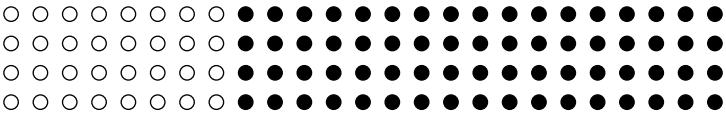

Avlaki
Stylida
Agia Marina
Livari
Maliakos Gulf
Agia Triada
Molos
Thermopiles
marsh
road network
flood risk
main river body
irrigation channel
built environment
railway
1 km
N

wetland degradation

The balance of the coastal ecosystem has been heavily destabilised due to the engineering interventions of the past century. These changes can be better understood through the orthophotos provided by the national cadastral service. The coastal landscape at the middle of the last century was characterised by an extensive deltaic ecosystem. At the same time, some island-like patches can be noted, formed through the flow of water over time in this muddy, shallow Gulf. The tidal nature of this ecosystem is apparent, with meandering lines piercing the land from the sea. The current situation looks much more different. The agricultural land has invaded the coastal area almost in its entirety. Much like the polder system of the Netherlands, a complex grid-like structure of large-scale plots are drained through irrigated ditches, resulting in a harsh border where the old coastline used to be. With the construction of the linear spillway a new deltaic system emerged at the northern part of the estuary, displacing the old delta structure. At the same time, a decrease of the advancement rate can be noted at the southern part, or even a retreat (Mentzafou et al., 2020, p.6).

Unfortunately, the degradation of the wetlands has not been limited to this region. For the entirety of Greece, it is estimated that up to sixty eight percent of Greece's wetlands have been drained or completely destroyed during the twentieth century (Zogaris et al., 2018, p. 405). The importance of these ecosystems can not be understated. They are key stops for global migration routes and precious assets for carbon storage.

Coastal wetlands of the Spercheios region in 1945-1960 (left) and 2016 (right).
Retrieved from the cadastral map service Ktimatologio https://gis.ktimanet.gr/gis/apr/
(38.854809898144744, 22.53893022952493)



68% of Greece's wetlands were drained or destroyed during the 20th century

Extent of wetland degradation in Greece.
Data by Zogaris et al., 2018. Diagram by the author.

1 km

N

soil

The expansion of the cultivated land through the invasion of the delta landscape has not proven to be fruitful in the long run. Salinisation and degradation of the soil quality is evident throughout the entire coastline. A large part of the lowlands, at the area along the old river, is even listed as infertile. To cope with this, a large amount of artificial fertilisers is needed, which in turn pollute the underground water bodies causing significant issues to irrigation and to the settlements that are reliant on them for drinking water (Stathopoulos et al., 2017). Also, similarly to the Dutch case, continuous efforts to pump the groundwater towards the sea has caused ground subsidence and erosion, exacerbating risks of flooding.

Soil degradation of agriculture land along the coastline.
Retrieved from the cadastral map service Ktimatologio https://gis.ktimanet.gr/gis/apr/ (38.8763558282748, 22.538824476320915)

100 m

N

Soil degradation of agriculture land along the southern gulf coastline.
Retrieved from the cadastral map service Ktimatologio https://gis.ktimanet.gr/gis/apr/ (38.819882513314, 22.570069330885463)

400 m

N

the delta

The entire river basin, coastal and marine areas are parts of a highly interdependent and complex ecosystem that is highly sensitive to anthropogenic interventions and climate change (Mentzafou et al., 2020, p. 24). As such, Spercheios is the key-factor in determining the biodiversity of the Maliakos Gulf (p. 19). This site is regarded as the most important wetland in eastern, central and southern Greece, according to the Hellenic Ornithological Society, where more than twenty thousand waterbirds are hosted regularly, as well as wintering and migrating ones. More than 167 different fish taxa, 36 crustaceans and 11 cephalopods have been recorded here, especially at Livari, the area near the mouth of the spillway. It is also a beautiful landscape, which is unknown and under-appreciated within Greek people.

pollution

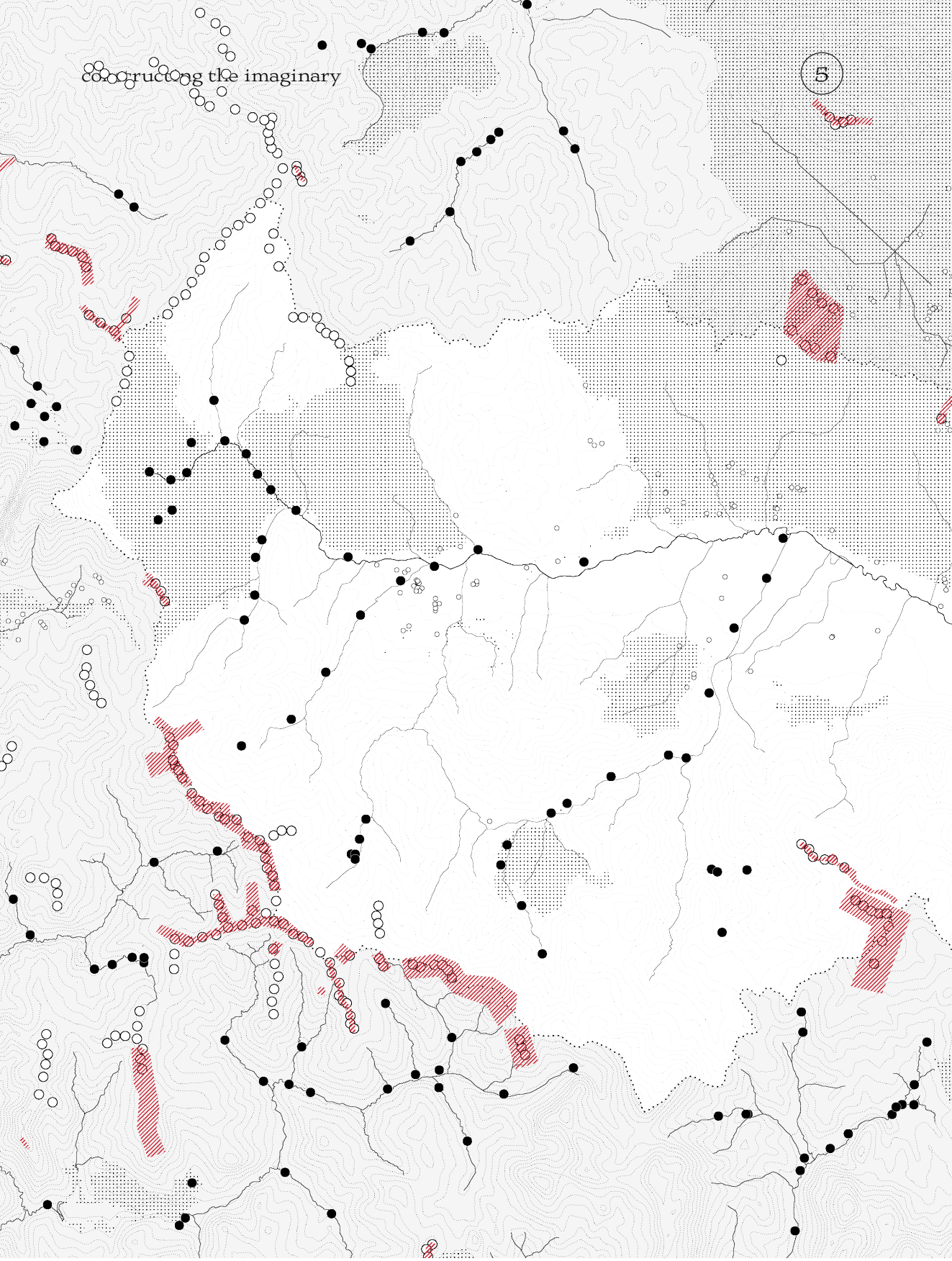
However, a lot of pollution is present in many areas of the lowlands and coastal areas. Without proper material waste management, natural areas like these often end up as dumping ground for trash of all kinds. This issue is known among locals and has been brought many times to the attention of the local governance officials, as noted at the end of the previous sub-chapter, but to no avail. Simultaneously, the region lacks proper waste water treatment in all levels. Waste from the city of Lamia and its industrial area are discharged into the river, after only a brief processing and removal of carbon and nitrogen. This has obvious effects to the water quality of the downstream area, with the highest deterioration being noted on the deltaic part itself (Stathopoulos et al., 2017, p. 783).

A flamboyance at the edge of the Spercheios delta landscape.
Photo by the author. (38.82176108379053, 22.59401205051316)

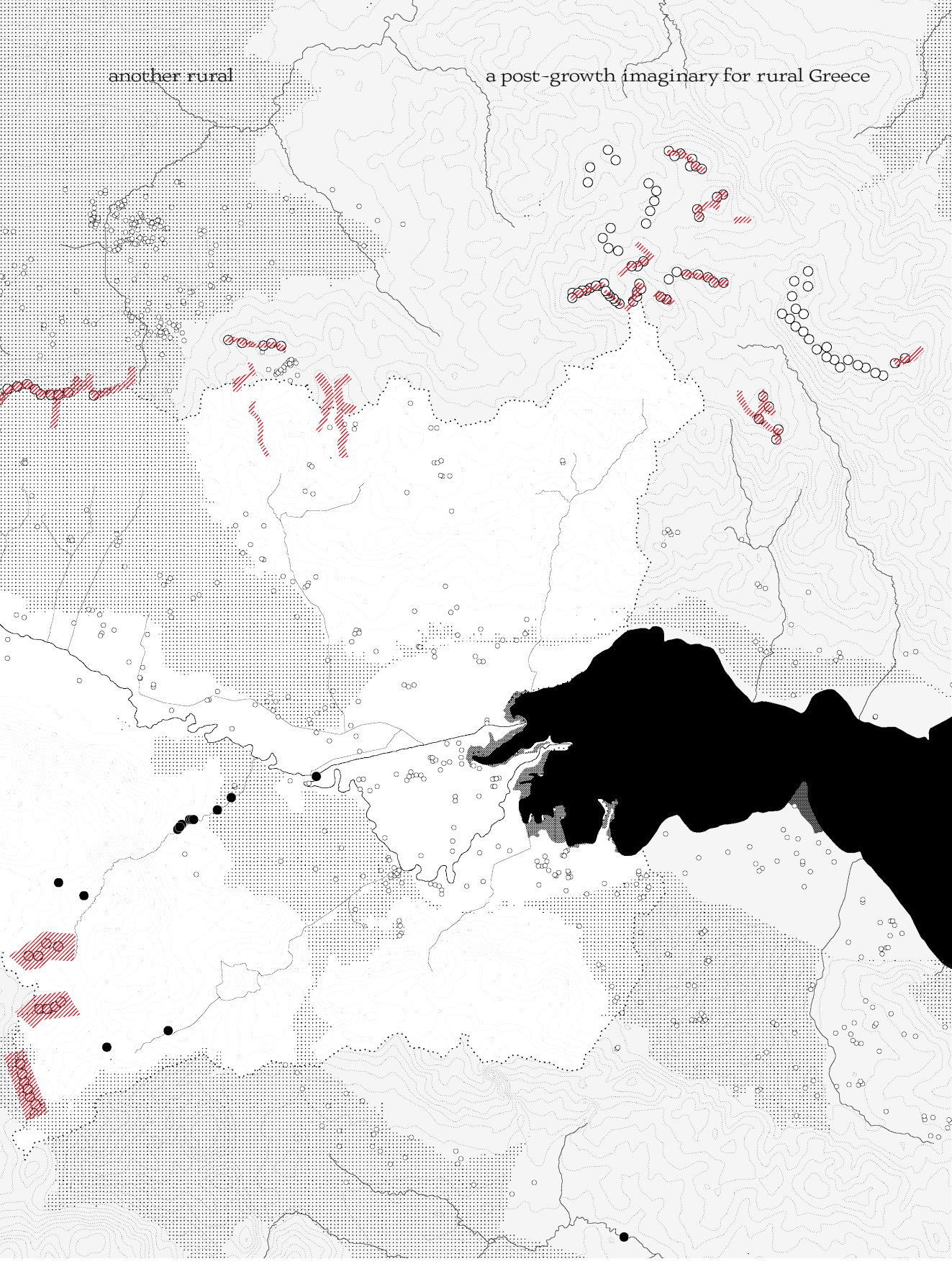
conclusions

Tracing the manifestations of growth in the land and the soil revealed a series of highly interconnected issues that are accurately reflected in the issues mentioned by the stakeholders at the previous subchapter. Thus, it becomes evident that a paradigm shift is required towards the management of the watershed, in order to limit the degradation of the present ecosystem and to ensure conservation and regeneration efforts. Policies regarding environmental protection are not necessarily lacking, but are almost completely unenforced. A more systemic change would be required.

Trash along the delta landscape.
Photos by the author. (38.82176108379053, 22.59401205051316)



A growth-based scenario for energy production: all hydroelectric stations and wind/solar farms that have received a construction or operation permit as of 2023, with the investment zone proposed by (Kati et al., 2021).
Drawing by the author with spatial data from https://geo.rae.gr/ & http://geoportal.ypen.gr/


another rural
a post-growth imaginary for rural Greece
operating wind farm
wind turbines
hydroelectric station
solar panel locations
investment zone
5 km
N

energy overshoot

Having traced manifestations of the growth paradigm to the natural environment, this exploration is furthered into the energy landscape. Here, the energy overshoot trend that was highlighted as a barrier towards the post-growth transition in the previous chapter will be further investigated within the selected key-region of Spercheios.

mapping wind

Through mapping the potential in energy production within the bioregion, it is evident that this trend is prevalent here too. Regarding wind energy, a myriad of turbines at the mountainous regions can be noted, especially along the north-western and south-western edges of the water basin. Of them, only the ones hatched are actually currently in operation - the rest have received a positive response in the permitting process, either for construction and/or operation. If all of the output of all existing and potential projects would be added, it would amount to 615.5 megawatts per year. While they are not placed within Natura zones, many environmental scientists denounce the construction of such large-scale projects in the mountaintops, as they would disturb the bird ecosystems.

mapping water

Looking at the hydroelectric potential of the region, the number of Small Hydroelectric Plants (SHPs) that have received a construction or operation permit as of 2023 is quite worrisome. Each with a potential output of less than one megawatt per year, would be small-scale production units that generate energy through the movement of water. Despite being considered a relatively low-impact renewable source of energy,

Solar panels in a small plot somewhere at the southern part of the Spercheios region.
Photo by the author.

they can have significant effects on the river ecosystem. They usually receive an amount of water from the flow of the river and divert it towards the main building further downstream, or within run-of-river projects, they require the construction of a dam that directly generates energy with the flow of water. Both cases can disturb the river integrity and fish migration, albeit much more significantly in the latter. At the same time, the construction of so many SHPs would require access roads for maintenance and construction, which would heavily disrupt the forest habitats as well. The total output of all these projects would be 39.2 megawatts per year for the bioregion of Spercheios.

mapping solar

Lastly, small-scale solar energy production can be seen mostly throughout the northern part of the valley, as it receives the most sun due to the high mountains in the south. Usually, previously-cultivated plots of land have been populated with solar panels for the use in agricultural activities. No large-scale solar farm can be noted as of now. The total output of such projects amounts to 110.4 megawatts per year. All solar, hydroelectric and wind energy production in the region totals 765,1 megawatts per year for the bioregion of Spercheios.

investment zone

A 2020 report highlights this global paradoxical phenomenon of biodiversity trade-offs within the renewable energy transition and investigates specifically the context of Greece (Kati et al., 2021). Here, the researchers suggest an operational basis for Greece in an attempt to counteract the lawless expansion of the energy sector that is forecasted.

Electrical grid lines in wooden posts, glittering in the sun.
Photo by the author.

Regarding wind energy, they propose an investment zone and a wind-farm-free zone - two exclusionary territories. The windfarm-free zone comprises all areas that have ecological importance, like the Natura 2000 territory, Special Protection Area and Sites of Community Importance for habitats and species conservation. This zone accounts for a little less than sixty percent of the terrestrial Greek territory. Antithetically, by mapping the fragments created through the national mobility network, they propose a prioritisation of investment in the areas that are most fragmented already and that lie outside of the Natura network. In this way, construction would potentially require less infrastructure for construction and service access, and would not alter the spatial continuity of protected zones.

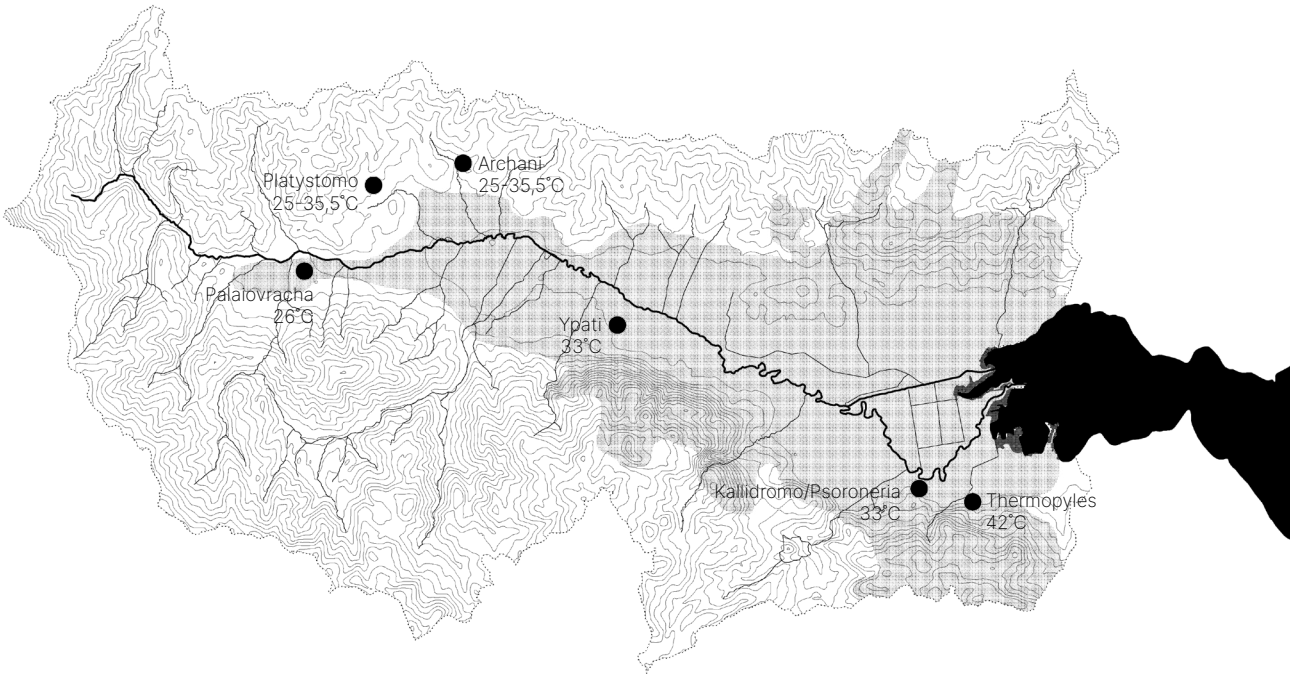
Interestingly enough, for the region of Spercheios, almost all existing and proposed wind turbine locations lie outside this investment zone. The ideal locations for wind energy are in the highest mountaintops of Oiti, where air velocity is highest. However, the integrity of these "unapproachable" natural habitats would be at risk, showing the difficulties in implementing such nation-wide policies.

post-growth & energy

Here, the post-growth agenda would propose a diversification in energy production within the bioregional territory, attempting an equilibrium of efficiency and environmental protection. Hinted through this speculative investment zone, wind energy production could be far more prevalent throughout the valley of Spercheios, with much smaller turbines

The mountaintops of Oxia.
Photo retrieved from http://www.paleochori.gr/2017/03/

than the ones installed in the mountaintops. At the same time, rather than focusing on large-scale energy production in a growth-based scenario of overshoot, the adaptation of existing settlements to small-scale energy sufficiency should be a priority, perhaps through the incentivisation of small self-organised energy communities. For the benefit of the already degraded river ecosystem, hydroelectric energy production should remain minimally explored. Of course, all such efforts ought to be highlighted from a conscious limitation of energy consumption through not only industry and agriculture adaptation, but also through personal changes towards a low-input yet prosperous lifestyle.



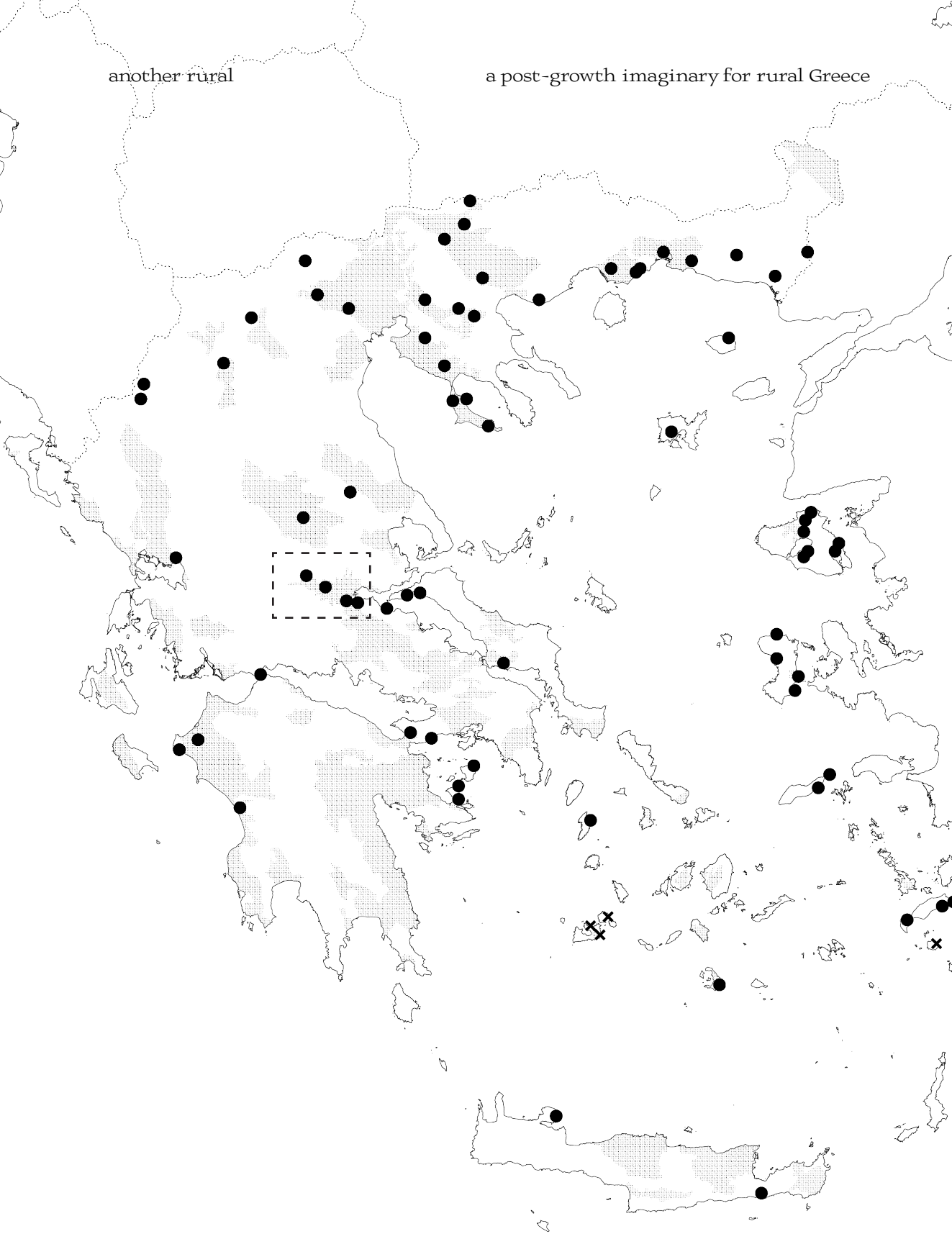
geothermal energy

Related to manifestations of growth in the energy sector, the attitude towards geothermal springs is relevant towards the construction of a site-specific imaginary. Greece in its entirety has many thermal springs, due to its geomorphological and tectonic nature. The region of Spercheios has a significant concentration of springs, however with relatively low surface temperatures. The water of many of the Greek thermal springs has therapeutic qualities, and in the past they used to be important nodes of internal tourist attraction. This has slowly faded overtime, but remains in people's perception as a means to recover the economy of their surrounding areas. When discussing the future of the region during brief interactions with locals, almost all of them highlighted the revitalisation of thermal spring tourism as a way that could bring prosperity to the region. While this suggests a more mild form of tourism, unlike the schemes that have developed in the islands, it also does constitute a growth-paradigm lock-in. As was explained in the previous chapters, the growth promised through tourism disallows other opportunities to emerge, like the potential for geothermal energy in this case. However, for the entirety of Greece the geothermal energy potential remains almost completely undiscovered.

Several thermal springs are present within the region of Spercheios. Drawing by the author with spatial data from http://geoportal.ypen.gr/

10 km

N



Locations of thermal springs and underground water bodies within Greece. Drawing by the author with spatial data from http://geoportal.ypen.gr/

underground water body

thermal spring

geothermal plant

100 km

N

defining the post-growth agenda

All of the examined issues, opportunities, risks and ambitions form a contextual bioregional post-growth agenda for the bioregion of Spercheios, which are later summarised in a table format.

Firstly, through the examination of the contextual problems and causes, and their spatio-historical tracing towards the growth-paradigm, the character of the current water basin management has been illustrated, characterised by a lack of adaptive qualities and integration of the human dimensions within the environmental aspects (Mentzafou et al., 2020, p. 24). The bioregional approach here would require a vastly different perspective, one that would "perceive river basins and coastal marine areas as an integral unit, incorporating community-based adaptive management, the human dimensions and social science" (p. 25). Such an approach would also have to consider "a level of uncertainty and continuous adaptation through an interdisciplinary approach" (p. 24) for complex and sensitive ecosystems like the Spercheios region. The rigid and dysfunctional administration that is in place now would not be able to enact such changes easily - a systemic reorganisation is required.

institutional agenda

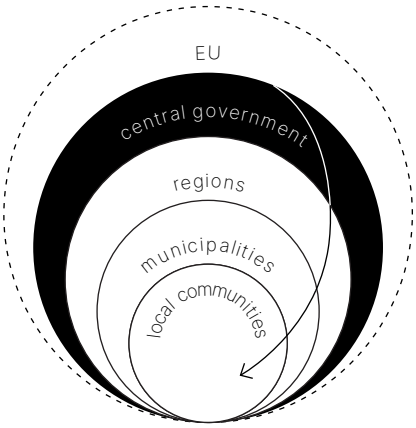
As was examined in the theoretical framework, bioregionalism proposes a shift towards the geomorphological and ecological reality in decision-making - which in turns offers a territorialisation to the post-growth transition. The most important element that enables the formation of the post-growth imaginary is the change to such an administrative system. More specifically, the current governance scheme can be described as top-down, as decisions and policy-making is happening almost exclusively from the central government. Regarding water basin management or environmental protection, this is usually a poor interpretation of EU regulations, without careful consideration of context-specific conditions and needs. This is to be expected since the decisions are being taken at such a high, abstracted level - out of context and without consulting locals. Regardless, these decisions, in the form of often poorly-written and almost purposefully complex policies, trickle down towards the other governing bodies. Despite having a clear hierarchy in terms of territorial scale, the processes are characterised by intense bureaucracy and lack of clarity in responsibility or jurisdiction. Thus, information is misinterpreted or lost in each administrative shift, creating an overall environment that lacks transparency and evaluation.

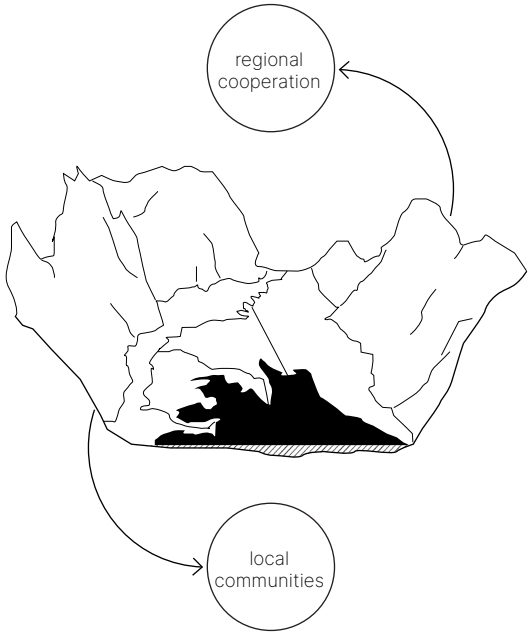
In contrast to such a system, the bioregional approach could be interpreted as the formation of a new administrative body, that exists between Regions and Municipalities, tasked specifically with the decision-making for the territory-at-stake, the bioregion. Such a governing body would inform and be informed by the many localities, as they would have to implement the changes and are most affected by them. At the same time, the cooperation between the different bioregions would also be at most priority, and could be the responsibility of either another administrative body or the central state.

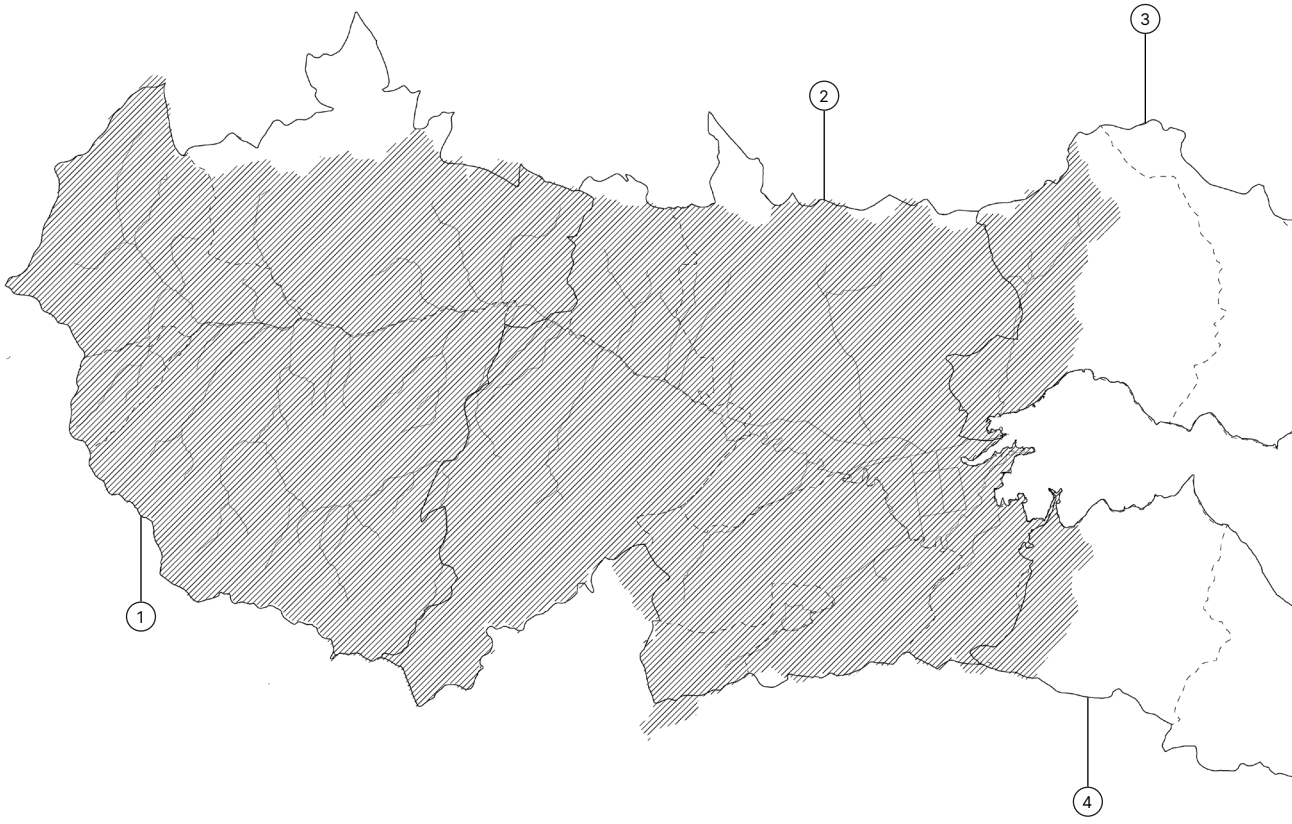
For the specific context of the Spercheios bioregion or river basin, the river flows through two different municipalities: the municipality of Makrakomi and municipality of Lamia, which both totaled about eighty

Above: From trickling top-down decision-making to a bioregional territory-based administrative system. Diagrams by the author.

Below: Overlay of the water basin on the current administrative borders. Diagram by the author.







1 Municipality of Makrakomi
837 square kilometres
16.036 residents in 2011
13.500 residents in 2021

2 Lamia
947 square kilometres
75.315 residents in 2011
66.657 residents in 2021

3 Stylida
461 square kilometres
12.750 residents in 2021
11.389 residents in 2021

4 Kammena Vourla
339 square kilometres
12.090 residents in 2011
10,924 residents in 2021

thousand residents in 2021. The water basin itself also extends towards the municipality of Stylida and Kammena Vourla, albeit for a very small part of their territory. For the most part, it is evident that the boundaries of the basin are matching the administrative borders already, which could make this speculative administrative system easier to implement. Thus, in terms of institutional changes, the most important change that enables a different imagining of a post-growth future is the formation of a bioregional administrative body. This would be starkly different from the current system, and would enact decision-making through an equitable, research-based and data-driven management of the river basin.

ecology

Ecology would be at the core of the bioregional thinking and thus prioritised. To allow more space for water to flow and for riparian habitats to flourish, the riparian zone ought to be expanded, coupled with a shift towards exclusively agroforestry practices for the entire valley of Spercheios. As this would be translated to a lower production yield, mild agroforestry practices could expand towards the mountainous forested zone, ensuring simultaneous prevention from forest fires through grazing and better land management. Lastly, but perhaps the most important and ambitious project proposed is the regeneration of the coastal wetlands. This is imagined as a reclamation of the infertile and polluted agricultural land for nature by deteriorating the protective dikes and letting the tidal landscape re-emerge.

economy

Such changes to the landscape would require much more employment in the agriculture sector, as they are more labour intensive and require much more resource and knowledge sharing. The coastal area would also have to shift towards different production means that would be adapted to saline water and to the changing climate - thus forming a more resilient economic model. In general, the post-growth approach requires much more investment and employment to the service and healthcare sector, considering the ageing population and the need to revitalise the provided service, in order to also attract more permanent residents in the rural region. A similar focus ought to be placed on the craft sector, revitalising lost techniques of production that were already more in-tune with the environment, aiding in closing local production loops.

infrastructure

In terms of infrastructure, a multi-scalar approach needs to be considered in both adaptation to sufficiency in water and energy availability, and to conditions of flood, drought and extreme weather. Adaptation measures need to be equally implemented to the scale of the individual house, village and cluster of settlements and the region as a whole. Against poorly engineered and costly infrastructure, that has historically failed to be implemented adequate, nature based solutions should be prioritised for the management of the river. At the same time, traditional practices of land and water management that have been almost forgotten need to not only be documented, but also considered as means of adapting to the changing climate through combining them with a more high-tech approach.

Fundamentally, the implementation of the items of such a contextual post-growth agenda would need to coincide with a measured population influx to the region. Along with individual changes to lifestyle and moving away from a consumerist and isolated way of living in mostly

urban centres, an increase of rural services and subsidisation could prove sufficient formal measures towards this purpose. Deeper engagement with processes of decision-making and supporting radically green politics is necessary.

towards a post-growth narrative

Exploring such an imaginary solely with traditional spatial planning means, like vision maps and policy documents, would not be sufficient in illustrating the complexity and interconnectedness of the issues. When considering the absence of spatial planning and relevant experts in the region, such a deliverable would not have an actual recipient. Instead, in order to create a more relatable, engaging and challenging imaginary, a narrative will be formed through the perspective of one dweller, traversing throughout the bioregion during the time-frame of one typical day.

dimension	item of bioregional post-growth agenda
institutional	formation of bioregional administrative body
	decision-making through data-driven management of the river basin
ecological	expansion of the riparian zone
	shifting the intensive agriculture production to agroforestry practices
	prevention of wildfires through grazing and mild agroforestry practices
	regeneration of the coastal marsh/wetland
economic	shift to mainly agriculture employment
	more investment to the service, nursing and craft sector
	adaptation of the coast to wet agriculture
infrastructural	adaptation to energy and sufficiency
	adaptation to conditions of drought and flooding
	emphasis on nature-based solutions to river management
	diversified and multi-scalar energy production and storage
	traditional practises of land and water management
social	engagement to decision-making and green politics
	population increase of existing villages

The post-growth agenda within the context of the bioregion of Spercheios. Table by the author.

phasing

institutional agenda

bioregional administration

1 formation of trans-continental policy on Mediterranean bioregions through the EU
2 pilot formation of bioregional unit at the river basin of Spercheios
3 establishment of the bioregional administrative units through Greece, enabling trans-bioregional cooperation and accelerating adaptation measures

ecological agenda

riparian regeneration

4 extensive surveying of existing riparian conditions
5 expansion of riparian zone into nearby agriculture zone through land expropriation
6 expansion and remeandering of the river at key locations, especially at the lowlands area of the bioregion where the river is mostly constrained
7 rewildening of riparian zone with native plants and re-introduction of wild grazing animals
8 slowly diverting more water towards the original river body at the lowlands and monitoring its consequences to biodiversity
9 closing and deconstructing the spillway entrance point

wetland restoration

10 initiation of wetland reclamation project at the infertile agricultural land
11 first signs of increased biodiversity and decrease of soil pollution levels
12 engagement of local farmers and gradual expansion of the wetlands towards the lowlands
13 unification of brackish water reservoir
14 adaptation towards wet, saline-resilient agriculture through transnational cooperation and knowledge sharing

shifting to agroforestry

15 collaboration with universities and farmers throughout Greece for documentation of local agroforestry practices
16 agroforestry pilot projects throughout the bioregion
17 engagement of local farmers to shift to agroforestry practices
18 subsidisation of agroforestry and other regenerative practices
19 formation of (trans) bioregional land- and labour-sharing network using familiar practices as basis
20 collaboration with other Mediterranean bioregions for up-scaling of practices and knowledge sharing for climate-resilient crops

economic agenda

agricultural economy

21 heavier taxation on environmentally-taxing farming practices
22 incentives and subsidies for young farmers, especially women to engage with rural food production

craftsmanship

23 collaboration with local museums and experts about documentation and research of traditional craft practices
24 collaboration with current practitioners and artists for exhibitions
25 engagement the public in appreciation of craftsmanship
26 subsidisation for craft-related jobs and creativity sector
27 establishment of craft schools throughout Greece

infrastructural agenda

adapting to local sufficiency

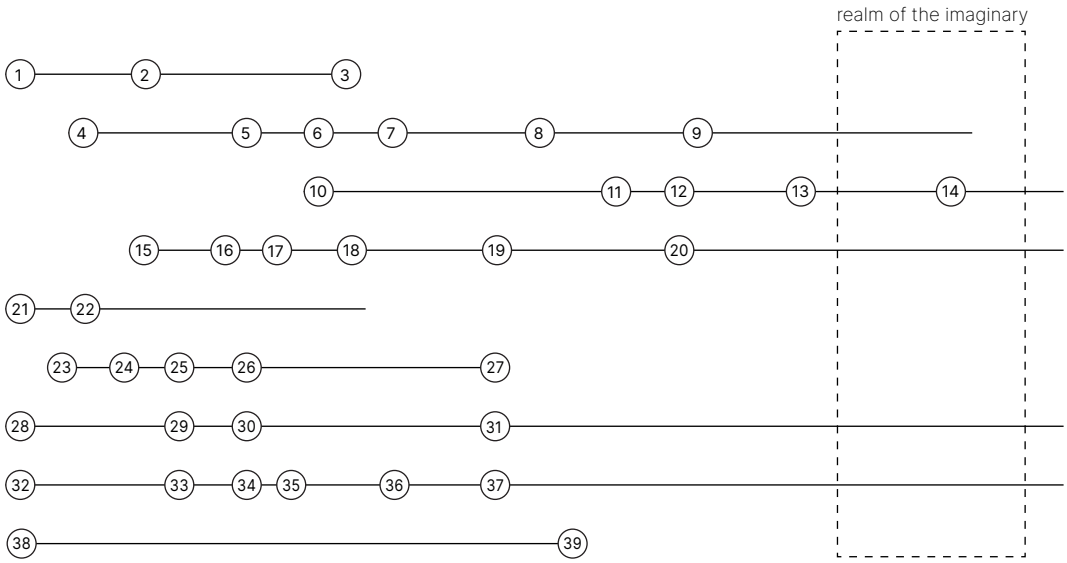
28 documentation of energy classes
29 pilot projects in prominent villages of different sizes
30 subsidising local communities to share resources and infrastructure for water treatment and energy production, storage and distribution
31 adapting the local systems for highest efficiency, considering material scarcity

nature-based solutions

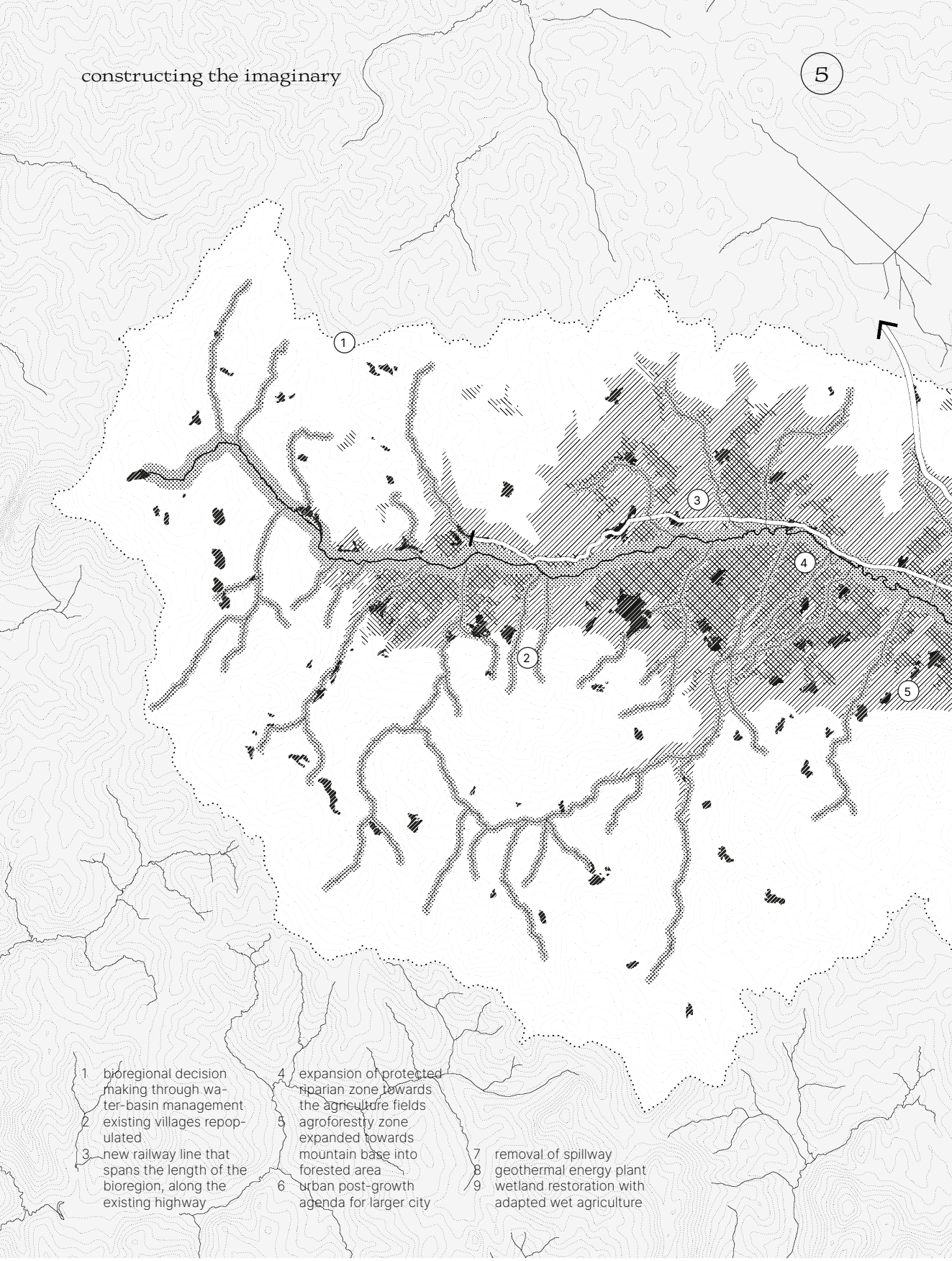
32 examination of conditions of current ageing or poorly-engineered infrastructure
33 collaboration with global networks of nature-based solutions for flooding and drought conditions
34 pilot projects throughout Greece, examining different building and maintenance techniques in diverse locations
35 engaging local residents in nature-based solution projects and highlighting the opinions of prominent community members to gain public acceptance, aiding in green political campaigning
36 drafting a bioregional plan for climate adaptation
37 drafting a national plan with clear adaptation goals, highlighting trans-regional synergies

social agenda

38 political campaigning of bioregional post-growth agenda and establishment of public support
39 reaching set population goal for the bioregion

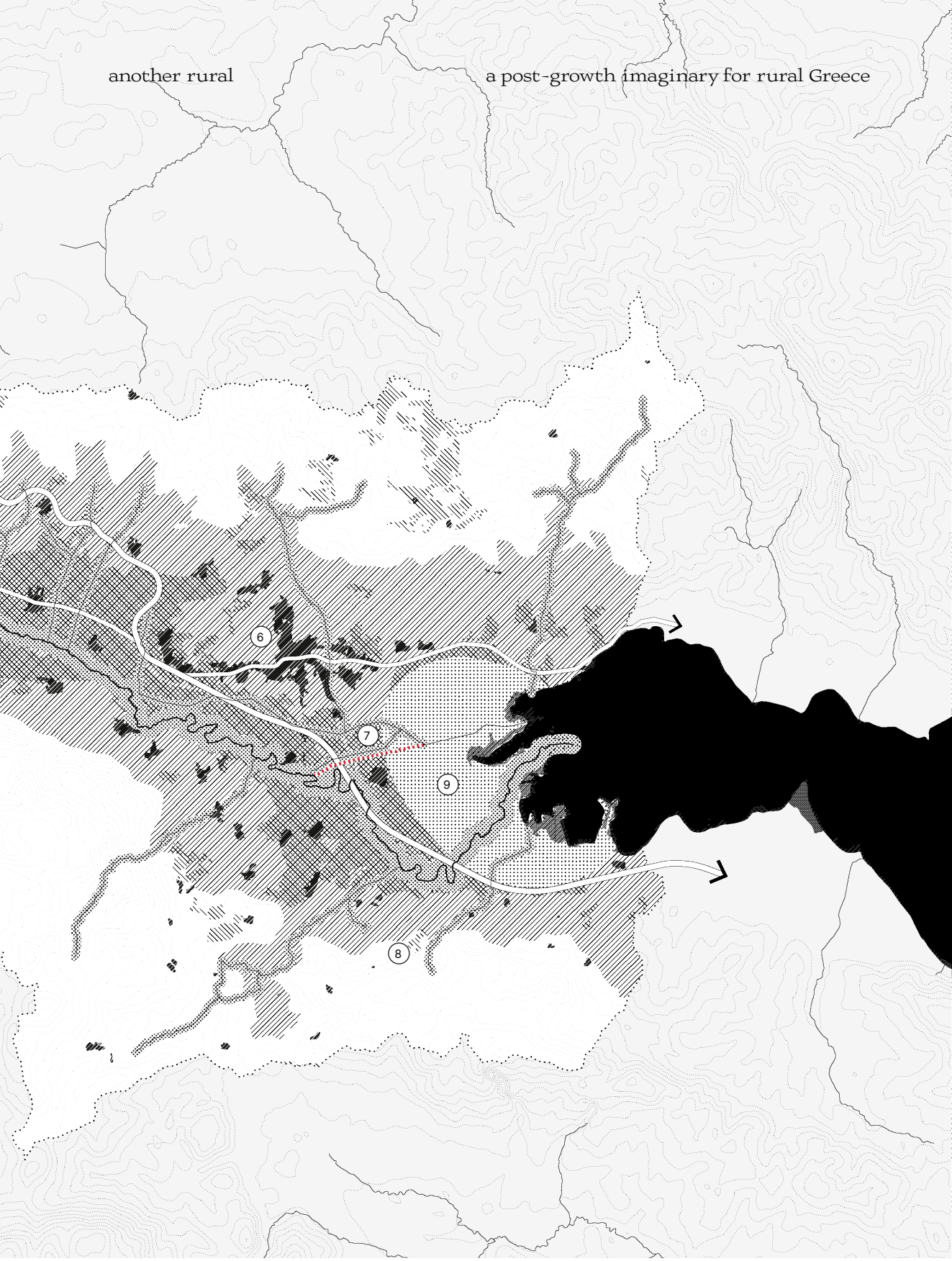


Potential phasing sequence of the suggested agenda. The post-growth imaginary is located in the future, where the majority of the necessary changes have already been established.
Diagram by the author.



1 bioregional decision making through water-basin management
2 existing villages repopulated
3 new railway line that spans the length of the bioregion, along the existing highway
4 expansion of protected riparian zone towards the agriculture fields
5 agroforestry zone expanded towards mountain base into forested area
6 urban post-growth agenda for larger city
7 removal of spillway
8 geothermal energy plant
9 wetland restoration with adapted wet agriculture

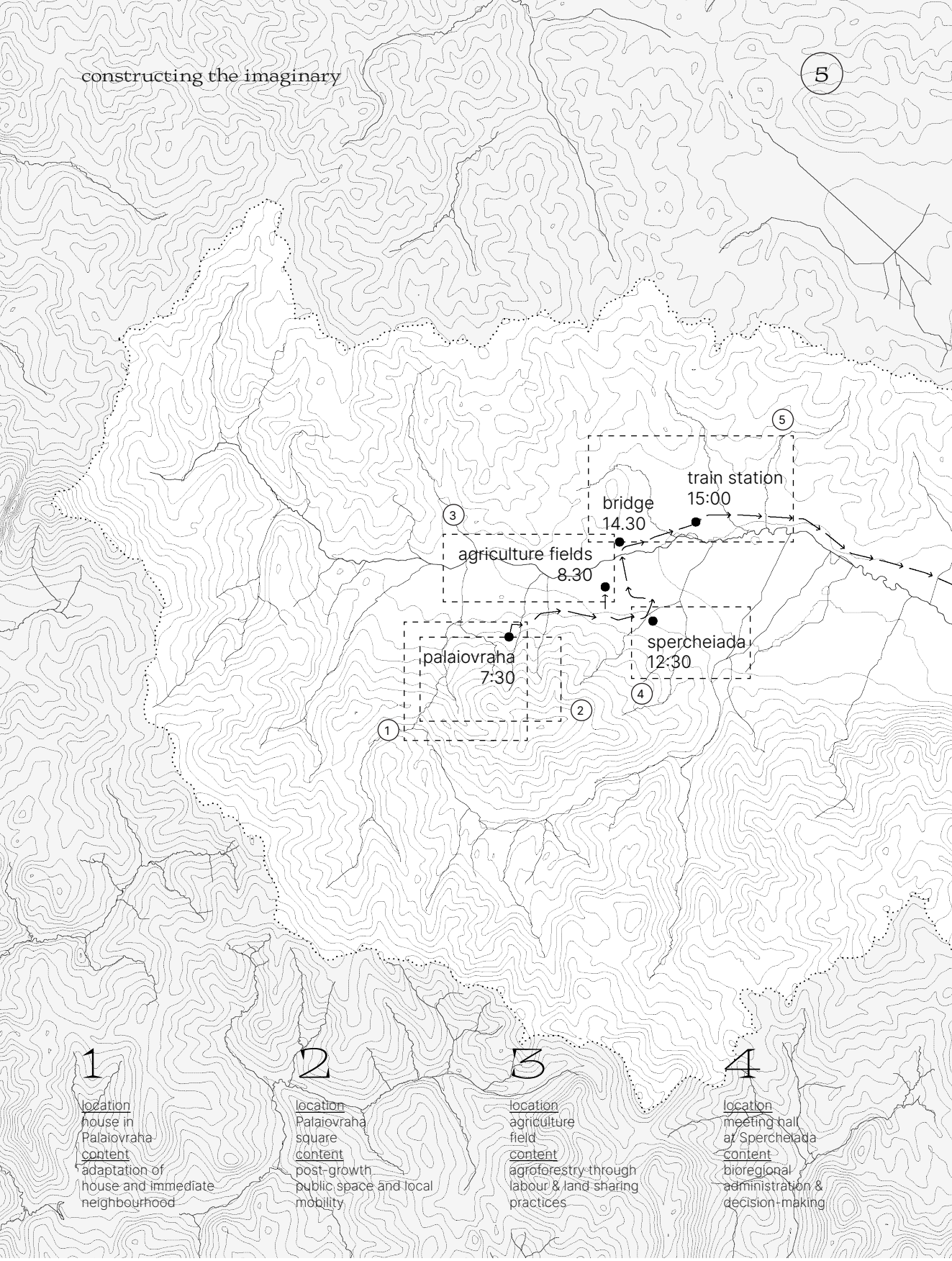
Vision map: spatialisation of main items of post-growth agenda for the region of Spercheios. Drawing by the author.



wetland restoration
built environment
expanded riparian zone
disused spillway
expanded agroforestry
investment zone

5 km

N



1

location
house in
Palaiovraha
content
adaptation of
house and immediate
neighbourhood

2

location
Palaiovraha
square
content
post-growth
public space and local
mobility

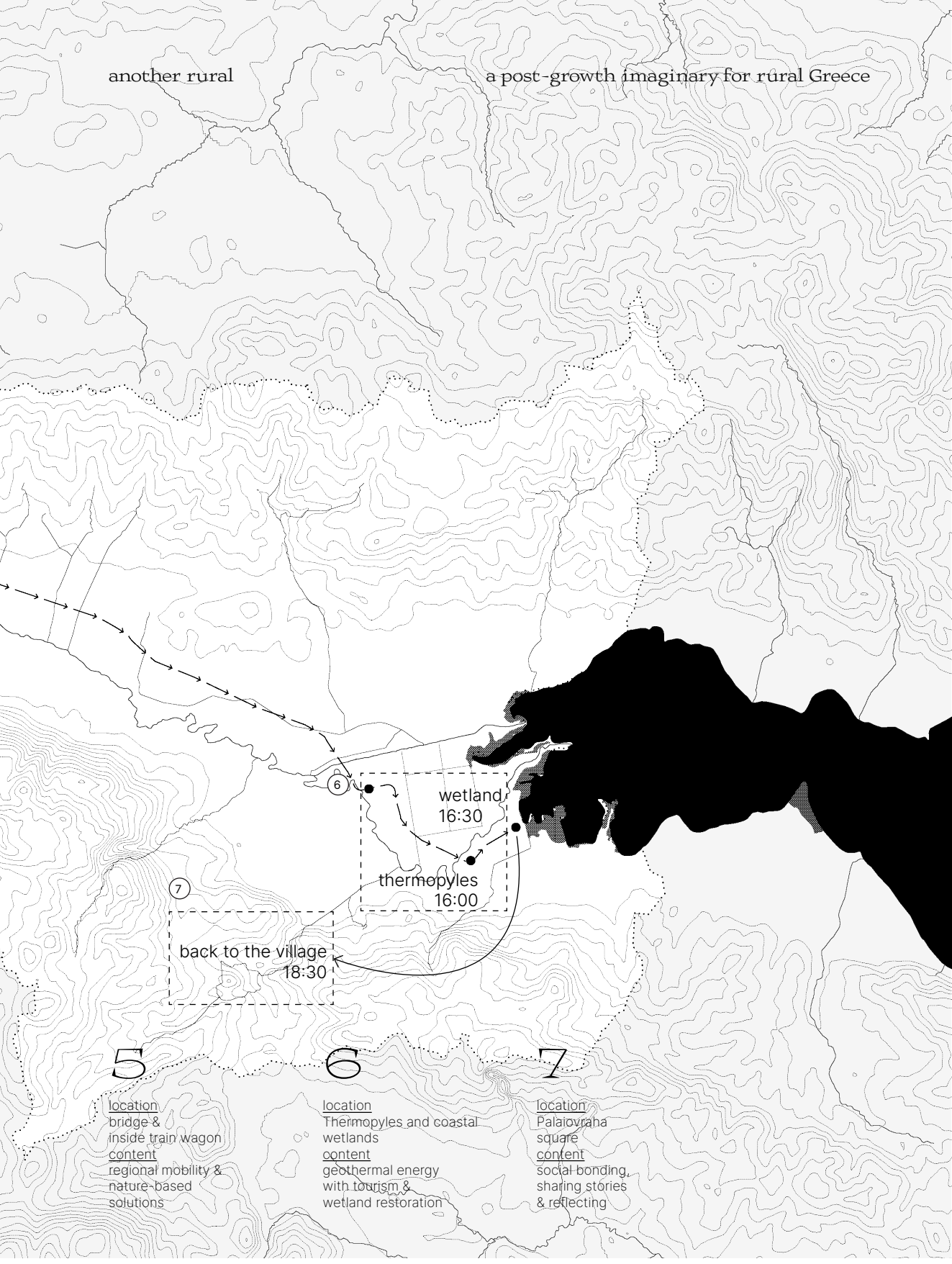
3

location
agriculture
field
content
agroforestry through
labour & land sharing
practices

4

location
meeting hall
at Spercheiada
content
bioregional
administration &
decision-making

The route the protagonist of the post-growth imaginary takes within the examined day.
Diagram by the author.



5

location
bridge &
inside train wagon
content
regional mobility &
nature-based
solutions

6

location
Thermopyles and coastal
wetlands
content
geothermal energy
with tourism &
wetland restoration

7

location
Palaiovrahа
square
content
social bonding,
sharing stories
& reflecting

5 km

N

This chapter explores the formation of a post-growth spatial imaginary for the region of Spercheios through the eyes of Vasilis, a dweller of the region. Vasilis wakes up in a post-growth society and engages in their daily rituals, exploring how the individual house has been adapted to sufficiency. After they walk through the village, engaging with the role of public space in a post-growth approach, they head towards their morning job at the agriculture fields, where the shift to sustainable food production is examined. At noon they participate in the weekly bioregional meeting and later commute towards the coast. There they explore the wetlands and complete their work tasks. Finally, they end their day back at the village meeting friends and sharing stories.

Painting by my grandmother Eleni. ♡

6

imagining the future

1 waking up in a post-growth world

A creek from the wooden bed as I moved was just enough to wake me up. It took a few seconds to orient myself to the realm of the living, taken from the one of the dreaming. It is still very early in the morning. I can tell as the sun barely touches the rug next to my bed - a very old persian woven rug that has been patched up with acrylic threads at different places. The combination of random blue, green and red colours betray that the threads that were used were just what was already at hand, but the work is still masterfully done, extending its lifetime by another couple of decades with careful use. Same goes for the thick blanket that feels too heavy in mornings like this, acting as my excuse to stay in bed for a little longer. Outside of my window you can already hear some drowsy conversations as people walk by.

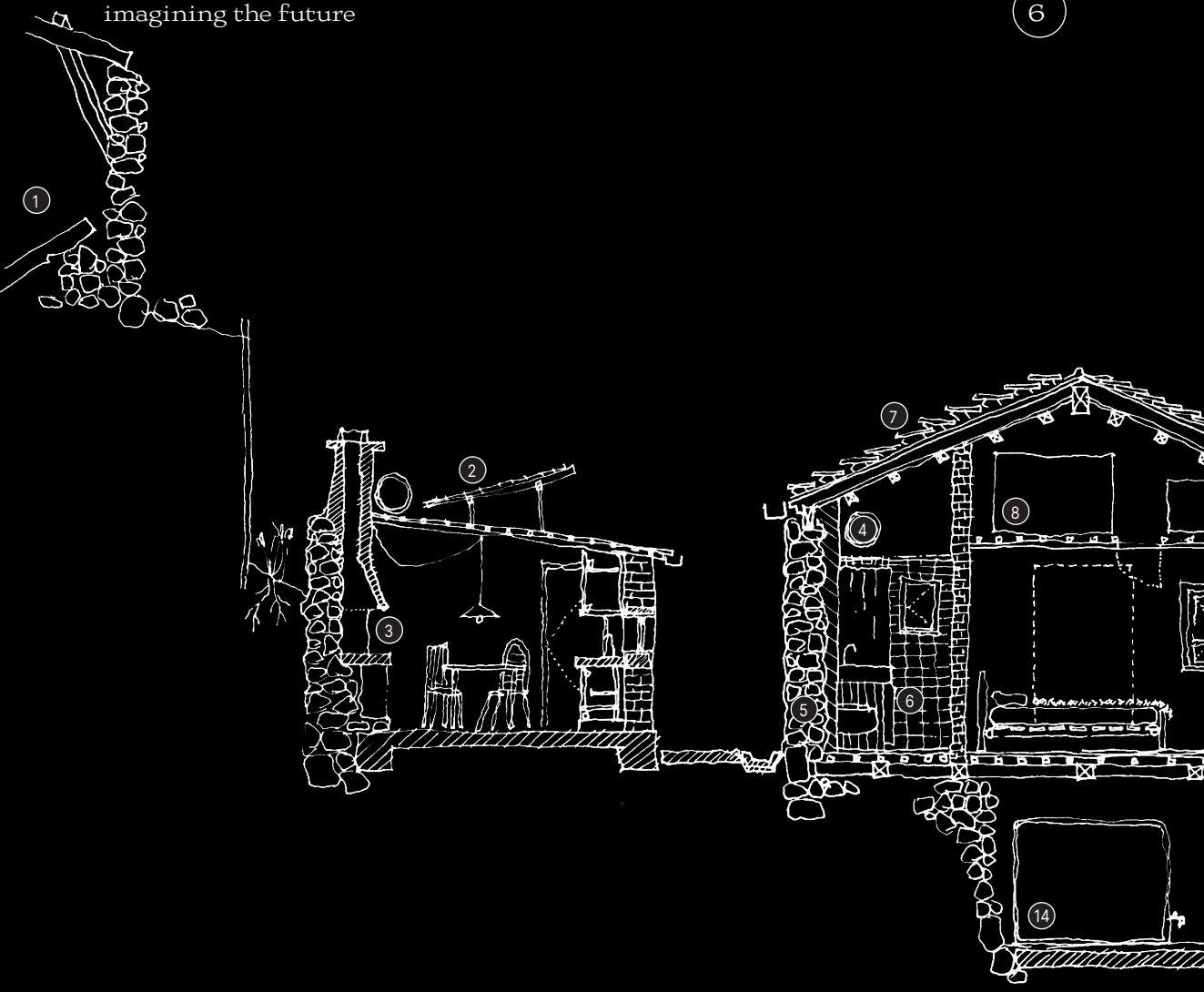
"It's already April huh", I think to myself. As I make my way to the bathroom the wooden floor complains slightly from my weight, making a few creaking noises. I always like to start my day with a quick shower, but especially this time of year as we have quite a lot of water saved up from the early spring rains. All the water that falls on our roof is collected in a storage tank stored in our basement. It slowly trickles down towards our neighbour downhill, which has a filtration tank and pump that five other houses share - including us. In the days of heavy rainfall all the excess water collects at our village's square. This way we can all have a little extra drinking water, which is very important in times of drought in the summer. A similar system is in place for solar energy. I was told that as the village started getting populated again, these small energy and water communities started popping up, with financial assistance from the bioregion later.

As I lazily wash my hair, the morning sun seeps through the window and shines brightly through the wall tiles, as if the world is trying to nudge me awake. I believe the bathroom is the most beautiful part of our house. Unlike the rest of the house with its old wooden floors, the bathroom is laid with a mixture of old tiles retrieved from the abandoned houses nearby. Despite the different sizes, colours and patterns mixed, I find the result funky yet harmonious in a way. Not all of us agree though.

There are a total of three - two other researchers and I - that live in this old stone house in Palaiovraha at the top of the village. It's reserved for researchers like us - living here for free in exchange for helping around the locals with some part-time work. None of us are sure how old it is exactly, but just guessing from the multiple layers of renovations and

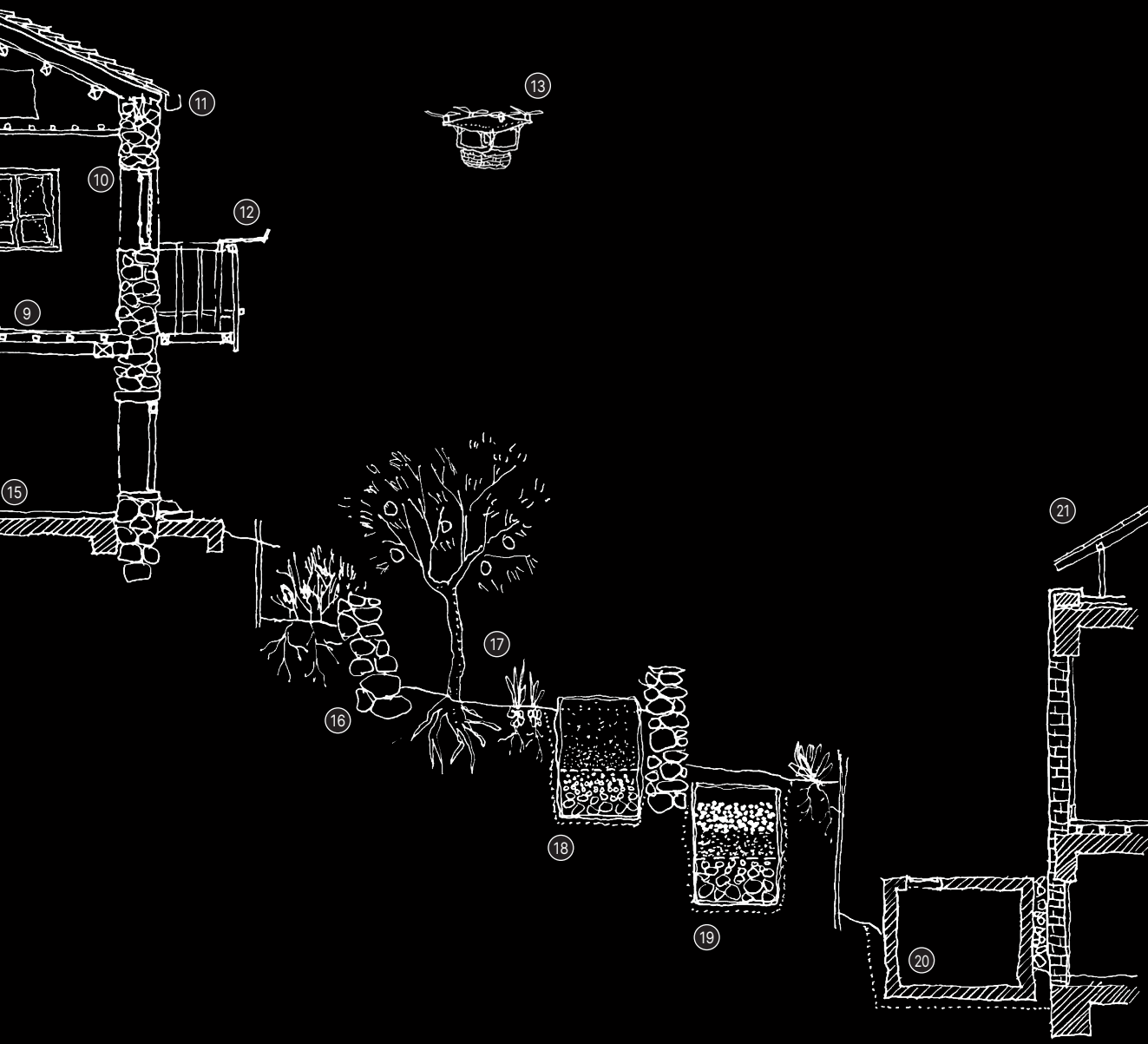
towards sufficiency

In our rapidly changing climate reality, adaptation measures need to be multi-scalar and interconnected. While the current Greek government has made promises of a significant adaptation project through large-scale infrastructure improvements, it is essential to recognise that solely relying on such large-scale endeavours for flood prevention, centralised energy production or waste-water treatment may not suffice. Instead, embracing a post-growth agenda suggests focusing on individual building adaptation to confront the imminent challenges posed by extreme weather and material scarcity. This approach advocates for leveraging existing building structures and focusing on communal resources, rather than relying solely on costly, polluting and potentially inequitable large-scale projects that may exacerbate access disparities. For example, many small settlements like the one examined, have major issues with drinking water infrastructure or access to central waste-water treatment. In this imaginary, the individual rural house is envisioned as hyper-adapted with rotatable roof tiles harvesting solar energy, communal storage batteries, an extensive rain water harvesting system and shared terraced food gardens.



1 abandoned properties: material is reused for renovations and space for solar energy production.
2 warm water from residual heat and solar energy
3 old wood-burning stove reused and adapted with electrical heating surfaces and storage of residual heat
4 warm water storage tank for showering, heated directly from solar roof
5 reinforcement of old stone walls with cocnrete injections
6 water-efficient appliances
7 rotatable solar tiles combine the aesthetics of heritage buildings with solar energy production. the post-growth approach would not disregard beauty in the name of efficiency
8 communal battery
9 wood flooring renovated with reused material
10 windows with removable double layer, preserving the old wood windows
11 rain-water collection gutter
12 landing surface
13 distribution drone
14 communal rainwater collection tank
15 pre-filtration tank
16 stone terraces with material from abandoned buildings
17 small-scale food production at irrigated house terraced garden
18 slow sand filtration tank
19 biochar adsorption tank
20 drinkable water storage tank
21 flat roofs adapted with communal solar panels

1 m


11
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19
20

ownership

Instead of a radical departure from the property and ownership system that is currently in place, the post-growth agenda reimagines a shift towards more communal land practices. This could be manifested through land trusts, co-ownership between public and private actors or through the communal use of infrastructure, which transcend property lines and unite residents into tightly-knit small scale communities within these villages through the sharing of resources, responsibilities and benefits. Also, there are a lot of properties that are lost in inheritance, divided between far too many people, or just abandoned and decrepit. Even beyond such extreme examples, many people own old houses but do not have sufficient funds to renovate them. Incentives like the one-euro-house program in Italy could be beneficial in allowing more people to relocate to rural areas, so long as it is coupled with assistance - here imagined as a bioregional building association of local builders and craftspeople, with an emphasis on empowering women as they are usually excluded from such activities. Similarly, the imagined bioregional administration would utilise such incentives to share ownership with the public domain, along with renovation costs. For example, a property owner that does not live in the bioregion could strike a deal with the administrative body, giving way for social housing to emerge, perhaps in exchange for keeping a room free during the holidays.

materials applied it must be very old. There's patches of different textures all over the walls from the localised concrete injections, holding all the loose parts together. Every house is inspected by the regional builder's association biannually - or after a strong earthquake - and then they decide what renovation is appropriate along with the owners, or the bioregion representatives in the case of public buildings. Like most houses in these villages, the kitchen and bathroom were constructed as additions ages ago, outside of the main house. We still use our detached kitchen like our ancestors planned it - but the bioregion and the owner of the house decided for a renovated bathroom inside. A welcomed change since the winters can get pretty rough - I can't imagine having to go outside to visit the bathroom in February.

"Good morning Vasili", says Theoni sat on the small kitchen table without turning her eyes from her screen, scrolling through some illegible notes on her tablet. I guess she can recognize how I'm always dragging my feet in the morning. I leave a few slices of bread on top of the oven to crisp up while I prepare a cup of herbal tea. When I sit on the table she gives me a warm smile, trying to sympathise with a sleepy person like me.

Theoni is always the last to wake up, but somehow the first to get out of bed. I'm still in awe of how she can just open her eyes, be fully awake and immediately go to the kitchen to prepare her coffee - no yawns, no snoozing, no hesitation. She is an electrical engineer and has attempted to explain to us many times what she's working on with the village's council, but we still only understand bits and pieces. With some metals used in batteries becoming rarer day by day, they've been trying to find ways to limit the use of new batteries. Right now the village is experimenting with communal batteries between households for energy storage. Our house is one of the testing grounds in the region. We share a unit with the neighbouring houses, where all the solar energy collected from our roofs is stored. It's actually right above my room, between the rafters of our old roof. An indent in the wall was used as storage space in the past, but Theoni didn't neglect such an opportunity for cable routing space. It ended up cutting the room's total height with a recessed ceiling, unlike the other bedrooms. When I moved in this was already constructed, but I don't have that many clothes for a large closet anyway.

She tells me a bit about what she's been doing lately with her work, mostly complaining about how hard it is to get some people to agree - family feuds can run through generations apparently. I can only give her some affirmative grunts, until I put something in my mouth.

"Are you heading out today?" she asks with a faint hesitation.

"Yeah, it's time to get moving."


property line
communal battery
filtration tank
waste water treatment stream
25 m
N

"Happy to hear that. Anything from the international news?" tactfully changing the subject.

"The Sarawi finally made a peace deal with Morocco and claimed their land back!" I exclaim as I'm scrolling through the news article on my phone.

"Oh nice! Send that to me, I'll go through it later."

As we chat a little more about our plans for the day, we can hear Elli heading to the bathroom from the corridor. She has a habit of playing her favourite music aloud in the mornings while taking a shower. Today it is a peculiar opera by Yma Sumac, in which she imitates the sounds of birds in the Peruvian jungle. Elli is the youngest of our group and is working at the retirement home at the base of our village, where she is both assisting the elderly while conducting her research on heritage and rural knowledge conservation. Her calm demeanour is comforting to people around her - even though Theoni and I have heard her curse and scream in rage like no other in a few instances of her tumultuous love life.

We have figured out a little routine for ourselves. Theoni starts the wood-burning stove in the morning to make breakfast, and the residual heat warms up the water for our morning showers. Elli stays mostly around the village and has lunch here so she fires up the oven again keeping the house warm till Theoni and I are back. I take care of bringing the firewood to our storage, sourced from the forest above our village. We take turns taking care of our little fruit tree garden, making sure nothing is obstructing the water channels. That's how this winter has gone by this year.

While Theoni and I are still having breakfast, Elli rushes to the kitchen.

"How did you like today's tunes?" she asks cheerfully while putting the last bit of coffee in her thermos.

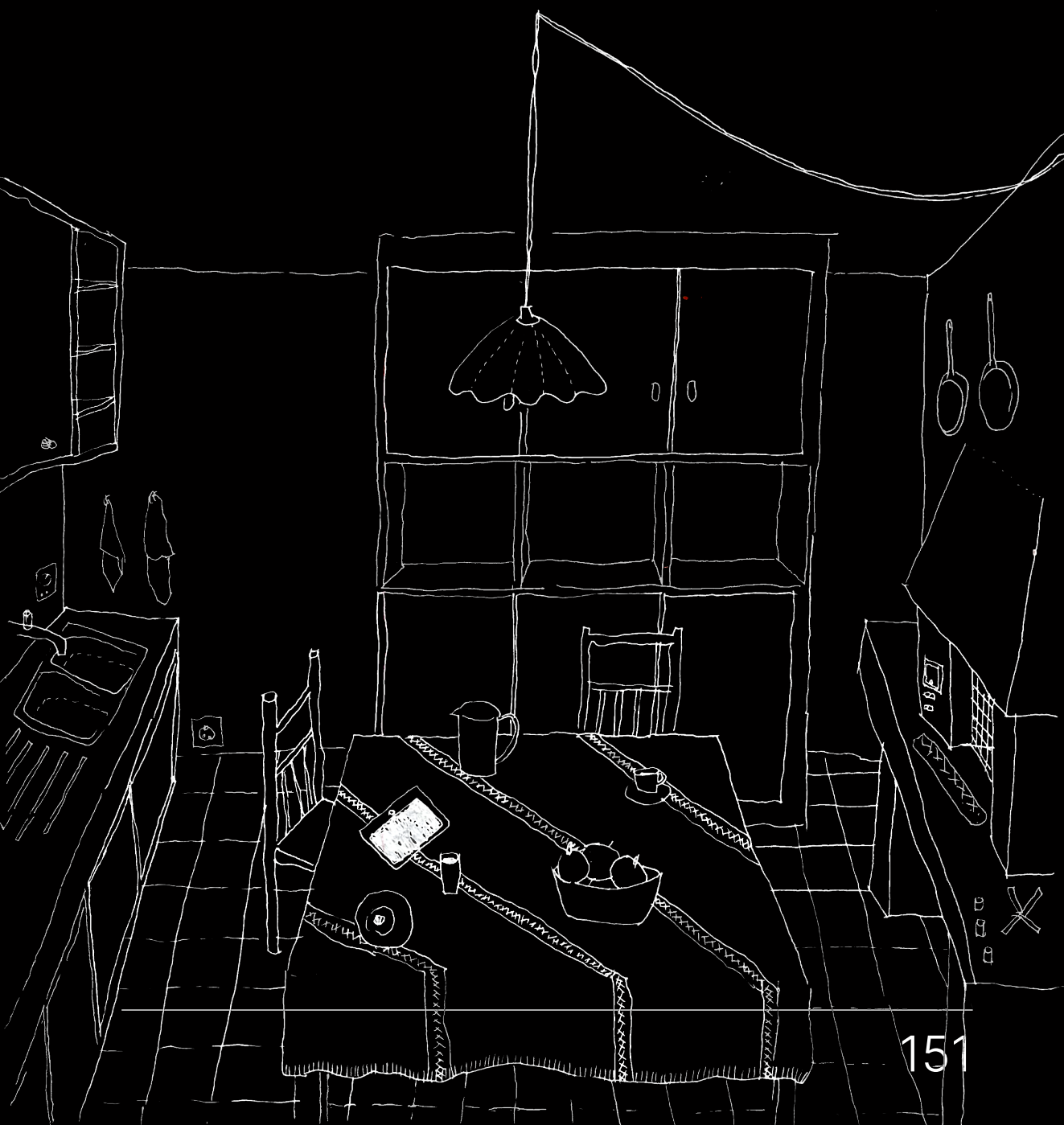
"Obscure" responds Theoni. "As always" I add.

Content with the answer she giggles and closes her bag. "See you guys tonight at the square! I have a lot to catch you up on" she says while rolling her eyes. Closing the garden gate behind her makes a loud squeaking noise - another thing that I add to my mental list of stuff that needs to be oiled up in this old house.

We each leave at our own pace, heading to our morning jobs. There is a lot to choose from: helping at the elderly house, assisting the teachers at the local school or helping the farmers. I went with the last. I grew up on the other side of the river at the village of Grammeni, where my grandparents had a vineyard and made their own wine. I would always help them with the harvest so I've picked up some skills along the way. After studying in Athens and living there for a few years, I decided to continue my research for wetland restoration in the region that I grew up in. This land seems to unconsciously dictate all of my life choices so far.

employment

While rising unemployment is one of the main concerns with the post-growth approach, the agenda for rural areas would actually demand a lot more labour. Most importantly, more people ought to work in the agriculture sector, as it needs to transition towards more extensive and regenerative practices, which are much more labour-intensive. Also, the experience of producing one's own food is incredibly valuable in the ambitious lifestyle changes that are required for such a society to function, like eating seasonally, shopping locally and reducing food waste. Secondly, considering the ageing population, a lot more occupation needs to be invested in the care and service sector. Such an investment could also have economic benefits in the long-term, as money that would have to be invested in medicine or pensions could in turn be used for adaptation or service-increase projects - and by having healthier elderly people that could contribute in education or other low-labour but high-skill occupations. Thirdly, the imagined post-growth society would require a lot more public employment to regulate the complex bioregional affairs, which could be partially achieved through the merging of the public servants of the here-redundant municipalities and regions. Allowing for flexibility through switching regularly between such modes of work could prove very beneficial in enabling social cohesion, as people could experience the hardships and benefits of each job. Finally, especial care ought to be placed also on the craft sector, reviving lost heritage practices and producing long-lasting and beautiful products - a type of work that also offers the experience of creation, which transcends purely monetary returns.



2 walking through the village

The early spring is still chilly and the morning air is refreshing. Just after taking a few steps and feeling the wind on my face I truly start to feel awake. I imagine the air moving from the mountaintops of Oiti, passing through our village streets, through the forested river and up again through the thorny bushes of Orthis. With my brain finally working again, I start to notice my surroundings more carefully. The usual vibrant blue colour of the sky I grew up under is interrupted by some fast-moving white clouds that look more like smudges, with no distinct shape. On the other side of the valley I can see the village Tsouka at the base of the mountain range, and a line of slow-turning wind turbines above it - slightly out of sync. A bit further away the solar farms glimmer while receiving the morning sun, like the scales of a sea bass in a fisherman's hand. Ever-so-slowly they turn to capture as much sunlight as possible, electrifying our bioregion.

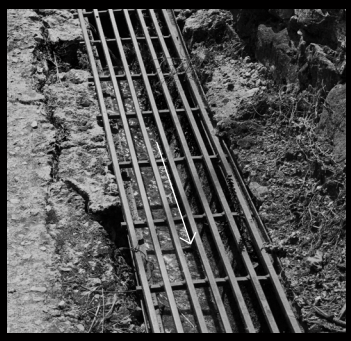
The path downhill towards the main square is a bit bumpy from the stone paving and the different concrete patches, forcing me to be conscious of each step. Mixed within the sounds of birds and the morning greetings, the sound of flowing water seems to be ever present. Like all the villages on the southern part of the region, Palaiovraha was built at the base of the mountains next to a stream. It flows from the steep mountain of Goulinas all the way to the main river body of Spercheios - one among hundreds of other streams.

Somewhere upstream the "*νεροφόρος*", nerophoros or water-bringer, would divert the flow of the stream towards a system of concrete channels throughout the village. They had to start before the sun rises, walking to the top of the village and blocking the stream with rocks or mud. These channels connected to the garden of each house, and people would dig up lines to guide the water to their crops and fruit trees. As the water slowly trickled in the different channels, they made sure to divert it to everyone's houses by placing different blockages. This would happen from the top of the village towards the bottom.

A similar process is happening today. Small automatic gates with monitoring devices check the amount of water that passes through, along with documenting basic data like water quality and biodiversity indices for fish and amphibian life along the stream. However, the sequence from top to bottom has remained the same. The people that live at the bottom of the village are quite unlucky in this regard, since they have to wake up in the middle of the night to make sure that the

infrastructure

Adaptation measures within a post-growth context would translate to solutions that are low-input material wise and making use of existing opportunities and infrastructure. Thus, looking towards traditional practices is sacrosanct. It is important to document them and learn from them. Similarly to many others in the Mediterranean region, the examined village of Palaiovraha had a complex network of channels for water distribution. Over the years they have been covered up from road renovations, or slowly become redundant due to centralised water networks. However, many rural areas still experience very poor access to infrastructure. Similarly to the adaptation of the existing house, instead of aiming for large-scale infrastructure projects that have historically failed to be implemented in the region, reviving these traditional practices through a more high-tech, automated approach could offer low-cost and non-invasive solutions to water management.



water is distributed correctly to their fruit trees. Our house is closer to the top, so some time in the mornings after Elli and I have already left, Theoni checks briefly if the water distribution is working properly. The process is otherwise automated and you can check in the village application both the water routes and other energy production data.

The square is already full of life. People taking their morning walk, going to grab a bike to head out to their jobs or going to claim a spot at the community work space. Due to the terrain, one side has been dug inside the ground and the other built up, so that when you approach it as you are walking down you have to take a few steps to reach the square and then another set of steps to reach the church. There's a tavern, two cafes, the youth centre and the community centre on opposite sides, and the bike storage underneath a family's house.

It was commonplace in the denser rural areas when constructing a concrete-frame house, usually with only one or two stories, to do the construction in phases. You would leave either the ground floor empty and live upstairs, or live downstairs and leave the concrete rebar poking out at the top, in hope of your children's family moving in and finishing the construction to their liking. The notorious "*αναμονές*" that can be seen all over Greece. In an effort to densify and make use of the existing houses, the bioregion offered subsidies to renovate and fill up these spaces with housing or shops, instead of constructing new structures. In a space like this next to our square, the bioregion made the local bike storage, adapted with a small ramp for easier access. The ground floor of an old building next to the cafe was converted into the bike storage of the village, with enough space for a total of twenty bikes and a desk for a repair person working. Another outdoor storage is next to the bus station at the other side of the square, at the side of the church. You can drop these bikes off wherever inside of our bioregion, and if there's an excess you can stack them at the back of the bus and then someone will be there to collect them in places where there are too few of them.

"Ready to get your hands dirty again?" says Ahmed jokingly when he sees me walking towards the bike storage. I smile and give both him and Yannis a loud "Good morning", to make sure they hear me. They are having their morning coffee at the main square, taking delight in observing and gossiping about the young people of the village.

"Don't listen to their teasing, Ahmed was never that good at the farm work" says Yannis followed with his snarky laughter.

Ahmed's family migrated to Greece a while ago fleeing from war and travelled around Greece from camp to camp. Eventually, they ended up here and started working as farmers. When Ahmed was born the situation had already calmed

public space

The design of public space in rural areas of Greece is usually limited to the material renovation of the main square or the paving of a few central streets, that often do not consider place-specific characteristics, like climate requirements, lacking services or public infrastructure. Such vanity projects can be considered growth-dependent urban space design, as they are usually aiming for a return-on-investment through attracting tourism, under the general goal of "showcasing our destinations". However, for many rural areas in Greece, including the ones in the specific region that I have visited, this practice has shown to be fruitless.

The design of public space in a post-growth context considers the increase of services and climate adaptation as the first priorities, through direct investment in them. Of course, this does not mean that spatial or material qualities are unimportant, but rather would emerge from the priority goals instead. As shown here, the public square is not only treated as an important gathering space for the local community, but it is also hyper-adapted with needed infrastructure, like central drinking water storage tanks for the drought periods, rainwater collection tank or trans-local mobility. Also, surrounding private property like the church or abandoned houses, that would be considered out of the scope of public space design, are embraced as valuable places for communal activities and infrastructure. To execute this agenda a different permitting approach would be required, than the current leasing to third-party private architecture offices, which contributes to the perpetuation of corruption and lack of transparency in design decision-making. The imagined bioregion would be involved in the design process through engaging the locals to express their needs and participate in co-design workshops.


DEPAVED SQUARE
BIKE LANE
PAVING W. CONSTRUCTION WASTE
BIKE STORAGE

1 space for communal food production, fruit trees, herbs with native flowers for pollinators
2 empty spaces in central public spaces adapted with housing or space for communal food production
3 public spaces adapted for drought and extreme heat: depaving, exposed soil or gravel, drinking water faucets, large shading trees and canopies
4 community water tank: storing excess rainwater or drinking water in periods of drought
5 community drinking water tank: instead of relying on centralized systems, the community can process its own waste locally.
6 pumping station
7 existing buildings around central squares or key public spaces adapted for public services
8 transportation: self-driving solar-powered electric bus to local villages and nearest railway station stops
9 fabric canopy
10 community energy storage: space for batteries or other network infrastructure
11 churches adapted for public services: library, maker space, music teaaching etc
12 solar tiles at the church roof
13 small wind energy producion at the church tower

2 m


13
7
12
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5

down a bit. They were quite academically gifted and decided to study chemistry at the local university. A minor lab accident made them fall in love with Yannis and they've been together ever since. Now, both in their early eighties, they are sometimes teaching at the university while also being involved with the local decision-making.

preparing for an ageing population

A post-growth society ought to place significant importance on caring for the currently ageing population, not only by adapting existing settlements for limited physical mobility, but also by increasing the rural services and ensuring adequate access to them. A project of the imagined bioregion is to provide resources to the elderly through travelling care providers and accommodation schemes that would turn existing buildings into care facilities. Both of these things would require much more investment and employment in the healthcare sector.

With so many older people in the bioregion there were many discussions about what we should do. One of the propositions was to construct a large retirement housing facility close to the main city of Lamia. Another called for smaller retirement homes at the lowest parts of few larger villages, so that they can be more easily accessible. Both were opposed since the majority of the elderly did not wish to leave their houses or their villages. In the end, a selection of existing buildings were adapted into elderly care facilities scattered throughout the bioregion. That's where Elli was rushing towards this morning. From up here I can see her arriving at the elderly house. Also, an association was formed that would deliver food and care services at each elderly person's home, with special attention to those that do not have families or live remotely. For those that were not as attached to their home another relocation program was formed, offering them the chance to cohabitate with other older people or with households that had a big-enough house.

I remember a discussion with Ahmed one cloudy winter evening, while sitting at the same spot under the large tree.

"There was a time when this village had only fifty people, you know. In winter especially, you would look around and see no one outside - it felt like a graveyard sometimes," he reminisced while focusing on the cup of coffee at the table. "Everyone would either leave for the big city or just try their luck somewhere else in Europe. This land was becoming degraded day by day - people were far too greedy to act on the changing climate around them." I listened closely with my warm cup of tea between my hands.

"When push truly came to shove, it came down to a decision - do we take this seriously or not. That sort of thing."

After that talk, whenever I was sitting under the large platanus at the centre of the square I often found myself trying to imagine what that empty and lonely scene of our square would look like. It was quite hard for me to conjure it. I have always known this square and the buildings around it as the most lively place of the village, even in days of shivering cold or dizzying heat.

To adapt with the current climate reality, the bioregion prioritised the adaptation of all villages, no matter big or small. This village, for example, always had issues with the lack of drinking water in the summers, but the rising temperatures made the situation much worse. To cope with that,

another rural

a post-growth imaginary for rural Greece

a large underground tank at the edge of our square stores water year-round, that we can use in the summer. It is also connected to the central bioregional water network, ensuring availability for all. That doesn't mean that we don't have to be frugal with water, of course.

After checking in my bioregional pass at the desk, I unlock one of the communal bikes and head outside with it.

It was close to when I was born, about thirty years ago, that the bioregion attempted to do away with cars completely. While it wasn't a complete success, the car use was significantly reduced after investing in local mobility. Things haven't changed all that much since then - there's still few people that can't live without a car, but nevertheless try to offset their emissions in other ways. The roads around the square were asphalt in the past, when cars were still the prevailing mode of transportation. Ever since, it has slowly been replaced with new paving from construction rubble, coming from all the renovations or demolitions of the old houses around the village. The outside perimeter of the square is also lined with a patchwork of stones and tiles, while the interior is now mostly a permeable ground with pebbles.

There are also two self-driving buses that are quite small - they can handle about 60 people standing and sitting. They are always going in circular routes that connect the nearby villages, Fteri, Ano Fteri and the smaller ones Kambia, Koutsoufliani and Lefkada... So if you want to use them to travel from one side to the other it would take quite some time.

The church's roof is equipped with solar panels that collect energy from the sun during the day, charging the bus overnight. The bus itself also has a panel up top to power its lights and speakers for the stop announcements. You can see the live location of the buses on the bioregion application - or by simply looking outside of your balcony when you are lucky like us three. Most of the young people still prefer to bike around, since the bike paths are well maintained.

Now on the bike, I circle around the main square, descend from the village and leave the last houses behind me. As I turn east towards the fields of Spercheiada, the large neighbouring village on the other side of the stream, the sun gently warms my face. I pass through the absolute nature zone and lower my speed at every habitat passage that goes perpendicular to the street. In the distance, the morning breeze passes through the wheat fields and wildflowers, a sea of green and yellow.

mobility

While moving away from car hegemony is mostly an item on the post-growth agenda of denser urban places, efforts to reduce car dependency should also be enforced in rural areas. Access to public transport has decreased significantly in rural areas, as they have become more depopulated over the past decades. For example, the examined region of Spercheios used to have buses that would connect the villages with the major city of Lamia - a service that is no longer in place, forcing locals to travel exclusively with cars and making it impossible for non-locals to travel without a car. The imagined bioregion would prioritise such trans-local mobility, giving better access to decentralised services and thus creating smaller clusters of connected villages.


1 Palaiovraha
2 Fteri
3 Ano Kambia
4 Spercheiada
5 Makrakomi
6 Vitoli
7 Ptelea
8 Tsoukka
9 Platistomo
built environment
agroforestry
circular bus route
agroforestry expansion
riparian zone expansion
heathland reforestation
1 km
N

3

working at the fields

familiar practices

Transitioning away from current intensive and polluting agriculture practices is a key point in the rural post-growth agenda. Instead, the bioregion ought to aim towards more extensive and low-resource agroforestry, which ensures ecological functions by providing better habitats and healthier soil. However, that is no easy task - especially at such a regional scale. Learning from the past is again crucial to moving forward. Before the intensification of food production and land use, site-specific forms of agroforestry had evolved after milenia of agriculture in the region. Testified from the many paintings that depict the agricultural landscape, most plots had trees that provided food for the farmers or their animals, firewood and also shade for resting and escaping the heat. Preserving and documenting these practices is crucial. By using the familiar basis of existing land- and resource-sharing practises, the imagined bioregional administration would assist farmers by providing them with an updated communication framework - perhaps in the form of an application or website - that would pair land-owners, farmers, agriculture workers and experts together, based on the needs of each and the requirements of each agroforestry task.

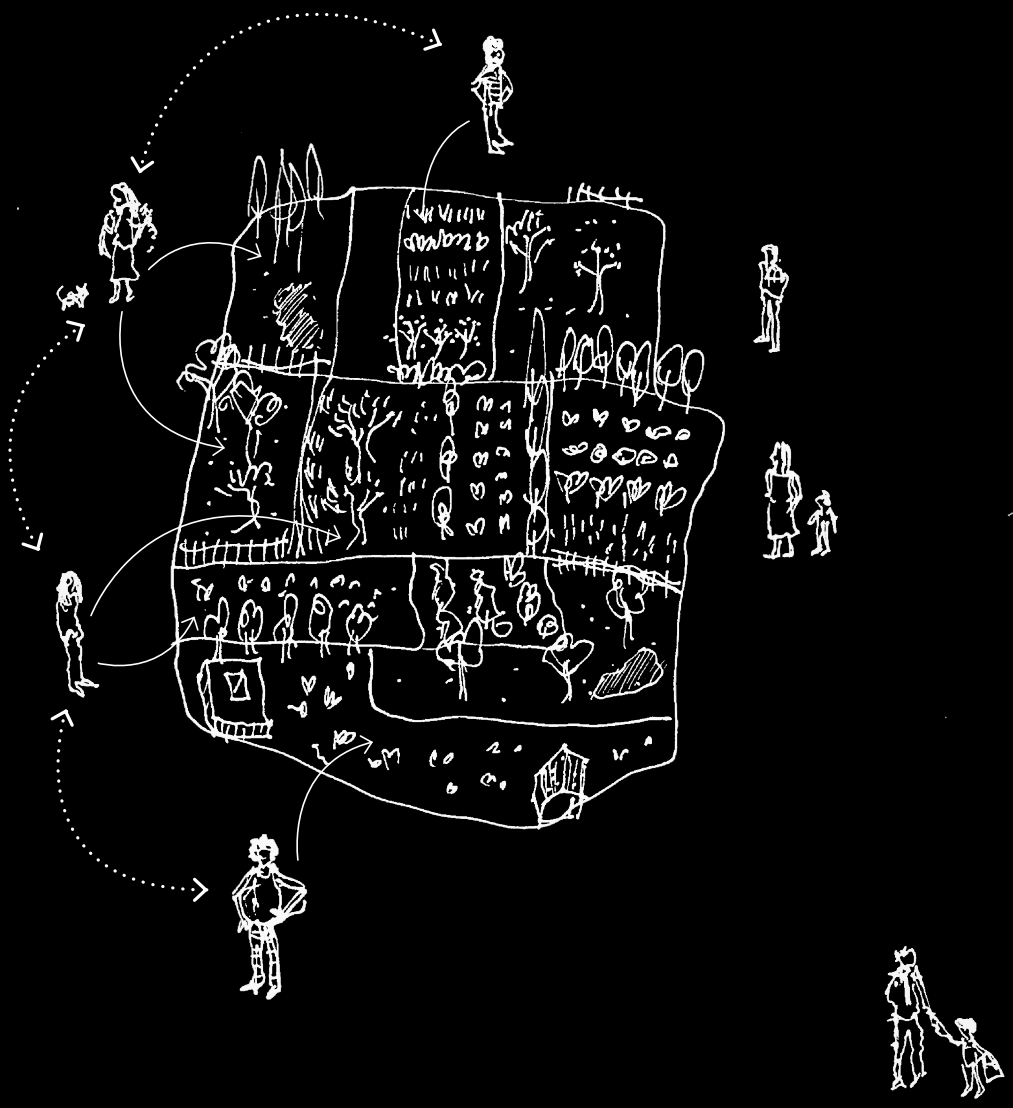
"Good morning! I'm here to help Nikos with the zucchini harvest" I say as I approach the group that has already gathered at the small gate of the plot. A pick-up truck is parked at the entrance of the plot, one bike leans next to the low wooden fence and one is on the ground.

"Hi Vasili! Thank you for joining us" responds the oldest among them - I suppose this is Nikos. "Such a nice day today, eh! The work shouldn't be too hard, I'll give you a few zucchini to take back with you as well."He must be in his late sixties now, with few white streaks in his black hair and beard. Looks like the face of a typical farmer, scorched slightly from all the labour out in the sun. His very rosy cheeks make him seem incredibly friendly. I can't imagine him trying to be intimidating and pulling it off. Everyone seems eager to finish the work quickly, so I also leave my bike and we slowly make our way to the crops.

"We are cultivating this *μισιακά*", says Nikos while pointing to Maria. I reciprocate her good morning and good month wishes. I recognized her from last month when I helped her with the trimming of some trees. I haven't seen our other companion before.

This is actually a very old land management concept - "*μισακά*", or halved. It is essentially a communal use of the land. For example, a person that has land but does not know how to cultivate it - or doesn't reside in the region anymore - strikes a deal with someone who wants to cultivate it. The yield is halved between them, hence the name. Another instance could be if a farmer wants to grow a specific crop, and would arrange with a friend that has the seeds and equipment. It is also accompanied by another practise - "*δανεικαριά*" it is called, or "borrowed". This one refers to sharing of labour within the local community. On the day of the harvest multiple families would come to a farmer's plot and help out. What would take three days for a single person to complete could instead be done in one. After this work is finished, the farmer would go help out at another person's harvest that had assisted them. A circular exchange of labour and knowledge.

Such traditional practices have been adopted by the bioregion as part of the effort to transition the production practices of the Spercheios valley completely to agroforestry. They made this system that enables farmers to participate in the land documentation process and an application that allows them to request assistance or for an expert to be brought in their plot. Also, people like me that are working part-time are called in for help with several odd jobs. This has allowed



poverty

A concern that arises with shifting towards a mainly agricultural economy for a European country is the fear of facing conditions of extreme poverty, as was experienced in many rural areas during the pre-growth era. However, in this imaginary it is argued that a combination of three conditions would combat such worries. Firstly, technological advancements in the agriculture field, like automation of harvesting or climate resilient crops, would ensure food availability and mild-labour conditions. Secondly, a diversified food production that is linked with agroforestry and permaculture practices would provide quality sustenance, unlike the sparse food production that pre-growth societies had access to, and the import-dependent monocultural food production that is in place now. Thirdly, a pan-European trade system would ensure national cooperation and alleviate food insecurity in areas that are more at-risk from climate change, and thus could not produce their own food.

technology

Technology and innovation in a post-growth society would not be an end in itself, an obsessive search for new advancements that would replace the current ones. Rather, it ought to be emphasised that the technology required for a post-growth transition is already available, but the growth-fixation disallows its application in the appropriate ways. Thus, reusing and repairing would be crucial processes in a post-growth society. The imagined bioregion relies on robots and machines that continuously gather data and monitor habitat functions. However, when it comes to automation in production, the imagined post-growth so-

different areas to develop an expertise to a specific product or type of cultivation, while the knowledge is adequately documented and shared to anyone that wants to learn.

We walk for a little while, as the zucchini harvest is a bit deeper inside, with no road access. We pass through a field of mixed fruit trees with chickens running around, and then along a small gravel path that separates rows of olive trees with small wheatfields. As they are gently swaying in the wind, I brush my hand through the tops and feel the spike kernels in my palms. A little further away is the agrivoltaic plot with the plump zucchini underneath, protected from the scorching sun. They are paired with rosemary bushes that fill the air with their scent, and deter specific pests from coming close.

This valley of Spercheios has been giving us food for millenia, but it was much more recently that the landscape was sectioned neatly into large plots, signifying the era of growth. Any trees or forest cover were deemed redundant, inefficient, and thus removed completely. The bioregion is still trying to recover that today, with the shift to agroforestry. I wonder how many hundreds of thousands of trees were required for this feat so far. It was also, apparently, very hard to convince people back then to transition away from intensive agriculture. However, after a few small pilot projects grew into larger operations, slowly people started to realise that long-term, these traditional forms of food production are very beneficial. They provide a much more diverse yield and require much less fertiliser - if any, as the soil was becoming healthy enough on its own. There are still many disagreements about how to operate today, however, they are usually resolved in the weekly meetings with the bioregional council.

Picking the zucchini is relatively easy - with this many of us at least. We each claim a row and with a sharp small knife cut the ones that are ready to be harvested from the stem, and gently place them in the carts. I always found them quite cute, trailing behind us like puppies. A little larger than a standard crate, they are woven with willow but some have some PLA mixed within to strengthen or patch them. Their wheels are almost comically large for the basket's size, but it's needed to traverse through the soil or the bumpy stone roads. Each of them are fixed with a little solar panel and their battery pack at the back. Once they reach their weight threshold they beep twice and head back towards the entrance where they unload to Nikos' larger cart. Sometimes you can see them at the sides of the roads, moving slowly towards the storage facilities. I have to admit, I've grabbed an apple from them once or twice in the past. But I've also helped one that was toppled over, so I believe my karma remains at a solid zero when it comes to them.

This is not a big harvest, so with us is only one other

ciety would value human labour and would not aim for the alienation of people from the management of the land through completely automated processes, as that would be unenjoyable and would disconnect them from nature. Technology could alleviate the pressures of everyday hassles, but also be reliant on human kindness and care to continue existing.

part-timer like me. We finally get the chance to talk a bit as we take a small break, sitting underneath the solar panels. It may be April but it's still quite warm, especially after all the bending and picking. "I'm Sidi, nice to meet you." A warm hand, hardened by physical labour, accompanied by an even warmer smile.

"I'm Vasilis. Do you also live around here?" He tells me a little story. His family is from Mauritania and was working for many years at the greening project to fight desertification. His father would swing at the hardened soil and create moon-shaped holes that would capture any run-off water, and slowly become green and bear food again. But when Sidi was ten years old, his father decided this life was too hard for them and migrated to Greece. Many years later, he is now living with his wife and elderly father at Makri, and are renovating their old house that was provided by the bioregion. "Yeah, it's going quite nicely! I got some help last weekend with the roof and will install some new kitchen cupboards tomorrow. My father still itches to work, so he is restoring the old dry stone walls in the garden. There's all sorts of stuff to do still - but one thing at a time."

migration

Climate change is expected to perpetuate migration, as the extreme weather conditions, desertification and material scarcity would perpetuate geopolitical conflicts. Southern European countries are already entry territories for such refugee movements and in a post-growth transition they ought to prepare for this. Instead of alienating refugees in uninhabitable camps in the Greek peripheral territory - what is happening currently - there should be more opportunities for rehousing programmes, making use of the abandoned house stock and providing equitable working conditions, especially in the agriculture sector where a lot of labour would be required.

When the decision to practise agroforestry was taken, the region had a bunch of empty houses and needed people to operate the agriculture jobs. A relocation program was drawn up, bringing refugees that were held at those awful camps in the islands to the mainland. With them they also brought valuable knowledge about farming at harsh conditions of water shortage, that was needed at times of drought.

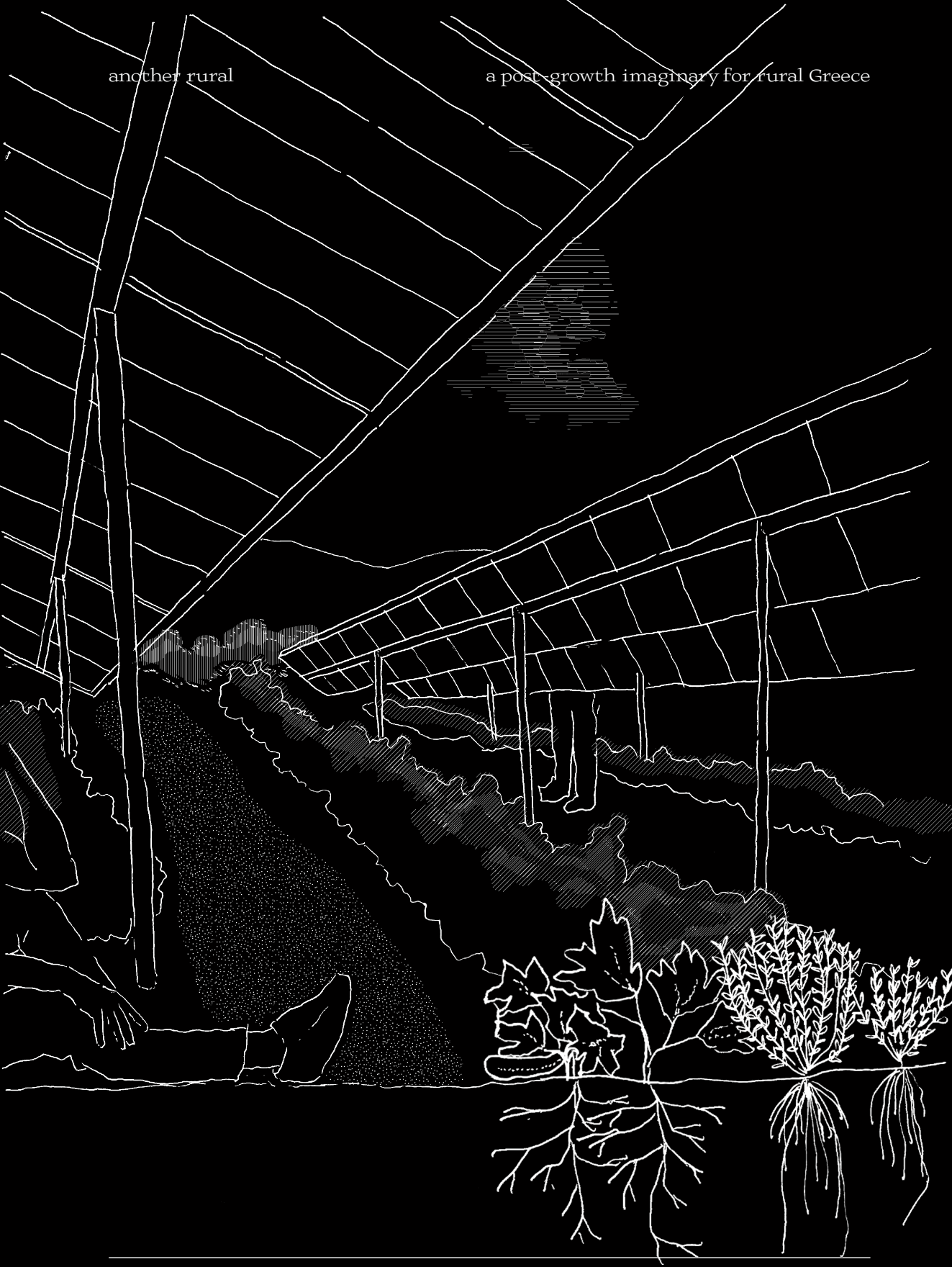
Nikos is too old to kneel like the rest of us, so he mostly goes back and forth to whoever asks for his opinion if a zucchini is ripe enough, or calls us when he wants to show us a pest, or if he spots a large zucchini he is very proud of.

At the faucet next to the gate I wash up my hands and face. Thanks to this cooling breeze and the light work, I didn't work up almost any sweat. "I'll head uphill to Spercheiada for the meeting. There will be discussions about the wetlands today, so I want to attend and take some notes for my research."

"You didn't grab your zucchini though!" says Nikos, looking deeply hurt.

"I can drop it off. I'm going to Palaiovraha to eat with some friends", Maria comes up with a solution immediately.

"Thanks! Leave it at the tavern and I'll grab it later when I get back to the village tonight." I wave goodbye to them while I ride my bike south towards Spercheiada. The sun now sits almost directly on top of me in a somewhat cloudy sky. The shadows from the tree branches are cast on the asphalt road and I tree to find meaning in their overlapping patterns.



4

participating to common affairs

It was only a few minutes biking through the fields to reach Spercheiada. It's the largest and most populated settlement in this upper part of the region - and got its name from the river itself. The meeting hall is a large, old building next to the stream, in a complex of public buildings that include a church and an elementary school. In the past there was also a playground and a small football field, but they both collapsed during a flood. They were built practically on top of the stream, as was done frequently back then. The concrete had grown eroded from continuous neglect and one night the entire thing just fell into the stream. The same thing kept happening - things getting swallowed up by the earth where the water wanted to run. It started with buildings, roads or bridges, but after a flash-flood that devastated the country, the whole neighbouring region of Thessaly apparently became a lake! Both the central government, along with the regional and local governing bodies were failing remarkably to implement any meaningful change. After that period of great floods and forest fires that caused irreparable damage to the country, the bioregional councils were formed to deal with the complex issues of water basin management. I think that's what Ahmed was referring to during our talk in the square that chilly evening.

The bioregion today operates through a very complex monitoring system that collects immense amounts of data every day. Monitoring devices are scattered along Spercheios, at every bridge and inbetween, measuring the water level, quantity of nutrients and pollutants - same with all the streams that end up in the main river, and the groundwater bodies. That information is juxtaposed with water consumption from agriculture activities, measured at each plot, each village, measured from each house, every faucet. The system also considers data from the forest and habitat monitoring, as well as for energy production, like the output of the geothermal plant, each wind turbine and solar farm, every solar panel from every house - and also the daily consumption of the industries, households and farms. All this data is fed through the Bioregional Artificial Intelligence Processing System, which makes a prognosis about the future of the land, in the form of a report with simple maps. I doubt any of the residents understand how this happens - myself included. Ancient stories describe *Πυθία*, the oracle of Delphi, sitting on a tripod with leaves of laurel in her mouth, intoxicated by fumes coming from a deep chasm in the earth. The god *Απόλλων* would speak through her, however the words of the gods would reach

space for water

It has been common practice in Greece to cover up streams or modify their course by encasing them in concrete, even in rural areas. Instances of collapsing infrastructure, like the ones described in the story, are increasingly more frequent as these structures are ageing over time. The bioregional post-growth agenda calls for a holistic approach to water management, by uncovering the streams and allowing space for them to flow. This is of course especially important for urban areas, like Athens that has been dealing with flooding for many decades , due to the mismanagement of the water structures. However, the same agenda can be translated to smaller settlements, as ensuring proper ecological functions is crucial for all parts of the complex and interconnected riparian systems. This act of uncovering should be coupled with appropriate public spaces or recreation uses, so long as they do not disturb the ecological functions.


1 currently covered stream
2 stream zone renovated into linear natural park with public space
3 church
4 meeting hall
5 school
6 public space
7 main car axis adapted with bike and bus lanes
8 space for communal farming
9 reforested riparian zone
50 m
N

post-growth and AI

The recent boom of AI raises many debates about its role decision-making processes. Similarly, its role within the post-growth agenda should be carefully examined. AI processing systems require a lot of material input to function; not only physical space for data centres, but also a lot of precious metals for the computation power. Is such extraction-dependent technology viable in a post-growth vision? The approach followed here is that completely shunning AI as inherently problematic is myopic. The management of water basins within changing climate conditions is far too complex, making such techniques of processing important for the future. However, all outputs should be carefully scrutinised, as is described in the story.

democracy

Ensuring democratic procedures is a fundamental part of a post-growth transition, as aiming for a degree of self-sufficiency could lead to feudalism and increased competition with other regions. The imagined bioregional administration here is imagined as a separate entity to the current politically elected bodies, and could mirror in some ways the Dutch Water Board or Rijkswaterstaat. Such a politically-detached entity is imagined mostly in order to ensure legitimacy, transparency and a data-driven approach to decision-making, given the problematic context of corruption. Nevertheless, space for debate needs to be ensured within the bioregional post-growth administration, allowing for different opinions to emerge, which would probably be similar to today's left-right structure, but with an underlying understanding of the importance of ecology as the main driver.

the mortals as equivocal words or riddles. Similarly to her divinations, the output of the AI needs to be carefully interpreted by the members of the bioregional board. I was told that in the past there were some major errors in this system when it was first implemented, due to the lack of data. People were blindly following the generated guidelines without carefully examining them. It led to some redundant adaptation measures in the upper part of the region, causing a bit of a scandal and uproar about the fate of AI in decision making. Since then, these results are never taken as an absolute.

The bioregional board is appointed every four years, at the same time as the elections for the politically elected body of resident representatives, and are a team of experts from different backgrounds, from environmental conservation, to spatial planning to mechanical engineers. They interpret the AI output and then debate about the implementation at the bioregional meetings. These are held every week at different locations, or often on-site when it comes to site-specific interventions. Once a month, the meeting takes place at the university campus, where a large, physical hydrological model of the bioregion takes up the space of one whole room. This is used to explore and communicate the implications of water management projects, while a smaller version of this is used at the weekly meetings.

Some people are already seated with this week's pamphlet on their hands. Most are standing and talking loudly in groups. "Good evening everyone. Please sit down, we are starting in about five minutes." Every meeting is scheduled to have four representatives from the bioregion - two spatial planners, a water management expert and an environmental expert, while a representative from the state is there to ensure democratic procedures are followed. The conversations between everyone continue unphased for another ten minutes, and then people sit down. There's about twenty or thirty people here - most prefer to see the meeting online or just read the newsletter after.

The secretary goes through today's agenda: a draft report for the water quality data gathered during March, a revision of last month's guidelines, a report on the extension of the railway and a debate about the economic future of the wetlands - the thing I'm actually interested in and why I bothered to join in-person today. I've already gone through the first report for my own work, so I can drift off for a bit. No one in the audience is interested in these numbers anyway - unless something looked very off. While the data for the forest monitoring is being presented, I imagine the sounds of the monitoring drones. They always signify the end of spring, like a prelude to the cacophony of the cicadas that is to follow. When I was little, my friends and I were trying to shoot them down with rocks and sticks but got scolded a lot by their par-


implemetend by
bioregional building association
agriculture research association
infrastructure association
travelling bioregional meetings
debated at
elected bioregional board
interpreted by
bioregional prognosis
bioregional AI processing system
land-use documenta-tion
water quality information
renewable energy monitoring
strategic long-term planning
bioregional structure plan
continuous data gathering
trans-bioregional synergy plan
EU guidelines & regulations
bridge node
stream node
crossing node
wetland node
ex. coastline node
ex. monitoring node
10 km
N

ents once they caught us. "Never mess with them! Do you want our village to burn down again?" My friend's mom grabbed my shoulders and terrified me with that thought, even though she had never lived through such a thing. I suppose it was inherited trauma from our grandparent's time. We just wanted to play, but that was indeed dangerous - not to mention how expensive the equipment was at the time! I snap back into reality when a man standing three seats to my left starts raising his voice. "You are saying contradictory things here. We have to farm more extensively but export more food?"

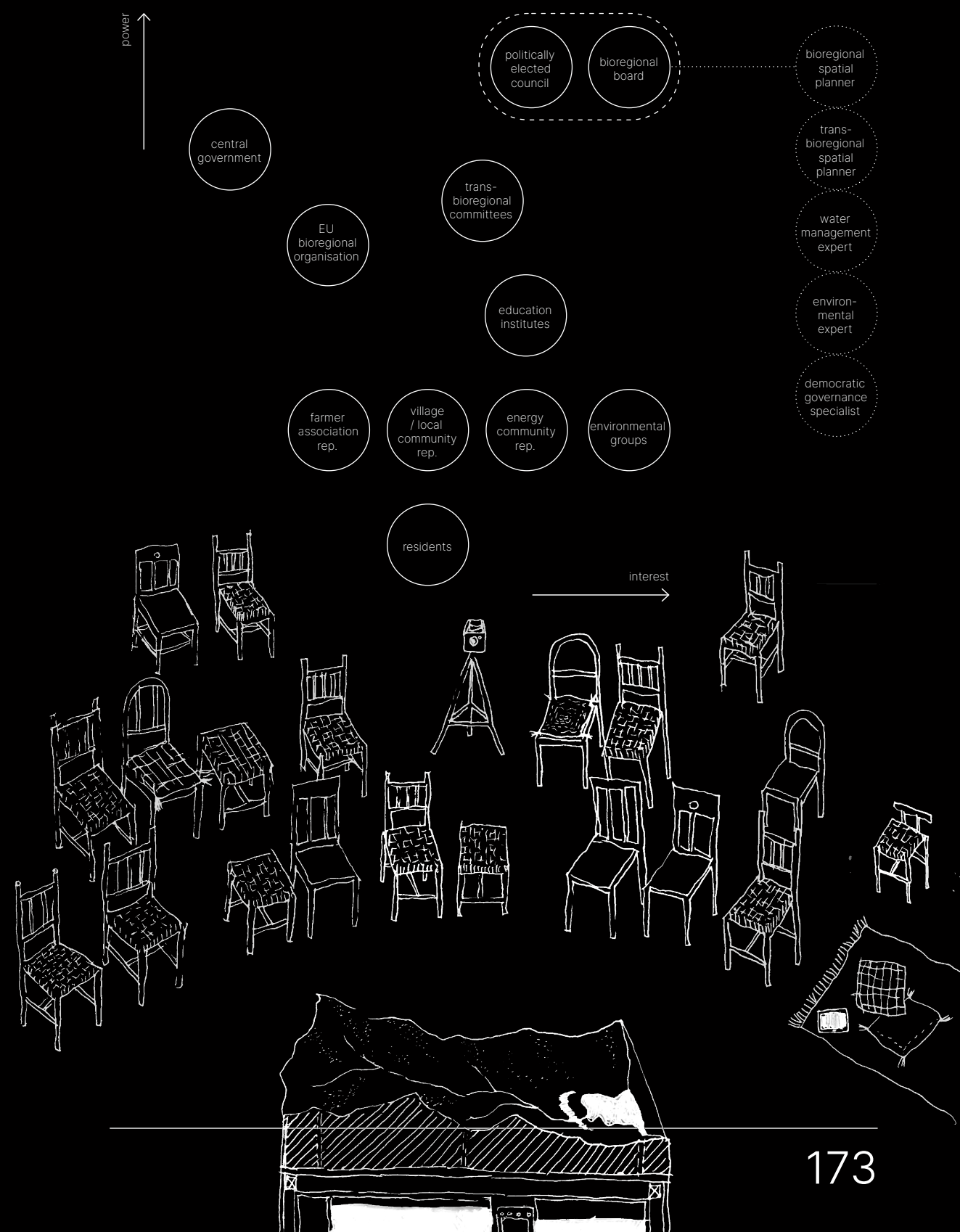
"Dionisi, we understand your concerns, however, as we showed it is not like that. We are not aiming to produce enough food only for our bioregion. Our country doesn't have that many flat areas to use for agriculture. With the current climate it's very hard for the island bioregions to sustain themselves. It's not food that is being exported to other nations, just for the sake of it." The old man sits back down, but looks quite dissatisfied with the answer. He must be a regular at the meetings for them to know him by the first name. There's still some people that look at things this way, fearing a globalisation that has never happened yet. "Yeah, whatever. As if we even have nations anymore", he says in a much lower tone to the person next to him, who barely acknowledges him.

He's not entirely wrong; national borders have become a bit redundant. For example the bioregion of the river Aoos extends from the mountain range of Pindus in Greece all the way to the Albanian coast. There, bioregional elections are held between residents of both countries. This didn't happen so smoothly though, there were many conflicts about a "loss of national identity" or concerns about "preserving the cleanliness of the language" in Greece. I believe history has shown quite the opposite though. It's more of a localisation of the problems, the decision-making, the sharing of risks and opportunities. People have much more in common than was believed back then. A board member is furiously taking notes on their tablet at the end of the table - must be the person that ensures democratic procedures. Mariana exchanges a few looks with them, but ends up taking the lead. "Let's move on, this is not the time to argue about these things. The report shows that despite the very little snow this year, we have managed to secure enough water in the tanks to last us through the next..." The examination of the report and the guidelines take quite a while to finish, but the discussions go smoothly.

"Alright then, I believe we can move to the final topic for today. To summarise for those that are new to the discussion, based on EU policies and the bioregional generated reports we have proposed the extension of the wetland restoration project to the other side of the reservoir. We have an updated proposal from the design team today." Some people gather around the bioregional model, where the design team

beyond borders

In essence, the bioregional approach is defiant of national borders. For such an imaginary administration to be able to operate based on characteristics of the land itself, trans-national cooperation is pivotal. The example that is mentioned in the story, the river Aoos or Vjosa, is such a case that extends beyond national borders. A large segment of the catchment zone on the Greek territory has recently been declared as a nationally protected zone, mainly through the significant efforts of many civil society organisations, while there are also efforts to create Europe's first Transboundary Wild River National Park (The Entire Aoos River in Greece and Its Tributaries Are Now Protected!, 2023). This status of institutional protection, along with specific guidelines provided by the EU, are needed to form the basis of a potential bioregional administration.


power
politically elected council
bioregional board
bioregional spatial planner
trans-bioregional spatial planner
water management expert
environ-mental expert
democratic governance specialist
central government
trans-bioregional committees
EU bioregional organisation
education institutes
farmer association rep.
village / local community rep.
energy community rep.
environmental groups
residents
interest

representative points at all the changes to the land. Most prefer to look at the live view from the screens, as they are accompanied by more information, graphs and annotations. They simulate a flooding event by running excess water through the river and show the capacity of the water reservoir that expands towards the agriculture zone.

"This looks great and all, but we are having to adapt too frequently here. The reservoir doesn't have fresh water either; it's brackish water. Are you saying we all have to switch to fish farming now?"

"No, not at all. We have been in contact with the bioregion of Ebro in Spain. They have been experimenting with salt-resilient crops for fifteen years now, and we have invited their research team to visit us next month. We will upload more information about this in the next few weeks, so you can read up on it and reach out to us if you have more questions. But, how about we resume this discussion for the on-site bioregional meeting, to also hear from their team?" The woman that asked the question raised both arms, agreeing with the verdict for now. "Any other questions?"

"Yes, thank you" another person chimes in. "I like the proposal in general, but I have also noticed from this and the previous one - neither of them have any bike paths or any access for residents. I think it would be very nice to be able to go to the wetland easier. I know there are some organised tours, and I've attended them all. But I still think it would be nice to have a bike path through there."

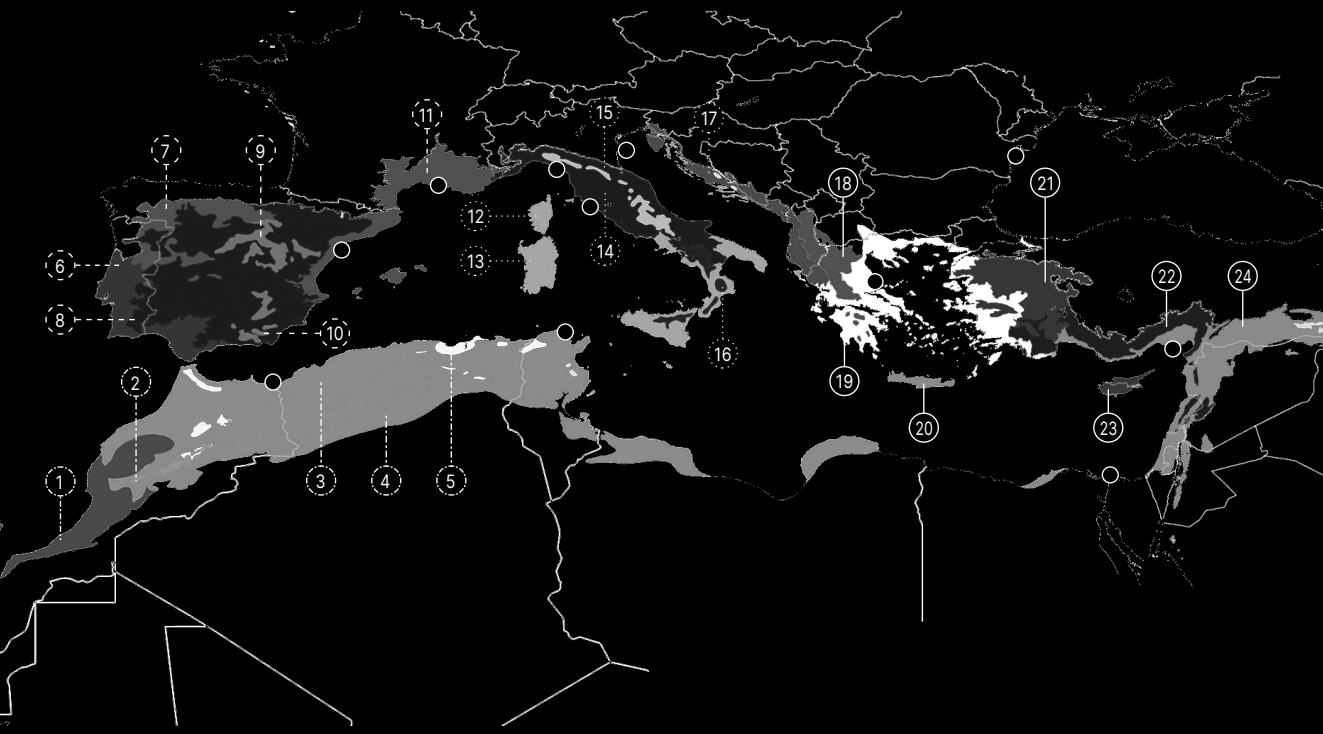
Margarita, the head of the citizen environmental group raises her arm to respond from the audience. "But how do you ensure that they won't become too crowded?" It wasn't clear who should respond to this question, so there was a brief pause. "To make it clear, I also don't agree that there shouldn't be any access for residents, but these things would be hard to control. We don't want the wetland to turn into a tourist attraction and disturb the habitats. But you definitely need to see this land's beauty to understand how special it is. Then it would drive you also to protect it."

"We have been discussing about some type of soft paths that you could only walk through, not really bike" responds the spatial planner from the bioregional council. "But we can look further into it and propose some options. It's also something that is much better to talk about on-site as well. Regardless, thank you for the comments."

Everyone looks a bit fatigued from all of the discussions. "Thank you all, let's continue in fifteen minutes with the last part." This is reserved for requests, complaints or ideas from the residents. I never found this section enjoyable to listen to, as the results would be posted on the news bulletin anyway. I use this as my chance to escape the crowd and grab a bike. My stomach is already complaining audibly.

Europe

In this paper, bioregionalism was deliberately interpreted on a regional scale in order to investigate its operationalisation. However, much larger bioregions could be formed based on the geomorphological and climate characteristics that would span throughout the entire Mediterranean basin. The role of Europe in the post-growth agenda would be to provide guidelines to assist in the transition to bioregional administrations, to coordinate trans-national cooperation and to organise trans-continental research efforts, as climate change would still have subsequent effects even in an optimistic scenario. Clusters based on similar geomorphological characteristics or similarly experienced challenges could emerge in this way, despite not having close proximity to each other geographically. These bioregional clusters could share knowledge and resources, accelerating the adaptation to climate change.



South Mediterranean Mixed Woodlands & Forests

1 Mediterranean Acacia-Argania Dry Woodlands and Succulent Thickets
2 Mediterranean High Atlas Juniper Steppe
3 Mediterranean Woodlands and Forests
4 Mediterranean Dry Woodlands and Steppe
5 Mediterranean Conifer and Mixed Forests

Balearic Sea & West Mediterranean Mixed Forests

6 Southwest Iberian Mediterranean Sclerophyllous and Mixed Forests
7 Northwest Iberian Montane Forests
8 Iberian Sclerophyllous and Semi-Deciduous Forest
9 Iberian Conifer Forests
10 Southeastern Iberian Shrubs and Woodlands
11 Northeastern Spain and Southern France Mediterranean Forests

Adriatic Sea & Central Mediterranean Mixed Forests

12 Corsican Montane Broadleaf and Mixed Forests
13 Tyrrhenian-Adriatic Sclerophyllous and Mixed Forests
14 Italian Sclerophyllous and Semi-Deciduous Forests
15 Apennine Deciduous Montane Forests
16 South Apennine Mixed Montane Forests
17 Illyrian Deciduous Forests

Aegean Sea & East Mediterranean Mixed Forests

18 Pindus Mountains Mixed Forests
19 Aegean and Western Turkey Sclerophyllous and Mixed Forests
20 Crete Mediterranean Forests
21 Anatolian Conifer and Deciduous Mixed Forests
22 Southern Anatolian Montane Conifer and Deciduous Forests
23 Cyprus Mediterranean Forests
24 Eastern Mediterranean Conifer-Broadleaf Forests

Ecoregions of Europe.
Diagram from the author with data from https://www.oneearth.org/

○ wetland restoration site

5 commuting along the river

The fastest way to reach the delta is to get to the terminal train station at Makrakomi, commute to Stavros, then switch to the line that goes to Athens and stop at Thermopyles. There I'll get on the bike again for a bit and get inside the wetlands. It's about a ten minute bike ride from Spercheiada - probably less if you rush. But I am not in a hurry anymore. The bridge is usually a very busy crossing place, but quite empty at this time of day. Most people are already back home to eat lunch and take a short nap, before heading back out for their afternoon affairs.

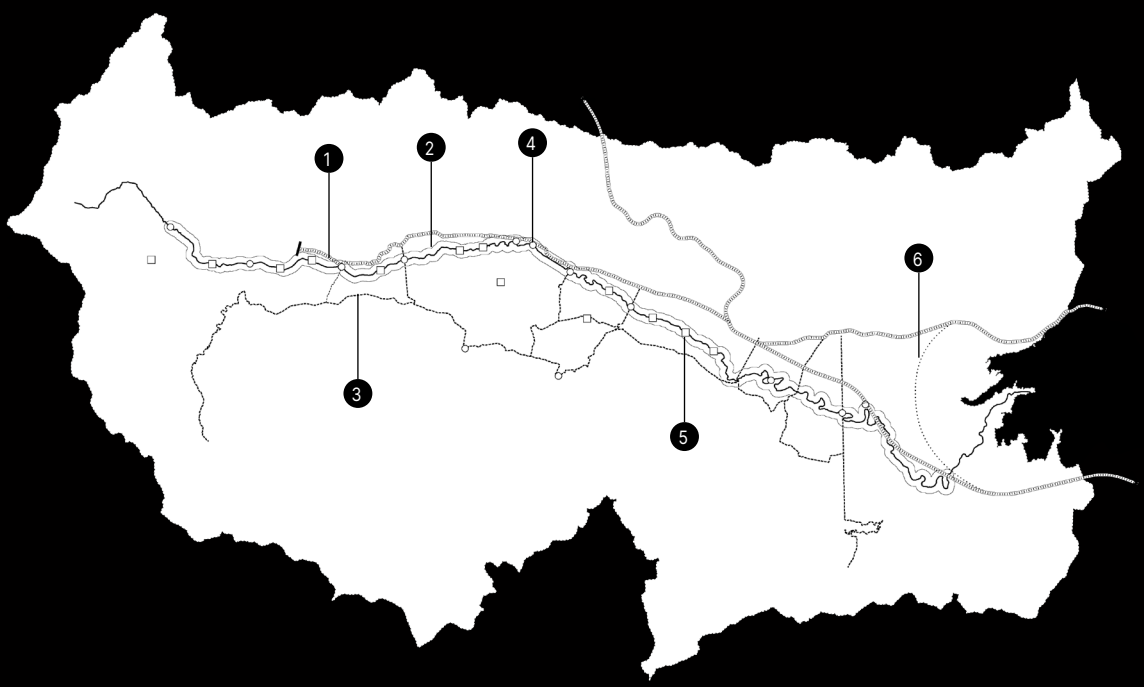
Just before I reach the station, I stop for a little while at the middle of the bridge to take in the scenery. The water is meandering along the wide river bed, slowly smoothing away any imperfections of the river stones until they look like precious jewels. This flat piece of land in front of me is surrounded by stoic mountains all around, like a gentle hug. I can't help but feel a deep sense of belonging, of being embraced by this landscape. Even the wind on my cheeks feels old and wise somehow. In the distance the wind turbines turn ever so slowly, reminding me of how slow the passage of time really is. "In this world there is no place for sadness. No place; not one." This is what I've been repeating to myself during this time. It's a line from a book I read recently, but can't recall which one.

"Might as well have lunch here", I think to myself. I leave the bike on the ground next to the bridge and lay down on the bank. We made my favourite yesterday with Elli, rice stuffed vegetables. Of course, they taste nothing like my grandma's, but good nonetheless. Good, but different. Another thing I have to come to accept.

The river banks have been stabilised with layers of stacked tree trunks, and large boulders closer to the stream. You can see the same technique at many parts along the river that were eroding. It requires quite a lot of maintenance, but the materials are readily available already in the region. Also, history has taught us by now that overengineered projects didn't stand the test of time. Trying to tame nature is not a losing battle - it's a lost cause. Coincidentally, this space also makes for a perfect lounging area, almost like an amphitheatre overlooking the flow of water and the change of the seasons ahead of me. As I am carefully scoring the skin from a stuffed tomato with my fork, to expose the flavorful rice mixture, a loud thud followed by clicking noises sounds off somewhere near me. I look around and see the "*περαταριές*" shifting. What perfect timing! Lunch with a show.

attachment

A degree of regional place attachment is necessary to enact the ambitious changes of the post-growth agenda, and part of it is achieved only through environmental awareness. This is at the core of the bioregional approach, and the most important driver in allowing a post-growth transition to occur. Such awareness and appreciation of the natural world can only emerge through shared memories and experiences of people with it. However, apart from the few bridges that cross over Spercheios, there are very few areas that provide direct physical and visual access to the river. The extended riparian zone is imagined as a linear nature reserve, with limited formal access but walkable and bikeable nonetheless.



1 railway extension till Makrakomi along the existing highway
2 biking path along the existing riparian zone edges
3 existing trans-local network renovated to ensure long-term safety, and adapted with small-scale habitat crossings
4 existing bridges adapted with bike and pedestrian lanes
5 scattered crossing points for bike and pedestrian access
6 dike with biking path, marking the edge of the wetland restoration project and protecting the habitated lowlands from sea level rise

learning from the past

Other than water management, soft infrastructure could also be implemented in mobility. Adapting mobility to the seasons was a way of living in the past that got lost with the hegemony of car infrastructure. As examined here, the traditional περαταριές propose light-weight and impermanent structures that could be useful in making the region more interconnected, but also diversify the river monitoring system. This would also call for more public employment for the maintenance of all this infrastructure, and the soft maintenance of the riparian zone itself.

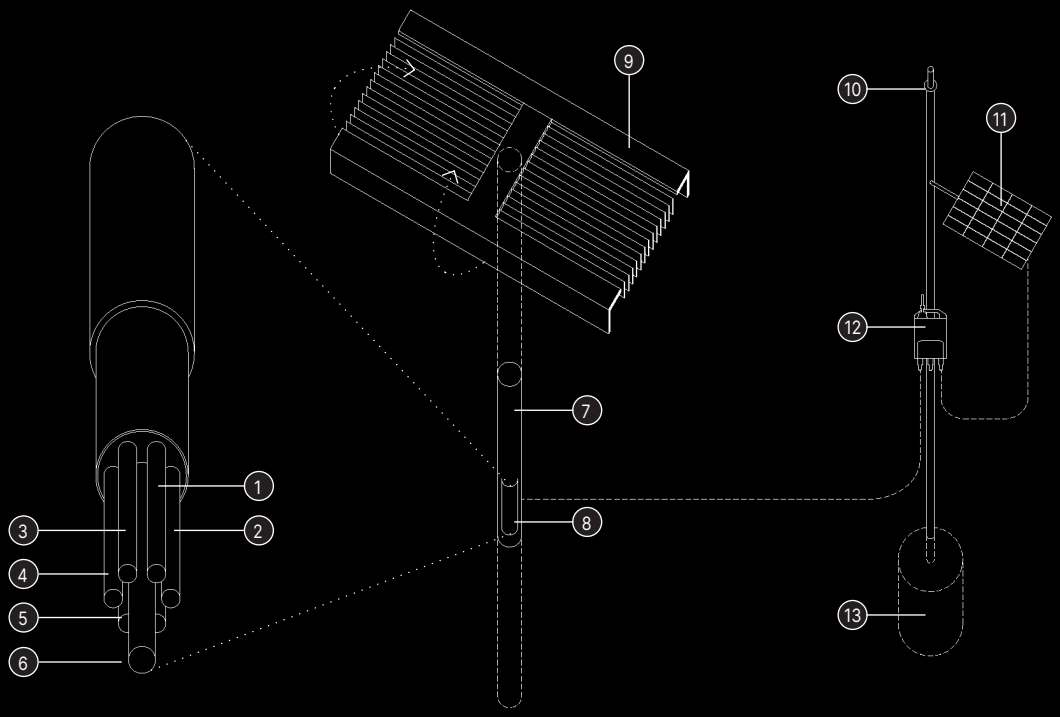
monitoring

Despite large parts of the region being protected as part of the Natura network or National Park, monitoring of the river basin is currently very limited, if non-existant. A pilot project was recently set in place, equipping two bridges close to the lowlands with a sonar measurement tool, to give live data about the water level. The imagined post-growth administration system requires intense data-gathering, not only from streams and rivers but also land use and forests. Therefore such projects need to be accelerated, installing data-points in every bridge and throughout the bioregion.

In the summertime, when the upper parts of the river are almost dry, you can cross it just by walking - getting your feet only a little wet. But during the wetter periods the river can be relentless in its way. People would build bridges, newer and sturdier each time, only for them to collapse again and again. Crossing from one side of the river to the other was a real hassle back then, especially if you had cargo or animals. That's why these people, the "*περατάρηδες*", from "*πέρασμα*" or crossing, would build their make-shift constructions. Some would make wooden decks and tie a rope on either side of the stream at something sturdy and charge trips while going back and forth with small boats. In other regions where the river was almost in a canyon, people would make bridges, hanging from tree trunks or other stable structures, usually made from stone. I've seen some old photos of these. To me they looked as if people started enthusiastically constructing a stone bridge, but a shocking embezzlement scandal caused them to stop abruptly, leaving just the beginning on each river bank. After that, they had to make do with what they already had, and made this janky bridge out of old wire and nets. Just crossing once could be a dare between boisterous kids.

A more high-tech system is in place today. Every now and then, you can see a line of poles inside the river in a linear formation, perpendicular to the direction of the flow. These steel tubes are anchored deeply into the ground and on top of them lay grate panels, forming a path that connects the two shores. The height of the platform adjusts automatically according to the water level - as it is doing now. When there is a lot of water, it elevates slightly, but when there's too much water, at a level that would make the crossing too dangerous, then the panels rotate to the side, disallowing access. On either side of the river bank, a staircase leads to the linear path. Instead of constructing more permanent bridges to facilitate local crossings between nearby villages, you can use these by biking or walking. Or just for a leisurely walk along the river.

But, equally as important, they are also equipped with monitoring devices, like a hydrostatic depth gauge instrument attached to one of the poles and a water quality monitoring sonde. It has sensors for dissolved oxygen levels, turbidity, chlorophyll & phycocyanin, and of course temperature and pH. I'm quite familiar with these - well, their readings at least - they are similar to the ones I sometimes have to survey at the delta. A solar panel at the bank is making this system self-sufficient. The bridges are also equipped with the same devices, along with radar instruments that automatically measure the water level. All this data is broadcasted live and is available for anyone to see online. Once these were installed at a few key points, like before and after the Vistriza or Roustanitis streams feed into Spercheios, flood prevention has been



1 dissolved oxygen sensor
2 turbidity sensor
3 pH sensor
4 chlorophyll & phycocyanin sensor
5 conductivity & temperature sensor
6 tip with cleaning brush
7 steel tube 150mm anchored in the ground
8 multiparapeter sonde with live data stream
9 rotatable and extendable steel grille panel
10 tipping bucket rain gauge
11 solar panel
12 intelligent monitoring terminal
13 concrete base

much easier to handle.

With my lunch finished I take a short nap as the sun falls between the leaves of the platanus and warms my body. I don't dream of anything.

A group of highschool kids forming a small circle are waiting for the train. It's past school time now so they must have had lunch and are probably headed to Lamia, to meet up with their friends and do something fun. A woman is carrying a large basket with fruit, and an exhausted-looking trio of people is asleep in the chairs. Looks like they were working from the morning at the fields, dirtying up their overalls. I hope a hearty meal awaits them back home. The train arrives shortly and we all board it, scanning our bioregional travel pass at the entrance and making our way to the comfortable red seats.

The railway line stretches along the river to the length of our region. In an effort to reuse the existing infrastructure they built a single railway line on the old highway, leaving space for a single car lane and bike routes on either side. The train goes back and forth from Stavros all the way to Makrakomi. An extension to Vitoli is still under discussion. I'm all for it - the line would then span the length of the Spercheios valley. But it seems that it's quite difficult to do because of the terrain. The train is slow yet reliable, carrying us around like a donkey laden with a family's belongings headed to the market in the old times.

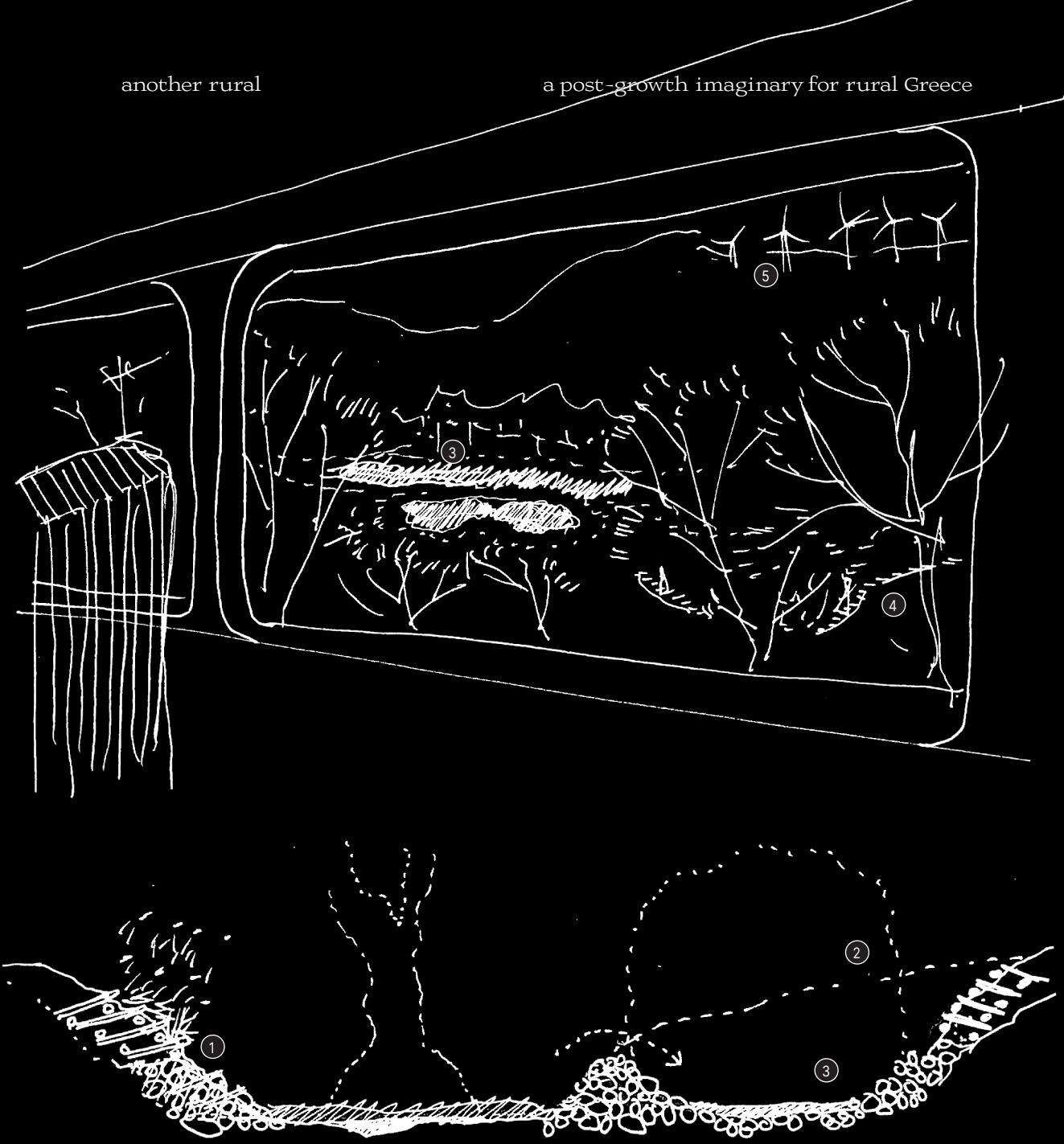
The forest grows thicker as the train moves closer to the river. From the few high points of the tracks, you can see all the way to Spercheios, between the trees. If you look closely you can even see the storage ponds, still glimmering with some water from the rainy period last month. These are offline reservoirs for times of flooding and are constructed with stones in rectangular shapes, about three hundred metres long by eighty metres wide, throughout many points along the river. When the water level of the main river starts getting too high, it naturally discharges into these ponds to lessen the flow. The water stays there until it evaporates or is drained naturally, benefitting the local wildlife as well.

We pass by Kastri and Paliouri, two neighbouring villages that are swallowed up by the platanus forest. This has been turned into a linear nature park, with few bike routes going around it, as well as hiking routes. "Maybe I should have been a bit more patient, and came here for lunch instead" I think. We used to come here often for single-day field trips with school when I was younger, and I once found a remote spot next to the river that was ideal for inconspicuous naps. One time I did get woken up by a cow that started chewing the grass in front of me - the park is mostly maintained naturally through wild grazing. I wonder if my special spot is still there today.

nature-based solutions

A few nature-based solution project pilots have already taken place in the region of Spercheios through the organisation Operandum , but documentation is limited. However, this data was used as part of a comparative analysis of three countries where nature-based solutions were deployed, through a series of surveys. The residents of the Spercheios region showed the lowest scores in the sub-themes of trust and satisfaction, at items like "implementers know what they are doing", "implementers have the best community interest" and "satisfied with how measures are being implemented". At the same time however, they also showed the highest scores in behavioural acceptance items geared towards the future, at items like "In the future, I would like to learn more about", "help implement or maintain", or "attend meetings about" the Nature-based Solutions (Anderson et al., 2021, p. 10). This attitude coincides with the larger context of distrust towards procedures, but measured eagerness towards the future. The researchers suggest increasing public acceptance through highlighting the positive experiences or opinions of well-respected and long-lasting community members that have been affected by flooding in the past and currently support Nature-based solutions (Anderson et al., 2021, p. 16).

For more information see https://www.operandum-project.eu/greece/.



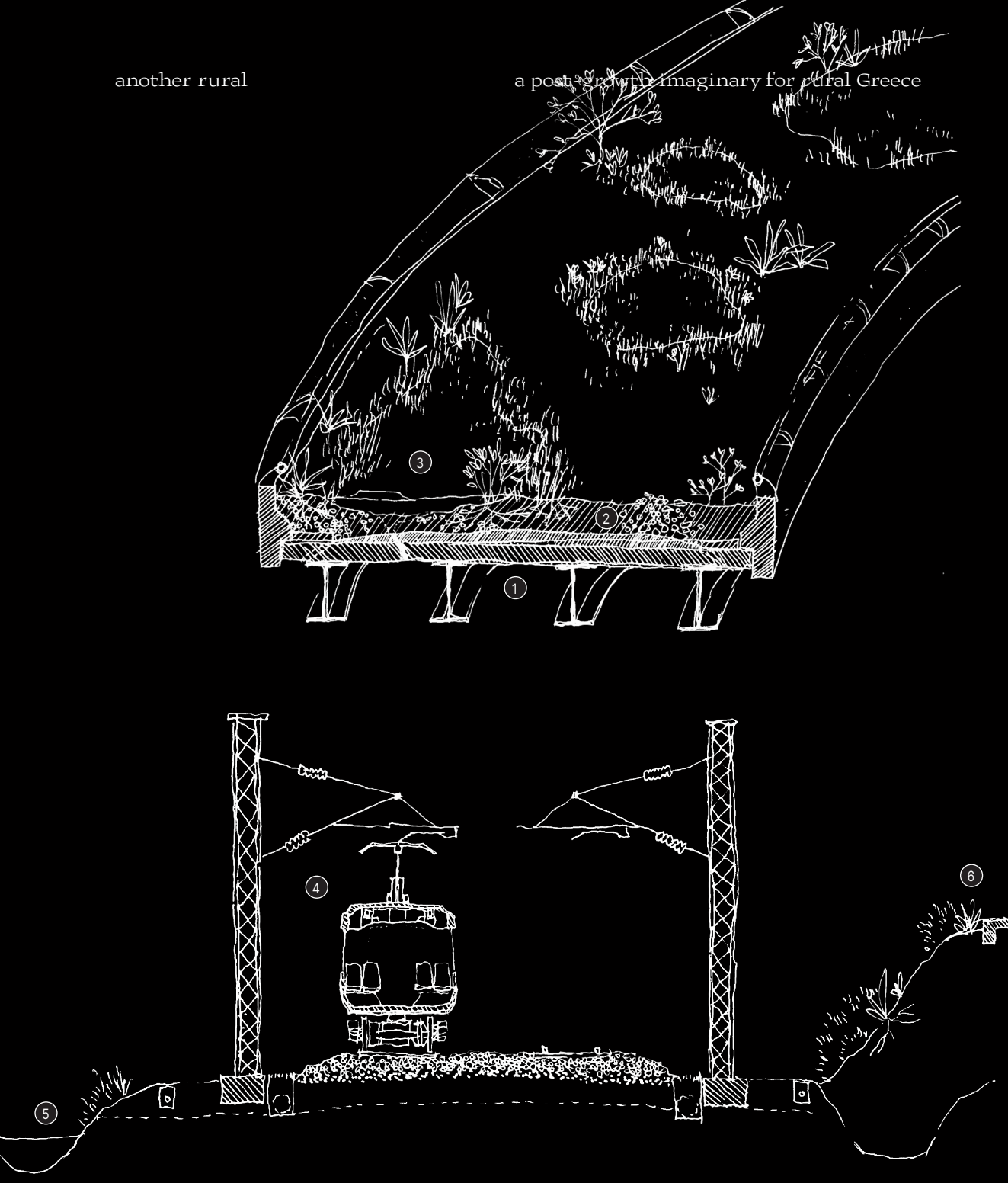
1 stabilisation of the river bank with wooden logs, subtly adapted with sitting areas for public use
2 expansion of riparian zone through reclamation of agricultural land as nature reserve space
3 offline flood reservoir constructed from stones, of maximum dimensions
4 path through platanus forest
5 wind farm atop the mountain of Oiti

redundant infrastructure

Poorly planned and low quality infrastructure is common in Greece, given the context of corruption with construction companies. For example, residents of the village Komma, which is to the south of the major city of Lamia and near the starting point of the linear spillway, have been experiencing constant flooding in the past years. After a significantly devastating flooding event in 2021, they have attempted to find justice against the construction company of the E-65 highway, claiming deliberate omissions and violation of orders from the Ministry of Infrastructure. Only recently, in April of 2024, has the court finally ruled in favour of them, calling for the immediate remediation and construction of the necessary flood-prevention infrastructure (Hatzigeorgiou, 2023). The imagined future here is radically different. As part of the conscious limitation of car use, road infrastructure would be increasingly more obsolete. These huge pieces of infrastructure could be left as ruins, allowing for new ecosystems to emerge or be completely removed.

After switching to the line towards Athens, the train passes under an old car viaduct from the era of growth. A lot of redundant car infrastructure was left unused, until the bioregion decided to turn this one into a habitat crossing, by dumping there tons of soil that was removed from the wetland restoration project. After being left untouched and out of mind for some decades, a couple of bird-watching enthusiasts decided to make their way up there. To their surprise they discovered that a new habitat had popped up, an incredibly rare one as well. A series of small ponds, with diameters not bigger than two metres had popped up, as the rainwater trickled down the road. These formed a Temporary Mediterranean Pool habitat - which at one point were thought to be extinct.

I imagine little tadpoles swimming frantically as their legs start to grow. I wonder if the change is terrifying to them. A whole new world of opportunities lies ahead of them. It's almost my time to get off - we'll be at Thermopyles in five minutes.



1 viaduct/elevated highway adapted into habitat crossing
2 soil and gravel fill
3 temporary pool habitat
4 existing railway network expanded west towards the valley
5 ditch along railway line
6 dike with bike and pedestrian lane

6

exploring the lowlands

This train station is really a treat for the senses. As soon as the door opens, the smell of sulphur immediately confronts your nose. After that, it's the giant cloud of steam coming from the base of the mountain, followed by a sense of dampness even during a dry day. In a children's book a cloud-manufacturing factory would be located there, inflating them like air balloons and slowly sending them off to the atmosphere. There really is a factory there though - well, a geothermal power plant. I stand for a little while at the train station seat to watch the steam disappear slowly, as the mountain top starts peaking through it.

"Do you know the history of how this geothermal energy thing happened?"

I am startled, as I barely noticed this old woman that had taken a seat next to me already. "Not that much. Just that it was a controversial topic when it was being constructed."

"Yeah, it was in everyone's tongue. They were trying back then to stop burning lignite for energy and figure out other ways to do it. Well, the lignite actually finished up first. A few companies wanted to buy this piece of land at the base of the mountains, where the geothermal springs are. 'Greece: the battery of Europe' was the slogan. They wanted to turn it into a huge geothermal plant and sell the energy to foreigners. That was before we moved away from growth of course."

What is it about me that makes older people want to share their stories all the time? I am an easy target, I suppose. I always listen to everything people tell me. It makes them tell me things they usually wouldn't share so easily. It's too much sometimes! This old lady's mannerisms look painfully familiar.

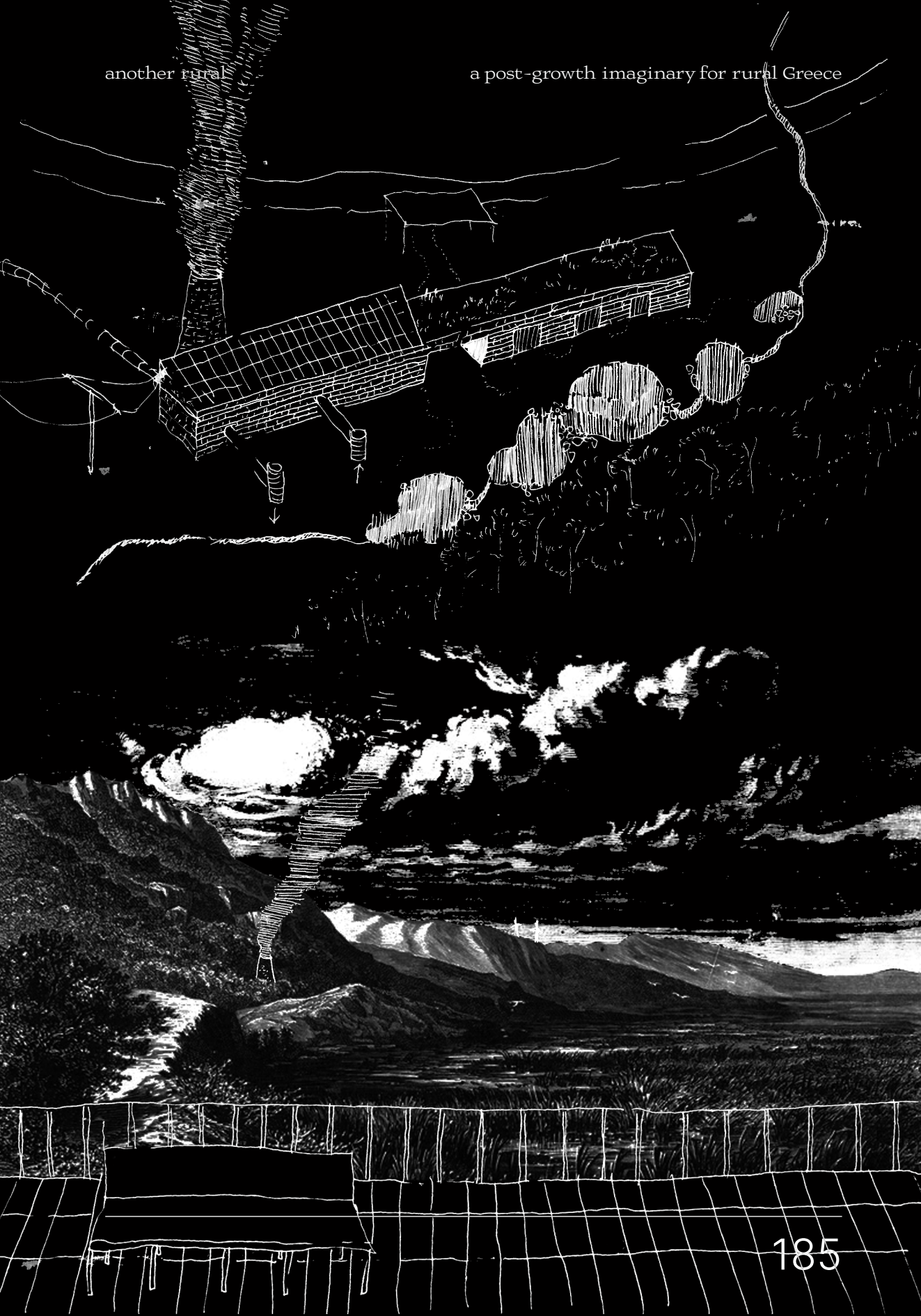
"But... People were really attached to those hot springs. They believed it would save them. Even though they barely used them themselves, they were arguing that the plant would destroy them, along with the surrounding landscape. How are we going to attract people to come to the region if we destroy them? That's what they were saying. I understand them though. They were seeing this land changing around them so much, getting emptier and emptier, and of course it made them worry about the future. What future? Is there a future if there's no one to share it with?" she paused while looking intently at me. I feel like she was trying to say two things at the same time. When I tried to respond with something, she quickly continued.

"Well anyways, in the end the solution was simple. Why not do both? So they made this little geothermal plant and this spa hotel right next to it. I've been to the springs a few

tactics

As tourism is deeply rooted in people's understanding of progress, then perhaps a more viable solution to gain public acceptance and accelerate the post-growth transition is to combine investment in tourism schemes with climate adaptation measures. Thus far, only lukewarm limitations have been placed on new construction of residential or tourist accommodation projects in congested touristic areas. Allowing construction in existing settlements could be coupled with placing emphasis on the improvement of the local community's infrastructure. This already happens in some ways, like the owner having to construct their own road access to their property. Going beyond that, new investment projects for tourism could be required to provide wastewater treatment for the community, storage space for drinking water or to produce enough solar energy for communal use. The case examined briefly in the imagined narrative is intentionally extravagant - the combination of geothermal energy production with thermal spring tourism. This also hints towards a required shift in the aesthetic expectations of travel.

Landschaft bei den Thermopylen (1887/1992).
Retrieved from https://eng.travelogues.gr/item.php?view=39790

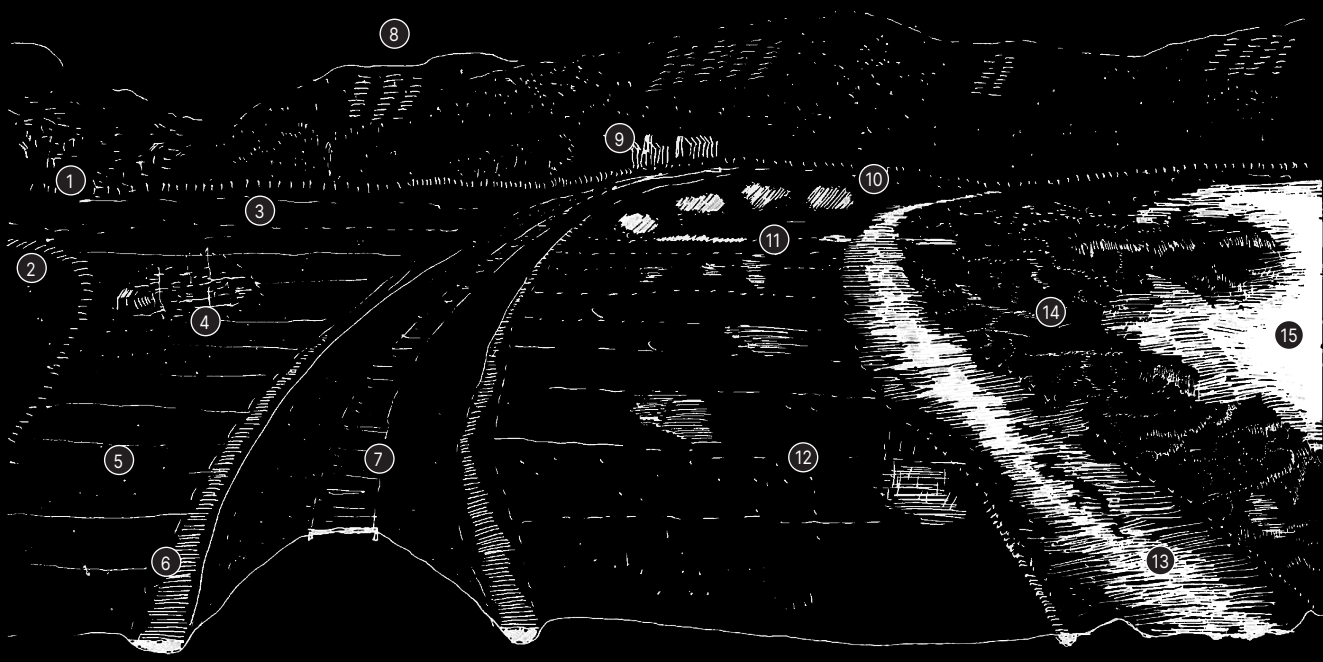


times there, they are okay. The one in "*Ψωρονέρια*" is better for your skin though. You know how it got its name? A horse that had mange escaped it's carriage and went to take a dive in the spring. When it came out it was healed."

I feel that she could have gone on forever, but the next train to Lamia came and she quickly said goodbye and walked towards it, to be the first to grab a spot inside. Behind the train, the white smoke continues to rise tirelessly. This region has many geothermal springs, besides the ones at Thermopyles. One is actually close to our village in Palaiovraha, in a location called Amplas. The water from that spring is used to heat up a few hydroponic greenhouses around it, but it also fills up the pools of a small thermal spring resort during spring and summer, when the heating for the greenhouses is not needed. But enough about hot water. Today it's about cold water; brackish, fresh and salty. I have to get to the wetland at last.

I exit the train station and take the stairs that lead to the upper side of the dike, while the story of the old woman still echoes in my head. The view from this side is also breathtaking. The dike is not even that tall, but you can see all the way to the coast. It separates the agroforestry fields from the wet agriculture, where salt-resilient crops are cultivated. The huge crescent-shaped reservoir divides the landscape and at the very edge lies the strip of reclaimed wetland, the marshes. On the other side of the dike, beyond the train tracks, a denser type of agroforestry is taking place. I pick up the only bike left at the racks and start heading towards the same direction I came from, biking towards the village of Anthili. I can only see another biker in the far distance on top of the dike, but a lot of people are still working on the wet fields.

In the far distance, in front of the wastewater treatment ponds, you can see traces of a linear water channel - perhaps the most hubristic action this region had committed. This man-made spillway was constructed close to the village Komma, and was literally a straight line all the way to the coast. It was supposed to be used in times of heavy rain and risk of flooding, by receiving the excess water, saving the lowlands from flooding over and over again. But of course, that's only half the truth. It gave way to an immense intensification of the land. Spercheios was bordered up, and the water flowed almost entirely into the spillway, leaving the original, meandering river with almost no water at all. This also displaced the wetland habitats, causing damage that even after such a long time we are still trying to rectify. From the linear diverter, the water was over-pumped for irrigation, but also worked as a dumping ground for agriculture processing waste and urban waste from Lamia. Soon the soil started losing its fertility, causing the farmers to use more fertiliser - in turn polluting the underground water wells too. Less than half a century later the soil became salinized, uncultivable. One of



1 Lamia city
2 existing railway line towards Lianokladi, extended along the river towards the west part of the river basin
3 existing railway line towards the east, currently till the city of Stylida
4 Anthili village
5 intensive agriculture plots adapted into extensive agroforestry
6 ditch
7 dike with bike and pedestrian lane at the edge of the wetland restoration project
8 solar farms along the northern mountains
9 soft-industrial area
10 waste-water treatment ponds
11 remnants of the old spillway
12 wet agriculture with saline water resilient crops
13 seasonal water reservoir as barrier for the wetland conservation area
14 wetland restoration with traces of old agriculture patterns
15 Gulf of Maliakos

ambition

A post-growth future should aim beyond adaptation, but towards ecosocial regeneration. The restoration of degraded valuable ecosystems like the wetlands should be a priority. This is not only crucial for the wellbeing of riparian and marine habitats, but also for carbon sequestration - an important part of meeting environmental goals for a carbon-neutral society. As projects like this can span decades, it is important to be ambitious from the beginning and initiate negotiations and expropriations immediately, while providing viable solutions to local farmers and other stakeholders towards a just transition.

uncertainty

Considering the complexity and long-term goals of the post-growth transition, its spatial planning approach needs to embrace uncertainty and open-ended design, rather than fixed masterplans with rigid implementation procedures. In this imaginary, the bioregion carefully curates a process of wetland regeneration that spans decades, by responding to site-specific conditions or limitations and continuously examining implications, while involving locals to all steps of the decision-making aspects. This is very different from the current practices of Greek municipalities and regions, and would require the presence of many more trained spatial planners, landscape architects and environmental experts in such spaces.

the first projects that the bioregion started implementing was the wetland restoration project, by gradually closing up the diverter, expanding the riparian zone and allowing more water to the original river. That was the main direction of the bioregion back then. "Let the water flow - and let us live along with it."

After I reach the point where the dike meets the river, I leave my bike, change to my rain boots and walk along the riparian zone till the wetlands. I wouldn't say my sense of direction is bad by any means, but sometimes I think this land is playing tricks on me. Every time that I visit it it feels new and unrecognisable - except for these mountains. When I get overwhelmed, I try to orient myself by looking at the mountains and try to recall the exact feeling I had when I was here last time. These mountains look back at me, stoic and serene, like drawings in a church. Compared to them, this land full of soil, water and mud is pulsating. Never-changing mountains that contain an ever-changing valley. That's what this whole region is. Even the bioregion gave up on trying to draw maps here. The axes and focal points of the proposed projects were always off, the calculated areas never matched what was constructed, and the essence of the spatial experience couldn't truly be captured when trying to draw it. Now the wetland is being restored on-site, by a team of environmental experts and a group of shepherds. A small team of researchers - myself included - traverse through this muddy landscape and take care of all the monitoring equipment. I take the sample tubes from my backpack - they come in pairs, one for soil and one for water - and fill them up at the points that are already marked with the little flagpoles. I wish they were easier to spot, but they can't be too big to not disturb the birds. The restoration of the wetlands is still underway, even if it has been going on for many many decades already. It is only recently that we found traces of a lost species of fish that is native to this region, barbus cyclolepis sperchiensis.

Traversing through this muddy landscape takes a lot of time. It's just a couple of hours till sunset. After I've made my way out, I clean my boots in the river and trace my steps back to the village. On the train, I tried to read a couple of articles for my research but quickly gave up and picked up a small poetry book I found at a second-hand bookshop in Lamia. I highlight one small poem about Spercheios, from a writer I don't recognise:

έψαξα μα τέμενος δε βρήκα, μήτε ευώδη βωμό
με τα πόδια μου στης γέφυρας την άκρη
τούφα απ' τα μαλλιά μου κόβω και ρίχνω στον ποταμό
αρχαίες προσευχές και ξόρκια πάει να βρει
στου κόλπου τον μαλακό πυθμένα, που ειν' το νερό θολό
να λυτρωθώ απ' του εαυτού μου την πλάνη
σφάζω ότι είμαι και χύνω αίμα αχνιστό

7

ending the day

This is my favourite time of day, when everything is dyed with the deepest blue. The sky seeps into the trees, the walls of the stone houses, the dusty gravel that crunches under my shoes, and into the familiar faces around me at the square.

Before I sit down for dinner at the tavern I sit at the bench observing people for a bit. Outside the tavern, they have already started the grill, and the smell of smoke and ash is taken up the mountain from the evening draft of wind.

Hearing the bus coming, some people started gathering in front of the church. A group of exhausted-looking school kids come out of the vehicle, trying to find their parents in the small crowd. It must have been an excursion today, to play at the river upstream and learn about the different species and habitats. I also did these fun things as a kid - I guess I am still doing them in some way, but a bit more lonesome now. The parents hurry home while holding the hands of their drowsy children, discussing who's going to do what and also quietly making plans to meet at friends' houses or come back to the square after they put them to bed.

Next to the grill two people are cutting eggplants in thick slices and brushing them with olive oil. Someone walks slowly towards them and hands them a few more vegetables.

"From the garden" she says and the other people nod thankfully. It is the tavern owner Stefania. She must be in her early nineties now, but looks at least a decade younger. "I'll go wash my hands and come help with the preparations."

I move to the tables at the tavern porch that are already set with a thick fabric tablecloth and a mismatched dining set. At the corner I notice a small basket, overfilled with zucchini.

"Oh yeah, Maria left these for you. Should we...?" says Stefania, gesturing with her eyes towards the grill, together with a smile.

"Yeah, sure! Should I help?"

"No no no, you sit down. You're also my grandkid now too."

She wipes her hands on her apron, and picks up the basket. Watching old and experienced people cut vegetables is always comforting. She cuts them lengthwise and places them on the grill, after she oils and salts them heavily. The sounds of the burning coal and a glass of ouzo with cherry juice in my hand make my tiredness melt away from my body.

After dinner I walk around the square but I don't see Theoni and Elli around yet. They must be eating at the house.

values

The described post-growth society is fundamentally built on the values of community, radical sharing and conviviality. These principles emphasise the importance of collective prosperity and welfare over individual wealth. Expecting such significant personal and societal changes to emerge on their own is unrealistic. While education is crucial in fostering such values, active efforts are also sacrosanct. These can include engaging locals in community-building activities and empowering their voices in local and regional decision-making.

βα Oops sorry, I forgot to text. Had some grilled veggies and rice at the square.

ελ no worries, we have 🍽 for tmr. Theo is taking a shower 🚿 and we're coming 😸

βα See you soon! ☆

craft

As has been already argued in theory, a shift towards the craft sector is an important item of the post-growth agenda. It creates employment that is not intrinsically tied with efficiency, speed and overconsumption, as well as highlighting the importance of long-lasting quality artefacts, instead of disposable and polluting ones. Such a shift could be achieved through first engaging deeper with art, not only as a tool to envision the future but also as a way to communicate it. For example, art-making workshops could be a way to engage the population, to express their ideas and grasp the values that are required for a post-growth transition.

Next to a group of old ladies that are shucking corn are Yota and Jorja, two ceramists that live in our village. They give out lessons at the church every week but have now moved their wheels under the large tree. I wonder how they managed to do that, as they are quite heavy. On the ground around them are two overlapping circles of scattered clay slip, settling on top of the gravel, as if it is warding off bad spirits and preppy people from stepping too close. With my work pants already visibly stained from the farmwork and traversing through the wetlands, I am unafraid.

Yota is struggling to centre the clay and build out the form, exhaling with annoyance. "This recycled clay is so gooey!"

"Are you also mixing the porcelain with the brown clay? They don't fire at the same temperature at all."

"Yeah, I haven't thought that far ahead."

Their different creative processes are quite clashing, but I guess that's what makes them a good duo. Jorja is delicately painting an odd-shaped vase with black pigment.

"Whoa, this looks so cool."

"Thanks", she replies and her whole face lights up when she smiles. "It's a commission from the bioregion actually. They asked a bunch of artists to make a piece about the history of the region, so I'm trying out this sort-of didactic scene thingie. I'm not sure yet if I like it - we'll have to see how it comes out of the kiln."

"What would you paint?" Yota asks me. I am taken aback by the sudden question and take a little time to think about it.

"I have no idea."

They both burst out laughing. I think they found my response way too earnest or maybe they also struggled coming up with this design, so they understand my difficulty too. I leave them to continue working on their pieces and take a slow walk around the square. What would I want to teach people?

I remember this old story, passed down to my grandma from her grandma. When she was a young girl, she and her cousin were walking along the river with their mule, towards a village upstream that was quite far away from theirs. The market was being held there and they had to deliver some products to a relative. Among the jars of honey, cheese and embroidered blankets was also a small wooden box, containing the bones of her grandfather. She was also tasked with delivering this to the priest of that village - to be buried in the


IMPOSSIBLE

place he was born at. If they were to travel for another hour or so, they would be able to make it to their destination, however, the night was starting to catch up to them. A woman from the nearby village saw them from a distance and rushed to them. She told them that they should spend the night there instead of continuing, as it would be dangerous without any light. They were a bit hesitant at first but the woman insisted so eventually they decided to accept her offer and stay the night. While they were tying their animal to the fence, they looked back to the river. During the time it took them to make their way up the village, the previously calm and slow-moving stream was now soaring through the valley. Proving the nature of its name, the river truly moves with such force.

I am still not sure why I chose to keep track of this day in particular - maybe so I make the best of it, maybe because I sense a change starting within me. The birth of a new story. The moon is already in the sky, fulfilling its contract to keep the world safe at night.

I see Elli and Theoni walking towards the square, already laughing at something that I can't wait to hear about. As the women are shucking corn they start to sing quietly... A low hum that mixes with the sounds of bugs, the rustling of trees, the beeping sounds of the monitoring devices and flying drones, the flow of water and the turn of the wind turbines at the church.

In this chapter I will attempt to answer the hypothetical claim that formed the main research question. The extent of bioregionalism to assist the post-growth paradigm is evident through theory, but the constructed imaginary will further explore and visualise the opportunities and potential limitations. The relevance to both society and the scientific field will be detailed, as well as proposals for further research. In the end, I will also reflect on my experience during the thesis project, hopefully explaining how much I have learned.

arriving at conclusions

responding to the question

To what extent can a bioregional approach to territorial planning result in spatial interventions that are compatible with a post-growth transition?

Revisiting the main research question, firstly, the compatibility of bioregionalism with the post-growth approach was tested, in order to enable further conclusions to emerge. The post-growth transition requires an agenda that is far too immense and ambitious, requiring not only institutional but also personal changes to lifestyle. However, from the interrelation of the bioregionalism literature and through reflection about its applications, I can conclude that bioregionalism has the capacity to respond to some key barriers of this transition. Most importantly, the bioregional approach to territorial planning could enable the emergence of territorial cohesion through individual place-attachment to a shared territorial place-attachment, thus enhancing societal acceptance of the transition. Also, considering the bureaucratic context of Greece, bioregionalism can assist through proposing a radical change to reorganising administrative structures.

The scope of the post-growth agenda is planetary, as it highlights the finity of material resources against endless economic growth. Its all-encompassing nature is a crucial part of this argument, but it also makes it challenging to imagine how its recommendations would translate into our physical reality, especially through the perspective of a non-academic. Bioregionalism has proven crucial in providing an operational territory to this approach, thus enabling its translation into tangible spatial qualities and interventions. By grounding the post-growth approach to place, it allowed for a process of imagining the future and tracing it to our current reality to emerge.

The formation of the imaginary was the method of testing the robustness of the post-growth society, which resulted in a variety of speculative design interventions. These varied from local mobility schemes, to the adaptation to energy and water sufficiency at the scale of the individual house to the region as a system, to the brief exploration of a decentralised water treatment system, to the design of a wetland conservation project for the lowlands region. These design interventions were highly interconnected and complementary, which would have been significantly harder to envision without the bioregional approach in territorial planning.

But there are limitations to its extent. Fundamental barriers of the post-growth transition, such as public debt or lack of accepted alternatives to GDP, are not explicitly addressed through bioregionalism. Such barriers are also not solved through design or spatial interventions. Bioregionalism is a deeply place-based approach, so it would require many such systemic changes, in order to operate in the imagined way as a lively administrative territory. Such potential requirements were explored through the imaginary, including curbing political corruption and idleness, shifting to an ecocentric and equitable decision-making scheme, and conducting water basin management through a research-informed and data-driven approach.

In conclusion, while bioregionalism does not directly enable a post-growth transition, it does provide important tools to further investigate its operationalisation through a contextual approach.

on transferability

Fundamentally, the bioregional approach employed in this project ensures a degree of transferability: defining the operative territory through natural, morphological features defies existing administrative boundaries and bypasses anthropogenic predisposed prejudices. In this way, my project's results about the bioregion of Spercheios would be applicable to any river regions with similar socio-morphological characteristics. Such transferable elements include nature-based solutions for flooding or drought conditions, the operation of small-scale energy and water communities, requirements for regional mobility or adaptation to agroforestry through traditional land-sharing practices. However, this high degree of transferability is constrained within similar contexts, mostly relevant within the Mediterranean basin.

Regardless, transferable elements are not limited only to other rural bioregional contexts, but some could be applied to urban or peri-urban locations as well. More notably, allowing space for water to flow should not be limited to riparian zones in rural regions. Actually, as it is briefly explored in the story, cities should be the first to engage with dismantling engineering projects of the past century, that either covered streams or altered their course through linear concrete river banks. This is especially important for Greece, where the majorities of rivers in urban contexts have been covered - as is most prevalent in the city of Athens. Cities have the most resources and are in most danger as of recent, with cases of intense flooding and lack of biodiversity. Similarly, the formation of a decentralised waste-water network or the formation of energy and water communities could be implemented in peri-urban areas that are lacking in central infrastructure, thus reducing emission-intensive and resource-heavy construction of new networks.

on methodology

My methodological approach for this thesis project consisted of theoretical research of post-growth literature and its interrelated concepts, the application of the learned knowledge to the context of Greece through the investigation of barriers and opportunities of bioregionalism, and the examination of the context-specific manifestations of growth in the selected key-region of Spercheios. This is a relatively traditional approach thus far, but I believe the interesting item within this methodology is the chosen design deliverable - the post-growth imaginary.

design as Storytelling

In this project I was confronted with two major hurdles. On one hand, the incredibly problematic and complex context of Greek rurality, and on the other hand the overwhelming and all-encompassing post-growth theory. The more research I did, the more seemingly unsolvable problems or instances of immense underlying corruption I found; and even more branches about the scope of the post-growth approach I could locate. At many times, these made me despair not only about the sufficiency of a potential design deliverable, but also about the future of Greece in general. As an act of radical optimism, I chose to partially disregard both of these aspects and instead focus on forming an imaginary. Momentarily forgetting about the how and allowing myself to envision: What would a post-growth society look like? And then: What would be required to make it work?

This method of story-telling and world-building allowed for multiple levels of design to become interconnected. The structure, tone and content of the narrative proved to be an element of design itself - which was quite challenging as I had never written anything resembling fiction before, let alone a short novel. Also, through this method, fictionalised processes and spatialities were explored that became objects of design as speculative design interventions

themselves: the adaptation of an individual house, proposing new mobility infrastructure for the region or imagining a geothermal plant coupled with a hotel, to name a few. In other words, the deliverable manifested as the design of a story containing designed interventions. At the same time, instead of going through scales in a typical large-to-small fashion, or vice versa, the fiction writing process enabled a meandering through scales, experienced from a person's perspective. The story explored the small-scale of a single house, then to the scale of the village, to a single plot of farmland, trans-regional mobility and so on. This allowed me to locate synergies or conflicts that I would otherwise not be able to observe. However, this also resulted in a far larger deliverable than I had initially anticipated. In hindsight, a more structured agenda should be formed before initiating the fiction-writing process.

Overall, I believe the employed method of story-telling through fiction text and speculative design interventions (assisted through contemplating about and constructing physical artefact) could be very useful when reckoning with complex contexts with many interrelated issues. It allows for a multiplicity of ideas to emerge, while still containing a degree of familiarity and relatability, as it is done through the perspective of a person. However, to embark on such non-traditional design approaches, the scope of the Urbanism teachings ought to be broadened, allowing for more space for experimentation and art as part of expected deliverables. One way to assist in this would also be to engage with lectures and workshops of story-telling and world-building from relevant practitioners or artists.

real fiction

While constructing the narrative through the combination of fiction writing and design interventions enabled me to envision and explore my ideas for the bioregional post-growth society, this process seemed absurd at times. I am aware that I am not versed in fiction writing - and also that it is in no way a requirement for Urbanism studies or the grading rubric at hand. Thus, when writing the story I tried to not overthink things too much, letting instead the story emerge organically. The characters were not intentionally based on anyone, but were loosely inspired by my own friends and family. I noticed that imbuing real events and places from my own experiences seemed to assist me in writing the story. All the places that were described are real - I only included areas that I had visited during fieldwork, as I could describe them better. At other times though, it made the process overwhelmingly personal, forcing me to reckon with my often untrustworthy perception of living in the region, formed mostly through hearing stories from my family and memories of visiting these (at the time) far-away places when I was a kid. In my attempts to describe the transpiring events and places to the best of my abilities, this story evolved into quite a large text. This makes it hard for someone to grasp the content without engaging a lot of personal time to read it - one of the main limitations of the chosen format.

hierarchy versus totality

At many times during the entire thesis process, I was confronted with the need to narrow down its scope and to focus on one specific thread or pathway. The typical approach, that I got familiar with during my time in TU Delft, is to compartmentalise and define a clear hierarchy of nice-to-have and must-have items. However, from the beginning of this project I instinctively tried to reject such a way of thinking, embracing instead a sense of totality - a cloud of ideas (as described by Leo). I can now conclude that this is of great importance in world-building, when trying to grasp a vision of the future through imagination and creative thinking. Just like in literature, the world needs to be described adequately-enough to illustrate the context and engage the reader, but loose enough to trigger their imagination

as well. I hope that in this way, the reader of my post-growth story would understand the intricacies of the post-growth agenda, but also speculate about their own interpretation and site-specific ideas.

art as method

An important part in forming the imaginary is the engagement with artefacts. At times when fiction writing, research and design seemed to get out of hand, I tried to devote time to speculating about the post-growth approach at the scale of an object. This enabled me to think about the otherwise all-encompassing and often unapproachable post-growth transition in a more material, physical way. For example, the first chapter opens with the description of the character's carpet, hinting towards the values that are required to make such a transition manifest. While I have not had the opportunity to engage deeply with this aspect of my thesis, for P5 I aim to follow my initial idea presented during P3, and actually construct a few of the described artefacts myself. Outside of policy guidelines, maps and diagrams, art can prove a powerful tool for engaging an audience - however it is often overlooked in the field of urbanism.

on future research

This paper explored the definition of bioregions in Greece through river basins, ultimately choosing the region of Spercheios as a case study. Following this method, the same approach could be tested in a different bioregion in Greece through further research and design experiments. By exploring synergies and implications, the extent of transferability of the examined elements could be better understood. Due to its complexity and similar shortcomings in water basin management, the examination of the nearby region of Thessaly could potentially lead to valuable findings. In light of the natural disasters that altered fundamentally the region's functions, such an exploration would be more of an urgency rather than a recommendation.

Another suggestion that could utilise this thesis' result, the formed imaginary, would be to use it as a communication tool with local stakeholders and administrative officials. By exposing them to the entirety of the illustrated text or through parts of it, like the agenda and few key-instances, would enable a process of gauging their reactions toward the spatial manifestations of the post-growth transition. This could be a valuable way to investigate people's perception of growth, understand implications and feasibility, and gather emergent new ideas, thus accelerating the post-growth transition. However, aside from its academic benefits, it could assist the local municipalities or region by providing them with a spatial imaginary that could function as a goal, as spatial planning departments in Greece usually do not explore long-term ambitions.

8

appendix

positioning

The general relation of my project towards the field of Urbanism is evident in the engagement not only with post-growth theory but also through an investigation of its spatial manifestations and implications. Through my project I aim to aid in the operationalisation of the post-growth paradigm, specifically for contexts like that of Greece, who traditionally lack an awareness of spatial planning. The lens of the Planning Complex Cities studio was crucial for my project, especially the earlier research stages, in reckoning with socio-spatial issues of the ageing Greek population, the depopulation of rural areas, and the politically corrupt and neglectful administrative system. Such a complex problem field contributed to an overall inability of Greece to adequately plan and respond to social and ecological pressures, thus a different response is required. My project follows in this way the research-driven and data-informed design approach of the studio, within the realm of Urbanism.

societal Relevance

My project is aimed towards the revitalisation of rural areas of Greece, enhancing human happiness, social cohesion, while ensuring ecological functions and long-term environmental resilience. Engagement with decision is quite limited in Greece, due to a problematic, politically corrupt and inert context. Through the formation of new bioregional administrative units I aim towards the re-organisation of local governance and the empowerment of rural dwellers in decision making processes. At the same time, the bioregional approach has the capacity to enhance trans-national cooperation.

Lastly, I believe my project is also of importance specifically for the Greek context, in providing a concise critique of existing planning, governance and participation practices - as well as to propose another operational framework in the form of the post-growth imaginary. An implicit barrier towards the transition to a post-growth way of living is the current perception of rurality. Forming a counter narrative that goes beyond tourism-dependent development can help people to imagine and relate to another way of living.

scientific Relevance

In Urbanism studies, there has been noticeable research regarding rural issues, but several knowledge gaps still remain. One such gap is located in post-growth theory and regional cooperation, as the majority is concerned with urban contexts and do not address explicitly the role of rurality. For example, after engaging with the work of Kate Soper, it is evident that while she offers many interesting views towards the necessary individual and societal changes needed, the work also shows a rather urban-normative approach. The role of rurality is implicitly expressed only through general concerns for the natural world. Through this work, I will attempt an application of such concepts and ideas to a rural context, exploring implications, limitations and opportunities, ultimately highlighting the importance of rurality in a post-growth vision.

Lastly, rural life in Greece is neglected by both citizens and government, with very little formal research found about contemporary rural life. While I hope that my work can contribute to expanding the knowledge basis, further research is needed to investigate rural issues.

ethical reflection

location bias

In light of the recent disasters that hit Greece in the summer of 2023 during the beginning of my thesis, like the flooding of Thessaly and the wildfires of Evros, I initially was set on choosing this location as my case study. Hence why the problem field exploration - the first chapter of my report - is largely based on these disasters. While I do believe that there can be transferable elements of my project that the region of Thessaly could use in its rehabilitation strate-

gy, I did not want to make light of the painful experiences of the affected residents by not engaging with the location. It was mostly due to the lack of information and complexity of that site that I chose instead the neighbouring region of Spercheios, with which I already also have personal knowledge due to my family's descent.

migration

Despite the refugee crisis not being a central part of my thesis, I attempted to engage briefly with issues on housing and integration of refugees, who are currently living in very harsh conditions in many Greek islands. Such conditions are only expected to worsen due to the changing climate. Rural areas are in urgent need of habitants, and could prove to be even desirable places of stay - as well as provide new opportunities in production of one's own food. However, I recognize that for many of the people that are seeking refuge, Greece is just an entry-point into other European countries. They might not want to stay in Greece, let alone relocate to a remote rural area. When touching upon this topic, I attempted to not enforce such policies of rehousing, as that could perpetuate the same issues refugees are facing today.

queerness and identity

Another topic that I initially intended to explore was issues of Greek identity and queerness. Part of the central argument for rural depopulation was that the countryside is being shunned as a backwards and unaccepting territory, unwelcoming to young people or queer people who are in turn seeking refuge in urban centres. Of course, queerness permeates all aspects and territories of life, it is not exclusive to urbanity. While these topics were not explicitly explored within my theoretical research of the post-growth approach, they are considered as part of the background of the formed imaginary. In the end, I believe that this could be part of further research, as increasing the rates of acceptance and tolerance of others in rural areas would also enable them to be open to other radical changes, like the ones required for the post-growth transition.

fetishisation

At many points during this project, I was alerted to the dangers of falling to a fetishisation of rurality, disregarding the innate difficulties of the lifestyle in terms of labour or isolation. I believe that this was partially due to my own reckoning with the context of the selected region of Spercheios, which fascinated me in the beginning. Listening to old stories from my family and from meeting locals urged me to share them, which admittedly infused the narrative with many elements of nostalgia at first. However, I explicitly attempted to focus on exploring the implications and struggles of such a rural post-growth society, without too much idealisation of the conditions. For example, I tried to speculate what sorts of arguments or differences would arise through the decision-making processes, or to think of potential conflicts between stakeholders regarding the wetland restoration.

tourism

Through this thesis project, tourism was somewhat intentionally looked down upon - shunned as the main manifestation of the growth-paradigm for Greece. This was mostly in order to attempt to decouple my own perception of growth and look towards different manifestations of progress. However, in the end, I do not believe that tourism ought to be completely excluded from the post-growth approach - it is also short-minded to think that such an industry would consciously disappear. I believe that there is space within the bioregional post-growth approach for mild forms of tourism, that could also enable an appreciation of the natural landscape. However, more sustainable means of transportation are to be considered (than millions of flights per year) and to disallow tourism development from further encroaching on habitat spaces.

research and design

The main design deliverable of my project was the construction of a post-growth imaginary in the form of a fictional narrative about the selected key-region of Spercheios. To approach such a non-traditional medium a strong theoretical basis had to be formed, through researching the post-growth agenda within academic literature. This informed all subsequent design choices. Moreover, by researching the site-specific conditions and manifestations of growth within the selected key-region of Spercheios, I could conclude on the items of the contextual post-growth agenda that would later form the speculative design interventions. However, this was not a linear process. At many points during the formation of the narrative I realised that further research was required at certain topics. For example, a more instinctive description of the bioregional weekly meetings gave way to conducting more research on how physical models can simulate the changes in the hydrological basin and act as a communication tool for participants. Such an interchanging of design and research modes was crucial to constructing a detailed and engaging narrative.

role of the urbanist

Engaging with such a creative process made me reflect many times about the role of the urbanist. For the formation of the post-growth imaginary I took on the role of the Visionary. This is perhaps in alignment with the more traditional approach to spatial planning, exemplified in the modern movement. However, in contrast to the often alien, non-contextual ideas that were imposed by the modernists, I aimed to ground my ideas to site-specific issues and extensive research of relevant post-growth literature, in order to ensure a degree of validity of the outcome. From my time at TU Delft, I have come to recognise the contemporary aspects of spatial planning, which many times involve efforts to engage stakeholders, co-design and participation schemes, as well as prioritisation of a research-based design through an interdisciplinary approach. However, this often is limited to building on the knowledge and ideas of others whether they be participants or experts. Oftentimes creativity and imagination are qualities that are overlooked, perhaps due to a fear of delegitimizing the profession, as it would transfigure it to the realm of Art. I believe that doing both is a requirement. In order to decouple from the deeply-rooted growth paradigm, new post-growth narratives are necessary. This ought to be the job not only of the philosopher or the politician, but also of the urbanist; to peer over and glimpse on a potential future, and to trace it through our current reality.

Finally, while I was only able to enact two single-day fieldwork trips, I believe that they were an extremely valuable part of the methodology that made me further reflect about the role of the urbanist. Travelling to the different villages throughout the region, immersing myself in the different landscapes and interacting with the locals inspired me immensely, while also providing me with important information that informed the narrative itself. Experiencing and understanding the landscape is mandatory when forming a site-specific imaginary. I believe this was also what partially inspired me to form the story from a person's perspective as well - to describe the region in the way I experienced it. This further informs the role of the urbanist, not as a voyeuristic designer but a deeply immersed participant of the land, who understands the complexities of the territory firsthand.

exhibition

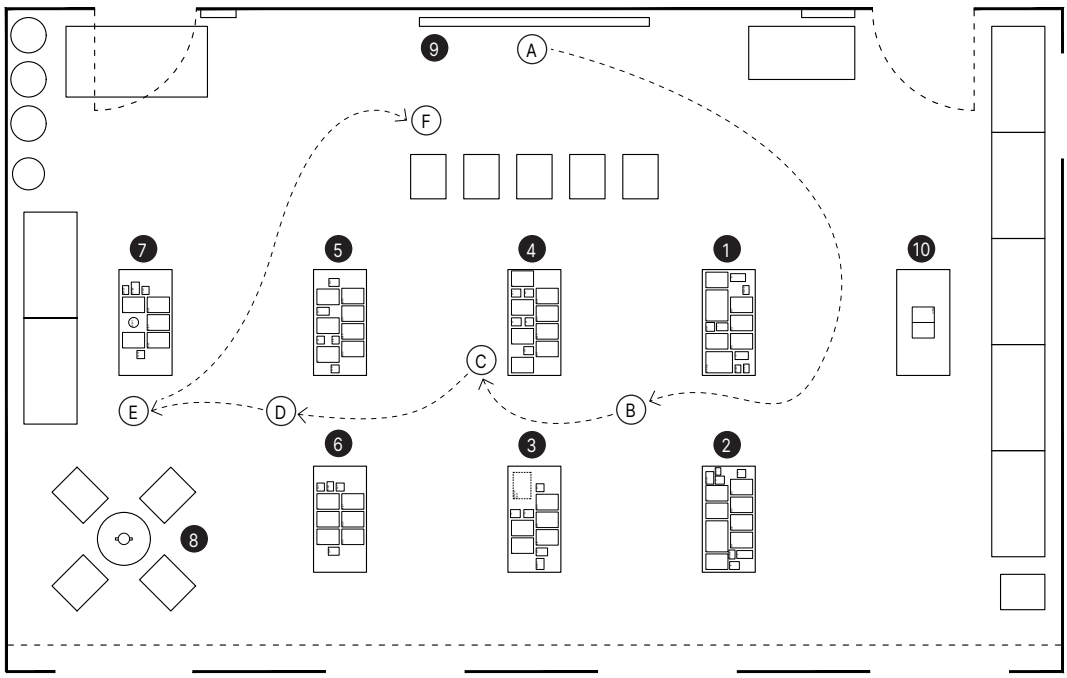
The methodology that was followed during this thesis project resulted in a long fictional narrative, with many small intricacies and nuancies, making it hard to communicate through a typical slide-speech presentation. As part of the exploration of ways to engage an audience and communicate the complex and all-encompassing post-growth future, I chose to create a small exhibition for my P5. Here, the content of the story is organised in seven tables, where the fiction text is intertwined with the visual material, the academic text annotations is intertwined with archival images from my family in the region, paintings from my grandma and a hand-painted ceramic vase. A video is playing on the projector, with sounds and visuals from my fieldwork that relate to the chapters of the story. A recorded story from my grandmother serves as an alegorical tale about hubris. At the corner is a small "painting station", where after engaging with the post-growth paradigm, the audience is guided to express their ideas, things learned or comments by painting them on a ceramic vase.

exhibition material

1 chapter one
waking up in a post-growth world
2 chapter two
walking through the village
3 chapter three
working at the fields
4 chapter four
participating to common affairs
5 chapter five
commuting along the river
6 chapter six
exploring the lowlands
7 chapter seven
ending the day
8 small table with four chairs:
the audience can paint their ideas on a bisque-fired ceramic vase with provided underglaze paints
9 soundscape with visual elements:
sounds of flowing water, stories from my grandma and images of the wetlands
10 printed thesis report

exhibition agenda

A brief introduction about problem field, post-growth theory and constructing the imaginary.
B chapters 1-2-3
post-growth adaptation of individual house, neighborhood and settlement
C chapter 4
post-growth decision-making and administrative structure
D chapters 5-6
exploring nature-based solutions on the riparian zone and the restoration of degraded ecosystems
E chapter 7
reflecting on the lessons, implications and limitations of post-growth
engage the audience to paint their ideas or conclusions on a vase
F brief academic conclusions and engaging the audience
what types of mediums do you think are best to convey the complexity of post-growth and to what audience would they work with?



P5 Exhibition layout at room D.

The material of the imaginary was organised in seven tables - a table per chapter - aided by fieldwork photos, paintings from my grandmother and family photos from my personal archive.

After a brief introduction through a slide presentation, I gave a guided tour of the material to the audience, highlighting the elements of the story and its relations to post-growth.

After the audience has engaged with post-growth through the guided tour and by watching the fieldwork video, they were invited to document their own post-growth ideas by painting them on an empty bisque-fired ceramic vessel in the form of key words or small sketches.

questionnaire

This questionnaire was drafted with the intention of being distributed during my brief fieldwork in December. The purpose was to understand the quality and intensity of place-attachment of the people residing in the region of Spercheios, through the lenses of place identity, place dependency, social bonding and nature bonding. This was heavily based on similar forms found in relevant place-attachment literature. In the end, due to time limitations, my lack of network on the region at hand and the uncooperative municipalities it was not used. Future research could consider gathering qualitative data through such questionnaires.

Gaging place-attachment at the Spercheios river basin

The questionnaire is directed to residents of Fthiotida, particularly to the region of the Spercheios river basin.

Under 18 - 18-24 - 25-34 - 35-44 - 45-54 - 55-64 - 65+ age

1 I feel that the house I live in is important to me — place identity
not at all - very little - to some extent - rather much - very much

2 I feel that the settlement I live in is important to me
not at all - very little - to some extent - rather much - very much

3 I feel that the Spercheios region is important to me
not at all - very little - to some extent - rather much - very much

4 I feel that I couldn't live in a different house — place dependency
not at all - very little - to some extent - rather much - very much

5 I feel that I couldn't live in a different settlement
not at all - very little - to some extent - rather much - very much

6 I feel that I couldn't live in a different region than the valley of Spercheios
not at all - very little - to some extent - rather much - very much

7 I have fond memories of the house I live in — social bonding
not at all - very little - to some extent - rather much - very much

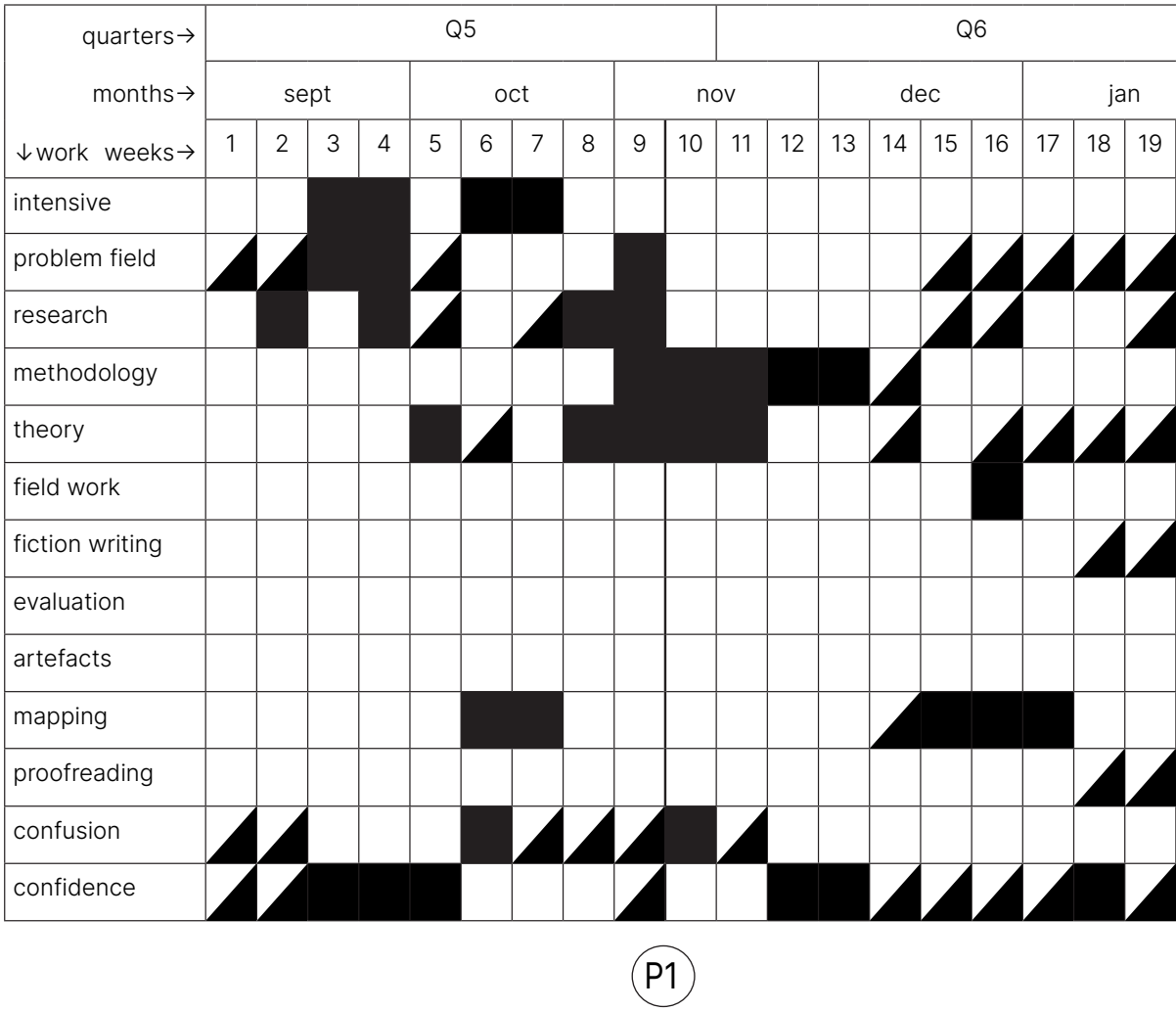
8 I have fond memories of the settlement I live in
not at all - very little - to some extent - rather much - very much

9 I have fond memories of the region of Spercheios
not at all - very little - to some extent - rather much - very much

10 I feel very attached to the natural environment of the region of Spercheios — nature bonding
not at all - very little - to some extent - rather much - very much

11 I would feel less attached to the region of Spercheios of the native plants and animals that live here disappeared
not at all - very little - to some extent - rather much - very much

12 I learn a lot about myself when spending time in the natural environment of the region of Spercheios
not at all - very little - to some extent - rather much - very much



graduation tracing

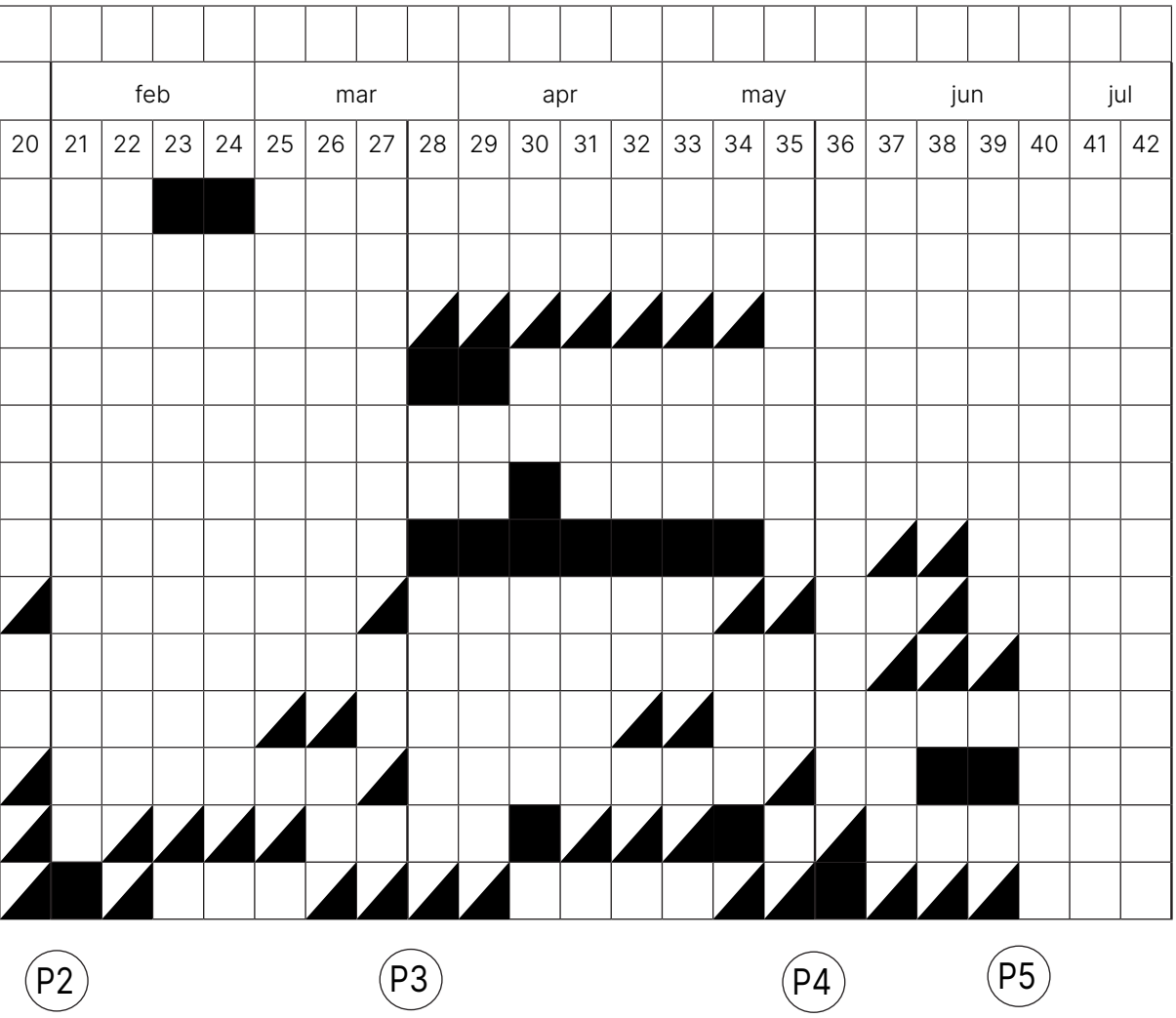
In the beginning of the thesus I started tracing my progress in general categories or actions, along with how confused or confident I felt throughout the process. After P2 I forgot about it, so it is not the most accurate representation as it is based on my unreliable memory.

P1 02-11-2023

- explored general problematisation
- gathered relevant bibliography
- defined first potential research questions
- initial ideas about expected results

P2 31-01-2024

- finalised problematisation
- formulated methodological approach
- finalised theoretical framework
- defined the approach in forming the bioregion and selected key-region
- explored general and site-specific barriers
- explored draft imaginary



P3 27-03-2024

- structured the overall argument of the thesis
- explored the structure of the imaginary narrative in chapters

P4 23-05-2024

- concluded and reflected on methodology, transferability etc
- first draft of the fictional and academic text, forming the imaginary
- decided against typical slide-speech presentation

P5 19-06-2024

- finalised visualisations
- finalised fiction and academic text for report
- prepared individual exhibition material
- reflected on lessons learned

9

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