APPROPRIATION OF FORESTS AND WATER RESOURCES IN MOUNT IDA AND SURROUNDINGS: DEALING WITH SOCIO-ENVIRONMENTAL PROBLEMS BY INTEGRATING BIODIVERSITY IMPACT CHAIN ANALYSIS INTO PLANNING

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Yağmur ÖZCAN CİVE

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İZMİR

We approve the thesis of **Yağmur ÖZCAN CİVE**

Examining Committee Members:

Prof. Dr. Mediha Burcu SILAYDIN
Department of City Planning, Dokuz Eylül University

Assoc. Prof. Dr. Emel KARAKAYA AYALP
Department of City and Regional Planning, İzmir Democracy University

---

Assoc. Prof. Dr. Adile ARSLAN AVAR
Department of City and Regional Planning, İzmir Institute of Technology

---

Assoc. Prof. Dr. Deniz GERÇEK
Department of City and Regional Planning, İzmir Institute of Technology

---

Assoc. Prof. Dr. Esin ÖZDEMİR ULUTAŞ
Department of City and Regional Planning, İzmir Institute of Technology

10 December 2024

Assoc. Prof. Dr. Adile ARSLAN AVAR
Supervisor, Department of City and Regional Planning, İzmir Institute of Technology

---

Prof. Dr. Hasan Engin DURAN
Head of the Department of City and Regional Planning

Prof. Dr. Mehtap EANES
Dean of the Graduate School

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ABSTRACT

APPROPRIATION OF FORESTS AND WATER RESOURCES IN MOUNT IDA AND SURROUNDINGS: DEALING WITH SOCIO-ENVIRONMENTAL PROBLEMS BY INTEGRATING BIODIVERSITY IMPACT CHAIN ANALYSIS INTO PLANNING

This thesis discusses the potential of re-establishing the link between conservation and planning based on the existing conservation criticisms and critical debates in urban and planning theory. It also explores the possibilities of developing a new understanding of environmental protection in planning for Turkey through the Mount Ida case. While market-based conservation approaches, such as ecosystem services valuation, expand the scope of traditional conservation, they are criticized for leading to "green grabbing" practices in newly designated areas and promoting unlimited exploitation of nature outside these areas. Concurrently, the spatialization of degrowth strategies aimed at overcoming socio-environmental crises and new inequalities, and the necessity of shifting planning away from economic growth focus towards a post-growth planning practice, are discussed.

In Turkey, the prioritization of economic growth and the centralization of decision-making processes have led to the concurrent carrying out of destructive activities and "greener" activities, even within protected regions. While Mount Ida National Park and its southern slope are partially protected, new mining activities in the peripheral forests and geothermal energy-based activities along the coastline continue with the allocation of forests and water resources in a way that leads to environmental pollution and inequalities due to export-oriented policies. Even if a new project of ecosystem services for the forests of Mount Ida is introduced, new inequalities may emerge at different scales due to isolated conservation decisions, economic growth-oriented targets and policies besides legal inadequacies. In this line, the thesis proposes 'conservation scales' for the area with “biodiversity impact chain” analysis as a tool to expose inequalities, propose and politicize post-growth alternatives.

ÖZET

KAZ DAĞLARI VE ÇEVRESİNDE ORMANLAR VE SU KAYNAKLARININ TAHSİSİ: BİYOÇEŞİTLİLİK ETKİ ZİNCİRİ ANALİZİNİ PLANLAMAYA ENTEGRE EDEREK SOSYO-ÇEVRESEL SORUNLARLA BAŞA ÇIKMAK

Bu tez, mevcut koruma eleştirileri ile kent ve planlama kuramındaki eleştirel tartışmalara dayanarak koruma ve planlama arasındaki bağlantıyı yeniden kurulmasının olanaklarını tartışmaktadır. Ayrıca Kaz Dağları örneği üzerinden planlamada yeni bir çevre koruma anlayışı geliştirmenin Türkiye için imkanlarını araştırmaktadır. Ekosistem hizmetlerinin değerlendirilmesi gibi piyasa temelli koruma anlayışları, geleneksel korumanın kapsamını genişletse de, bu yaklaşımlar yeni belirlenen bölgelerde "yeşil gasp" uygulamalarına yol açması ve bu alanların dışında doğanın sınırsız bir şekilde sömürülmesini teşvik etmesi ile eleştirilmektedir. Bir yanda da sosyo-çevresel krizlerin ve yeni eşitsizlilerin üstesinden gelmeyi amaçlayan küçülme stratejilerinin mekansallaşması ve planlamayı ekonomik büyümeye odağından uzaklaştırarak büyüme sonrası bir planlama pratiğine geçişin gerekliliği tartışılmaktadır.

Türkiye'de ise ekonomik büyümenin önceliklendirilmesi ve karar alma süreçlerinin merkezileştirilmesi nedeniyle, koruma bölgeleri içerisinde dahi yıkıcı faaliyetler ve "daha yeşil" faaliyetler eş zamanlı olarak yürütülmektedir. Kaz Dağı Milli Parkı ve güney yamacı kısmen korunurken, çeperdeki ormanlarda yeni madencilik faaliyetleri ve kıyı şeridinde jeotermal enerji kaynaklı faaliyeler, ihracata yönelik politikalar nedeniyle ormanların ve su kaynaklarının çevre kirliliğine ve eşitsizliklere yol açacak şekilde tahsisi ile devam etmektedir. Kaz Dağları ormanları için yeni bir ekosistem hizmetleri projesi söz konusu olsa bile, yasal yetersizliklerin yanı sıra izole koruma kararları, ekonomik büyüme odaklı hedefler ve politikalar nedeniyle farklı ölçeklerde yeni eşitsizlikler ortaya çıkabilir. Bu doğrultuda tez, eşitsizlikleri ortaya çıkarmak, büyüme sonrası alternatifleri önermek ve politikleştirmek için bir araç olarak "biyoçeşitlilik etki zinciri" analizi ile alan için 'koruma ölçekleri' önermektedir.

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LIST OF ABREVIATIONS

BIC	Biodiversity Impact Chain
ÇEM	General Directorate of Combating Desertification and Erosion
CSO	Civil Society Organization
DSI	State Hydraulic Works
EIA	Environmental Impact Assessment
EPDK	Energy Market Regulatory Authority
ESA	European Space Agency
EU	European Union
FAO	Food and Agriculture Organization
GEF	Global Environment Facility
GMKA	South Marmara Development Agency
HEPP	Hydroelectric Power Plant
IUCN	International Union for Conservation of Nature
LULC	Land Use Land Cover
MAPEG	General Directorate of Mining and Petroleum Affairs
MTA	General Directorate of Mineral Research and Exploration
NGO	Non-Governmental Organization
PES	Payments for Ecosystem Services
REDD	Reducing Emissions from Deforestation and Forest Degradation
SDG	Sustainable Development Goals
SEA	Strategic Environmental Assessment
SEPA	Special Environmental Protection Area
TEBB	The Economics of Ecosystems and Biodiversity
TEMA	Turkish Foundation for Combating Soil Erosion, Reforestation, and the Protection of Natural Habitats
TMOBB	Union of Chambers of Turkish Engineers and Architects

TUSIAD	Turkish Industry and Business Association
UNDP	United Nations Development Programme
USGS	United States Geological Survey
WFD	Water Framework Directive
WHO	World Health Organization

CHAPTER 1

INTRODUCTION

This thesis aims to interrogate the conventional conceptualization of "environmental protection", its boundaries, and its integration into the planning discipline. In the planning practice, the boundaries of environmental protection are generally accepted as a top-down spatial input. A rethinking of conservation is necessary to encompass global commons, including biodiversity, forests, and water resources, as an integrated concept. Moreover, mainstream planning and conservation practices are inextricably linked to economic growth objectives. This has led to the emergence of newly created inequalities and the unlimited exploitation of natural resources outside of designated protected areas. Drawing on the relevant literature, the thesis argues that debates in urban political ecology and planning need to incorporate radical conservation discussions in order to re-establish the connection between nature and the city.

The concepts of "sustainability", "conservation" and "green transition" have been shaped by environmental policies, particularly in the response to new emergencies, including climate change, water crises, fires, and pandemics. The current approach to conservation and sustainable development entails the preservation of certain areas to ensure the continued availability of natural resources and facilitating environmentally ‘friendly’ activities, while less environmentally ‘friendly’ operations continues to maintain economic growth in the other areas (Sullivian 2009; Apostolopoulou and Adams 2015). Mainstream protection is typically confined to biodiversity, flora, and fauna or it is focused on carbon mitigation within defined geographic boundaries, with limited consideration afforded to the broader socio-environmental context. The robust and boundary-specific conservation practices persist when sustainable economic activities and unlimited consumption are maintained concurrently (Adams 2020; Büshcer 2012). At the periphery of conservation areas, including forests, water catchment areas, agricultural lands, and commons, primitive accumulation continues through land-grabbing and water-grabbing practices (Benjaminsen and Bryceson 2012; Fairhead, Leach and Scones 2012). This has resulted in environmental injustice, socio-economic

inequalities, and the loss of global commons, including oxygen, water, biodiversity, and soil.

Recent market-based conservation initiatives hold considerable significance for the potential incorporation of conservation with commons and urban areas. Discussions in literature, particularly those related to the "water–food–energy nexus" or "ecosystem services," are invaluable for the development of a relational conservation concept and model. The prevailing conservation approach's shortcomings are evident, particularly in light of its dual objectives of mitigating climate change and reducing economic and social inequalities. In parallel to these limitations, natural capital solutions or the valuation of ecosystem services provides a rationale for viewing the ecosystem itself as a "commodity," thereby accelerating production and consumption practices (Robertson 2004; McAffee 2012; Fletcher and Büscher 2020). Moreover, the implementation of existing conservation approaches in newly created territories has the potential to result in the rise of authoritarian regimes in some geographies and the further exploitation of ecosystems (Büscher et al. 2020). It is imperative that critiques of the current solutions be taken into consideration, and that the actual causalities and dynamics of the trade-offs and networks be subjected to scrutiny in the policy-making processes. If they are politicized and considered beyond technical solutions, they have the potential to reduce environmental and economic inequalities at various scales (Williams, Bouzarovski and Swyngedouw 2019).

The prevailing conservation policies and practices are inadequate in addressing the necessity for "new" paradigms or "structural" changes to surmount multiple crises and inequalities. Critical theorists assert that structural reform and radical ideas are the only means of achieving successful conservation and the removal of inequalities. Büscher and Fletcher (2019) propose a "convivial conservation" approach, a transformative conservation model that emphasizes the coexistence of human and non-human systems, cultivating meaningful relationships with nature. This model involves shifts in everyday life practices to escape exploitative practices and the "commercialized" and "commodified" imaginaries of nature (Büscher and Fletcher 2019, 287-288). The analysis of networks of production and consumption, the roles of diverse actors, and the causal relationships across scales is crucial for comprehending the underlying inequalities, needs, and trade-offs.

Biodiversity Impact Chain (BIC) analysis is a methodological framework developed by Büscher et al. (2022) that elucidates the biodiversity losses and inequalities

that result from an isolated conservation practice. The authors' objective is to reveal the networks of conservation policies and to ascertain the activities that enhance biodiversity or cause biodiversity loss in disparate geographical regions and scales, whether directly or indirectly. The restriction of activities except for "market-based" conservation activities as "green" activities in one area for conservation purposes can result in an increase of these activities in other "unprotected" areas, such as agricultural activities or mining elsewhere due to demand (which is also increasing in a "growth-oriented" context). The analysis also presents itself as a "politicization tool" from the authors by exposing the responsible actors of these activities and disadvantaged groups (Büscher et al. 2022, 255–258; Büscher and Fletcher 2019). This analysis also addresses the socio-environmental inequalities caused by these activities and conservation practices.

Concurrently, studies of the metabolic urbanization and urban political ecology endeavor to map these networks with responsible policies. In critical planning and urban theory, the discourse on "urban-nature" and metabolic urbanization considers the networks and connections of urban growth relative concrete entities, such as waste, infrastructure, and construction inputs, including mineral extension. Water, in particular, functions as an interconnecting link that transcends urban boundaries (Kaika and Swyngedouw 2000; Arbodela 2016). While the discipline of urban political ecology may extend beyond the "non-urban" distinction within its own field of discussion, it remains inadequate for addressing socio-ecological relations beyond the urban context or non-human nature (Swyngedouw 2006; Tzaninis, Mandler, Kaika, and Keil 2021). It is evident that there is a gap in the literature that critical discourses within the field of conservation are inadequately reflected in urban political ecology discussions, and they remain outside the area of concern for the planning discipline.

Planning engages with this discourse through the concepts of resilience and vulnerability, it strives to achieve a balance between ecological, economic and justice objectives (Campbell 2016). A new focus is "ecosystem services" which consider urban forests or upstream areas that provide essential services to the city. However, a comprehensive conservation approach that considers forest and water resources is lacking. Furthermore, it is inadequate in the face of environmental degrading factors that occur outside of urban boundaries or beyond defined ecosystem services area. Protected areas, including water basins, forest preserves, and national parks, are acknowledged by planning as requiring protection. However, by accepting these boundaries as a direct

input, planning remains ineffective in terms of intervening in inadequate legislation with regard to conservation and questioning them.

Besides, de/post-growth discussions continue focusing on urban areas or city-scale initiatives, or to examine disparate sectors independently, such as water resources, forestry, or agricultural production. In post-growth discussions within the context of urban planning, the limitations of existing plans and planners' role are considered (Lamker and Dieckhoff 2022; Ruiz-Alejos and Prats 2022). Degrowth potential has been highlighted as a necessity for scaling up and spatializing them (Kaika et al. 2023). This necessitates a shift in planning, whereby boundaries are conceptualized such as bioregions or thinking beyond "urban" or detached from economic growth objectives (; Xue 2014; Savini 2024). This conceptual shift holds the potential for a convergence with radical conservation, planning, and urban political ecology. The potential of de/post-growth planning is to provide a means of concretizing a "convival conservation" that transcends the boundaries of conventional conservation concept. This can be achieved by the assessment of metabolic relations within bioregions or conservation scales and by using repoliticizing tools such as the BIC analysis. In this manner, natural resources situated outside of protected areas can be regarded as global commons, thereby facilitating the revelation of their socio-ecological value through embracing the concept of "commons planning" (Marcuse 2009). In line with Büscher et al. (2022) proposals beneficiary and disadvantaged groups and actors should be analyzed for 'conservation scales'. In addition, strategies, limits, and promotions of sectors, needs, and actors can be defined according to the socio-environmental impacts and distribution of wealth at the various scales in planning process.

It is agreed that the proposal of radical solutions is necessary; however, the creation of a practical model necessitates the consideration of the political, economic, social, and cultural limitations in different contexts and scales (natural regions, sub-basins, basins, city-regions, etc.). While re-territorialization is problematic, it is evident that a policy production independent from geographical and spatial context is impracticable. It is possible to define flexible boundaries and locally based solutions. One of the most significant challenges in the conservation practices and water governance pertain to the displacement of local populations, their impoverishment, and the emergence of inequalities across various scales when new actors become involved in the 'governance' or 'community-based conservation' process (Dressler et al. 2010). These studies can serve as a scientific foundation upon which non-governmental organizations

(NGOs), policymakers, and planners can assess and criticize proposed economic activities. In alignment with Büscher et al. (2022), the analysis of beneficiaries and disadvantaged groups and actors across various conservation scales becomes paramount. Furthermore, strategies, limitations, and promotions of sectors, needs, and actors can be defined according to the socio-environmental impacts and distribution of wealth at the various scales in the planning process.

In light of the preceding discussions, the research questions have been defined in the Turkish context. The objective is to assess the limitations of environmental protection in terms of creating new inequalities and biodiversity losses in natural areas. Furthermore, a framework for implementing a new conservation strategy is assessed, considering the need to depart from the dominant "growth" focus of planning. This framework is evaluated with its potentialities in the Turkish context through empirical research. In this direction, the potential for conservation models and scales to be applied at multiple scales is considered, with a particular focus on important ecological areas, water, and their socio-environments for the focus area. The operationalization of the Biodiversity Impact Chain (BIC) analysis has the potential to facilitate the planning process by establishing connections between nature and urban areas. This thesis also endeavors to implement BIC analysis across various spatial scales and with spatial dependencies, thereby offering a new approach to environmental conservation in planning that is not isolated. The analysis encompasses not only the impact networks of protected areas or decisions but also sectors. Furthermore, the impact of strategic and plan decisions is examined on this trajectory, thereby elucidating the limitations and inequalities perpetuated by growth-oriented conservation and planning practices. The following research questions were addressed through field research:

1. What are the conceptual and practical limitations of environmental conservation in planning in Turkey? Is it possible to address these limitations with radical conservation and post-growth approaches in planning in Turkey?

2. What are the ways to integrate biodiversity impact chain analysis into planning to address these socio-environmental problems in Mount Ida?

3. Which types of conservation model or policy set are required for Mount Ida and the surroundings to address the limitations of environmental protection?

In Turkish practice, the implementation of isolated conservation practices has resulted in the exacerbation of socio-spatial and environmental inequalities as the pursuit of conservation and growth goals occurs concurrently. Although the “new” conservation practice results in the partial conservation of protected areas, renewable and sustainable energy investments are also being made in the newly created conservation territories areas such as Special Environment Protection Areas. Conversely, destructive economic activities such as mining, persist with increasing proposals in other areas, including forest and agricultural areas adjacent to protected areas. In addition to the conservation projects, in Turkish practices energy investments continue to serve as a means of legitimizing these practices (Adams 2020; Turhana and Gündoğan 2017).

Moreover, the existing legal and administrative infrastructure for the conservation of protected areas and natural resources in Turkey remains insufficient. In addition to the re-regulation and deregulation of laws, a range of activities are conducted in these areas through plan amendments, simplified environmental impact assessment processes, license exemptions, changes to conservation boundaries, and classification by presidential decrees (Akay and Akgün 2014; Tansel 2018; Serter 2020).

The implementation of new conservation strategies, such as ecosystem services projects, has the potential to mitigate ecological degradation, at least in part attributable to Turkey's pursuit of economic growth. Presently, there is a shortage of spatial plans that consider protected areas and their ecosystems, as well as the impact these have on urban settlements and production areas. The implementation of integrated river basin and forest management projects has emerged as a potential solution to address these deficiencies. However, it is imperative that these projects be incorporated into spatial plans at multiple scales. This incorporation is necessary for the successful integration of the projects into land use decisions and the identification of relevant capacities. A shift in priorities in response to emerging concerns could lead to the formulation of conservation-oriented plans. In this context, while the discussion of radical conservation alternatives and post-growth requirements, rather than degrowth, is both possible and necessary, it is also challenging.

Mount Ida is a site of significant importance for the exploration of these limitations and potentialities. Mount Ida forests represent a significant area of biodiversity and carbon storage, with a portion encompassing the boundaries of the designated national park. Conversely, mining activities in and around the area persist, accompanied by the pollution of water resources and deforestation. Alongside newly proposed

conservation projects or basin plans, the implementation of growth-oriented policies at the periphery of Mount Ida National Park and along the coasts of the North Aegean Sea has resulted in the appropriation of forests and water resources, as well as the emergence of inequalities at various scales.

It is important to note that a specific boundary was not delineated in the initial stage of the research. The absence of a defined research area is attributable to two primary reasons. The first reason relates to the selection of Mount Ida and its surroundings as a research area. The limitation of Mount Ida's protection to the boundaries of the National Park is problematic. In addition to proposals for the conservation of the Mount Ida Forest Area (Key Biodiversity Area), there are also proposals for the conservation of the Biga Peninsula as a whole or Mount Ida "natural region" from various disciplines (Erol 1993; Eken et al. 2006; Türkeş and Altan 2012). The forest area on Mount Ida plays a pivotal role in providing ecosystem services to surrounding settlements and agricultural regions, particularly in terms of carbon sequestration and water retention. As a global common, policies in this area impact communities that extend beyond the immediate local or urban residents. Spatial plans have been formulated for the economic region encompassing the provinces of Çanakkale and Balıkesir, which include the forest mass. This forest mass is also situated at the intersection of three main watershed boundaries. The selection of a research area within these intricate and multifaceted boundaries also presents an opportunity to examine the limitations of the designation of the boundaries of protection areas.

Secondly, the critique of the concept of conservation necessitates the problematization of the boundaries of conservation and the uncovering of the networks of conservation and the city. To further this objective, conservation scales were defined to examine conservation and planning practices around Mount Ida and the defined research area.

The following chapter elaborates on traditional, "new" (market-based) conservation and radical conservation approaches. Furthermore, the spatializing degrowth and post-growth planning as a strategy for achieving radical conservation will be examined, with the objective of integrating conservation debates into planning discourse. The third chapter examines environmental conservation, conservation in planning, and their limitations and potential in Turkey. The fourth chapter exposes the methodology and research design of the thesis. The fifth chapter elucidates the defining research area and conservation scales. In Chapter 6, the environmental problems in the

defined research area are examined, with an emphasis on water and air pollution resulting from mining operations and thermal power plants. The chapter analyzes the impact on forest and water resources, as well as the socio-economic consequences of these problems, focusing on the spatial distribution of them. In Chapter 7, strategies, policies, and plans are examined in defined research areas and conservation scales, with their de/post-growth alternatives. In Chapter 8, a pioneering "biodiversity impact chain" analysis is conducted based on the findings of Chapters 7 and 8 related to Mount Ida National Park, defined research area, and conservation scales. In the final chapter, the necessity of a conservation approach, different from the isolated one, particularly in the planning context, is examined through the findings of the thesis. A new conservation approach in planning is introduced to address this critical necessity.

CHAPTER 2

CONCEPTUAL FRAMEWORK: TRADITIONAL, MARKET BASED AND RADICAL CONSERVATION APPROACH AND POST-GROWTH PLANNING

2.1. 'New' (Market – Based) Conservation

Environmental concerns are not new, 'green capitalism' and 'free market environmentalism' concepts have already been debated but they came on the global agenda for assigning a monetary value to environmental outcomes and ecosystems (Coase 1960; Demsetz 1969; Sullivian 2009, 18). One of the most important paradigms about conservation has occurred in the 1980s and 1990s by the crisis of capitalism. A new path has emerged through the awareness that both human beings and the current economy cannot survive without natural resources. The approaches brought along 'environmental governance' term supposed that can take into account the cost of environmental problems or natural assets, and 'public choice' to avoid environmental problems. Besides the limiting factors of free-market environmentalism, private actors can make a profit from all environmental externalities and common areas by assigning use right on them within some contracts or permits, or privatization of natural resource managements as waters (Bakker 2005; Penington 2005, 40-42). The solutions are like Hardin's (1968) solution as the privatization of commons or controlling of them by central authorities to sustain natural resources rather than the enhancement of 'public choice'. Hence, increasing consciousness of the limits of nature and environmental problems with exurgent climate change and deepen inequalities need solutions beyond calculating the environmental cost of investments or paying the costs of pollution. 'Sustainable development' began to be discussed by expressing reducing long term environmental problems and spreading poverty and need of protection to future of planet by the Brundtland Report in 1987.

> The concept of sustainable development does imply limits - not absolute limits but limitations imposed by the present state of technology and social organization on environmental resources and by the ability of the biosphere to absorb the effects of human activities. (Our Common Future Brundtland Report 1987, 6).

'Greener' economic activities began to be evaluated by technical calculations and constraints. In addition, some of ecological economists (Barbier et al. 1990; Pearce 1992) assert that economical costs and benefits analysis of environmental services should be considered to provide sustainable development activities. After the global agreements and conventions like Rio De Janeiro Conference in 1992 and the Kyoto Protocol in 1997 climate change, carbon credits, and environmental pollution costs began to be addressed by some regulations and limits. Further, market–based conservation became a current issue with new the terms such as 'natural capital' or 'economic valuation of nature' by advocators (Daily 1997; Costanza et al. 1998). The approaches is originated from the idea that nature cannot be conserved effectively because it has not a monetary value. The assigning 'commodity value' to the environment itself like biodiversity, ecological restoration, air, water, etc. is a requisite instead of the cost of environmental problems. Hence, monetary valuation of ecosystem like carbon stock according to the size of protected forests began to be calculated rather than cost-benefit analysis. Costanza et al. (1998) put forward that monetary valuation of ecosystem services can be a solution for poverty reduction accompanied to environmental degradation.

In 2005, 'natural capital' and 'economic valuation of ecosystem services' have included in the global agenda by the Millennium Ecosystem Assessment. The report defines ecosystem services as "the benefits that people obtain from functioning ecosystems". Henceforth, new forms of 'ecological commodities' began to be marketed. Natural resources are not gained exchange value from processing their use value rather nature has 'exchange value' itself like carbon credits by market-based conservation (Smith, 2007, 17).

Economic valuation of nature itself is adopted over conservation areas by new international contracts like Convention on Biological Diversity in 1992, and programs associated with payment for ecosystem services and nature-based solution policies and implementations. The governance has scaled up and global actors have attended local conservation practices as new players. Thus, combating climate change began to be a profitable element rather than a threat to capital accumulation. After this point, the well

accepted market-based conservation practices moved to a global arena with international conservation institutions and conventions like IUCN congresses about 'natural capital and conservation', United Nations' development strategies and programs such as TEBB (The Economics of Ecosystems and Biodiversity) and REDD+ (Reducing Emissions from Deforestation in Developing Countries), 'Payment for Ecosystem Services', and World Bank Foundations, (McAfee 1999; Fletcher 2014).

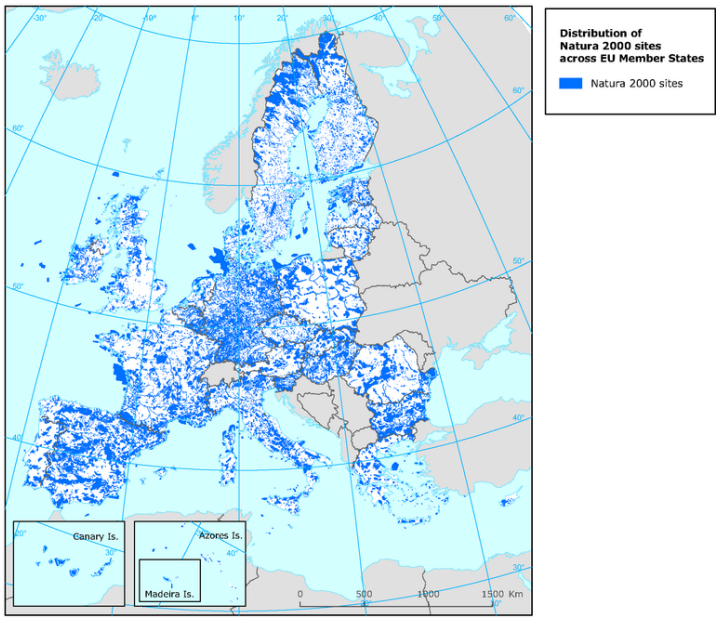


Figure 1.Distribution of Natura 2000 sites
(Source: European Environmental Agency Official Website)

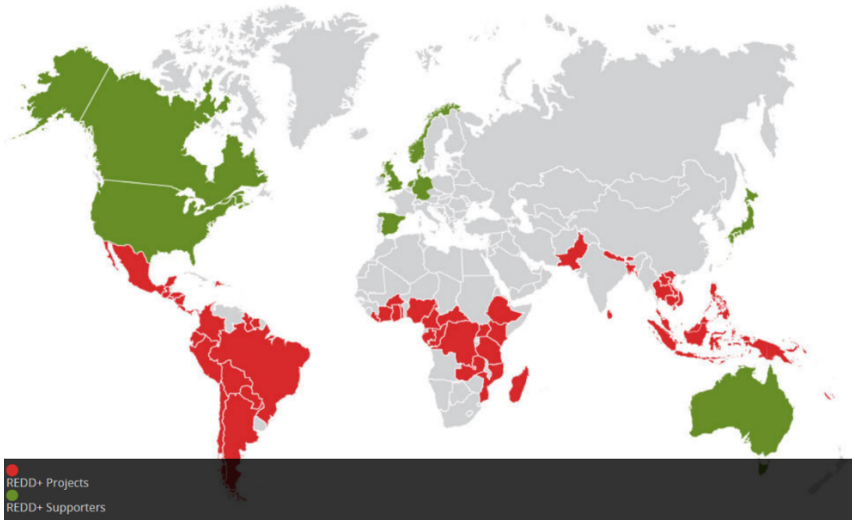


Figure 2. UN - REDD Programs and Partnership Countries

(Source: World Wildlife Foundation Official Website 2015)

Announcements of conservation areas like Natura 2000 sites in Europe (Figure 1) and programs and fundings of ecosystem services have proliferated. Globally funded programs like Payments for Ecosystem Services and REDD+ started to be implemented in Global South which has rich biodiversity and carbon stock like rain forests. The programs are conducted in developing countries, where generally have rural characteristics and indigenous or local communities live. Payment for Ecosystem Services is funding-based programs by paying money to local people to conserve the areas or not degrade the forest resources like REDD (Figure 2). The program aims to reduce deforestation by the foundation, certified agroforestry production, and ecotourism in developing countries. It has tried to achieve to conserve the areas and degradation of forests caused by illegal small-scale mining, logging and trade by means of funding (Hirons 2013; Mayo-Ando and Torres 2014). These market-based conservation programs promise more 'democratic' and participatory governance by protection aims of local communities when supporting biodiversity conservation in green market practices such as ecotourism, agroforestry, etc. (Igoe and Brockington, 2007, 433). Ecosystem services are classified mainly four categories as, provisioning, regulating, cultural and supporting. Hence, the programs are said to be 'nature-based' or 'community- based' solutions according to the advocators. In some programs, like in Brazil Amazon Forests, the attempts are integrated into social and educational improvement programs for promoting local people.

2.2. Critique of Market-Based Conservation

Political ecologists have criticized valuation of ecosystem services and market-based conservation regarding 'neoliberalizing nature' literature (is discussed by Heynen and Robbins 2005; Bakker 2007; Castree 2008; Smith 2007). The authors express the critique of the 'new' paradigm in the recent two decades to clarify its mechanism with new conceptualizations such as "commodification of ecosystem services" (Robertson 2004), "neoliberal conservation" (Igoe and Brackington 2007; McAfee 2012; Fletcher 2012), "Nature^{TM} Inc." (Arsel and Büscher 2012), and "green-grabbing" (McAfee 1999; Corson and MacDonald 2012; Fairhead, Leach and Scones 2012). Current conservation practices, payment for ecosystem services or natural capital have crucial consequences as

the appropriation of natural resources, land grabbing, environmental degradation, dispossession, and social inequalities against the 'promises' or 'discourses' of the advocators, international contracts and programs. Hence, neoliberal conservation practices have also affiliated with "primitive accumulation" (Marx 1976) by the authors. Büscher et al. (2012) briefly explain critiques of neoliberal conservation as a 'win-win solution' with these points that process together; "1) the stimulation of contradictions; 2) appropriation and misrepresentation; and 3) the disciplining of dissent." (5-6). Moreover, in some practices, the process accompanied by enclosure of global or local commons resulted in loss of human right rather than direct dispossession of local people.

2.2.1. Green grabbing as Continual Process of Primitive Accumulation

The seeking of new type 'protection' and monetary valuation of ecosystem services is based on 'economic' reasons indeed as a conceptual limitation. The first critique point is related to "second contradiction of capitalism" and the "ecological contradiction of capitalism" (O'Connor 1994; Büscher et al. 2012, 13-14). The overexploitation of nature results in ecological crisis, and if ecology is under threat and natural resources are depleted, global economy experiences crisis (Sullivian 2009, 18). Hence, setting a monetary value for ecosystem services and conservation cannot differ from the previous solutions of capitalism crisis like free-market environmentalism rather it open new spaces for capital accumulation and caused over exploitation of nature. Protected areas, environmental services to combat climate change, forest conservation, water flood regulations, water provision, increasing soil fertility, create recreational areas etc. have gained a 'monetary value' as a strategy for "selling nature to save it" (McAfee 1999; McAfee 2012). Inherent protection is limited, and even 'conservation' itself is an instrument for sustaining capital accumulation. Fletcher and Büscher (2020) define PES and REDD+ programs as market-based instruments. The authors say:

> …to harness economic markets as a means to attach sufficient monetary value to biodiversity (understood as comprising 'ecosystem services' or 'natural capital') to cover the opportunity costs of alternative land use and thereby incentivize conservation over resource extraction. (Fletcher and Büscher 2020, 2).

Because oxygen/carbon capacity in a forest or biodiversity in a wetland as particular natural boundaries can be sold in global markets as carbon credits, certification or tax reductions by creating new conservation territories. Thus, new types of conservation create new opportunities for new economic sectors and branches, and new potential scales to fix capital by redefining 'limits' of nature and commodifying ecosystem services (Robertson 2004).

The second one is about the appropriation and enclosure of resources which is functioned like 'privatization' of the use rights of common areas. In this stage, mechanisms of neoliberalizing nature as 'privatization', 'rescaling of governance', 'deregulation', 'reregulation' become the main drivers of neoliberal conservation practices (Igoe 2007; Langholz 2003; Igoe and Brockington 2007, 437; Büscher 2009, 92). Protected areas or conservation territories (national parks, forests, biosphere reserve areas etc.) which are previously common or State areas are enclosed and secured by the aim of protection although there is not privatization of the properties (Corson and Macdonald 2012, 273). The residents or previous users of the area are transformed as wage laborers. The attitude of the conservation programs or designation of conservation territories is like 'local people harm these valuable areas; we can avoid with payments and expropriations'. Because these community-based programs like REDD+ in forests reserve promise less destructive than old ones like timber production or small-scale mining. Indeed, large-scale investments are conducted as mining, hydropower or cultivation of exotic forests near or inside of REDD program boundaries or protected areas.

Land-grabbing confronts us as 'green-grabbing' in new conservation territories or scales by appropriation of natural resources and lands where local people have the use right on it. As a difference from land grabbing, outcomes of the economic activities are more 'greener' in here like ecotourism, carbon sequestration, ecosystem services, agroforestry, etc. in forest reserves, protected areas, wildlife zones, etc. (Fairhead, Leach and Scones 2012, 239). However, the 'greener' practices can use as a trade-off to conduct more destructive economic activities in other spaces. Commons are re-appropriated by regulations and enclosures by strategies and programs of governments at different scales, administrative or natural boundaries such as international, national, basins, regional, villages or forests. Also, a new type of environmental governance consists of NGOs, civil society, private actors, etc. that is created to control and 'management' new territories within the limits of a regulated law. Because market environmentalism requires to involve

new actors in the management process as mentioned previously, however, for guaranteeing of capital and privatization of natural resources, state intervention and law regulation need (Castree 2008, 142-147; Bakker 2005). Nevertheless, the areas are enclosed by international contracts, national regulations, or announcements of protected areas; then, the areas or resources are allocated for ecotourism, agroforestry, ecosystem services, etc. in the global market. Hence, 'ecosystem services' become a beginning point of 'green grabbing'.

The third one is related to the deprivation of people from their land resources through discourses of 'conservation', 'environmental governance', 'poverty reduction' or 'equitable sharing'. As Castree (2008) argues mechanism of neoliberalizing nature, stakeholders as NGOs, civil society, and international actors have a voice in 'reregulated' environment by state. The power relations in new conservation territories are restructured, and national or transnational elites have right in here more than local communities (Igoe and Brockington 2007, 441). Newly constituted conservation territories are depending on a 'cross-boundary' and international authorities such as Natura 2000 sites in European Union administrative boundary, or REDD+ program areas which are management by funding of partner countries (Figure 1 and 2). There are many stakeholders such as NGOs, the private sector, civil society in different scales for the governance of the conservation areas. In recent environmental governance promises more democratic and equitable practices when stakeholders and intervention of business sector increase in the conservation areas (Igoe and Brockington 2007, 433). It means new interventions and interests become visible in the areas indeed. The critique is that non-state actors and private firms are in a collaboration with the green capitalist activities (Fletcher 2014, 330). Hence, all governance, funding, and participation process in conservation territories or 'community-based conservation' program areas become a convincing mechanism like Castree's (2008, 162) conceptualized as neoliberal governance. Displacement and enclosure are legalized by convincing the need for conservation, community-based programs, or designation of protected areas. The conservation programs promise property rights of local people on the areas at expense of the conservation of the areas. However, they were deprived of their use rights over natural resources in the areas. Because the biodiversity or carbon stock of the areas are no longer sold in the global market or commodified for ecotourism or agroforestry. In some instances, displacement practices are implemented in a manner that is more destructive, which could be labelled as "green violence" in order to "secure" conservation. Conservation practices, in turn, serve to

legitimize the privatization and marketization of protected territories for the purpose of conducting "green activities" (Adams 2019; Büscher et al. 2012, 22).

One radical critique is that REDD as green grabbing is the ‘biggest land grab in history’. (Mukerjee 2009; Corson and MacDonald 2012, 273). In the light of the process, discussions of the new type of colonization have emerged because of the exploitation of the biodiversity and richness of the Global South in a greener and profitable way. McAfee argues that “In recent years, many diversity-rich countries have also been motivated by hopes for new revenue from the export of their genetic green gold.” (1999, 12). Commodifying rich biodiversity of the Global South and accessing of ‘Northern’ countries to ‘Southern’ genetic resources and ecosystems are guaranteed besides ‘conservation’ targets of the programs and international contracts (especially in forests by the goals of the Convention on Biological Diversity) to reduce carbon emission or protect biodiversity. According to the map of REDD+ programs and partners, Global North countries are supporter actors for REDD+ programs in the Global South (Figure 1). ‘Free-market environmentalism’ has opened common or natural areas for capital accumulation according to the political ecologists’ critiques indeed. Similarly, market-based conservations have extended capital accumulation on conservation territories, forests, and biodiversity areas where generally local people or indigenous people live in. Indeed, it means that use right of local people in the areas has been limited in exchange for insufficient funding when the ‘protection’ has become profitable. In other words, the use rights of local people are transferred to private actors by the designation of protected areas so that the green commercial activities continue here. On one hand, commercializing ecological features and processes have extended, state-sponsored protected areas have increased in global scale especially recent two decades on the other (West and Brockington 2006; see Igoe and Brockington 2007, 433-437).

The socio-environmental impacts and actual ‘trade-offs’ in Global South are intensely investigated by political ecologists. Osborne and Sphario – Garza (2018) have examined commodification of Mexico’s forest carbons at the expense of certified agroforestry activities. Sheba and Sheba (2017) show that REDD+ project in Tanzania is an example of neoliberal conservation that Tanzania’s forests are commercialized in ‘global forest carbon market’ by the way of payments for carbon and FSC (Forest Stewardship Council) timber production. In this community-based management programs, ‘local politics over forest resources’ and re-structured local relationships with new ‘inclusions’ and ‘exclusions’ which is resulted in social inequalities have occurred.

The projects are discussed with insecurity of local land tenure rights over forests (Larson et al. 2013), social and gender inequalities, and appropriation exploitation of commons and natural resources with 'green' growth discourses (Wilkinson et al. 2014). Although the 'goal' and 'promise' of ecosystem services programs are conservation of nature and promoting social welfare by conducting 'community and nature-based' solutions, crucial socio-spatial impacts occur by valuation of ecosystem services.

Primitive accumulation occurs by including an outcome and its production processes in the capital accumulation process. Historically, the farmers were turned into waged labor and their products became commodities by the way of assigning use or property rights to landlords on agricultural lands (Marx 1976; Glassman 2006, 610). Similarly, in accumulation by dispossession (Harvey 2005) and green - grabbing processes, the commons (pastures, forests, water resources, conservation areas) or private lands of local people allocated to the private actors for more profitable capitalist activities. The local people were deprived of their use right in the area and became waged laborers in mining areas, ecotourism areas, agroforestry activities, etc.

Besides, these critiques also the new conservation paradigm means changing 'spatiality' and 'perception' of conservation by complex financing system and tradeoffs. Hence, socio-environmental inequalities become deepened and unpredictable. International initiatives such as The Kyoto Protocol and The Green Deal and the European Emissions Trading System brought payment requirements and penalties for exceeding carbon emission limits, based on valuing emissions with a monetary price in the international financial market. Also 'carbon credits' can be obtained by supporting zero-carbon or low-carbon industrial or energy activities, as well as preserving and restoring forests, or promoting sustainable agricultural activities (Lund et al. 2017). These carbon credits are sold to the companies that exceed their carbon emissions limit and actually have to pay high penalties. Nevertheless, carbon offsets serve as greenwashing so that high carbon emissions activities such as aluminum and cement industries, and even oil companies can maintain their activities by investing in conservation or ecosystem services (Ye 2023). Even if the aim is to encourage companies to engage in environmentally friendly economic activities, the involved countries try to 'control' emissions without making concessions to their economic growth.

On the other hand, commodification and financialization of nature was deepened with new actors, specialists and economic branches, ranging from consultancies for environmental assessment processes, financing and insurance, mining and industrial

actors for the development of 'green' technologies to construction companies for the provision of ‘green’ infrastructures or ‘renewable energy’ production. Green infrastructures such as solar power plants, water supply systems and designated recreational areas become “ecological fixes”, opening the untouched natural areas and restructuring the built environment for profitable activities. Hence, ‘sustainable’ development and strategies to fight climate change become the means of sustaining capital accumulation, rather than protecting nature (Castree and Christophers 2018). Even if not so much in conservation territories, such mechanisms as carbon credits, pricing ecosystem services and trade-offs secure destructive investments in other territories.

2.2.2. Forest and Water Grabbing

The water and forests are essential local and global resources that are intrinsically connected to the concept of ‘ecosystem services’, human rights and the rights of nature. Forests are distinctive carbon storages and habitats for biodiversity, and they provide resources for sustaining local communities. The concept of ‘water stress’ or ‘carbon sequestration’ has been highlighted by international contracts and new precautions aimed at improving the situation, as evidenced by the Sustainable Development Goals (SDGs), REDD programs, and EU directives. In light of the critiques of neoliberal conservation, market-based incentives cannot be seen as a means of avoiding forest degradation. Rather, they are associated with new economic activities and environmental degradation in conservation territories. The overexploitation of natural resources has been caused by both green grabbing practices and destructive economic practices. This has resulted in an increase in water and energy uses. Indeed, most countries are currently experiencing high or extremely high levels of water stress, due to a greater demand for water than is currently available (Figure 3). On the other hand, the Global South exhibits less water stress, which coincides with the concentration of both neoliberal conservation initiatives, particularly the REDD program, and forest reserves (see Figures 3 and 4).

Current conservation practices of forestlands and water resources are criticized through land – grabbing practices. Allocation of the use rights have private actors or privatization of local common lands (in some geographies ‘*de facto*’ rights) have occurred in developing countries for cultivation and supply food needs of foreign countries. Rulli,

Saviori, and D'Odorico (2013) shows that global agreements regarding the appropriation of agricultural land and freshwater have increased after 2005. The authors expose ultimate networks between land grabbers and developing countries. It means that virtual water - use and forest conversion practices have increased through new global dynamics and new conservation attempts. Inherent forest conservation to avoid water scarcity should be considered rather 'economic growth'.

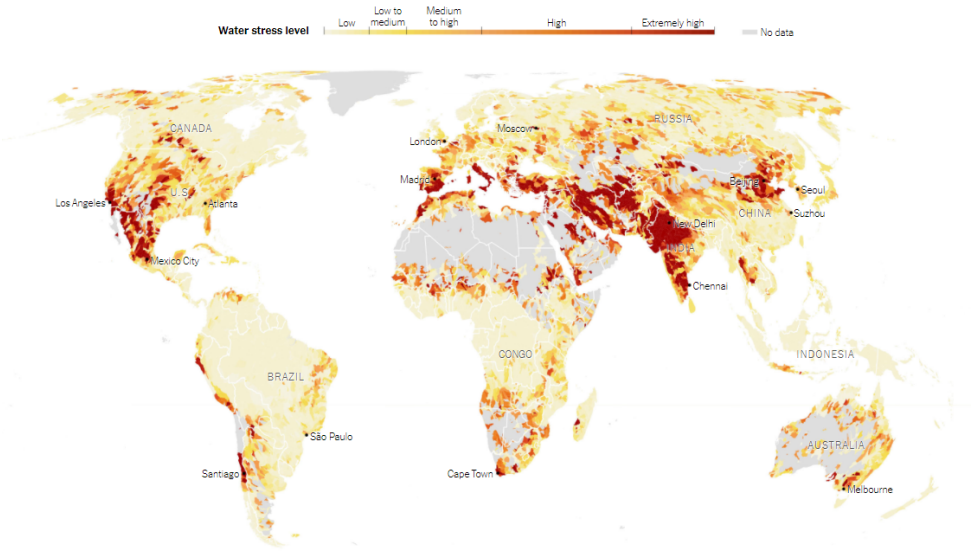


Figure 3. Water Stress Level

(Source: World Resources Institute 2022)

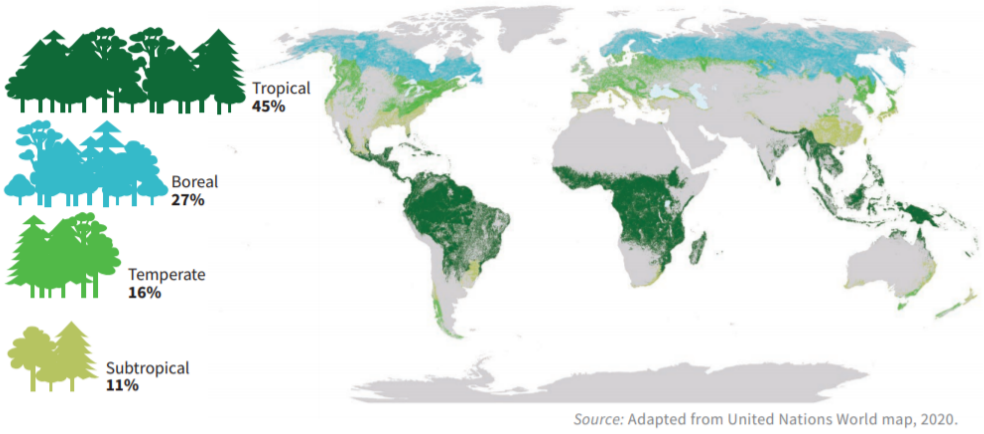


Figure 4. Global Forest Areas

(Source: FAO 2020)

The spatial dimension of conservation differs with technical/scientific practices such as remapping and zoning protection areas, and new planning strategies created outside the borders of these areas. On the one hand, these conservation practices directly affect land use rights and local economic activities in these areas, and on the other hand they directly associate with conservation practices with land and water usurpation in other areas. Types of conservation may be in the form of “land sparing”, “land sharing” or “rewilding” in and outside existing protected areas and the use of recreational areas (in cities) or forests declared as protected areas on a larger scale with new functions (hunting/keeping/walking/ecotourism). In other words, the rescaling and regionalization of protected areas directly affect the management and use of areas outside the boundaries of protected areas, in order to let ‘greener' practices to be used for trade-off for “compensating” more destructive economic activities in other places. On the other hand, the increase in existing protected areas through land-sparing brings about the release of intensive and large-scale production in existing agricultural areas (Adams, 2020).

Forest grabbing becomes a practicable issue because local people cannot use the forests that are protected when the forests are economically valuable and more profitable through new green activities or agroforestry production. Moreover, agrarian capitalism and green capitalism practices result in the conversion of forests and lands to produce more fertile and profitable outputs. As Pearce (2001, 286) mentions the geography and biodiversity of the forests are important to exotic and profitable products such as coffee and palms. For this reason, with the aim of ‘greener’ or ‘certified’ and profitable agroforestry activities, forest conversion occurs in conservation areas. Ango’s (2018) article shows a crucial example of forest conservation and forest grabbing through agroforestry activities as coffee plantations in Ethiopia. After the conservation announcement, forest conversion, clearance, and planting of exotic trees have occurred, and the management of the forestlands have transferred to private investors. In past, the local people earned money from the forests through coffee and honey production. Then, the forests have announced as conservation forests because of the rich biodiversity and gene pool. The conservation results in the extending use of the forests, the social, and environmental negative impact.

The companies carrying out 'green' economic activities in the announced conservation program boundaries benefit directly from these territories at the expense of berefting local peoples off their commons and traditional subsistences. Adams (2020) emphasizes, such trade-offs have yielded very limited results in nature conservation, and

have rarely been successful in reducing poverty. Hence, such programs in large-scale conservation areas create opportunities for "market-based conservation and nature-based economic development investment". As exploitation of nature and socio-spatial and socio-ecological inequalities have been strikingly deepened and expanded, so has conservation been employed to legitimize the need for "green- growth" (Büscher et al. 2012; Sullivan 2009). Communities in protected areas or designated program areas in the Global South or developing countries may benefit in exchange for small funds or basic services (Fletcher and Büscher 2020). In some geographies, the ecosystem services are provided through trade-offs between utility infrastructure and mining (Purwins 2020). Mining activities have proliferated around or in such protected areas (Alveraz-Berrios and Aide 2015; Duran, Rauch and Gaston 2013). 'Un-green grabbing' practices occur like mining activities or energy production in forests, protected areas, or water catchment areas even in Natura 2000 sites as Apostolopoulou and Adams (2015) argue.

Water grabbing is associated with land grabbing by the virtual water use and appropriation of water use right. The scale of capital circulation and a new type of environmental governance in wetlands are not 'fixed' unlike conservation areas or forests (Robertson 2004, 371). Water resources are fluid, changeable, and have complex boundaries, governance and impacts on ecosystems. Hence, water governance becomes problematic in terms of rescaling of politics over water resources that lead to inequalities, environmental degradation, and uneven development (Cohen and Bakker 2014; Wilson et al. 2019). Houdret's (2014, 193 – 194) study shows how inequalities are created between local people and economic elites by reallocating waters for use only large-scale export-based agricultural production. The grabbing process results in negative environmental impacts such as excessive use of water or environmental degradation and social inequalities because of the power inequalities, allocations, and complexity of hydro-structure.

Similarly, current water 'conservation' and insufficiency of the politicizing water management are also debatable in terms of inequity, water availability and food security. Shah et al. (2021, 592-93) mention as 'drought-freeness' programs occur with top-down management practices and resulted in social inequity. These interventions without considering community-based characteristics or lack of governance, as a top-down and standardize plans and practices can be resulted in externalities and excessive withdrawals. Water should be available and accessible for all villagers to reduce agricultural risks, in upper scales. Mehta, Veldwisch and Franco (2012) expose that water resources using for

irrigation of agricultural lands are allocated to foreign investors and private actors or using for hydropower and mining activities like practices in Lao forests. Local people cultivation and small-scale economic activities are limited or reduced by REDD+ program in exchange for small funding; however, the key drivers of Lao's economy as mining and hydropower are maintaining in Lao's wetlands. According to the research, forests and its management are required for conservation of watersheds which is essential for hydropower activities as large-scale economic activity. In this way, new phase of colonialism occurs by limiting local activities and maintaining economic elites' interests by territorialization of REDD+ areas (Devine 2015; Ramcilovic-Suomien 2019, 270).

2.3. Emergence of Radical Conservation

Market-based mechanisms don't provide an inherent aim for conserving nature and cannot eliminate environmental degradation or poverty when taking into consideration the critiques and practices. These mechanisms support welfare of a specific part of society and partial environmental benefits in some geographies in terms of reducing carbon sequestration, enhancing wildlife etc. However, the solution is very limited and weak to success target of halting climate change and poverty. Indeed, the success of conservation cannot be occurred by 'green grabbing' rather it causes destructive environmental impacts like forest conversion, water pollution and loss of habitats. On the other hand, the valuation of ecosystem services generally brought along new and alternative profitable activities in or around conservation areas with newly defined boundaries and scales as fundable and economically valuable natural areas (McAffee 1999; Igoe and Brockington 2007; Fletcher 2014). Conversely, it can be employed to maintain large-scale economic activities, such as mining and electrical production in forests and watersheds outside of designated conservation territories, as previously outlined.

Advocators of green economy or market-based conservation and valuation of ecosystem services also express that these attempts should pursue to success biodiversity conservation although their findings about the failure of the attempts. Balmford et al. (2002, 952-953) find out that habitat loss continues, and income inequalities increase

because of environmental conversion and degradation, and the lack of ecosystem services in their study area. The authors claim that conservation can be achieved continue to support ecosystem services. However, Pearce (2001, 293-294) evaluates the economic value of forests, and it is claimed that non-direct use of forests is less profitable than others and unsustainable uses. The calculation and comparison of the economic valuation of conservation and forest conversion profits are needed to understand to support the actual benefits of conservation. The author expresses the necessity of focusing on economic benefits of conservation to increase tendency of forest conservation.

As the solution for a successful conservation, McGauley (2006, 28) says "Nature has an intrinsic value that makes it priceless, and this is reason enough to protect it.". On the other hand, Costanza (2006, 749) as an advocator of 'valuation of ecosystem services' responds to McGauley that the idea is not beneficial for the welfare of the poor countries, and the ecosystem services remove the choice or battle about economy and environment; it is the only way to conserve nature. It is obvious that local people in developing countries are exposed to dispossession or deprivation for the sake of capital even in conservation areas. But also, this approach to conservation results in the re-territorialization and rescaling of governance structures within the designated areas. The approach provide opportunity to be used conservation areas less or more degraded besides triggering the use of other areas more destructively. In other words, fully 'conservation' in specific boundaries or geographies, and more destructive economic activities can occur growingly in other areas without a limit simultaneously.

Furthermore, McAfee (2012) mentions that the benefits of the ecosystem services in 'ecological complexity' cannot be known and measured. The programs are required environmental about monitoring and mapping to calculate benefits of ecosystem services or finance. For example, it is needed to monitor carbon stock of a project area to define the 'selling' cost. However, it is difficult to account all effected factors on ecology. Busso et al. (2012) highlights the conservation gap in Italian territory, especially for threaten species, and necessity of the forest corridors and restoring of them that provide connection between habitat areas. Moreover, current trends turn back us to 'technocratic' focus and solutions with regretting political factors and social complexities. Designation of PAs (protected areas) like Natura 2000 site is a solution to enhancing biodiversity as a mainstream approach especially in EU and Turkey. However, as Dimitrikapoulous and Jones (2021) discuss, protected areas also present a number of challenges and problematic

issues in terms of social equity, deforestation, and ineffective forest governance in conservation areas in a variety of countries and contexts.

Flecther (2020) mentions about the 'lack of foundation' to local people. Indeed, the access of local people in their commons have cut in exchange for a little amount of funding. Hereby, contribution of 'ecosystem services' to local welfare is blur. The author purposes a new 'conservation basic income' model to protect nature and promote local welfare. The model is not an adequate solution as the authors say, however, it is a starting point to think alternative solutions.

All the literature directs us to consider socio - ecological connectivity, politics and the requisite of more inclusive governance processes for an effective conservation practice. Capital flow is extended and scaled up on protected areas and new territories. It has contributed to the ecological crisis and crisis of the global economy again (Sullivian 2009; O'Connor 1998). It is important to consider distribution of wealth and accessibility of the natural resources, forests, water, and commons. Recently, radical solutions are discussed in terms of local promotion and an 'actual' environmental conservation.

Dinerstein et al. (2021, 1-10) purpose to increase conservation areas up to %50 of the world and reconnect them to construct a 'Global Safety Network' as a response to emergencies such as covid-19 and climate change. It means to propose additional %35.3 protected areas. According to the authors, increasing conservation areas by supporting restoration with creating corridors is crucial to achieve the target of decrease 1.5 C, and preventing deforestation to avoid contact and spreading areas of viruses like Covid -19. The 'Global Safety Network' approach try to achieve three main target as conserving diversity, enhancing carbon storage, and creating wildlife corridors. The attempt is a start to broaden conservation term with new emergencies through "conserve enough nature and the right places". Another important point of the article is being aware of the exclusion of local people or indigenous people in conservation areas. The article has mapped overlapping between indigenous land rights and target conservation areas besides 'Global Safety Network'. As the article says, it is needed to "think globally and act locally", hence, defining conservation areas in terms of national or local needs, and being respectful local governance strategies on commons are indispensable to achieve an effective conservation. The work is based on biodiversity criteria such as species rarity or carbon storage capacity. It can be developed with freshwater and marine environment or agricultural land analyses to handle water and food security as authors express. From my point of view, besides biodiversity and forests, uplands and water catchment areas

can be evaluated as conservation criteria. Because existing pollution and threats on water resources are current and future emergencies of ‘climate change’, ‘water scarcity’, droughts and floods. Profit centered policies make closing streams for the sake of construction or approving mining or industry in upstream which provide fresh water to cities possible should be reconsidered through limitations and strict rules.

On the other hand, the authors (Büscher and Fletcher 2020; Büscher et al. 2022) who previously worked on political ecology of protected areas emphasize the importance of considering ‘conservation’ out of and beyond conservation areas. As mentioned before, current conservation practices have not been successful to limit investments which is destructive and contribute environmental problems. They continue to maintain besides ‘sustainable’ economic practices. The authors highlight the requisite of rethinking conservation practices and governing within the larger context and with their footprints. Hence, they conceptualize “biodiversity impact chain” as a governance tool for structural or transformative conservation approach called as “convival conservation” (Büscher et al. 2022, 246). Convivial conservation aims purpose a conservation model which coexists with humanity. This approach introduces that “would entail living with other aspects of nature in ways that balances human and nonhuman needs” (Büscher and Fletcher 2019, 289).

Convival conservation requires a number of transformations, such as from protected areas to 'promoted areas', from selling nature to 'celebrating human and non-human engagement', from tourist voyagerism to ‘engaged visitation’, from spectacle to ‘everyday environmentalism’, from privatised expert technocracy to ‘democratic engagement’ (Büscher and Fletcher 2019). This shift entails recognising that our lives and needs can be shaped in multiple manifestations, rather than distinguishing between non-human and human or viewing nature as something to be saved. It involves engaging meaningfully with nature rather than consumerism by escaping 'commercialised' and 'commodified' imaginaries of nature and celebrating diversity (Büscher and Fletcher 2019, 287-288).

The shift can be viewed as an attempt to reclaim and de-commodify protected areas and ecological commons by opposing extractive activities such as funded tourism in these areas, and instead promoting biodiversity enhancement and socio-ecological production areas. The approach is transformative in terms of conservation and social justice. As Kraus (2021) emphasizes, the concept encompasses historical reparations in financial and ecological terms, decolonization, an alternative economy, ecological limits,

actual needs, and global and intergenerational justice. Additionally, it incorporates alternative global governance mechanisms, such as a "convivial conservation coalition."

2.4. Bringing Radical Conservtion into ‘Urban’ Debates

In the light of the discussion about current conservation trends and critiques, their conceptual limits and practical impacts such as forest and water grabbing should be considered with new alternatives and inherently conservation aimed policies that recently radical conservation approaches proposed by some authors (Fletcher and Büscher 2020; Dinerstein et.al 2021; Büscher et al. 2022). The constitution of a new conservation concept and model is fundamental in order to address the deepening inequalities at different scales and the unavoidable environmental destruction. In addition, conservation term can be extended by focusing ‘water’, the area which affects its existence (water catchment areas, forests, soil and even wastes and pollution from anthropogenic factors), and its socio – natural environment (agricultural lands, villages, cities, buffer zones etc.). This section considers the potential for a novel interconnected and relational conservation approach through the lenses of both "planetary urbanization" and "socio-metabolic urbanization" (Brenner and Schmid 2015). The objective is to identify ways of overcoming the limitations of traditional scale-based conservation strategies. In this manner, ‘ecosystem service’ and radical conservation discussions can be considered within the context of critical urban theory, urban political ecology and also critical urban planning.

2.4.1. Scale Problem

Discussions of decision – making process and policies about the use of natural resources focus on ‘scale’, ‘boundary’ and ‘comprehensiveness’ for a while. It is possible to behold that all the issues are entangled with debates of ‘urban’ phenomena; where is the city begin and end, is it bounded, or what are the effects of an intervention to urbanization processes? No doubt, insufficiency of thinking urban without ‘nature’, or

discrete from ‘nature’ to urban is a not new debate. It is necessary to consider urban-nature connectiveness beyond the Chicago School's "urban ecology" which posits that urban phenomena or human geography are the result of an evolutionary process. The process cannot be evaluated without political interventions and historical context. It is not purely ‘natural’; the production of nature is a result of the historical development of human being that reshape urban-nature relations along with capitalist production (Smith 2010). Crisis of capitalism and its effects on human geography can be observed as ‘concrete’ form of urban or city. Currently, it can be envisioned as a new ‘complete urbanized world’, not just concrete, but with connections and networks such as urban services, electrical infrastructures, wastes etc. through the “plenatary urbanization” and “global cities” discussions (Lefebvre 2003; Brenner and Katikis 2014; Brenner and Schmid 2015; Sassen 1991). In the planetary urbanization era, the limits of the urban and urban studies, its disconnectedness with ‘nature’, and ignorance of the relations in various disciplines began to be criticized by critical urban theorists and political ecologists. Heynen, Kaika and Swyngedouw (2006, 2) remark the essentialness of “re-natured” urban theory to understanding and analysis of the connectiveness of nature and urban -or society-, and decode socio-environmental problems. Examining the relations of socio-environmental changes and urban metabolic processes, thinking out of the scale - and sometimes place‘less’ - become more important.

> Urbanization can indeed be viewed as a process of contiguous de-territorialization and re-territorialization through metabolic circulatory flows, organized through social and physical conduits or networks of “metabolic vehicles. (Swyngedouw 2006, 21)

The relations have recently been re-evaluated in the context of the ecosystem services approach, which is currently a prominent area of research. The issue of scale is a controversial one in the context of ecosystem services and water-related issues. Ecosystem services project areas as forests in Global South can be aimed to reduce ‘carbon’ in ‘global’ scale, and poverty reduction in local scale. However, in Global North, designated protected areas are seen only cultural ecosystem services. On the other hand, ecosystem services like improving urban green infrastructure or urban landscape are used like an urban planning tool. Urban ecosystems services are limited to a specific scale and their limit cannot be reach to ‘urban’ limits. In some practices, intervention of air, protection areas, upstream forests and water can promote service a city center like Ecosystem Services in New York City Watershed project. Considering from upstream

forests and water resources to urban green areas are fundamental for a living city. Small interventions and implementations cannot be alternative for the benefits of forests or natural areas (Beichler et. al. 2017). In these debates, boundaries and relations of urban and rural, and lack of access to ecosystem services become problematic.

It is fundamental to think city with its wastes, infrastructures, agricultural lands for food service etc. where generally located in 'rural' or 'natural' areas. However, the 'city' term is discussed in a bounded context, and it is criticized by 'methodogical cityism' (Angelo and Wachsmuth 2015). Urban political ecology researches should be focused more 'rural' areas, however, rural researches also should be evaluated in a large scope. Researches on rural or natural areas become important to understand urban-nature connectiveness, networks, flows, production and consumption pattern, transformations etc. In the planetary urbanization era, a problem or a conflict in natural areas about energy production, waste, mining, tourism activities result in environmental or social injustice. The issues are not only about local people but also everyone as global problems and commons anymore. Actor-network theory and methodology is useful to apprehend socio-environmental changes and dynamics as a complementary path (Brenner, Madden and Wachsmuth 2011). The insufficiency of new conservation concepts and the critique of the urban political ecology open new paths to handle the relation and dynamics of socio-environmental changes in terms of structure, causality, transformation, limits and potentials.

Parallel to urban political ecology literature (Heynen, Kaika and Sywngedouw 2006; Brenner and Schmid 2015), Büscher et al. (2022, 250) highlights that protected areas are connected to city center, and should connect more. Protected areas serve, also, are impacted from demands and supply of the cities. A larger scientific analysis like BIC, inequalities and power imbalances can be exposed, and an integrated approach can be created with this awareness. Conservation priorities can be possible to think in a larger extend with relative scales such as upstream watershed areas, agricultural lands around them, and cities.

As the conceptual boundaries of "protection" should be redefined, the necessity arises to establish operational frameworks that extend beyond these boundaries to encompass urban centers, agricultural areas, and larger regions. Planning needs to intervene more effectively in these areas and their relationship with the city. Since conservation of forest, water and food supply is profoundly related to the protection of livable climatic conditions in the urban areas, radical conservation approaches offer a

conservation thinking that would be more ‘urban’ but also able to go beyond it (Büscher and Fletcher 2019). In a similar vein, Swyngedouw (2006) and Tzaninis et al (2021) concede that the conservation concerns must go beyond the urban-nature dichotomy and fixed ‘urban’ scales by incorporating the notions of socio-ecological metabolisms and urbanization of nature. For achieving conservation beyond technocratic perspective, it needs to be scaled up, reconceptualized and politicized by taking ‘water as concrete connectedness of the urban and nature’ as a heuristics as well as a model (Williams, Bouzarovski and Swyngedouw 2019).

2.4.2. Thinking Around Water: Nexus or Commons?

The majority of academics engaged in decision-making, environmental policy, and governance, among other fields of interest, have a keen interest in water-related issues. Political ecologists are particularly interested in water due to its fluid nature and its relevance at different scales, which are not spatially fixed. It can be reasonably deduced that studies related to water can assist in the resolution of socio-environmental issues and the alleviation of inequalities at various scales, while also identifying the root causes of these problems. The objective and scope of water-related searches vary considerably in terms of their disciplinary focus, geographical scope, scale of interest, and the specific concepts under investigation. As Cook and Bakker (2014, 99) indicate, the focus on climate change and water scarcity in the Mediterranean is a crucial aspect of hydro-policy and water availability in the Middle East and North Africa (MENA) region, particularly in light of the growing importance of security concerns. Furthermore, the phenomenon of "water grabbing" or "virtual water use" is also addressed in the research at various scales, as evidenced by the work of Rulli, Saviori, and D'Odorico (2013) and Wilson et al. (2014). The concept of water has been the subject of considerable debate in recent years, particularly in the context of the climate crisis, water scarcity, water security, floods, and new forms of governance. The complexity of water necessitates consideration within a broader conceptual framework.

New approaches to the ‘management’ of water use, such as the water-food-energy nexus, assert the possibility of accounting for benefits, trade-offs, and other factors on a

sector-specific basis. Additionally, the PES approach is developing around the concept of "resources," which are typically defined as forests or water resources. Forests and water catchment areas play a pivotal role in flood mitigation. The direction of water flow has a direct impact on the surrounding environment. The implementation of water resources use or conservation policies is contingent upon the policies of the city center, region, county, or village. This is because it is essential for the provision of freshwater and the security of the food supply. Nevertheless, the water scarcity or water food energy nexus are criticized by the goal-oriented view. (Cook and Bakker 2011; Arjen Y Hoekstra et al. 2018). These lacks clarity regarding the identification of beneficiaries and disadvantaged parties.

As the conceptual limitation of ecosystem services, water-energy-food nexus approaches and water scarcity, the concepts serve technical solutions for sustainable development and poverty reduction. The concepts are criticized by depoliticizing the problems like sustainability, conservation, uneven development or inequalities. On the other hand, the common nexus critique is the same as green growth and current conservation trends like valuation of ecosystem services. The 'solutions' present not a new and radical thing to overcome the "structural problems". (Waughray 2011; Williams, Bouzarovski and Swyngedouw 2019, 660-661).

Fransisco et al. (2019, 13) claims that both PES and water-food- energy nexus approaches tend to offer technical and basic solution to environmental problems through ignoring the complexity of the problems and powers in different scales that is impacted by natural resources. Like PES critiques, water – energy – food nexus approach is used for sustaining natural resources such as rivers are conserved partially for energy generation or water provision directly, or some forests are conserved for gaining carbon credit or sustaining agro-forestry activities or tourism activities. Bakker (2012) remarks that water security is also handled in different scales by various academician, however, especially focusing river or watershed or nation-state scale caused by "scalar-mismatch" and poor governance. Because the studies can be missed out various dimension of water use such as groundwater use and boundaries, virtual water use, or water – food- energy trade – offs.

It is important to understand and discriminate the aim of this type of 'conservation', and who is the beneficiary or disadvantaged. The profit centered practices result in environmental justice and inequalities. Fransisco et al. (2019, 11) clarify to importance of politicizing nexus approach by explaining how PES are instrumentalize for

‘guaranteeing’ water and energy security that is essential for hydropower in Colombia. The article also shows how hydropower plant in upstream watershed affect to downstream externalities negatively. This ‘green-washing’ activities result in dispossession of villagers from their ancestral livelihood and the situation threat to food security. By this program, the alliance between ecosystem seller as landowners of upstream and ecosystem buyer as hydropower company is become more important than the practices of downstream watershed activities like fishery, agricultural activities etc.

Besides the ‘techno-managerial’ thinking of resource nexus approaches, the essential problematic issues like scalar politics, interconnectedness and material and resource flow are missed out that is directly related to uneven development, inequalities and power imbalances.

> The resource tensions and trade-offs driven by urbanisation are unevenly distributed, both within cities and beyond their geographical boundaries, creating new socio-ecological vulnerabilities. (Williams, Bouzarovski and Swyngedouw 2019, 658)

Nexus understanding does not provide a ‘socio-ecological’ connectivity, as authors says a ‘politicised’ nexus approach can be useful as a complementary vision (Williams, Bouzarovski and Swyngedouw 2019, 663-64). Uncovering inequalities and causal mechanisms of the ‘context of context’ can be helpful, thereby, a broader perspective can be presented in a large scale by focusing ‘water’ as fluid source which is inter-related various scales (Cook and Bakker 2011; Brenner and Schmid 2015). Except from the villagers which locate water-besides, downstream or upstream, the water and its sustainability is vital for human being. In this direction, water resources are local and global commons that various population use.

‘Commons’ can be a starting point to think emergency of new type of governance to exceed uneven development and top-down approaches. To overcome the problematic, all concept about conservation, water, and commons should be evaluated interrelatedly. Because, populations are interconnected and responsible to each other in terms of use and management of the water resources. The ‘common’ term has been discussed for a long time especially after Hardin’s (1968) article. The author defends that if the common resources like rivers, pastures, or forests or common agricultural lands are collectively or self-managed, the resources come to an end. Because, every farmer or individual want to use the land more without thinking the limit or sustainability to gain more profit, more products with more fertility. Privatization of commons or conservation areas like national

parks and limit to the use of the areas for a specific part of the society have purposed as solution in the article. The article has become a base for the international contracts to defend green capitalism's 'sustainability' term or current conservation practices that cut local access to the areas and suggest to 'greener' sector in there on the other (Angus 2008). This traditional common approach has been criticized by triggering and supporting 'privatization' and 'commercialization' of the natural resources and areas, and 'centralization' of the management of the areas concomitant enclosure practices (Adaman, Akbulut and Kocagöz 2017; De Angelis and De Harvie 2014).

The current conservation trends implement with top-down management, even they promote 'authoritarian' regimes in some geographies (Büscher et al. 2022). It is like a proof that Hardin's (1968) article is well-accepted. Following Ostrom's (2002) categorization and scientific foundation of self-governance, the probability of achieving common goals became a subject of debate. This self-governance system has been discussed by the successful management in ancestral pastures, forests or water resources in different communities (Adaman, Akbulut and Kocagöz 2017; Angus 2008). Re-considering 'common' term in various scale become important to create alternatives for mainstream governance through understanding the failure of the top – down approaches. It is also significant to understand and solve socio - environmental problems named as 'climate crisis', 'water crisis' or disasters that actually caused by the crisis of capitalism. Besides thinking integrated water management plans, communities with their characteristics, in- situ interventions, and reconsidering the role of local governance is important to support water accessibility, and food security for everyone, or every village (Shah et al. 2021).

However, as mentioned before, the current conservation trends like ecosystem services are based on the community-based management and 'rural development' discourses (Dressler et al. 2011). Indeed, more central and global actors have involved in the 'management' process. The process results in socio-environmental inequalities, and the restriction of local use rights in expense of the new sectors. Hence, the commons and community-based management turn a tool to manage or control easily the community who is used resources or commons from the outside as an authority. The process is seen as democratic and local based process, however, it is actually controlled by global actors or elites or companies. The attempt can be called as "community fix" to compromise capital accumulation and 'commons' as new commodities (Bakker 2007; De Angelis and De Harvie 2014).

As community-based management in commons, to defend the use or conservation of the commons as a 'right' can be resulted in extreme use of commons by promising to supply this right to every individual. Bakker (2007) claims that 'water right' discourse is not contradictory with neoliberal use of water; both say to the need of accessing water to every human. This discourse encourages to continue state – private partnership, not about the 'alternative globalization' or radical changes. The author suggests using the term 'water commons' against to the 'commodities' to achieve new radical solutions and democracies like water services as a public services.

On the other hand, natural and rural areas become important arena to defend people (even who do not live in here) their 'rights', or commons. The conflictual areas should be also searched to understand dynamics of socio - environmental change and social movements. As social movements in urban commons to reach right to the city, rural and natural areas have potential to turn bigger social movements to search for 'right to the nature'. Exposing inequalities and injustices and the dynamic in the areas with a larger scope, purposing radical changes or structural changes to survive the planet rather than creating new exploitation spaces, and 'politicize' of them can be a way to defend our global commons as Marcuse (2009) says for 'right to the city'. Creating alternative policies to reach right to the city and reproducing urban commons like streets, schools or public areas and services can be thought for all global commons / ecological commons such as forests, oxygen, conservation areas etc. (Charetton, 2010; Gidwani and Baviskar, 2011).

The discussion is parallel to the 'community-based regionalism' as Soja highlights and planning discussion as mentioned in previous parts (in Soureli and Youn 2009, 58). Policies and researches should consider for each localities and local realms, but handle them a broader perspective. Each intervention should be evaluated in different scales, because it can be resulted in uneven development or inequalities. Villages as socio-environmental assemblages and context of context are examined to grasp 'whole' situation with relations and networks (Shah et. al. 2012; Brenner and Schmid 2015). The uncovered dynamics can be potential to resist to standardized solutions or 'panacea' of capital crisis or ecological damage, or convenience mechanisms of capitalism. This perspective can provide us to realize the actual problems, urgencies, dynamics by analysis commons in varied political, geographical, social, cultural and economic contexts. The

insufficiency or inefficiency water-related issues, ecosystem services, or conservation practices can be surmountable.

Socio-ecological crises, current and future emergencies related to climate change, water scarcity, droughts, and floods that pose significant threats to urban and non-urban environments are closely linked to growth-oriented policies. Their unpredictable outcomes require structurally transformative interventions. The rising new inequalities under the circumstances of planetary urbanization demand new forms of governance, planning and design (Brenner and Schmid 2015). The following section examines the potentialities of a relational thinking, which is essential in aligning urbanization and planning policies, and spatializing degrowth alternatives.

2.5. Post-growth Planning as a Tool for Radical Conservation?

2.5.1. Spatializing Degrowth

As another radical solution, 'degrowth' debates came up the global agenda. Afterwards the failure of new paradigms such as natural capital and 'sustainable' use of environment, "degrowth" emergency has begun to be mentioned in global reports (Büscher et al. 2022, 244-250). The Degrowth Conference for Ecological Sustainability and Social Equity held in Paris in 2008 has initiated debates on degrowth policies and strategies across various disciplines. The degrowth approach, emphasizing inherent conservation, has risen in response to policies and strategies of the green-growth or green-transition (Demaria et al. 2013). Degrowth, on the other hand, "signifies a society with a smaller metabolism, but more importantly, a society with a metabolism which has a different structure and serves new functions" beyond 'economic' terms (Kallis, Demaria and D'Alisa, 2014, 3). The advocates of degrowth argue for the necessity of radical transitions, articulating economic as well as political and social restructuring. According to them, partial degrowth alternatives, such as agro-ecological initiatives and eco-villages have the potential to be a model for structural change. Also, the proposals for up-scaled transitions such as circularity and relocalization of the economy have the potentiality to

transform the system (Latouche 2009; Martinez-Alier et al. 2010; Kallis 2011; Savini 2023).

However, it should be clarified that “degrowth” term can be dangerous when it is misunderstood. As discussed in previous parts, rural population is blamed to be responsible for deforestation or environmental degradation. Most of ‘community-based’ management and encourage program adopt to reduce rural or local activities in conservation areas or forests instead of destructive mining activities or luxury tourism activities (Dressler et. al, 2010). Nonetheless, solutions to environmental problems under capitalism have resulted in uneven transfer of socio-economic welfare to particular geographies. Hence, it is crucial to avoid policies that would culminate in new potential injustices in pursuit of degrowth. Kaika et al. (2020) emphasize that, besides the policies or interventions targeting degrowth that are to be responsible for the inequalities, the impacts of degrowth on vulnerable populations have to be scrutinized considering the uneven dynamics in or between the Global North and South. As it was witnessed in the EU region ‘degrowth' meant recession at the periphery of the EU when it came to the global agenda following the 2008 crisis (Demaria 2015; Akbulut 2021). This legitimasation mechanism under post-political conditions is threatened by urban movements and crises such as the financial crisis in 2008-2009. Through the crisis, some geographies have experienced austerity and selective degrowth, and this led to be understood that growth-based policies and practices do not imply social justice (Fearn 2022; Varvarousis 2019).Degrowth is more separated from dependency of global market entangled with decommodification with reducing extraction and emissions, and reforming social and financial institutions is rather than reduction in GDP (Schneider, Kallis and Martinez-Alier 2010).

Recent studies have been concerned with the political ecology and economics of degrowth as a response to inequalities, particularly between the Global South and North. Rammelt et al. (2023) demonstrate the unequal distribution and consumption of resources on a global scale. They define minimum levels of access to energy, water, food and infrastructure, and provide a comprehensive analysis that highlights wealth inequalities, vulnerabilities in terms of access to services and unequal carbon emissions between the Global North and South. This research is crucial in identifying the real priorities and needs for quitable access, beyond defining minimum dollar-based assessments in global reports. Although degrowth is not directly addressed, the article clearly demonstrates the need for

a radical redistribution of resources, beyond merely stating that SDG targets are insufficient.

Indeed, cities in the Global North have recently been involved in debates on the degrowth agenda, with approaches such as the circular economy or cities, the doughnut model and post- growth cities (Savini 2024; Calisto Friant et al. 2023). Debates on the doughnut model or the circular economy are compatible with neoliberal policies, SDG targets, sustainability-oriented policies or just transition strategies aimed at overcoming the ecological contradictions of capitalism. Rather than reducing exploitation in the Global South, these practices are inadequate as they only propose sustainable and just societies within isolated boundaries. For example, Creutzburg (2022) argues that Switzerland has policies and practices in place to reduce emissions at the city or national level, but they do not serve global degrowth. However, the high-income country imports materials and energy and leads both direct deforestation (through mining) and indirect deforestation through carbon credits in the Global South. The purchase of carbon credits with funds such as REDD programs is associated with injustice and environmental degradation.

Schmelzer and Nowshin (2023, 17-18) argue that the commoning or alternative economic, feminist and post-capitalist and globalisation-critical currents of degrowth have transformative potential through an institutionalist degrowth agenda. The authors emphasise the importance of commoning, reproduction and decommodification for global justice and ecological reparation. According to the authors, a number of structural changes on an international scale are needed, including the degrowth of the Global North (not in its borders, but also in the degrowth of its appropriation of material and labor), ecological reparation, the transformation of trade and mining, the reform of the global monetary and financial system, and the prioritisation of global governance. The categories identified include specific actions such as debt cancellation, unconditional cash transfers, return land ownership to local communities, rewilding, carbon drawdown, global socio-ecological taxes, rights to the nature.

Rethinking both the conservation concept or degrowth alternatives in relational terms could contribute planning to problematize the planning decisions or programs fixed within a pregiven scale and move beyond traditional boundaries of the discipline. Planners can also propose and spatialize degrowth possibilities to address multiple crises and inequalities. A conservation approach that moves beyond a fixed understanding can aid in concretizing and scaling up degrowth alternatives. Social-ecological values and

their networks can be revealed and alternatives for their protection can be proposed by integrating radical conservation into planning policies.

New emergencies such as climate hazards, water crises, and pandemics require the planning discipline to consider 'degrowth' in decision-making processes. New attempts refocusing planning beyond growth-orientation have been developing towards degrowth-connected urban studies and planning. The latter refer to post-growth planning (Kaika et al. 2020). Degrowth refers to restricting both production and consumption, and redistributing wealth. On the other hand, selective degrowth or recession may result in uneven socio-ecological outcomes, including the risk of environmental degradation and injustice. The impact of each intervention must be evaluated at different scales as it may lead to uneven development or inequalities. This perspective enables us to understand the actual problems, urgencies, and dynamics by analysing commons in different political, geographical, social, cultural, and economic contexts. Indeed, urban studies and planning discipline have already tools to spatialize degrowth, since their primary concerns have been the organization and structure of settlements and governance units.

Degrowth in production and consumption is directly linked to urban areas, as well as the resources and energy used for activities within them, including the restructuring of urban and rural areas. Achieving equitable and sustainable degrowth in consumption and production requires large-scale transformation of material flows and the operationalisation of communal living conditions in degrowth such as housing, infrastructure, transport, the location of renewable energy production. Spatial planning institutions play a crucial role in clarifying the spatial organisation of degrowth policies, their conditions, and socio-spatial impacts or outcomes (Wacher 2013; Krahmer 2022; Kaika 2023; Kębłowski 2023). For example, Kębłowski (2023) examines transportation policies as urban planning policies that can contradict growth-driven development and provide socio-spatial justice and solidarity. Degrowth is a critical alternative to economic growth and growth-driven policies, institutions, and urban development that have the potential to trigger radical transformation (Durrant 2023; Wacher 2013; Kębłowski 2023; Savini 2021; Schmelzer 2023).

2.5.2. Moving away Planning Beyond ‘Growth’ Focus

Planning has been a field of expertise that alleviates the contradictions of economic growth and urban development under advanced capitalism (Harvey 1976). According to Marcuse (2016), planning generally limits itself with physical interventions to either overcome obstacles to economic growth and welfare or to ensure "social welfare" without taking into account economic processes and power relations. It essentially focuses on the design and technical parts of the problems or suggest improvements that are limited to a certain scale. Here, the concern for "equality" is actually an element taken into consideration to "mitigate" the contradictions at the delineated scale. Unless questioning the economic, social and political system in which planning is situated, it cannot go beyond spatial improvements, and make suggestions for change. However, planning has attempted to overcome new emergencies such as climate crisis, water insecurities or unforeseeable environmental hazards through technoscientific or “ecological” spatial strategies. As planning tried to solve socio-ecological problems through ecological planning and resilience practices against “vulnerabilities”, it not only depoliticized these crises, but also transformed its spatial practices into “spatial fixes” (Joseph 2013; Bigger and Webber 2021; Robin and Acuto 2023).

In the planning discipline, the preconditions of sustainable spatial development was to be laid down by overcoming the conflicts “between environment and growth” and "between growth and justice” (Campbell 2016). Whilst current planning approaches and practices try to incorporate "aesthetics", "public health", "diversity" and even "ecology" concerns (Campbell, 2016; Hirt and Campbell, 2023), they cannot deviate from the focus of “growth” and "reducing contradictions” within established frameworks. Even Justice Planning seeks ‘justice’ as defined within the legal framework presented to it, within certain conditions (Marcuse 2009). Only on the condition that could sustainability principles be defined and put into action, appears a possibility of overcoming these contradictions and achieving a just city as well as a green city. Planning strategies have fell short of socio-ecological problems and injustices related, directly or partly, to spatial policies and practices. Indeed, social equality is overlooked measured against the central concern of economic growth and environmental protection. It is also disregarded that the contradictions of economy-equality (property contradiction) and equality-environment

(development contradiction) have been immanent to capitalist development centered around economic growth (Campbell 2016; Hirt and Campbell 2023). Hence, sustainable urban development remained as an 'ideal'.

By the 2000s, three priorities of planning -growth, environment and justice- were replaced by "economic resilience", "environmental resilience" and "social resilience", respectively, on which "urban resilience" was to be based. Social justice and unequal distribution of benefits and costs of growth, whilst socio-ecological problems have been getting deeper and more destructive in the urban and non-urban areas out of the delineated scale in which planning and design strategies were to be carried out for the sake of "resilience" or ecological urbanism (Gleeson 2012; Campbell 2016; Hirt and Campbell 2023). On the one hand, as planning has adopted neoliberalism, which is not only antithetical to social justice and equality but also seeks economic growth uncompromisingly, technoscientism and ecological urbanism became dominant in planning, spatial policies and processes (Campbell, Tait and Watkins 2014). In other words, so far as planning adopted neoliberal language and policy sets, and brought out technoscientific and design-focused spatial strategies, it left decisively its pursuit of social justice (Brenner and Schmid 2015; Novy and Mayer 2009). Resilient city or eco-city solutions, subjected to managerial concerns like increasing the city's competitiveness, become "spatial fixes" or "urban sustainability fixes", and hence trigger uneven development (Joseph 2013; Bigger and Webber 2021; While, Jonas and Gibbs 2004).

Marcuse (2009) suggests "Commons Planning" as a new role for planning instead of communicative planning and justice planning. Neither communicative planning nor justice planning consider power relations and inequalities during planning or decision-making processes (Fanstein 2005; Purcell 2009). Marcuse (2016) suggests that planning needs to address: i) what is the purpose of the decision and action of local or central government in a given situation? ii) is the purpose simply to find the most efficient and effective use of a piece of land, to encourage and support tax revenues or this commercial investment? iii) what is the influence of capital and political forces in decision-making? iv) does it serve the public interest? These questions, which also concern who benefits and who suffers, are an important part of planning analysis.

In line with Kaika et al.'s (2023) "spatializing degrowth" and Marcuse's (2009) critical planning proposals, socio-ecological values damaged in planning and governance processes need to be identified, networks of capital accumulation and unequal distribution of benefits at different scales need to be exposed; alternatives that prioritize

environmental and spatial/social justice need to be proposed; and these problems and alternative proposals need to be politicized. Besides, unlike the shrinkage practices or neoliberal austerity policies, the equal distribution of development and wealth is an indispensable element of degrowth. Planning discipline can help the spatializing degrowth alternatives through scientific knowledge and communicative skills, and contributing more ‘just’ and ‘sustainable’ society and also to overcome possible inequalities caused, for example, by ‘selective degrowth’ (Swyngedouw and Heynen, 2006; Latouche 2009; Xue 2014; Xue, 2022). On the other hand, the role of planning in 'post-growth planning' and changing the priorities of 'growth' and the role of the planner are discussed (Xue 2022).

As Xue (2018) and Ruiz-Alejos and Prats (2022) point out, planning discipline still lacks the tools and vision to deploy degrowth as a transformative alternative. Not only overexploitation of natural areas but also the creation of new socio-ecological inequalities, to which ‘green’ growth oriented urban strategies fail to respond, continue out of the delineated planning boundaries. In fact, in contrast to the goals of today's mainstream sustainable planning practices, Campbell (2016) describes “sustainability" as the center of his model focusing on creating 'fair' cities alongside 'green' cities, pointing to the goals required by the post-growth planning practice as discussed with degrowth alternatives. Campbell considers the concept of “sustainability” with a "steady-state" economic condition. However, let alone “sustainability” goals and practices never present a “static” economic model, they increase environmental destruction by offering new economic growth alternatives. In this regard, Campbell (2016) also suggests rescaling the economy and society according to ecological limits, which are discussed with the concept of 'bioregionalism' in degrowth alternatives to overcome inequalities and contradictions. “Bioregionalism” can help to concretize sustainable regions and to define the networks of components and contradictions such as capital and its trade-offs in these regions. Indeed, the "development contradiction" related to the “equality-environment contradiction” is actually also the problem of "degrowth" alternatives. It is crucial to prioritize the actual needs of people, commons, bioregions and local perspectives. This prioritization points to structural changes going beyond solving the “contradictions”. It can help to politicize conservation in planning concerning a more sustainable and just society. While relocalization, bioregionalism, and decentralization debates are immanently related to de-growth possibilities, the recent studies address the scale and governance of degrowth, conservation in planning and urban theory (Xue 2014).

Xue (2022) proposes a policy framework for planning, and examines the new role of planners in creating just and sustainable societies with ecological limits and possible requirements. Lamker and Dieckhoff (2022) delve into the potential change in the role of planners, particularly emphasizing the post-growth planning. Urban planners still interrogate the possibility of post-growth planning under the existing circumstances. Ruiz-Alejos and Prats (2022) discuss the possibility of de-growth alternatives criticizing the plans that are adapted to current green growth discourses. Focusing on the infinite ecology and more just societies, they emphasize the need of plans showing the potentialities towards degrowth transition to achieve sustainability programs. In a similar vein, while Otchere-Darko (2023) focuses on a new urban agenda and resilient practices for de-growth alternatives. Thus, a multi-scalar engagement of the policies and planning can scale up degrowth alternatives by repoliticizing the mainstream practices. Savini (2023) criticizes the concept of circular economy and call for a novel understanding of 'degrowth circularity'. The planning discipline can adopt a shift from the monetary value of waste to the value of the socio-environments, from existing production and consumption patterns to more collective responsibilities and bioregional thinking in waste disposal (Savini 2023). Similarly, the SDGs and resilience-oriented strategies must be reconstructed from a social justice, decolonization, and degrowth perspective due to their failure to incorporate indicators of socio-ecological complexities (Bocci 2022; Kraus 2021; Rammelt 2023). Despite that the strategies seem to address the structural transformation; they do not move beyond economic growth.

Opposing to 'growth'-dependent urban planning practices, Savini (2021) advocates for socio-ecological autonomy in regions as distinct from policies driven by regional competitiveness; defining standards and limits rather than promoting infinite urban development; and considering socio-ecological qualities rather than traditional land use. The author proposes instead reorienting planning towards the vision of 'degrowth' through a shift from 'functional polycentrism' to 'polycentric autonomism', from 'scarcity' to 'finity', and from 'Euclidean zoning' to 'habitability'.

Moreover, Savini (2024) recognises that both degrowth agendas and postgrowth strategies must transcend scales while addressing critical issues of overconsumption, distributive justice and the degradation of urban and planetary commons. As a transformative proposal, the Manifesto for a Post-Growth City advocates a consideration of urban spaces in terms of their social and reproductive values, rather than just rent. It prioritises ecological regeneration and aims to limit the ecological impact of land use

policies, housing and consumption. The manifesto also promotes the sharing of resources and services and attempts to decommodify housing. It calls for just access to food, health and education to be taken into account in design, planning and governance processes (Savini 2024). In line with planetary urbanisation, post-growth city researches and practices should include more concrete discussions about radical distribution of critical infrastructure and resources, water and food supply alternatives, and degrowth of carbon emissions. Also, post—growth planning should consider strategies on global and socio-ecological commons that affect urban metabolism, well-being and livability.

This ‘degrowth’ and ‘convival’ conservation recenter distribute wealth in a equal way in different scales. It is crucial to assess how degrowth can promote social equity, and be transformative at different scales. Different types of plans address the territorial organisation of an industrial area with its logistics and infrastructure, land-use decisions in response to deficiencies and risks in a water basin, and the physical and social infrastructure of a settlement. Planning decisions at one scale and geography are directly linked to consumption, material extraction and waste at another space and scale. Planning can provide the spatial organisation needed to re-establish a meaningful relationship with nature. Policies and spatial plans can promote self-sufficient food supply networks, decentralised alternatives for water supply, enhancement of community activities in line with 'actual' needs rather than extractive, carbon emitting activities. What are the actual needs of communities and ecology in bioregions and upper scales? What are the degrowth alternatives for the needs that are prioritised? Where will the 'limits' be set, which communities or actors will be affected by this degrowth? What are the possible impacts and risks of this intervention at different scales, such as city regions, extended urbanisation areas, water basins, food basins, oxygen reserve areas, inter-scale protected areas and global scale?

On the other hand, the Biodiversity Impact Chain is a valuable tool for defining complex socio-ecological networks and avoiding inequalities and environmental degradation being overlooked in planning processes. This analysis can be useful in defining both the 'working down' and 'working up' activities of existing practices, degrowth alternatives and post-growth policies at different scales and dimensions (Bischer et al. 2022). On the other hand, this analysis can enable the questioning and rethinking of both administrative and 'naturalised' boundaries that are accepted as inputs in planning practice. During the planning process, it is possible to identify and address inequalities that arise not only in protected areas or bioregions but also in 'commons',

agricultural lands, or urban reproduction areas. Re-evaluating decisions in this direction can enable planning to go beyond current conditions and limitations. Practices that threaten and prioritise liveability through factors such as urban heat islands, flooding, carbon emissions and water pollution must also be addressed. Although “Global Safety Network” model portrays 'spatial boundaries' that are problematised by radical conservation, it can be a starting point for rethinking the boundaries, scale and connectivity of protected areas and ecologically significant areas, particularly for planning discipline. It can provide intermediate scales for the mapping of the inequalities and vulnerabilities, and integrating biodiversity impact networks into planning practices.

Protected areas are significant spatial units that include different profits, inequalities and power unbalance as Büscher et al. (2022) express. Besides, the areas serve an opportunity to expose inequalities in different scales with assessing networks. The whole process of community-based management or governance in conservation areas resemble in communicative planning process. According to some critiques of communicative planning, planners’ scientific knowledge is ignored. Negotiation of the groups can result in undesirable results such as rapid growth or environmental degradation. Another problem is about neglecting different power relations even consolidating these power relations and inequalities in the groups (Fanstein 2005; Purcell 2009). Besides these limits, the listening and observing can be useful to assess power relations in society during the planning process as Forester (1999) mentions. Distinctly, the scientific knowledge is used as a convincing mechanism or produced through a specific aim for example ‘carbon sequestration’ in a specific boundary of a forest in community-based management or valuation of ecosystem services programs. Repoliticization of scientists, planners, and institutions is necessary to undermine post-political bias and the neoliberal policies and accompanying illusion of participation, justice and freedom (Blühdorn and Deflorian 2021). Biodiversity Impact Chain analysis is important to decide ‘working up’ and working-down’ activities, where and why? The process provide to exposed to detect beneficiary and disadvantaged groups or actors in larger scale. Analysis of economic activities and value chain is fundamental to decide the major responsible of environmental degradation (Büscher et al. 2022, 246 - 258). It is a challenge because of the complexity of economy or lack of data, however, some version and options can be applied like actor – use analysis by classifying them (Büscher and Fletcher 2020, 182).

CHAPTER 3

RETHINKING ‘CONSERVATION’ IN TURKEY

3.1. Differentiated EU and Turkish context

As asserted by Büscher et al. (2022), the ‘new’ paradigm of conservation practices is becoming increasingly problematic, particularly in third-world countries, where it is driving the implementation of authoritarian governance practices. The Global South has been adversely impacted by both conservation and land grabbing practices, which have resulted in displacement, "green" violence, socio-environmental inequities, and injustice. In areas designated for the implementation of the REDD program, conservation measures are being undertaken concurrently. The countries situated at the periphery of Europe and Turkey, which are involved in the process, have experienced it in different ways. In this context, there has been a notable intensification of centralization and rescaling processes, particularly in the post-2007/2008 crises period. Forests, agricultural lands, and waters have been subjected to significant destruction, even within the boundaries of Natura 2000 sites, in the name of economic development. Nevertheless, this has primarily originated from decisions made by the EU as an international institution. The implementation of environmentally destructive policies at the regional level has resulted in environmental injustice and the exacerbation of existing inequalities in EU. In Turkey, the legislative and regulatory framework governing environmental restrictions and approvals on natural areas has been subject to frequent re-regulation in the pursuit of profit. This has led to the transfer of authority to a single institution. It is evident that common lands, particularly agricultural lands, forests, and waters, have been appropriated for profitable activities, including mining, tourism, and large-scale energy investments, rather than for "greener" economic activities.

As a new, current monetary valuation of ecosystem services, it is possible to identify certain practices that could be considered "cultural ecosystem services" in some Natura 2000 sites and, more generally, "regulatory ecosystem services" in Turkey. The inefficiency of conservation practices in Natura 2000 sites has been the subject of

criticism on the grounds of a lack of governance, a lack of scientific basis for the designation of the sites, a lack of conservation history and government capacity for it, top-down policies and decisions, and a lack of communication between institutions (Apostolopoulou et al. 2009). Another criticism is that some researchers have portrayed conservation policies and practices as a "romantic" view, without considering the local economy. The aforementioned unsuccessful practices can be evaluated in light of the prevailing regional inequalities, the economic crisis and its concomitant impact on environmental goals, the misguided "conservation" policies and the lax environmental regulations. Furthermore, even in ecosystems that are particularly vulnerable to degradation, such as the Natura 2000 protection sites in the Aegean Islands, there has been an increase in the extraction of raw minerals and the development of renewable energy sources (Apostolopolou and Adams 2015; Siamanta and Dunlap 2019; Busso et. al. 2012).

It is inappropriate to apply the term ‘indigenous’ for the people of Turkey and the EU, as this is a concept that differs from the general neoliberal conservation literature. Nevertheless, there are ethnic or cultural minorities in Turkey, including the Yörük and Kurdish people. In addition, the discourse surrounding neoliberal conservation is shaped by the actions of firms or investors, as well as the state and local communities who have historically benefited from the exploitation of common resources. Those engaged in rural livelihoods, including forest villagers, farmers, shepherds, and beekeepers, derive their income from the commons through the utilisation of common property rights or what might be termed 'de facto' rights. In Turkey, there is currently less involvement from global actors in the economy of ecotourism and ecosystem services than is observed in Global South countries, which are frequently discussed in neoliberal conservation literature. The actors are typically large firms collaborated with state institutions, tourism investors, secondary homeowners, small-family businesses, and villagers who derive their livelihood from agricultural practices in rural areas in Turkey similar to EU. The quality of life for local residents has deteriorated as a result of the enclosure or destruction of their livelihood sources, including tourism, agriculture, beekeeping, and husbandry at the periphery of the EU. As a consequence of these developments, small-scale family businesses have been compelled to cease operations due to an increase in environmental degradation (Milanokis et al.2022, 8).

As the number of Natura 2000 sites increases, green and destructive economic activities, including gold mining, continue to be permitted and pursued in forests, areas,

and countries that are vulnerable in terms of surface and groundwater availability. The implementation of new green growth policies has not resulted in environmental benefits or positive outcomes for the majority of citizens in some EU member states or Turkey. Conversely, these policies have created new opportunities for large companies and foreign investors, providing them with new sectors and spaces in which to invest and profit. The privatization of land and the influx of foreign investment have resulted in the practice of land grabbing, which can be classified as either "green" or "ungreen." This has led to an unequal redistribution of wealth, as well as uneven development between regions and social classes. Inequalities between the EU's northern and southern regions, along with regional disparities across Europe, persist (Apostolopoulou and Adams 2015; Farmaki et al. 2021; Lekasis and Kousis 2013; Milanokis et al. 2022).

It is not feasible to conclude the SDG or EU goals related to the "green deal" due to the prioritization of economic growth for both Turkey and the peripheral countries of the EU, particularly in the aftermath of 2010. Following the long-term economic crisis, the implementation of accelerated regulatory frameworks from 2010 onwards has facilitated the proliferation of destructive economic activities, including mass tourism, real estate development, large-scale infrastructure and transportation projects, and material extraction. These activities have been complemented by investments in renewable energy sources, such as wind energy, photovoltaic, geothermal, and hydropower, in the periphery of the EU. The relaxation of policies, coupled with tax reductions, prompted an influx of investment into more speedy and lucrative sectors. Conversely, the endorsement of the utilisation of the 'green fund' for other public necessities has resulted in the exploitation of mining for fossil fuels. The economic crisis and subsequent increase in taxes on fossil fuels have led to a rise in illegal mining activities, driven by the need for heating and electricity (Lekasis and Kousis 2013). In this manner, the process is regarded as a continuous primitive accumulation rather than a "green growth" through the extension of privatization and foreign investment (Milanokis et al. 2022, 6-7). Besides the decrease of the carbon emission, also decreased of GDP have been observed, recent studies show that it is not the effect of the environmental policies, it is an effect of the economic crisis indeed (Lekasis and Kousis 2013; Farmaki et al. 2021; Janikowska and Kulczycka 2021).

All of these developments conflict with the European Union's "green transition" and "green growth" policies, as well as conservation measures such as the designation of Natura 2000 sites and key directives, including the European Water Framework Directive

(2000/60/EC), the Environmental Impact Assessment Directive (2011/92/EU), and the Restriction of Hazardous Substances Directive (2011/65/EU). Moreover, countries situated at the periphery of the EU are distant from the objectives set forth by the Water Framework Directive, largely due to a deficiency in data, poor water quality and quantity conditions, and an inadequate capacity to develop river basin management plans for each stream. In a recent study, Farmaki et al. (2021) have highlighted the inconvenience of the EU Water Framework Directive through the proposal of hydropower in fragile Mediterranean basins. Indeed, there are more favorable regions in the EU with regard to water quantity and technology. Additionally, it is notable that 'green mining' activities have been conducted especially in Greece. Conversely, it is evident that mining operations, particularly those involving gold, have adverse socio-environmental consequences, even when they are conducted in a controlled manner. These include deforestation, a relatively negative impact on water quality and contamination, environmental pollution, a decline in the quality of life for local residents, public health concerns, and a loss of ecological value in the affected areas (EU Policy Department for Citizens' Rights and Constitutional Affairs Directorate-General for Internal Policies Report 2022).

In addition, the economic crisis, climate crisis, droughts, pandemics, and the necessity for independence and sovereignty in food and water supply have led to the emergence of degrowth practices within the EU. The concept of food sovereignty and security has motivated the emergence of degrowth alternatives in food production, including cooperative and self-governance-based agricultural practices in Germany (Spanier, Guerrero Lara and Feola 2023). Similarly, the need for water sovereignty has led to the development of water alternatives in Spain, a country with vulnerability to water scarcity. Once more, municipalities have sought alternative forms of decentralized water management with the objective of reducing external dependency (Dom`enech, March, and Saurí 2013). In the context of Global North cities, such as the Netherlands, degrowth practices have typically been discussed in the context of the "circular city," offering potential solutions to minimize life and consumption in urban areas. However, these have been combined with reformist discourses rather than radical ones (Calisto Friant et al. 2023).

More radical responses and initiatives to these crises are included post-growth planning debates and the resurgence of radical municipalism (Schmid 2023). A movement in Barcelona was constituted by the establishment of a common platform

because of the 2008/2009 economic crisis and the protests and square movements that emerged as a result of the politics of scarcity. In many cities, collective experiences in different areas are experienced with or without the aim of degrowth. Social networks and support networks are established, and different segments of society are involved in these initiatives and activities. During this experience in Spain, social housing has increased, numerous sanctions have been imposed to regulate the tourism industry and the property market, and a series of measures have been implemented to reduce carbon emissions in the city, particularly through interventions in transportation. In Greece, the Coalition of the Radical Left (SYRIZA) is a more nationally oriented political movement with roots in the Greek political system. A series of social welfare policies, including food banks, social kitchens, and social clinics; social housing; and rent subsidies were developed.

As conceptualized by Schmid (2023), there is a "scalar gap" between the national and high-scale post-growth policies and parties where these alternatives are discussed and the space/scale where they can be implemented and concretized. The most concrete space and scale at which these practices will be experienced, institutionalized, and "anchored" is the municipal scale. It may be for this reason that the Greek example does not yield such distinctive and radical results as the Barcelona example, and that we observe more concrete examples in Barcelona. On the other hand, the lack of strong social movement about environmental concerns and absence of critical NGOs seems to be a reason in some part of EU (Apostolopoulou et al. 2009).

Notably, the absence of effective governance and operational inefficiency of NGOs, despite their constructive criticism and strong advocacy for environmental protection, are challenges in Turkey. These efforts are often constrained by legal enforcement measures. Turkey's governmental institutions have been centralized, and the practice of deregulation and reregulation has been increased with the objective of releasing both sustainable and destructive economic activities in natural areas, including national parks, protected areas, and Special Environmental Protection Areas. The transition process is accelerating rapidly in accordance with international agreements for a shift towards a "green growth" strategy. As a result of changes to the status and classification of existing protected areas and the introduction of new regulations in Turkey, the management and permissions systems have become more flexible and centralized.

3.2. Green Growth rather than a 'Transition' in Turkey

In addition to the conceptual limitations of valuation of ecosystem services with regard to the success of environmental conservation and local welfare, Turkey's economic development strategies, regulated environmental legislation, and lack of governance present obstacles to the adoption of ecosystem services. Turkey's economic policies, which prioritize growth and lack adequate environmental regulations, impede the adoption of conservation paradigms such as 'green transition' or 'market-based conservation' (Adaman and Arsel 2010; Başak et al. 2022). In recent years, legislation and centralized decisions in protected and natural areas have permitted numerous activities, notably construction, energy production, and mining, which are likely to result in ecological degradation, property rights loss, and enclosure and appropriation of commons. Planning and conservation are conducted on the basis of economic priorities through centralized decision-making processes, and scientific reports and civil society participation have proven to have a limited impact on the outcome of these processes (Akay and Akgün 2014; Paker et al. 2013).

Turkey initially abstained from global environmental agreements and conferences, including the Kyoto Protocol and the Rio Conferences. However, following the enactment of Environmental Legislation in 1983, the country began to demonstrate a growing awareness of and engagement with environmental issues (Adaman and Arsel 2010). Turkey recently participated in the Rio +20 summit. Turhan and Gündoğan (2017) examine the "Claiming the Future Report," which outlines sustainable development goals in Turkey. As the article notes, the report indicates that the current legislative and institutional framework in Turkey, which is oriented towards economic development and competitiveness, presents a significant challenge to the concept of sustainability. Turkey's pursuit of an "un-green" development policy is driven by its ambition to become an "energy hub" (Dombey 2014; Turhana and Gündoğan 2017, 285). Erensü (2017) asserts that certain legislative measures, such as the Urgent Expropriation law (no.2942), have been employed to facilitate the acquisition of land for energy-related investments. The authorities of protected areas and special environmental protection regions are centralized, and the legislation is not aligned with conservation objectives. Instead, it is reoriented towards facilitating the development of green energy sources, alongside investments in energy and mining. Balaban (2016) posits that institutions have been

privatized since the 1980s through neoliberal restructuring in an effort to overcome economic crises. Moreover, legal regulations that facilitate the expansion of the construction, mining, and energy sectors have been in conflict with environmental protection policies. Since the year 2000, the provision of public land and the expropriation of private land have increased in order to meet the demand for land for large-scale housing and infrastructure projects, especially urban transformation projects and renewable energy investments (Balaban 2016; Erensü 2017). Moreover, environmental and planning laws and regulations have been amended and refined to facilitate the approval and implementation of projects and activities.

Notwithstanding the existence of competing national objectives, policy frameworks, or centralized implementation processes, it is imperative for Turkey to align with the EU Green Deal and net zero carbon targets in order to maintain foreign trade and exports. The European Union is implementing carbon taxation on imported products from countries that have not implemented carbon regulations at the border to prevent carbon leakage. The legislation will have a significant impact on a number of key industries, including aluminum, cement, steel, fertilizer, and energy. It will result in increased tax burdens and obligations to comply with environmental policies for Turkey (Mirici and Berberoğlu 2022). Currently, the growth targets are supported with additional objectives, including the promotion of a green transformation of industry, the advancement of blue growth, and the revitalization of the recycling economy.

As indicated in the National Energy Plan 2053, projections indicate a decline in energy production based on coal and oil to 9.2%, a reduction in natural gas to 11.7%, and an increase in nuclear energy production to 29.3%. Moreover, it is anticipated that renewable energy sources will constitute over 50% of total energy production (Republic of Turkey Ministry of Trade 2022). Nevertheless, this reduction in the proportion of energy production from fossil fuels does not signify a decline in overall energy production. Over the past decade, there has been a notable acceleration in large-scale infrastructure investments, including thermal power plants and natural gas, in addition to unlicensed energy production. Consequently, the number of instances where an Environmental Impact Assessment (EIA) was not required has increased (Republic of Turkey Ministry of Environment, Urbanization and Climate Change 2023). From 1993 to 2022, a total of 73,210 decisions were made, with the majority falling within the "EIA not required" category, followed by "EIA positive" decisions, which constituted 6,926 cases, and only 67 in the "EIA negative" category. It is noteworthy that approximately

48% of the "EIA not required" decisions were specifically related to oil and mining. In the case of "EIA positive" decisions, 29% were related to petroleum and mining, and 22% were related to the energy sector. In 2005, the number of "EIA positive" decisions surpassed 100 for the first time, reaching a maximum of 296 in 2012. The following year, the average exceeded 400. In 2022, the number reached 464 (Republic of Turkey Ministry of Environment, Urbanization and Climate 2023). The proportion of thermal capacity installed declined from 49.98% to 49.71% over the course of a year, while the proportion of "licensed" renewable energy generation increased from 50.02% to 50.29%. Including those plants that are not licensed, the total installed capacity ratio at the end of 2022 is 46.05% for thermal and 53.95% for renewable energy sources (EPDK 2022). In a final act, the Electricity Market License Regulation of 2020 has set forth the terms defining both a 'Combined Renewable Electricity Generation Facility' and an 'Auxiliary Resource'. The objective of this regulation is to enhance the capacity and encourage the implementation of electricity generation initiatives utilising auxiliary resources within the licensed power generation regions.

The process of depoliticization occurs through the utilization of discourses pertaining to the "green" economy in environmental policies, in natural areas, in protected areas, or in special environmental protected regions. As demonstrated by Çavuşoğlu (2016) in the context of disaster and urban transformation policies, economic growth in Turkey is at times achieved through the implementation of legislative measures and coercive tactics, while it is facilitated by the provision of loans, incentives, and the promotion of a discourse of development at other times. Similarly, in pursuit of energy security and independence, designated areas for energy investment include natural and agricultural landscapes as well as protected areas, facilitating the development of thermal and nuclear power plants in addition to renewable energy sources (Turhan and Gündoğan 2017). In legal and regulatory matters, the term "public interest" is frequently invoked to justify actions such as the degradation of protected natural areas, the prohibition of agriculture and livestock farming in these areas, and the prevention of communities in these areas from sustaining livelihoods (Turhan and Gündoğan, 2017).

While Turkey has effectively transformed conservation paradigms, such as the ‘green transition’ into persuasion mechanisms and utilized them as opportunities, it is obliged, for economic and political reasons, to comply with recently introduced environmental protection policies, including those pertaining to the prevention of "carbon leakage" (EU Regulation No 2018/841). In addition to conservation policies, directives

aimed at the protection of biodiversity, such as the EU Habitats Directive (92/43/EEC), and the enhancement of water resources, including the EU Water Framework Directive (2000/60/EC), play a critical role. These policies could serve as mechanisms to constrain Turkey's growth aspirations and, at the very least, mitigate threats to conservation-critical areas directly connected to important biodiversity hotspots, as well as upstream forests critical for urban flood prevention and drinking water supply. This could assist in the prioritization and enhancement of local alternatives, thereby countering the increasing tendency towards centralized management and decision-making in Turkey. To achieve this, it is essential to comprehend the constraints of such approaches and to "politicize" them.

3.3. ‘New’ Conservation Attempts

In Turkey, in alignment with the EU Water Framework Directive (2000/60/EC) and its associated directives, such as the Environmental Quality Standards Directive (2008/105/EC), Floods Directive (2007/60/EC), Groundwater Directive (Directive 2006/118/EC), Nitrates Directive (91/676/EEC) a series of regulatory measures have been adopted to achieve harmonization. These include the Flood and Sediment Control Regulation, Surface Water Quality Management Regulation, and the Regulation on the Protection of Wetlands, Regulation on the Protection of Water Against Agricultural Nitrate Pollution (See Appendix A). These directives and their national adaptations have also facilitated the enactment of regulations aimed at protecting wetlands, forest ecosystem services, and aquatic organisms linked to water resources. The scope of these regulations encompasses water quality monitoring, improvement of water availability, investigation of water contamination, development of basin-based plans, and the implementation of measures for flood control and urban wastewater treatment. In particular, the development of basin-scale plans has become a critical requirement, ensuring that water management strategies are designed and implemented within the geographic boundaries of designated basins. Notwithstanding the legally binding nature of basin plans, even at the highest levels of planning, the protection of water resources remains inadequate due to the inability to make sufficient decisions or integrate these decisions into the spatial planning stage.

Historically, there have been regulations in place governing the protection, allocation, ownership, and management of waters such as the Law on Waters (no. 831) published in 1926, and the Law on Groundwater (167) published in 1960. According to the law, groundwater is a shared resource and that measures have been implemented to prevent its excessive exploitation. These include the designation of groundwater as a state-owned resource and the establishment of the right of neighboring use. Even if a well is drilled, the property owner is permitted to utilize it to the extent required. Furthermore, the DSI is granted permits and authorizations, including those pertaining to water allocations, well drilling, and operation. The current water law is inadequate in several respects. It fails to adequately address the shortcomings of the existing system, which is marked by bureaucratic challenges inherent in the management (allocation) of water resources. Furthermore, the allocation process is unclear, particularly in the context of climate crises and future water scarcity. A new draft proposal for a Water Law has been under consideration since 2012. The proposed Water Law defines water as an both economic and ecological resource, recognizing it as a commodity and delineating between general and special water.

The draft is discussed with a series of objectives related to the conservation of water quantity, the improvement of water quality, the prevention of flooding, the resolution of irrigation-related problems, and the realization of these objectives under conditions of potential drought. Additionally, there are concerns regarding the use and recycling of wastewater, the feasibility of sea water intakes, and numerous other matters that require further investigation. These issues necessitate a comprehensive, basin-based strategy that extends beyond the conventional approaches of water allocation, institutional authority, and penalty regulations. Civil society organizations are endeavoring to incorporate a multitude of proposals, including those pertaining to holistic basin protection and basin-based planning, into the law. From a legal standpoint, the quality of water resources, drinking water, geothermal waters, and their extraction, as well as wastewater management, are subject to the purview of different institutions and legislation. A considerable number of institutions and studies have indicated that this situation gives rise to confusion regarding the respective authorities and presents practical challenges (TEMA 2014; TUSIAD 2013).

The revision proposal for the draft legislation put forth by trade-oriented institutions is designed to safeguard the interests of capital. For example, the definition proposals include terms such as "geothermal water source," "full cost principle," and

"beneficiary." Despite the absence of any mention of packaged water production in the legislation, the term is deliberately included in the relevant articles. In addition to interpretations based on the cost of water allocations or previously acquired rights, it is stated that legal entities should be prioritized and their strategic importance should be taken into consideration in water utilization and use (TUSIAD 2013). Conversely, professional chambers such and non-governmental organizations must fundamentally alter their perspective on water. Despite the institutions' assertion that the draft law does not mention the "right to water" and that environmental and ecological law proposals should be presented as supplementary to this law, the discrepancy in these definitions will in fact result in significant structural change proposals that will guarantee the equitable utilization of water and respect for the non-human environment in which it exists (TEMA 2014; TMOBB 2013).

The pivotal question is that of the manner in which water allocations will be made and by whom. Indeed, the reduction of water allocations in terms of years to rethink the prioritization of allocation according to conditions is a positive step towards evaluating the sustainability of water resources by years. The designation of water as a 'common' in the context of the draft may facilitate the implementation of integrated basin-based approaches to water governance at the planning stage, through the process of sectoral allocation, and in resolving water-related challenges.

The process of adopting “river basin management” to planning began with the aim of aligning development plans with EU harmonization efforts. Since 2000, the focus shifted towards adhering to the EU WFD (Topçu Mumlu 2023). This directive is significant as it prioritizes basin-based water management and attempt to overcome governance issues by creating cross-border river basin plans. Also, it attempts to consider the societal and environmental value of water rather than just its economic value. However, it lacks a broader scope beyond "impacts" and "measures” and follows the “polluter pays” principle. The policy proposal is crucial for comparing the situation without any changes and future scenarios, as well as for implementing measures to recycle and improve water quality (Kibaroğlu et al. 2006; Topçu Mumlu 2023). Issues of 'new inequalities' and 'power relations' in participation processes were not considered in the model, as mentioned above. Rather than implementing a structural solution, the system endures by reducing current threats to water quality while maintaining economic growth. However, as investigated by Kibaroğlu et al. (2006), as in the case of Spain, which has similar institutional structure and geography with Turkey, centralization

processes may be impeded through the policies. Nonetheless, it can offer advantages such as achieving more transparent governance processes, fostering inter-institutional cooperation, clearly defining job responsibilities, and regulating water allocations among sectors.

Turkey's objective is to incorporate these understandings into its agenda through initiatives such as the introduction of ecosystem services or integrated forest management projects collaborated with NGOs and global institutions like FAO, and the enactment of 'Regulation on Ecosystem-based Functional Forest Management Plan' in 2008. This is in order to ensure compliance with EU directives. Conversely, there has been no progress made with regard to the draft law on Nature and Biodiversity, which has been in preparation since 2002, with the exception of the revision made in 2021 (Appendix A).

Conservation practices such as 'payments for ecosystem services' are not yet established. Because of the priority goals of 'economic competitiveness' and limits of legislation in Turkey, the practices of ecosystem services and community-based programs are very limited in 'urban scale' or partial technical solutions, or cultural ecosystems. Some designated protected areas like National Parks, Special Environment Protection Zone and Biosphere Reserve Areas have included in ecosystem services. For example, there is some project about economic valuation of Special Environment Protection Zone for Foça, Gökova and Ayvalık by UN. Also, there are some initial projects in protected forest areas based on timber production and ecotourism in East Mediterranean Forests, and ecosystem services for agricultural industry in Southern Anatolia Project by UN. The attempts clearly show the possibility of economical valuation of the areas by instrumentalization of conservation. However, as previously mentioned the projects have limited economic based strategies like forests are evaluated according to drinking and bathing water supply for agriculture and livestock, recreation and tourism.

'Regulatory' ecosystem service practices are a priority in Turkey, accompanied by scientific research that concentrates on the effects of rapid and intensive land-use change on ecosystems and biodiversity (Başak et al. 2022, 20-22). Economic valuation of protected areas as payment for ecosystem services proposals, which are just emerging in Turkey, constrain certain local economic activities, including grazing and logging, while proposing the development of ecotourism or recreational areas to increase visitor numbers (Başak and Bann 2011; 2013; Balkız 2016). International organizations advocate the involvement of local people, especially female villagers, in biodiversity and forest conservation initiatives. They also caution that Turkish forest dwellers have significant

employment opportunities and that sustaining local economies should not be neglected (World Bank Group 2017). In addition, the literature addresses the funding of conservation projects using carbon offsetting, the involvement of organizations and companies in the management of these areas for economic benefits from local biodiversity, and the resulting trade-offs.

Ecosystem services projects in Turkey are based on calculation of economic benefit of protected areas or green park or calculation of monetary value of the areas to evaluate the areas ecosystem service area. Foça Special Environment Protection Region and Ayvalık Adaları Natural Park have already a report of the United Nations Development Program and with the support of the Global Environment Facility (GEF) in terms of economic valuation of the protected areas. In these reports, calculations and strategies to contribute the areas into global market are expressed like economic valuation of Posidonia sea grasses in blue carbon market or potential tourism venues. The reports suggest 'biodiversity offsets' with implementing some tax exemptions in exchange for rehabilitation or forestation. Another example is the report on the socio-economic assessment of the Düzlerçamı forest, which was prepared in collaboration with organisations such as FAO. The study compared the monetary value of biodiversity and carbon stocks generated by recreational spaces established to promote conservation efforts with activities such as timber production, and analysed the resulting economic returns (Balkız 2016). However, these calculations did not take into account the impact of local people's animal husbandry activities.

In the project named as 'Mapping of Ecosystem Services in Mediterranean Forests', done by Nature Conservation Centre and Forestry Operation Directorate, monetary value of a forestland in Muğla region was calculated. It was found that economic valuation of carbon emission stock is higher than timber production. Monitoring regulation of water flow in terms of flooding and soil erosion, defining tourism potential areas studies were done. Furthermore, the Nature Conservation Centre and the Forest Management Directorate executed the "Mediterranean Integrated Forest Management Project", which is highly comprehensive. The project sought to explore the economic value of protected areas through examining the relationship between forest areas and the local economy rather than simply identifying potential tourism areas. The research was conducted to monitor the flow of water to prevent flooding and soil erosion, to simulate water retention for the provision of drinking water, and to map significant vegetation coverage for grazing purposes. Although strategies promoting tourism and

recreational activities are generally advantageous to economic elites rather than the local inhabitants of the region, it is important to consider that forests serve as vital carbon sequestration areas and water catchment basins. Consequently, protection in these areas have benefits at local and urban scales (Pamukçu - Albers, Lise and Balkız 2019).

In contrast to technical problems, there is problems about the effectiveness and missing of ‘governance’ and reappropriation of resources by excluding local practices. The administrative authorities in protected areas have been centralized and restructured through legal amendments. The powers granted to central institutions, the Ministry of Environment, Urbanization and Climate Change after 2011 and Presidency after 2018. In addition, the granting of new legal and administrative ‘powers’ to central institutions in protected areas accelerates planning, project and approval processes. The practices of PES or REDD+ projects are directly related to the involvement of private actors, NGOs and civil society in market-based nature conservation. Lack of or inefficient participation of all actors may be possible in different countries because of the political environment. "Environmental fix 4" as defined by Castree (2008), which is related to "hollowing out" the state and come in sight of "flanking mechanisms" as a pursuit mechanism. However, in Turkey, this practice entails the centralization of decision-making practices and the participation of CSOs 'only on paper' (Tansel 2018, Paker et al. 2013).

Especially after 2010, Turkey experienced an authoritarian turn through centralized decision-making processes, regulation and deregulation of laws, and intervention in media and organizations through the strategic interests of the ruling party (Tansel 2018). These re-centralization practices have been accompanied by strict re-regulations for the enclosure of natural areas, even expropriation of private lands. Therefore, in this political environment, the discourses of "participation", "democratic decision" or "involvement of civil society" cannot be experienced as flanking mechanisms. Only local protests and more centralized decisions have come to the fore in Turkey. For example, Paker et al. (2013) explore the participation of civil society organizations in environmental legislation in Turkey. The authors found that CSOs can contribute to the decision-making process by holding workshops, conferences, etc. They can express their opinions, but their opinions are not adopted in environmental policies or decisions. The function of the organizations is limited to preparing some scientific reports on environmental issues and conflicts, but these works or reports cannot be included in any process of legislation.

On the other hand, any PES or global funding scheme cannot be proposed because of the lack of legislation about it and inconvenient ‘sustainability’ goals of Turkey such a type of programs (Bann and Başak 2011;2013). Hence, the projects are far from the aim of ecosystem services as ‘halt environmental degradation’ or ‘reduction of poverty’ because of both conceptual limitations and practical limitations in Turkey. The project report suggests specific plan strategies, however, Forest Law (no. 6831) is approved even ‘unsustainable’ or ‘ungreen’ practices like mineral extraction in forests indeed. The legislation of National Parks and Special Environmental Protection Zones, remains inadequate for the conservation of these areas. Serter (2020) reports that 'recreational' activities carried out in protected areas in recent years have caused disturbance to their natural state, without such practices being carried out in a way that preserves their natural character. In addition, activities with the potential to cause substantial damage to the environment, such as mining, large-scale construction and energy production, are continuing without restrictions in or around protected areas.

3.4. Conservation and Planning in Turkey

In Turkey, designated environmental protection areas are classified according to the IUCN classification system (Table 1). Environmental plans are typically delineated according to economic regions and administrative boundaries. The boundaries of protected areas are incorporated as a given "spatial" input. In the case of the remaining areas, decisions are made with regard to the location of future development. National parks are regarded as areas of absolute protection, and may be designated as urban green spaces or recreational zones in accordance with the IUCN's stated objectives, as “the primary objective is the conservation of an ecosystem and the preservation of large-scale ecological processes, encompassing ecological, recreational and social values”. In contrast, Special Environmental Protection Areas (SEPA) can be planned according to the parameters and sensitive zones defined by scientific research.

The legislation on protected areas and planning of areas in Turkey, such as the Regulation on Plans to be Made in Protected Areas, cannot avoid key driver investments in terms of environmental degradation, while the National Park Law (no.2873) has relatively strict safeguards, and where necessary, tourism investments or mineral

exploration can be approved by presidential decree. In fact, the laws and regulations have been re-regulated to open the areas for mining and energy production besides "greener" economic activities such as ecotourism. Protected areas have been transformed into recreational areas such as "recreation areas" or "national gardens", and in some places into reserve areas for "green" economic activities such as ecotourism and "renewable energy" investments.

The number of areas designated as protected areas, especially national parks, has increased, but the categories of these areas have been changed and their protection status lowered (Serter 2020). The institutions stated that the natural protected areas increased from 2,450 to 2,572 according to "ecologically based scientific research" and increased by 113,872 hectares in one year, between 2018-2019 (Republic of Turkey Ministry of Environment, Urbanization and Climate 2023). Serter (2020) has shown that although the number of protected areas increased between 2002 and 2010, the same assessment cannot be made qualitatively. Similarly, the announcement of large protected areas has increased as "Karaburun-Ildır Bay", "Marmara Islands", and "Salda Lake" have been announced as "Special Environmental Protection Areas" by presidential decree after 2019.

However, energy and infrastructure investment projects in these regions are continuing at a rapid pace. The natural gas transportation and loading port project around Saros Bay, which is proposed and under construction between 2020-2022, the "Nation Garden", which started construction immediately after the declaration of Lake Salda in 2019, and the "Combined Renewable Energy Power Generation Facility" and "Auxiliary Source" solar power plant proposals and "Positive EIA Decisions" on the applications, which increased within the energy production license areas after the declaration of Karaburun - Ildır Bay in 2019, are some of them.

There are many protected natural areas in Turkey, but most of them are small areas. On the other hand, the classification of the protected natural areas has been changed and the permissions in the areas have been extended by laws. Lastly, with new Protection and Use Conditions of Natural Protected Areas Principle Decisions allow activities such as the cultivation of medicinal and aromatic plants, aquaculture, and renewable energy investments such as wind and solar power plants and the installation of various infrastructure in "qualified natural protection areas," which were previously equivalent to 2nd degree natural protection areas, up to a certain capacity. The capacity of these energy investments is not limited in "sustainable conservation and controlled use areas", which were previously equivalent to 3rd degree natural protected areas.

Table 1. IUCN Categories and Classification of Protected Areas in Turkey (Source: Produced from IUCN 1994; Ministry of Agriculture and Forest Official Website 2024)

Conservation Classification Types in Turkey	Sub-classificaiton	IUCN Definition
Ia Strict Nature Reserve:	1st degree Natural Protection Area / Sensitive Areas in Absolute Protection	Category Ia are strictly protected areas set aside to protect biodiversity and also possibly geological/geomorphical features, where human visitation, use and impacts are strictly controlled and limited to ensure protection of the conservation values. Such protected areas can serve as indispensable reference areas for scientific research and monitoring
	Nature Conservation Area	
	Protection Forests	
	Gene Conservation Forests	
Ib Wilderness Area:	2nd degree Natural Protection Area / Qualified Natural Protection Areas	Category Ib protected areas are usually large unmodified or slightly modified areas, retaining their natural character and influence without permanent or significant human habitation, which are protected and managed so as to preserve their natural condition.
	Wildlife Conservation Area	
II National Park		Category II protected areas are large natural or near natural areas set aside to protect large-scale ecological processes, along with the complement of species and ecosystems characteristic of the area, which also provide a foundation for environmentally and culturally compatible, spiritual, scientific, educational, recreational, and visitor opportunities.
III Natural Monument or Feature:	Natural Monument	Category III protected areas are set aside to protect a specific natural monument, which can be a landform, sea mount, submarine cavern, geological feature such as a cave or even a living feature such as an ancient grove. They are generally quite small protected areas and often have high visitor value.
	Natural Assets	
IV Habitat/Species Management Area:	Wildlife Improvement Area	Category IV protected areas aim to protect particular species or habitats and management reflects this priority. Many Category IV protected areas will need regular, active interventions to address the requirements of particular species or to maintain habitats, but this is not a requirement of the category.
	Sub-reigons of Protected Areas	
V Protected Landscape/ Seascape:	Natura Park	A protected area where the interaction of people and nature over time has produced an area of distinct character with significant, ecological, biological, cultural and scenic value: and where safeguarding the integrity of this interaction is vital to protecting and sustaining the area and its associated nature conservation and other values.
	Urban Park	
VI Protected area with sustainable use of natural resources:	2nd - 3rd degree Natural Protection area / Sustainable Protection and Controlled Usage Areas	Category VI protected areas conserve ecosystems and habitats together with associated cultural values and traditional natural resource management systems. They are generally large, with most of the area in a natural condition, where a proportion is under sustainable natural resource management and where low-level non-industrial use of natural resources compatible with nature conservation is seen as one of the main aims of the area.
	Wetland areas (Ramsar/ National Importance/ Local Importance & Other)	
	Special Environement Protection Areas	
	Seed Orchard	
	Seed Stands	

The relevant amendment article stated that the construction of hydroelectric power plants could also be allowed in these areas, but as a result of lawsuits filed, this phrase was removed by a decision of the Council of State. TMOBB continues to object especially to the areas whose protection status has been changed and whose registration with new classes has been completed (TMOBB 2018; 2023).

In the case of large conservation areas, such as national parks and special environmental protection regions, plans are prepared that encompass both spatial decisions and "restrictive" guidelines. A long-term development plan is formulated with the objective of determining and shaping recreational activities in national parks (Table 2). The decision-making process entails the spatial organization of the protected areas, as well as the arrangement of entrances, exits, activities, and other pertinent elements. In contrast, SEPAs encompass not only natural areas but also urban settlements and industrial activities. In some cases, boundaries of the regions extend into marine areas. The preparation of management and master plans for SEPAs are based on the results of terrestrial and marine biodiversity surveys. These surveys are used to determine the location of sensitive areas and prohibited activities within the region. While the master plans attempt to address the interrelationship between ecosystems and urban areas within the confines of pre-defined protected areas, they have the potential to bridge the divide between conservation and urbanization. Furthermore, the plans possess the authority to restrict certain industrial, mining, and energy production activities that have resulted in environmental degradation. They also have the capacity to intervene in land-use decisions and regulate the density of development. However, the total capacities for tourism, commercial activities, and industrial production are not included in the plans in current practice. Areas that are to be protected for their ecological importance or sensitivity are identified and zoned. Conversely, related legislation allows many activities to be carried out in these areas without a permit or comprehensive assessment. Without specific planning notes in the areas, there are no restrictions on activities.

Table 2. Planning Categories Related to Conservation in Turkey

Focus	Category	Boundary/Scale	Zoning (for Protection)
Water Resources	River Basin Management/Protection Action Plan	River Basin	Protection and Buffer Zones, Risk Areas, Sensitive Areas
	River Basin Master Plan	River Basin	Protection and Buffer Zones, Risk Areas, Sensitive Areas
	Lake/Dam Basin Special Protection Plan	Water Catchment Basin	Absolute Protection Zone/ Buffer zones (based on distance)
	Drinking/Irrigation Water Protection Plan	Water Catchment Basin	Absolute Protection Zone/ Buffer zones (based on distance)
	Flood/Drought Management Plan	River Basin	Risk Areas
	Wastewater Management Plan	River Basin	Risk Areas
	Sustainable and Integrated Water Resources Management Project	River Basin	Not yet in practice (potential to make conservation decisions at multiple scales)
	Water Allocation Plan	River Basin	Sector based decisions
Forest	Integrated Forest Management Project	Forest Boundaries	Not yet in practice (potential to make conservation decisions at multiple scales)
	Forest Management Plan	Forest Boundaries	Tree species/ Risk areas
Biodiversity	Special Environmental Protection Region Management Plan	Conservation Decree Boundary	Sensitive Zones/ Protected Areas
	Special Environmental Protection Region Master Plan	Conservation Decree Boundary	Sensitive Zones/ Protected Areas
	Long Term Development Plan	National Park Boundary	Not yet in practice
	Ecosystem-based Forest Management Plan	National Park Boundary/ Forests	Ecosytem services areas (for national park only ecological and socio-cultural functions)
Coastals	Integrated Coastal Plan	Coasts/ Coastal Settlement Boundaries	Protected Areas
Protected Plains	Special Project Area	Specially Defined Areas (e.g. Agricultural Lands/Plains)	Special Zonnig
Urban Commons	Environmental Plan	Economic Regions/Administrative Boundaries	Protected Areas / Decided Areas to Protect
	Master Plan	Administirative Boundaries	Protected Areas / Decided Areas to Protect

Forest management plans are developed for specific forest areas with the objective of classifying, identifying the species and age of tree communities within a given region, and determining the most appropriate areas and capacity for logging. The plan also determines the extent to which grazing and other uses by forest villagers are permitted. In recent years, there has been a proliferation of project studies for "Integrated Forest Management Plans" and “Ecosystem Based Functional Forest Management Plans” in national parks and forest area around conservation areas (Table 2). These plans represent a relatively recent and comprehensive approach to the protection of ecosystem service areas. They have the potential to facilitate the integration of forest conservation with urban settlements, agricultural activities, and water supply. Nevertheless, the impact of land use policies and the conservation of related ecosystems is overlooked or constrained.

Water resources, including drinking water, dams, and wetlands, are protected by their catchment areas, absolute, short, medium and long-distance protection zones, or buffer zones established by law (Table 2). River basin management and action plans are developed at various levels. River basins have the potential to consider ecological cycles most effectively through their boundaries. Comprehensive research reports exist on basin protection plans in Turkey. These reports address the analysis and issues concerning sectoral water use, point source and diffuse pollution, groundwater and surface water

protection threshold analysis, infrastructure deficiencies, institutional and implementation incapacities and gaps. However, the management and action plans for the protection of river basins have only limited and partial decisions on wastewater and solid waste management, such as recycling, prevention of pollution around rivers, unplanned industrial facilities, regulation of water supply. These plans call upon relevant institutions to carry out their duty by highlighting the necessity of EIA and medium- and long-term planning decisions. Meanwhile, flood and drought management plans tend to make decisions related to urban areas and land use policies, but these areas are limited to immediate interventions such as streambed and canal cleaning, decisions on alternative crop production and implementation of dryland agriculture, mapping of erosion/desertification risks, action plans for fire sensitive period.

The designation of "Special Project Areas" offers a promising avenue for the transition to conservation-based planning. In order to ascertain this potential, studies and projects conducted in Muğla (Yörür et al. 2018). In recent times, "large plain protection areas" were designated. These regions are agricultural areas that interact with urban settlements and are directly affected by the decisions made regarding these settlements. Intervention in these areas is typically undertaken with the objective of regulating construction activities in the plains. In the case of agricultural regions such as "large plains," decisions may be made by designated "special project areas." Nevertheless, it is crucial to consider the integration of these areas with upper scales, including their interconnections with forest ecosystems and water conservation.

3.5. Evaluation: Potentials in Conservation and Planning in Turkey

In Turkey, a new conservation approach is required to address the limitations of current practices, as well as the challenging political environment and legislative framework. This model must constraint on the overexploitation of natural resources and prioritize the equitable distribution of wealth, rather than focusing on economic growth in isolation. The implementation of payments for ecosystem services are identified as a contributing factor to land expropriation or allocation in protected areas, leading to adverse environmental consequences. The formulation of practices and regulations must consider the violation of rights as a fundamental issue. It is imperative that these

frameworks go beyond the mere consideration of ecosystem services as a means of financing, particularly in the context of Turkey (Kaya 2019). Besides, natural resources situated outside of protected areas are facing significant challenges due to the intensification of destructive activities. This trend appears to be resistant to change, despite the necessity of adopting global trends in environmental policy.

The main problem is that conservation is still dealt with at specific boundaries, rather than at the city or water catchment basin. Başak et al. (2022) found that these studies, which they consider to be 'regulatory' ecosystem services, are prioritized in Turkey. On the other hand, according to the same study, most of the studies on ecosystem services have been conducted in protected areas such as national parks, special environmental protection areas, Ramsar sites and wildlife development areas, which are protected by law and compatible with the protection category recommended by international organizations, or in areas that directly serve the city, such as drinking water basins.

At the urban scale, ecosystem services are predominantly implemented as "nature-based solutions," particularly in the context of urban parks and public spaces. The areas are designated as ‘cultural ecosystem services’ or functioned as ‘urban ecosystem services’. There are some urban design scale strategies like creating ‘ecological corridor’, ‘collecting rainwater’ or in more comprehensive scale as ‘branding products with geographical signs’ (see Çağlayan et al. 2020). These projects are generally implemented for a specific scale and can serve partial climate regulations and municipality services; however, it is limited to solve poverty or climate change due to the ‘ungreen’ practices which are approved and promoted by legal framework. They are limited to comprehend all urban environment. As mentioned before these interventions are debatable issue that ‘green-rent’ and gentrification occurs where the rehabilitation and ‘green’ investments occur by the projects like Barcelona (Maia et. al. 2020). Hence, they have potential to create socio-spatial inequalities in terms of lack of access to the services and increasing land prices. However, in Turkey, the support and implementation of these activities by local governments also has the potential to politicize and present alternatives to increasingly centralized conservation practices.

On the other hand, protected areas and areas that are important in terms of ecosystem services suffer from both "growth" and "green growth" objectives. The proposal for a nuclear power plant in the vicinity of İğneada Forests National Park and the increasing number of proposals for thermal power plants and related mineral resource

extraction in the vicinity of Mount Ida National Park are being proposed and implemented in the ecosystems associated with protected areas. Köprülü Canyon National Park is one such example. Furthermore, the boundaries of the designated area have been subject to change for a considerable period of time. Additionally, local people's use of the area for agricultural and livestock purposes were restricted. However, the region was permitted tourism activities such as rafting. In addition, the construction of the dam and hydroelectric power plant surrounding the national park was resulted in the flooding of local residences and the felling of trees (Büyüksaraç 2020).

In Turkey, scientific researches have been carried out on nature conservation by considering the connectivity between nature and urban areas at both the city and river basin levels (Pamukçu-Albers, Lise and Balkız 2019; Tezer et al. 2012). Furthermore, studies have explored socio-metabolic urbanization regarding waste disposal and the particular role of water, as well as the relationship between the socio-ecological environment and the dynamics of urbanization (Acara 2022; Tuçaltan 2022). There is a direct link between planning and water policies, every decision in the city has an impact on water use. It is crucial to overcome the division between nature conservation and urban planning (Sılaydın 2007; 2021). It is necessary to link the protection of forests and biodiversity with the protection of water resources in order to create sustainable and habitable settlements and to preserve also agricultural production. Demanding the right to the city now encompasses the defense not only of the urban commons, but also of socio-ecological areas such as forests, water and oxygen, which ensure the continuity of life in urban and peri-urban areas. This is not merely a local "conflict" or "discontent"; rather, it is directly linked to the loss of environmental and human rights at different scales.

Current research into integrated forest management plans and integrated river basin management plans aim at establishing connections between urban areas and nature conservation. It is imperative that these studies be implemented and prioritized in urban planning, particularly at the level of “environmental planning”. The plans are limited in two ways: firstly, they are not based on natural boundar-ies, and secondly, they generally focus on economic objectives rather protection of ‘commons’ in comprehensive way (Table 2). This latter point requires further discussion on how to move towards a form of planning based on the concept of the commons. While master plans for SEPAs have the potential to overcome these problems, the persistent pursuit of economic growth weakens the efficacy of these protection plans. Urban planning should move away from the idea

that conservation areas are strictly defined by boundaries and that other areas must be designated for development.

The planning discipline is equipped with the scientific expertise and tools necessary to identify conservation priorities and to create actual "sustainable" cities. It is imperative that the concept of conservation be integrated into the planning and decision-making processes by questioning the boundaries, laws, and regulations that currently exist, as well as the economic objectives that are typically pursued. This approach requires an understanding of the problematic issues associated with defining boundaries and the potential socio-environmental implications of different spatial scales. It is challenging to implement strategies and policies in the absence of defined spatial boundaries, particularly in the Turkish context. Nonetheless, recommendations for conservation in varying zones with relatively flexible boundaries have the potential to circumvent the issue by exposing the underlying problems and inequalities. Conversely, investments must be evaluated in accordance with the "actual" needs, trade-offs, and beneficiary parties through a global common perspective. It is essential to define priorities for community-based, regional, and national needs at different scales.

On the other hand, a planning process that is driven by 'economic growth' objectives, re-regulated laws, centralized decisions cannot be carried out. As Marcuse (2009) points out, economic growth does not always mean that the 'public good' is guaranteed. Therefore, a transition from growth-focused planning to 'post-growth' planning practices must be undertaken. The planning discipline must redirect its priorities to overcome the climate crisis and the multiple ecological crises such as the water crisis and pandemics.

As in water management, forest management is expected to overcome problems and ensure a sustainable use of resources by delineating boundaries with a technoscientific understanding and conducting sectoral cost-benefit analysis. Önder Özşeker's (2024) research revealed that forest management plans are developed through the designation of zones with the objective of forest preservation, considering various parameters, including biodiversity, forest and tree types, and other factors. The necessity of new forest-integrated management approaches that are more "conservationist" in nature is evident in the literature and in attempts to create a new type of ecosystem-based integrated forest management. However, the production vision, which is oriented toward wood production and harvesting, prevents the implementation of this conservation-oriented approach. Furthermore, the zoning of important areas in terms of forest

ecosystems is not applicable in this respect. In many cases, zoning is ignored, and the zoning process is often stretched beyond its intended scope generally as “economic growth”.

In light of the prevailing economic growth-oriented approaches, attempts have been made to implement new measures to address complex problems such as pollution, environmental degradation, and inequality. However, these measures are inadequate. It is evident that the actual underlying issues can largely be attributed to inadequacies and gaps in legal and administrative procedures. A strategic impact assessment can be utilized to monitor the potential impacts of plans. Although the procedure for drought and flood mitigation plans has been implemented in Turkey in recent years, these reports typically assess the compliance of the plans with the law and the potential adverse impacts of preventive and mitigation measures. Spatial plans related to conservation, water resources or forests need bolder restrictive decisions in line with “new” priorities.

The draft water law proposal has the potential to facilitate the development of alternative approaches to the commodification of water, particularly in light of the defining allocation priorities based on climate conditions. However, it is imperative that the draft water law address the rationale behind the sectoral allocations, the entities responsible for making them, and the intended outcomes. A legal framework must be designed to facilitate the concept of water as a common resource.

Even within designated protected areas, unlicensed activities can take place under the EIA processes, which assesses proposals in a fragmented manner and generally results in a 'positive' decision. It is possible to undertake a multitude of activities by obtaining the opinion of relevant institutions, such as the Ministry of Agriculture and Forest during the EIA process. Short-medium-long distance protection zones for lakes and dams, as well as wetland boundaries, are established with the some protection distance for each water source, according to topographic thresholds. In addition, the DSI set forth conditions that prohibit activities within a specified radius around drainage channels. In some instances, these limitations can be exceeded in the context of renewable energy activities. The majority of decisions are contingent upon the findings of EIA reports. It is incumbent upon the companies in question to prepare these reports. However, this situation raises questions about the reliability and methodology of the information produced in the EIA report, given that it is produced by the private sector. The cumulative impact assessment is frequently absent or misunderstood in the reports.

The loss of vegetation, habitats, ecosystems, and other natural resources, as well as the infrastructure (roads, electricity transmission lines, transformers, wastewater treatment plants, evacuation pipes, waste storage areas, and so forth) that accompany these investments, have significant ecological impacts on the region and its surrounding areas. The generation of waste and consumption of raw materials by these facilities, along with the destinations of their outputs, are directly related to issues such as spatial inequalities and unequal development. These issues must be addressed within the context of "metabolic urbanization."

To illustrate, electricity generated from renewable energy sources in a protected area is consumed in a factory in an industrial zone. While the factory espouses sustainable production practices, the construction of an underground connection for a solar power plant in the protected area may necessitate the excavation of kilometers of land. While this industry may result in air pollution within an urban setting, it has the potential to cause significant damage to vegetation within a conservation zone. Furthermore, the proposal can be located between two forests increases the risk of fire and habitat fragmentation. Additionally, the proposed site is situated on agricultural land that plays a crucial role in supplying the city with essential products.

The notion of "degrowth" appears to be a very distant option for Turkey and similar countries may create new inequalities. Especially for the 'Global South', the peripheral countries of the EU and Turkey, it could mean a 'recession' (Akbulut 2021). However, the concept of degrowth means the equitable sharing of environmental risks and benefits at the same time. Prioritizing and highlighting the socio-ecological value of the bio-regions affected by communities and promoting the spatialization and politicization of degrowth alternatives with its networks are imperative. Alongside protecting socio-ecological value at the local scale, making decisions about the global commons for the benefit of all has become more urgent with the new ecological crises. This brings about necessary changes to the priorities and role of planning.

CHAPTER 4

METHODOLOGY

4.1. Research Area and Design

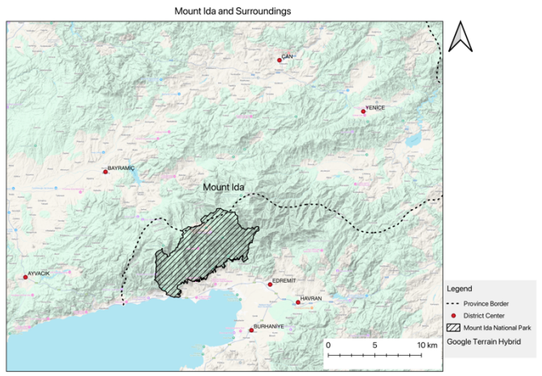
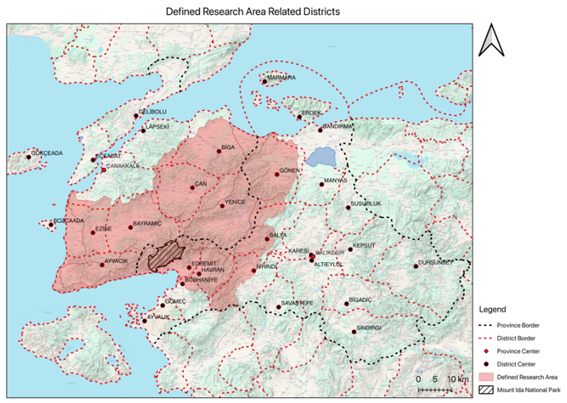
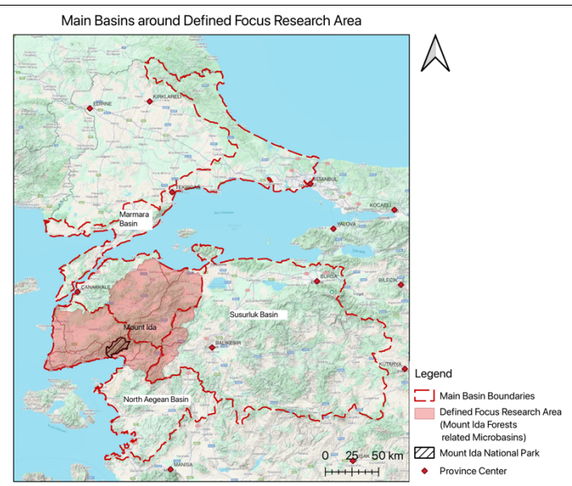
The Mount Ida region was selected as the research area because it offers a valuable opportunity to assess the complex interconnections between water resources, conservation areas, agricultural lands, and forest resources at various spatial scales. In this regard, the research was not initially constrained by fixed boundaries in terms of developing a conservation model. However, the forests of Mount Ida (a Key Biodiversity Area) and the settlements at the hillsides were defined with the objective of providing insight into the current situation and the socio-environmental problems present.

Firstly, the existing situation of conservation areas and ecological commons around Mount Ida were identified related with various scales. Significant ecosystems, defined as "ecosystem services," were modeled and evaluated with different parameters, including land use, water quality, and natural areas. In accordance with the parameters the focus research area and the relevant scales were then defined. This step also demonstrates the constraints of the study. When defining the focus research area, assignment and acceptance were made by adhering to "natural" and "technical" boundaries, protected areas, basin boundaries, forest boundaries, areas of significance in terms of carbon and biodiversity at the global scale, and zonings created with computer software. In order to overcome this, the relevant conservation scales were defined.

Following the definition of the focus research area and the 'conservation scales', the problems associated with the conservation of natural resources, with a particular focus on water and forests, were evaluated. Strategies, policies, and de/post-growth alternatives through a newly defined conservation approach were examined and proposed. In conclusion, the "biodiversity impact chain" analyses and socio-ecological connections were subjected to evaluation for Mount Ida, defined research area and conservation scales. In order to determine the research area and conservation scales, as well as reveal the current problems, situation and policies in these areas, it was necessary to collect data

at different scales. To this end, a schema was developed to indicate which data were collected at which scale and boundaries, and which research questions and parts of the research this data was used for (Table 3).

Table 3. Research Design

	Definition / Map	Data Boundary	Data	Findings
Mount Ida National Park and Surroundings		Çanakkale – Balıkesir provinces	- Conservation areas - Forests - Watersheds/micro-basins - Agricultural lands (large plain protected areas) and dams - Sensitive water bodies / rainfall basins - Ecosystem model outputs	- Defining problems around Mount Ida National Park - Defining focus research area
Defined Research Areas		Çanakkale and Balıkesir provinces - Specifically districts in defined research area (Çan, Biga, Yenice, Ezine, Ayvacık, Gönen, Edremit, Balya and Havran)	- Data about main problems in focus research area (specifically water and air pollution) - Mining licenses and Data about mining related activities (Thermal power plants and geothermal activities in the area) - Water Quaility - Water and Food Security relation (Pollution related dams, agricultural lands etc.) - Supervised classification - Socio-economic characteristics of the districts	- The main problems spatially differentiated at the periphery of the Mount Ida National Park, in defined research area - Socio-environmental and biodiversity impacts of investments and policies in relation to the problems in the defined research area - Spatially differentiation of the impacts around National Park and defined research area - Input for Biodiversity Impact Chain analysis
Research Area Related Scales (Largest scale: Main Basins)		Çanakkale and Balıkesir provinces Susurluk - Marmara - North Aegean Main Basin Boundaries	- Groundwater / surface water bodies and pollution - Basin plans and research reports - New conservation plans (Ayvalık Islands, Saros SEPA, and Mount Ida National Park) - Spatial and regional plans related to defined research area (Çanakkale and Balıkesir Provinces)	- Defining Conservation Scales - The strategies and plans that have impact on the defined research area - The problems differentiated in and around research area - Consideration of related conservation areas/ scales in existing plans and projects - De/post-growth potential of the strategies and plans - The possible impacts of an ‘extended conservation’ on socio-environment and biodiversity - Input for Biodiversity Impact Chain analysis

4.2. Data Collection and Processing:

The data, source, and related findings are presented in Table 4. Both global and national data were obtained from internet resources of various international institutions such as USGS and ESA, and national institutions such as TUIK, EPDK, and the Ministry of Climate, Environment and Urbanization. Digital data were requested from the GIS unit of the Ministry of Climate, Environment and Urbanization, and data from specific water quality stations were requested from DSI. Some of the digital data were obtained from the open resources of the web application of the GIS Unit of the Ministry of Climate, Environment and Urbanization (atlas.gov.tr) and the website of the General Directorate of Mapping of the Ministry of Defense and the official website of the Ministry of Agriculture and Forestry's Directorate General of Water Management. Fieldwork was conducted in May of 2022 and June of 2023, respectively, with the aim of collecting data from institutions and universities in Çanakkale and Balıkesir provinces, especially in the cities of Çan, Bayramiç, Yenice, and Edremit. Some digital data, plans and reports were obtained from relevant institutions, including municipalities during the field research. In addition, the digital data of the Çanakkale–Balıkesir Environmental Plan were obtained from the CP 301 Strategic Spatial Planning Studio (Fall 2014-2015) archive at İzmir Institute of Technology. Data from these various institutions were updated and compiled for different boundaries. For example, the current status of dams was updated and verified using data from the Ministry of Agriculture and Forestry National Water Information System (usbs.tarimorman.gov.tr).

Digital data on mining licenses were obtained from MAPEG. The areas permitted for mining licenses are larger and the total area of operation is not definable. Furthermore, the data set does not include information on the status of closed mining areas. A table was prepared based on an evaluation of EIA reports related to IV. group mining activites with the aim of assessing the current and potential future status of proposed or existing investments. This report was obtained from the official website of the General Directorate of Environmental Impact Assessment, Permitting and Inspection of the Ministry of Environment, Urbanization and Climate. A limitation of this study is that EIA reports will only be available from 2017 onwards. As a result, a media research project was initiated and the scientific reports of civil society organizations were examined in detail.

Table 4. Data, Method and Findings

Data	**Findings**	**Source**
- Satellite data (Landsat 5 and Landsat 8 data by years, Digital Elevation Model Data) - Globally Produced Datasets (land use land cover, erosivity, carbon sequestration etc.) - National and local data about land use for Çanakkale and Balıkesir Provinces	- Change in Land use -Correlation with conservation, natural areas and land use - Hydrogeologic structure and its relation with land use - Input for ecosystem services - Input for new conservation model	- Open resources and Internet resources (e.g. earthdata.nasa.gov; land.copernicus.eu) - Open resources in national databases (Ministry of Agriculture and Forest, DSI) - Ministry of Environment, Urbanization and Climate Change, Municipalities in Çanakkale and Balıkesir -Universities
- Statistical data about socio-economic structure (GDP, demography, agricultural production etc.)	- Socio-economic structure and changes in time -Changes in agricultural production	- TUIK -Provincial Agricultural Directorate (Çanakkale and Balıkesir) - Reports from CSOs and official institutions
- National and local data about investments (specifically mining and energy) for Çanakkale and Balıkesir Provinces	- Statistical data about investments - Land use changes due to the investments -Changes the use rights on common and private areas (allocated or expropriated lands) - Input for ecosystem services and BIC analysis	- Data from national database and reports about investments (e.g.EPDK, Ministry of Environment, Urbanization and Climate change) - Government Institutions (e.g. MAPEG, General Directorate of National Estate in Çanakkale)
- Scientific reports - Water quality data	- Problems in the region specifically air and water pollution	- CSOs and professional chamber reports - DSI
- Produced historical and future supervised classification data - Produced ecosystem models and scenarios	Problems in the region and specifically forest loss and damage to ecosystem services	- Created by author by using Google Earth Engine and INVEST software -Different global and nationally produced datasets as input of models.
- Plans (e.g. river basin management plans for Northern Aegean, Susurluk and Marmara Basins, environmental plans for Çanakkale and Balıkesir, integrated coastal plans, master plans, implementation plans for investments.) - Produced Maps	- Evaluation of land use changes, policies and decisions historically - Input for BIC analysis and socio-metabolic relations	- Open Internet Resources (Official websites of ministries such as Ministry of Urbanization and Environment, Municipalities) - Çanakkale Special Provincial Administration - Municipalities
Qualitative Data	- Socio-environmental impacts of decisions and land use changes - Governance Process	- Field Research and observation - Interviews with local people live in the area, and CSOs (e.g. City Council).
- Media (e.g. news, legislations.)	-Changes in regulations by years -Governance process and social conflicts	-Official Websites of Government Institutions (e.g. mevzuat.gov.tr) -Official Websites of Newspapers

The data was confirmed and updated by reviewing EIA applications, permits and reports, as well as energy investment approvals and institutional reports. In this way, the location and circumstances of the investments were validated. On the other hand, in order to detect LULC changes, existing built-up areas and mines, current and historical LULC maps (for 2001, 2006, 2011, 2016 and 2024) have been created by the author using Supervised Classification method in Google Earth Engine.

The Digital Elevation Model (ASTER GDEM version 3) obtained from USGS (United States Geological Survey) data was subjected to analysis to generate digital data representing topographic and hydrological features, including elevation, slope, and surface water network, within the specified area. The data, which were in different formats and types, were processed using ArcGIS 10.3 and QGIS software.

The social and environmental impacts of the investments, conservation, and governance process were evaluated through an assessment of the literature. Additionally, the situation and pollution reports produced by CSOs were also examined, including those from the Chamber of Medical Doctors, the Chamber of Agriculture Engineers, and TEMA (the Turkish Foundation for Combating Erosion, Reforestation, and the Protection of Natural Habitats). To evaluate the situation of groundwater and surface water pollution, the findings of previous studies, local institution reports, and assessment reports for the North Aegean Basin, Susurluk Basin, and Marmara Basin Plans were analyzed. The problems in the field were identified through an evaluation of hydrogeological features, land use data, investment trends, an assessment of relevant reports and plans, and findings from fieldwork. This involved collecting data, including water quality data from the DSI, and reviewing documents related to the allocation of use, such as EIA reports and documents from the General Directorate of National Estate in Çanakkale.

Furthermore, in order to gain insight into the current situation and problems facing the region, as well as to ascertain their knowledge of plans, projects and the governance process, several interviews were conducted with key stakeholders in institutions such as Balıkesir MTA, National Park General Directorate, Çanakkale Special Provincial Administration, General Directorate of National Estate, and Edremit Municipality. A number of in-depth interviews were conducted including members of civil society organizations (CSOs) such as Edremit Çevre Koruma Derneği, IDA Daynışma Derneği, Marmara ve Ege Belediyeler Birliği, and Kaz Dağları Koruma Derneği, as well as residents, particularly those employed in the mining or energy sectors.

4.3. Exposing Ecosystem Services (Values)

The factors and modeling methods for determining valuable ecosystem areas were reviewed through the literature. Scientific research on ecosystem services and natural capital provides the opportunity with methods, analysis tools and software's to uncover the " actual " values of natural resources with the effects of them on urban settlements and agricultural areas. Some spatial analysis software such as QGIS, ArcGIS and Google Earth Engine and ecosystem services modeling software as InVEST were used to create ecosystem models as well as an input for defining both research focus areas and scales and 'conservation' areas and scales.

Beyond the monetary objective, it is possible to analyze which areas we should promote or invest in to enhance biodiversity, water resources, forests, etc., depending on your objective and available data. Significant factors and vulnerable areas for local settlement, agriculture or urban services can be identified by analyzing satellite images using geographic information systems and remote sensing data. Complex data such as land cover, land use, vegetation, hydrological structure, biodiversity, carbon sequestration areas, etc. should be analyzed and integrated. It is an advantage for collecting and finding data because most of the data are produced by global scale or can be produced by remote sensing data.

Data can be varied and outputs can be evaluated differently through the target. For example, Durete, Riberio and Pagia (2016) define priority conservation area for their study area (Iron Quadrangle, a mining province in Brazil). In this modelling, habitat quality, carbon stock, and sediment retention are involved to overlapped ecosystem services or conservation areas with their priority areas to contribute decision making or planning processes by thinking trade-offs comprehensively. According to the article their finding conservation priority areas are 42.2% overlapped with protected areas (p.14). They purpose except from the previously defining protected areas, other areas should involved as strictly protected natural reserves (IUCN Category Ia). Nelson et al. (2009) with using LULC and InVEST try to model and show the changes hydrological services, soil and biodiversity conservation, and other related factor to environment, as human use like agricultural production according to various scenarios as plan trend, development, and conservation. The findings of the article show that water quality and soil conservation scores increased depend on enhancement of forests and prarire in only for conservation

scenarios when carbon sequestration also increased for planning and development scenarios. According to the authors, there is negative correlation between ES or conservation and commodity production. Lin et. al (2014) analysis to the effects of two different land use scenarios on run – off, floods and droughts by using SWAT tool (Soil – Water Assessment Tool). The river discharge data from station in various catchment areas in different time series is used to the analysis. The authors finds the correlation between deforestation and urbanization and run off.

Various parameters and criteria are taking into consider for ecosystem services models and analysis of trade – offs during the spatial analysis process like water contamination, soil conservation, erosion, carbon sequestration, biodiversity, land conversation. The factors is also important to purpose a comprehensive conservation model. For example, Nelson et al. (2009) accounted carbon sequestration change depend on timber production, harvested wood products, and its social cost in time. In addition, the authors take into account SAR score for each species in habitat area for their study area. In this phase, Ecogeographical variables (EGV) dataset can be used for considering habitat potential areas and forest heterogeneity thorough evaluating global climate data, soil features such as humidity or type as Busso et al. (2012) and Avotins, Kerus and Aunins (2022) use.

In light of the current challenges and circumstances within our research area, a range of parameters can be addressed, including the direction of water runoff and the occurrence of hazardous contamination leakage from sources such as mining operations. Durete, Riberio and Pagia (2016) model impacts of threat distances on biodiversity and habitat quality and carbon stock, however, they highlights that they are not interested in punctual impacts that is related to pollution, water quality, habitat fragmentation etc. In our research, punctual factors are significant for habitat, biodiversity, forests, and water resources, and local practices. In our area, we observed mineral extraction activities and energy generation that negatively affected water security, public health and local practices. Although it is punctual, the harmful effects of the factors spread in different scales and ranges such as air and water pollution. On the other hand, mining activities threat not just their actual operation area. Water catchment areas especially covered by valuable vegetation have high capacity to sediment retention like forest. The loss of this vegetation due to mining is a risk for not only habitat but also settlements and agricultural lands at the hillside in terms of erosion and flood. Wang, Lechner and Baumgartl (2018) have found the relation with mining activities and sediment export amount. They also

model the contribution of the rehabilitation on sediment export ratio in regional scale. As a result of the study, the conversion of the vegetation to bare lands like mining and pits can cause to erosion risk and inability to manage soil transportation towards the lower elevation like croplands. The authors claim that rehabilitation can contribute to decrease these risks.

Some models were decided to be used through various discipline studies about spatial modelling. In the lights of the discussions in urban and conservation studies, it was aimed to focus on carbon and water cycle, biodiversity and threat factors associated with main socio-environmental problems in the research area. In our research, Sediment Delivery Ratio, Carbon Storage and Sequestration, GLOBIO and Crop production modelling tools in InVEST software were used. Globally produced data that is covered Turkey by different institutions like ESA (European Space Agency), European Soil Data Centre and USGS (United States Geological Survey), and global scale project like GEOCARBON (Global Forest Aboveground Biomass) were used as inputs. Then, the model data was synthesized with local scale by governmental institutions. The required parameters to create models were defined by evaluating global and region based accepted parameters in previous studies. The values were adopted on our model in a rational way thanks to the researches conducted in Mediterranean region, Turkey or our study area (Çanakkale and Balıkesir).

Required inputs as data and parameter for each model is summarized in Table 4 with the data type, format, year, source and references. This model were used to define focus research area and conservation scales with other compiled data and conservation proposals.

Additionally, scenarios were developed for the defined research area regarding land cover change. These ‘deforestation’ scenarios entail an increase in bare land, with a particular emphasis on mining activities within the region. Subsequently, the scenarios were employed as inputs for sediment delivery ratio, carbon storage and sequestration, and crop production. The models based on scenario constraints consider the specific threat of converted land as bare land. In addition, the scenarios may include factors such as the conversion of land from agricultural to non-agricultural use, the establishment of settlements and facilities, and the transformation of forests and agricultural lands into bare lands.

The creation of conservation or planning models can facilitate a more comprehensive understanding of the impact of interventions on ecosystems, including

factors such as water run-off, coastal or urban vulnerability. These models can be used to inform decision-making processes, and the analysis they generate can inform a range of applications, including plans, lawsuits, cumulative impact assessments of environmental assessment reports, or the scientific basis for NGOs. A further limitation is the potential for discrepancies between the data and local practices and knowledge with regard to land use. In addition to the expression of ecosystem values, fundamental and locally utilized areas can be incorporated as a factor, including village common areas, ancestral used paths, agricultural lands, pastures, or water sources.

Table 5. Modeling Methods, Inputs, and Parameter values

Model	Data / Index	Data format	Source	Data Year
Sediment Delivery Ratio				
Inputs	Digital Elevation Model	TIFF	*ASTER GDEM Version 3 data* (United States Geological Survey: usgs.gov)	
	Erosivity	TIFF	*The Global Erosivity Map* - Rainfall Erosivity (European Soil Data Centre: esdac.jrc.ec.europa.eu/content/global-rainfall-erosivity)	30-40 years (predominant 2000-2010)
	Soil Erodibility	TIFF	*Global Soil Erosion map* (European Soil Data Centre: esdac.jrc.ec.europa.eu/content/global-soil-erosion)	2012
	LULC	TIFF	*Global Land Cover Data* (European Space Agency: www.esa-landcover-cci.org/)	2020
	Biophysical Table	csv	Created by using LULC codes	
	Watersheds	shapefile	Created from DEM data by using hydrology toolset in ArcMap	
	Drainages	shapefile	Created from DEM data by using hydrology toolset in ArcMap	
Parameters	Treshold Flow Accumulation = 1000		Defined during created stream network. Jenson, S. & Domingue, 1988	
	Borselli K Parameter = 0.3		Cebel et.al, 2013; Pektezel, 2015	
	Max. SDR Value = 0.5		Default Value	
	Borselli IC0 Parameter = 0.5		Default Value	
	Max. L Value = 122		Default Value	
Parameters (biophysical table)	usle_c = 0 - 1		Tağıl, 2007; Ozcan et al. 2008; Efe, Ekinci & Cürebal, 2008	
	usle_p = 0 - 1		Efe, Ekinci & Cürebal, 2008	
Carbon Storage and Sequestration				
Inputs	LULC	TIFF	*Global Land Cover Data* (European Space Agency: www.esa-landcover-cci.org/)	2020
	Biophysical Table	csv	Created by using LULC codes and defined parameters	
Parameters (biophysical table)	is_tropical = 0			
	c_above = 0.1 - 80		*GEOCARBON Global Forest Aboveground Biomass* - Avitable et al. 2014; Santoro et al. 2015; Hendriks et al. 2020; Tolunay, 2010	
	c_below = 0 - 21.5		*Global maps of above and belowground biomass carbon density* - Spawn & Gibbs, 2020; Hendriks et al. 2020; Tolunay,	2010
	c_soil = 12 - 80.2		*Carbon stock map of Turkish Soil* (Ministry of Agriculture and Forest Official Website); *Turkey Organic Carbon Soil Map* (Ministry of Agriculture and Forest Soil Organic Carbon Project Report); Tolunay & Çömez, 2007	2017-2018
	c_dead = 0 - 7.8		Tolunay & Çömez, 2008	
Crop Production			Created by using LULC codes	
Inputs	LULC	TIFF	*Global Land Cover Data* (European Space Agency: www.esa-landcover-cci.org/)	2020
	Model Data (climate regression, production yield in terms of climate)	File (include .csv data)	naturalcapitalproject.stanford.edu/software/invest	
	LULC to Crop Table (crops in terms of lulc)	csv	Çanakkale Provincial Status Report	
GLOBIO				
Inputs	LULC	TIFF	*Global Land Cover Data* (European Space Agency: www.esa-landcover-cci.org/)	2020
	Infrastructure Directory (used only mining activity)	File (include .csv, shp and tiff data)	*Çanakkale - Balıkesir Mining License data* (MAPEG)	2023
	LULC to Globio LULC Table	csv	*Global Land Cover Data* (European Space Agency: www.esa-landcover-cci.org/); natural capital project guide	
	Pasture	TIFF	*Arranged local land use data from various institutions*	
	Potential Vegetation	TIFF	*Arranged local land use data from various institutions*	
	msa_table	csv	natural capital project; Alkemade et al. 2009; Faley et al. 2011	
Parameters (msa_table)	msa_primary, msa_other distance (value = <500, >1000); MSA_x = <0,4, >1)			
	msa_primary, msa_other distance (MSA_x = <0,4, >1)			
	msa_primary, msa_other distance (SE = <0,22, >0,2)			
	msa_f, FFQI (value = <0.43, > 0,99)			
	msa_f, FFQI (MSA_x = <0.3, > 1)			
	msa_f, FFQI (SE = <0.15, > 0,2)			
	msa_lu, land cover class = LULC code			
	msa_lu, land cover class (MSA_x <0, >1)			
Parameters	Proportion of intensified agriculture = 0.4		Çanakkale Provincial Status Report	2019
	Primary Treshold: 0.58		natural capital project; Alkemade et al. 2009	
	Pasture Treshold: 0.90		natural capital project; Alkemade et al. 2009	

4.4. Exposing the Current Situation

The problems in Mount Ida and Surroundings, and in defining research area in Çanakkale and Balıkesir Provinces, specifically defining research focus districts (Çan, Biga, Yenice, Ezine, Ayvacık, Gönen, Balya and Havran Districts) main problems were revealed. A variety of industrial activities, including gold mining, coal mining, and the construction of fossil fuel power plants in and around Mount Ida, pose a significant threat to the sustainability of forests, agricultural lands, and water resources. Moreover, the expansion of renewable energy sources, such as hydropower and geothermal power plants, has the potential to impact the environment and the region's natural resources. The problems were investigated detailed in relation with the concepts of "water insecurity" and "food insecurity". The legislation, plan decisions and incentives in the area were also revealed.

4.5. Purposing Conservation Scales and Purposing Post-Growth Alternatives

Evaluation of 'conservation' in a larger scope and scale is crucial by considering the parameters like water quantity and quality, the situation of upstream and downstream areas, vegetation, economic and local practices besides biodiversity and carbon sequestration. A comprehensive approach needs to support conservation areas with its socio-environment beyond considering just in the limits of protection areas. The policies and practices cannot be separated from or considered without urban needs and ecosystem services as previously mentioned. In this direction, 'urban' – conservation areas networks were exposed by using various data to understand economic structure, land use land cover changes, causal mechanisms of policies on conservation areas etc. (Table 3; Table 4). The ecosystem model outputs and produced maps was accepted an input for a new type of conservation model at different scales.

Multiple-scale policies and strategies were purposed for addressing socio-ecological values, problems, and threats about conservation and inequalities. Previous and current plans with complementary research reports in areas and related basins were

examined and evaluated with its limits in terms of sustaining 'commons'. The plans were assessed by redefining priorities, limits of urban development, water use, energy consumption etc. Rather than using a single index to assess plans and proposed models in terms of their potential for de/post-growth, studies in literature became a guideline.

4.6. Evaluation of Biodiversity Impact Chain and Politics on Commons

In this part, rather than a technical analysis, it is tried to uncover inequalities or socio-metabolic networks with a "politicizing tool" through a political ecology approach. As all the literature discusses, to understand the causal mechanism, it is essential to understand ‘context of context’ but also resolve them with networks. Therefore, evaluating practices on global commons with regional inequalities and uneven development in different socio-political relations and dynamics is also essential.

In this regard, a pioonering "Biodiversity Impact Chain" analysis (Büscher et al. 2022) was conducted around Mount Ida National Park, considering the defined focus research area and conservation scales. As Büscher et al. (2022) suggest that classifying social actors to analyze economic situation or impact on the investments or decision directly become important. In this direction focus areas’ socio-economic characteristics were considered. For example, in Turkey maybe global actors are not directly involved the area with conservation programs, however, the classes are varied similarly like agri-business, large scale companies with foreign investors, small family business and villagers and local producers who used common areas. In Turkey practices, size of agricultural plot size can be a parameter to analysis the size of agricultural production. The quantitative and qualitative data such as agricultural statistics, socio-economic situation in research focus area were evaluated to uncover who is the real beneficial or disadvantage groups. Bioregions and networks at national and international levels in terms of waste, water use, import, export, energy production, etc. were also evaluated with upper scale plans and their growth-oriented focus. Current planning and conservation policies, scenarios and foresights were assessed with the potential uneven development or inequalities with spatial correlation.

This analysis can be supported with different water indices or methodology like ‘green city index’ or ‘sustainable water city index’ etc. which purposed by different authors to exceed the complexity of water search (Siemens, 2012; Arcadis, 2016). These can be evaluated as complementary methodologies for both exposing the networks among assemblages and purposing ecosystem modelling and water relations of the scenarios. Hoekstra et al. (2018) remarks the requisite considering water as a part of urban sustainability context. The authors claim that integrated water management should be thought with also water – related sectors or impacts.

CHAPTER 5

DEFINING RESEARCH FOCUS AND CONSERVATION SCALES

Mount Ida represents a critical case for examining the limitations of conventional conservation approach and defninig protection boundaries. The thesis critiques the isolated conservation boundaries and the isolated management of forest areas, water resources, protected areas, and coastal areas within these boundaries. It identifies shortcomings in the integration of these areas with spatial planning processes. In this line, a focus research area was identified, together with the relevant 'conservation' scales. The research focus area was defined through an evaluation of previous studies and conservation proposals, land use characteristics, hydrogeological features, and ecosystem service models, with consideration of the complexity of the boundaries.

5.1. General Characteristics of Mount Ida and Conservtion Proposals

Mount Ida is located within the administrative boundaries of Çanakkale and Balıkesir provinces. Mount Ida National Park is in Edremit, Balıkesir province. The national park covers an area of 21,300 hectares. The boundary of the national park and its sufficiency is a controversial issue. Only a small part of the forests of Mount Ida is protected as a national park (Figure 5). The entire mountain was designated as a Key Biodiversity Area by Doğa Derneği, an NGO that is Birdlife International's partner in Turkey (Eken et al. 2006). Proposal of the Key Biodiversity Area also covered main forest of mount Ida including the Çanakkale part of the forest (Figure 6).

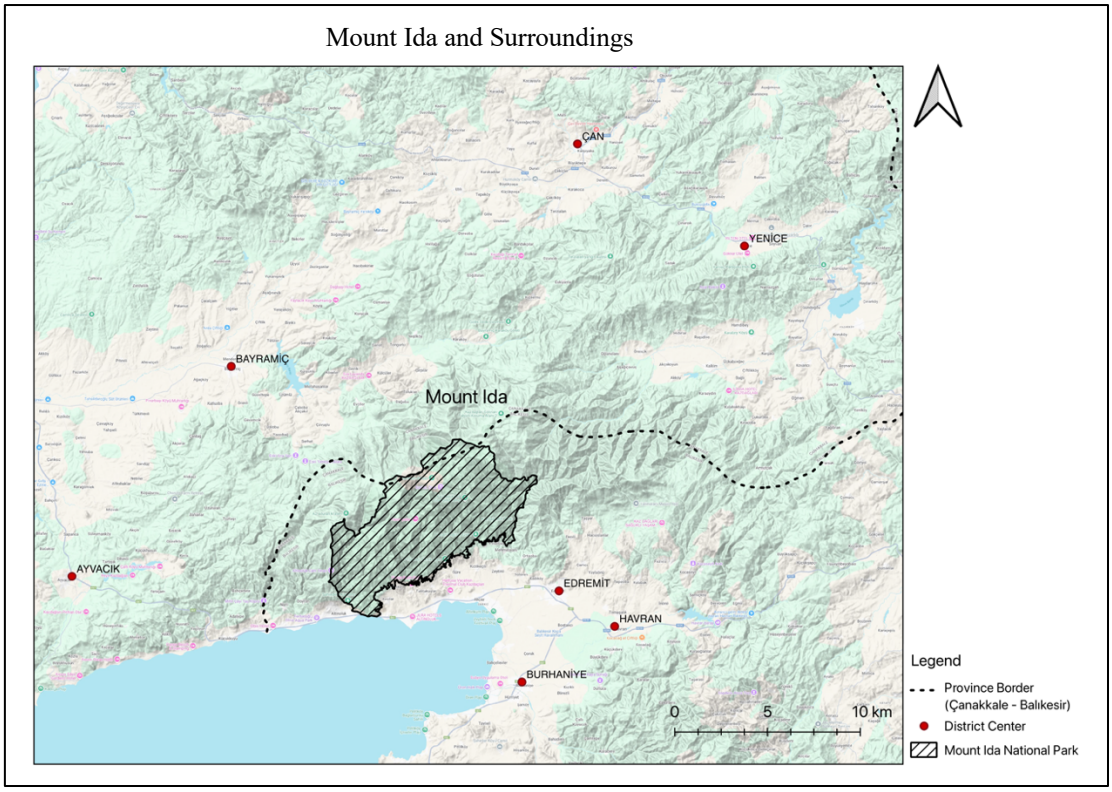


Figure 5. Mount Ida National Park and Surroundings

(Prepared by using 2024 data from the General Directorate of Mapping, Ministry of National Defense, and 2023 data from the General Directorate of Nature Conservation and National Parks, Ministry of Agriculture and Forestry)

Figure 6. Mount Ida Key Biodiversity Area

(Source: Doğa Derneği 2006, 101)

Mount Ida has been the subject of considerable research in order to ascertain the presence of flora in the surrounding area. The mountain is located at the junction of Euro-Siberian and Mediterranean plant geography (Deniz and Selvi 2021). The Mount Ida fir is an endemic species that is distinctive to the region. Satıl, Dirmenci and Tumen (2006) identified a total of 78 endemic plant taxa, 30 of which are endemic to the national park and classified as CR (Critically Endangered) and EN (Endangered) particularly in the Sarıkız, Karataş, Kartalçimen, Nanekırı, and Kapıdağ areas within the Mount Ida National Park. A recent study classified the tree and shrub taxa in the Mount Ida National Park and surroundings according to the IUCN endangerment categories. The results indicated that 52 taxa were classified as Least Concern (LC), two as Vulnerable (VU), and two as Endangered (EN) (Deniz and Selvi 2021). Additionally, the area is rich in medicinal and aromatic plants (Selvi, Dağdelen and Kara 2013).

The mammal species inhabiting in the area include Roe deer (Capreolus capreolus), Wild boar (Sus scrofa), Wild cat (Felis silvestris), Jackal (Canis aureus), Badger (Meles meles), Marten (Martes foina), Hare (Lepus europaeus), Squirrel (Sciurus vulgaris), Brown bear (Ursus arctos), Glis glis, Hedgehog (Erinaceus europaeus), Fox (Vulpes vulpes), the Wolf (Canis lupus), and bat species (Rhinolopus hipposideros and Desmodus rotundus). Besides, Ida Mountains Fir Protection Area at the North of the National Park is home to a diverse range of flora, including the Kazdağı Fir, Black Pine, and Eastern Beech and fauna such as Deer, Roe Deer, Pig, Bear, Wolf, and Coyote also inhabit this region (Ministry of Agriculture and Forest General Directorate of Nature Conservation and National Parks Nature Tourism Database). The presence of wildlife is not only limited to Mount Ida but also extends to the surrounding region. According to the Doğa Derneği, several mammal, bat, and bird species within the area are categorized as Vulnerable (VU), CR (Critically Endangered) and EN (Endangered) according to the IUCN Red List in Mount Ida Key Biodiversity Area (Appendix B).

Several academic studies by various disciplines have purposed to extend conservation area or consider management of Mount Ida in a large scale. Because biodiversity, regional climatic and hydrological features of the Mount Ida are significant especially for North Aegean and South Marmara region (Yıldırım and Ölmez 2005; Satıl 2009; Türkeş and Altan 2012). Yıldırım and Ölmez (2005) demonstrate that the distribution of Mount Ida fir extends beyond the borders of Mount Ida National Park to

Yenice and Kalkım districts, while the wildlife continues to the northern slopes of the mountain (Figure 7). Ayaşlıgil (2006) expresses the need for biotope mapping in Mount Ida in order to conserve the biodiversity of beyond the protected area that are affected by antropogenic factors but also to sustain their existence. Therefore, the national park boundary should be extended to the mountain mass.

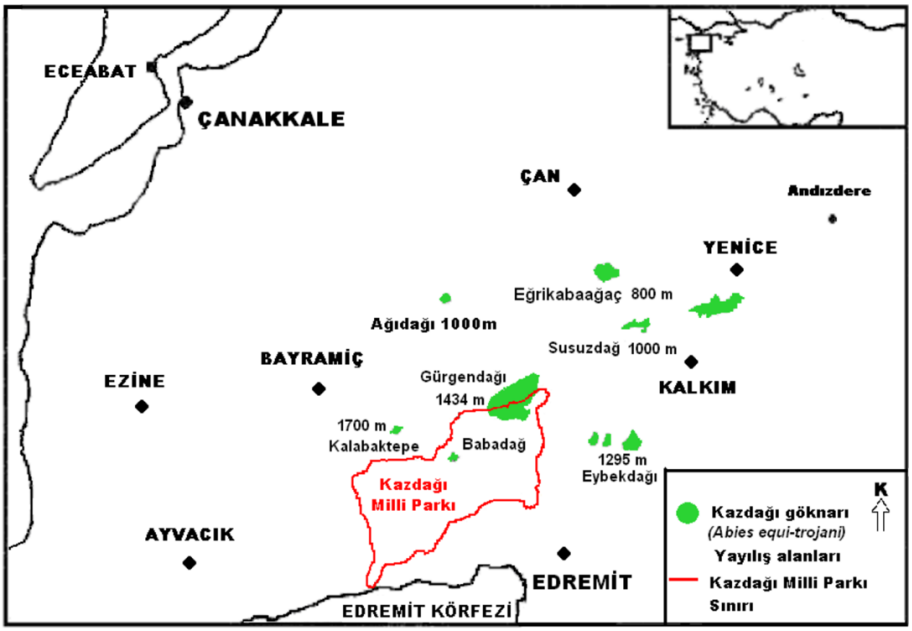
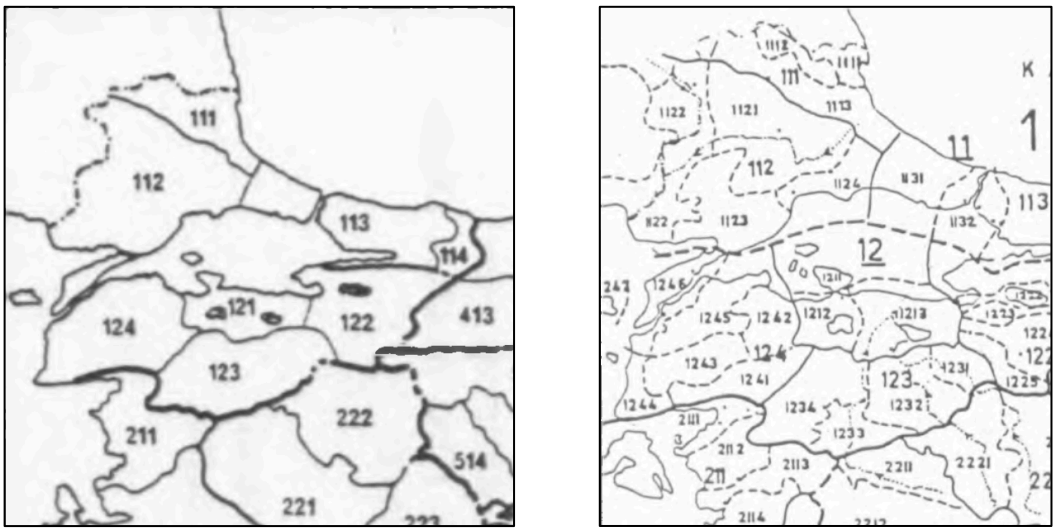


Figure 7. Distribution of Kazdağı Fir

(Source: Yıldırım and Ölmez 2005, 263)

Besides, the discussion of assignment of new conservation boundaries to Mount Ida, the need an integrated approach to ecosystem and ecology of Mount Ida and surroundings has been discussed. The Biga Mountains (which include the Kestane, Tuzluk, and Ağı Mountains) is another Key Biodiveristy Area at the north of the Mount Ida. According to Türkeş and Altan (2012), it is an emergency to include Çanakkale part of Mount Ida in the National Park boundary, and Mount Ağı (Çanakkale Center district) and Mount Ida should be defined with new strong conservation decisions considering the climatic, geological, hydrological, biogeographical features and services in or around Biga Peninsula. Parallel to the suggestion, Erol (1993) defines "natural regions" for Turkey, and proposes that evaluations of decisions, planning, and implementations should be conducted within these boundaries (Figure 8). Lastly, a report of TEMA defined a study area with extending the 'natural region' for Mount Ida and surroundings to expose the mining and environmental problems (Figure 9).



(a) (b)

Figure 8. Natural Regions for Turkey (a) – Mount Ida Natural Region (b)

(Source: Erol 1993)

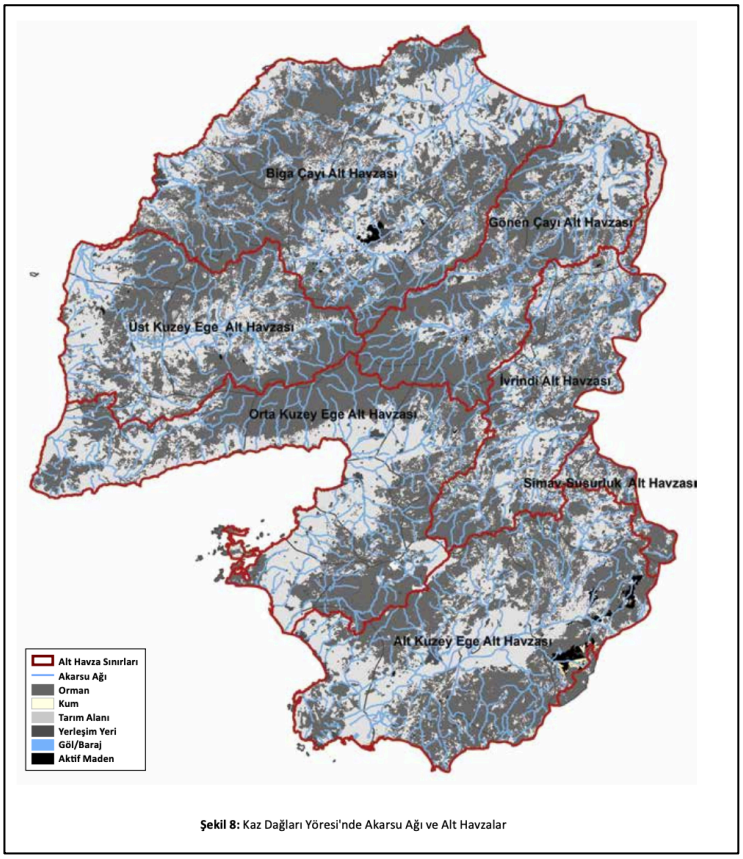


Figure 9. Stream Network and Sub-basins in Mount Ida Region

(Source: TEMA 2020, 22)

The forest area of Mount Ida is important in terms of oxygen reserve, filtration of rainwater, and groundwater availability. Studies in the area reveals that the current protection boundary of Mount Ida National Park is inadequate is inadequate for conserving the area's ecology. Moreover, while the extension of the boundary to the Key Biodiversity Area ensures the conservation of species, oxygen reserves, and water resources in isolation, this is insufficient to guarantee the maintenance of these benefits within sub-basins. To ensure the conservation of the region, it is imperative to consider various scales rather than boundaries in decision and planning practices. Although an expanded version of the 'natural regions' or considering the Biga Peninsula together provides a more comprehensive scale, it should go beyond the boundaries with considering main basins, water cycles and ecosystem interconnections in these areas. Mount Ida is in the border of Çanakkale and Balıkesir, and at the intersecton of three main watershed boundaries as Susurluk, Northern Aegean, and Marmara basins (Figure 10).

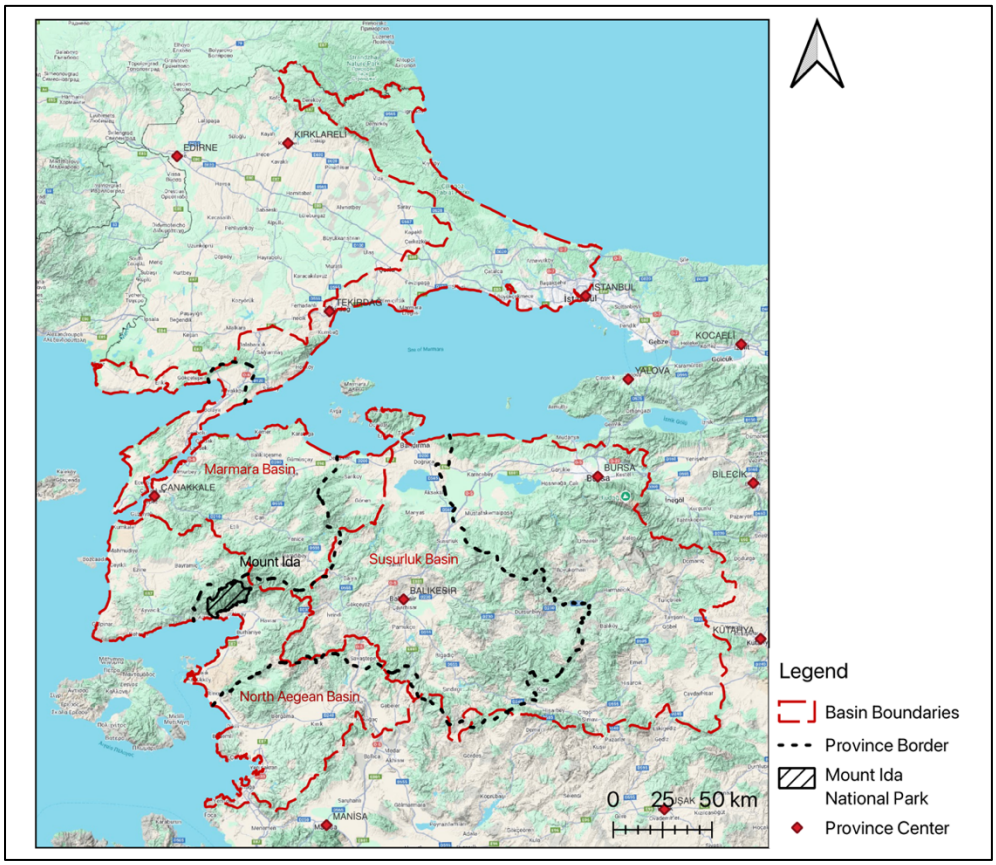


Figure 10. Main River Basins Boudaries and Mount Ida

(Prepared by using 2024 data from the General Directorate of Mapping, Ministry of Defense, and 2024 data from DSI)

Moreover, the boundaries of the Mount Ida Key Biodiversity Area are in overlap with a further designated area, Global Safety Net (Dinerstein et al. 2020; Global Safety Net Initative 2024). In addition, Key Biodiversity Areas in the Biga Peninsula, including Manyas Lake and the coasts of Ayvacık, necessitate examination with regard to their connectivity and the potential for wildlife corridors with the Global Safety Net, as well as the upscale coastal conservation areas including Çanakkale Boğazı, Saros Bay, and Marmara Bay (Figure 11 and 12). Certain areas within these zones, as well as the coasts of Mount Ida, are subject to various environmental protection statuses (Figure 13). An extended natural region can be an appropriate scale for defining the critical conservation decision. Nevertheless, it is essential to evaluate water resources, groundwater basins, and the ecosystem services provided by these systems, as well as define the various 'conservation scales' especially in the planning process.

Figure 11. Key Biodviersity Areas around Biga Peninsula

(Source: Doğa Derneği 2006)

Figure 12. Global Safety Net Areas in around Biga Peninsula

(Source: Global Safety Net Initative 2024)

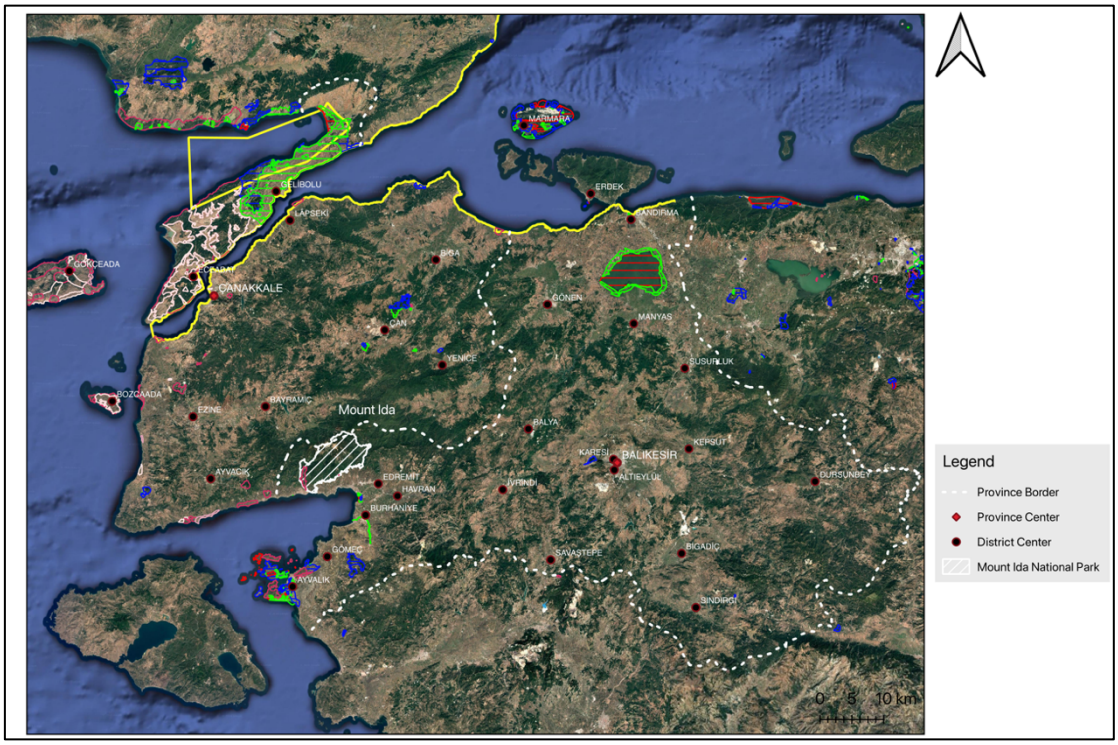


Figure 13. Environmental Protection Areas in Mount Ida and Surroundings

(Source: Prepared by using 2024 data from the General Directorate of Mapping, 2024 data from the General Directorate of Protection of Natural Assets)

5.2. Socio-economic Characteristics of Mount Ida

Recreational activities, including trekking and photo safaris, are conducted within designated areas and routes within the Mount Ida National Park. There are also designated areas for day visits and areas with controlled access, such as camping. In the vicinity of Mount Ida National Park, the Darıdere Recreation Area is located to the west, the Mount Ida Fir Protection Area is situated to the north, and a designated hunting area is present on the Kalkım side, located to the north of this designation (Figure 14). Prior to its designation as a national park in 1993, the region was used by the Yörük and Türkmen communities, primarily for grazing, forestry, and socio-cultural activities. Following this designation, access and utilization of the region were restricted, leading to a significant decline in forestry and grazing activities of the communities (Arı and Soykan 2006). While some studies indicate an increase in forest cover following conservation efforts, some studies highlight the negative and polluted impact of recreational activities on the Mount Ida National Park (Poyraz 2013; Özcanlı 2014).

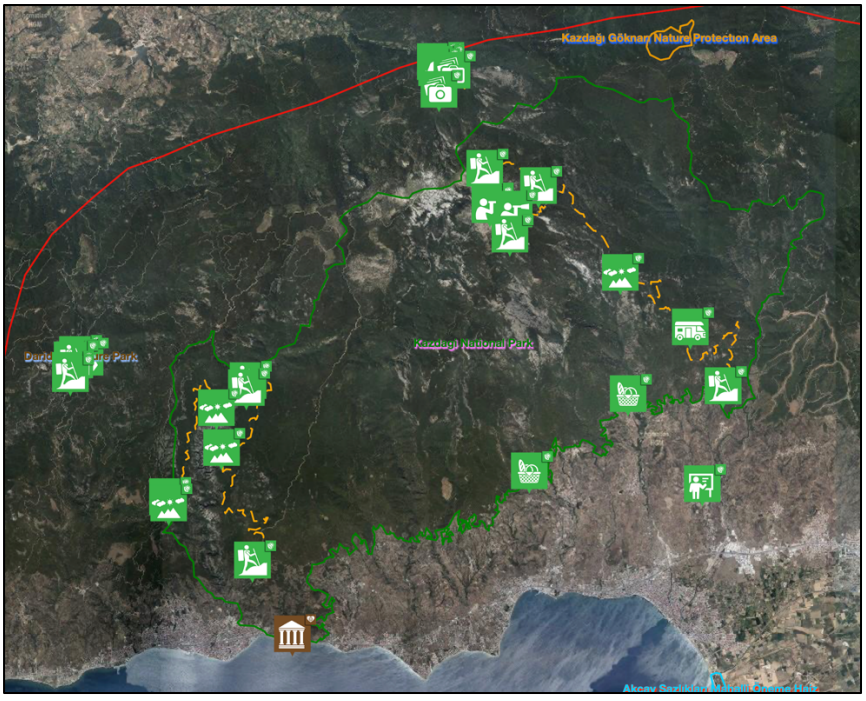


Figure 14. Location of Recreational Activities in and around Mount Ida National Park (Source: Ministry of Agriculture and Forest General Directorate of Nature conservation and National Parks Nature Tourism Database 2024)

The Mount Ida reaches an elevation of 1,774 meters above sea level, with Karataş Hill representing the highest point. While the southern of part the National Park is characterized by steep slopes, the terrain on the Bayramiç side is relatively gentle, with extensive plains covering a significant portion of the landscape. The microclimate, hydrogeological and geomorphological structure, and vegetation cover vary on different slopes in the north and south part of Mount Ida (Koç 2007; Cürebal et al. 2012). Furthermore, the socio-economic structure of the hills differs. In order to gain insight into the distinctive characteristics of the geography, it is essential to consider a range of parameters, including the ecosystem services of Mount Ida in relation to sub-basins and related settlements and socio-economic activities (Figure 15).

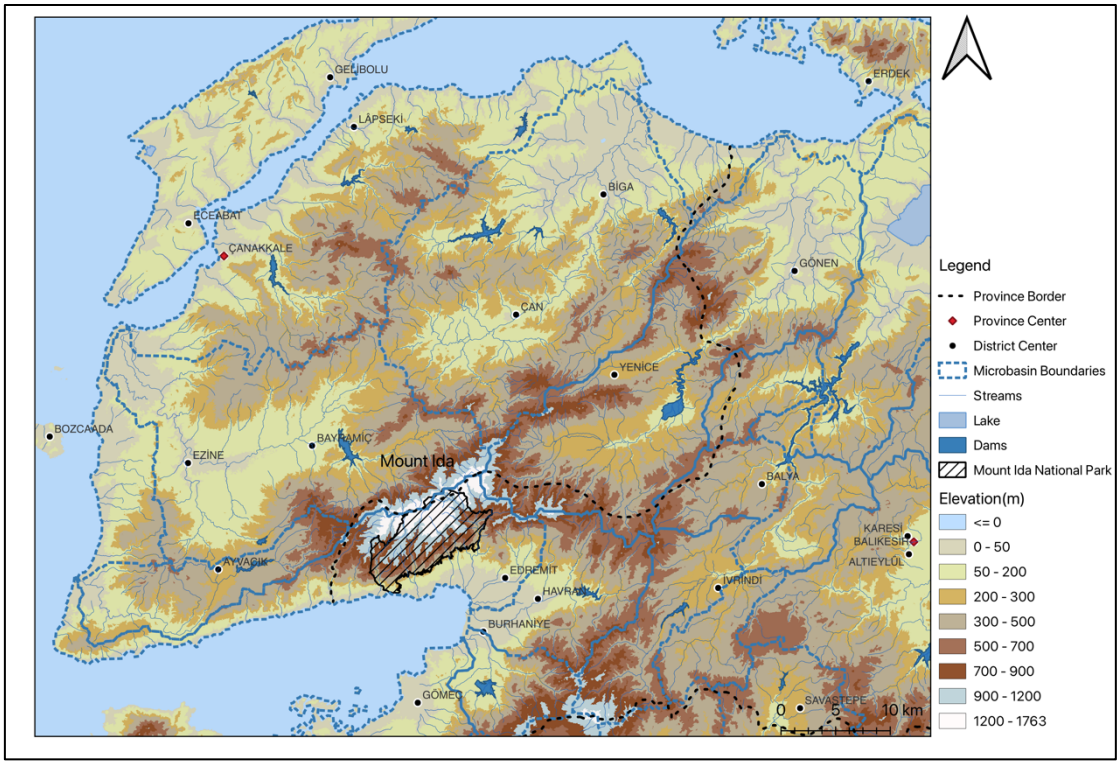


Figure 15. Topographical and Hydrological Structure of Mount Ida and Surroundings

(Source: Preperad by analysing DEM data and using HydroBASINS 2024 data)

In the northern region, Çan, Yenice, and Bayramiç are characterised by agricultural activities, particularly irrigated agriculture, and small rural settlements (Table 7; Figure 17). The southern region is characterized by a considerable population of tourists and secondary homeowners, with a notable olive cultivation activity in the Gulf of Edremit and in close proximity to the National Park. The two most significant districts

in the region are Balıkesir and Çanakkale. Balıkesir is a metropolitan district, whereas Çanakkale is comprised of both central and district municipalities. Conversely, Edremit, a prominent tourist destination and secondary housing area, has a population that exceeds Çanakkale's central district population (Table 6 and 7).

Table 6: Population of Districts in Balıkesir
(Source: TUIK 2023)

District	Population	District	Population
Balıkesir(Gönen)-1360	75572	Balıkesir(Altıeylül)-2077	185458
Balıkesir(Havran)-1384	28287	Balıkesir(Ayvalık)-1161	74643
Balıkesir(İvrindi)-1418	31626	Balıkesir(Balya)-1169	13000
Balıkesir(Karesi)-2078	188846	Balıkesir(Bandırma)-1171	166836
Balıkesir(Kepsut)-1462	21804	Balıkesir(Bigadiç)-1191	49177
Balıkesir(Manyas)-1514	18190	Balıkesir(Burhaniye)-1216	65790
Balıkesir(Marmara)-1824	11454	Balıkesir(Dursunbey)-1291	33621
Balıkesir(Savaştepe)-1608	16787	Balıkesir(Edremit)-1294	171700
Balıkesir(Sındırgı)-1619	32879	Balıkesir(Erdek)-1310	32268
Balıkesir(Gömeç)-1928	17556		

Table 7: Population and Distribution of Agricultural Population of Districts in Çanakkale
(Source: Çanakkale Provincial Agricultural Unit Brifing Report 2023)

District	Population (Center)	Population (Village)	Population (Total)	Agricultural Population	Ratio of Agricultural Population to Total Population (%)
Merkez	146.125	57.398	203.523	19.303	10
Ayvacık	10.172	24.969	35.141	18.203	52
Bayramiç	15.879	13.281	29.160	16.908	58
Biga	59.819	33.959	93.778	35.847	38
Bozcaada	3.243	-	3.243	666	21
Çan	30.910	16.714	47.624	16.769	35
Eceabat	5.764	3.016	8.780	2.871	33
Ezine	16.825	16.588	33.413	17.407	52
Gelibolu	32.423	12.038	44.461	14.368	32
Gökçeada	7.746	2.975	10.721	1.552	15
Lapseki	16.193	14.066	30.259	15.116	50
Yenice	8.164	22.232	30.396	20.545	68
Total	**353.263**	**217.236**	**570.499**	**179.555**	**32**

Table 8: Land Use Distribution in Çanakkale and Balıkesir

(Source: Balıkesir Governorship Official Website 2022; Çanakkale Provincial Agricultural Unit Brifing Report 2023)

Landuse Distribution	Balıkesir Area (hectare)	Ratio(%)	Çanakkale Area (hectare)	Ratio (%)
Agricultural Land	390.873	26,80	331.633	33,3
Pastures	82.715	5,67	33.028	3,3
Forest	628.614	43,11	489.702	49,2
Non-agricultural lands	356.098	24,42	**141.581**	14,2
Total	**1.458.300**	**100**	**995.954**	**100,0**

In Çanakkale, 43.11% of the total land area is classified as forest, while in Balıkesir, the ratio is 49.2%. Agricultural land constitutes 26.8% of Çanakkale's total land area and 33.3% of Balıkesir's. Furthermore, the presence of meadows and pastures in the region is of particular importance for husbandry (Table 8). Çanakkale and Balıkesir are among the provinces in Turkey with the highest production of fresh fruits, cereals, vegetables, oil, and canned products. Industrial activities in the region are primarily concentrated on the manufacturing and agriculture-based industry sectors (GMKA 2014; Balıkesir Governorship Official Website 2022; Çanakkale Provincial Agricultural Unit Brifing Report 2023).

While the agricultural employment rate for TR22 Çanakkale-Balıkesir was 39.8% in 2010 and 36.6% in 2012, this rate decreased to 23.3% in 2023 (GMKA 2013; TUIK Larbor Force Statistics 2023). In Çanakkale, the rate is as high as 32%, while in the Yenice district, which is also situated on the northern slopes of Mount Ida, the rate reaches 68%. In the Bayramiç and Ayvacık districts, the rate exceeds 50%. In settlements situated at a distant from the city center and in rural areas devoid of industrial activity, the majority of the population is constituted by landowners and agricultural workers (Table 7). The Yenice district of the Gönen basin was previously characterized by a high agricultural population, which constituted up to 81% of the district's total population in the year 2010. Currently, the majority of the Yenice district's residents are landowners, with agriculture representing their primary source of income (Dinçer 2004; Balkan 2010; General Directorate for Water Management 2017). Even in districts with significant coal mining and thermal power plant activities, such as Çan district, the agricultural employment rate remains at 35% (Table 7).

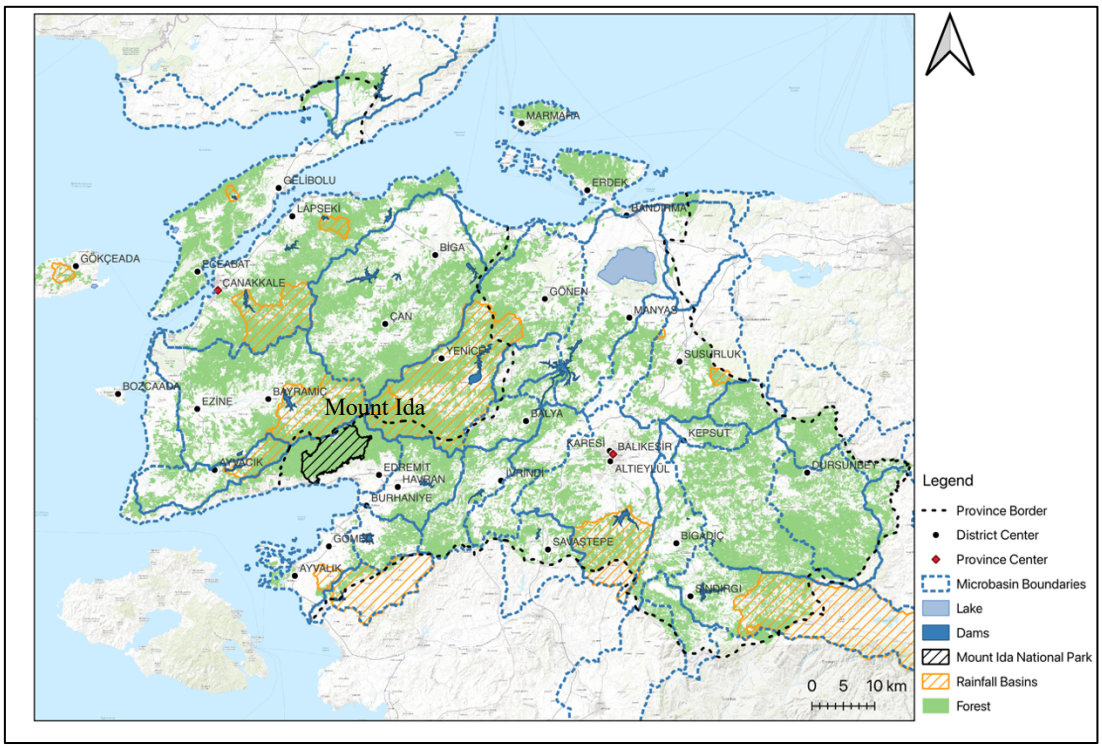


Figure 16. Forest, Dams and Rainfall Protection Areas in Çanakkale and Balıkesir

(Source: Prepared by using 2013 data from Ministry of Environment, Urbanization and Climate Change, 2024 data from the General Directorate of Water Management and General Directorate of Mapping, and 2024 HydroBASINS data)

Mount Ida provides a range of ecosystem services, including water retention, carbon storage and biodiversity. These services benefit not only the surrounding population and district centers, but also the national scale. As illustrated in the Figures 16 and 17, Mount Ida and its associated ecosystem provide a range of ecosystem services to the surrounding basins. The initial beneficiaries of these services are the districts of Çan, Yenice, Bayramiç, Ayvacık, Havran, Yenice, Edremit, and subsequently Gönen and Balya. The agricultural areas, plains, and dams within these districts also benefit from the services provided by Mount Ida. The conservation of vegetation in these regions can be beneficial in the context of flood risk mitigation and the prevention of soil erosion in agricultural areas. Moreover, the type and intensity of activities in water catchment areas are significant factors influencing water run off and water quality collected in the dams utilized for drinking and irrigation purposes in these districts. In order to develop a comprehensive conservation strategy, it is necessary to consider agricultural lands,

particularly large plain protected areas, sensitive water bodies, dams, and related micro-basins that are connected to the Mount Ida forest area (see Figures 16 and 17).

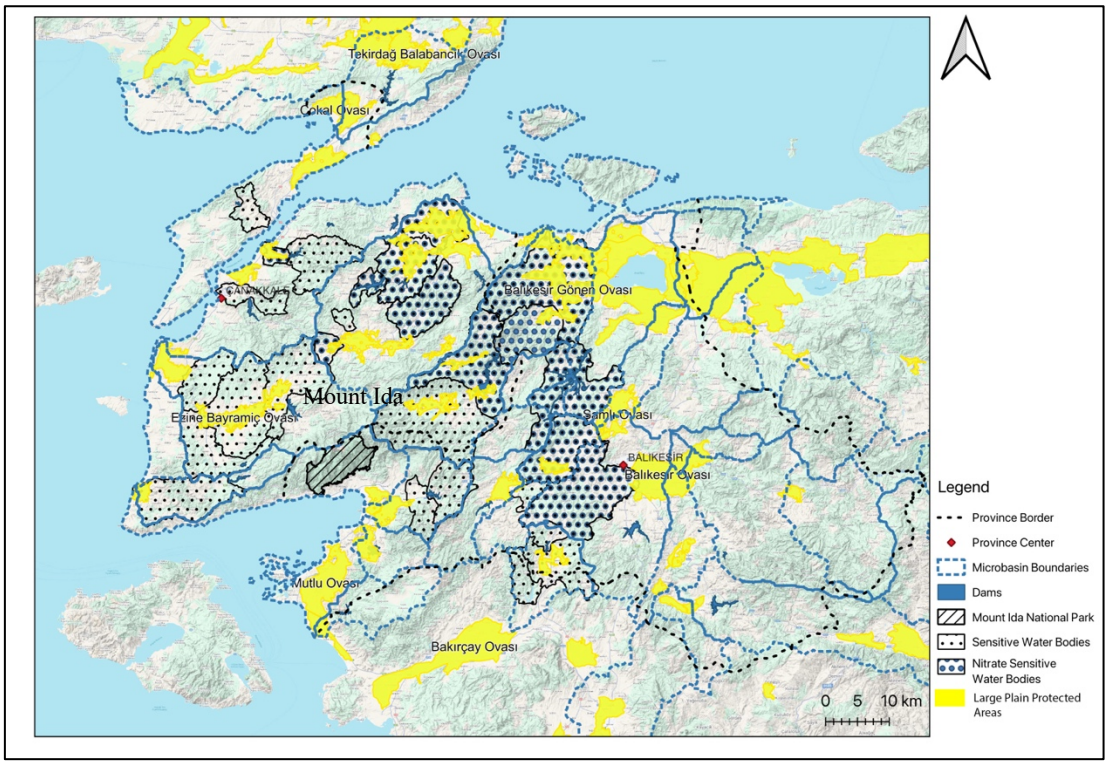


Figure 17. Plain Protected Areas and Sensitive Water Bodies in Çanakkale - Balıkesir (Source: Prepared by using 2024 data from Ministry of Agriculture and Forest, General Directorate of Environmental Management and General Directorate of Mapping, and 2024 HydroBASINS data)

5.3. Defining 'Ecosystem Services' of the Mount Ida

The carbon sequestration, sediment delivery ratio, and GLOBIO models were developed to facilitate understanding of the interconnected ecosystems, regions, and features of Mount Ida. by using ecosystem service assessment tools All models use a LULC (land use land cover) raster as an input that has the appropriate projection and a biophysical table relation. The LULC map was gained from European Space Agency for 2020 year (Figure 18). The map was proceeded in ArcGIS. Biophysical Table was arranged in terms of the classification of the land cover, and the parameters. Each model is required various parameters which are related to land cover classification (Table 9).

Table 9: Biophysical Table of Created Models

lucode	COUNT	DESCRIPTION	is_tropical_forest	c_above	c_below	c_soil	c_dead	usle_c	usle_p
10	40631	Cropland: rainfed	0	0.5	0.5	40	0	0.38	0.19
11	88900	Herbaceous cover	0	0.5	0.5	40	0	0.3	1
12	25539	Tree or shrub cover	0	0.16	14.5	50	0	0.3	1
20	28130	Cropland: irrigated or post-flooding	0	0.5	0.5	35	0	0.38	0.19
30	9378	Mosaic cropland (>50%) / natural vegetation (tree: shrub: herbaceous cover) (<50%)	0	0.16	2	50	0	0.09	1
40	45651	Mosaic natural vegetation (tree: shrub: herbaceous cover) (>50%) / cropland (<50%)	0	18	3.75	60	0	0.09	1
60	20683	Tree cover: broadleaved: deciduous: closed to open (>15%)	0	85	20	80.2	3.1	0.02	1
70	37936	Tree cover: needleleaved: evergreen: closed to open (>15%)	0	75	21.5	63.7	7.2	0.02	1
80	4	Tree cover: needleleaved: deciduous: closed to open (>15%)	0	75	21.5	63.7	7.2	0.02	1
90	3887	Tree cover: mixed leaf type (broadleaved and needleleaved)	0	80	18.75	70.8	7	0.02	1
100	60176	Mosaic tree and shrub (>50%) / herbaceous cover (<50%)	0	37.5	14.5	60	0	0.09	1
110	10	Mosaic herbaceous cover (>50%) / tree and shrub (<50%)	0	37.5	14.5	60	0	0.09	1
120	3054	Shrubland	0	9	9	75	3	0.04	1
122	23	Shrubland deciduous	0	9	9	75	3	0.04	1
130	10687	Grassland	0	0.8	4.5	78.3	3	0.1	1
150	504	Sparse vegetation (tree: shrub: herbaceous cover) (<15%)	0	0.6	3	40	0	0.5	1
153	14	Sparse herbaceous cover (<15%)	0	0.6	3	40	0	0.5	1
180	214	Shrub or herbaceous cover: flooded: fresh/saline/brakish water	0	0.4	13.75	20	0	0	1
190	3499	Urban areas	0	0.2	2	16	0	0	0
200	9446	Bare areas	0	0.1	4	12	0	0.5	1
201	72	Consolidated bare areas	0	0.1	4	12	0	0.5	1
202	2	Unconsolidated bare areas	0	0.1	4	12	0	0.5	1
210	269730	Water bodies	0	0	0	12	0	0	0

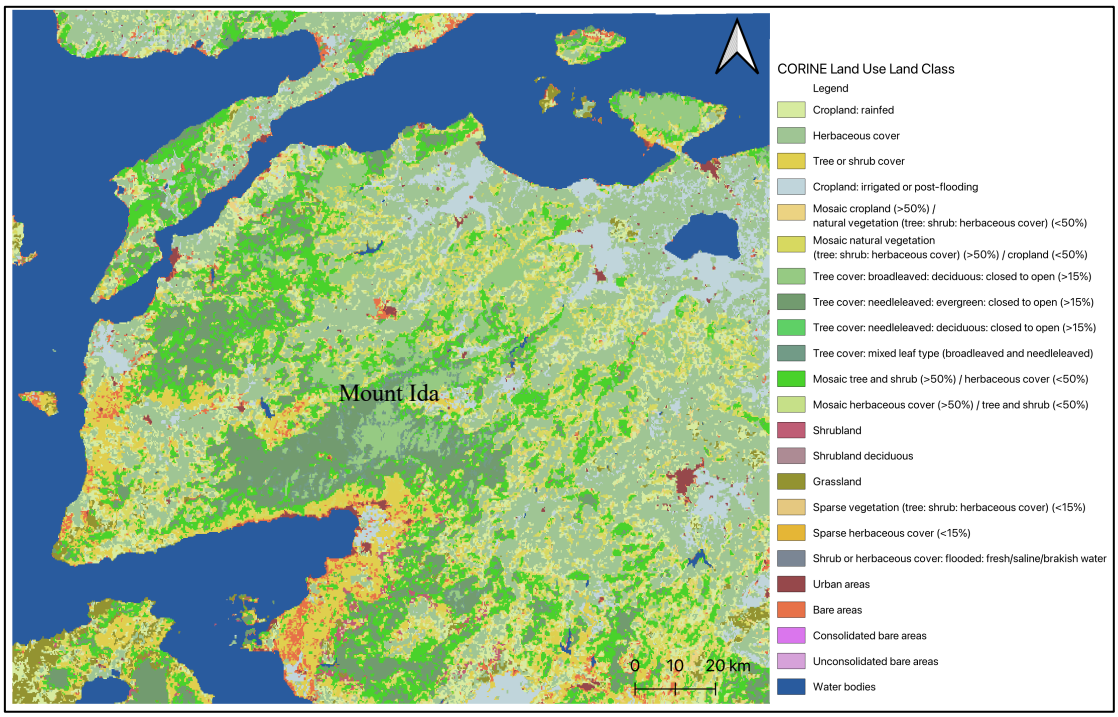


Figure 18. LULC Map for Mount Ida and Surroundings

(Source: ESA 2020)

5.3.1. Carbon Storage and Sequestration

The model is used to map carbon storage and sequestration of interest areas. The model considers aboveground biomass, belowground biomass, soil, and dead organic matter besides land cover classification to define carbon pools. The model is commonly used as ecosystem service tool to account carbon credits regarding carbon pools. In the research, these carbon pools are important to determine priority conservation areas. Additionally, the areas serve as inputs for the newly developed conservation scales, which facilitate the sustaining carbon cycle. Moreover, the projected changes in carbon stock and sequestration capacity within the area can be modeled according to the revised scenario of land cover, considering investments, licenses, and plan decisions.

Biophysical table of the model should include information that the land use characteristics associated with tropical forest and carbon storage parameters as belowground biomass, aboveground biomass, soil and dead material carbon density. In the model 'is_tropical_forest' value is accepted as 0 because there is no tropical forest in

the research area. Indexes in Carbon Stock Map of Turkish Soils and Turkish Soil Carbon Maps that are created by Ministry of Agriculture and Forest were used to determine soil carbon parameter (ÇEM 2018). However, the soil carbon parameters according to the forest type were confirmed in literature due to inconsistencies in the maps. The forests of Mount Ida are classified basically three category as coniferous, broad-leaved, and mixed forests. Coniferous trees generally are consisted of larch, red pine, and fir, as well as broad-leaved trees are consisted of beech, oak, chestnut, heather, sweetgum and endemic species. Tolunay and Çömez (2007;2008) define an accepted parameters for tree communities with these characteristics. The parameters were compared and evaluated with soil carbon maps. Soil organic carbon data for urban areas, water bodies, artificial and bare lands were accepted in Turkish Soil Carbon Map project report (ÇEM 2018). Therefore, soil carbon stock parameter ('c_soil') were classified the range between 12 and 80 in terms of land cover classification in Çanakkale and Balıkesir.

Tolunay and Çömez (2007) define dead biomass carbon density in terms of tree communities and forest types for Turkey. Carbon stock for dead biomass carbon density parameter in biophysical table ('c_dead') was taken from the research as the range between 3.1 and 7.8 for various forest classification and maquis formation. The parameter for other areas was accepted as 0.

Aboveground biomass carbon density data are produced globally in different projects (Avitable et al. 2014; Santoro et al. 2015). Belowground biomass carbon density data is produced only by Gibbs and Spawn (2020)'s research. The datasets of the global data were processed and classified in terms of the ranges in various land cover types. The average of pixel values for each land classification were defined. Carbon stock values change in terms of the type of forests and land cover. In order to determine rational indexes, the approximate accepted values in the literature for tree species in study areas like red pine, oak, and blech, etc. were taken into consideration. In this phase, some research that is done for Mediterranean region and Turkey were used by considering geographical dependency. Aboveground and belowground biomass carbon density parameters ('c_above' and 'c_below') in terms of vegetation and forest types were examined. For example, aboveground biomass carbon stock value is varied the range between 50 – 150 for coniferous, 75-150 for deciduous forests, and the value is higher than 70 for Oak forests. Tolunay (2010) founds the approximate values as 31.42 (total 40.52) for coniferous forests, 53.30 (total 65.55) deciduous forest, and 13.72 (total 20.09) for shrublands in Turkey based on 2004 data. However, Hendriks et al. 2020 express that

Mediterranean evergreen forests above ground carbon density value changes the ranges between 75-150, 150-255 for deciduous forests, and higher than 75 for dry grasslands. Pixel average of the values for global aboveground biomass carbon density data for the year 2010 is generally convenient with the parameters in Mediterranean studies. The factors like ages and types of tree communities, and geographical climate should be considered. Mount Ida has various species with higher capacity to stock carbon like Göknar, Sığla and red pine. It can explain the situation that forest in Mount Ida can have higher carbon stock than the average of Turkey. Therefore, the total aboveground carbon density value for deciduous and evergreen forests are accepted as approximately 100 like general accepted value for Mediterranean region.

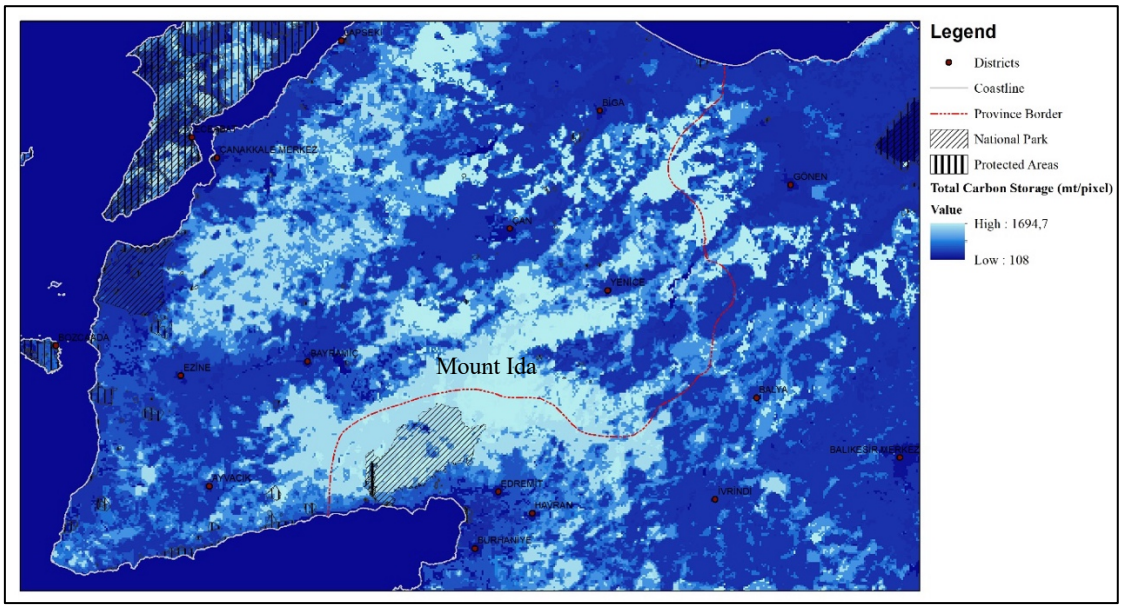


Figure 19. Carbon Storage Capacity Model

(Source: Created by using InVEST software)

Total carbon storage raster of current situation was created by using LULC map in 2020 (Figure 19). The amount of carbon stored in metric tons for each pixel is shown spatially in Figure 20. The forest areas are most important areas in terms of carbon storage. The model generally overlaps with the Global Safety Network and Key Biodiversity Areas. On the other hand, the North forests which have the highest carbon storage capacity is not under protection. Mount Ida National Park area is much smaller than the significant carbon storage area.

5.3.2. GLOBIO Model

Protected areas are defined generally based on biodiversity; however, the important habitats are not evaluated with their interconnectedness. Threat factors on habitat can consider with GLOBIO model. The model is based on correlation between mean species abundance (MSA), vegetation and infrastructure or investments. As outputs of the model, the MSA indexes of the interest area and the maps with regards to the impacts of infrastructure, land use, and fragmentation of the species are created. The model inputs are LULC map, infrastructure directory, pasture and potential vegetation shapefiles. MSA (mean species abundance) table affiliated with the primary and other vegetations, distance from infrastructure and FFQI (Forested Floristic Quality Index) were created. The default values and classification of land use, distances from infrastructure, and FFQI were accepted. MSA table was arranged according to the values. Land cover codes in LULC map were converted GLOBIO land cover codes. The codes were modified according to importance of land cover classifications for species in the research area. For example, marquis and olive groves are important areas for our interest area. Hence, the areas were defined as primary vegetation. Proportion of intensified agriculture was defined in terms of cultivated lands ratio as %40 of land is predicted to be cultivated according to the Çanakkale Provincial Status Report (2019).

The output models express distribution of MSA indexes spatially in terms of land use, FFIQ index and infrastructure. It is obvious that forest wealth mostly impacts on MSA factor and biodiversity (Figure 20 and 21). The MSA factor is getting less value according to the fragmentation of land uses where the rich biodiversity exists (Figure 22).

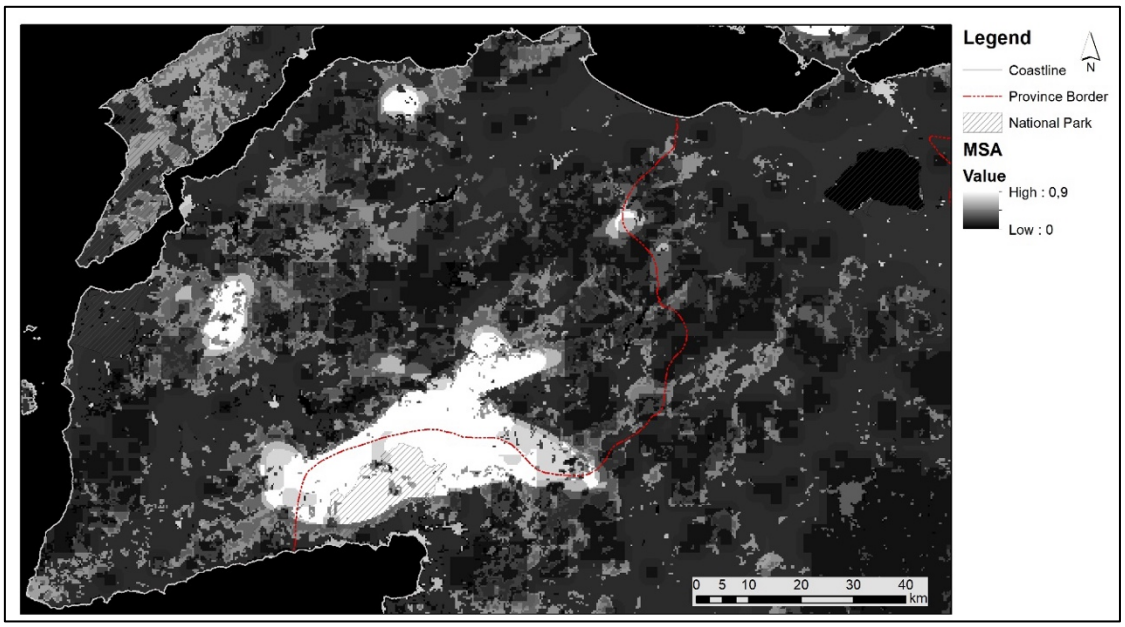


Figure 20. MSA Indexes of GLOBIO Model

(Source: Created by using InVEST software)

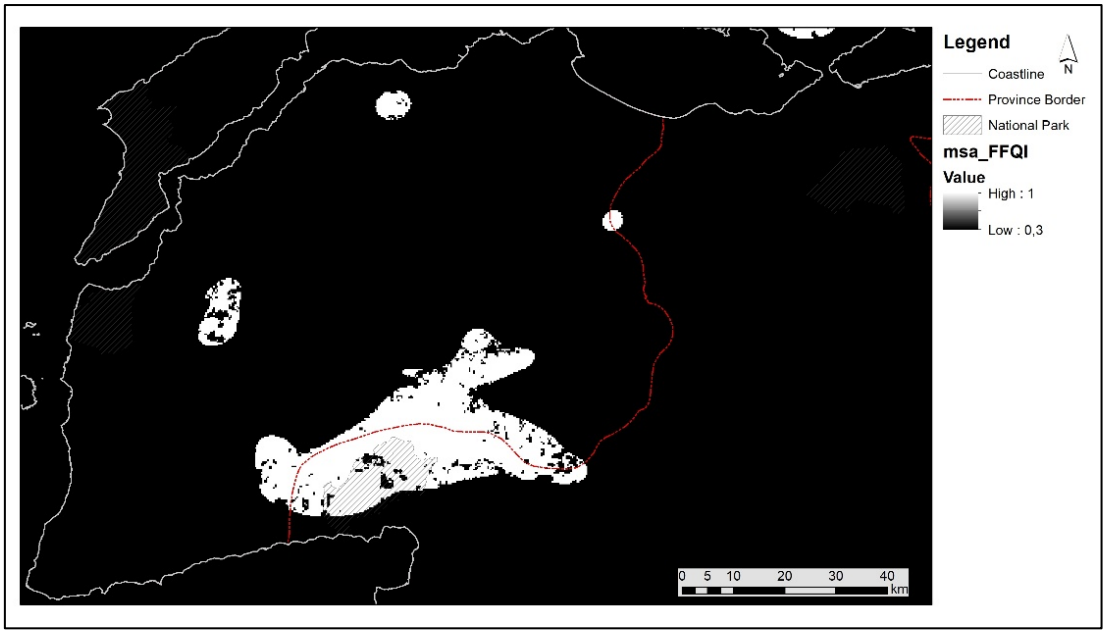


Figure 21. MSA FFQI of GLOBIO Model

(Source: Created by using InVEST software)

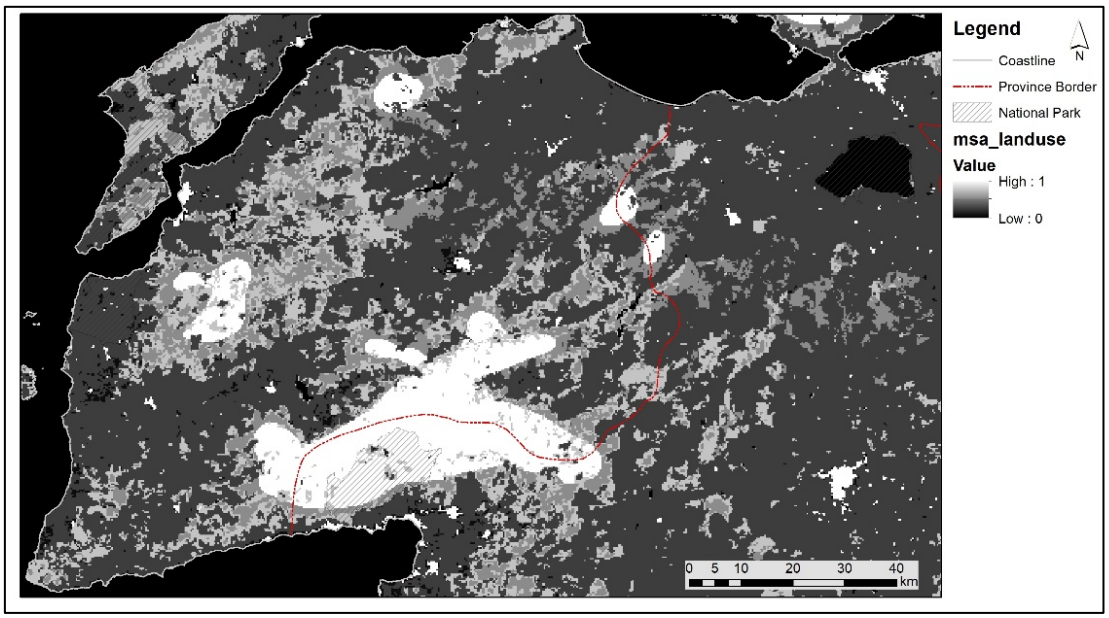


Figure 22. MSA Land Use Index of GLOBIO Model

(Source: Created by using InVEST software)

As illustrated in the models, biodiversity areas are found to overlap with important nature areas. However, the incorporation of additional biodiversity areas, such as pastures and olive groves, reveals that these GLOBIO areas are distributed across the expanses of forest areas (Figure 22). In addition, the model demonstrates that the Mount Ida National Park, which encompasses only a limited portion of biodiversity, requires the designation of additional protected areas. The model's limitations are evident in its exclusion of wetlands and coastal regions, such as Lake Manyas and the Çanakkale Strait, from its scope.

5.3.3. Sediment Delivery Ratio

Sediment retention, deposition and export factors can be predicted by using Sediment Delivery Ratio model. The model takes into account land use, vegetation and hydrogeological features like topography, stream network, rainfall erosivity and soil loss by years. Land cover changes and vegetation loss can increase sediment export that impacts on quality of soil and water contamination. The situation can be resulted in

hazards in agricultural lands and settlements like erosion, landslides, and floods. The model output as Sediment Retention Index is used to predict sediment retention service areas for economic aims like decreasing water treatment costs. The model can be useful in this research to simulate how sediment delivery ratio changes depend on scenarios like the situation of the forest conversions due to mining licenses. The model can contribute to determine priority conservation areas to avoid hazards in unique biodiversity areas, croplands and settlements. As outputs of the model, the data about sediment deposition and retention capacity of the lands, soil loss potential and vulnerable areas depends on the stream, soil and topographic features can be detected.

Inputs of the models are Digital Elevation Model, Erosivity map, Soil Erodibility map and LULC map in raster formats, and watersheds and drainages in shape file format related to the interest area. The model can be applied for existing LULC and the scenario LULC. The parameters and data were prepared according to current situation. ASTER GDEM V3 data of interest area was downloaded from the website of USGS as the input of digital elevation model. Watersheds and drainages were produced by processing DEM data by using ArcGIS 'Hydrology' tools, and the accuracy of the data was controlled by comparing local data. The Global Erosivity (2000-2010) Map and Global Soil Erosion Map (2012) that were produced by European Soil Centre were used as inputs for the model.

In the biophysical table, universal soil loss equation (USLE) cover and management factor as 'usle_c' parameter to estimate relation of land cover and soil erosion, and support practice factor as 'usle_p' parameter to consider the impact of support practices to avoid erosion should be defined for the research area. Support practice factor is varied the range between 0-1 according to the implementation and conservation against to erosion risk. Cover and management parameter changes the range between 0-1 in terms of potential erodibility of land cover and soil features. The previous studies generally try to predict or model the factors for specific fields with NDVI data by using remote sensing. The factors change in terms of geography, soil structure and vegetation. Basically, forests and vegetated areas have a lower 'usle_c' value near 0 when bare lands or agricultural lands have a value near 1. A few research examines the factors for the interest area of this research. One of them is located the highest level of the study area in Edremit, Balıkesir, and the other one is located the lowest one as Tuzla, Çanakkale (Tağıl 2007; Efe, Ekinci and Cürebal 2008). The factors of the studies were evaluated together by considering average values in Turkey. Tağıl (2008) considers the local

characteristics of Aegean region with specifying special vegetation classes like olive groves, cultivated and planted land agricultural lands when defining C factor. That's why, generally the C factors in the research were accepted and classified by considering Turkey's average (Özcan et al. 2008). On the other hand, the research conducted in Edremit defines support practices against to erosion are for cultivated lands and settlements. These ratios for settlements and cultivated lands accepted as 0.19 and 0 (Efe, Ekinci and Cürebal 2008).

Besides parameters in biophysical feature table, average of SDR, L value, Borselli ICO and Borselli K factor and threshold of flow accumulation should be defined regarding the research area. Maximum SDR, Maximum L value and Borselli ICO parameters were accepted as default value in InVEST software. During the creating stream network for interest area, flow accumulation treshold was defined as 1000 to map all drainage network and smaller tributaries in sub watersheds (Jenson, S. and Domingue 1988). The value can choose bigger with different objectives like calculating flood, working bigger basins etc. However, the threshold value was accepted 1000 to create detailed results in this SDR model.

The soil erodibility factor as 'Borselli K' parameter was defined through the literature. Cebel et al. (2013) defines the ratio of K factor according to the provinces in Turkey. K parameter value for Çanakkale is classified as strongly erodible soils (%56) with the values $0{,}20 < k < 0{,}4$, and medium degree erodible soil (%22) with the values $0{,}1 < k < 0{,}2$. And Pektezel (2015)'s research about the K factor prediction the value changes generally the range between 0,1 and 0,3 for Gelibolu. Hence, the average K factor was accepted as '0,3'.

Two models were created for existing situation based on various C factor. The aim is to show vegetation impacts on C factor. In the first model, C factor were accepted as 0.5 for all land cover codes. In the second model, the values for vegetation like forest and grassland that influence sediment retention and export are varied the range between 0 and 0.19. The value was accepted 1 for bare lands or urban areas. It is obvious that lower C factor is directly related to high sediment retention and sediment export. Sediment export amounts are varied for two model significantly in Mount Ida National Park boundary and at the North of the National Park (Figure 23-26).

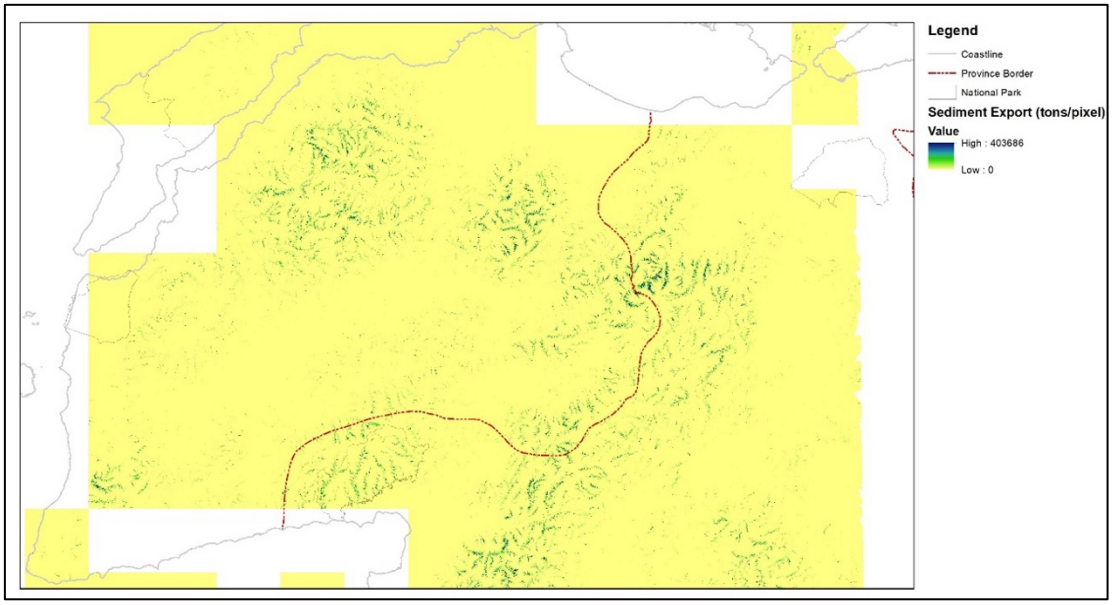


Figure 23. Sediment Export Model (C-factor = 0.5)

(Source: Created by using InVEST software)

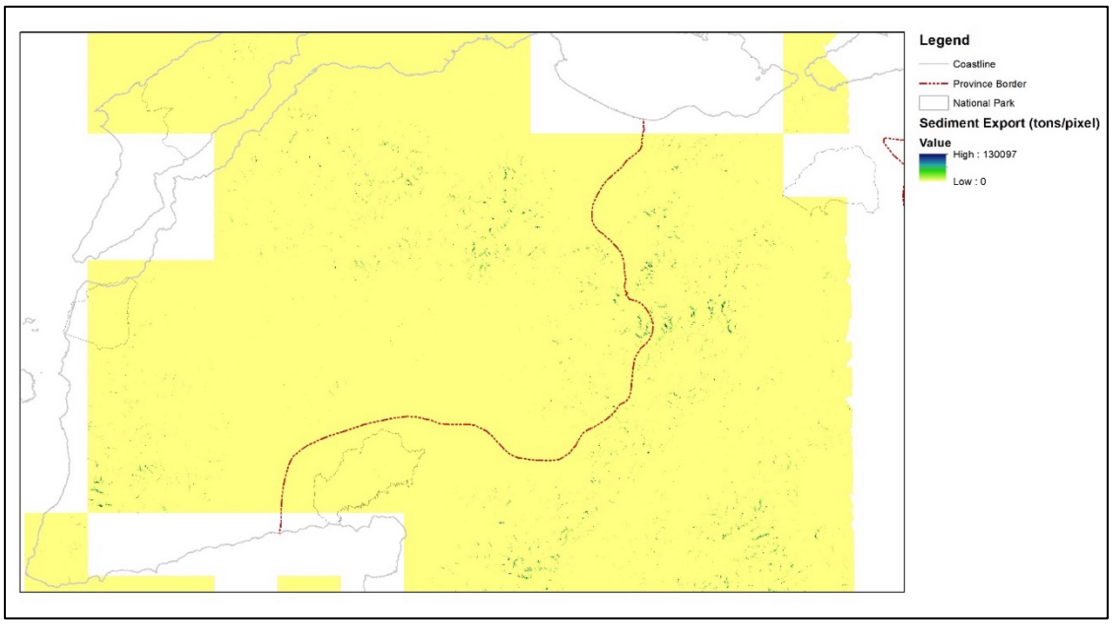


Figure 24. Sediment Export Model (C-factor is varied)

(Source: Created by using InVEST software)

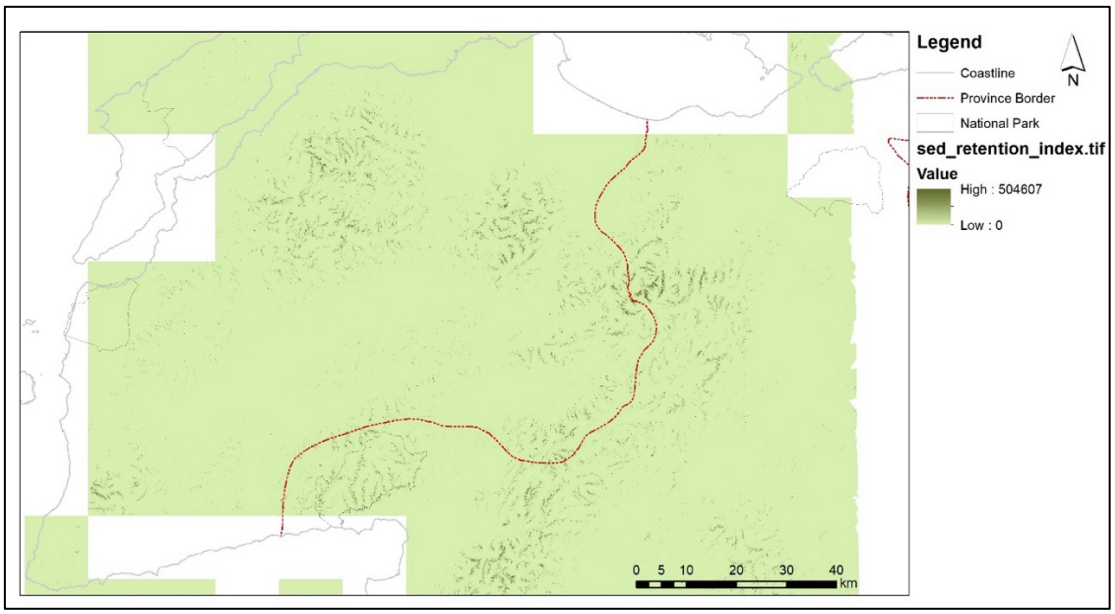


Figure 25. Sediment Retention Index Model (C-factor = 0.5)

(Source: Created by using InVEST software)

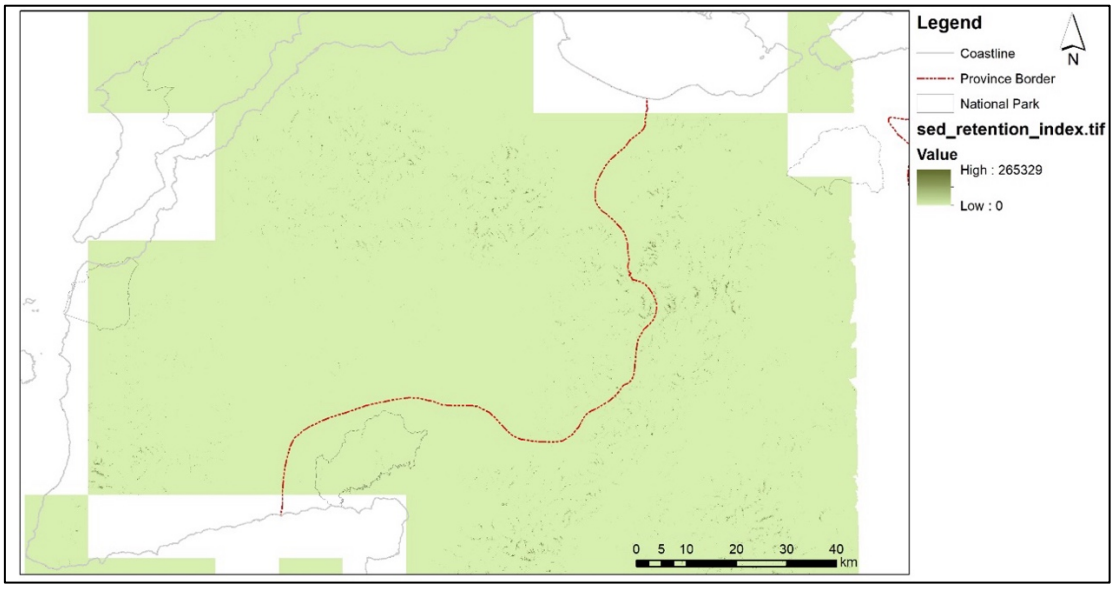


Figure 26. Sediment Retention Index Model (C-factor is varied)

(Source: Created by using InVEST software)

As illustrated by models, the highest sediment transport are predominantly observed in plains and flat terrain situated on the slopes of forested areas. These regions are particularly concentrated in the eastern regions, including Yenice, Gönen, Balya, and the west Ayvacık. In the northern region, the areas of Biga and Çan is observed high sediment transport.

5.4. Defined Research Focus and Related Scales

The research focus area was defined, with parameters including forest areas, ecosystem models, large plain protected areas, sensitive water bodies, and micro-basins and their connections. Furthermore, conservation scales were proposed, which extend beyond the conventional boundaries and provide a framework within multifaceted dimensions and networks. Such an approach can facilitate the identification of socio-environmental inequalities and uneven development created by legitimations and policies in and around isolated protected areas. This approach can serve as a tool for ensuring conservation beyond the confined boundaries of protected areas, facilitating the identification and advocacy for actual needs and post-growth alternatives.

1. Mount Ida forests related microbasins:

The microbasins including Çan, Bayramiç, Edremit, Havran, Ayvacık, Ezine, Yenice, Gönen, Biga, Balya and İvrindi disticts were selected for analysis in order to evaluate the socio-environmental problems on agricultural areas and water resources connected to the Mount Ida forest area (Figure 27). The definition of microbasin boundaries varies according to the objective of the studies conducted in various academic disciplines. The microbasin boundaries proposed by the HydroBASINS project at various levels for Turkey were used. Level 8 was selected as it provides micro-basin boundaries that are largely overlapping in previous studies and provides a basis for evaluating the upstream and downstream connectivity by focusing on Mount Ida.

Mount Ida is an important carbon storage area, as indicated by the results of the ecosystem services model in the area (Figure 19). The defined research area encompasses the coasts of Biga, Ezine and Ayvacık, as well as Edremit Gulf, situated at the foothills of Mount Ida (Figure 27). Edremit has the highest population of the region, particularly due to the development of secondary housing, especially in Akçay and Güre. Mount Ida National Park provides protection for the region's natural and pastoral characteristics along the coast. In the northern periphery of Mount Ida, small settlements are characterized by agricultural activities and suffer from industrial and mining pollution. Biga and Gönen districts, on the other hand, are characterized by considerable population centers, which are notable for their industrial development and agricultural practices. This

scale also allows for the observation of the legitimization of investments outside the boundaries of the National Park, as well as the changing of the socio-economic structure. As the research area includes significant carbon sequestration and functions as a critical zone for the prevention of water resource contamination, it is crucial that critical conservation decisions are made in this area. Moreover, two urban centers in the region (Çanakkale and Balıkesir) are not included in the first scale level, which presents an opportunity for further analysis at the bioregional level.

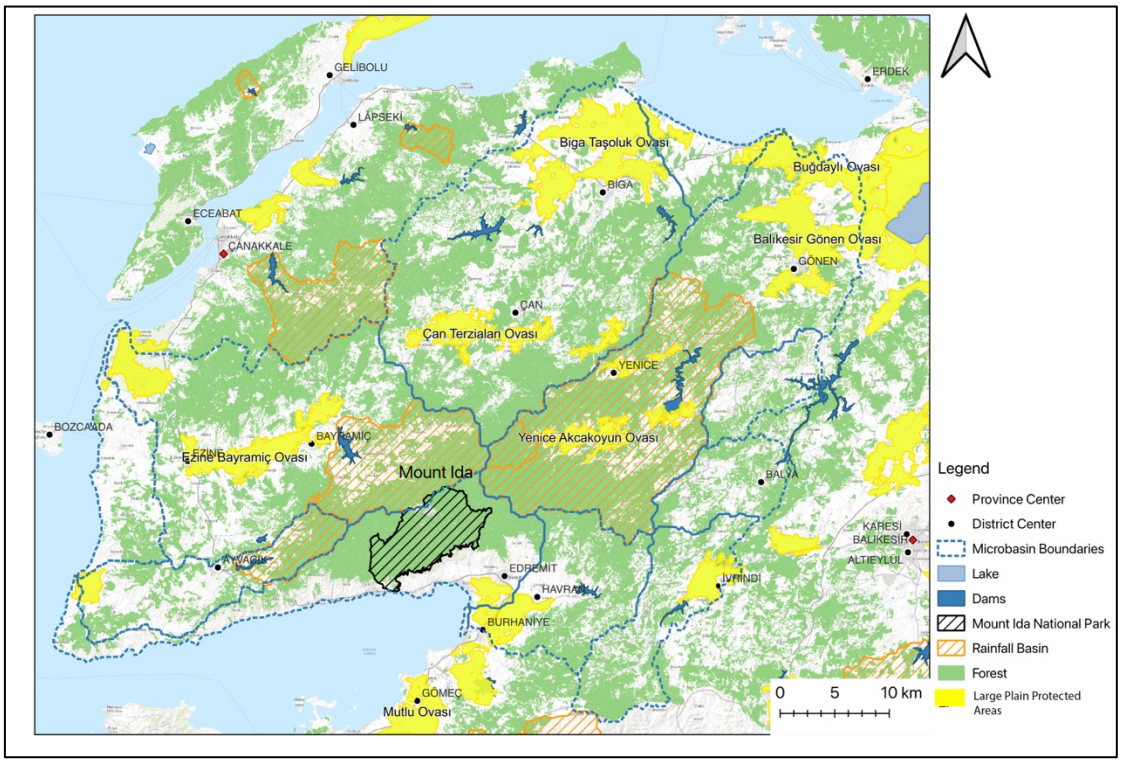


Figure 27:Defined Research Area (Mount Ida and Related Microbasins)

(Source: Prepared by using 2013 data from Ministry of Environment, Urbanization and Climate Change, 2023 data from the General Directorate of Nature Conservation and National Parks, 2024 data from Ministry of Agriculture and Forest, 2024 data from General Directorate of Mapping, and 2024 HydroBASINS data)

2. Karabiga Peninsula:

This conservation proposal has already been discussed in the literature and in the CSOs report with various versions. The study recommends that the region should encompass the Balıkesir center, the Manyas Lake, and the Çanakkale strait (Table 10). Notwithstanding the existence of plans such as the Integrated Coastal Plan, which take into account coastal integrity, the terrestrial integrity of the region, the loads and wastes sourced from the development of related regions, the consideration of these factors remains inadequate. The periphery of the defined research scale is subject to significant industrial and mining pressure, particularly in the Madra Mountain, Lapseki and Bandırma. In consideration of the growth directions of urban built-up areas, the expansion of sectors, the decisions related to the sustaining and threatening ecology in the protected and natural areas, and their interconnection with coastal protection, it would be beneficial to consider these regions when making plan decisions.

3. Susurluk - North Aegean - Marmara basins (including Marmara islands SEPA - Saros Bay SEPA and important Global Safety Network areas):

Mount Ida and defined research area are situated within the main basin boundaries of North Aegean, Susurluk, the Marmara basin. The Northern Marmara basin is seperated in terms of terrestrial boundaries. In light of the absence of consideration of groundwater interactions between basins and coastal integrity, it is imperative that a connection between the basins be established, particularly with regard to water allocation and pollution issues. Furthermore, the decisions made in coastal areas and in Special Environmental Protection Areas beyond the coastal zone, such as the Marmara Islands and Saros Bay, to which the basins are connected, are also of significant importance for the protection of terrestrial areas (Table 10). It is thus imperative to evaluate the potential direct and indirect impacts of land use decisions and development strategies in various basins on water use in other basins. Furthermore, the impact of water allocation between basins, considering the basins' individual hydrological cycles, precipitation basins, and projections such as potential droughts due to climate change in the future, should be evaluated simultenously. In addition to the issue of water allocation at the regional scale, another significant concern is water pollution. This is directly linked to the land use decisions made for the regions and the economic roles assigned to the various centers. This situation is also addressed in the plans through the EU WFD, which incorporates

ecological dimensions, particularly with regard to issues such as groundwater pollution and the deterioration of aquatic ecosystems. The reduction of environmental pollution can be achieved by considering these issues at the inter-basin level.

4. Partially visible networks (Food basins supply networks, trade networks such as İstanbul and Bursa, port destinations):

The regions are not defined by a fixed boundary; rather, they are conceptualized as networks. These networks have a considerable impact on the defined research area and other conservation scales. These areas can be exemplified as harbors, city-regions, and metropolises, which serve as useful spatial indicators to assess anthropogenic impacts at a regional scale. The development agency has identified Bursa, Bandırma, Istanbul, Tekirdağ, and Izmir as the most proximate metropolises within the region. These regions may exhibit an overlap with agricultural basins, which enables a analysis of food supply networks in the coastal Mediterranean, the Marmara region, and the Aegean region (Table 10). These networks are important input for BIC analysis and identifying priorities of the defined research area or bioregion. In addition, boundaries such as terrestrial and eco-region areas can be considered in the evaluation of areas with objectives of conservation, such as the creation of a wildlife corridor or network.

5- Invisible networks (Global and export networks):

This classification represents global networks such as production for export, waste, raw material exports and related industries, tourist traffic, market-based conservation funds without requiring a clear geographical connection point (such as where carbon credit used gained in protection areas). Trade-offs and related inequalities can be revealed at this scale.

Table 10. Defined Research Area and Related Conservation Scales

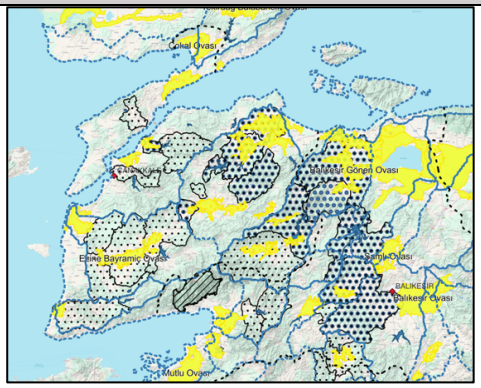
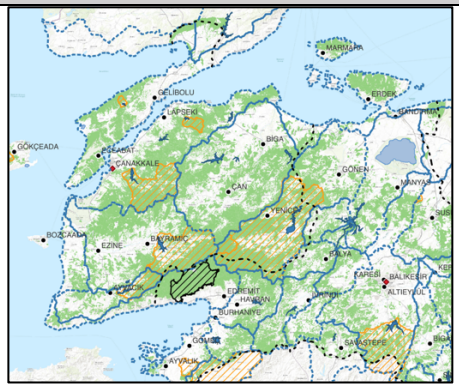
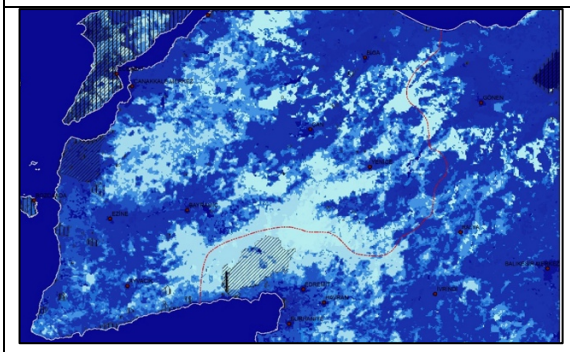
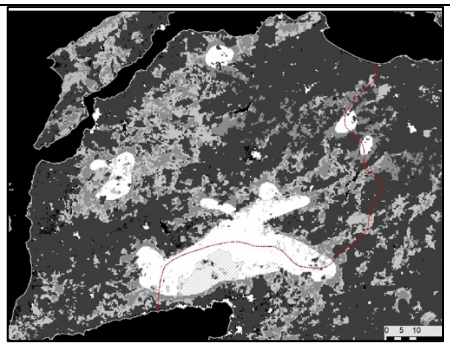
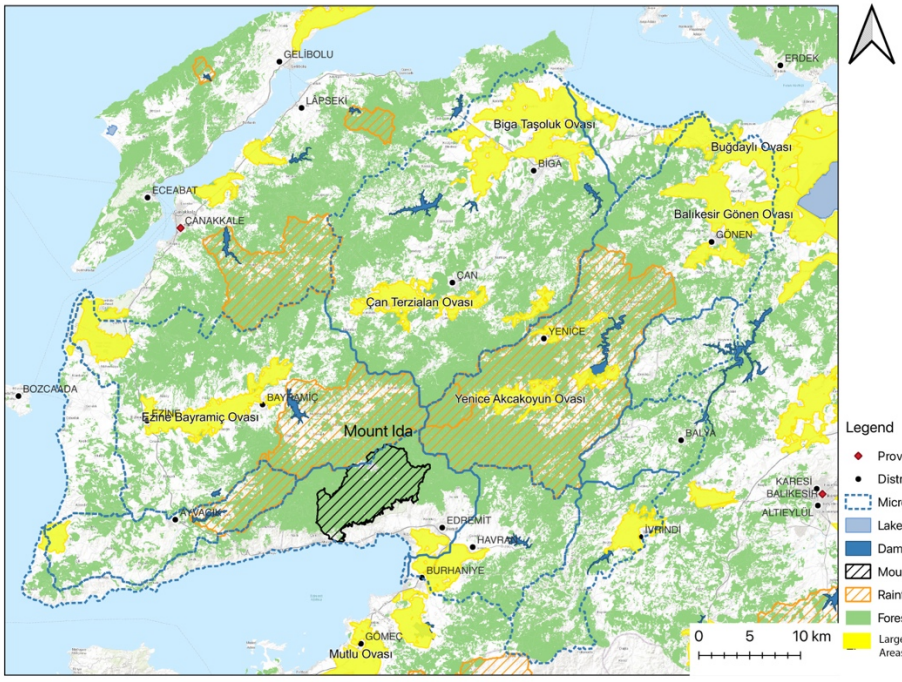
1. Defined Research Area and Parameters	
	
Plain Protected Areas, Sensitive Water Bodies and Microbasins (see Figure 17)	Forest Related Microbasins (See Figure 16)
	
Carbon Storage Areas (see Figure 19)	Important Biodiversity Areas (see Figure 22)
	
Defined Research Area (see Figure 27)	

Table 10. (Cont.)

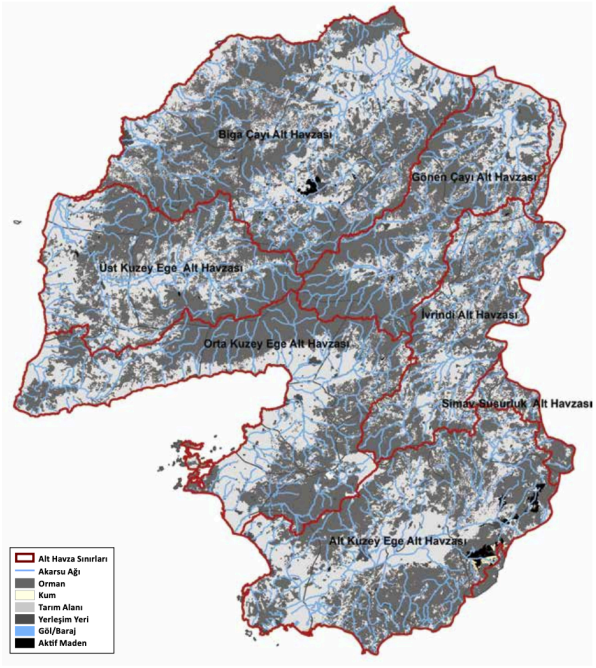
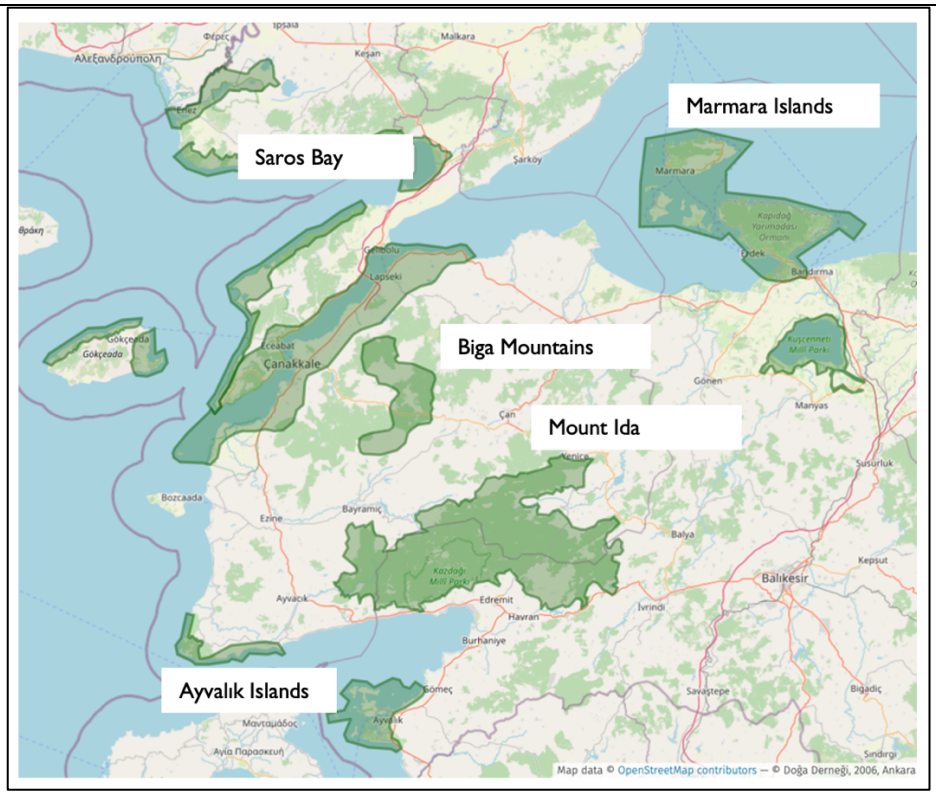
2. Karabiga Peninsula
 **Şekil 8:** Kaz Dağları Yöresi'nde Akarsu Ağı ve Alt Havzalar Stream Network and Sub-basins in Mount Ida 'Natural Region' (TEMA 2020)
 Key Biodiversity Areas around Mount Ida 'Natural Region' (Doğa Derneği 2024)

Table 10. (Cont.)

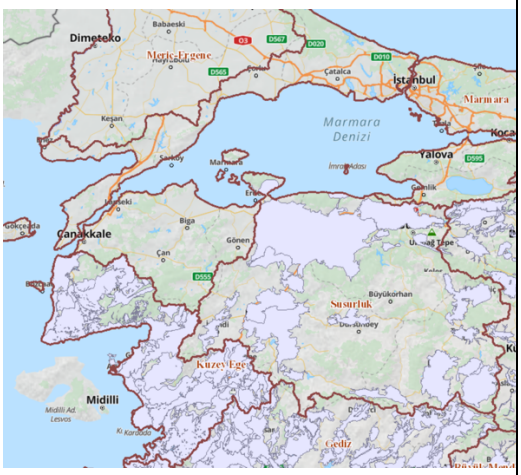
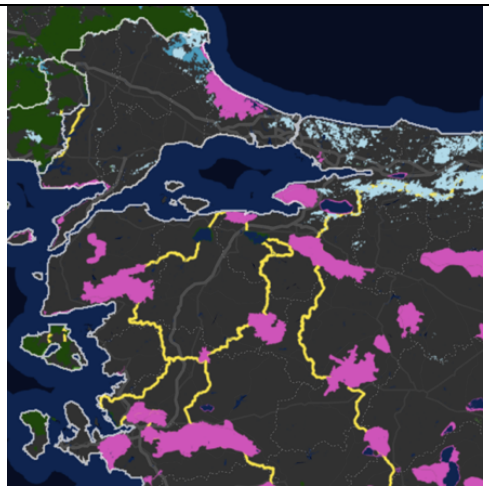
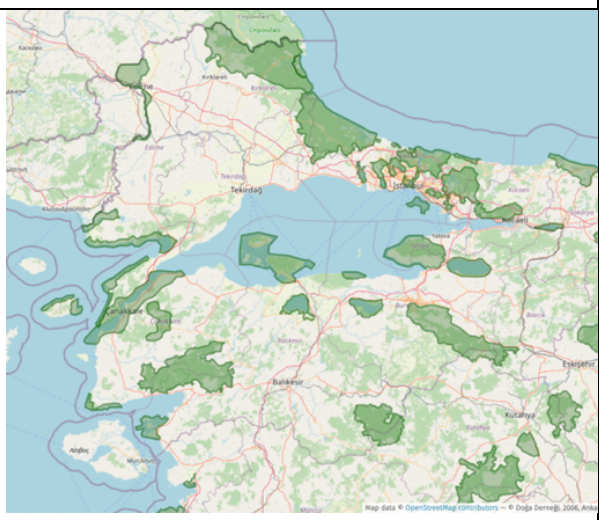
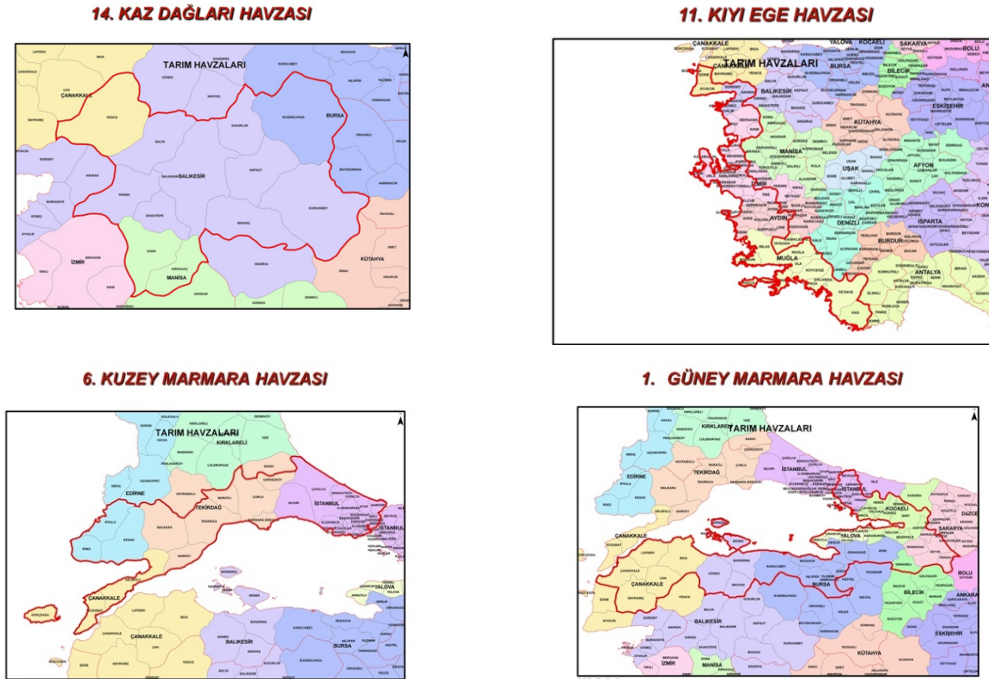
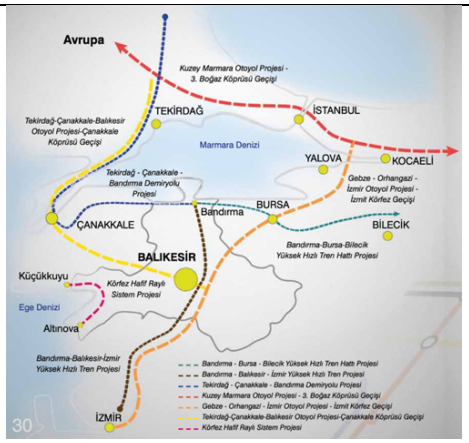
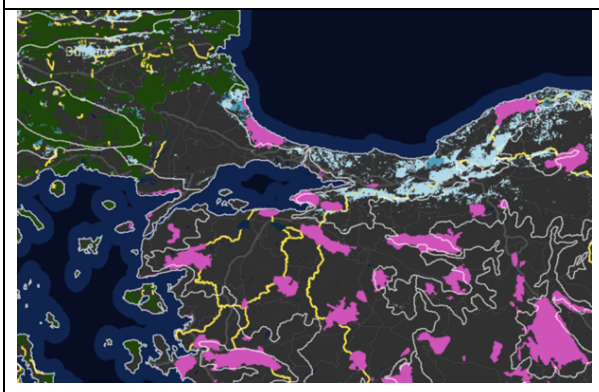
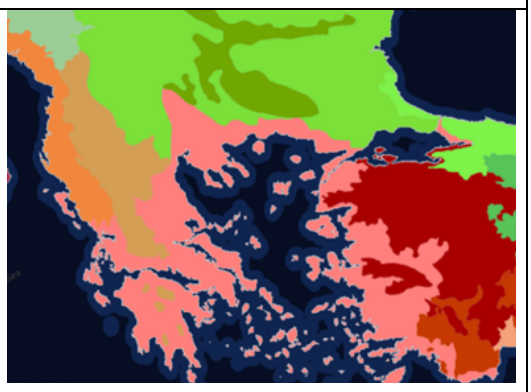
3. Focus Area Related Main Basins	
	
Groundwater Resources in North Aegean and Susurluk Basins (Ministry of Agriculture and Forest USBS 2024)	Focus Research Area Related Main Basins (see Figure 10)
	
Global Safety Net in and around the Three Main Basins (Global Safety Net Initative 2024)	Key Biodiversity Areas in and around the Three Main Basins (Doğa Derneği 2024)

Table 10. (Cont.)

4. Partially Visible Networks
 Agricultural Basins (Ministry of Agriculture and Forest 2024)
 Ports of TR22 (GMKA 2014)	 Logistic Networks (GMKA 2016b)
    Terrestrial and Eco Regions (Global Safety Net Initative 2024)

CHAPTER 6

FOREST AND WATER RIGHT GRABBING 'AROUND' MOUNTAIN IDA NATIONAL PARK

This chapter identifies the socio-environmental problems in the defined research area, with a focus on mining-related deforestation, water, and air pollution. This analysis is based on a synthesis of the findings from the literature review, field research, and an examination of relevant plans and research reports for the area. Furthermore, this chapter examines the spatial distribution of threats surrounding the Mount Ida National Park. Despite the fact that the forests in Mount Ida and the surrounding region are a significant regional source of biodiversity, carbon sequestration, water and oxygen, this area is subjected to considerable mining, industry related to energy production, agricultural production, and export pressures, with the exception of certain privileged parts. Despite water and air pollution being significant concerns in the area, the investment pressure in the peripheral region of the focus research area, particularly in Balıkesir and Bandırma, is relatively high. However, recent observations indicate a shift in this trend, with the emergence of alternative investment proposals.

6.1. Fossil Fuel Plants, Coal Mining and Air pollution

The water-intensive industries of electric production, mineral extraction, and the steel industry are among those that lead to the excessive withdrawal and pollution of water resources (Howe 1968). The cooling and recharging of water at different temperatures constitutes a significant water usage for fossil fuel plants. Moreover, mining activities associated with fossil fuel plants represent a significant environmental concern, particularly with regard to groundwater contamination, surface water pollution, and soil degradation. The operation of fossil fuel plants in the northern regions of the Mount Ida,

specifically in Çan district, and the presence of abandoned coal mines are identified as significant contributors to the deterioration of air and water quality. The quality of water in the region is poor due to the heavy metal contamination such as aliminium from abandoned coal mines and current mining activities, specifically in Çan and Bayramiç (Şanlıyüksel Yücel and Baba 2013; Yavuz and Bakar 2013). Furthermore, Baba and Gündüz (2017) discovered the presence of arsenic in the blood of individuals residing in the Çan and Bayramiç region. Baba et al. (2019) further observed that the level of hair arsenic in Çan was higher than that in Bayramiç, indicating a correlation with the prevalence of mining and industrial facilities in the area. The authors discovered that the arsenic levels in the central districts were higher than those in the villages. Additionally, they posited that the high arsenic levels in Bayramiç may be attributed to the pesticides and fertilizers utilized in agricultural practices. Parlak, Taş and Görişgen (2022) demonstrate that soils in the vicinity of the Bekirli, Değirmencik, and 18 Mart power plants in Çan and Biga have been significantly contaminated with Cd, Cu, Mn, and Zn, as indicated by the pollution load index.

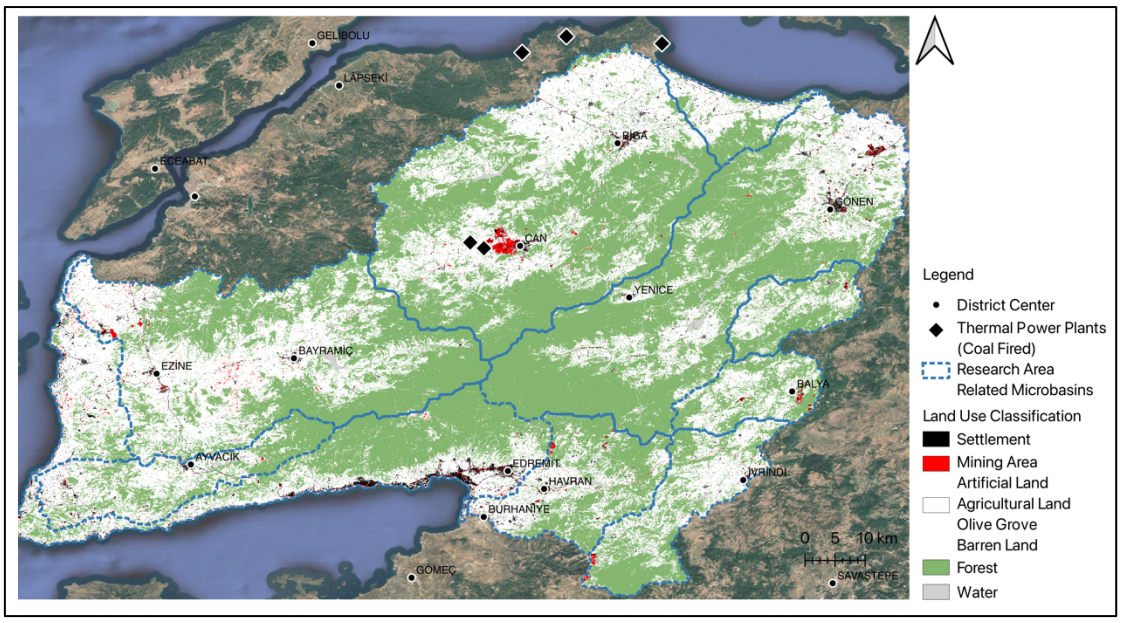


Figure 28. Thermal Power Plants in and around Research Area on Supervised Classification Map for 2024

(Source: Prepared by using Google Earth Engine and 2024 HydroBASINS data)

Five thermal power plants in and around the defined research area utilize coal as a fuel source, with two located in Biga and two in Çan (Figure 29). Additionally, licenses

for various thermal power plants in focus research area, were cancelled. Similarly, licenses for thermal power plants in Lapseki, situated in close proximity to the focus area, were revoked. Balıkesir province encompasses two thermal power plants that operate on coal in Bandırma and Balıkesir Center, with a comparatively lower installed power capacity (Tables 11 and 12).

Table 11: Thermal Power Plants in Çanakkale
(Source: EPDK 2024)

Firm	License Status	License Number	License Start Date	Plant Name	District	Thermal Generation Plant Fuel Type	Plant Information		
							Plant Type	Source Type	Installed Power (MWm)
İÇDAŞ ELEKTRİK ENERJİSİ ÜRETİM VE YATIRIM ANONİM ŞİRKETİ	Under Operation	EÜ/1160-3/833	12.04.2007	BEKİRLİ TERMİK SANTRALİİ	BİGA	Imported Coal	Thermal	Main source	1215,82
İÇDAŞ ÇELİK ENERJİ TERSANE VE ULAŞIM SANAYİ ANONİM ŞİRKETİ	Canceled	EÜ/1447-7/1048	31.12.2007	İÇDAŞ BEKİRLİ TERMİK SANTRALI	BİGA	Other	Thermal	Main source	607,91
ELEKTRİK ÜRETİM ANONİM ŞİRKETİ (EÜAŞ)	Under Operation	EÜ/101-44/020	13.03.2003	ÇAN	ÇAN	Domestic Coal	Thermal	Main source	320
İÇDAŞ ÇELİK ENERJİ TERSANE VE ULAŞIM	Under Operation	EÜ/1435-26/1041	27.12.2007	İÇDAŞ BİGA TERMİK SANTRALİ	BİGA	Imported Coal	Thermal	Main source	410,34
							Solar	Auxliary Source	11,5463
FİLİZ KİRAZLIDERE ELEKTRİK ÜRETİM ANONİM ŞİRKETİ	Canceled (25.07.2024)	EÜ/4301-5/02545	07.03.2013	KİRAZLIDERE TERMİK SANTRALİ	LAPSEKİ	Imported Coal	Thermal	Main Source	1280
CENAL ELEKTRİK ÜRETİM ANONİM ŞİRKETİ	Under Operation	EÜ/4315-42/02574	20.03.2013	CENAL TERMİK ENERJİ SANTRALI	BİGA		Thermal	Main Source	1380
KALESERAMİK ÇANAKKALE KALEBODUR SERAMİK SANAYİ ANONİM ŞİRKETİ	Under Operation	EÜ/4969-155/2855	01.05.2014	ÇANAKKALE	ÇAN	Natural Gas	Thermal	Main Source	25,2
							Solar	Auxliary Source	0,1508
AKÇANSA ÇİMENTO SANAYİ VE TİCARET ANONİM ŞİRKETİ	Under Operation	EÜ/5417-3/03222	31.01.2015	AKÇANSA ÇANAKKALE ATIK ISI ENERJİ SANTRALİ	EZİNE	Process Waste Heat	Thermal	Main Source	16,2
SARIKAYA KARABURUN ELEKTRİK ÜRETİM SANAYİ VE TİCARET ANONİM ŞİRKETİ	Canceled (25.07.2024)	EÜ/6041-4/03415	31.12.2015	KARABURUN TERMİK SANTRALİ	BİGA	Imported Coal	Thermal	Main Source	1340
ÇAN2 TERMİK ANONİM ŞİRKETİ	Under Operation	EÜ/6083-2/03428	28.01.2016	ÇAN-2 TERMİK SANTRALI	ÇAN	Domestic Coal	Thermal	Main Source	340

A proposal for a new thermal power plant in the region, designated the Yenice-Çırpılar plant. The project had been approved with 'EIA positive decision', which included the expropriation of agricultural land for the purpose of coal mining in the region. The request for the extraction of coal reserves and the expropriation of agricultural lands related to the cancelled Çırpılar thermal power plant, in the vicinity of the village of Kovancı, situated just above the Gönen Dam, had been submitted previously,

according to the information gained from the General Directorate of National Estate in Çanakkale (personal interview, June 2023). Due to the objections raised by civil society organizations and local residents, the project was canceled by court decision (TEMA, 2020, May 8). There is also some coal mining proposals in Gönen and surrounding rural settlements, including Tütüncü, Koyuneri, and Sebepli villages (Appendix D).

Table 12: Thermal Power Plants in Balıkesir

(Source: EPDK 2024)

Firm	License Status	License Number	Start Date	Plant Name	District	Thermal Generation Plant Fuel Type	Plant Information		
							Plant Type	Source Type	Installed Power (MWm)
ENERJİSA ENERJİ ÜRETİM ANONİM SİRKETİ	Under Operation	EÜ/1485-7/1080	07.02.2008	BANDIRMA DOĞALGAZ KOMBİNE	BANDIRMA	Natural Gas	Thermal	Main	959,584
							Solar	Auxiliary	17,4805
A.B. GIDA SANAYİ VE TİCARET ANONİM ŞİRKETİ	Canceled (07.06.2011)	EÜ/2132-7/1500	17.06.2009	A.B GIDA BANDIRMA TERMİK SANTRALİ	BANDIRMA	Other	Thermal	Main	137
ETİ MADEN İŞLETMELERİ GENEL MÜDÜRLÜĞÜ	Under Operation	EÜ/4969-196/2896	01.05.2014	BANDIRMA	BANDIRMA	Domestic Coal	Thermal	Main	49,7
ETİ MADEN İŞLETMELERİ GENEL MÜDÜRLÜĞÜ	Under Operation	EÜ/4969-194/2894	01.05.2014	BANDIRMA PRİT	BANDIRMA	Process Waste Heat	Thermal	Main	11,5
KASTAMONU ENTEGRE AĞAÇ SANAYİ VE TİCARET ANONİM ŞİRKETİ	Under Operation	EÜ/4969-195/2895	01.05.2014	BALIKESİR	MERKEZ	Natural Gas	Thermal	Main	31,401
TURYAĞ GIDA SANAYİ VE TİCARET ANONİM ŞİRKETİ	Canceled (30.07.2015)	EÜ/4969-216/2916	01.05.2014	TURYAĞ TERMİK SANTRALİ	MERKEZ	Coal	Thermal	Main	1,62
TÜRKİYE ŞEKER FABRİKALARI ANONİM ŞİRKETİ	Under Operation	EÜ/4969-782778	01.05.2014	BALIKESİR	SUSURLUK	Other	Thermal	Main	9,6
BAĞFAŞ BANDIRMA GÜBRE FABRİKALARI ANONİM ŞİRKETİ	Under Operation	EÜ/4969-29/2729	01.05.2014	BANDIRMA-BALIKESİR	BANDIRMA	Fuel-oil	Thermal	Main	10,75
MAURİ MAYA SANAYİ ANONİM ŞİRKETİ	Under Operation	EÜ/4969-8/2708	01.05.2014	MAURİ MAYA BANDIRMA KOJENERASYON SANTRALI	BANDIRMA	Natural Gas	Thermal	Main	2,07
ALBAYRAK TURİZM SEYAHAT İNŞAAT TİCARET ANONİM ŞİRKETİ	Canceled (15.12.2016)	EÜ/4969-23/2723	01.05.2014	ALBAYRAK BALIKESİR KOJENERASYON TESİSİ	MERKEZ	Fuel-oil	Thermal	Main	10,25
ENERJİSA ENERJİ ÜRETİM ANONİM ŞİRKETİ	Under Operation	EÜ/5117-1/03066	10.07.2014	BANDIRMA II DOĞALGAZ KOMBİNE ÇEVRİM SANTRALİ	BANDIRMA	Natural Gas	Thermal	Main	614,3
							Solar	Auxiliary	11,8805
BUPİLİÇ ENTEGRE GIDA SANAYİ TİCARET ANONİM ŞİRKETİ	Under Operation	EÜ/6153-17/03462	17.03.2016	BUPİLİÇ SANTRALİ	BANDIRMA	Natural Gaz	Thermal	Main	2,056
VARAKA KAĞIT SANAYİ ANONİM ŞİRKETİ	Under Operation	EÜ/6660-5/03613	31.12.2016	ALBAYRAK BALIKESİR KOJENERASYON TESİSİ	MERKEZ	Imported Coal	Thermal	Main	42,227

Furthermore, land use decisions are being made in the research area that may result in increased water use and water and air pollution. Existing industrial and energy production zones are being expanded through zoning changes. For instance, the thermal power plant in the Karabiga Port was designated as a private industrial zone of İÇDAŞ in 2019 by the amendment of the Çanakkale-Balıkesir Environmental Plan (2015) through a presidential decree (Çanakkale – Balıkesir Environmental Plan Amendment Report 2019). In addition, the Gönen Dam serves the industrial zone in Bandırma, which is to undergo expansion in accordance with the Çanakkale-Balıkesir Environmental Plan. According to the General Directorate for Water Management (2017), the allocation of water from the Gönen-Yenice to the region to Bandırma is to be implemented.

The necessity of these projects in the region is justified by the potential economic contributions they will make. According to the discourses, at the national level, they can contribute to economic growth through the extraction of raw materials and the energy production processes. At the local level, they can provide employment opportunities for residents in the surrounding settlements. On the other hand, some of the thermal power plants utilize imported coal (Tables 11 and 12). A report about the Gönen Dam basin indicated that Çırpılar project will create employment opportunities in the regional economy based on a poverty analysis conducted in Yenice (General Directorate for Water Management 2017). However, the study also indicates that this poverty is a consequence of land acquisition and irrigation, and that the majority of the population owns land (see Akgiş and Akbulak 2015). Additionally, both this report and the Chamber of Agricultural Engineers' (2019) report address structural issues within the agricultural sector such as production costs. Conversely, the residents of the neighboring communities voiced opposition to the construction of the Çırpılar-Yenice thermal power plant. The villagers' objections were based on concerns regarding the potential environmental and public health impacts of the project, particularly the risk of lung cancer and other respiratory diseases. Additionally, they highlighted the threat to their agricultural activities (TTB 2017; 350 Türkiye 2022).

The review of the fieldwork and an examination of the EIA reports indicate that these mining activities are typically conducted in forest areas or agricultural land through the purchase of land, rather than through expropriation (see Appendix D). Furthermore, interviews conducted during the fieldwork revealed that a family residing in Çan purchased land from a mining company (personal interview, May 2022). According to the General Directorate of State Property in Çanakkale, there have been no expropriation

decisions for energy production activities except for decisions related to sustainable energy investments. There was a demand for the expropriation of certain parcels of land for the coal mine situated in the vicinity of Kovancı village, Yenice district (personal interview, June 2023). As stated in the EIA report of the Çırpılar thermal power plant, expropriation and the purchase of additional lands were planned for the Çırpılar coal mine.

One contributing factor is the air pollution generated by the Çan thermal power plant. Thermal power plants are a source of pollution in the region. While it is acknowledged that the number of cancer cases in the vicinity of Çan is on the rise, the Turkish Medical Association report also highlights the potential health risks associated not only with thermal power plants but also with air and water pollution during the extraction of minerals (Yavuz and Bakar, 2013). Some of the residents of Çan and the plant workers expressed concern about the potential for air pollution. In an interview, the wife of a worker stated that her husband commutes daily from the center of Çanakkale to Çan for work. Nevertheless, they have no intention of relocating to Çan. This is due to the fact that her sister, who resides in Çan, succumbed to cancer, and the worker is concerned about the potential health risks associated with air pollution for their children (personal interview, May 2022).

Figure 29. A Photograph of the Çan Thermal Power Plant

(Source: Author's Archive, May 2022)

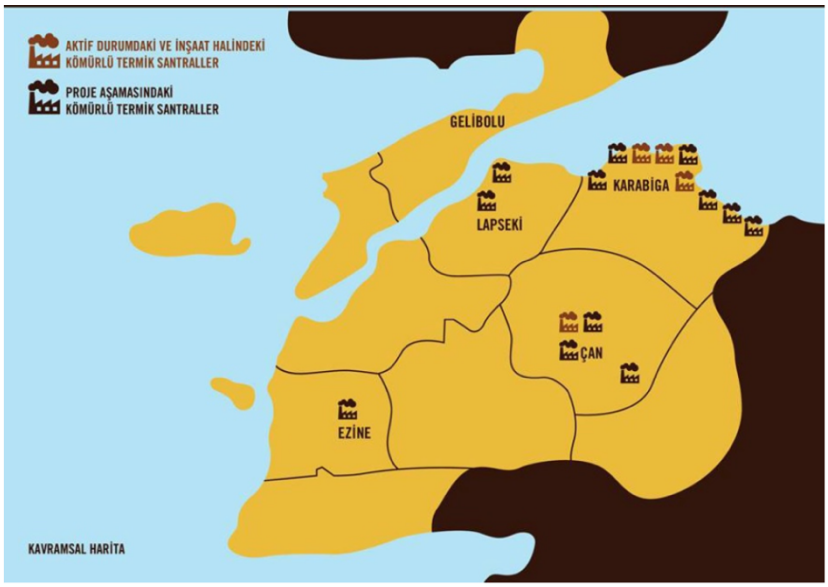


Figure 30. Active and Planned Thermal Power Plants in Çanakkale

(Source: Myllyvirta and Katısöz 2017, 7)

As demonstrated in the air pollution modelling study examining the impact of existing and planned thermal power plants in Çanakkale (Figure 30) conducted by Myllyvirta and Katısöz (2017), thermal power plants contribute to the formation of toxic particles in the air due to the emissions of NO2, SO2, and dust particles. Exposure to NO_2 can contribute to the development of lung cancer, stroke, heart disease, and respiratory illness, ultimately increasing the risk of mortality. According to the model results of Myllyvirta and Katısöz (2017), the impact is predominantly apparent in the vicinity of thermal power plants, such as Biga and Çan; however, the effect is not confined to these areas, extending throughout the region. In particular, it persists in the central region of Çanakkale, Ezine, and the Gallipoli peninsula, and then to Bandırma and Gönen. The planned power plants may potentially elevate PM2.5 levels in the region by up to 10-18 $\mu g/m^3$, which represents a 50-150% increase in the average annual levels. Furthermore, it is asserted that emissions from coal-fired power plants will have an adverse impact on agricultural and ecologically significant regions due to acid deposition and the accumulation of fly ash containing heavy metals. It is estimated that acid deposition will be in the range of 20-80 kg/ha, while fly ash deposition is estimated to be approximately 10-20 kg/hectare in the extended spatially affected areas (see Figures 31-33). In and around the northern part of the Mount Ida, an area with a reputation for its natural landscape nad clean air, activities that result in both air pollution and water pollution persist.

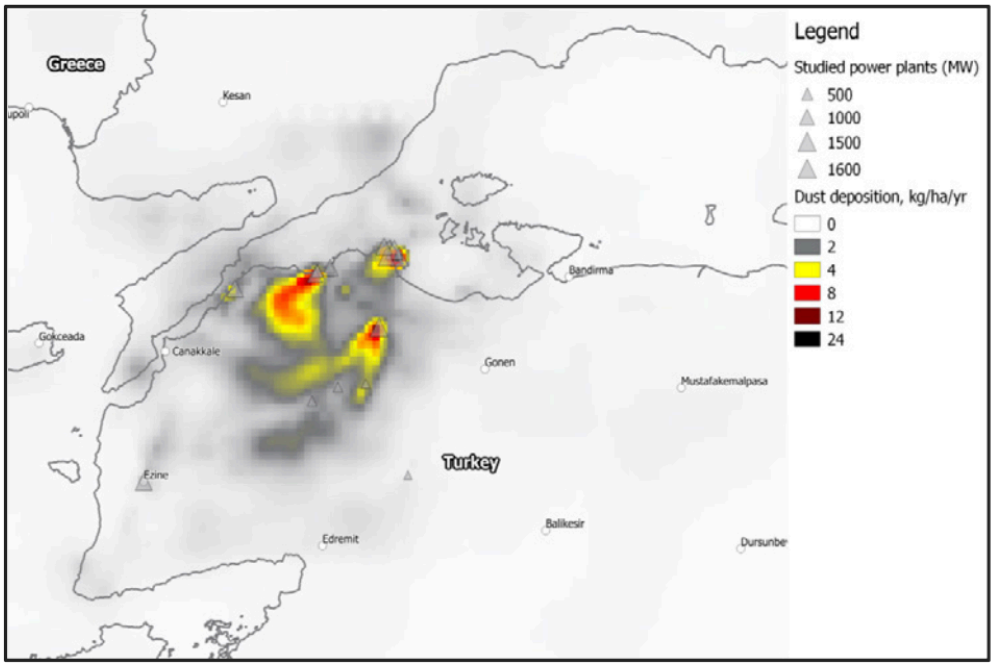


Figure 31. Estimated Fly Ash Accumulation from Planned Coal-Fired Power Plants (kg/ha/year)

(Source: Myllyvirta and Katısöz 2017, 16)

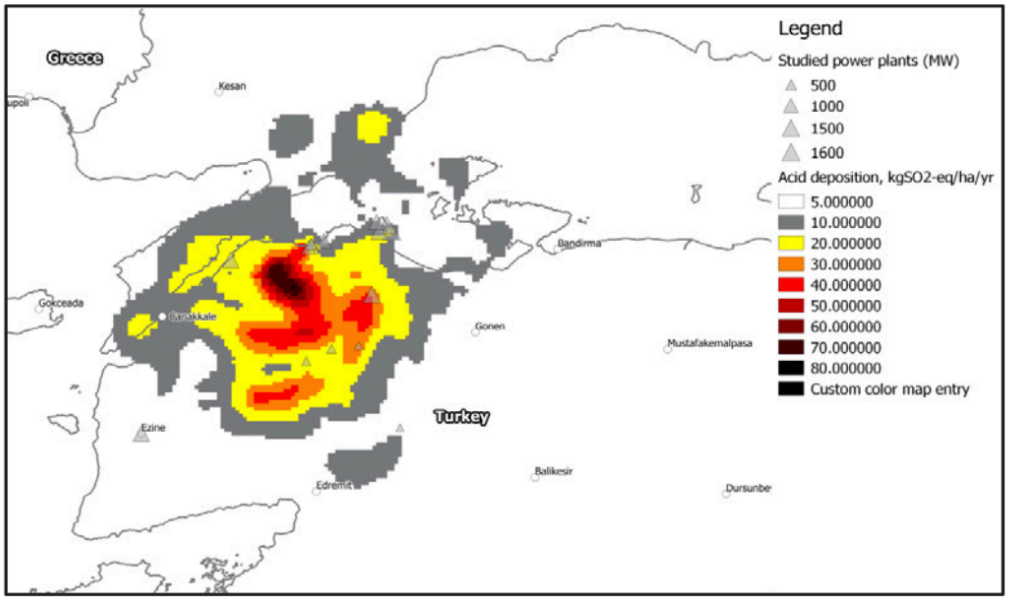


Figure 32. Estimated acid deposition (SO2 equivalent) from planned coal-fired power plants (kg/ha/year).

(Source: Myllyvirta and Katısöz 2017, 15)

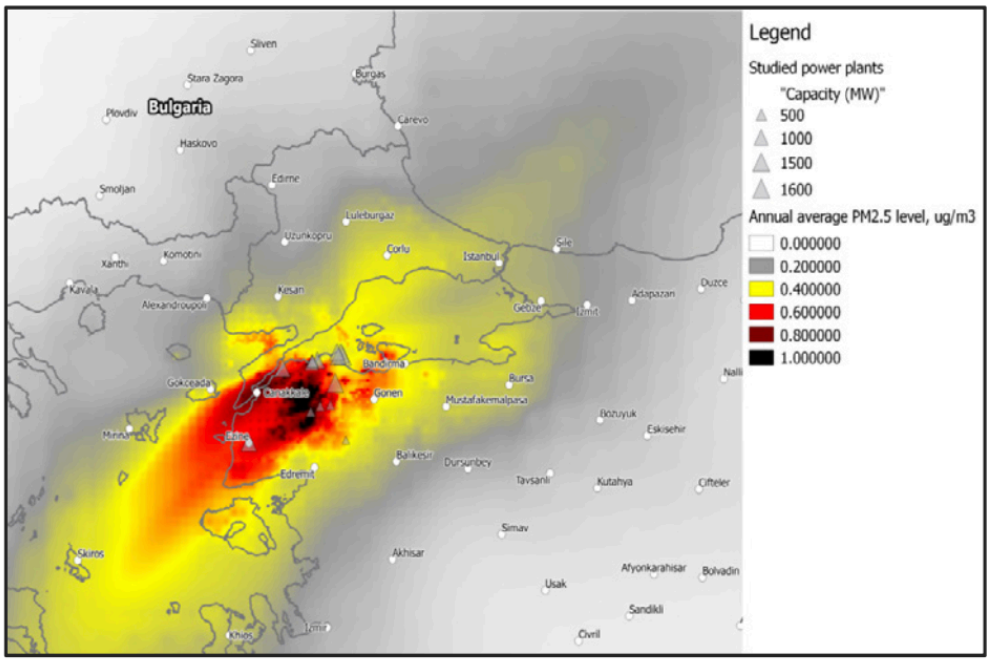


Figure 33. Estimated Annual Increases in PM2.5 Concentrations (µg/m3)

(Source: Myllyvirta and Katısöz 2017, 12)

6.2. Mining activities

Mining activities and exploration in the region have a history dating back to the 1980s. Mining activities, particularly those involving coal, zinc, and lead, are concentrated in the Çan and Havran districts. Additionally, gold mining exploration activities have been noted for many years (Yavuz and Bakar 2013). According to TEMA's (2020) report, approximately 79% of Mount Ida Natural Region, encompassing not only Gönen and Balya but covers Ayvalık, Bergama, Kınık, and Soma, has been subjected to gold and coal mining activities for an extended period, has been allocated licenses for mining operations (Figure 34).

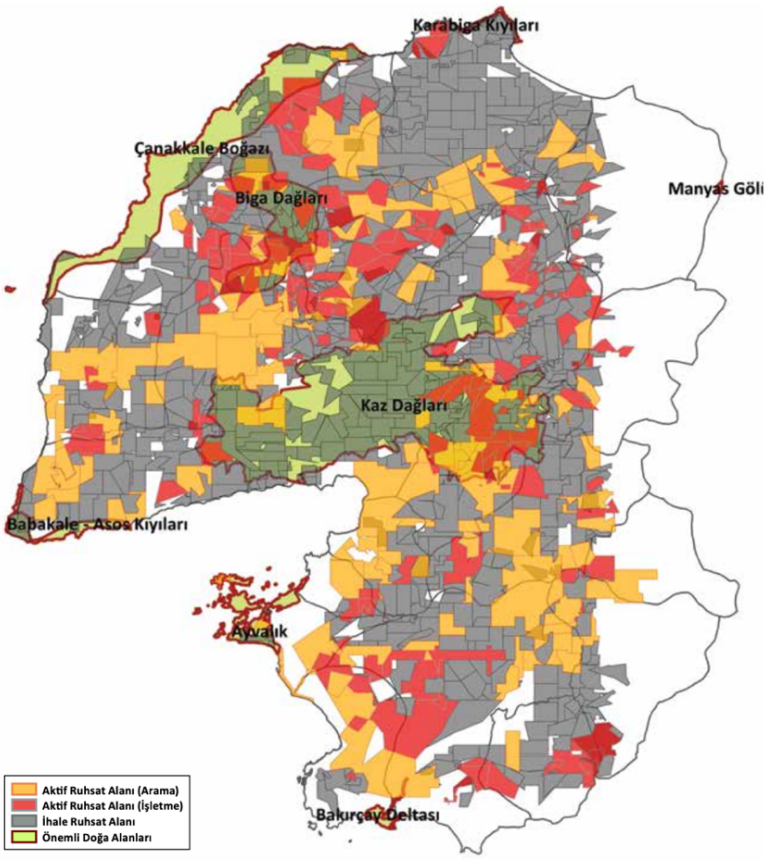


Figure 34. Distribution of Mining License Areas in Key Biodiversity Areas in the Mount Ida Natural Region

(Source: TEMA 2020, 31)

The types and spatial distribution of the current mining license area and the proposed mining activities in the research area were analyzed. The digital data of mining license includes type and status of licenses in 2023 were obtained from MAPEG. Company and license information is provided in the mining license digital data. Previously obtained pre-exploration, detailed search, operating licenses are available in the map of mining licenses. Most of the natural areas not only in Mount Ida but also in Biga Peninsula have been licensed for mining exploration, operation or tender (Figure 34 and 36). In general, IV. group mining (gold, copper, silver, etc.) and geothermal mining are intensified in the research area (Figure 36). Group II mines are located in relatively smaller license areas and generally occupy most of the license are (Figure 35). These mining activities are associated with the loss of forest and agricultural land.

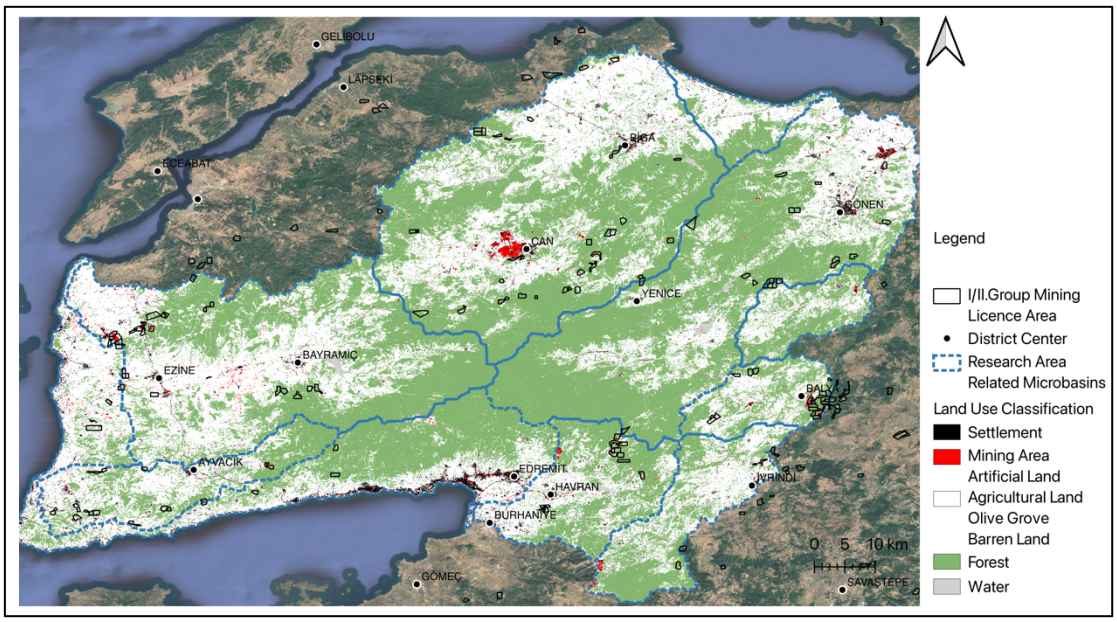


Figure 35. II. Group Mining License Areas on Supervised Classification Map for 2024

(Source: Prepared by using Google Earth Engine and 2023 mining license data from MAPEG)

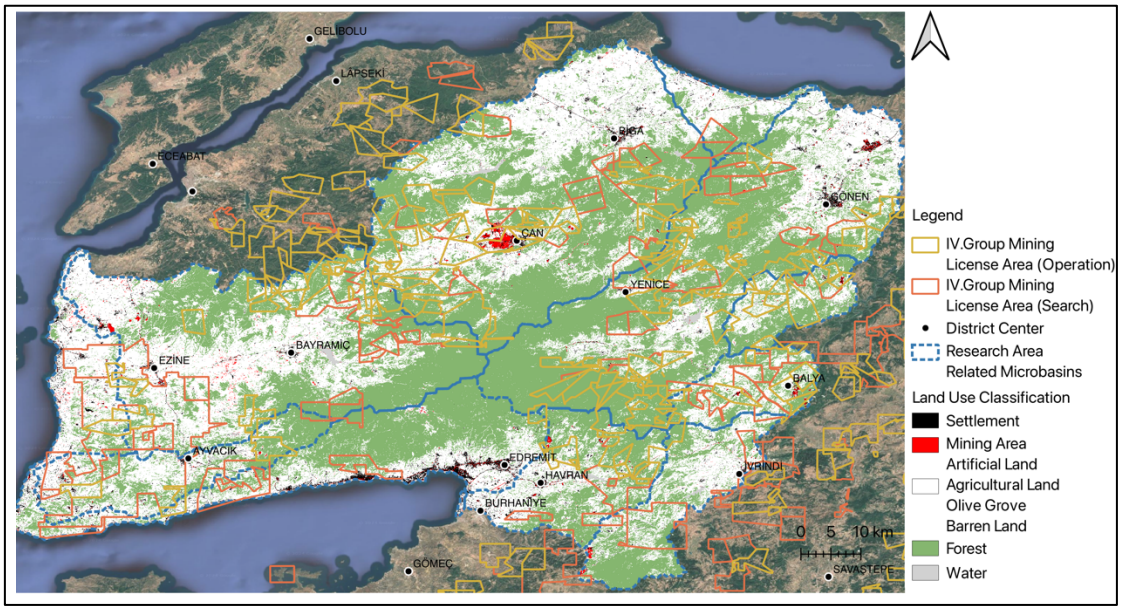


Figure 36. II. Group Mining License Areas on Supervised Classification Map for 2024

(Source: Prepared by the author using Google Earth Engine and with 2023 mining license data from MAPEG)

The total area covered by Group IV mining licenses, which includes both operational and exploratory activities, is 342,019 hectares. The total area covered by Group II mining licenses is 5,981 hectares within the research area. The mining license area data were then overlapped with the created supervised classification map (the creation of supervised classification model is examined in Chapter 6.6). Generally, Group IV mining license areas overlap with forests and agricultural lands. However, only a small percentage of these areas, approximately 9%, intersects with existing mining zones or built-up areas. Similarly, Group I-II mining license areas predominantly overlap with forests, with only 11% of the total area intersecting with existing mining or built-up areas (see Figures 35 and 36).

The active Group IV mines in the focus research area were analyzed in particular. Although the license areas for this group of mines are quite large, they may cover only a small portion of the operating areas. It may be misleading to make an estimate based on the size of these license areas. Besides, some of the mining license area is shown as under operation status, despite the absence of active operations. Some of them have not yet started any exploration or operational activities.

It was necessary to obtain information regarding active mining activities or proposals related to mining licenses. The analysis of the proposals and impacts regarding the operation is important for both the ecosystem service scenarios and the BIC analysis. For this purpose, the mines in the EIA process for the research area are listed and then associated with GIS data on mining licenses, media scanning, EIA reports for verification, and analysis of the information. 51 EIA reports were collected from the official websites of the Ministry of Environment, Urbanization and Climate Change (eced-duyuru.csb.gov.tr), and the location of mining licenses, ownership and the status were compared to the digital mining license data. The locations of active mining areas were confirmed by also current and historical satellite imaginary. The objections and reactions against to mining initiatives from CSOs and local people were also detected by CSO reports and media research. Tables were created to summarize information of mining activities around Mount Ida (Appendix D and Appendix E).

EIA reports were collected for Group IV mining activities in the Yenice, Bayramiç, Çan, Ezine, Ayvacık, Havran and Biga districts of Çanakkale and the Gönen and Balya districts of Balıkesir. In addition, partial information on capacity expansions and exploration activities related to old mines was obtained during this phase. However, it should be noted that the EIA reports are not available before 2017. For this reason, a

supervised classification map was created using Google Earth Engine. The model predicts the existing mining activities with some errors (see Chapter 6.6). Moreover, the list of investments given that 'EIA is not require' decisions in Çanakkale district was accessed that include between 2006-2018. This list was also used in the data validation process. In this period, 398 mining (include all type) and mining exploration projects gave 'EIA is not required' decision (Çanakkale Governorship, Provincial Directorate of Ministry of Environment, Urbanization and Climate Change, 2018).

As it can be seen from the corresponding table, the EIA process has been started for mining investments on approximately 6, 500 hectares of land after 2017. The proposed mining operations for Group IV covers approximately 5,600 hectares, which includes the general operational area. It should be noted that the area does not include those whose licenses have been revoked. However, instances in which investors withdrew their involvement in the project themselves were included in the calculations, because they have option to address the identified shortcomings and reapply. The table included after the 2017 EIA process contains some missing data for certain mining areas (Appendix D).

The findings indicate that the extraction of gold, copper, feldspar, and coal is predominantly occurring on forests and agricultural land. As can be seen from the list, lignite mining activities for use in thermal power plants in the region continue with proposals to increase capacity. The initiatives of new companies regarding coal mining continue with the promise of the rehabilitation of the acid ponds (Appendix D). The region is confronted with the issue of acidic mine drenaiges, a prominent example of which is the abandoned coal mine in Çan district. A copper mine in Yenice - Havran, which was closed in 2018, was subjected to tree-planting activities as part of a restoration initiative. Additionally, there exist both active and abandoned zinc and lead mines in the district of Balya.

On the other hand, it is known that various minerals such as copper, lead, zinc, quartz and feldspar have been extracted in the region for many years. While the existing mines generally continue their activities with proposals to increase capacity, exploration activities are being carried out by various companies around the old mining areas or EIA processes are being applied for these activities. In the license area of the underground quarry, where lead-zinc is currently being mined by the CVK Madencilik, there is also a capacity increase project in the forest area on the Yenice-Havran border. There are also various operations and proposals of the company in the research area such as a zinc-copper open pit mine on the Kalkım side. On the other hand, a company received a

decision that ‘EIA does not required’ for the expansion of the gold quarry previously owned by TECK Resources Ltd. in the forest area in the water catchment area of Havran Pond (Appendix D).

Recently, Truva Mining Ltd. has initiated preparatory activities on the site for the extraction of copper and gold as by-products in the forest area, which is a significant carbon sequestration area in Bayramiç. The EIA report of the project states that DSI will build ponds for mining and agricultural use. The construction of these irrigation ponds is presented as a compromise to address concerns raised by local residents, ensuring their access to water resources. However, the land of the villagers can be expropriated to construct the ponds that would serve to partially allocate water for the mining process (Hacıbekirler 1-2 ponds). It is also known that the company wants to buy the land of the villagers if the mining preparation continues (Evrensel, 2024, October 16). Notwithstanding the ongoing judicial proceedings against the ‘EIA is positive’ decision, preparations in Bayramiç or Ağı Mountain, situated in the northern region of Mount Ida, persist. The cutting of forests in the area started first for the construction of ponds and currently for the mining activities (Evrensel 2023, August 4; Birgün 2024, November 5).

Figure 37. A Mining Site on Yenice – Balya Road

(Source: Author’s Archive, May 2022)

Figure 38. Mining Sites on forests on Yenice – Balya Road

(Source: Author's Archive, May 2022)

Figure 39. A Zinc and Lead Mine Site in Balya

(Source: Author's Archive, May 2022)

While it is known that there are gold quarries operating in Lapseki and Merkez around the area, there is also an existing gold quarry in the Yenice/Armutçuk -Havran part of the Mount Ida forest area, and it is known that various companies have proposals to extract gold and silver quartz mines in licensed license areas around this area. Satellite data on drilling exploration in the area was also obtained. Again, these areas have been confirmed by EIA reports (Figure 40; Appendix D). On the other hand, it is also reported

that MTA and various firms has conducted gold mine exploration in various years (Yavuz and Bakar, 2013). Furthermore, current threat is geothermal power generation and uranium extraction for nuclear power plant in the focus research area. MTA was conducted uranium search operations in Ayvacık around Gargaria ancient site (Akdemir 2022, July 1).

Figure 40: Satellite Image of a Gold Mine Site and Search Drilling (Before 2013) in Büyükşapçı – Havran
(Source: Google Earth 2024)

As can be seen from the list, mining activities in the region are generally carried out with 'EIA is not required' decisions. CSOs in the region are challenging these decisions and 'EIA is positive' decisions. On the other hand, villagers living near the mining activities have reacted to the attempts with protests and objections. The distance from the settlement is not important, as the quality of the surrounding waters has been negatively impacted by pollution, and the forest cover has been significantly reduced (Appendix D).

In recent years, despite the presence of an environmental movement and protests against the gold mining proposals and the beginning of operating activities in Kirazlı Mountain near Mount Ağı and Bayramiç, there has been an increase in the number of EIA proposals. Indeed, the protest and objections of CSOs and local people has continued for an ongoing period against the construction of fossil fuel plants, coal mining, proposals for new mineral extractions and HEPPs. Political ecology researches have been conducted

on the topic of mining disamenities and objections from local people in the region, particularly in relation to gold search activities (Avcı 2010; Hurley and Arı 2011). Avcı (2010) draw as the profile of the opponents and dynamics. As studies show that generally the discourses of the environmental groups have shaped against foreign exploitation because many companies in the area generally foreign based companies as Canada. After the last large scale environmental movement in Kirazlı, in response to these opposition movements, many foreign companies have transferred their licenses to national large-scale mining companies or continued their activities and proposals with companies based in Turkey. This is also stated in the EIA reports of the companies. While license holders in the region are generally national mining companies, large mining projects are often proposed or carried out by multinational companies and their subsidiaries (Appendix C and Appendix D).

Exposing the mining – energy networks are important to understand the relations between large scale infrastructure or energy investments and their consequences in a regional or country scale with the beneficiary and disadvantaged groups. In this phase, we should mention about the plans and infrastructure of the area shaped through this investments. There are important ports in the research area and at the periphery of the area. There are strategies and investments to facilitate transportation and logistics to the industrial areas and ports in Bandırma, Bursa, İzmir, İstanbul through the highways and bridges (GMKA, 2016a). Lastly, in the Çanakkale-Balıkesir Integrated Coastal Plan (2023), there is proposed dangerous stalling areas in the Edremit bay, and Gökçeada offshore and Bandırma.

6.3. Excessive Geothermal Mining and Pollution

Notwithstanding the challenges associated with the excessive withdrawal of water from coastal areas amd water pollution, there has been a notable rise in geothermal energy production and drilling activities in the region. There are four geothermal power plant in Ayvacık, however, geothermal drilling and capacity increase proposals continue in the area (Table 13). This growth is in alignment with the region's renewable energy strategies. The number of licenses for renewable energy sources has increased in the region, with a

notable rise in bioenergy investments in Balıkesir, particularly in Gönen. Furthermore, following the definition of combined renewable energy or auxiliary source in 2020, renewable energy projects have increased.

Table 13: Geothermal Power Plants in Çanakkale
(Source: EPDK 2023)

Firm	License Status	License Number	Start Date	Plant Name	District	Plant Information		
						Plant Type	Source Type	Installed Power (MWm)
TUZLA JEOTERMAL ENERJİ ANONİM ŞİRKETİ	Under Operation	EÜ/318-12/451	11.05.2004	TUZLA	AYVACIK	Geothermal	Main	7,5
						Solar	Auxiliary	0,08745
MTN ENERJİ ELEKTRİK ÜRETİM SANAYİ TİCARET LİMİTED ŞİRKETİ	Under Operation	EÜ/4052-21/2444	03.10.2012	BABADERE JEOTERMAL ELEKTRİK ÜRETİM TESİSLERİ	AYVACIK	Geothermal	Auxiliary	8,5
YERKA ELEKTRİK ÜRETİM ANONİM ŞİRKETİ	Under Operation	EÜ/9174-5/04432	13.02.2020	İDA JES	AYVACIK	Geothermal	Main	11,75
						Solar	Auxiliary	1,72992
TRANSMARK TURKEY GÜLPINAR YENİLENEBİLİR ENERJİ ÜRETİM SANAYİ VE TİCARET ANONİM ŞİRKETİ.	Under Operation	EÜ/10096-2/04841	25.03.2021	TRANSMARK JEOTERMAL ENERJİ SANTRALİ	AYVACIK	Geothermal	Main	19
						Solar	Auxiliary	0,22182

In Balıkesir, a number of geothermal exploration activities are underway in the districts of Gönen, Sındırgı, Manyas, Ayvalık, and Erdek. Furthermore, an 'EIA is not required' decisions were made for geothermal exploration drilling activities in Lapseki and Çanakkale Center. In focus research area, these activities are concentrated in Ayvacık, and the decision was made that an EIA is not required for most of these activities (Appendix E). The majority of geothermal licenses are concentrated along the Çanakkale-Balıkesir coastline and in Gönen and Manyas districts, are situated in the vicinity of the Manyas Lake (Figure 41).

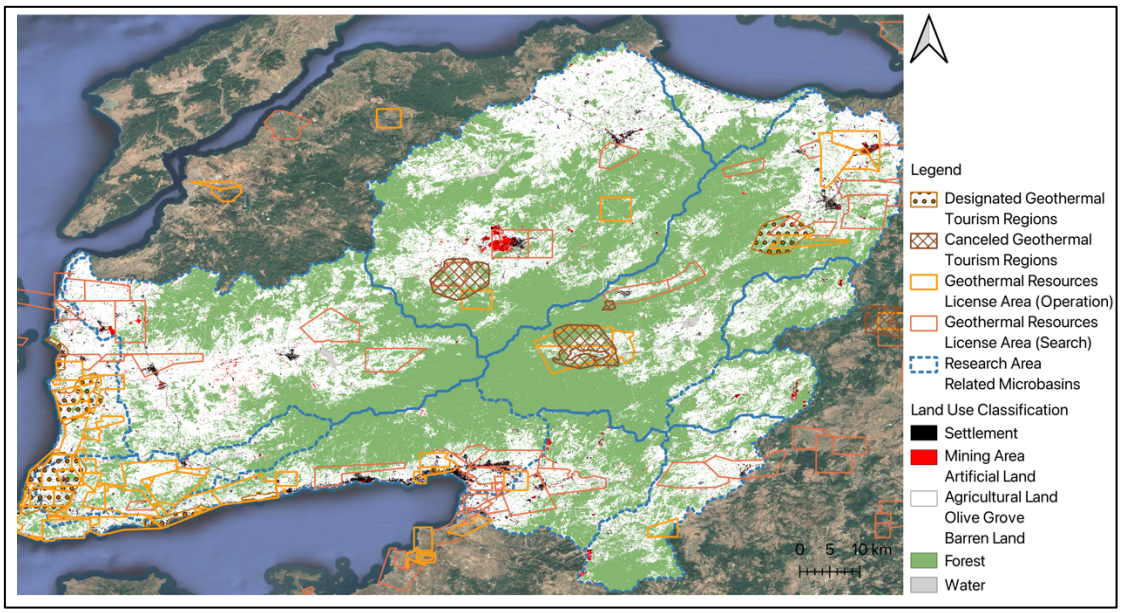


Figure 41. Geothermal Mining Licenses and Designated Tourism Regions on Supervised Classification Map for 2024

(Source: Prepared by using Google Earth Engine and with 2013 data from Ministry of Environment, Urbanization and Climate Change and 2023 mining license data from MAPEG)

The utilization of geothermal resources is currently being pursued in Edremit, situated at the downstream area of the National Park, through the development of thermal hotels. Geothermal resource protection areas were designated along the coastlines of the National Park in Tahtakuşlar and Küçükkuyu. Furthermore, thermal tourism regions had been designated in Ayvacık-Küçükkuyu, Ezine-Geyikli, Çan-Etili, Yenice-Hıdırlar, and Gönen since 2006. Nevertheless, in addition to these plans and strategies for the development of geothermal tourism, some tourism regions, including Yenice-Hıdırlar and Gönen, which are not characterized by touristic facilities and are affected by mining activities, were canceled by presidential decrees (Figure 41). Strategies and plans for the development of the tourism sector have been formulated with a specific focus on the evaluation of geothermal sources.

However, the utilisation of geothermal energy in the region for agricultural or tourism purposes is not a recently developed practice. It is notable that both geothermal drilling and energy production activities, as well as mining facilities, are receiving primary attention with regard to the growth focus in the area. Recently, the Balıkesir-

Gönen region has witnessed the submission of several EIA applications pertaining to the exploration and drilling of geothermal resources, with the objective of utilizing these resources for agricultural purposes. In addition, the number of firms has been proposed for exploration, reinjection, production, and capacity increase for electric generation in recent years. These areas are typically situated within agricultural lands or pastures. Some of the facilities are situated in irrigation areas or on the periphery of protected zones. In general, the number of geothermal facilities intended for tourism and agriculture is relatively low. However, there are instances where these projects have been proposed in areas that have already been designated as tourism regions (Appendix E).

According to North Aegean Surface Water Assessment report, in Tuzla surface water bodies, the water has high heavy metal concentration like aluminum, steel, bromide, titanium caused by land disposal, industrial waste, and other potential pollutants defined by experts like mining. According to North Aegean Groundwater Assessment Report, in Tuzla shows that high concentration of arsenic (34 ug) and mangan are found caused by geothermal (Ministry of Environement, Urbanization and Climate 2020).

According to Baba (2003), the soil formation of the Tuzla geothermal field is comprised of metamorphic rocks, with the alluvium formation representing a younger unit (see Mutzenberg 1997). According to Baba (2003, 102), the geothermal water in Tuzla exhibits a high concentration of metals, including Zn, Pb, As, and Sb. The author proposes an environmental assessment of geothermal activities, taking into account the characteristics of the area. The potential impacts of geothermal fluid include soil contamination, geothermal influx into surface and groundwater, air pollution, climate change, habitat and ecological damage. Additionally, gases such as hydrogen sulfide (H2S) and carbon dioxide can be released, affecting the habitat and human health. The proximity of the area to the coastline contributes to the high salinity of the geothermal source, attributable to the presence of mixed-temperature value fluid within the geothermal field.

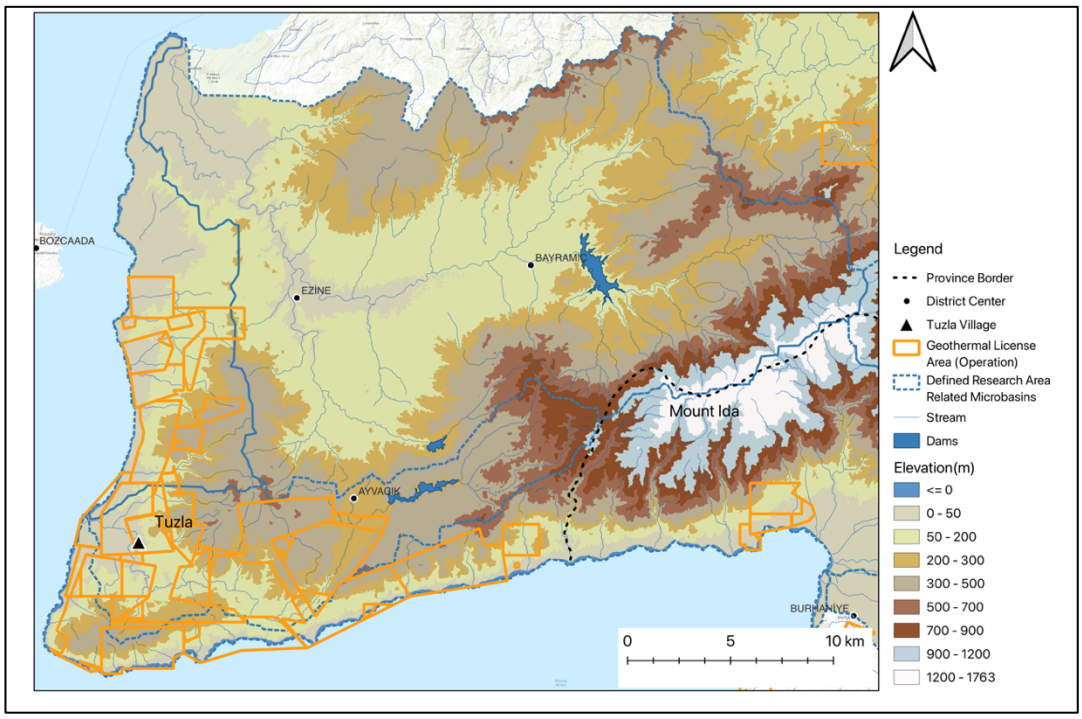


Figure 42. Hydrological Structure of Ayvacık – Tuzla and Geothermal Mining Licenses

(Source: Preperad by analysing DEM data and using 2023 data from MAPEG)

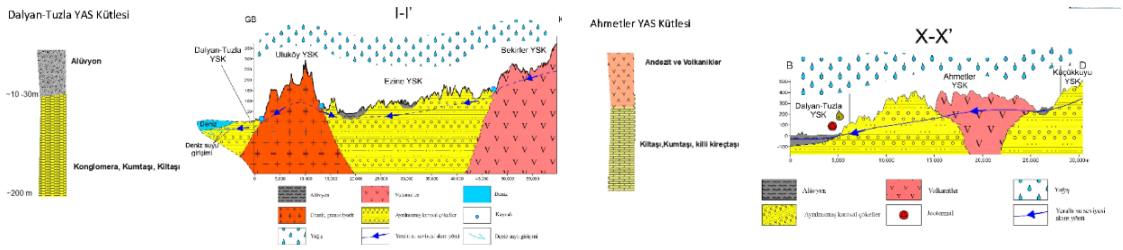


Figure 43. Section of Soil Formation in Groundwater Bodies in Tuzla and related Basin

(Source: Ministry of Environement, Urbanization and Climate Change 2020, 1- 73)

The North Aegean Groundwater Assessment report (Ministry of Environement, Urbanization and Climate 2020) indicates the occurrence of sea water intrusion into the fractures of groundwater bodies. Furthermore, the cross-sections of the groundwater bodies and soil formations of the Tuzla region and related areas demonstrate that seawater intrusion (Figure 43). The arsenic contamination of groundwater in the Tuzla region may

be caused by seasonal sea water intrusion and mixing with geothermal water through fractures (Baba et al. 2009; Bunduschuh et al. 2013, 958).

Geothermal pollution and saltwater intrusion in the area have a significant impact on the waters of the Ayvacık Basin. The research identifies several potential risks associated with the geothermal actvities, including earthquakes, landslides, and the potential for damage to project infrastructure due to geological hazards (Baba 2003). Tuzla region has numerous faults, which are directly associated with earthquakes, fractures, geothermal potential, and saltwater intrusion. Furthermore, other water basins in the region, such as Bayramiç and Çan, have also been affected by mining activities, and the threat persists with the implementation of new strategies. The recently licensed and tendered geothermal plants in Tuzla represent potential threat to the water quality of the region and agricultural activities therein, due to the cumulative impact of the plant and other similar facilities. There is a current report about the cumulative impact assessment guide for Turkey (Ministry of Environement, Urbanization and Climate Change 2020). However, the current EIA processes are insufficient for the assessment and evaluation of activities with cumulative impacts.

6.4. Water Pollution

Both groundwater and surface water quality in three main basins (Marmara, North Aegean and Susurluk) related to the research area water quality is in poor condition and under risk due to mining, industrial facilities and agricultural activities (Figure 44, 45 and 46), but especially heavy metal contamination due to mining activities is a major concern in the focus research area. (Ministry of Agriculture and Forestry 2018; 2020).

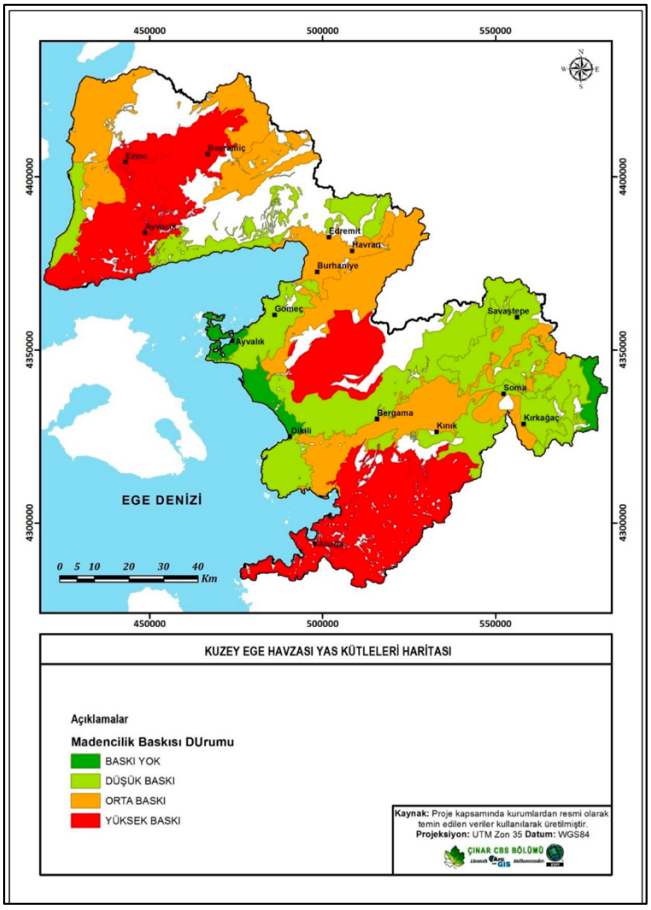


Figure 44. Pressures Due to Mining on Groundwater Bodies in the North Aegean Basin

(Source: Ministry of Agriculture and Forest 2020, 311)

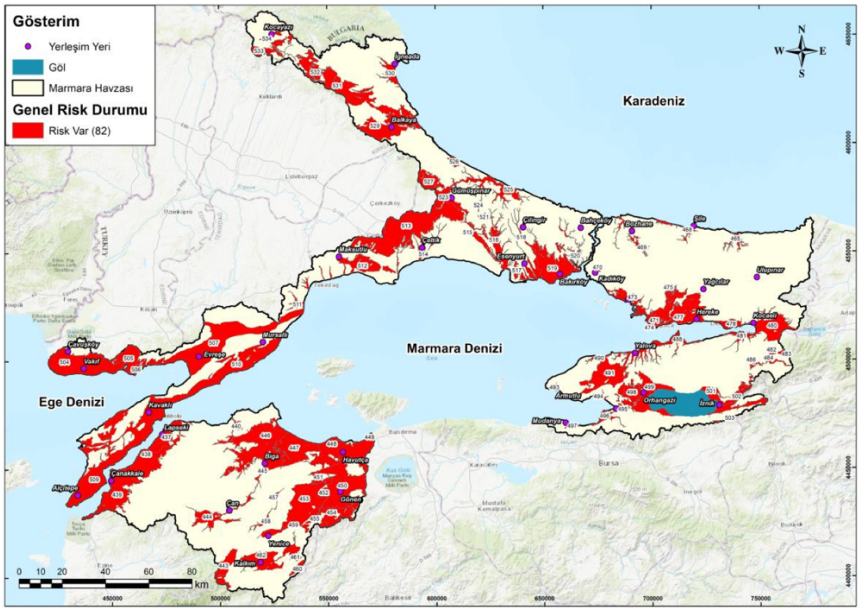


Figure 45. Results of the Final Risk Assessment of the Groundwater Bodies in the Marmara Basin

(Source: Ministry of Agriculture and Forest 2024, 62)

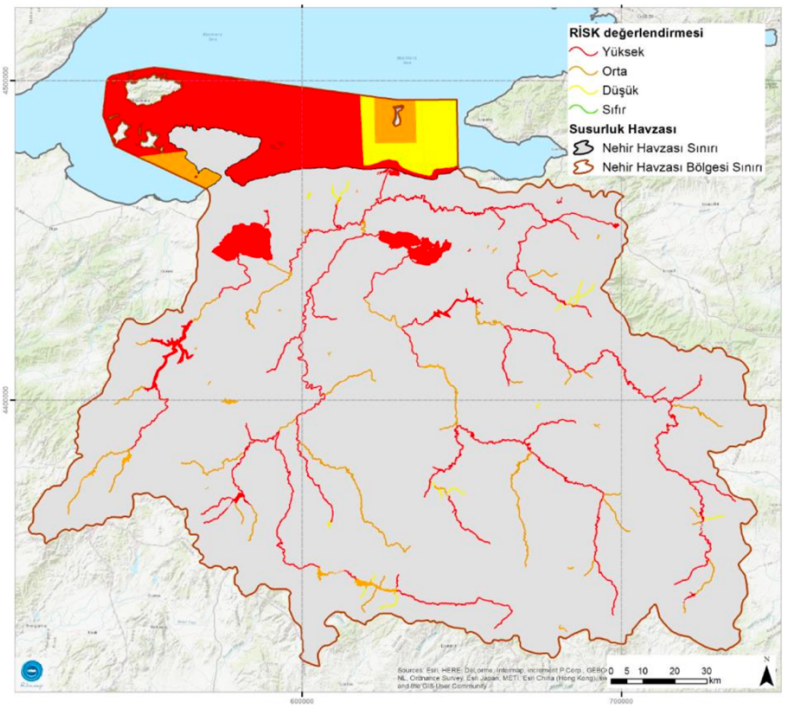


Figure 46. Surface Water Risk Assessment in Susurluk Basin

(Source: Ministry of Agriculture and Forest 2018, 35)

The data set was obtained from the DSI for 20 stations and 54 years in order to conduct a comparative study. The data set was selected for analysis from a number of locations, including around Mount Ida National Park, locations where there is no settlement pressure, and locations in close proximity to dams and irrigation areas, where there is no agricultural activity and minimal urbanization pressure (with the exception of the stations in the Edremit Bay and Gönen Plain). The location of the stations change for two periods, before and after 2015. In particular, data for protected areas and springs are available for the years 2016 and 2019. The remaining station data is available prior to 2016 (Figure 47). As a time series data set, the years 2000, 2005, 2012, and 2015 were analyzed. In some previous studies, the necessity of a more detailed study and data production, as well as the absence of data pertaining to mineral exploration and activities in scientific reports and studies—including the absence of measurements of substances such as cyanide—were mentioned (Yavuz and Bakar 2013). It was observed that data pertaining to heavy metals, including aluminum, arsenic, and nickel, are notably absent, particularly prior to 2015. However, the data sets from 2015, 2016, and 2019 include comprehensive information, including data on heavy metal contamination and cyanide.

The data were evaluated with particular attention to the concentration of heavy metals and the overall quality of the water, as well as to spatial maps showing the results for each year. The objective is to provide insight into factors contributing to the pollution with spatial dependency. At this juncture, the data were evaluated with the findings of the literature review. It is important to note that changes in station locations over time, in addition to the fact that certain parameters, such as heavy metals, are not present in every station, have introduced obstacles to the interpretation of the findings.

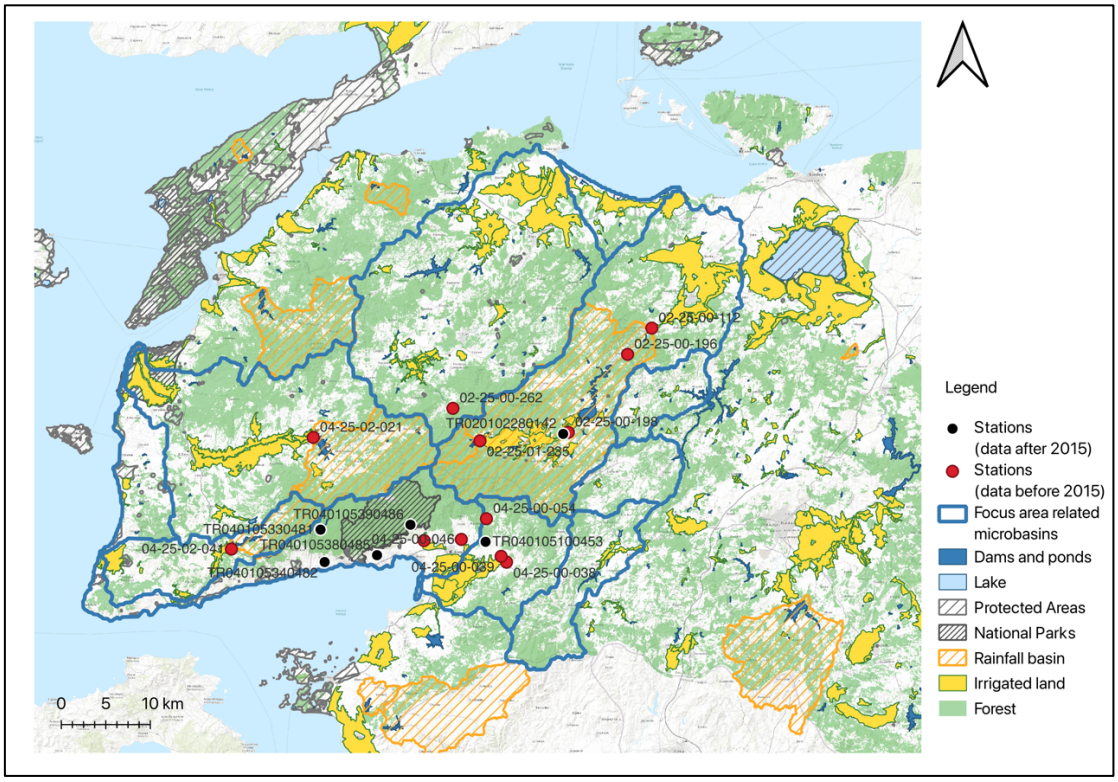


Figure 47. Stations Where Water Quality Data are Obtained

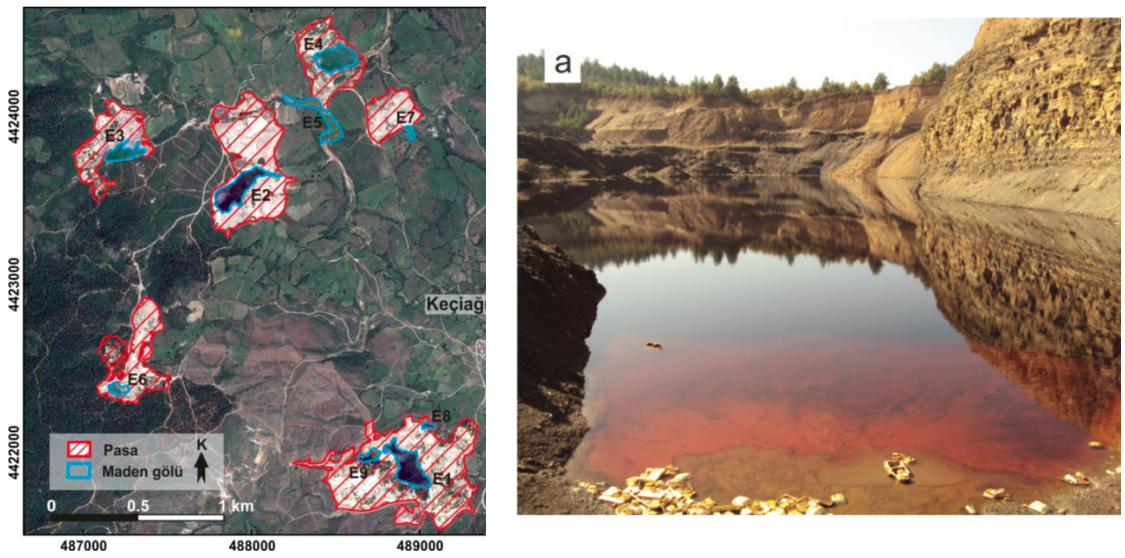
(Source: Prepared by using 2023 data from DSI, 2013 data from Ministry of Environment, Urbanization and Climate Change, 2023 data from the General Directorate of Nature Conservation and National Parks, 2024 data from Ministry of Agriculture and Forest and 2024 HydroBASINS data)

Mineral extraction activities persist in the region, and gold search activities and attempts have continued in the vicinity of Ida Mountain, which has been the subject of significant attention from local communities and CSOs due to concerns about the use of cyanide and potential threats to water and soil resources. In addition to these concerns, scientific researches have been conducted on the effects of cyanide use and leakage in

gold mining, with findings indicating a detrimental impact on the environment and human health (Lázár and Kiss 2001). Nevertheless, the focus area is home to one operational gold mine, which has proposed a capacity increase directly within the Mount Ida forests. In fact, there is a considerable number of copper, zinc, and other mineral extraction activities that have the potential to yield by-products such as manganese and heavy metals. The proposals and capacity increases persist (Appendix D).

The majority of these are located within or in the vicinity of the Mount Ida forests. Mineral extraction represents a significant threat to the region, as it results in the dissolution of dangerous elements into water resources and soils, which in turn leads to the decline of vegetation and the disruption of the surrounding ecosystem. The processes of mineral extraction and operation, such as drilling and blasting, can also have an adverse impact on the environment through the generation of dangerous waste and wastewater. These activities can contribute to the contamination of aquatic ecosystems and pose a risk to the biodiversity and health of aquatic species. The processes of metal and coal extraction can lead to metal toxicity in groundwaters or soil (Taulkder et al. 2023; Yang 2024). In addition, sulfate pollution or leakage of dangerous wastes can occur due to accidents or acid mine drainage (Taulkder et al. 2023). The presence of metal elements, including As, Zn, Cd, Ni, Fe, and Cu, in groundwater, streams, and soil, with potential risks to the environment and public health due to mining activities (Akabzaa, Banoeng-Yakubo and Seyire 2007; Yang 2024).

In a similar vein, the consequences of coal extraction and unrehabilitated open pits have resulted in acid mine drainage, which in turn has contaminated groundwater with heavy metals, thereby endangering human health in the research area. This is particularly evident in the Çan province (Figure 48; Şanlıyüksel and Yücel 2013; Yavuz and Bakar 2013). Additionally, acid mine drainage and its associated effects on water resources were observed in the region surrounding Mount Ida, specifically in the Balya district, due to the mining leading to contamination of Pb and Zn (Gül 2014). Additionally, Şimşek, Gündüz, and Elçi (2012) demonstrate that abandoned mining in Balya has resulted in water contamination and an increase in environmental and human health risks due to elevated levels of arsenic, copper, and lead. The basin reports indicate that the area, particularly in Bayramiç and Çan, is characterized by high levels of aluminum, manganese, and arsenic (Gündüz and Baba 2010; Ministry of Agriculture and Forest 2019; 2020).



(a) (b)

Figure 48. Mine Lakes in Çan – Etili (a) and An Asicid Mine Drenaige in Çan (b) (Source: (a) Şanlıyüksel Yücel and Yücel (2016, 785); (b) Şanlıyüksel Yücel and Baba (2013, 3)

In interpreting these data, the threshold values established by organizations such as the World Health Organization (WHO) and the United States Environmental Protection Agency (EPA) were utilized as a reference point, in accordance with the prevailing literature related to research field. In parallel to the studies conducted in Çan and Bayramiç (Gündüz and Baba 2017), the permissible limit was accepted for arsenic is 10 µg/L, 400 µg/L for aluminum, 200 µg/L for manganese, 20 µg/L for iron, and 20 µg/L for nickel.

According to the water quality data that collected from DSI, there are occasional excesses in the values of manganese, iron, arsenic, aluminum generally in the focus research areas. These heavy metals are related to the mineral extraction processes such as byproducts of the mines or enrichment processes. Furthermore, certain substances may also occur naturally in water resources due to the hydrogeological characteristics of the region influenced by anthropogenic factors or alteration such as increased mobility of these substances on soil or water (Aykır et al. 2023; Gündüz and Baba 2010) With the available data, the levels were compared with previous years.

The heavy metal ratios in the stations situated in the immediate vicinity of the National Park are relatively low. A review of the water quality data at the Gulf of Edremit stations serviced by the National Park revealed that the stations, which are not situated in proximity to olive farming activities or coastal settlements, exhibited generally good water quality. While the concentrations of certain metals, including nickel, lead, and iron, did fluctuate over time, they did not reach the threshold values recommended by WHO. Furthermore, ammonium levels exhibited an increase over the course of one month, which may be attributed to a range of factors, including fertilizer use and other activities. The other two stations are situated in closer proximity to the border and in closer proximity to settlements and olive groves. Their values are generally stable and within safe limits, as demonstrated by the aluminum and iron data, which occasionally exceed 100, especially in 2019. While an anomaly was observed in the ammonium value at the station above, the manganese values at the station below increased in 2012 and 2015, reaching the upper limit. Such factors as the presence of small-scale industrial activities in the vicinity may also be contributing factors. However, no anomalies were observed in the manganese values at the stations. The observed discrepancies between the two stations may be attributed to leakage between the specified years.

While the water quality was generally acceptable at coastal stations within the protected area, there were occasional instances where the aluminum threshold was exceeded. Furthermore, while elements such as zinc, copper, barium, nickel, and chromium demonstrated periodic increases between 2016 and 2019, these concentrations remained well below the regulatory limit. Although an extreme increase was observed at one station, it was noted that this was not a continuous occurrence. In December 2019, noteworthy increases in the ratios of nickel and zinc were documented. The concentration of nickel reached 56.83 µg/L, while that of aluminum reached 622 µg/L, exceeding the safe limits set by the WHO.

Again, the aluminum value reaches high levels from time to time at the station in the area outside the protection boundary in the west of the Mount Ida National Park. It reached 344 µg/L in 2016 and 580 µg/L in 2019. However, there is no activity around the station point. There are conservation and recreation activities. Mineral exploration activities and drilling are known to take place in the upper part of the basin, and the effects of acidic rainfall resulting from thermal power plants in the vicinity are also a cause for concern. However, this can may be attributed to the geological formation of the area.

Furthermore, both surface water and groundwater are at significant risk with mining pressure in the region.

The pollution levels is a concern due to geothermal activites and tourism activities along the coastlines. According to the data from the station situated in the vicinity of the Ayvacık-Tuzla stream, situated at a considerable distance from the protected area, arsenic levels exhibited an increase in 2012, with values reaching 10.3 µg/L and 10.9 µg/L, respectively. While manganese and iron levels were generally within safe limits, they were increased to 300 µg/L and 600 µg/L, respectively.

The remaining stations are situated in the northern and southeastern regions of the protected area, which are subject to heightened levels of mining activity. The majority of the stations in this region have data before 2015. The stations can be classified as Yenice-Havran, Bayramiç, and Yenice-Gönen.

Two stations are located close proximity to forest land, which is devoid of human settlements, industrial activities, and agricultural operations. Despite data from the stations situated on the northern slope is limited, it is notable that aluminum levels remained within the acceptable range in 2015. However, there was a notable increase in one instance, reaching 2032.96 µg/L. Furthermore, although manganese values remained within the safe range in 2015 (100-300), they increased to values of 500 µg/L and 700 µg/L in 2012. The cyanide measurements were typically higher than those observed in the surrounding area, yet remained within the safe range of 0.005 mg/L. It is acknowledged that this region has been the subject of mineral exploration, with the presence of underground mines. The forest mass at the Kızılelma side, although the data is again limited, the aluminum value was generally within the safe limit. However, the aluminum value increased to 468 µg/L which exceeded safe limit for one month and manganese increased to 400 µg/L.

It is important to note that the point-based detection of primary sources, such as the discreting of hydrogeological formations or pollution sources, requires a specialized perspective. Gündüz and Baba (2017) demonstrate that the Çan and Bayramiç sub-basins have been subject to significant anthropogenic pressures, which coupled with the alterations to the geological formation of the region caused by open pits and acidic mines, have led to severe water pollution, particularly of aluminium, iron, manganese and arsenic. This has the potential to pose serious risks to human health and the local ecosystem. The findings indicate a high prevalence of metal contamination and water

pollution in the majority of samples from the study area, and a considerable degree of contamination of groundwater resources.

The older data sets for stations related to Bayramiç Dam with do not include arsenic, aluminum, cyanide, and select heavy metal data. The data appears to be within the normal range. Conversely, the stations with data from 2016 and 2019 indicates that the iron, chromium, and nickel values exceeded the safe limit in several experiments, while other values remained within the normal range. The cyanide value was 0.004. Nonetheless, it can be stated that, in an other station in forests and in the same basin, as well as in proximity to mining operations in Çan, there is a higher aluminum concentration.

Other stations are located in Havran and Gönen, where copper and coal mining activities have been observed. These stations have elevated levels of heavy metal contamination, which exceed international standards. With regard to the copper acid mine drainage site in Havran, it should be noted that data is only available for the year 2016. In 2017, the company was granted an EIA exemption for molybdenum-copper exploration. The mine was permanently ceased operations in 2018. In general, the quality of the water was above the levels that would be considered safe for aluminum. As evidenced by measurements, the concentration increased to 605.79 µg/L over the period of the year 2016. However, although the molybdenum level was within the safe range for human consumption, it was observed that the unsafe limit for the ecosystem was occasionally exceeded (10-50 µg/L). Moreover, an increase in metals such as iron and chromium was observed. The most recent measurement revealed that aluminum levels reached unsafe limits for human health, with a concentration of 8871.95 µg/L, chromium at 71.20 µg/L, and lead at 12 µg/L. Besides, the EU directive limit of 10 µg/L for copper for the environment was exceeded, though not for human health, reaching a value of 35 µg/L. This finding may be indicative of an increase in mining activities or an anomalous situation. In the lower basin of the mine, which is not directly related to the mine in question, and in the upper basin where no other mining activity is taking place, it was observed that the levels of iron (328 µg/L), manganese (900 µg/L), and chromium (30 µg/L) exceeded the safe limit. Furthermore, the arsenic concentration was recorded at 10.5 µg/L over the course of one month. It is important to note that the data set is limited to 2015.

The water quality data surrounding the Havran dam, situated in close proximity to the iron mine and IIA mining sites, as well as the station data from the lower basin, revealed that manganese levels were largely within the normal range while arsenic values reached 13.11 µg/L and 15.03 µg/L. Additionally, iron levels exceeded normal levels by up to 450 µg/L in certain months and years.

Aykır et al. (2023) mentioned the pollution sources and ecological risks in Havran Lagoon. It was found that As, Mo, Mg, Cd and Ti levels in the lagoon were enriched due to anthropogenic effects. There is currently an ecological risk due to Cd contamination caused by industrial effluents and agricultural fertilizer residues. As and Mo levels in the area were found to be currently at a low risk level, but in the past they were at a medium risk level and originated from the copper-molybdenum plant in the area. In parallel with our findings on water quality, arsenic levels are at high levels prior to the closure of the mine in 2015. The increase of industrial and agricultural activities in the lagoon has been pointed out for the high risk of Cd levels at present (Aykır et al. 2023; Mutlu, 2020). According to the study conducted in the Edremit Lagoon, which is also affected by the Edremit Stream and the Aegean Sea, it was found that the ecological risk of Cd occurred due to olive cultivation activities in the Gulf of Edremit and the increasing urbanization pressure extending to agricultural areas. On the other hand, the ecological risk parameters in the lagoon decreased after the closure of the mine, but the ecological risk level of mobile elements such as Hg, As, Mn and copper mine derived elements already high (Aykır et al. 2022). It should be noted that there are mining licenses and exploration applications around the closed pit (Appendix D).

The data of stations from Bayatlar Yenice to Gönen Dam demostrates that the manganese level increased in 2012 and were above the normal limit in most of the stations, increased up to 1200 µg/L in some stations and decreased to normal levels in 2015. This situation may be related to the start of mining activities. In the same water source, but in two different stations, arsenic values have exceeded the safe limit after 2012, and in 2015. Iron was temporarily elevated to 640 µg/L. Aluminum levels began to be measured in 2015. Although these values were not stable throughout the year, they occasionally reached 866.91 µg/L, generally above the safe limit. Again, in the Bayatlar part, where mining activities are observed, aluminum levels in 2015 occasionally exceeded the safe limit. Especially in the vicinity of these stations, feldspar and other mines received decisions that 'EIA is not necessary' after the date of data (Appendix D).

Studies on the pollution of Gönen and Biga creeks generally draw attention to Cr, Pb and Zn pollution caused by industry and discharges. In particular, the Gönen a leather factory is shown to be the source of this pollution (Sarı 2008). Among the factors threatening the dune plant diversity in Gönen Delta, pollution caused by sand extraction, coastal regulation and agricultural activities as well as general industrial activities from the upper basin were pointed out (Satıl, Tümen and Selvi 2019). The research that focused on the aquatic ecosystem and fish fauna in the area from Eybek Mountain in Yenice to the Gönen Delta draw attention to the agricultural and livestock pollution in the basin, industrial and domestic wastes as well as mining activities that started to intensify in the region (İlhan, Sarı and Ustaoğlu 2014). On the other hand, the pollution of the Gönen Stream, the effects of mining in the vicinity of Balya, and the water resources contributing to Lake Manyas are within the range of influence of the species there (Aykol et al. 2003, Türker, Ünal and Öktener 2019).

6.5. Water and Food Security

The prevailing view within the region is that water resources are contaminated by a combination of agricultural activities, animal husbandry, and mining operations. The use of chemicals in industry and agricultural pesticides represents a significant factor in the contamination of water and soil (Rosegrant, Ringler and Zhu 2009). Related research plans and basin plan reports indicate that surface water bodies have been contaminated with certain pesticides and heavy metals, including aluminum, in areas such as the Bayramiç and Menderes rivers (Ministry of Agriculture and Forest 2020). The majority of water resources are utilized for irrigation purposes. Besides, the Basin Reports and the Sectoral Allocation Report indicate that water quantity is not a significant concern in the areas where water availability is not under pressure (see Chapter 7). The region's agricultural sector, however, represents a significant source of income. In addition, the region's agricultural products are of significant national importance, as previously discussed.

The North Aegean River Basin Management Plan (2020) indicates that mining represents the most significant challenge in terms of water resources. With regard to the allocation of water resources, pollution resulting from industrial activities is typically

associated with specific locations, such as Soma and Aliağa, which are situated outside the designated focus area but included within the boundaries of the basin under investigation as upper conservation scale. In the relevant plans, pollution factors such as waste, agricultural pesticides, and animal husbandry are also mentioned, and strategies and measures are designed in this direction. On the other hand, despite the presence of heavy metals in both groundwater and surface water, and in light of the consensus that such contamination is largely the result of mining activities, measures such as wastewater discharge at select mining sites have not undergone further precautions (see Chapter 7).

The absence of adequate policies for preserving Mount Ida's water resources, coupled with the intertwined issues of "water insecurity" and "food insecurity," represents a significant concern. The agricultural lands and water resources are facing threats from a number of sources, including gold mining, coal mining, fossil fuel plants, and geothermal power plants. Arsenic and cyanide are particularly dangerous to human health, and are directly related to the concept of "water insecurity" (Habiba, Abedin and Shaw 2014). The combined effect of anthropogenic factors results in the degradation of water used for irrigation purposes. Brammer (2008) posits that arsenic is not only present in water resources but also accumulates in soil, representing a significant threat to the sustainability of agricultural products, particularly in irrigated farming and floodplain areas.

Heavy metals can accumulate in irrigated lands that are irrigated with wastewater. The presence of Cd, Cr, and Pb in irrigated land can pose a health risk (Khaliq 2022). Similarly, the contamination of groundwater and surface water with heavy metals, such as arsenic and cadmium, caused by mining activities, can affect the accumulation of these metals in crops, particularly irrigated crops like rice (Williams et al. 2009; Hoang, Prinpreecha and Kim 2021). Ömeroğlu et al. (2023) demonstrate that Gönen, an area with a high level of intensive paddy production, is irrigated from the Yenice dam, which has a high level of arsenic contamination in its stream water. Furthermore, arsenic levels are present in soil content. These factors contribute to the accumulation of arsenic in rice in Gönen, necessitating the reduction of associated risk factors, particularly those pertaining to public health.

Mount Ida is the highest point of the Biga Peninsula. Its forestland serves as a significant water catchment area for dams (Figure 49 and 50). The forests of the Mount Ida have great importance for the sustenance of agricultural production on the hillside, where the local population derives its livelihood from agricultural activities. The majority

of significant industrial facilities and small-scale olive oil and milk producers, which supply food to other provinces in Turkey, are situated in this area (Çanakkale Environmental Situation Report 2014; Çanakkale Situation Report 2018). Mining activities, particularly those involving copper, feldspar, coal, and gold are conducting in both the forests and hillsides. In addition to the operational activites, exploratory searches are conducting in these areas.

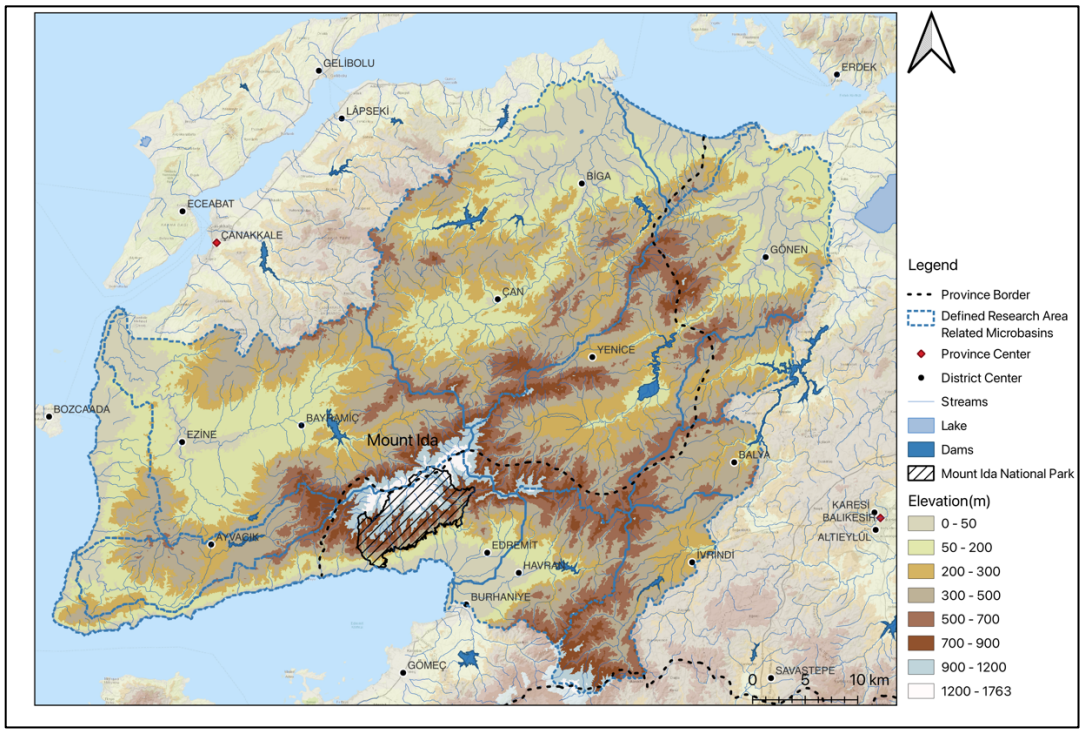


Figure 49. Topography and Hydrology of the Defined Research Area

(Source: Preperad by author from analysing DEM data with using 2024 data from the General Directorate of Water Management and 2024 HydroBASINS data)

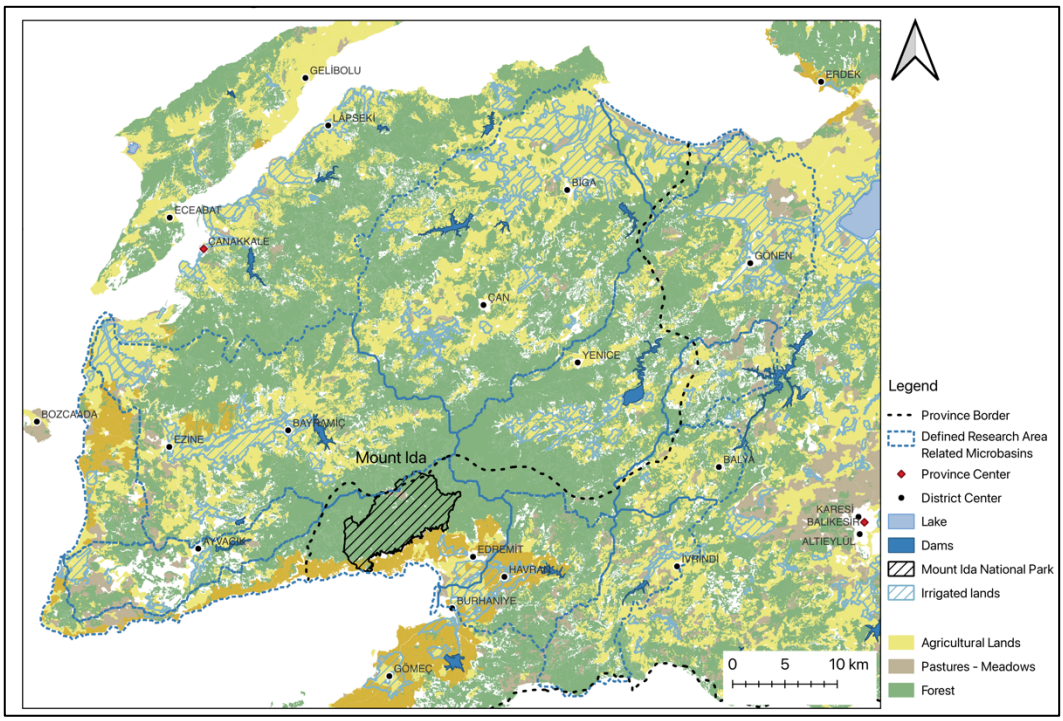


Figure 50. Agricultural Lands and Forests in Defined Research Area

(Source: Prepared by using 2013 data from Ministry of Environment, Urbanization and Climate Change, 2024 data from the General Directorate of Water Management and General Directorate of Mapping, and 2024 HydroBASINS data)

Ayvacık, Bayramiç and Gönen dams on the slopes of Ida are used for irrigation and drinking water supply for the defined research area and Çanakkale and Balıkesir (Table 14). The dams in the downstream area at the north of Mount Ida are affected by the surface water bodies and rivers pollution. There are rural settlements and cultivated lands around the water (Figure 49 and 50). On the other hand, the groundwater of the sub-basins is also in 'poor' condition according to the basin plans because of the heavy metal concentration and also the other factors such as salt water intrusion. The most extensively irrigated districts in the research areas are Biga, Bayramiç and Yenice. In addition, the size of the areas under public irrigation in these districts is also remarkable. The population of the Yenice district benefits the most from these irrigation projects. In total, 67.73% of the irrigated area is currently irrigated (Table 15). As mentioned above, the population living in the northern foothills of the Ida Mountains consists mainly of agricultural families. In Çanakkale province, 65.8% of family farms are operated by small families (Table 16).

Table 14: The Situation of Dams around Mount Ida Forests (Çan, Yenice, Bayramiç, Ezine, Gönen and Havran Districts)

(Source: DSI 2024)

Dam Name	Function	District	Status
Bayramiç	Irrigation, Drinking, Energy	Bayramiç	in Operation
Örenli	Irrigation	Bayramiç	in Operation
Yassıbağ	Irrigation	Bayramiç	in Operation
Zeytinli	Irrigation	Bayramiç	in Operation
Çavuşlu	Irrigation	Bayramiç	in Operation
Ayvacık	Irrigation, Drinking	Ayvacık	in Operation
Çamköy	Irrigation	Ayvacık	in Operation
Akçin	Irrigation	Ezine	in Operation
Altıkulaç	Irrigation	Çan	in Operation
Karakoca	Irrigation	Çan	in Operation
Hamidbey	Irrigation	Yenice	in Operation
Kayatepe	Irrigation	Yenice	in Operation
Kovancı	Irrigation	Yenice	under Construction
Yukarıinova	Irrigation	Yenice	under Construction
Gönen	Irrigation, Drinking, Energy	Gönen	in Operation
Muratlar	Irrigation	Gönen	in Operation
Havran	Irrigation	Havran	in Operation

Table 15: Irrigated Land Area in Çanakkale Districts

(Source: Çanakkale Provincial Agricultural Unit Brifing Report 2023)

Provinces	**Agricultural Land (ha)**	**Irrigable Land (ha)**	**Beneficiary producer**	**Irrigated Area from State Irrigation (ha)**	**Community Irrigation (ha)**	**Total Irrigated Land (ha)**
Merkez	24.551	14.395	2.491	7.085	1.320	8.405
Ayvacık	33.256	5.999	1.548	3.360	440	3.800
Bayramiç	31.780	15.201	7.548	9.420	1150	10.570
Biga	60.422	26.000	6.378	13.071	3.920	16.991
Bozcaada	2.061	465	0	0	34	34
Çan	26.572	5.900	1.401	2.290	560	2.850
Eceabat	18.506	4.500	53	250	728	978
Ezine	26.894	9.811	3.061	5.825	1.965	7.790
Gelibolu	39.748	10.216	838	1.735	1.713	3.448
Gökçeada	3.350	1.678	806	1085	54	1.139
Lapseki	36.190	4.868	2.892	4.915	2.942	7.857
Yenice	28.303	14.225	8.034	9.280	3.563	12.843
Total	331.633	113.258	**35.050**	**58.316**	**18.389**	**76.705**

Table 16: Structure of Family Businesses (Farms) in Çanakkale
(Source: Çanakkale Provincial Agricultural Unit Brifing Report 2023)

Status	Farm area (da)	Farmer Family Number	The Ratio of the all family farms (%)	The ration of the all farm areas %	Avarage farm area for one family business (da)
Small Family Business (Farms)	0 -10	6.446	65,8	31,5	33,5
	10-20	4.896			
	20-50	19.949			
	50 -100	10.547			
Medium Family Business (Farms)	100-200	4.661	32,1	55,9	121,7
Big Family Business (Farms)	200>	976	2,1	12,6	429,2
TOTAL		**47.475**	**100,0**	**100,0**	**69,9**

The northern coastal area of the focus area, which is fed by the Gönen Dam, plays a pivotal role in terms of irrigation. The area is characterized by a vast plain, particularly suited to the cultivation of crops that require large quantities of water, such as rice. In addition, the Havran Dam, located in the southern region, fullfills the irrigation requirements of the Edremit Gulf. Furthermore, the Havran plain was designated as large plain protected area. Additionally, mining activities that contribute to the pollution of the water and soil, including coal mining in Gönen and gold and copper mining in Havran, are conducted in two significant dams and water catchment basins.

On the other hand, agricultural activities themselves present a significant risk to both water and soil pollution. It is established that olive groves are located in the foothills of the National Park at the Gulf of Edremit (Figure 50). Some forest lands diminished as a consequence of agricultural activities. Despite a decline in agricultural employment in the region on an annual basis, agricultural areas have not decreased, but rather olive groves in the region have increased 0.2% in Çanakkale and approximately 4,2% in

Balıkesir since 2015 (Çanakkale Provincial Unit Brifing Report 2015; 2023; Balıkesir Governorship Official Website 2022; GMKA 2014).

The industrial activities that utilise inputs of agricultural products are predominantly located within the region. Planning decisions have been made to advance these activities through the utilisation of geothermal greenhouses and the establishment of food-specialised industries. One such initiative is the special food industry designated in the wetland area of Ezine (see Chapter 7). In addition to strategies designed to increase large-scale agricultural production in the target areas, measures tried to be taken to enhance water quality in the context of agricultural activities. Some institutions have been conducted to assess the potential for agroecological agricultural production in the region, resulting in the formulation of strategies (GMKA 2016b; 2021b) in addition to strategies through large-scale agricultural production shifts.

6.6. Land use Land Cover Change

Supervised classifications for various years were created with the objective of identifying both land use patterns in focus research areas and changes in forest cover. Moreover, the outputs were utilized to identify patterns of urban growth, land use practices that result in forest loss, and the delineation of the exact locations of mining operations. Furthermore, land change and the determination of changing classes were incorporated into scenarios for ecosystem services models. The Corine Land Use and Land Cover (LULC) classification data provided by ESA is insufficient in terms of both the level of detail and the accuracy of the data. Accordingly, models were created to differentiate the land classes, taking into account the land use characteristics of the area.

A supervised classification was conducted over seven periods using the Google Earth Engine platform. Landsat-5 images were used for the years 2000-2001 and 2005-2006. Landsat-8 surface reflectance images were utilized for the periods spanning 2011-2012, 2013-2014, 2015-2016, 2020-2021, 2021-2022, 2022-2023 and 2024. Feature collection dataset was created in accordance with the characteristics of the area of interest, which encompasses the forest area of Ida Mountain and its surrounding hills. Training data for each feature was defined as input of the algorithm. Because of the lack of satellite images or bad quality of the satellite images the classification was done for after 2000. During

collecting the training data, historical satellite images of Google Earth Pro were considered to distinguish changes in land use. The area of interest has generally settlements with rural characteristics, secondary house condensed urban settlements, mining activities and several industrial facilities. Because of the general land use characteristics of the area, olive groves, fields, forests, barren lands, settlements, water bodies and mining were classified separately, and then reclassified. Training data about settlement areas were collected by considering villages, city center patterns, and industrial facilities. After creating output maps, the areas with errors were determined and the training data as algorithm entries were rearranged for more correct results for each category in every year. The final outputs were compiled and visualized. The output models for the years 2001, 2006, 2011, 2016, and 2024 have the most accurate results when considering controls from satellite images and the kappa value. Upon testing the results obtained with the study and training data, it was observed that all kappa values exceeded the acceptable threshold of 0.82. The kappa values are 0.94, 0.91, 0.93, 0.82, and 0.88, respectively.

The samples were collected with a particular concentration around the Mount Ida forest mass. The findings are generally more accurate in the focus research area. In general, the main urban centers of Çanakkale and Balıkesir, as well as their respective urban growth directions, are also generally accurate. It should be noted that some errors are possible in barren lands, particularly along the Ezine-Geyikli coastline, which is predominantly composed of stony and sandy lands. Outside of the area of interest, especially in the Gelibolu and Bandırma regions, some errors are possible in the coastal areas due to the presence of islands and peninsulas, as well as in land uses that have distinctive characteristics, such as wetlands in the vicinity of Lake Manyas.

Furthermore, olive groves are sometimes included in the category of agricultural land especially in 2016 model. Similarly, forest land, which generally lacks robust characteristics, may also be included in these categories because the model predicts the areas as cultivated land (with trees). Another limitation of the model is the variability in satellite quality over time, which is influenced by factors such as image quality or invalidity. To address this limitation, it is essential to conduct a separate comparison of the 2001 and 2006 results.

As illustrated by the models, the settlements and developments in the focus area are predominantly concentrated within the Edremit Bay and Gönen districts, in addition to rural settlements. The period between 2000 and 2006 was notable for an immediate

increase in the extent of settlements, particularly in Edremit Bay and Gönen (see Figures 48 and 49). The data indicate that the extension of settlements has increased almost twice from 2011 to 2024 for the focus area. However, this increase generally occurred between 2011 and 2016 (see Figures 53–54).

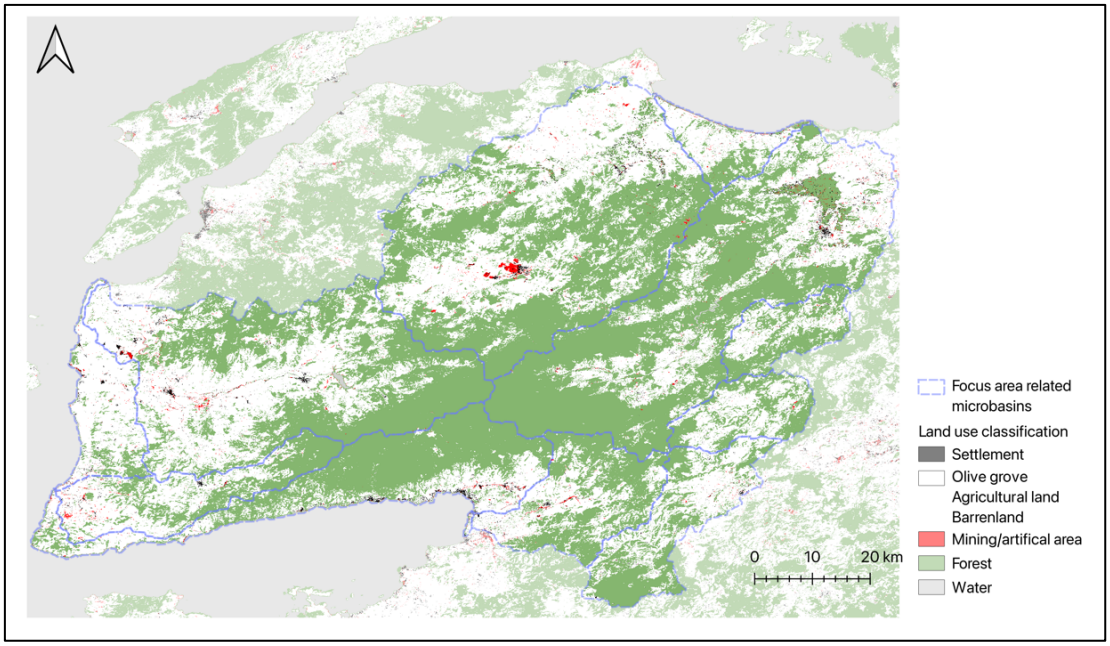


Figure 51. Supervised Classification Results for 2001

(Source: Created by using Google Earth Engine)

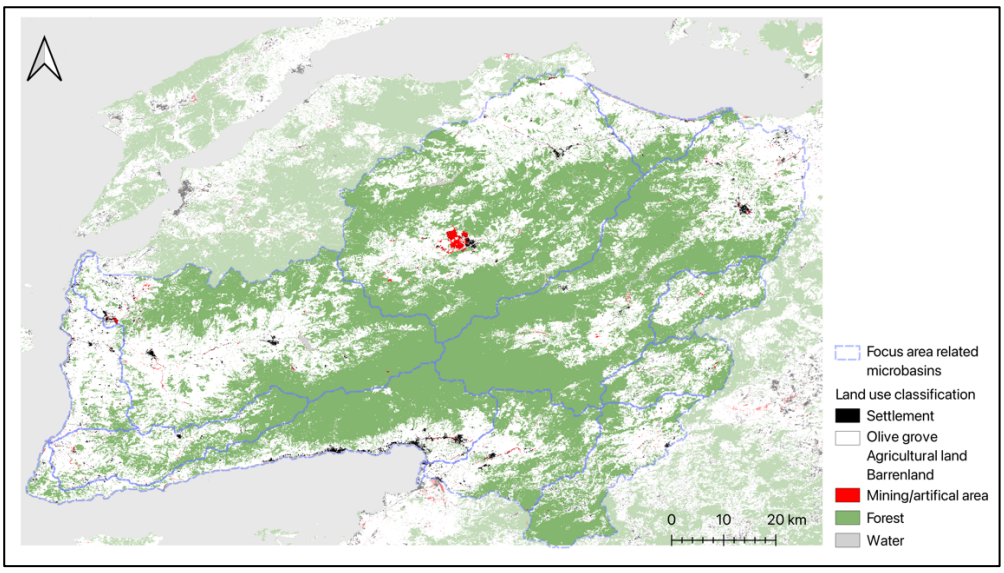


Figure 52. Supervised Classification Results for 2006

(Source: Created by using Google Earth Engine)

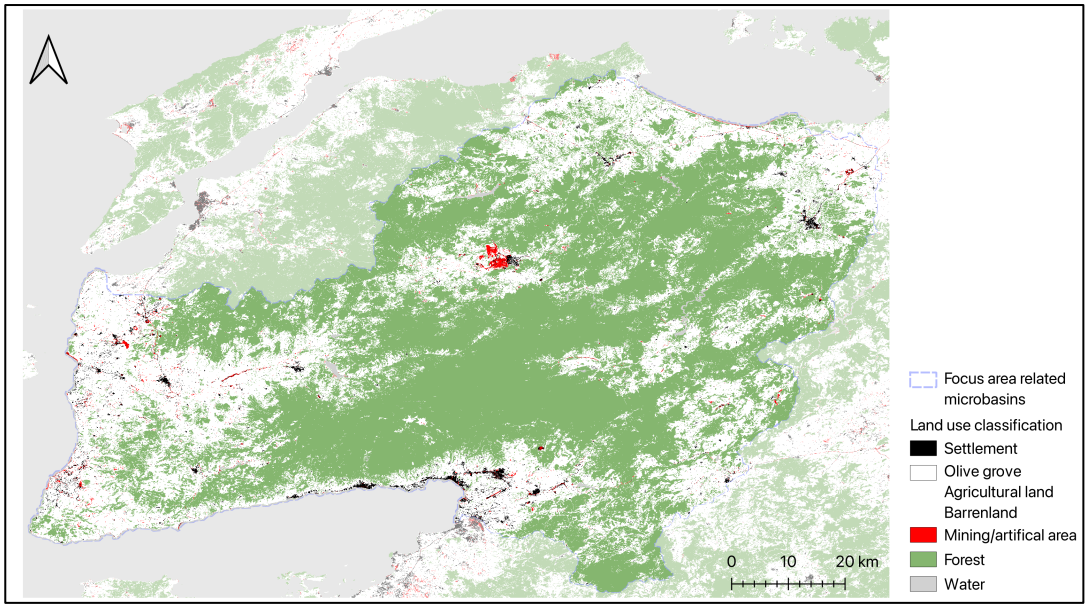


Figure 53. Supervised Classification Results for 2011

(Source: Created by using Google Earth Engine)

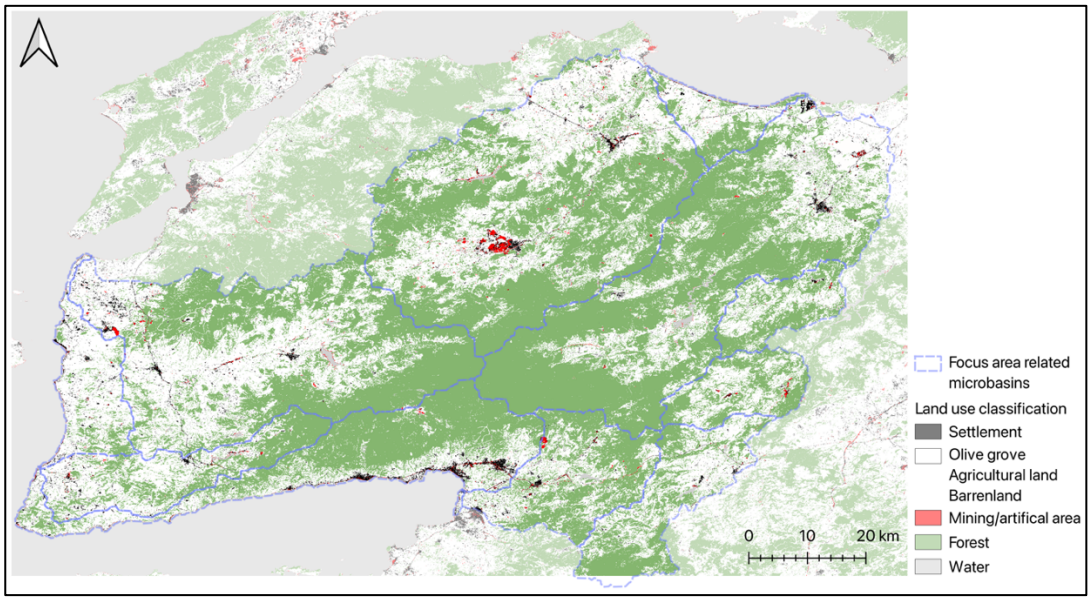


Figure 54. Supervised Classification Results for 2016

(Source: Created by using Google Earth Engine)

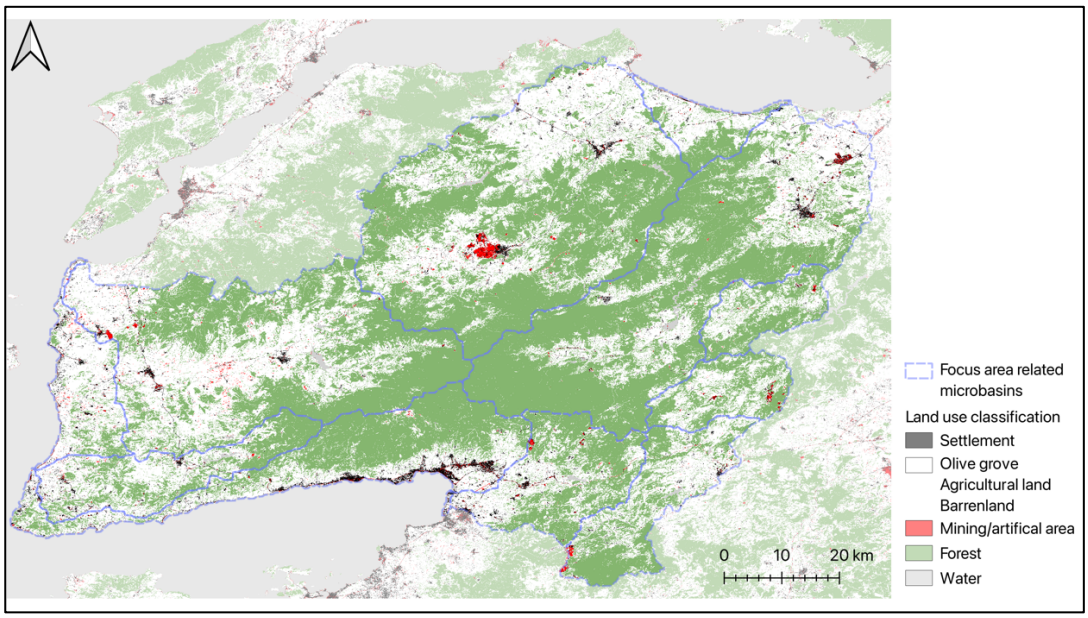


Figure 55. Supervised Classification Results for 2024

(Source: Created by using Google Earth Engine)

Mining activities in the region have a history dating back to the 2000s. Specifically, coal mining operations, which are associated with a thermal power plant and an industrial sector, are clearly evident in models. Moreover, it is apparent that these activities have persisted and expanded in the Mount Ida forests, with a notable intensification following the advent of industrial operations after 2011 (Figure 51-53). As illustrated by this model, the concentration of settlements in specific regions, particularly in the research area, has resulted in the fragmentation of forests due to the combined influence of various anthropogenic factors over time. The proportion of forest cover in the research focus area has exhibited a downward trend after 2001. The ongoing decline in forest cover is accompanied by a direct reduction or fragmentation of forest areas in the focus research area and surrounding regions, including Lapseki, Çanakkale Center, and Havran, due to urbanization and mining activities (Figure 57-60).

With the exception of the agricultural zones that were incorporated into the mining and residential expansion of the region, there was no reduction in the extent of agricultural land or in the activities associated with olive cultivation. This finding is also consistent with the data of agricultural units of the Çanakkale and Balıkesir provinces (see Chapter 6.5.). The findings indicate that forest areas in the region have undergone degradation and fragmentation due to the combined effects of human activities, including settlement, mining, and agricultural operations. This fragmentation typically occurred with the

transformation from forest to barren or agricultural lands (generally olive grove), except for settlement and mining sites.

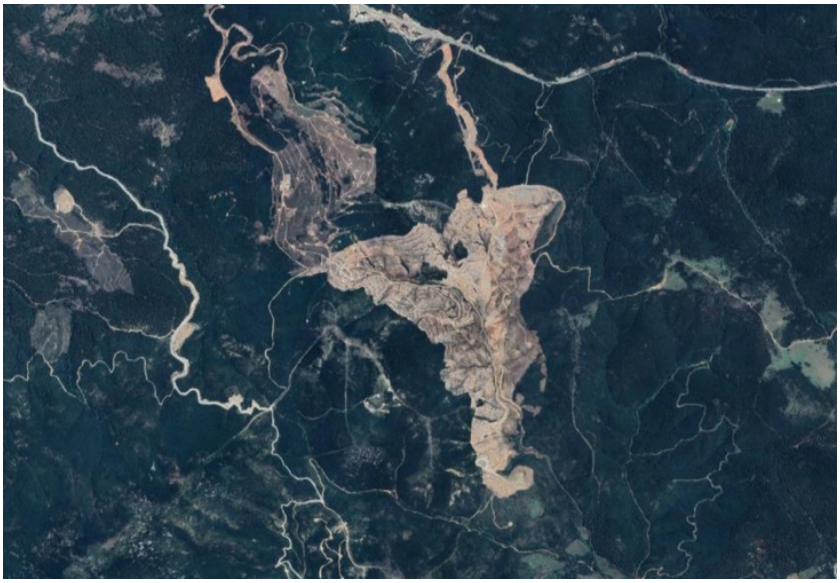


Figure 56. Soil Stripping and Forest Loss in Kirazlı Mining Area

(Source: Google Earth Pro 2020)

It is important to note that the mining areas do not always undergo any operational activities; instead, the soil is modified without any construction or concreting operations. Besides, the area can undergone modifications through the removal of trees and soil stripping and also due to fires. To illustrate, in the area where extensive tree cutting occurred in the vicinity of the Kirazlı mining site, there was a notable shift in land use, with forestland (in 2001) seems converted to agricultural land in supervised classification model in 2021. Subsequently, a portion of the region appears to undergone a transformation from forest land due to the cessation of mining operations. But the operation did not continue due to the public opposition (Figure 56).

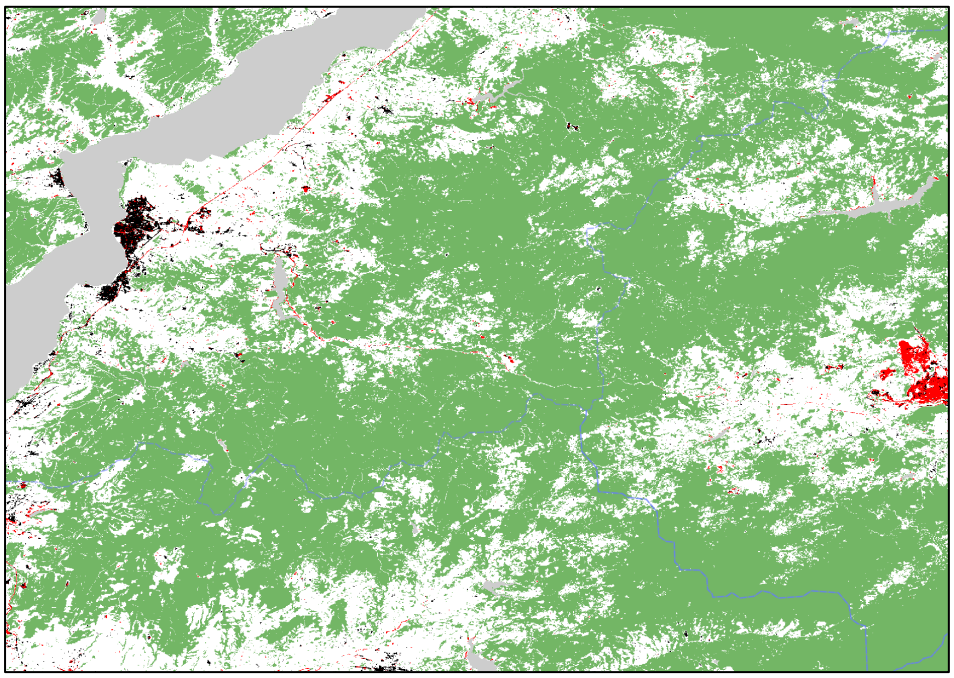


Figure 57. Supervised Classification Results for 2011- Çanakkale City Center and Lapseki

(Source: Created by using Google Earth Engine)

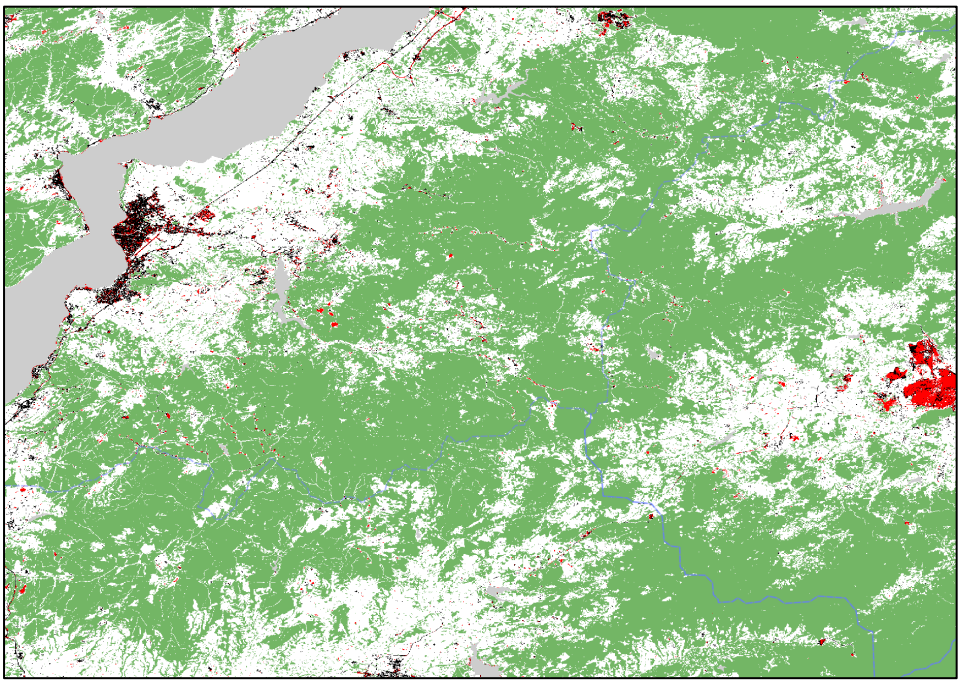


Figure 58. Supervised Classification Results for 2024- Çanakkale City Center and Lapseki

(Source: Created by using Google Earth Engine)

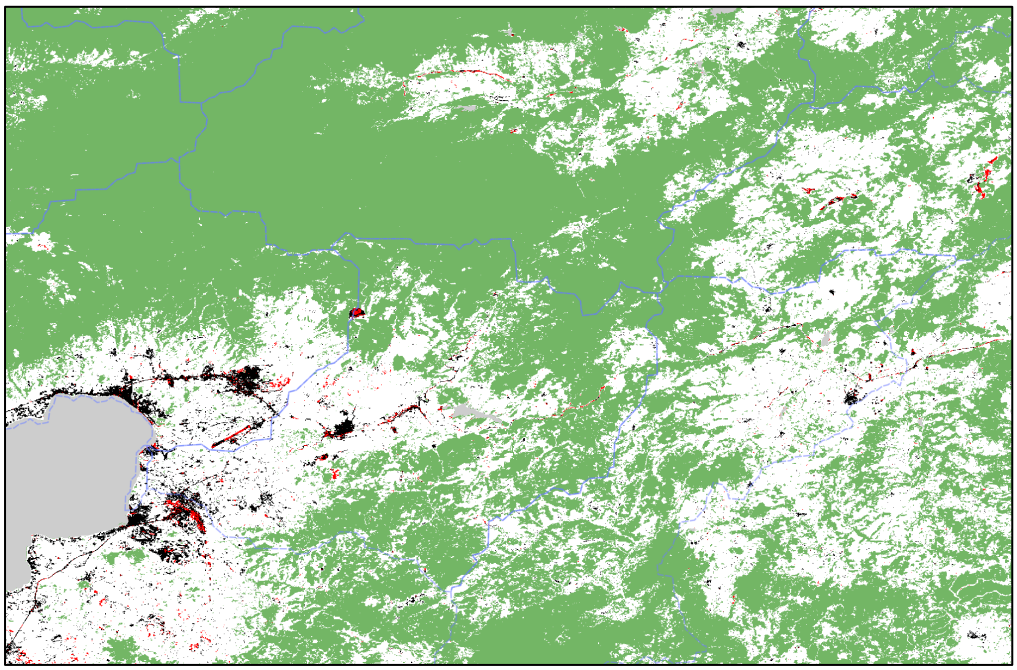


Figure 59. Supervised Classification Results for 2011- Edremit Bay and Havran at the South of the Mount Ida

(Source: Created by using Google Earth Engine)

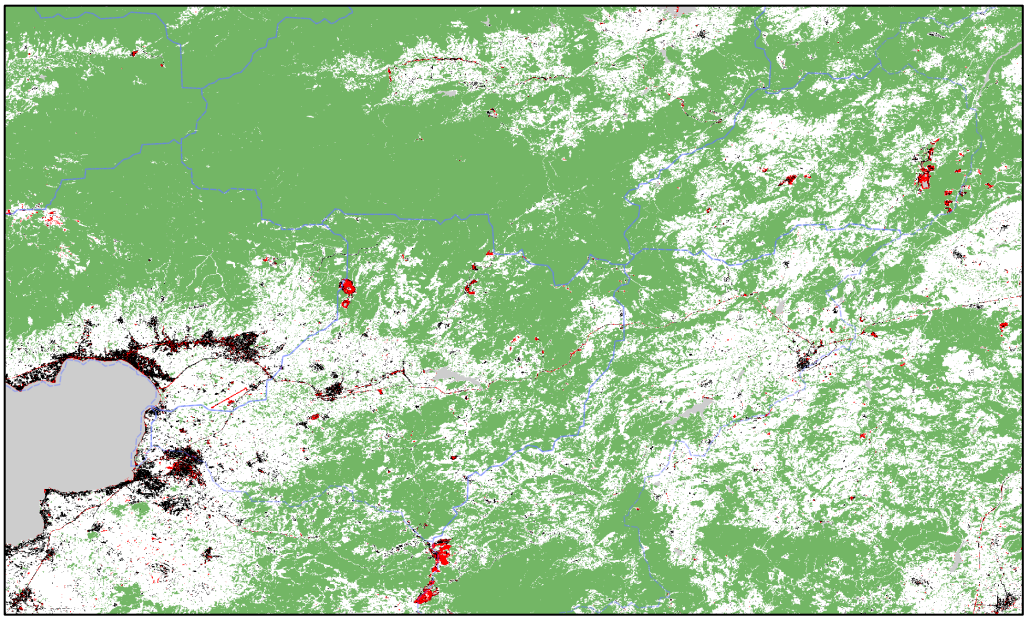


Figure 60. Supervised Classification Results for 2024- Edremit Bay and Havran at the South of the Mount Ida

(Source: Created by using Google Earth Engine)

6.7. Ecosystem Services Scenerios

The supervised classification results indicate a reduction and fragmentation in forest area between 2011 and 2024. In accordance with historical models, settlements have a tendency to expand in proximity to agricultural and olive groves, frequently in close proximity to existing settlements. In addition, mining activities are being proposed in hillside areas that are predominantly forest and partially agricultural land (Appendix D).

In consideration of the land use classification models and previous findings regaring mining activities in the research area, it was determined which areas are potentially subject to conversion to 'bare land'. A scenario LULC model was created in InVEST. The scenerio LULC results reflects the situation that some of the forests and natural vegetation in mining operation license areas are converted bare lands. The EIA area was considered to be 6,500 hectares for Group IV mining activities, under the assumption that all proposals submitted will be approved (Appendix D). Even infrastructure or logistic facilities may result in a transformation into bare land. In fact, the areas threatened by mining exploration and operation are more than the accepted size. II. Group mining was generally smaller EIA process, but generally directly affected soil and habitat loss. It was assumed that there would be an increase of approximately 500 hectares in Group II mining areas, along with mining licenses overlap with built areas in created supervised classification model (Chapter 6). It was assumed that approximately 7,000 hectares will undergo a transformation. Furthermore, activities such as geothermal and renewable energy, as well as industrial processes, are not included in the analysis. Additionally, vegetation in the vicinity of transportation routes to mining areas may be adversely affected. It should be noted that a portion of the peripheral districts (Havran and Burhaniye) were excluded from this calculation.

Ecosystem models was created based on scenario LULC maps. Scenerio land-use and land cover (LULC) maps was generated using the Invest software. As indicated in the land-use and land cover (LULC) table, the first model depicts a shift in land use, with the transformation of 100- Mosaic natural vegetation (tree shrub: herbecous cover) (>50)/ herbaceous cover (<50), 60 – Tree cover: broadleaved: deciduous: closed to open (>15) , and 11 – herbaceous cover classes, predominantly concentrated around the Mount Ida forests into the bare lands (200 class code) entity (Figure 61). An additional model was constructed on the assumption that the change would occur in the forest area, once more

focusing on the 60 class, which underwent alterations in the 60, 70 – Tree cover needleaved: evergreen: closed to open (>15%), and 100 classes (see Table 9). One limitation of this model is that the classes located at the border of the National Park are also subject to partial modification (Figure 62).

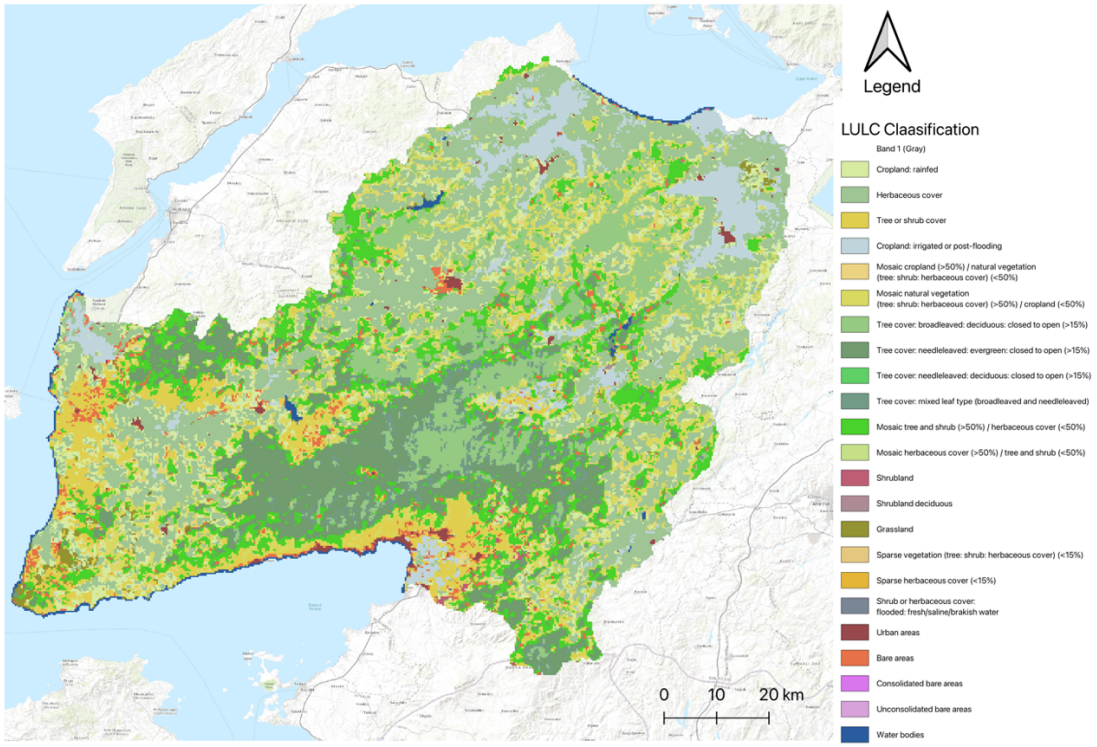


Figure 61. Scenerio LULC Map 1

(Source: Created by using InVEST software)

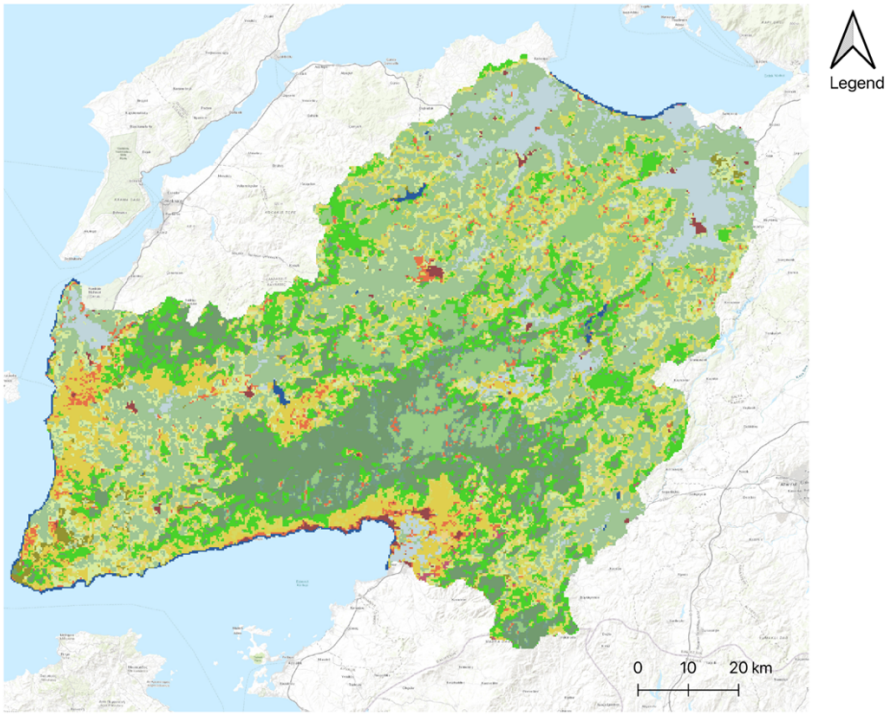


Figure 62. Scenerio LULC Map 2

(Source: Created by using InVEST software)

6.7.1. Carbon Sequestration

In the scenerio based ecosystem models, a decline in carbon sequestration capacity are observed in areas that have undergone transformation into barren lands. Even when changes occur at the periphery of forest ecosystems, they have a significant impact on carbon storage, leading to fragmentation of these vital carbon sinks (Figure 63 and 64). The changes are primarily concentrated in the hills of the Biga Mountains and the Mount Ida. In the initial scenario, a decline in carbon sequestration capacity is observed at the periphery of forest areas (Figure 64). In the second scenario, the majority of the forest mass is affected in and around the area. The carbon storage capacity of the transformed areas exhibits a dramatic decrease (Figure 65). When the second scenario is implemented for the most extensive area in the Karabiga Peninsula, it becomes evident that the reduction and fragmentation of carbon sequestration areas primarily occurs in Mount Ağı and Mount Madra, which are located at the periphery of the research area (Figure 66).

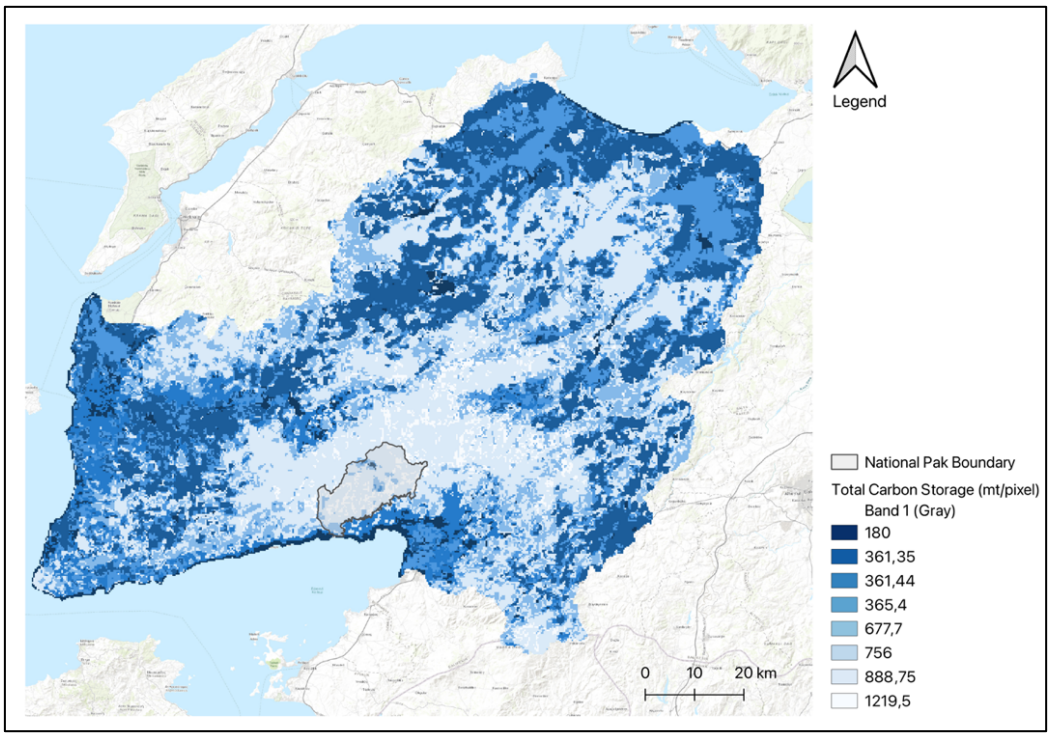


Figure 63. Current Carbon Storage Model

(Source: Created by using InVEST software)

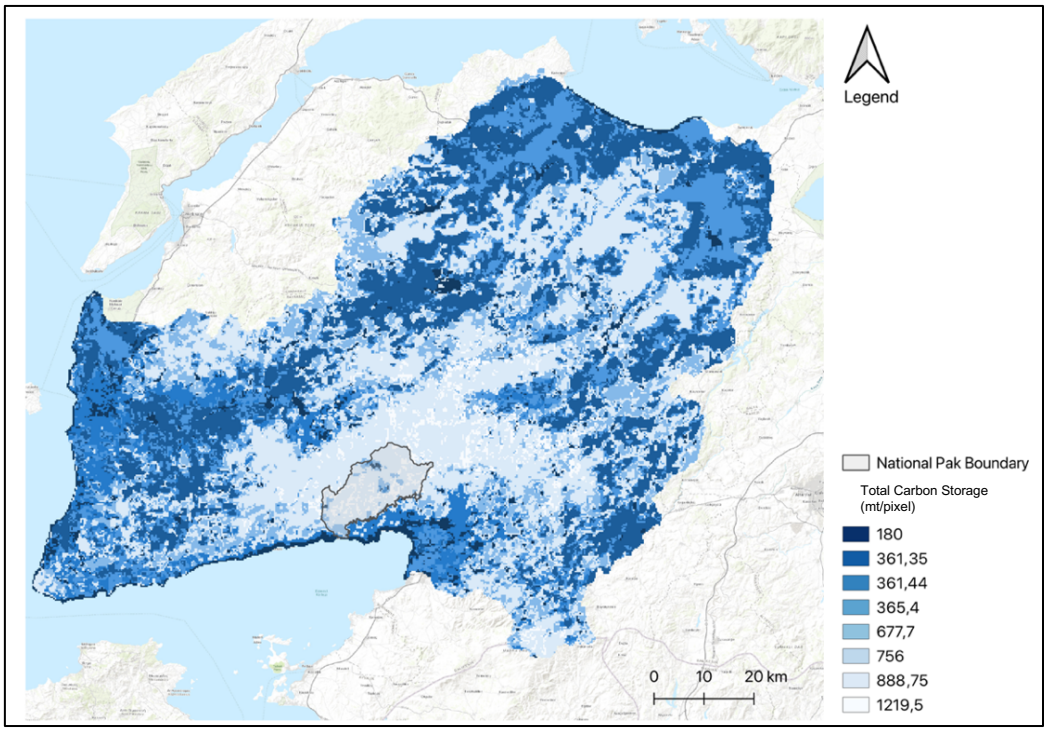


Figure 64. Carbon Storage Model for Scenerio 1

(Source: Created by using InVEST software)

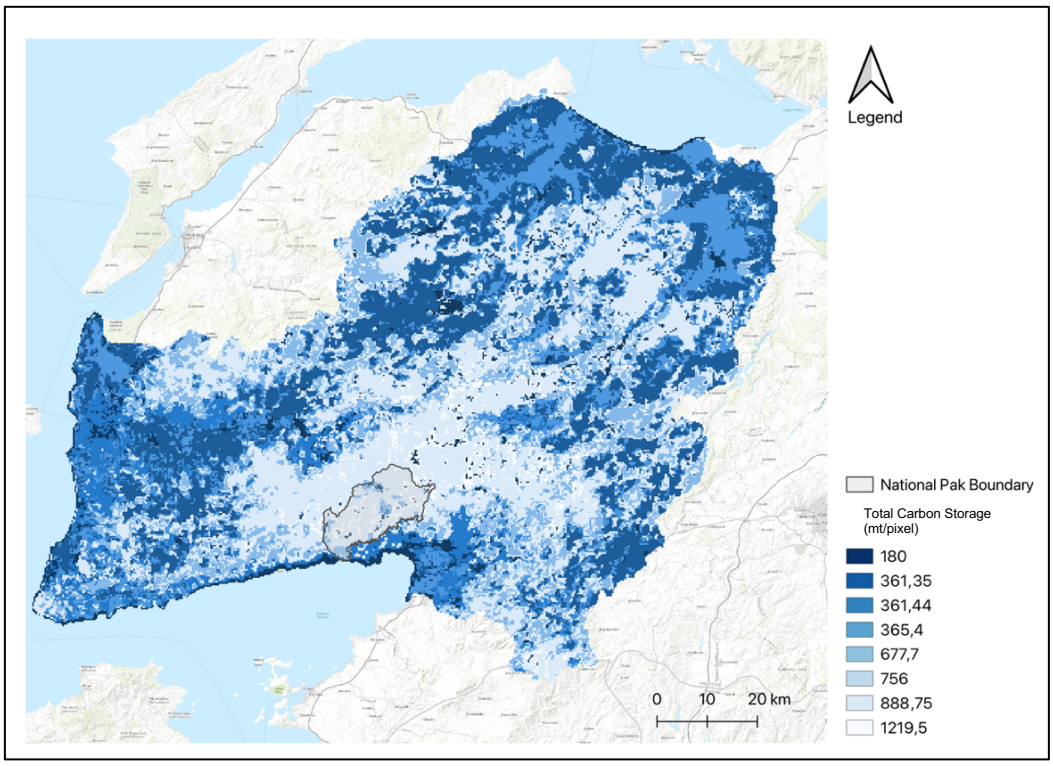


Figure 65. Carbon Storage Model for Scenerio 2

(Source: Created by using InVEST software)

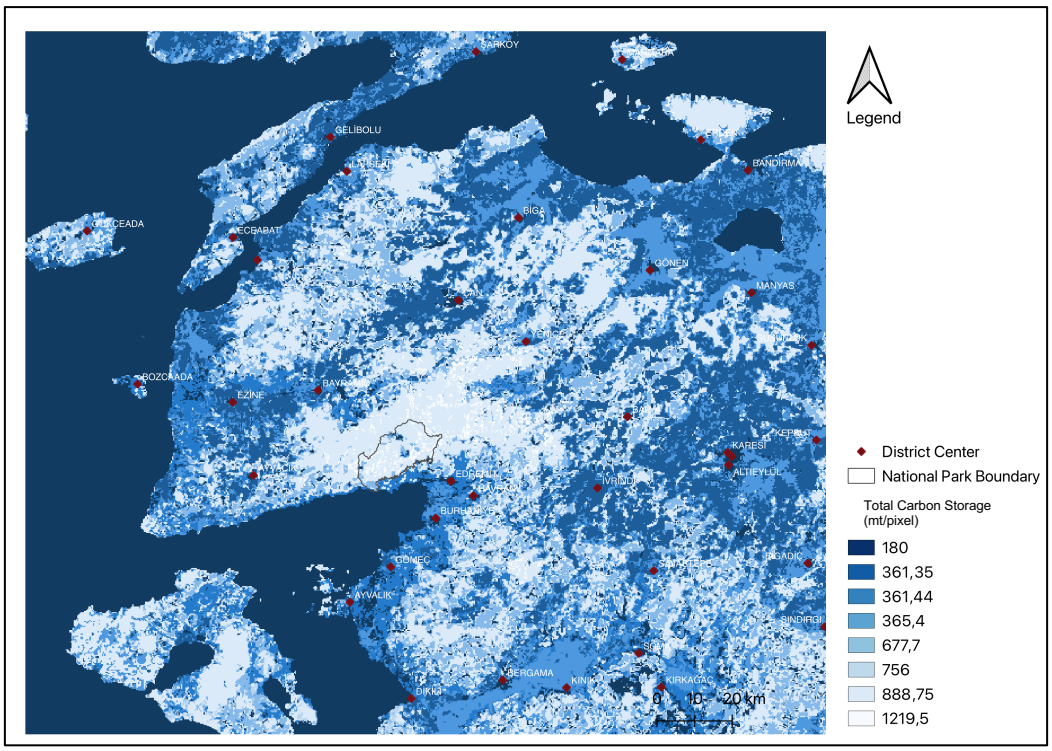


Figure 66. Extended Carbon Storage Model for Scenerio 2

(Source: Created by using InVEST software)

6.7.2. SDR Models

The current model indicates that the districts of Yenice, Gönen, Balya, and the west of Ayvacık are predominantly impacted by sediment export and soil loss (Figure 64). In the scenario model, this trend persists; however, the vulnerability of certain regions is exacerbated due to soil loss. The findings indicate that Scenario 1 (changes on the hillside of forests), demonstrate an extension of the spatial distribution of sediment deposition with an increasing value. In particular, in the vicinity of Havran and the Yenice sediment export areas, an increase in sediment export is observed due to the loss of vegetation, which has resulted in the formation of new sedimentary deposits (Figure 68, 71 and 74). However, in the SDR model Scenario 2 (changes in the forest class), sediment export increases at higher elevations (Figure 62 and 75). As evidenced by the model outputs, the southern portion of the National Park and the eastern region of Mount Ida forests are particularly susceptible to the effects of vegetation loss, particularly in the context of mining activities as depicted in Scenario 1 (Figure 68). In scenario 2, the districts of Çan, Yenice, and Gönen also exhibit higher soil loss (Figure 69). The risk of erosion and soil loss for agricultural lands and villages in downstream areas is heightened with an increase in sediment transfer. Furthermore, sediment deposition and export are linked to water quality due to the transport of soil and potentially pollutants (Wang, Lechner, and Baumgartl 2018).

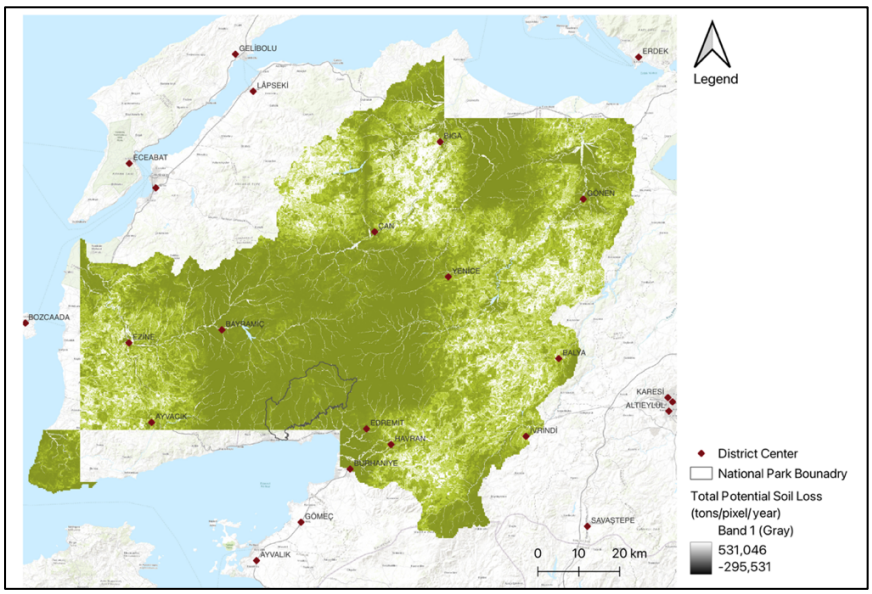


Figure 67. Current Total Potential Soil Loss

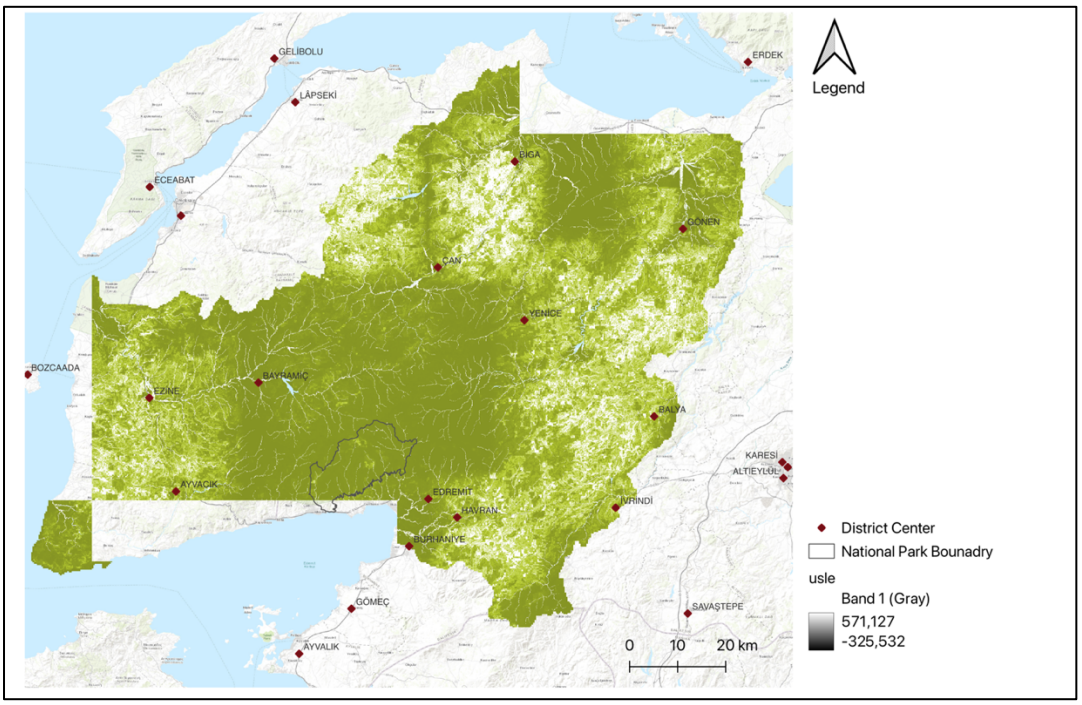


Figure 68. Total Potential Soil Loss for Scenerio 1

(Source: Created by using InVEST software)

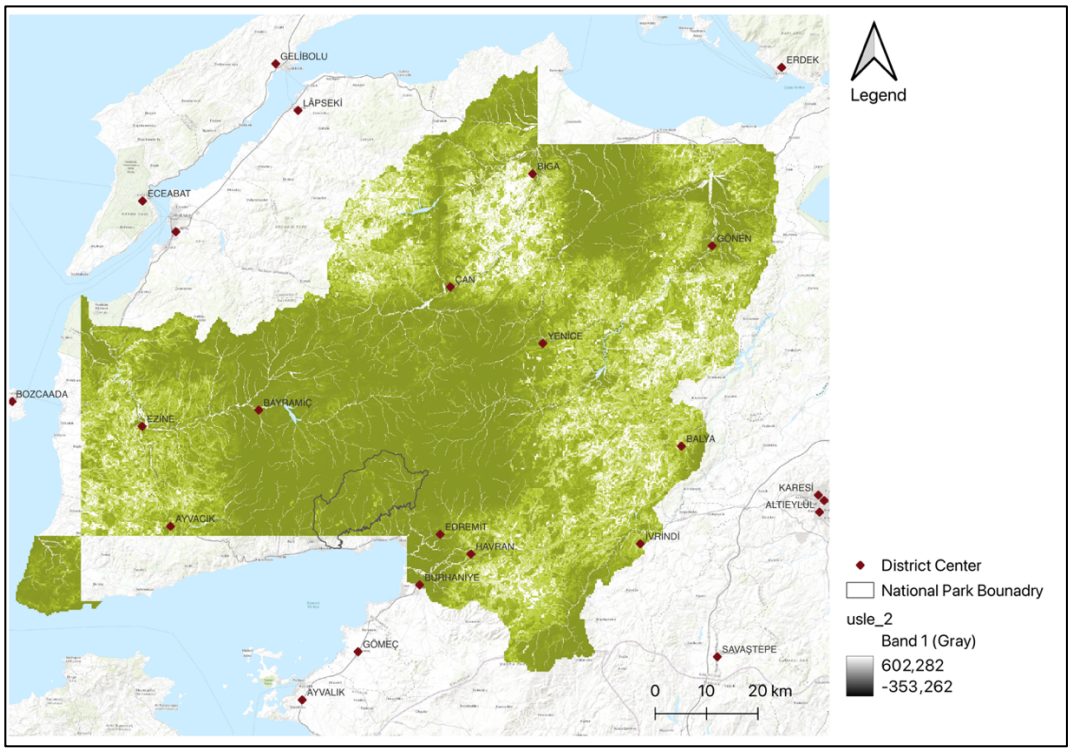


Figure 69. Total Potential Soil Loss for Scenerio 2

(Source: Created by using InVEST software)

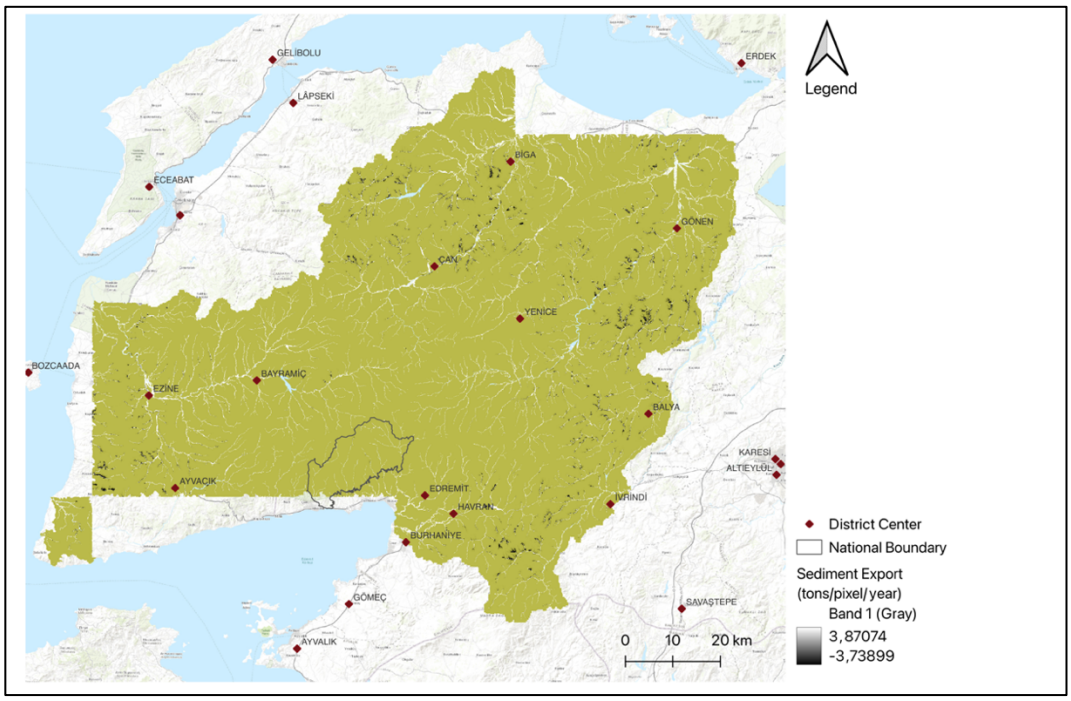


Figure 70. Current Sediment Export Model

(Source: Created by using InVEST software)

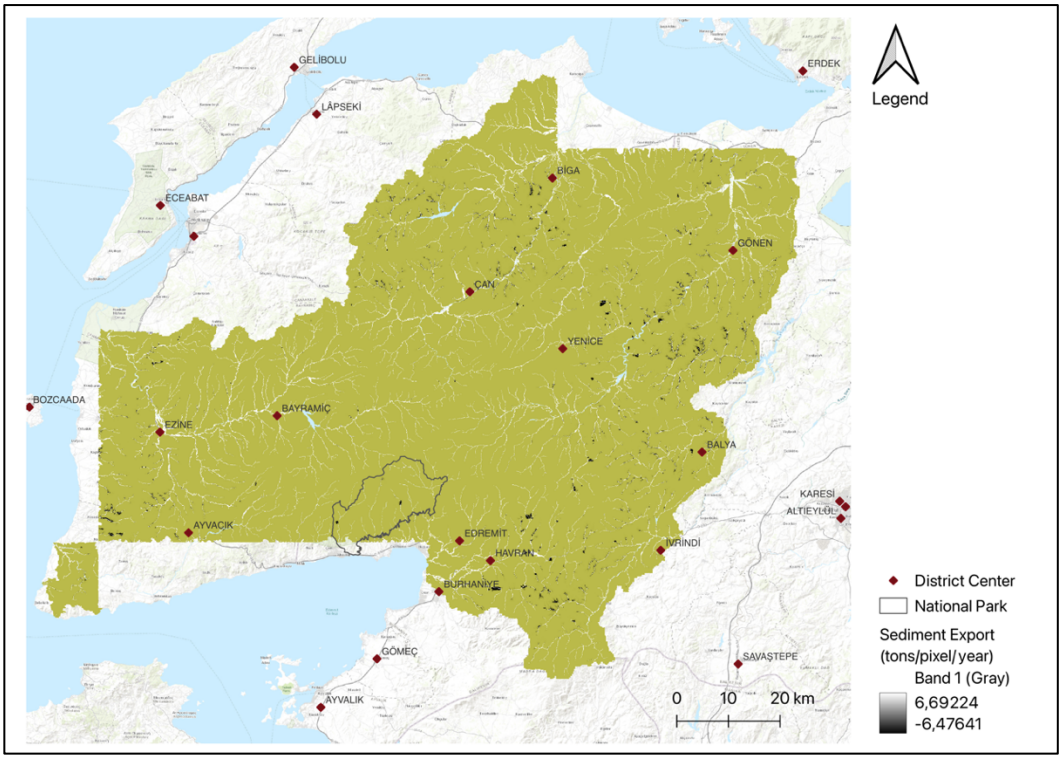


Figure 71. Sediment Export Model for Scenerio 1

(Source: Created by using InVEST software)

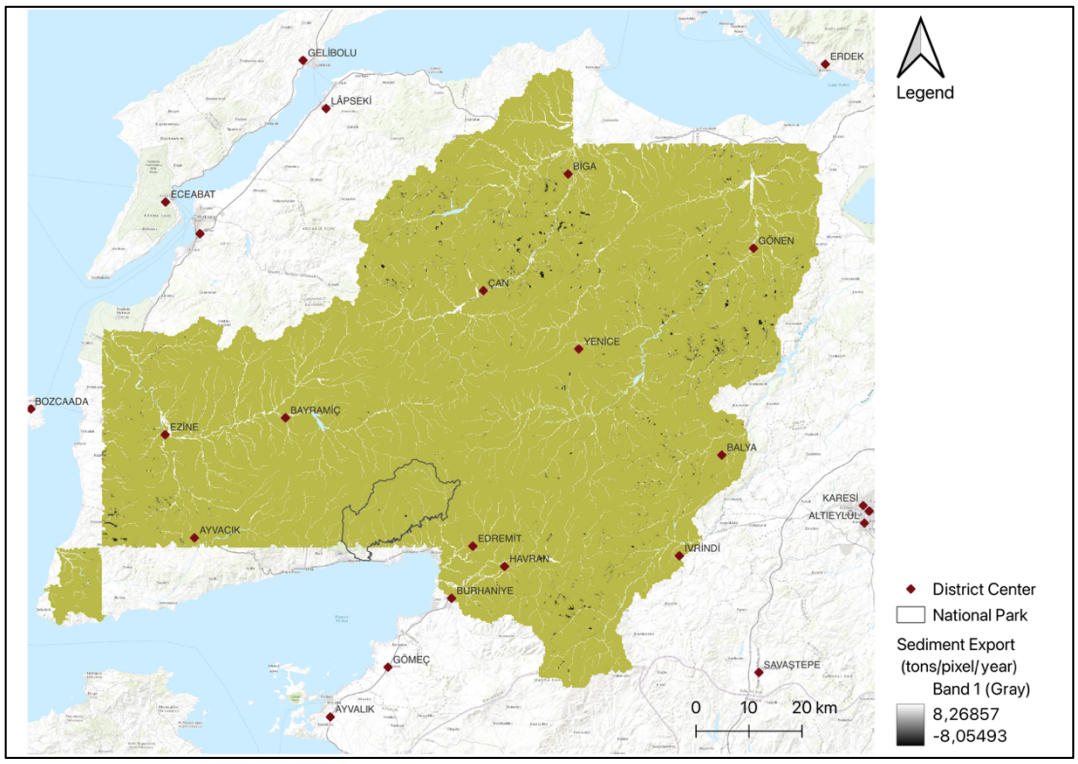


Figure 72. Sediment Export Model for Scenerio 2

(Source: Created by using InVEST software)

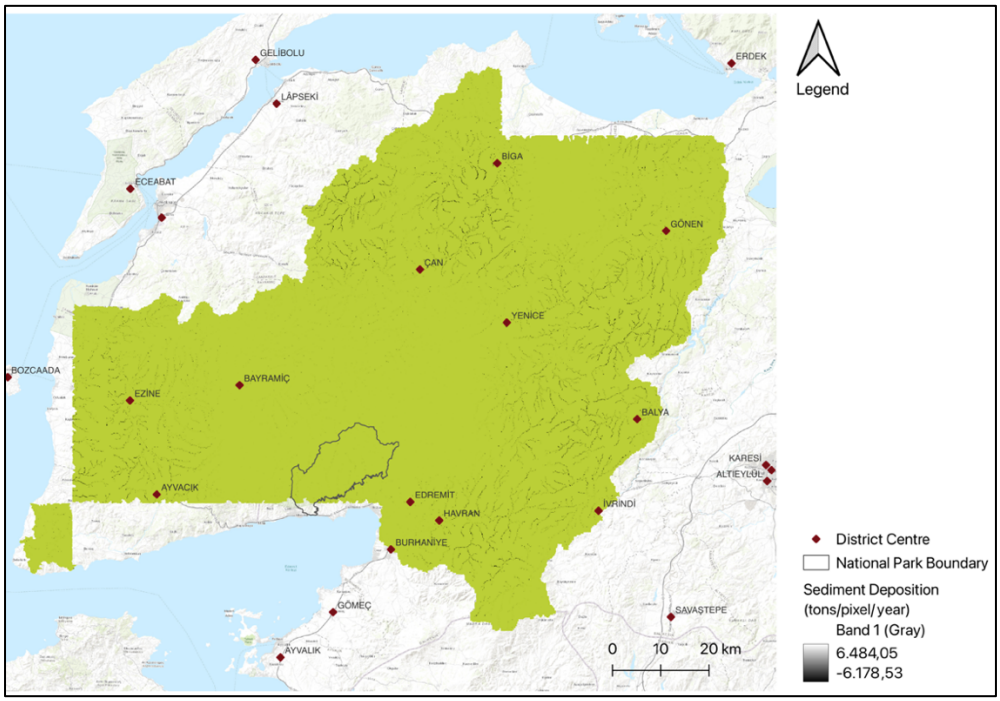


Figure 73. Current Sediment Deposition Model

(Source: Created by using InVEST software)

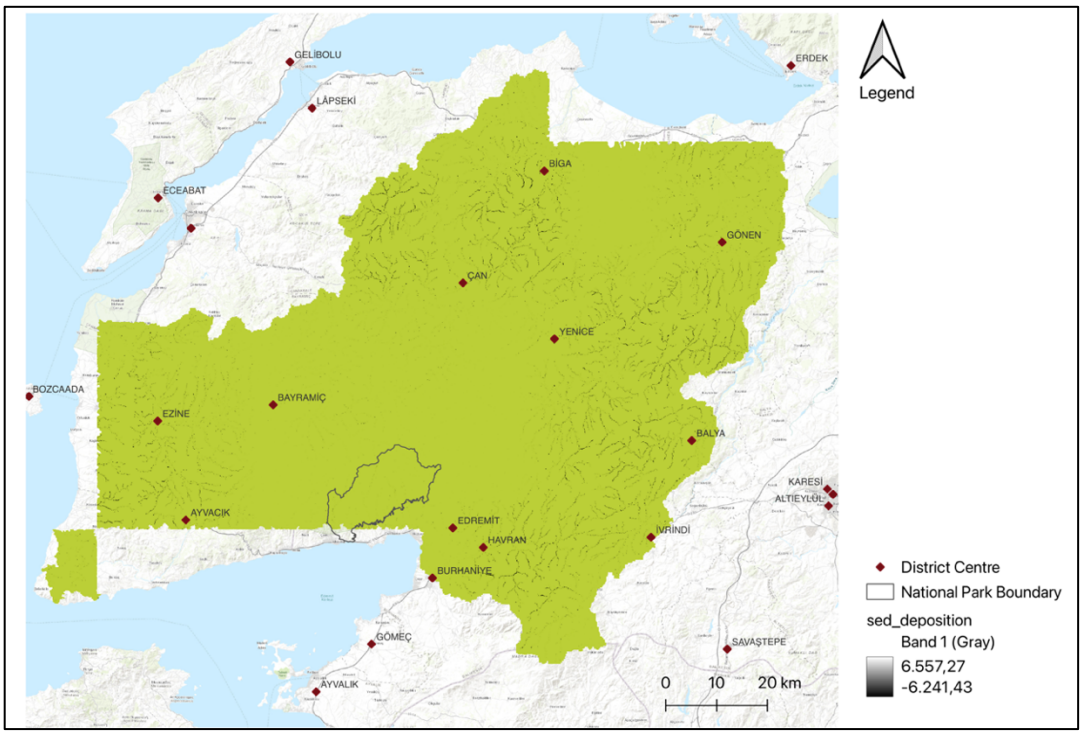


Figure 74. Sediment Deposition Model for Scenerio 1

(Source: Created by using InVEST software)

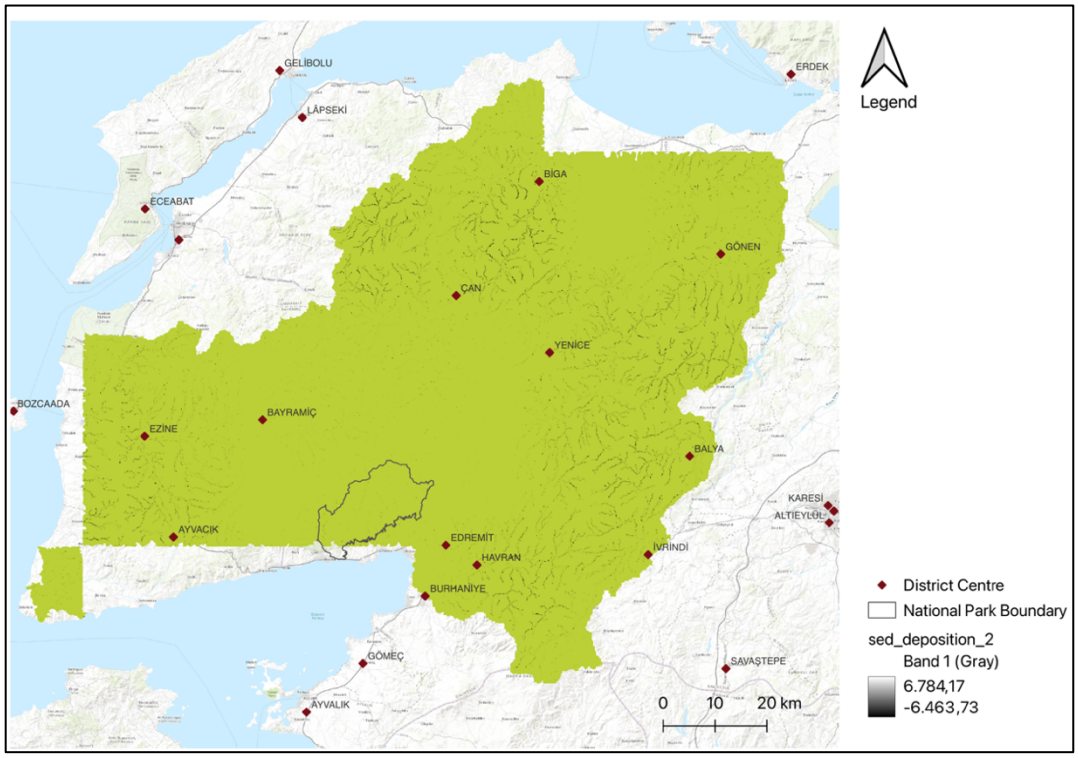


Figure 75. Sediment Deposition Model for Scenerio 2

(Source: Created by using InVEST software)

6.7.3. Crop Production

Crop production model aims to predict crop yield spatially according to land cover and climate regression data. The model can help to evaluate investments and land use land cover changes on crop yield. LULC maps and a table that expresses the spatial relations of crop types according to land cover classification are required to model crop production. LULC to crop table was arranged according to the information about crop types and spatially dependencies of crop production in Çanakkale Status Report (2019). In this phase, the satellite images were used to confirm and detect crop types like olive groves or fruit trees with regarding land cover codes.

The models for current situation and scenario LULC which was accepted the situation that built area (mining and settlements) mostly occur in mosaic natural vegetation with planted trees. Mostly land cover codes associated with fruit trees were converted bare lands as scenario. The change in production rate are observed just where land conversion occurs in terms of crop type. In this scenario, the production values differ from the current scenario. However, it depends on only land vegetation changes. The complex impacts should be considered like water pollution or scarcity by using the model.

CHAPTER 7

GROWTH ORIENTED FOCUS OF PLANS IN THE RESEARCH AREA AND RELATED SCALES

This chapter examines conservation and growth strategies related to the research area through the analysis of basin plans and spatial plans, such as environmental and coastal plans, in Çanakkale and Balıkesir with post-growth alternatives. 'New' conservation attempts are examined in the contexts of projects and plans within and surrounding the research area. The area of focus excludes urban centers and is distinguished by its natural characteristics. The identification of strategies related to different food supply, mining, and industrial networks, and conservation is an important input for assessing city-region relations and BIC analysis.

7.1. Basin Plans

The basin plans, accompanied by technical assistance reports, were examined for three distinct basins: the North Aegean, Susurluk, and Marmara basins. These basins are intricately linked to the defined research area. The following plans were evaluated in terms of their growth-oriented limits to conservation and potentialities: North Aegean Basin Protection Action Plan (2010), North Aegean Basin Master Plan (2016), North Aegean River Basin Management Plan (2019-2020), North Aegean Basin Pollution Prevention Action Plan (2016), North Aegean Basin Nitrate Action Plan - SEA Pilot Region (2020), North Aegean Basin Flood Management Plan (2019), Preparation of North Aegean Basin Sectoral Water Allocation Plan (2023), Susurluk Basin Sensitive Water Body Improvement Action Plan (2015), Susurluk Basin Master Plan (2017), Susurluk River Basin Management Plan (Transformation of Basin Protection Action Plans into River Basin Management Plans Project - 2018), Marmara Basin Protection

Action Plan (2010), Marmara Basin Sensitive Water Body Action Plan (2015), Marmara River Basin Management Plan – SEA Scoping Report (2024).

Both groundwater and surface water sources are considered, with particular attention given to plans developed with the objective of adopting the EU WFD, including the recent North Aegean and Susurluk River Basin Management Plans and the current Marmara River Basin Management Plan – SEA Scoping Report. A comprehensive examination of point and diffuse pollution sources is provided in the plans, accompanied by expert assessments of their sources. For North Aegean and Susurluk, while there is currently no risk of groundwater depletion in the initial regions, future projections indicate that these regions will be vulnerable to drought and will experience a decline in groundwater reserves. Mining activities are identified as a significant source of pollution in the region, particularly in relation to the exceedance of high threshold values for heavy metal contamination especially in groundwater bodies (Ministry of Agriculture and Forest 2018; 2019; 2020).

The North Aegean Basin report (2020) addresses the issue of excessive water withdrawal and pollution due to geothermal resources, particularly in the Tuzla and in the Gulf of Edremit, which is in the focus research area (Figure 77). Furthermore, the detrimental impact of mining activities and the presence of abandoned coal mines in the region, particularly in Ezine, Çan and Yenice regions, is addressed in the North Aegean and Marmara basin plan groundwater assessment reports (Figure 76 and 78). It is crucial to highlight that industrial activities in the Susurluk and Marmara basins, including those in the Biga sub-basin within the focus research area, are the primary source of pollution in the basins. This has included the Biga thermal power plant and port. Besides, the plan reports for all three basins emphasise pollution caused by agriculture and livestock activities in the regions. As previously mentioned, the quality of groundwater and surface water bodies is poor and under high risk of contamination in three basins (see Chapter 6.4.)

In accordance with the findings presented in basin plan reports or research reports related to them, the measures to be taken in response to the pollution caused by mining areas are limited to the installation of meters and the reinjection of water for geothermal areas, the treatment of wastewater and the construction of waste storage facilities in some mining areas. In addition to this, the proposal includes encirclement around the mining areas and the restoration of old mining areas. Although the increase in the number of mining licences and the inadequacy of EIA processes in the region are acknowledged, no

restrictions or conditions are set on the capacity, geographical scope or scale of such activities (see Table 20).

A number of proposals put forth regarding the establishment of discharge limits for industrial pollution, which has the potential to cause significant harm, especially in the Susurluk Basin. These proposals are presented with the aim of incorporating them into the relevant legislation. In addition, there are suggestions regarding the capacity of fish farms in the region and the necessity to adapt them to the existing legislation. In this sense, the plan has the potential to address the capacity of important pollutant elements and to intervene in a structural manner.

In the North Aegean River Basin Management Plan (2020), the necessity of developing a drinking water protection plan is identified. In the Susurluk River Basin Management Plan (2018), the proposal put forth for the delineation of a groundwater protection zone. Moreover, the aforementioned plan proposess the development of sectoral plans and drought and flood management plans. Furthermore, the necessity of revising the protection of aquatic organisms and habitats, as well as the necessity of coastal restoration, is mentioned. At this juncture, the plan has the potential to re-evaluate and integrate both land use and decisions on protected areas into the plan (see Table 20).

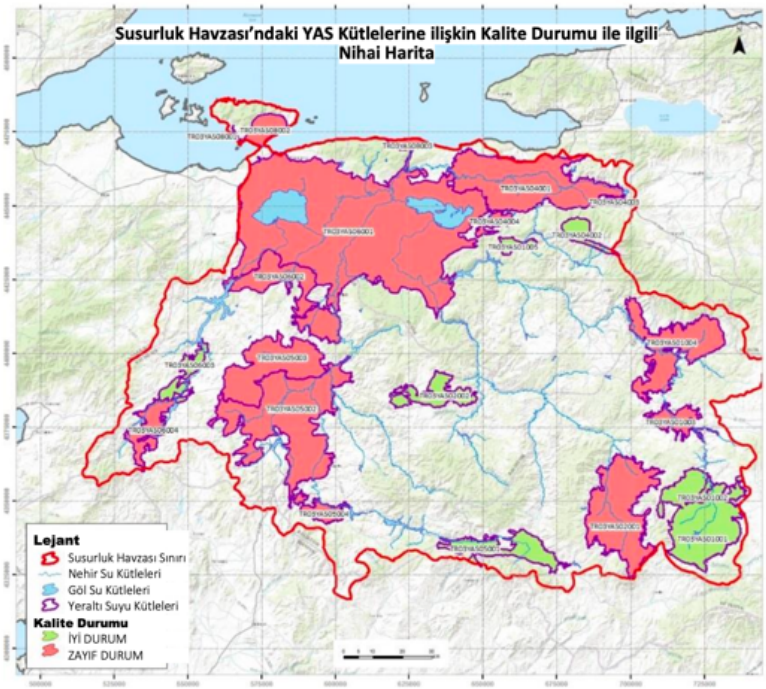


Figure 76. Groundwater Quality in Susurluk Basin

(Source: Ministry of Agriculture and Forest 2018)

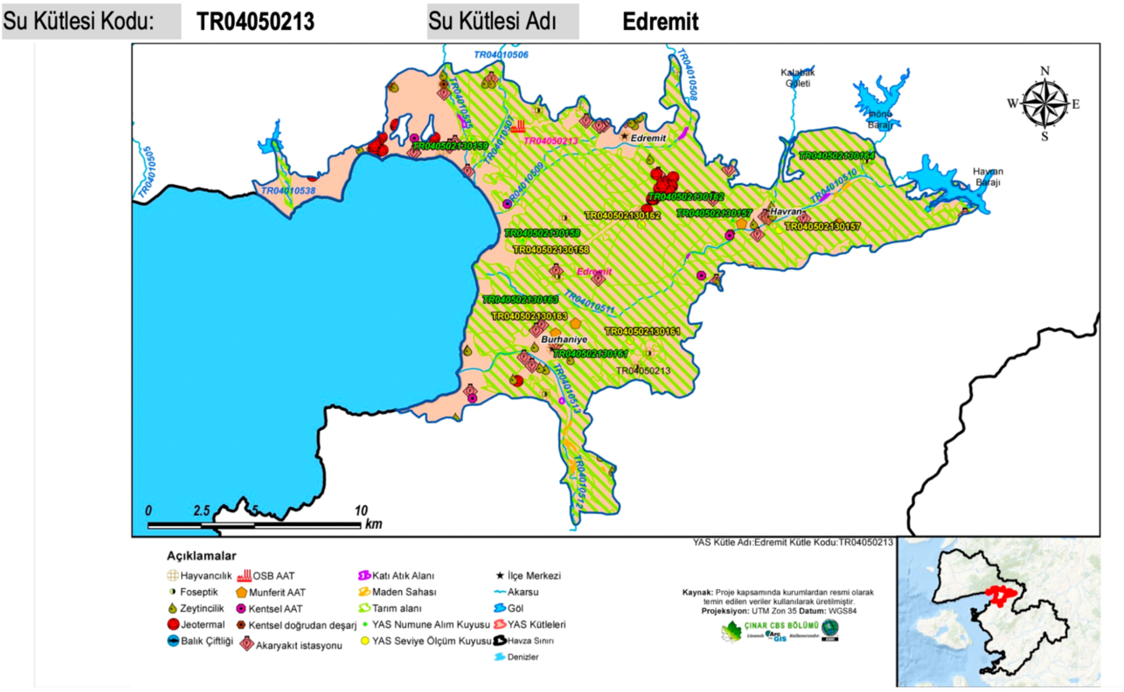


Figure 77. Threatments on Edremit Groundwater Bodies

(Source: Ministry of Agriculture and Forest 2019, 85)

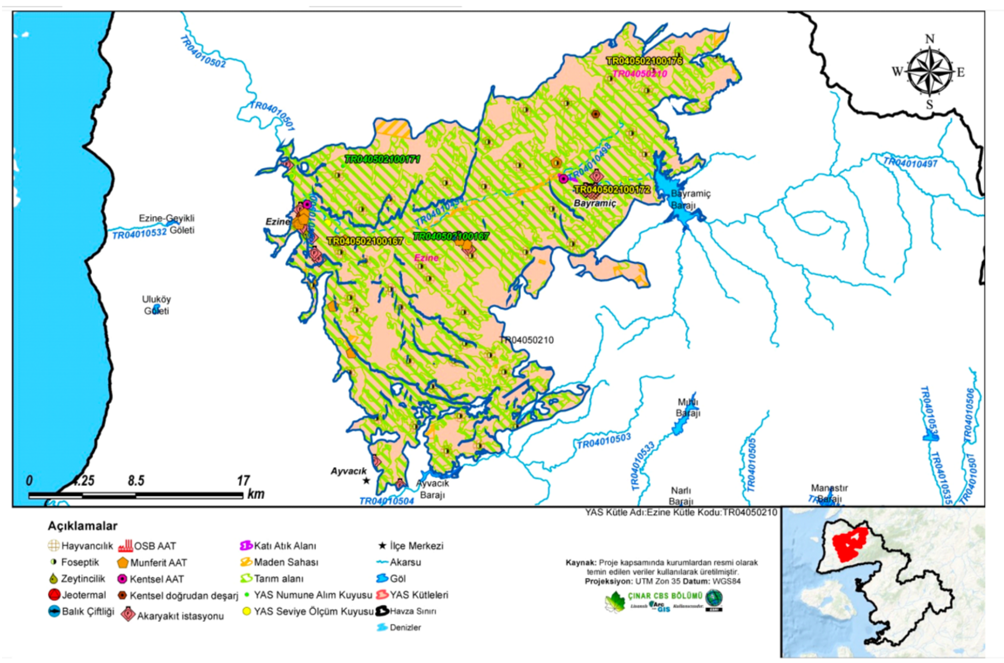


Figure 78. Threatments on Ezine – Bayramiç Groundwater Bodies

(Source: Ministry of Agriculture and Forest 2019, 110)

Both basin management plans include structural proposals for waste management, such as the development of wastewater treatment and the establishment of sanitary landfills. In addition, the reuse of olive water treatment and waste sludge is worthy of note as it represents an alternative means of recycling. On the other hand, there are recommendations for good agricultural practices, including the use of fertiliser tanks, green barriers, terracing, and pesticide management measures. Crop rotation is also recommended for the North Aegean basin. However, although this rotation seems to be implemented to prevent pollution from olive production, products are preferred (barley, feed, corn, sunflower) subjected to industrial inputs with an export-oriented aim. Notwithstanding, the region is the site of the cultivation of a variety of local fruits and vegetables. (Çanakkale Provincial Agricultural Unit Brifing Report 2023; Balıkesir Governorship Official Website 2022).

The plans for the identification and remediation of sensitive water bodies are focused on specific pollution parameters and measures, such as those indicating pollution from agricultural activities and urban areas. In addition, the development of infrastructure, such as wastewater treatment plants and the elimination of deficiencies, is among the measures taken. Other measures include the promotion of good agricultural practices and the implementation of erosion control and afforestation strategies.

In the action plan for the improvement of sensitive water bodies in the North Aegean basin, a limited number of actions are defined for the elimination of industrial wastewater pollution from specific producers and industrial companies. While the actions proposed in the North Aegean Basin Pollution Prevention Action Plan (2016) bear similarity to those outlined in the Sensitive Water Bodies Improvement Plans, it also includes proposals for the improvement and construction of wastewater treatment infrastructures, particularly in industrial and mining areas. Furthermore, the plan recommends enhancements to wastewater treatment and infrastructure in tourist areas.

Flood Management Plans provide recommendations and interventions for urban settlements in the sub-basin area. Further detailed studies were conducted to determine the extent of flood zones and the necessity of building structures to prevent the associated risks. The recommendations and measures for the upper basin are relatively limited. On the other hand, decentralised alternatives for in situ water use and infrastructure proposals for rainwater harvesting are also discussed, they have potential for degrowth alternatives.

The establishment of river basin management plans and sensitive water bodies improvement plans is beneficial in terms of providing more comprehensive data on the status and pollution sources of water resources, as well as assessing groundwater resources. This is in accordance with the requirements of the recently enacted EU Water Framework Directive. Furthermore, the aforementioned plans are beneficial in terms of facilitating the formulation of additional plans, such as those pollution prevention, flood and drought management, as well as the integration of drinking water protection and habitat protection plans.

However, the Marmama Basin Protection Action Plan (2010) addresses water resource issues in a more comprehensive and systemic way. For instance, the monitoring of pollution from the upper basin and the improvement of upper basin conditions, basin-based governance and legislative amendments, as well as proposals for the evaluation of basin-based decisions at the local level, are not addressed in other recent plans. On the other hand, the plan also includes more structural solution proposals, such as the closure and rehabilitation of mining areas that do not operate properly and do not produce under appropriate conditions, and the establishment of wastewater discharge standards. The plan emphasises the necessity of making decisions and taking measures regarding land use by taking into account protected areas, wetlands and coasts. Additionally, the plan aims to implement measures such as atmospheric pollution monitoring, which can be applied at both basin and related scales. In addition, decentralised water management alternatives and options such as grey water use are also discussed. With regard to agricultural practices, spatial proposals are presented that aim to rehabilitate pastures, rotate crops according to the character of the basin and taking into account factors such as drought, identify areas where organic farming will be practised, promote the reuse of manure and provide a place for livestock activities within organised industrial zones to prevent pollution. In addition to conservation approaches, such as the restoration of pastures, it is recommended to identify places for organic farming and livestock production and to prevent pollution and improve product quality directly in these areas. These areas can be supported by infrastructure. However, it is important to identify the users of these areas to avoid practices that resemble land consolidation.

At last, a sectoral water allocation plan was prepared for the North Aegean Basin. The plan entails the periodic analysis of the status of groundwater, surface water resources, and dams in the basin, as well as the determination of scenarios and sectoral allocations for various drought conditions. It is determined that by the year 2040,

agricultural activity within the basin will increase in accordance with the necessity for water, yet there will be a reduction in water demand as a result of enhanced irrigation efficiency. It is established that the demand for water in the region will increase in line with the growth of animal husbandry, forestry, tourism, and the packaged drinking water industry. Conversely, water usage within the industrial sector will grow in organized industrial zones, for the olive industry remain unchanged, and there are no plans for expansion within the context of agriculture-based industries. Furthermore, technological opportunities will expand. With regard to mining activities, given that new explorations are ongoing in the region but no capacity increase is determined, the allocation amount remains unchanged, with the expectation that water consumption will remain consistent. Furthermore, as no new energy production facilities are planned for the basin, it is anticipated that the water consumption of this sector will remain consistent (Table 17 and 18). Furthermore, the plan stipulates that deficiencies in the current system must be identified and that the potential for alternative uses of treated water, including landscape irrigation and industrial applications, must be evaluated.

Table 17: Sectoral Water Allocations in 2020 for Sub-basins of the North Aegean Basin (Source: Preperation of the North Aegean Basin Sectoral Water Allocation Plan 2023)

2020 Sub-Basin Based Sectoral Water Allocations (hm^3/year)				
Industry Name	**Lower North Aegean**	**Central North Aegean**	**Upper North Aegean**	**Total**
Industry	52,4	4,2	7,5	64,1
Mining	0,6	2,2	0,2	3
Energy	38		0	38,1
Agriculture	312,7	81,1	153,3	547,1
Drinking and Utility Water	41,6	40,3	7,3	89,2
Livestock	10	4,8	2,8	17,6
Fisheries and Aquaculture	16,1	0	23,7	39,9
Tourism	0,1	0,2	0,2	0,6
Packaged Water		0,3		0,3
Forestry	0,1	0,1	0,1	0,3

The lower North Aegean basin have the highest water consumption for energy and indutrial facilities among the subbasins (Table 17). The region also comprises the Petkim and Tüpraş industrial complexes, as well as the nearby Koza gold enterprise. The Edremit and Havran districts, which are located within the focus research area, are situated in the middle of the North Aegean Basin. This region requires greater water allocation for mining purposes than other parts of the basin.

Table 18: Sectoral Water Allocations in 2020 for Sub-basins of the North Aegean Basin (Source: Preperation of the North Aegean Basin Sectoral Water Allocation Plan 2023)

2025 Sub-Basin Based Sectoral Water Allocations (hm³/year)				
Industry Name	**Lower North Aegean**	**Central North Aegean**	**Upper North Aegean**	**Total**
Drinking and Utility Water	45,2	42,6	7,8	95,5
Livestock	10,5	5,1	2,9	18,5
Fisheries and Aquaculture	16,5	0	24,3	40,8
Tourism	0,2	0,3	0,4	0,8
Packaged Water		0,3		0,3
Forestry	0,1	0,1	0,1	0,3
Industry	56	4,4	7,4	67,8
Mining	0,6	2,2	0,2	3
Energy	37,5		0	37,5
Agriculture	305,4	80,6	151,2	537,3

It should be noted that this plan does not include the existing Çan and Biga thermal power plants or proposals for thermal power plans in the research area. Moreover, mining operations and capacity enhancements, such as those in Balya and Gönen, are situated within the Susurluk basin. In light of this tendency, in addition to the expected increase in mining and energy sector activities, the need for water allocation may increase in the focus research area, where geothermal-based agriculture and agriculture-based industry are expected to increase as well. It is imperative that potential future adequate water supplies take into account these trends in adjacent basins.

7.2. Balıkesir - Çanakkale Provinces Integrated Coastal Plan:

Integrated Coastal Plan of Çanakkale-Balıkesir (2023) Provinces covers the coasts of the Biga Peninsula. The Integrated Coastal Plan had been the subject of legal proceedings since its suspention in 2020. It was approved with amendments in 2023. Several NGOs, in particular the Çanakkale TMOBB Chamber of Architects, opposed the plan due to its capital-oriented focus and the construction pressure and pollution it will bring to the coasts. One of the points of contention in the lawsuit is the extention of built-up or construction area shown in the coastal area (Başakçıoğlu 2020, December, 11). In the amended plan, a statement was provided in the explanatory report to clarify that the plan merely illustrates the areas in question schematically and is not legally binding.

The plan is centred on the identification of priority coastal areas where infrastructure deficiencies and investments will be made in the sea area. These include the Marmara Islands, extending from Ayvalık Bay to Bandırma. The plan's decisions are based on the research conducted in the study area, which is defined as the coastal hinterland. A multiple criteria approach was employed to identify the most appropriate and non-appropriate areas for investment along the coast. A number of factors were considered, including land use, biodiversity and the potential impact of coastal logistics in these areas. These criteria was revised following the amendment of the plan, with the addition of the criterion of protected area. Ferry proposals was removed from the significant areas such as Sazlıdere and the Historic Peninsula by plan amendement. It is noted in the plan gives responsibility for investment approval or final site selection other related institutions.

Another significant issue was the necessity of the proposed cruise port on Bozcaada. It is inevitable that the construction of this port will have a significant impact on the environment of the region. In light of the objections raised, it was determined that the cruise port in Kepez is sufficient, and the harbour proposal in Bozcaada was removed.

There are also questions about the scientific criteria used to determine the boundaries of the plan area and the method used to determine the priority areas. The plan does not extend to crucial protected areas such as the Saros Bay SEPA, nor does it address the potential pollution and waste that may be transferred to this area. The plan identifies priority areas and requires approval from the Ministry, which must be accompanied by a scientific research and justification report if an investment is to be made in areas other than Priority Area 1. The plan determines the capacities of facilities such as the yacht harbour, fishing harbour, shipyard, cruise port, cargo port, and ferry. The investment capacities are identified for each sub-region, with limits on capacities also being set. However, as previously stated, these capacities and types of investment are based on capital demands and are excessive for the area. The potential impact of groundwater and marine ecosystems is also considered, with proposals for restoration being made for protected areas and buffer zones. However, the implications of terrestrial and marine pressures, biocomplexity and land use are not identified. The plan places an emphasis on the development of marine infrastructure, with a lack of proposals for integrated land use and sectoral developments (Özaydın 2021).

In addition to the proposals for infrastructure improvement, it is also stated that aquaculture production areas can be constructed within the scope of priority areas, taking

into account the groundwater level and provided that the facilities producing shellfish are not detrimental to the ecosystem with the approval of the relevant authorities. The tourism potential in the region is also mentioned. Although the plan explanation report mentions the pollution caused by tourism and secondary housing areas, there is no measure proposed to address this issue. Instead, the report suggests restricting development to secondary housing or tourism development in one specific region.

Conversely, the report proposes that yacht ports as priority facilities in each region. The amendment does not revoke any significant capital investments, such as marinas and cargo ports. The location for shipyards, cargo ports and ferries is proposed in The Gelibolu-Gökçeada sub-region. Bandırma is also proposed as the site for cargo ports, marinas and ferries, despite Erdek being situated within the sensitive region in Marmara Sea. The plan is identified locations such as ship mooring and mooring of ships carrying hazardous waste. It is notable that mooring places for ships carrying hazardous materials are identified in important coastal areas with a high tourism potential, such as the Edremit-Burhaniye Gulf, the offshore areas of Gökçeada and Bozcaada, and Biga, where the İÇDAŞ industrial facility is located (Figure 79 and 80). The report indicates that water pollution resulting from industrial and energy production operations on the Biga coasts may be subject to future reinvestment proposals, contingent on improvements in quality. NGOs have identified mining extraction and imports in the region as a significant concern. These plan proposals aim to shape the region's future in accordance with capital demand, with the intention of extending the export-import network (Seçkin Sağlam 2020, December, 20).

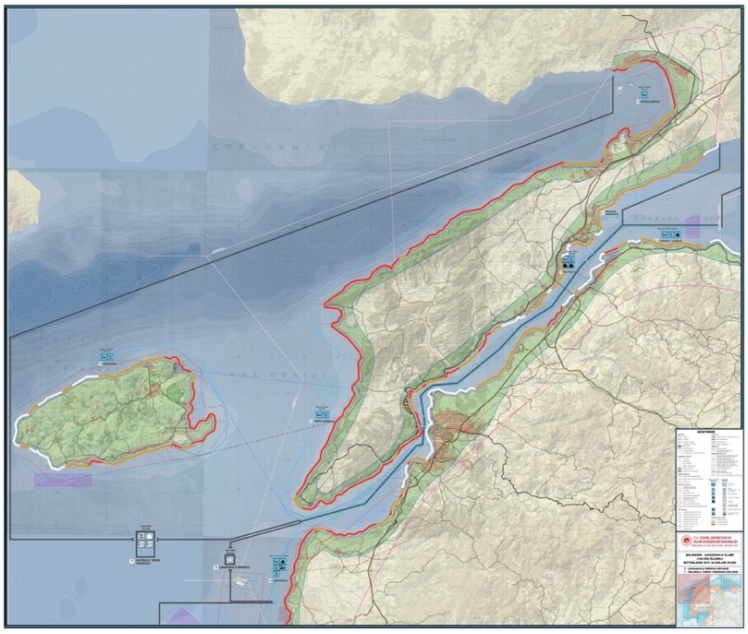


Figure 79. Balıkesir – Çanakkale Integrated Coastal Plan / Gökçeada - Gelibolu Subregion

(Source: Ministry of Environment, Urbanization and Climate Change 2023)

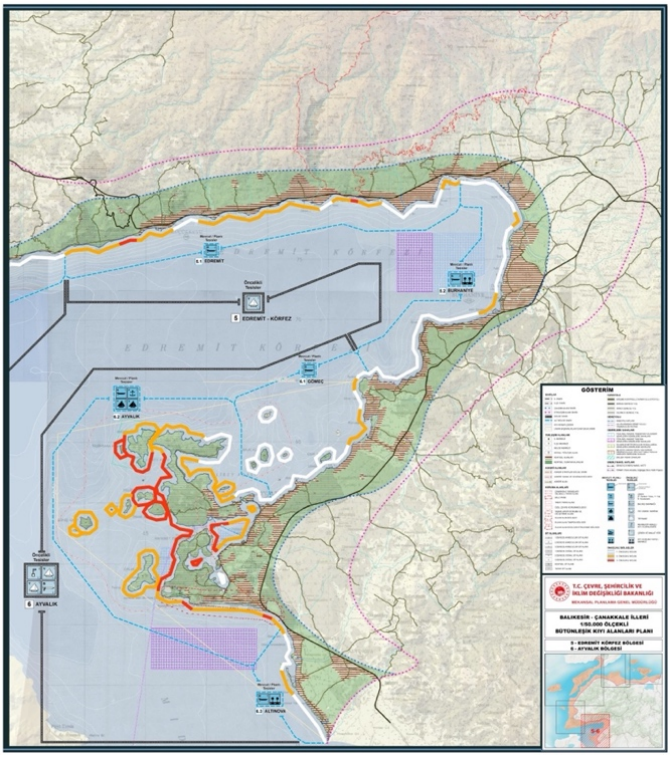


Figure 80. Balıkesir – Çanakkale Integrated Coastal Plan / Edremit Bay Sub-region

(Source: Ministry of Environment, Urbanization and Climate Change 2023)

7.3. Çanakkale – Balıkesir Environmental Plan and Related Previous Plans:

The most comprehensive spatial plan pertaining to the study area is the Çanakkale-Balıkesir Environmental Plan (2013). The city of Çanakkale is not a metropolitan city. There are older environmental plans, particularly for coastal settlements, obtained from the Çanakkle Special Provincial Administration. The district centres of Çanakkale are also the subject of sub-scale zoning plans. Furthermore, environmental plans were prepared for thermal tourism regions in 2006. Balıkesir is a metropolitan municipality. The sub-scale environemental and master plans are currently under construction. There are zoning plans covering the district centres for example Edremit.

In the Environmental Plan, protected areas, national parks, forests, agricultural lands, wetlands, pastures, designated drinking water protection areas are marked and it is stated that these areas will be protected. It is stated that surface water resources that exceed the basin boundary must be protected by water catchment areas. There are some restrictions regarding activities to be carried out around wetlands and the prevention of groundwater discharge.

According to plan decisions about mining, the necessity for the use of protective belts is outlined. It is recommended that concrete and mining areas should be orientated in designated industrial zones as much as possible. Conversely, additional industrial areas designated in the plan were established through the amendements and presidential decree. Despite the decision that polluting activities must not carried out in the vicinity of the wetlands, a food-specialised industry is designated for the Ezine-Akçin wetland by the amendement in 2016. Previously, this area was designated as a livestock and grazing area (Figure 82). The energy production area on the coast of Biga was expanded and designated as İÇDAŞ private industrial zone in 2019 by presidential decree (no 1252). Additionally, amendments were made regarding the establishment of industrial production zones in Gönen and Bandırma coasts and in Edremit Bay on agricultural land and pastures (Figure 81). Besides, the provisions of the plan remain subject to laws such as the Forest Law (no. 6831) or Pasture Law (no. 4342) and any investment can be made in accordance with Presidential decree. One of the example is that the previously established Çan-Etili and Yenice-Hıdırlar Thermal Tourism Centers were formally revoked by presidential decree due to the absence of requisite investment (Figure 83 see

Chapter 6). The pollution of water resources due to livestock and mining activites is the main problem in the region. Proposals for mining operations are located around the regions. On the other hand, there is no restriction on mining in natural areas in the plan. There are suggestions to determine livestock and agricultural production areas (such as technological greenhouses) and to prioritise facilities to benefit from thermal energy in order to utilise the geothermal potential in the region.

Tourism potential of the region on the coasts has been enhanced by the expansion of both transport infrastructure and the extension of tourism development areas in the plan. This is based on the tourism areas identified in the previous South Çanakkale Plan (1992), which covered the Ayvacık, Ezine and Merkez districts (Figure 84). In general, the suggestions put forth in the previous plan were accepted and extended in the current plan (Figure 82). Conversely, in addition to the central districts (such as Çanakkale, Balıkesir, Edremit centre), it is evident that development areas are designated in proximity to settlements where tourism and secondary housing are concentrated (Güre, Ayvacık, in the vicinity of the Saros Gulf). Moreover, the plan aims to facilitate the utilisation of geothermal energy in the tourism and agricultural sectors in this region.

The previous Environmental Plans (1992) include strategies for the Ezine/Geyikli tourism zone at the coast, different from the Environmental Plans for Thermal Tourism Zones (2006). It is also important to note that the health and thermal tourism zone proposed for the inland area was previously identified as a maquis heathland in environmental plans in 1992. The region is characterised by the presence of agricultural lands (Figure 84). With the exception of small settlements (villages), the majority of the area remains undeveloped. In these designated thermal tourism regions in 2006, health facilities and accommodation facilities with social and physical infrastructure can be constructed up to five storeys in height, subject to the requisite planning permission. Furthermore, it is indicated that technological greenhouses and other similar structures can be constructed within these designated areas through the implementation of zoning regulations.

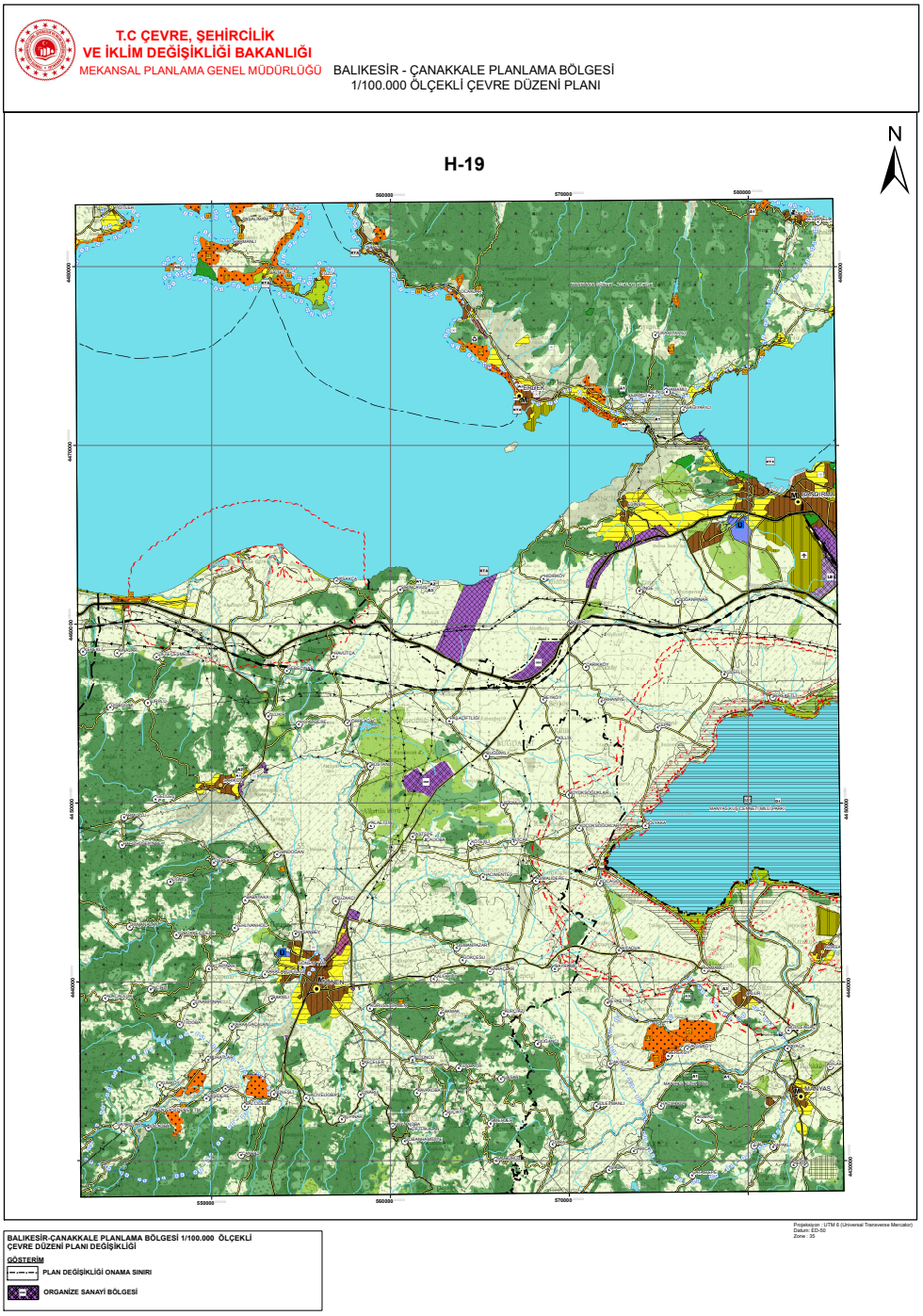
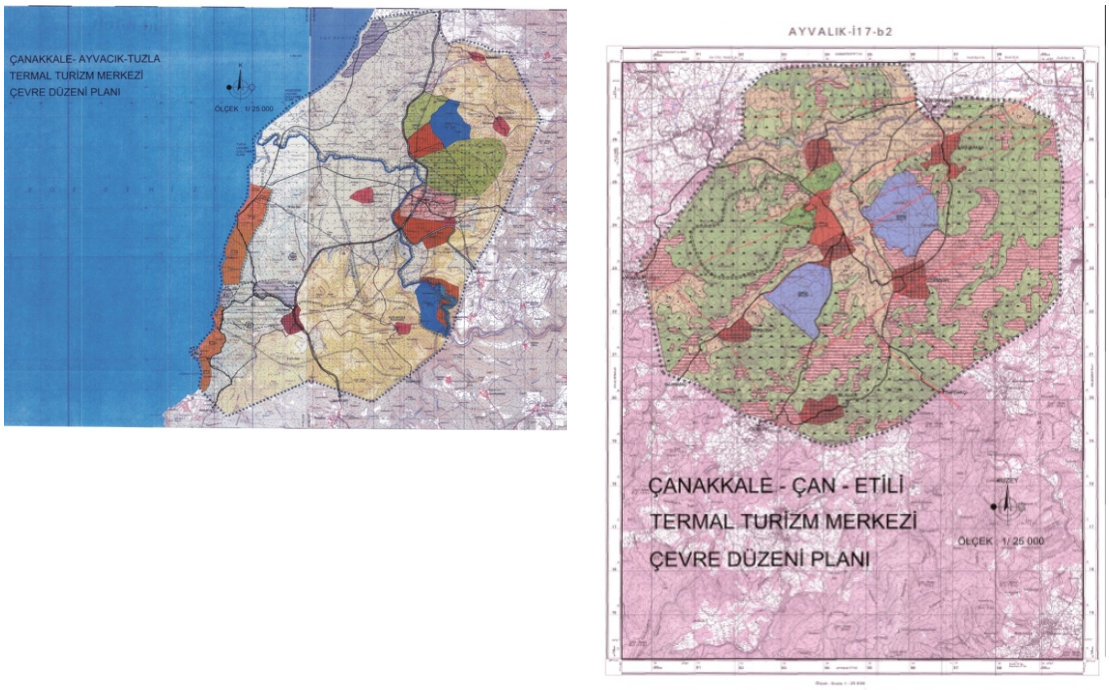


Figure 81. Organized Industial Area Decision in Bandırma and Proposed Geothermal Based Industrial Area and Tourism Zone in Gönen in Çanakkale – Balıkesir Environmenetal Plan (2015)

(Source: Ministry of Environment, Urbanization and Cliamte Change 2022)

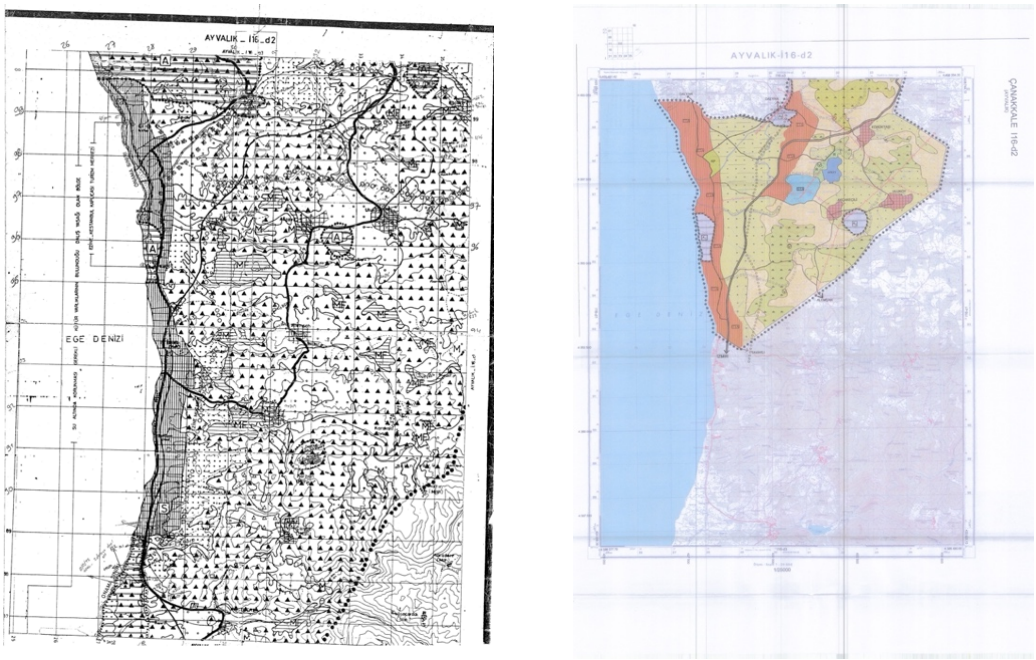
Figure 82. Tourism Development Decisions in Ezine and Ayvacık and Organized Industial Area Decision in Çanakkale – Balıkesir Environmenetal Plan (2015)

(Source: Ministry of Environment, Urbanization and Climate Change 2016)



(a) (b)

Figure 83. Designated Ayvacık - Tuzla (a) and Çan- Etili (b) Thermal Tourism Centres in Environmenetal Plans in 2006
(Source: Çanakkale Special Provincial Directorate 2006)



(a) (b)

Figure 84. Tourism Develeopment Decision in Ezine in Previous Environmenetal Plan 1992 (a) / Ezine - Kestanbol Thermal Tourism Centre Environmental Plan 2006 (b)

(Source: Çanakkale Special Provincial Directorate 2006)

The thermal tourism zones in the Ezine-Kestanbol and Ayvacık-Tuzla tourism regions were situated in close proximity to the coast. Furthermore, these coastal areas are designated as tourism development areas in the current Çanakkale–Balıkesir Environmental Plan (2013). These urban and tourism development areas have the potential to expand into the agricultural areas between the two areas, given the existing and proposed road connections (Figure 82, 83 and 84). The future development of the area between these two tourism areas, particularly in relation to the development of villages, remains unclear.

7.4. Conservation Attempts in Mount Ida National Park, Saros SEPA and Ayvalık Islands

The Long-Term Development Plan for Mount Ida National Park serves as a guiding document. According to the interview with the General Directorate of the Mount Ida National Park, the boundaries of the national park have remained unchanged since 1993. Furthermore, it was confirmed that activities such as hunting are not conducted within the national park. Additionally, it was established that activities such as hydroelectric power plants and mining are already prohibited by regulation, and that such activities are not observed within the park (personal interview, June 2022). The new plan process continues. During the study fieldwork, it was reported that ecotourism, village-style projects, and land rental projects have increased around Mount Ida.

"Strengthening Sustainable Management of Forest Landscape and Conservation of Biodiversity in Mount Ida Project" for sustainable forest management in Mount Ida is being carried out by FAO with GEF funding for the conservation of biodiversity. The project aims to conserve biodiversity, strengthen forest management, rehabilitate forests and develop the socio-economic value of the forest. It aims to create a 'sustainable financing' mechanism to conserve biodiversity by exploring the potential and value of ecosystem services, alternative income from medicinal and aromatic plants, other non-timber products and ecotourism. Defining biodiversity hotspots and creating zones and

buffers around the national park is planned (Ministry of Agriculture and Forest - General Directorate of Forest Official Website 2020, May).

Additionally, a Tourism Master Plan exists for the Balıkesir provinces. Balıkesir Nature Tourism Master Plan (2013-2023) assesses the potential for tourism in the region and defines the various types of tourism and the means of their development. In essence, the objective of defining tourism areas differs from mass tourism activities. This includes facilities that facilitate pastoral tourism, mountain biking, caravan camping, and other related activities. Conversely, the preservation of traditional settlement patterns and the valuation of cultural heritage is tried to be enhanced through the implementation of specific strategies, including the designation of villages as protected areas for the maintenance of local quality standards and the promotion of sustainable practices to ensure their continued viability. Conversely, the private sector is tried to be encouraged to engage in activities such as tour agencies, fairs, and the advertisement of ecological markets, as well as the promotion of local traditions and the development of organic agriculture. A strategy to incorporate secondary residences into the tourism sector and enhance tourism capacity is in place. The presence of protected species and botanical features on Mount Ida presents a potential for attracting both local and international tourists. It is recommended that immediate activities outlined in the Mount Ida Master Plan be initiated, either through public or private sector involvement. The objective of this plan is to assess the socio-economic capacity and parameters for touristic areas. The findings indicate that the socio-economic capacity of Mount Ida has not been exceeded.

As previously mentioned some designated protected areas like National Parks, Special Environment Protection Zone and Biosphere Reserve Areas began to be included in ecosystem services projects. Ayvalık Adaları Natural Park have already a report of the United Nations Development Program and with the support of the Global Environment Facility (GEF) in terms of economic valuation of the protected areas. In these reports, calculations and strategies to contribute the areas into global market are expressed like economic valuation of Posidonia sea grasses in blue carbon market or potential and alternative tourism venues.

The United Nations Development Programme (UNDP) has initiated a project with the objective of protecting seagrass beds and controlling invasive species, such as seaweed. The projects occur with collaboration with nongovernmental organizations (NGOs) and other associations in the region. The economic value of ecosystem services provided by the coastal zone has been identified, including the provision of seabeans,

carbon sequestration, erosion control, tourism and recreation, and natural filtration of wastewater. Furthermore, the issues of coastal pollution, infrastructure deficiencies, illegal commercial fishing activities, and illegal diving and boat tours were highlighted. The project's objective is to facilitate the development of a sustainable tourism industry, with a particular emphasis on ecotourism and agrotourism. Moreover, the project emphasizes the preservation of the area's cultural heritage as a form of cultural ecosystem service, the sustainable harvesting of fish, the enhancement of the area's biodiversity, and the establishment of regulatory services designed to safeguard sea grasses. Additionally, it addresses the need for an integrated management plan and an analysis of the area's socioeconomic factors.

In 2015, Saros Bay was designated a special environmental protection zone. An environmental plan for the Special Environmental Protection Zone is available in a 1/25.000 scale. It is also acknowledged that the natural gas pipeline project traverses this area. The plan identifies a number of sensitive areas, including sensitive endemic biotopes (such as sea streams, coral populations, waterfowl breeding areas, drinking water protection areas, and large plains protection areas). The designation of "Sensitive A" areas signifies a restriction on human activities and a general preservation of forest integrity. "Sensitive B" areas are characterized by fragmentation and a limited number of buildings within agricultural areas, particularly in forest fragments. In “Sensitive C” areas, construction densities have been determined, and the building of structures such as energy facilities and tourist infrastructure is prohibited without prior authorization. The establishment of agricultural areas and settlement areas is not permitted outside the existing land use. In coastal areas, the approval of the ministry is required for the construction of any building, and the filling of land with sand, stone, gravel, and other materials is prohibited. Additionally, the disruption of the topography through excavation is not allowed in inland areas. It was determined that the dispersed, modest industrial zones should be relocated to the designated areas in the plan. Besides, the plan imposes restrictions on the potential uses of the land in the areas adjacent to the Istanbul-Tekirdağ-Gelibolu-Çanakkale-Savaştepe highway connection project and the increase in density in these areas.

In areas that have been designated as areas with existing character that is to be preserved, the decisions that have been made regarding the use of land in sensitive areas, such as coastal zones, reedbeds, and marshes, remain valid. In cases of necessity, energy production may be permitted. The construction of geothermal, hydroelectric, wind, and

biogas facilities is permitted, provided that they are not located within the boundaries of "sensitive area A." Solar power plants may also be constructed without the need for a change in zoning designation, provided that they are not situated within "sensitive areas A" and "sensitive area B," and with the approval of the relevant ministry. The regulation regarding the construction and operation of Botaş crude oil and natural gas pipeline facilities remains in effect.

Despite the relatively restrictive and holistic approach and the measures taken to protect forest areas and agricultural lands in sensitive areas, an evaluation of terrestrial activities connected to the opposite shore and the Dardanelles is not to be considered. This is due to the fact that a BOTAŞ port has been proposed on the opposite shore. Conversely, it is a limitation that renewable energy sources are permitted without any restrictions in Sensitive areas B and C, and the cumulative impact of these investments is not considered. Furthermore, the decisions made in these sensitive zones are beyond the scope of laws that are insufficient in terms of protection against to the some investments such as energy or tourism.

7.5. Regional Plans and Logistics

A review of the regional development plan and investment guides for the provinces of Çanakkale and Balıkesir reveals that, while strategies and guides promote agriculture and animal husbandry across the region, there are also initiatives to enhance mineral extraction in Balıkesir and energy investments, particularly geothermal in Çanakkale. These plans, which are generally aimed at increasing regional competitiveness, place emphasis on the presence of metropolitan cities around the region and the advantages of infrastructure and logistics investments. They posit that such investments present an opportunity to invest in related sectors, thereby fostering regional competitiveness.

It is asserted that these significant investments in transportation and logistics infrastructure provide enhanced accessibility to major urban centers, including Istanbul, Kocaeli, Tekirdağ, Bursa, Manisa, Izmir, and Manisa. Additionally, the region is positioned as a pivotal intersection point. The Gebze-Orhangazi-Izmir Motorway project, which is expected to reduce the transportation time between Istanbul and Izmir to 3.5

hours, and its continuation, the Tekirdağ-Çanakkale-Balıkesir Motorway Project with 1915 Çanakkale bridge which provides transportation between the Anatolia and Europe, was completed in 2022. In GMKA reports, it was asserted that these projects will reinforce the connection with metropolitan areas, which are experiencing particularly robust growth in industry and tourism, and that the sectors supported in Çanakkale and Balıkesir will undergo a period of revitalization. Furthermore, it is highlighted that the Bandırma-Balikesir- Izmir and Bandırma-Busa Bilecik high-speed rail projects, which will facilitate freight and passenger transportation will reinforce industrial connections in the area. The Tekirdağ-Çanakkale-Bandırma railway project is particular significance in facilitating connectivity between Bandırma's specialized industrial zones and those in Gönen. Additionally, the Great Anatolian Logistics Organizations Project (BALO) and the Trans-European North-South Motorway (TEM) Project, which will extend from the Gökkoy Logistics Village's Bandırma load collection point to Europe via Tekirdağ, were highlighted as key enablers of enhanced connectivity with Europe (GMKA 2016a; 2016b).

These investments will directly affect industrial activities in Biga, Bandırma, and Çan, as identified in the relevant strategies. While water pollution is identified as the most significant environmental issue in the regional plans of the development agencies, the proposed measures to address this problem focus on the development of infrastructure, including the strengthening of wastewater, landfill, and sewerage systems, as well as the recycling of industrial wastes. In contrast, there are strategies such as supporting renewable energy investments, particularly geothermal and biogas.

It is asserted that the agricultural, animal husbandry, and food-based industries in both Balıkesir and Çanakkale are of significant regional importance. Balıkesir is described as a "province that feeds Turkey," meeting the fruit and vegetable demands of the metropolitan areas. Additionally, the region is identified as a notable producer of olives and a major center for cattle breeding, both at the small and large scale (GMKA 2016b). Additionally, it is noted that geothermal and greenhouse production are favorable in the agricultural sector, and that organic production has the potential for growth. A preliminary feasibility study was conducted for the potential investment in greenhouses, particularly in the Ayvacık district of Çanakkale. Conversely, the construction of geothermal power plants and the drilling of associated wells is proceeding at a rapid pace in the region. For Çanakkale and Balıkesir, the recent analysis of cooperatives and the proposed solutions to increase their efficiency represent a potential opportunity, given the

sustainable and organized nature of the region's agriculture. However, it remains unclear whether food specialization industry investments and geothermal energy-supported greenhouses in the region will include small-scale producers in this system (GMKA 2021a; 2021b).

Furthermore, while the reports address the environmental impact of mines, the misappropriation of agricultural and pasture lands due to tourism, industry, and mining activities, and the lack of port capacities and infrastructure, the strategies also considers the absence of collaboration with other cities in the industrial sector and evaluates the mineral wealth of the region, particularly boron, as an opportunity. While directing industrial areas to Ezine, Biga, Çan, Gönen, Bandırma and Balıkesir, the coastal parts of the region assume a tourism role (Figure 85; GMKA 2014). These regions are already coping with water and air pollution from industrial, energy production and mining activities.

Conversely, GMKA report was asserted that the number of mining licenses in the region is 3.5 times greater than the national average for Turkey. Additionally, it was indicated that the findings of gold exploration studies in Kirazlı and Lapseki are being evaluated by the MTA in Canadian laboratories, and that mines were identified in the Havran, Ayvalık, and Kepsut districts (GMKA 2010). These strategies and tendency continue with ‘investment guides’. It is indicated that a variety of minerals, including kaolin and halloysite, are extracted in Balıkesir and satisfy the majority of Turkey's domestic demand. These minerals are subsequently exported to countries such as England. Conversely, it is asserted that the region boasts a plethora of granite and marble industries, with notable concentrations in Edremit, Erdek, Ayvalık, and Susurluk. These facilities not only serve the domestic market but also export their products to international destinations. In particular, it is stated that lead-zinc-copper mines, which are currently the source of environmental contamination in the region, are located in the region. These mines are utilized in a number of significant industrial, machinery, and construction sectors. Furthermore, the BALO project presents an opportunity for the export of these minerals to Europe (GMKA 2016a).

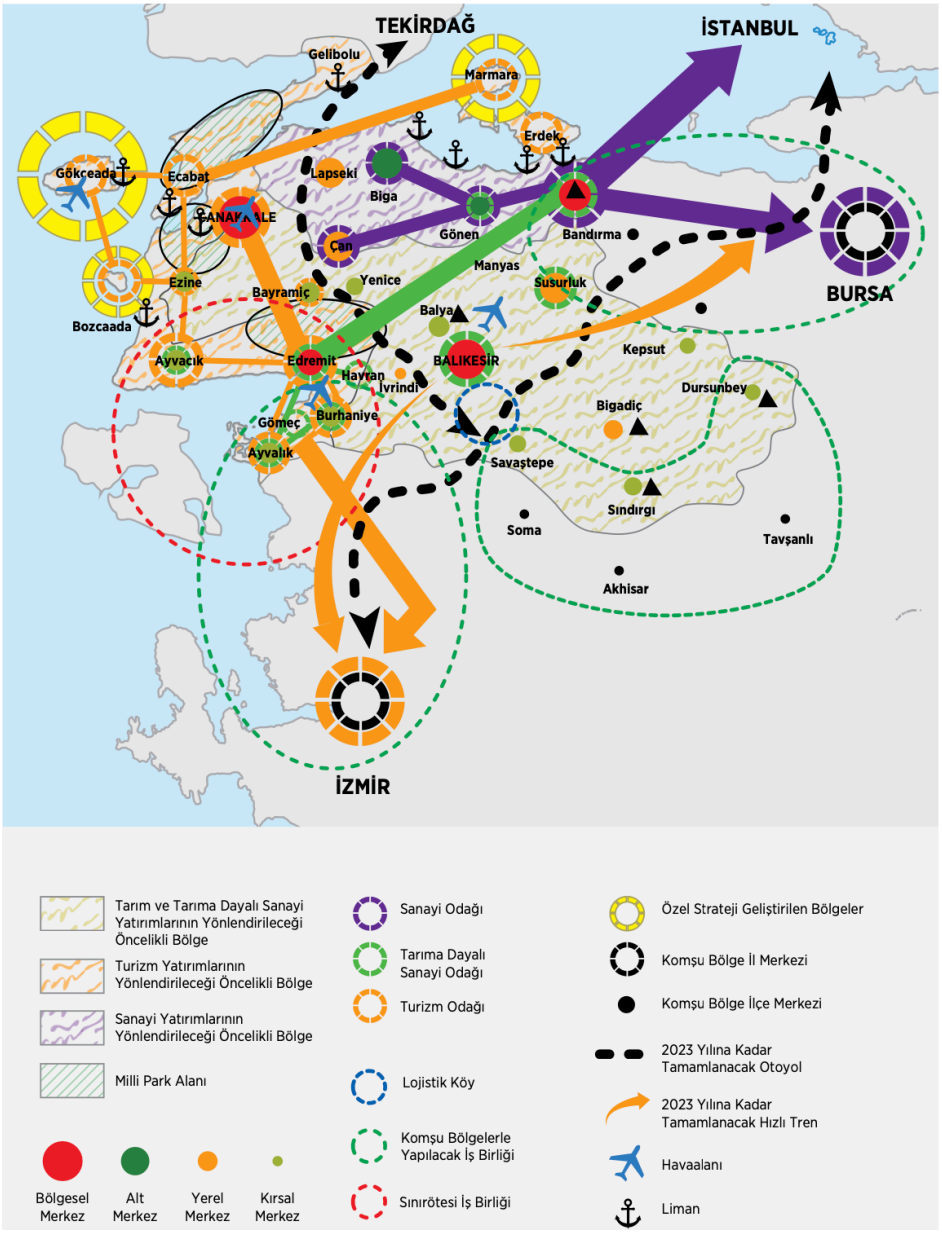


Figure 85. Çanakkale – Balıkesir Region Plan

(Source: GMKA 2014)

7.5. Evaluation of Conservation and Post-growth Potentialies

In spatial plans, basin plans, and even large-scale conservation plans, the transitions between these boundaries and relative ‘conservation scales’ are frequently neglected when plans for growth or resource-based conservation are developed. While the issues of transition and allocation between basins began to be addressed in basin plans, the land use decisions made within the basin are not sufficiently problematized or reflected in spatial plans. In contrast, regional plans acknowledge the challenges within the basin or coastal areas but they are primarily focused on attracting capital, promoting economic growth beyond visible borders, strengthening invisible networks, and making investments that will enhance the region's competitiveness. In accordance with the environmental protection "paradigm" and EU regulations, these plans endeavor to address dimensions such as carbon footprint, recycling, and sustainability through the implementation of diverse strategies. However, they fail to address the actual pressures and inequalities, including basin plans the growth targets set forth in the basin plans. Strategies in agricultural basins or agriculture-related basin plans tend to prioritize the management of crops as direct industrial inputs or the mitigation of agricultural pollution.

A summary of new studies on degrowth, steady-state and post-growth alternatives for commons, with their evaluation criteria and scales, is presented in Table 19. The table includes agenda, policy proposals and practices on forests, water resources, agricultural lands, urban commons, settlements and wastes. While some of these are not directly related to degrowth, they are studies that converge on degrowth practices and challenge the focus on growth. Furthermore, an attempt was made to establish a connection between this and the Table 20 that contains an analysis of existing plans and the presentation of post-growth alternatives. The potential of planning decisions, trends, practices, and projects was evaluated. What is the potential for reducing the carbon cycle in the forest area? Is it possible to reduce water consumption for water use with these policies? Is it possible for the area to shorten the food supply chain and reduce carbon footprint and energy consumption? Are investments such as transportation systems environmentally friendly, what is their impact on the ecology? Are there policies that can ensure climate justice in the region and globally? How can the plans address them? Based on very recent studies that converge to degrowth or a steady-state situation (Table 19), it was tried to provide limits and alternatives.

Table 19. Degrowth/ Steady-state/ Post-growth Alternatives

Article/Author	**Focusing Commons**	**Criteria for assessing "degrowth" (local) practice or potential / proposed policies**	**Criteria for assessing "degrowth" (global) network**	**Post-growth potential**	**Triggering factor**
Creutzburg (2022)	Forest sector	Ecology - **decrease of forests** / forbidden forest clearance (law)	Critique - commodification of ecosystems of forests - **carbon credits selling by private owners**	Reducing ecological impacts at local scale	General global economy direction / crises
Degrowth policies of government		But forest loss through compensation does occur	**REDD program/carbon credits selling** support by Federal when Sweden forests decommodified	Local ecological regeneration	
		Types and effects of ecosystem services / sector in forest nature-based forestry generally enhance biodiversity	**Exploitation of resources** from other states	Reducing carbon emission/pollution/waste in both scale	
		Intensive management / but decline in Swiss wood harvesting	Industrial high income state - importers of forest and timber (products)	Local democratic governance	
		Excluded human being connection with nature / Forest Landscape Integrity Index is low	High ecological footprint	Not fetishize private property at local scale	
		Non monetary ecosystem services for villages by federals etc.	**Deforestation direct of indirectly** in Global South e.g. Meat consumption/ soy cultivation through forest conversion (agroforestry vb.)	Considering unequal distribution of resources and wastes at global scale	
		More local tree species and older forests (put ecological condition than economic profit maximization)			
		Responsible consumption / **short - term or long term use** of wood products (for house/ or paper, online shopping)			
		Wood energy use (no carbon neutral)			
		Domestic and local timber use (for public buildings or housing)			
		Recreational activities such as hiking			
		Bioeconomics & technology - **big forest machines** / logging - need convivial technology			
		Democracy - generally public/ common ownership of forests - inclusive and participatory management			
		Justice - in Sweden decommodified and communal use of forests			

Table 19. Cont.

Domenech, March and Sauri (2013)	Water management/ irrigation	Financial/Social/Environmental/Technological values, costs, preferences of non-conventional water resources	**Private international** capital control water cycle / desalinated water **emancipated** from this	Local attempt to provide access of water supply reduce dependency (more local solution)	Drought/water sovereignty
Alternative policies of local governments /converge to degrowth		**Reusage** (decentralized water system such as rainwater harvesting and greywater reuse)		Potential to engage local communities	
		Transportation & need of infrastructure (desalinated water) / CO2 emission - more local (rain water and grey water)		Potential to attempt reduce waste/emission	
		Energy consumption (comparing desalinated & others) / CO2 emission		Unequal distribution of resources globally	
		Environmental concerns / impacts on aquatic systems (desalination -)		Political dependency water as a 'commodity' globally	
		Public acceptability/ health risks/ drinkability (simple treatment or treatment by aim can be purposed?)		Potential to turn commodity to common of water	
		Life cycle analysis (decentralized water alternative - reuse waste compared central water system)			
		Ecosystem services? minimizing flood and pollution risks of water bodies (rainwater harvesting)			
		Simple and available **technology** (rainwater)			
		Yield or **available** during year (rw -)			
		Water conservation and efficiency programs in build environment (**water consumption**)			
		(Fair distribution?) decentralized water systems - "**commons**"			
		Rainwater harvest - **shrink urban water cycle**			
Spanier, Lara and Feola (2023) / Tschumi et al. (2019)	Agricultural Areas/ Food supply	**CSA structures** and possibility of the alignment to degrowth	Attempt to local (community-based or farmers in Germany) or **global food sovereignty**	Local/bottom up attempt to access sustainable, health, local food	Food sovereignty
Alternative practices of bottom-up initiatives/converge to degrowth		Community structure (political/**scale/alternative production**)		Decommodification of food	Economic constraint of farmers / unsustainable food production
		Property owner/use (commonly/collectively owned property or means of production)		Against to unequal distribution of resources	Environmental crisis

Table 19. Cont.

		Attempt to **local (community-based or farmers in Germany) or global food soverginity**		Regeneration of society attempt	Political independency attempt
		Sustainable and local food supply attempt		Ecological regeneration attempt	
		Generally **self-organized** / some of example leadership		Not attempt to maximize profit	
		Some organization - **conservation or regeneration** attempt (conservation of agriculture, biodynamic farming, soil regeneration)		Value networks and products	
		Some organization - **technological professionalization**		Not main issue is "growth" rather independency/sovereignty	
		Scaling up network (city-region-local government - communities) attempt		Local and solidarity based economy	
		Consumer to prosumer			
		Short supply chains			
		Strong, well organized network in community/inclusive			
		High capital inputs to manual labor			
		Purchase guarantee - **decommercialized**			
Karakaya Ayalp et.al (2023)	Food supply / policy & action	**Shortening** food supply chain - transforming institutional and social organization - inclusive, **more collective** and local or public based institutions (cooperatives/ public imitative market & butchers etc.)	Defining and creating network of city-region for food supply / strengthening food city-region infrastructure	Scaling - up potential	Food sovereignty
Alternative policies of local governments /converge to degrowth		Shortening food supply chain - strengthening green infrastructures and transformation available for **more local food distribution**	Adopting basin - based approaches	Bioregionalism reducing global dependency	Food poverty
		Creation of new governance mechanisms (neighborhood communities, city food councils, local bazaars, transparent controlling, cost etc.)		Reducing carbon emision,pollution,material dependency etc. in city-region	Crisis/pandemic/ disaster
		Supporting **agro-ecological production** (technical, educational, physical (infrastructure) support /Promoting urban agriculture			
		Reducing food waste (waste management, rainwater collection, reducing plastic covers (by deposits) , promoting compost etc.)			

Table 19. Cont.

		Promoting **fair distribution** (prioritizing food poverty regions, supporting public transportation for agroecological bazars etc. Points (for producers or consumers), promoting cooperative or initiative producers sell)			
		Developing disaster management for accessing **safe food and water** (physical like infrastructure or economies protocols interventions suggest / agricultural twin city			
Schmelzer & Nowshin (2023)	Climate/ ecological reparatation	Degrowth needs to incorporate **reparatations**	Internationalist degrowth agenda / to climate justice	Scaling - up potential	Selective degrowth / localized degrowth policies and practices
Policy agenda suggestion / research / degrowth inequalities	Economic/ politic transformations	**Degrowing 'Global North'**	Stopping the process of accumulation and appropriation of global resources and labor	Reducing carbon emission/pollution/waste	
		Ecological reparatations of local - return of **local ownership**- local communities	cash/technology transfers, knowledge commons, emergency relief, drawing down carbon etc., rewilding	Decommodification of basic needs	
		Just transition in South, **Deglobalization**	Reversing terms of trade, price stabilizations, **supply chain justice, limiting, energy-intensive trade**, transforming shipping and aviation, **globally just delinking**	Local and solidarity based economy	
		Local ownership and democratic say in the process of resource extraction and **mining, localization of use and value-added production**		Promoting independency / sovereignty	
		Prioritizing Indigenous land rights, **decolonizing conservation**	Global democratic institutions, Rights of Nature, open localization, freedom of movement for people across borders, safe passages for relocation of people and communities		
		Cancelling Global South debt	International currency (Bancor), democratic management, SDRs, **tax justice**, ending tax havens, introducing g**lobal social-ecological taxes**, capital controls		

Table 19. Cont.

Calisto Friant et al. (2023) / Savini (2023)	Circular cities/ degrowth circularity	Focusing on economic competitiveness or **social justice**	Global North practices / composition of degrowth policies and (mostly) technocentric circular economy and reformist circular society policies	Not fetishize private property in local scale	General global economy direction/ crises
Degrowth policies of the government	Housing	**Redistribute** unused building stock / housing **cooperatives**/ community housing	Contrary to discourses / growth-oriented policies imply - not actual - CE transformation / socio-economic impacts on the Global South	Promoting self-sufficient settlements	
	Transportation	**Multi-functional** neighborhood / supporting rural livelihood		Promoting commoning / collective based activties /economy in local scale	
	Water/natural resources	Transportation decision / **ecologically sensitive**		Local ecological regeneration	
		Community based repair network/ reuse/ composting/ gardening sharing		Water commons understanding in local scale	
		Local cooperatives / **solidarity economy**		Inequality at the global scale	
		Reducing water consumption			
		Conserving/ restoring / protecting biodiversity			
Uy and Nakegoshi, (2007) / Zhang et al., (2006) / Sılaydın Aydın & Çukur (2012)	Green space / oxygen sequestration	Calculating **required area of green spaces** (oxygen capacity of the downtown/ carbon emission from industrial facilities and domestic oxygen consumption)	Specific scale proposal for balance	Promoting self-sufficient settlements	Need to balance carbon and water cycle in cities
Policy agenda / research on balance calculation / Steady - state focus	Forests/ water resources	Planning of green spaces (creating **green network**, mosaic and routes)	Neighborhood scale/ land use decision proposals	Increasing urban common areas in local	
Useful to spatialize degrowth actions	Housing	Increasing public green spaces (**urban commons**)		Water commons understanding in local scale (limited)	
	Urban Commons	**Re-evaluate** the industrial activities in the area		Potential to attempt reduce waste/emission locally	
		Enhancement ecology in cities with landscape		Not analysis other scale rather than city	
		Population capacity of towns and the necessity agricultural production/area		Not mentioned global equity	
		Oxygen- carbon balanced assessment (industrial and domestic oxygen consumption calculation)			
		Water supply demand equilibrium (water reserves and consumption comparison)			
		Potential to policies about **reduction of forest conversion**/ increasing reforestation (as common areas)			
		Potential to **restrict policies** in carbon intensive activates and activities excessive water usage			
		Residential unit based oxygen consumption / Considering climatic factors			
		Possible to **intervene housing and land use decisions** with considering oxygen-carbon balance			

The findings, based on a variety of methods, including literature reviews, statistical data analysis, and historical evaluation of land use classification, indicate a notable decline in forest areas, despite the absence of urban centers in the research focus. This trend continues at particularly due to the rising prevalence of mining operations and the emergence of new projects in forest areas within this region (see Chapter 6). Çırpılar thermal power plant had reached a point where an expropriation request had been made for the coal mine to the instutions before its cancellation within the area. Additionally, the coal extraction activities that ensure the continuity of Çan and Biga thermal activities continue to operation with newly proposed mineral extractions in the research area. In addition, new industrial zones were declared by presidential decree and plan amendements Ezine, Gönen, Edremit and Bandırma. In Bayramiç, a significant copper mining project were approved, and tree cutting were commenced despite ongoing litigation. Besdies, an analysis of the plans and projects, including the GMKA plans and guides and the Balıkesir nature tourism master plan, reveals that the primary economic driver of Balıkesir is mining. In light of the aforementioned, it is not feasible to reduce the research area with regard to carbon emissions.

Conversely, if the integrated forest management plan for the area surrounding Mount Ida is implemented in a way that prioritizes ecosystem services, it may be constrained to protect this specific region, encompassing the national park and its critical forest (carbon sequestration) areas. Nevertheless, this may merely result in a partial reduction in mining activities or the imposition of restrictions on local activities such as lumbering. Once more, the plan may result in an unequal distribution of resources, with a reduction in local activities in this area and an increase in mining activities in the surrounding region, including Havran and Mount Ağı and Mount Madra, where gold mines are located and proposed. Moreover, the Forest Law (no. 6831) and Mining Law (no. 3213) permits activities in these regions on the basis of EIA reports, without imposing any restrictions. Conversely, it is argued that the extraction of raw materials at the regional level will reinforce the inputs that sustain the industry and the industry in neighboring provinces, with these products subsequently exported abroad.

Upon examination of the basin-based plans, it becomes evident that the proposed measures for reducing water usage or preventing pollution are essentially recommendations, such as the improvement of infrastructure, reinjection for geothermal resources, discharge measures for mining areas, and wastewater treatment. In addition, measures were proposed to address pollution caused by livestock and agricultural

activities. These include the delineation of livestock areas, the implementation of agroecological practices, the management and improvement of pesticide use, and the enhancement of irrigation techniques. In contrast, no solution or mitigation measure for heavy metal pollution were proposed. In light of these considerations, there is an opportunity to implement decentralized and alternative water management proposals. These alternative forms of water management were considered in the context of flood prevention and sectoral water allocation plans. However, sectoral water allocation plans are predicated on the assumption that current trends in water usage will be offset by technological advancements, without any reduction in demand in sectors such as mining and industry. Conversely, both in the focus research area and within the North Aegean basin, there is energy production from industrial activties and thermal power plants with high water consumption. In addition to proposals such as the expansion of public irrigation and the remedy of infrastructure deficiencies, there is no definition under which water or other common resources should be removed from the sphere of privatization. Because, there was an increase in the allocation of water resources, as evidenced by the expansion of tourism sector or bottled water production in the North Aegean region.

Once more, the utilization of renewable energy resources, including geothermal and biogas, is a key strategy in both the development and environmental plans for the production of energy. These resources offer promising possibilities for integration into various sectors, including agriculture, tourism, industry, and domestic heating, with a particular focus on the food industry. In the meantime, it is notable that these activities have persisted in recent years, with proposals for wind, solar, and hydroelectric power plants continuing to emerge. The cumulative impact of geothermal energy activities in this area, particularly in regard to the mitigation of water pollution and saltwater intrusion, has not been adequately addressed. On the other hand, the production of fossil fuels in the region persists. This is consistent with Turkey's environmental policy. Moreover, the upper scale plans indicate that renewable energy activities can be conducted without restriction in the Saros Gulf Special Environmental Protection Zone, for instance, outside the specific sensitive zones.

Despite the fact that ecosystem servies projects are designed to safeguard carbon resources, such as seagrass meadows and forests, by crediting them or suggesting activities, such as ecotourism, in these areas, they remain unable to cope with the intensity of tourism that surrounds them as evidenced by the case of Ayvalık. Indeed, they even produce strategies to support them. In contrast, proposals have been put forth regarding

the development of geothermal tourism facilities as part of the research focus area, in addition to the construction of tourism regions that are generally aligned with the concept of mass tourism.

In conclusion, the majority of sectors within the region are being developed with the primary objective of growth, with minimal consideration given to the potential issues that may arise, such as water scarcity, air pollution, and food insecurity. The focus is on achieving economic growth in both the focus research area and the region. Conversely, proposals to safeguard water and forest resources and biodiversity remain disparate and do not impose any constraints on these sectors. The inhabitants of the region are subjected to environmental inequalities through extractive activities, which result in the deprivation of their rights to water and to nature. Besides, these activities are carbon- and water-consuming sectors, such as the manufacturing industry and energy production. Rather offering "degrowth" opportunity in the region, the sacrifice of the environment and natural resources for the sake of economic growth at the national level represents a significant challenge. The following Table 20 present a summary of growth-oriented decisions related to spatial plans in the region, together with post-growth alternatives and a broader framework.

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Table 20. Existing Plan Policies and Decisions with Limitations and Post-growth Potentials and Alternatives

Plan	Commons	Policies/Strategies	Focusing Problem / Growth-oriented Aspect	Actual problem in the Area	Post-growth Alternatives
Çanakkale - Balıkesir Environmental Plan	Water Resources	Integrated water distribution & waste water management projects	Investment-based decisions / water pollution	Imbalance water use	Defining water commons & their infrastructure network by prioritizing deficit areas
Scale: 1/100.000		Conservation of irrigation and drinking water resources with water catchment areas and reserve areas Restrict mining activities in water conservation bands Prohibited groundwater decharge	Limited to define buffer areas against soil and water pollution Conflict with other related policies (e.g. geothermal use/industry proposal) or inefficient intervention of the use of these areas (e.g. mining)	Pollution of water resources using for irrigation and drinking (mining & geothermal) Forest degradation	Showing groundwater & sensitive water bodies and relational irrigations and natural areas/ restrict the activities in the areas
Year: 2014-2023		Surface water protection (trans-basin)		Lack of analysis trans-basin pollution or sectoral use	Prioritizing use for common good
Amendment dates: 2015-2016- 2017-2018-2019-2020	Conservation Areas	Restrict activities around wetlands	Proposal of food special industry on wetland (e.g. Ezine - on Akçin stream) by plan amendment	Soil and Water pollution related to plains and watersheds	Considering plain protection and watershed areas with upstream land decision
	Water Resources / Agricultural lands / Coastal	Promoting geothermal using in agricultural and tourism sectors (e.g. technological green houses)	Utilizing renewable energy potential on driving sectors / Defining this type of tourism or agricultural activities not promote ecotourism or small scale farming	Excessive groundwater withdrawal due to tourism and agricultural pollution	Promoting self-sufficient tourism or agricultural alternatives with minimizing energy/water use and waste
		Defining organized agriculture & livestock areas (facilities that will benefit from thermal energy will be prioritized)	Development of food industry in the region by targeting sustainable development / soil pollution sourced by livestock	Promoting thermal use and indirectly geothermal activities in region that is generally source of the pollution in the region /soil pollution sourced by livestock	Prioritise the support of collective actions of small farmers / self-sufficient agricultural production (commons with their infrastructure and networks based on the principles of degrowth and recycling / considering who and what kind of development they serve).
		To direct concrete industry and mining industry activities to existing and designated industrial areas.	Prioritize investments in built environment but not constraint the activities radically (depending on law and EIA assessment they can built on any/ natural areas.)		Evaluating land use decision about restricted areas and capacity of existing industrial areas to develop land use decisions determining the strictly prohibited areas and capacities for mining or industrial activities
	Pasture/Forests	Defining special industrial area for private companies/ defining new organized industrial areas on natural areas (forests or pastures)	Presidential decree - plan amendment - strengthen the area on forests at coastal in ‘private company’ for energy production (non-renewable)	Air and coastal pollution due to thermal power plants and coal extraction in the area	
	Agricultural lands/maquis/coasts/ water resources	Accepted previous plan decisions on defining tourism development areas by extended the areas with urban development areas and infrastructure (transportation networks etc.)	Acceptance of both pre-defined tourism areas from previous environmental plans and 'Tourism Conservation and Development Areas' from the Ministry of Tourism (5-storey facilities can be built in these areas, which were previously agricultural land around villages).	Excessive groundwater withdrawal due to tourism and secondary houses / Unpredictable development of villages around tourism regions	Reconsidering the decisions with their spill over effects and uneven development. Controlling secondary house and tourism development in the area. To propose activities suitable for the socio-economic structure and texture of rural areas and settlements.

Table 20. Cont.

Balıkesir Çanakkale Provinces Integrated Coastal Plan	Coastal Area/ Sea	Proposing freight port/shipyard in sub-region. Defining mooring area for ships carrying dangerous goods even in tourism or conservation affected areas like Bozcaada, Edremit bay, Gökçeada, Ayvalık.	Strengthen logistics networks export - import	Establishing logistics networks for the mining and industrial activities of foreign capital, which is the most important problem in the region industry or mining activities	Reconsidering the actual need of the network with their risks in terms of pollution/ public health and triggering industrial or mining activities indirectly in the region
Scale: 1/50.000	Coastal Area	Proposing yacht marine in each sub-region	Enhancing mass tourism in the region	The necessity of the proposed facilities is controversial / The region suffers water pollution due to seasonal tourism	Reduction of the proposals / increasing common coastal uses
Year: 2020	Coastal areas affected water resources or natural resources	Defining prioritized investment areas	Although they generally restricted investment proposals by defining priority areas (in priority areas 2 and 3, no investment can be made in activities without a scientific report), defining priority areas cover wider coastal areas	Defining criteria and their scientific basis are controversial	Reconsidering them with possible spill over effects on land use and natural areas
Plan Amendment and Approval: 2022		Defining capacities of investments	Even if they define the limits of the capacity of each infrastructure, they accepted also all planned infrastructures.	The necessity of the proposed facilities is controversial.	Reconsidering them with possible spill over affects on land use and natural areas
		Suggestion to re-evaluate some tourism development decision on the environmental plan Sectoral development foresight	Suggestions for the facilitation of sectors with infrastructure	The impact of supporting the activties with infrastructure on the hinterland and coastal use has not been addressed.	Need to integrate environmental plan land use decisions / Need to consider the problems of the region that analyzed in scientific reports

Table 20. Cont.

Kuzey Ege River Basin Management Plan (including the scoped version in accordance with the Water Framework	Groundwater/ Surface Water Resources	Reducing waste water decharge through improvement of infrastructure (Construction of waste water treatment plants and waste landfill facilities)	Water pollution / investment based strategies rather defining limits	Even bad water quality caused by coal mining, geothermal facilities, industrial activities is expressed in plan reports, there is not any restriction or defining limit strategies about the activities	Define the "water commons" and prioritise the use of the commons in view of future risks and most needed sectors at both local and city scale.
Year: 2019/2020		Increasing water yield Promoting surface water usage	Climate change and possible effects on water quality and quantity and the possible socio-economic outcomes - limited suggestion about evaluation of them in the scope of WFD/ predictions about controlling geothermal facilities.	Even the plan mention excessive groundwater withdrawal and geothermal activities in the areas resulted with soil pollution & risk of public health, there is no suggestion to limit of the appropriation of water	Considering decentralized water alternatives / purpose - based treatment alternatives
		Geothermal reinjection Installation of monitoring meters in geothermal plants	Finding definite pollution source by monitoring	Excessive withdrawal/ soil pollution	Limit to extractive operations (especially under risk / groundwater related areas)
		Reducing industrial pollution by partial solutions (reducing waste water due to olive production through treatment, reducing chemical usage in fish farms, filter usage in petrol stations.)	Infrastructure or mitigation strategies	There is no sectoral limitations/capacity definition	Define the limits and capacities of the sectors and integrate them as a spatial intervention.
		Finding definite pollution source by monitoring	Even though there is no definite restriction in the planning reports, it is said to show groundwater and proposed licensed mining relationships in the EIA process.	Bad quality and high metal contamination in water resources / Unlimited licensed mining/ inefficient EIA processes	Limit to extractive operations (especially under risk/groundwater related areas)
		Preparation of protection plan for drinking water basin protection	Possible spatial intervention on pollution (e.g. restriction around sensitive areas) Possible to go beyond simply protecting wells and buffer zones (50-100m)	Pollution of dams and drinking water / public health risks	Possible to define and network water commons and prioritize water usage
	Agricultural lands/water resources	Alternatives to pesticides (Improving pesticide management), terracing, promoting good agricultural practices & fertilizer tank etc.	Mitigation strategies / possible to support recycling infrastructure and reduction of waste or chemical use	Fertilizers/ nitrate pollution	Promote agroecological production through creating collective production areas with network
		Crop orientation	Local crops in particular, such as olive production, which may be linked to the dominant sources of pollution in the region, have not been preferred. However, crop rotation seems to have been carried out in such a way as to favour industrial production (barley, fodder, etc.).	Pollution/ Drought/ Water use	Promotion of local products appropriate to the microclimate conditions

Table 20. Cont.

Susurluk River Basin Management Plan (Technical Assistance for Transformation from Basin Protection Action	Soil/Water Resources	Restoration of old mining areas	Water and soil pollution	Abandoned mining areas in the region	
Year: 2018	Groundwater	Setting industrial discharge limits for specific pollutants & introducing discharge standards into legislation	Indefinite discharge limits and recharge standards in legislation / possible to limit water waste but not able to neutralize	Bad water quality/ Unlimited mining licenses and approvals	Possible to intervene and go beyond existing law and regulations - Limiting polluted activities and defining capacities of them at various scale
	Coastal areas and affected water resources or natural resources	Restoration of coastal areas	Prevent pollution from activities in the coastal zone from affecting the hinterland / Possible to limit the development of land use in the coastal zone partially	Coastal soil use in construction/ Excessive withdrawal at coasts/ industrial areas (energy production) at coasts	Integrated water conservation strategies to coastal land use and plans/ increasing the number common areas and conservation areas at coasts
	Surface waters	Revisions related to the protection of habitats and aquatic organisms	Possible to limit water use in waters with poor ecological status	Habitat degradation in waters	
	Water Resources	Designing groundwater conservation regions	Possible to concrete spatial interventions to pollution (e.g. restricting polluted activities around sensitive areas)	Groundwater pollution/ public health risk / risk of reducing groundwater quantity	Possible to define water commons with their networks and priotize water usage
		Preparation of flood prevention / drought management/ sectoral water appropriation plans	Possible to re-evaluate water usage/ pollution problems in an integrated way	Partial plans/ lack of integration	Possible to re-evaluate water usage with related sectors and land use decisions
	Coastal area/ rivers	Fish farming application improvement & defining fish farming discharge limits & regulations on law	Indefinite fish farming standards in law / possible to limit capacity of the activities but not be able to neutralize pollution	Water pollution and habitat degradation due to fish farming chemicals	Possibility to intervene and to go beyond the existing laws & regulations - to define the capacities of these also in a spatially dependent way
	Agricultural lands/water resources	Treatment sludge control and management & fertilization	Possible to support recycling and reuse	Soil pollution	Organizing recycling and reuse network with cooperatives
		Treatment of mine site effluent	Reducing mining wastes / there is no suggestion to limit the activities	Bad quality and high metal contamination in water resources	Limit to extractive operations (especially under risk / groundwater related areas)
	Water Resources	Geothermal reinjection Installation of monitoring meters in geothermal plants	Bad quality and high metal contamination in water resources / there is no suggestion to limit the activities just monitoring	Excessive withdrawal/ soil pollution	
	Agricultural lands/water resources	Treatment of waste water due to olive production	Mitigation strategies / possible to support recycling infrastructure and reduction of waste or chemical use	Water pollution/ fertilizer/ water usage	Promote agroecological production through creating collective production areas with their network
		Green barriers, terracing and good agricultural practices			

Table 20. Cont.

Marmara Basin Protection Action Plan	Water Resources/ soil	Closing/rehabilitating mining areas with negative environmental impact (not operating under appropriate conditions)	Soil/ water pollution - Potential to limit to extractive activities especially risk for environment		
Year: 2010		Improvement of the legislation and discharge standards for wastewater	Indefinite discharge limits and recharge standards in law / possible to limit water waste but not able to neutralize		
		Sewage & sludge reuse proposals Rainwater harvesting infrastructure/ grey water reuse proposals	Possible to support recycling and reuse with decentralized water alternatives		
	Agricultural lands/water resources	Designate livestock areas in organized industrial zones to control and prevent pollution from manure. Promote the reuse of manure.	Pollution due to livestock/ more organized infrastructure need in terms of waste management.	Pollution led not only small scale or distributed livestock but also large scale production. It can resemble land consolidation practices. Small-scale livestock farming should be maintained to prevent this.	Ensure that areas promote rather than restrict the activities of small-scale farmers, rather than promoting large-scale enterprises / Where necessary, common grazing areas should be identified and developed with the necessary infrastructure and networks.
		Organic/good farming practice incentives & identification of potential areas for organic agricultural production			
		Pasture rehabilitation works	Possible to restore/protect feed fields	Industrial operations/ fertilizers/ over	
		Crop orientation according to the basin character / drought / export potential	Even the concern for local production and the sustainability of water resources is also an export-oriented (growth) strategy.	Agricultural production/livestock led pollution/ excessive water usage	Prioritizing the self-sufficiency of the city-region. Promoting geographical labels, local and agroecological production
	Water Resources/ Coastal Areas	Suggesting that coastal areas and protected areas and land use decisions in these areas should be handled in an integrated manner with basin protection plans	Possible to re-evaluate water usage/ pollution/ ecological degradation problems in an integrated way		
		Defining flood areas/ making specific decisions on the use of drinking water	Possible to restrict polluted activities around sensitive areas / and upstream areas that created risk for flood areas due to environmental degradation or sediment retention	Upstream related problems / the need for specific spatial interventions	
		Improving the condition of the upper basin. Upstream intervention / Pollutant monitoring proposals	Potential to intervene at different scales / but still a monitoring strategy	Recognizing that pollution needs to be addressed at different scales and boundaries	Need to spatialize the analysis and integrate them land use decisions in different scales through defining restrictions and actual
		Monitoring the distribution of air pollution from industrial activities in the basin			
		Suggestions for localizing the strategies of the Basin Conservation Action Plan	Giving priority to the local, however, does not mean not stimulating economic growth.	Depletion and pollution of soil/water resources in the region for the sake of exports	It should also be possible to see how they relate to different scales of waste, pollution or development.
		Proposals for basin-based water management/governance system	Strengthening the role & participation of some cooperatives, but possible increase in privatized tariff water services through targeted new governance scheme.		Need for more collective/community-based governance systems / improvement of public sector services rather private sector prioritization

Table 20. Cont.

Sensitive Water Bodies Improvement Action Plan (Susurluk - Kuzey Ege - Marmara)	Water resources	Industrial waste water measures (specific companies)	Mitigation strategies /focusing on water pollution due to specific sectors (specific parameters & chemicals are considered)	Industrial operations/mining/ fertilizers	Define limits and capacities of sectors and integrate them as spatial interventions (e.g. restriction around sensitive water bodies).
Year: 2015		Improvement of 'good' agricultural practices		Nitrate pollution	
	Forest	Erosion control & forestation	Upstream intervention	Environmental degradation/ forest conversion	
	Water Resources/ soil	Improvement of waste water and disposal treatment infrastructure	Investment-based decisions	Water / soil pollution	
Prevention of Pollution Action Plan (Kuzey Ege)	Water resources	Improvement of waste water treatment infrastructure	Not stopped growth/ Mitigation strategies against point or diffuse water pollution (focusing on specifically Bakırçay river)	Industry/mining - not considered high metal contamination	Define limits and capacities of sectors and integrate them as spatial interventions
Year: 2016		Improvement of waste water management of industrial areas and mining			Limit to extractive operations
	Agricultural lands	Improvement of good agriculture and livestock practices		Agricultural & livestock activities	
	Coastal areas/ affected water resources or natural resources	Improvement and developed infrastructure of tourism points / areas		Excessive water use in tourism areas and areas where secondary housing is concentrated (at the coasts)	Reconsidering land use decisions of the development of tourism/secondary housing at the coastal (especially areas related to sensitive areas)
Flood Management Plan (Kuzey Ege)	Urban commons	Improvement of infrastructure in water sensitive urban areas	Risk based investment for infrastructure	Urban development on stream bed/ Upland basin problems (deforestation, fire) / Extreme rainfall	Defining upstream/ upper basin problems
Year: 2019		Defining water sensitive urban settlements and fields	Precaution for urban (downstream) areas under risk		Designing urban common/green areas especially around risk areas
	Agricultural lands	Alternative (decentralized) strategies to water absorption and rainwater collection	Partial upstream solutions / inefficient use of water resources		Foster the expansion of alternative/decentralized water solutions (treatment/slowing/rainwater harvesting strategies) to agricultural land and urban upland areas

CHAPTER 8

BIODIVERSITY IMPACT CHAIN ANALYSIS OF MOUNT IDA (NEOLIBERAL CONSERVATION OR PRIMITIVE ACCUMULATION?)

The Biodiversity Impact Chain analysis, as proposed by Büscher et al. (2022), is a tool for assessing socio-economic inequalities and biodiversity loss due to isolated conservation practices. In this section, an attempt is made to concretize a Biodiversity Impact Chain analysis through the findings identified in the previous sections. The analysis will illustrate the differentiated problems, growth-oriented strategies and plans, and their impacts on socio-environments and biodiversity for Mount Ida National Park, defined research areas, and conservation scales.

In addition, Büsher and Fletcher (2019) identify four main categories of actors who are impacted by or affect conservation areas and policies. The upper classes are defined as the political and economic elites, as well as global capitalists who own "nature reserves" or hold multiple properties. These groups represent the wealthy segment of the population. The land-owning capitalist classes, comprising commercial farmers with large plantations, constitute another group. The middle and lower classes are defined as wage laborers residing in "urban," "peri-urban," or "peri-rural" areas. Rural and forest communities are considered to be part of the lower rural classes (Table 21). The objective of the analysis is to identify networks of beneficiary-disadvantaged social actors, and the "working up" and "working down" activities for biodiversity in spatial correlation, as discussed in the literature on political ecology (Büscher and Fletcher 2019; Büscher et al. 2022). In pursuit of this objective, a biodiversity impact chain was analyzed for the current situation in Mount Ida National Park and the surrounding area, given the differentiated spatial context due to the conservation decision (Table 23). Additionally, the analysis was conducted for a potential conservation project involving Mount Ida forests as a scenario with a potentially differentiated spatial context (Table 24). Finally,

the research area was assessed with socio-environmental problems and the relevant beneficiaries and disadvantaged across various sectors (Table 25).

Table 21. Generic Categorization of classes important for conservation (Source: Büscher et al. 2022 see Büscher and Fletcher 2020, 182)

1. Upper classes	- Political, economic and other elites, inherited wealth - At the helm of the global capitalist system - Multiple properties, including in wealthy urban neighborhoods and (biodiverse) estates or areas
2. Land-owning capitalist classes	- Commercial farmers, large plantation or otherwise productive landowners - Responsible for / implicated in much land-use change, soil depletion, biodiversity loss, etc.
3. Middle and lower classes	- Urban, peri-urban, peri-rural working classes - Non-subsistence: dependent on wage labor, market-based commodity consumption
4. Lower rural classes	- Rural/forest communities, residents, dwellers - Partially or wholly dependent on subsistence activities - At the bottom of global capitalist system

It is important to note that conservation practices in Turkey have not yet been subjected to the kind of green violations or green-grabbing on ecosystem programs that have been observed in the Amazonian forests. These latter ecosystem programs are funded on a global scale and involve the participation of global elites in the area of management. Besides, the presence of wildlife in Turkey is comparatively limited and distinct from that observed in Global South regions. In the context of the BIC analysis in Turkey, the situation differs from that observed in the Global South. The financial and administrative framework for prospective ecosystem service initiatives in Turkey remains uncertain. Additionally, Turkey's socio-economic structure differs from that of countries in the Global South. There are no indigenous populations in the area. The forest villagers and Türkmen and Yörük communities were among those who utilized the national park. Following the establishment of Mount Ida National Park in 1993, these communities were no longer permitted to access the forest and water resources, which had previously been used for their traditional subsistence activities, including animal husbandry. (Arı and Soykan 2006). The boundaries of the national park have remained unchanged. Based on statements from the National Park Directorate, activities such as hunting are not conducted within the national park. Additionally, it was confirmed that activities such as hydroelectric power plants and mining are already prohibited by regulation and that such activities are not observed within the park. It was also stated that the chemicals utilized

in olive farming operations in the vicinity of the national park constitute a threat to conservation (personal interview June, 2022). Hurley and Arı (2017) also demonstrate that the designation of the National Park was associated with an increase in olive groves and a socio-cultural transformation in the southern part of the Park.

In parallel with the neoliberal conservation literature, Mount Ida National Park serves to facilitate tourism activities and the gentrification of Edremit Bay. Olive groves that had previously been converted from forest areas are located on the hillside. There are thermal hotels, seasonal tourist facilities and secondary houses on the coasts. Hurley and Arı (2018) discusses the commodification of oxygen and the transformation of the Mount Ida landscape through the development of tourism facilities and the process of rural gentrification. The actors in the tourism industry and the wealthy residents of urban neighborhoods who have greater influence in the coastal region can be broadly categorized as land-owning capitalist class or the middle class. Moreover, with the exception of the Gulf of Edremit and Ayvalık, there is no significant tourist presence or tendency in the inland (northern) regions, in contrast to the recently canceled geothermal tourism area proposals. It can be concluded that the tourism industry is not responsible for the unaffordability of housing and gentrification in this area.

In alignment with the critiques of payment for ecosystem services, the National Park has guaranteed a water supply for both the runoff and the hydropower plants situated in the north and south (Fransisco et al. 2019). The protected area of Mount Ida, which has been designated as a national park, serves to conserve water supplies on both sides. The construction of dams and hydropower plants on the Mıhlı, Kızılkeçili, Zeytinli and Mıhlı rivers has been planned at the Edremit Bay (Figure 87; Table 22). Nevertheless, despite the presence of olive groves and secondary residences or tourist facilities, the construction of dams has not yet commenced due to opposition from residents of Edremit Bay. A member of a CSO indicated that the current situation in Edremit Bay is relatively stable, with few problems. In the past, there have been some hydropower station projects in the area; however, there are currently no ongoing hydropower projects (personal interview, May, 2022).

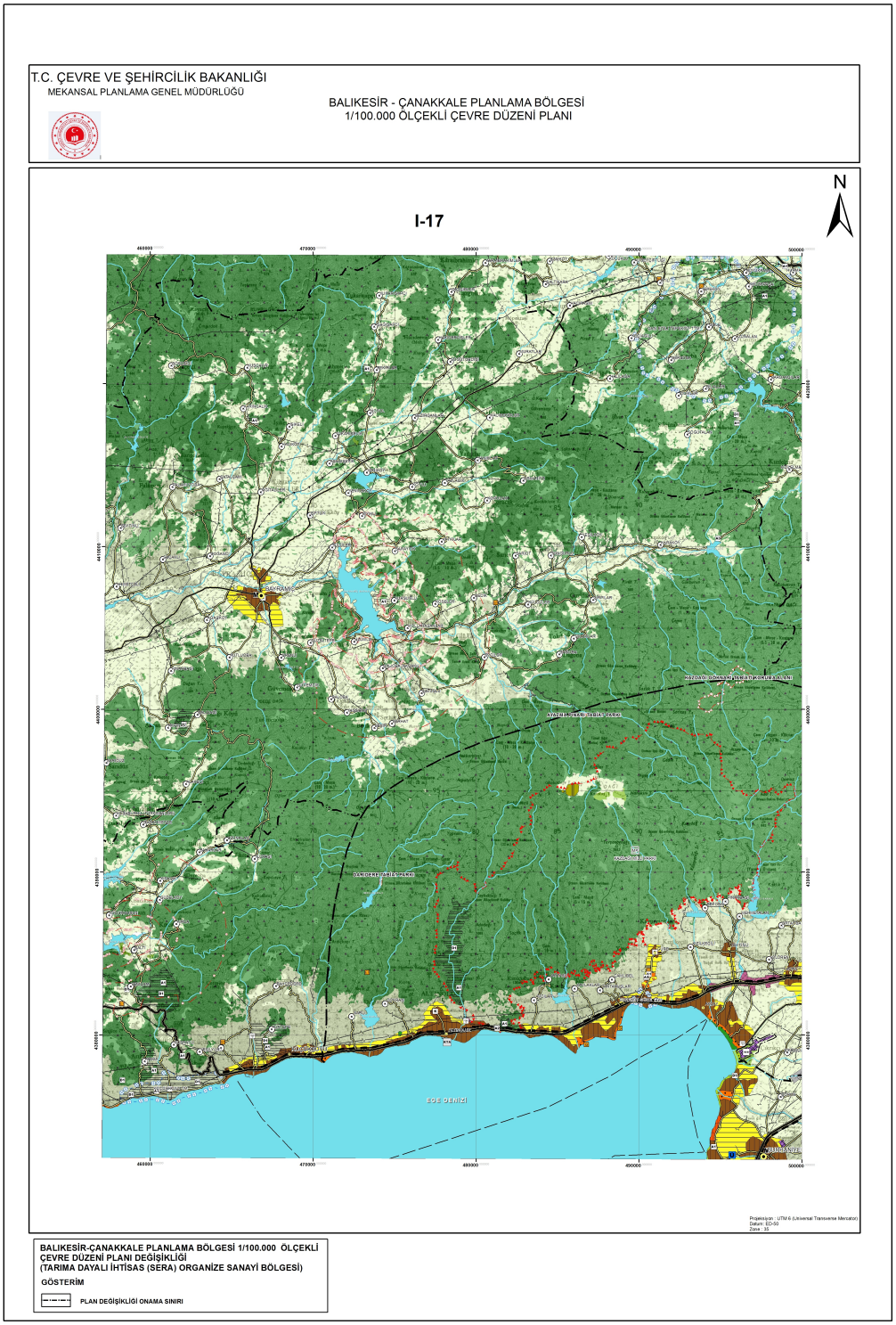

Figure 87. Planned Dams at the South of Mount Ida National Park and Edremit Bay in Çanakkale – Balıkesir Environmental Plan

(Source: Ministry of Environment, Urbanization and Climate Change 2019)

Two HEPPs are situated in the northern regions of Mount Ida, specifically in Bayramiç and Gönen (Table 22). These districts are distinguished by their prevalence of agricultural activities. Notwithstanding the fact that the HEPPs and dams in the region have been the subject of some objection, it is evident that the agricultural areas in the north, particularly those that require irrigation, and the population engaged in agriculture, require investment in irrigation. On the other hand, the Gönen dam fulfills the water demands of industrial and energy production operations in Bandırma (General Directorate for Water Management 2017).

Table 22. The Situation of HEPPs around Mount Ida (in Bayramiç, Ayvacık, Edremit, Yenice, Gönen and Manyas Districts)

(Source: DSI Department of Sustainable Energy Official Website 2024)

HEPP Name	District	Status
Bayramiç - Karamenderes	Bayramiç	in Operation
Ayvacık	Ayvacık	Preliminary Survey
Zeytinli	Edremit	Master Plan is done
Kızılkeçili	Edremit	Preliminary Survey
Manastır	Edremit	Preliminary Survey
Mıhlı	Edremit	Preliminary Survey
Gönen	Yenice	in Operation
Gönen II	Gönen	Preliminary Survey
Kavanlıkdere Linlin (1-2-3)	Yenice	Preliminary Survey
Manyas	Manyas	Construction is finished.
Manyas II	Manyas	Preliminary Survey

Nevertheless, the most critical issue in the northern region is mining, which has a direct impact on food and water security. It is imperative to conserve the north hillsides of Mount Ida in order to ensure the continued provision of irrigation and drinking water in terms of both quality and quantity, and to sustain the food supply. The contamination of soil, vegetation, forests, and the pollution of the northern hillside have a detrimental impact on agricultural activities in the Yenice, Çan, and Ezine–Bayramiç plains (see Chapter 6).

The socio-spatial characteristics of the surroundings of Mount Ida National Park differ with conservation strategies and problems, especially between the south part of the Gulf of Edremit, which is served by the oxygen and scenic vistas, and the north part of the defined research area. Hurley and Arı (2017) revealed that olive farming activities situated in close proximity to Mount Ida, which even encompass the boundaries of the

national park, represent an area of accumulation of rural capital alongside tourism and secondary housing in the region. Besides, Avcı (2010) provides insights into the actors and dynamics of anti-mining movements. The author posits that the opposition to the gold mines in Mount Ida is structured in a manner that is directly related to the landscape of the area. This opposition primarily comprises individuals who reside in the city or are engaged in olive farming activities. In addition, the study's findings indicate that the opposition group's primary concern is exploitation of foreign companies, which they view as a threat to the region's social and environmental justice issues. Indeed, Hurley and Arı (2017) while questioning the extent to which the social movements in this region are ecosystem-oriented, the authors claim that the state effectively protects an important export product, such as olive cultivation, and allows mining activities to be conducted flexibly in areas such as forests and agricultural zones that are already unprotected. Besides socio-ecological characteristics of the areas also threats and risks have changes.

In a similar vein, as detailed in the EIA reports and discussed in Chapter 6, mining operations in the focus research area are typically conducted on state-owned forest lands with the necessary permissions and on agricultural lands (Appendix D). The distribution of protected areas and the beneficiaries of forest resources exhibit notable differences between the northern and southern parts of the Mount Ida National Park. In villages situated in the northern part of the Ida Mountains, such as Bayramiç, Çan, and Yenice, the local population relies on agricultural activities despite owning land. The inhabitants of this region are suffering from the detrimental effects of air and water pollution, which are a direct result of energy production and mining activities.

Presently, no specific segment has yet emerged that stands to benefit from the national park defined as the "at the helm of global capitalist system". However, companies with investments in various regions of Turkey, particularly in the infrastructure, construction, and energy sectors, and those that are especially involved in the activities of mining and thermal power plants in the defined research area, can be considered "political and economic" elites. Besides, international mining companies that are situated within the area or that were previously granted mining rights and then transferred to other big national companies can also be considered "upper classes" as global actors.

In 2019, there was growing opposition to soil stripping for proposed gold mining activities in Kirazlı Mountain, located in close proximity to the center of Çanakkale. The project was cancelled, but proposals for mining activities in the region continue. In the

period following the environmental movements in Kirazlı, a number of foreign companies transferred their licenses to national large-scale mining companies or continued their activities and proposals in association with companies based in Turkey (Appendix C). The protests initiated by CSOs persist, having already resulted in the cancellation of several EIAs. However, proposals for mining activities involving copper, zinc, gold, and other metals in Bayramiç, Havran, Balya, Yenice, and Kalkım to capacity increases, particularly in the interior and southern slopes of the forests of Mount Ida, are ongoing (see Appendix D).

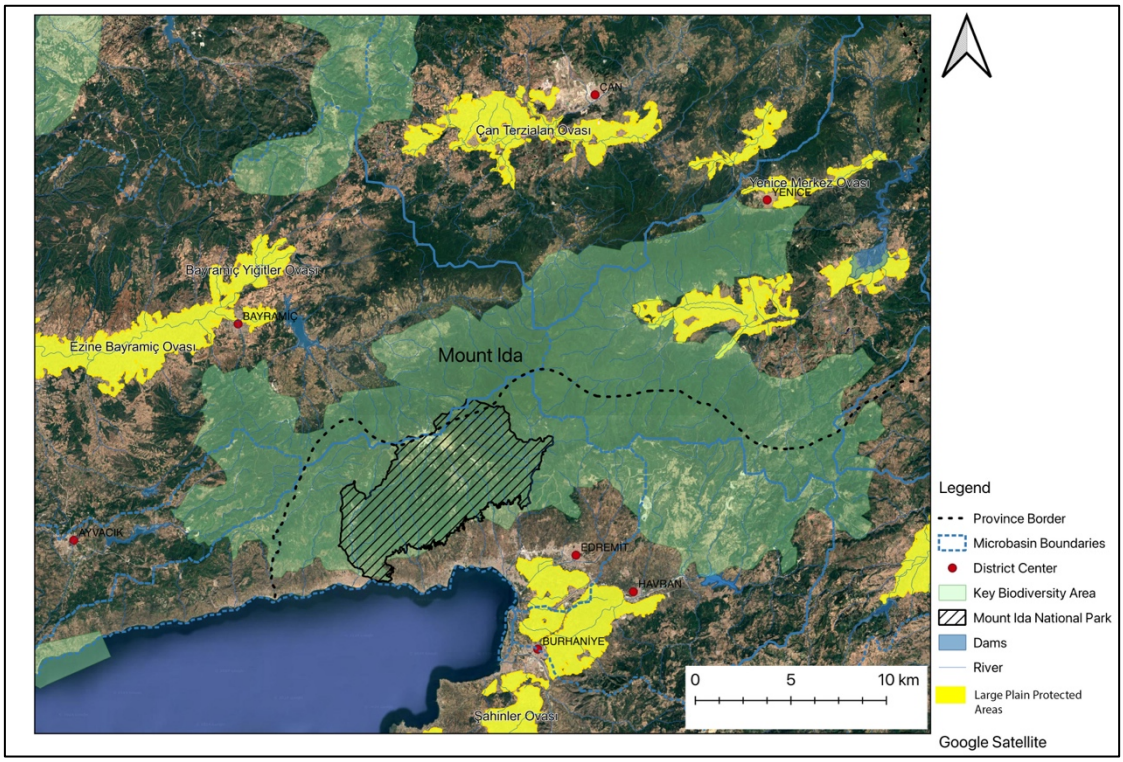

Figure 88. Large Plains and Dams in Mount Ida National Park and Mount Ida KBA (Source: Preperad by using General Directorate of Nature Conservation and National Parks 2023; Ministry of Agriculture and Forest 2024; HydroBASIN 2024 and Birdlife 2024 data)

Although there is a conservation decision for large plain protected areas in the research area, related legislation (no. 5403) does not explicitly prohibit mining activities, including those related to geothermal energy production. The conservation boundaries of the large plains have been determined in accordance with the risk of erosion, desertification, and pollution posed by the fertile plains. However, water catchment areas and upstream areas that are directly related to erosion risk have not been taken into

account. Indeed, various categories of sensitive waters have been delineated by relevant institutions, including those containing nitrate or urban sensitive waters. The relationship between Mount Ida, large plains protected areas and water bodies is illustrated in Figure 88. While the necessity for conservation is evident in the context of water catchment areas for the plains, polluted and deforested mining activities are conducted in conjunction with new projects. The periphery of the protected area, comprising valuable forests and water resources, has been subjected to destruction and pollution, resulting from the pursuit of primitive accumulation in a manner that parallels the discussions surrounding water and land grabbing.

Thermal power plants have an impact on both the research area and the periphery of the the area. This impact can be observed in the “working down” of biodiversity in other conservation areas at the periphery, as well as in the impact on both urban and rural populations due to air pollution and the requirement for coal mining activities. There are thermal power plants in Çan and Biga districts. As indicated in Chapter 6, scientific studies demonstrate the dispersion of pollutants from the thermal power plants. The pollution has an impact on the settlements beyond the defined research area, including those in the vicinity of Biga, Manyas Bird Lake, and Gelibolu–Saros Bay. On the other hand, the proposal of a thermal power plant in Yenice were cancelled as a result of the objections of CSOs. Although the pollution in Erdek and the pollution of the Gulf on the Biga and Bandırma, industrial areas are defined at the coasts with the amendment in environmental plan by presidential decree (see Chapter 7).

Table 23. BIC Analysis for Mount Ida and Conservation Scales

	Beneficiary Social Groups	**Disadvantaged Social Groups**	**Working up**	**Working down**
At the south of the conservation area (Ida mountain)	Tourism elites (land-owning capitalist class)	Rural/forest communities - Changing socio-cultural structure of the area	Biodiversity in the boundaries of Mount Ida National Park	Soil and environmental degradation on the hills of the National Park and at the coasts
Benefit from oxygen, biodiversity and landscape of the National Park	Olive producers (land-owning capitalist classes or)	Residents and dwellers - Changing in land use increasing rents and gentrification	Partially water quality and environment - upstream forest of National Park	Pestides / soil depletion pollution / land use change at the hills of the National Park
	Wealthy urban neighborhoods secondary houses			Soil and environmental degradation at the coasts
	Villagers (middle or lower class)			
At the north side of the Ida mountain (due to the water run conservation)	HES and dam construction (upper class and political, economic and elites)	Rural/forest communities, Residents, dwellers / villagers (middle-lower rural classes) - Water allocation	Biodiveristy at south side (for water demand of tourism / secondary houses for now (projects at the south of the Mount Ida already exist)	Biodiversity loss and change in flooded area and affected conservation area such as Gönen plain and Manyas Lake
	Small family companies / cooperative based producers - Irrigation		Biodiversity in food supply cities/regions	Land-use change, soil depletion in the area
At the periphery of the Ida national park in focus research area	Mining Companies (at the helm of the global capitalist system, upper class and political - economic elites) - Forest and land allocation	Rural/forest communities, Residents and dwellers, Small cooperative based producers / small scale farmers (middle or lower rural classes) - Appropriation of water resources, agricultural lands and forests - water pollution and soil loss	Countries that import mineral and industrial products (especially in EU and the Global North countries)	Water quality around conservation areas especially at the north side of the National Park
Legitimize mining areas as being 'outside' the National Park but still in the ecosystem service area of Mount Ida	Energy Generation Firms (Political and economic elites) - Appropriation of water for industrial use in and outside of the research area	Urban / rural dwellers in and around the focus area - Water and air pollution - Forest and water allocation		Forest and biodiversity loss in and around National Park, forests and coastal
	- Geothermal energy production and related facilities (political & economic elites)	Small scale producers that cannot be involved in geothermal/technology based agricultural production system		Regions that use the inputs for polluted industrial facilities (e.g. Bursa, Balıkesir)
		Residents and dwellers that live around the activties and served by related dams - groundwater pollution		Environemental degredation & biodiversity loss in project area
		Socio-economic transformation around geothermal tourism regions		

The research area does not include “metropolitan” or “provincial center”. However, the research area provides a food supply to Balıkesir, Çanakkale, and Bursa, and subsequently to Istanbul as the region’s major urban centers. The energy required by the urban centers and industrial complexes in this region is generated on-site, while the minerals extracted as raw materials are transported from this region to other locations in Turkey and abroad. This can be an illustrative case for the revealing metabolic urban network analysis.

The provinces of Balıkesir and Çanakkale represent an important region in terms of Turkey’s food supply. The regions in question are notable for their dairy production, animal husbandry, fresh fruit and vegetable production, legumes, and olive oil production. As evidenced by reports from Çanakkale province, the number of small, medium, and large family farms is considerable. The majority of farms in Yenice are small, family-owned operations, with an average land area of approximately 20 decares. (Balkan 2010; General Directorate for Water Management 2017) The majority of villages in the region has their own cooperatives. Contrary to the findings of global studies, villagers and small-scale producers have their own land and provide for their own livelihoods from their land. It can be posited that the investments made in agricultural activities in the region are beneficial, particularly for farmers who are registered in cooperatives. In this particular context, it is important to note that the middle and lower classes, as defined in this classification, do not necessarily include wage-earning agricultural workers; rather, they can refer to family businesses.

Despite the region’s numerous small producers and farmers who have cooperative-based structure, as well as their familiarity with agroecological production techniques, these producers still face significant challenges. The lack of assurance for producers to sell their products, low prices for their goods, inefficiency of the products, climate anomalies due to the increasing climate crisis, problems in water allocation and irrigation, and other factors make it difficult for small producers to sustain their livelihoods in the field (Çanakkale Provincial Status Report 2019). On the other hand, as in many parts of Turkey, mining and land allocations/expropriations or land purchases in the surrounding area cause farmers to sell their arable land and their children to become ”wage laborers" (see Chapter 6; Appendix D).

Notably, the region has a considerable number of factories engaged in the production of tomato paste, milk, and oil. In the region, common areas use are utilized as technological greenhouses and factory facilities that utilize geothermal energy (see Chapter 7). Despite the existence of numerous proposals advocating the integration of small enterprises and livestock farms within these designated areas, the inadequacy of the financial and technical assistance provided to establish a technological production facility remains a significant concern. It is evident that these areas will be allocated to major agricultural production enterprises or agro-industries, which could be considered the “land-owning capitalist classes” or "upper class".

In addition, in conjunction with neoliberal conservation, an effort is underway to shape the region into a tourist destination as a strategy for ‘rural development’. The socio-economic analysis in the Yenice situation report also shows that most villages are in the poor class. The report prepared for Gönen dam assumes that poverty will be alleviated by investments in ecotourism and health tourism in the area. Additionally, it is predicted that migration from villages will be temporarily prevented by investments in the energy production industry (Akgiş and Akbulak 2015; General Directorate for Water Management 2017). This area, along with other geothermal tourism regions, is targeted for development in the service sector. However, the demographic and socio-economic structure of the region is not suitable for this type of ‘growth’.

A variety of boutique hotels are located in the foothills of Mount Ida, along with smaller-scale investors and larger-scale facilities. Some of these facilities utilize geothermal energy. The proprietors of the land and boutique hotels classification are not clearly delineated in the Turkish context. This demographic is considered to place them within the land-owning capitalist class or the middle class. However, it is evident that this situation will not be the same in newly proposed health tourism facilities/complexes. The proposals describe mass tourism activities with mutli functional complexes, and it seems likely that the beneficiaries of health tourism in this area will be international or upper-class individuals (see Chapter 7).

Table 24. Scenerio BIC Analysis for Mount Ida Forests and Conservation Scales

	Possible Beneficiary Social Groups (after conservation only ecosystem services / forests in Mount Ida)	**Possible Disadvantaged Social Groups (after conservation only ecosystem services / forests in Mount Ida)**	**Possible working up**	**Possible working down**
Ecosystem service area - Extended conservation areas as forests (include at the north side of the Ida mountain)	- Biodiversity based production - medical firms, agroforestry companies etc. (upper class - political, economic and other elites) in the conserved forests - Energy firms - sponsors for carbon credits (upper class - political, economic and other elites) outside the conserved forests - Ecotourism/ alternative tourism companies in the forests (upper class - political, economic and other elites)	-Energy and mining companies that conducted activities in forests (upper class - political, economic and other elites)	Ecosystems and biodiversity in extended conservation area	The natural areas and related biodiversity where 'carbon credits' gained from the conservation will be used
	-Partially - middle or lower rural classes - Rural/forest communities, residents, dwellers (But possible turning conservation labors?)	-Rural/forest communities, residents, inhabitants - who will be restricted in their livelihood activities in the forests.		Forests and biodiversity in the area where destructive activities are proliferating due to legitimizing of new conservation decision and 'green growth' need.
At the south of the extended conservation area	- Tourism elites and olive producers - Urban and rural dwellers		Maintaining biodiversity conservation in the area	
At the periphery of the extended conservation in focus research area	- Small scale producers at the hills of the conserved ecosystem forest ares / related cities and regions benefited from food supply	- Small scale producers at downstream (middle or lower classes) - Possible increase in alternative energy production and extractive activities on agricultural lands and coasts	Ecosystems and biodiversity at the hills of the extended conservation area	Fragmented forests, agricultural land, and coastal biodiversity at downstream where destructive activities are proliferating
	- Tourism elites (especially alternative tourism) on the hills of the conserved ecosystem forests	- Possible mass tourism activities increase at coasts	Partially related ecosystem biodiversity such as Manyas Lake	
	- Downstream settlements / neighborhoods that are impacted carbon sequestration and sediment retention services in or outside of the area	- Urban / rural neighborhoods due to extensive tourism or urbanization at the coasts / gentrification		
At the periphery of the extended conservation area outside of the focus area / related upper scales	- Energy producers, industrial and mining companies (political and economic elites) Possible increase in energy production and extractive activities in forest outside of the focus area	- Rural/forest communities, residents, dwellers outside of the focus area (Mount Ağı & Madra, forests in Balıkesir) Land and water allocation/ soil loss expropriation	Partially related ecosystems of the extended conservation areas in regional scale	Forests and conservation area biodiversity in the area where destructive activities are proliferating
Legitimization of the energy security and need of economic growth		- City center population that ait benefited from services of the forests outside of the conservation due to extensive economic activities Water and air pollution		

The spatial organization of the region should be the efficient in terms of economic growth. While Mount Ida National Park and the south hillside is protected, mining and geothermal investments are increasing on the other three sides of the mountain mass (Appendix D and Appendix E). In Turkey, the pursuit of economic growth remains a primary objective, while activities pertaining to the green economy continue to gain momentum. As a consequence of the centralisation of decision-making processes in the region, these capital accumulation processes have accelerated. It is also noteworthy that the Presidency has cancelled tourism zones in areas where they overlap with mineral extraction activities, such as in Yenice and Çan. However, at coastal locations like Ayvacık, where geothermal activities for energy purposes are also increasing, proposals for geothermal-based health tourism are valid (see Chapter 6).

The discussion of the necessity of the "extended conservation" for Mount Ida is parelel to the subject of ‘new’ conservation practices. In Turkey, in newly designated large conservation regions, it is generally allowed for the implementation of renewable energy sources that are ‘less’ detrimental to the environment except from specific sensitive zones such as Saros SEPA. An integrated forest management plan, which has yet to be implemented in practice, is currently being developed in the vicinity of Mount Ida National Park. In general, alternative economic activities such as agroforestry or ecotourism in forests are aimed in ecosystem service areas. The assessment of these projects encompasses the evaluation of the area's potential for sustainable utilization, the integration of plant resources into the local economy, and the employment of women within the ecosystem service area.

A potential conservation strategy for Mount Ida forests may involve constraints on mining operations within the isolated forest boundaries, as well as constraints on the activities of forest villagers in the wider region. Such an approach could provide partial conservation and beneficial outcomes for hillside rural communities. Moreover, tourism and settlements at the periphery of coastal conservation areas could be extended or intensified in conjunction with the development of renewable energy sources, such as geothermal power plants or wind farms. Consequently, the implementation of the ‘extended conservation’ aimed at preserving biodiversity in isolated conservation areas may result in ‘working down’ biodiversity in surrounding non-conserved regions, including forests and coastal areas (Table 24). Nevertheless, it appears to remain a mere possibility due to the prevailing growth-oriented policies in Turkey and the incompatibility of the current legislative framework.

The emergence of environmental movements in opposition to the Kirazlı gold mine in 2019 was met with attempts to suppress them. The company, along with several media institutions, have stated that the mining site is located at a considerable distance from the National Park and has no direct connection to Mount Ida or the dams serviced in Çanakkale city center. In addition, the company official stated that the claims and mining activities that were resulted in cyanide contamination of water resources have no scientific basis, the company was not used cyanide in both exploration and mining processes. (Diken 2019 August, 2; A haber, 2019 August, 5). Moreover, a former mining engineer who had previously worked around the research area stated that it is not economically feasible to extract gold without the use of cyanide, as the wastewater resulting from the extraction processes would remain in the area. (personal interview, October 2024). Mount Ida should be considered in the context of ecological integrity, according to environmentalists. The Kirazlı gold mine is situated in the north of the Mount Ida. As demonstrated in this study, it is not possible to consider the forest in the Biga Mountains and Karabiga Peninsula in isolation from watershed connectivity and pollution issues (Erol 1993; Eken et al. 2006; Türkeş and Altan 2012). Although this area is not within the boundaries of the National Park, it serves as an important carbon storage, water supply, and sediment retention area for the city center of Çanakkale (see Chapter 5).

In addition to the environmental movement that is in opposition to the Kirazlı mine, members of the CSOs in the area have highlighted the necessity to direct attention toward other mines in Balıkesir, particularly Madra Mountain. Gold mining activities are generally ongoing in the region (personal interview, December 2021; May 2022). For years, exploration and operational mining activities have been the subject of contention in the Mount Ida region. However, the mines in the periphery of the Mountain are primarily engaged in more active operational mining. The area that began in Balya (in our focus area) extends through Ayvalık and Bergama.

As previously discussed, ecosystem services projects in potential examples around the world and in Turkey are generally focused on small-scale investments, such as grazing, logging, and the mitigation of their impacts. As evidenced by the research conducted in the vicinity of Ayvalık, efforts have been made to safeguard ‘blue carbon’ through the conservation of Posidonia sea grasses. However, the legal framework, specifically the Tourism Incentive Law (no.2634), is not fully aligned with this objective. Moreover, the coastal regions are undergoing an increase in tourism activities and marine

ports, which are being developed without adequate consideration of their environmental impact.

It is currently unclear how these legislation should be complied with the ‘new’ conservation practice. The prevailing legal and administrative regulations and practices in Turkey tend to support the extraction of minerals wherever they are found. With ecosystem services projects for the preservation of the carbon stock, there may be a potential for limiting mining activities in forests and coastal areas. Nevertheless, it is unlikely that this will prove to be a comprehensive solution to the existing inequalities in and around this area. In this scenario, the ecosystem services could be provided in isolation or indeed protect biodiversity and non-human habitants in the project area. Nevertheless, as more destructive activities will occur beyond the conservation borders particularly with the legitimacy gained from burden and carbon credit

Table 25. Sector based BIC Analysis

Investment	Beneficiary sector (social actors) - directly	Beneficiary sector (social actor) - secondary	Disadvantaged social actors - directly	Disadvantaged social actors - invisible	Effected 'commons'	Problems - environmental 'burdens' in national scale	Local benefits	National / International scale benefits
Extractive activities (gold/copper mining)	Foreign / national mining companies	Industries / factories Luxury companies	Villagers / farmers - land appropriation, water pollution	Urban dwellers / who use the water resources for irrigation or drinking purpose	Forests / water resources	Environmental degradation / water pollution (heavy metal concentration) / soil pollution	Employement	Profit from extraction and sale
Coal mining	National mining companies	Energy production / thermal power plants	Villagers - expropriated for coal extraction / who moved from their villages	Urban dwellers / who use the water resources for irrigation or drinking purpose / who effected from air pollution (thermal energy production activities)	Agricultural lands/ water resources	Environmental degradation / water pollution (heavy metal concentration) / air pollution	Employement	Profit from energy production and supply / Energy supply at national scale
Goethermal energy production	Foreign / national energy production companies	Industries / large agricultural companies / tourism firms able to invest in defining geothermal tourism region	Villagers / farmers - water pollution, land degradation	Urban dwellers / who use the water resources for irrigation or drinking purpose	Agricultural lands/ water resources	Environmental degradation / water pollution (heavy metal concentration)	Employment / supporting food supply factories	Profit from geothermal drilling and setting Energy supply at national scale
Industrial facilities (thermal energy production)	National energy production companies	Industry / Logistic	Villagers who effected from air pollution and land appropriation	Urban dwellers who effected from air pollution	Forests / water resources/ coasts	Environmental degradation / water pollution (heavy metal concentration) / air pollution	Employment	Energy supply at national scale

Table 25. Cont.

Industrial facilities (designated industrial areas & geothermal based industry areas)	Industries and energy production companies (technological based)	Agricultural sector (large agriculture companies)	Small scale/ cooperative based farmers which used to common 'irrigation' areas or not able to place in the newly designated areas	Urban dwellers (neighborhood) / farmers/small cooperatives or villagers - loss of watershed & forests or water and resource caused appropriation of the commons	Forests / irrigated lands/ Pastures	Biodiversity loss/ environmental degrading / soil pollution / water pollution	Employment / food and energy supply	Export/import food and industrial products
Tourism development projects (areas)	Tourism facilities	Geothermal drilling / construction firms	Villagers	Villagers (rural gentrification)	Agricultural lands / water resources / soil	Possible to urban sprawl/ land degradation	Employement	Cash flow
HES/ dam projects	Energy firms	Agricultural sector / Villagers - irrigated land beneficiaries	Villagers - land appropriation	Downstream villagers - flooded lands / environmental degradation	Agricultural lands / water resources / soil	Biodiversity loss / land appropriation	Employment / food and energy supply	Energy production Water supply
Infrastructure / Logistic	Mining and export companies and industries	Tourism, agricultural firms, construction firms, industries at the periphery of the region (metropolitan cities, big ports)	Residents (affected from construction, mining and energy production activities)	Residents in destination nodes (affected from industrial activties)	Forests, agricultural lands, pastures	Possible to urban sprawl/ uneven construction / land degradation / biodiversity loss	Employement / food and energy supply	Export/import industrial inputs and products, food

CHAPTER 9

CONCLUSION: AN EMERGENT NEED FOR INTEGRATING CONSERVATION INTO PLANNING IN DIFFERENT WAY

The concept of conservation itself, as well as the boundaries of conservation and the necessity of the designate these boundaries, represents an intricate and challenging subject. On the one hand, the political ecology movement unveils the political dimensions of market-based conservation, highlighting the displacements and constrained local activities undertaken by communities in pursuit of "greener" activities within these boundaries (Fairhead, Leach and Scones 2012; Larson et al. 2013; Wilkinson et al. 2014), and the newly created inequalities and over-exploitation beyond the boundaries with the mechanisms such as carbon credits (Smith 2007; Osborne and Sphario – Garza 2018; Adams 2020). On the other hand, radical approaches to conservation are discussed against the commodification of conservation or ecosystem services (Fletcher and Büscher 2019; Büscher et al. 2022). Indeed, a radical conservation approach and practice cannot be addressed without a degrowth and post-growth understanding. However, the geographical inequalities may be perpetuated by degrowth practices (Demaria 2015; Kaika et al., 2020). For the countries of the Global South, particularly Turkey, this could mean an economic recession, with the poor suffering the most (Akbulut 2021). It is imperative that degrowth engage with social justice, ecological reparation, and critical distribution of resources and infrastructures at various scales (Kraus 2021; Rammelt et al. 2023; Schmelzer and Nowshin 2023). Besides, transformative alternatives have yet to become strong planning and environmental protection alternatives, whether in Turkey or in the Global South. Furthermore, developing countries are unable to systematically incorporate these perspectives and alternatives into their planning practices, indicating the need for a concrete conservation policy.

When payment for ecosystem services alternatives and problems are discussed globally, we should discuss first this failure of ‘conservation’ and its relation with primitive accumulation in Turkey. It is notable that, in contrast to other developing

countries, the conservation practices and networks present distinctive characteristics. In Turkey, sustainability is viewed as a potential avenue for capital accumulation rather than as a transitional phase. The prevailing concept of conservation, as it is currently operationalized within planning practices, is unable to extricate itself from the focus on growth. This results in the over exploitation of water and forest resources, land grabbing practices, and the exacerbation of inequalities, as evidenced by the case of Mount Ida and its surroundings.

Besides, the current state of ecosystem practices in Turkey, which are in their initial stages of development, involves the economic or legislative feasibility assessments of protected areas. These offer recommendations that support alternative economic activities, such as ecotourism or the establishment of recreation areas. Despite the researches about the protection of forests, water sources, and biodiversity in a more comprehensive manner, focused on the provision of ecosystem services that benefit both urban areas and local communities (Pamukçu-Albers, Lise, and Balkız 2019; Tezer et al. 2012), such projects and alternatives are incompatible with Turkey's economic growth focus objectives and legislation. In ecologically significant regions situated in close proximity to urban centres, activities that result in environmental degradation and pollution are being conducted, even in forests that provide vital ecosystem services to surrounding settlements and agricultural areas through their water catchment basins and carbon sequestration capacities.

The absence of effective conservation policies to safeguard the forests and water resources in Mount Ida surroundings has resulted the problems, air and water pollution, water and food insecurity, and biodiversity loss. The findings indicate that legislation pertaining to forests and the environmental assessment process, which is typically positive or not required, enables unrestricted mining activities in these areas. Spatial and basin plans are inadequate and ineffective in terms of preventing deforestation and pollution resulting from investments. It is imperative that the Mount Ida forests be designated as a protected area, as indicated by the existing literature on the subject (Eken et al. 2006; Türkeş and Altan 2012). The whole forest of the Mount Ida is not within the boundaries of the national park. This designation should guarantee the protection of the forest as a whole, as an important carbon stock site, as well as the extensive plains and sub-watersheds it serves. It is critical to protect these areas due to the detrimental effects of forest fragmentation on biodiversity and the direct impact on water pollution. However, it is insufficient to extend protection to the borders alone. Even if the protected boundary

will be extended on a larger scale, this approach cannot provide adequate protection of "ecosystem as a whole". It may encompass the allocations and appropriations of water and forest resources at the periphery of the newly designated protection area, within the delineated research area. This has the potential to exacerbate water pollution, deforestation, loss of agricultural land, and biodiversity loss at various scales. These scales are defined in the study as "conservation scales". The challenge at hand is a complex one, encompassing the intertwined problems of water, food, and climate, which must be addressed at both the city and national levels. A new conservation model should be defined beyond boundaries by examining socio-environmental transformations, water rights and commons in Mount Ida.

As is the case in Turkey, the determination of the protection boundaries is a relatively beneficial strategy for the conservation of biodiversity and natural resources within the boundaries. Besides, it is difficult to implement land use, planning, and conservation policies without clearly defined boundaries or a specified jurisdiction. However, the scope of permitted activities within these boundaries is expanding with legislative amendments and presidential decrees, which raises concerns about the potential for further environmental degradation. On the other hand, the legislative restrictions that apply in or around the protected areas have resulted in a constraining of socio-economic activities undertaken by the local population in or around protected areas as can be observed around Mount Ida National Park (Soykan and Arı 2006; Büyüksaraç 2020). Although the displacement of local populations and involvement of a global elite group have not yet occurred in protected or ecosystem services project areas, there is a possibility that proposed ecosystem services projects may eventually include global funds that do not take into account the practices of local people, particularly those residing in forest villages. In this regard, the authors draw attention to the ecosystem services and possible inequalities of carbon finance in Turkey (Kaya 2014).

On the other hand, the delineation of boundaries is problematic that is concurrently addressed in the literature, with this territory becoming an eco-scalar fix (Cohen and Bakker 2014). In Turkey, this process is operationalized through the redefinition of plan boundaries and the practices of making plans at different scales, as well as the definition of protection zones, exemplified by the declaration of Special Environmental Protection Zones. The centralization of the 'management' of these areas, and the approvals of "sustainable" investments in these areas, have been previously addressed. In contrast to the general strict conservation of "forest" or "coastal" areas for the purpose of protecting

carbon sequestration areas or providing ecosystem services, the areas have also been the subject of both "green" and destructive investments at present in Turkey.

How might this contradiction between the necessity of borders and the transformation of the region into a "fix" through the establishment of new borders be overcome? It is evident that a solution to this contradiction would be to determine the principles of conservation with a post-growth approach and to ensure that the conservation in these areas is not used for any legitimization or instrumentalization mechanism such as carbon credits. One potential avenue for achieving this is for institutions and the planning discipline to decouple from political and economic growth-oriented objectives at this juncture. This would entail determining the areas and principles to be protected on a scientific basis and delineating actual needs. Nevertheless, it remains unclear how long these resources will remain to be protected without degrowth. As eco-socialists and proponents of degrowth argue in conjunction with existing literature, even socialism without degrowth is an inadequate means of ensuring environmental protection (Kallis 2017; Gudynas 2019).

In addition to the structural issues, the fact that conservation boundaries are only accepted as a given input in planning is also problematic. Forests, water resources (including watershed boundaries), coastal areas, designated natural areas, and buffer or conservation zones are accepted directly into the planning process. The necessity to conserve these regions is frequently emphasized, often with reference to the pertinent legislation. In the context of conservation plans, such as Special Environmental Protection Plans that identify sensitive areas, the potential for planning to go beyond this assumption in relation to post-growth alternatives arises through planning decisions that restrict investments for conservation purposes. It is recommended that "global commons" be given precedence over planning practices or conservation decisions made beyond the boundaries.

River basin-based planning practices in Turkey persist as a comprehensive scientific report and a list of recommendations that are not been incorporated into the relevant spatial plans. Despite the necessity for the change emerging in response to multiple crises precipitated by the climate crisis, and despite efforts to address this deficiency through studies on ecosystem services and the new water conservation plans through EU Water Framework Directive, plans and projects remain as calculations with benefits at the city scale or within sectoral evaluations. Furthermore, it is evident that the calculation of the interests of these stakeholders or sectors is influenced by economic growth objectives.

The necessity of proposing a comprehensive framework is discussed in light of the reasons the 'integrated water management' approach has been abandoned in water studies and, in parallel, conservation and planning practice. The reason is the inability to ‘manage’, cope with and take everything into account, which has resulted in the function of the discipline being shaped around economic growth or remain its fragmented solutions (Bigger and Webber 2021; Robin and Acuto 2023). Similarly, with regard to water, interventions and assessments have been largely confined to the assurance of the water's quality and availability. This has involved a particular focus on specific sectors and on the security of the water supply, with due consideration given to its transboundary nature (Bakker 2012; Bakker and Morinville 2013). Although the resilience approach or water-food-energy nexus has potential to consider socio-ecological systems in the planning process, it primarily functions as a means of consensus building and participation to ensure the implementation of ecosystem services. This approach ignores inequalities and power relations in society (Bocci 2022; Williams, Bouzarovski and Swyngedouw 2019).

In the face of all these intractable problems, it is necessary to radically rethink the meaning of 'conservation' and shift the focus of planning away from growth and towards responding to these urgencies. The protection of natural areas is not independent of everyday life, the built environment and, what we produce and what we consume. For this reason, conservation should be inherent in all planning processes, regardless of scale or type.

1. The boundaries and scales of planning and conservation need to be reconsidered.

The areas defined as common areas and their interconnections at different scales should be addressed. The results of the field study demonstrate that the area designated for carbon storage is situated at the intersection of three distinct main basin boundaries. The national park boundary encompasses a relatively limited geographical area within this region. Besides, the delineation of the basin boundaries with limited consideration to the interactions groundwater bodies. Spatial planning practices are carried out in the economic zone that encompasses two administrative boundaries, within which the area is located. Conversely, the comprehensive coastal plan does not encompass the coastlines and conservation areas such as Saros Special Environmental Protection Area directly impacted by this region.

The recommendation is to establish conservation and planning scales comprising boundaries that encompasses the water catchments to which forest areas are connected, as well as biodiversity and water supply critical areas that interact. At this juncture, the

delineation of regions (upstream - dowstream) should be informed by hydrological considerations. These 'global' commons should be considered defining conservation scales: forests (carbon storage areas), - water resources (basins), conservation-critic and biodiversity areas, coastal integrity. These scales and boundaries can be extend with considering food supply basins or global conservation proposals such as global safety net. The comprehensive consideration of conservation is necessary to ensure that spatial decisions are not isolated from the impacts of these scales.

2- Transitional "commons planning" practice at different scales can prevent boundaries from becoming fixed.

It is imperative that conservation practices be integrated into everyday life by incorporating degrowth and post-growth transitions and reforms in social, economic, and cultural dimensions. Degrowth and post-growth alternatives are intrinsically linked to resource allocation and consumption patterns, which are deeply intertwined with practices in urban areas under plenatary urbanization conditions (Swyngedouw 2006; Brenner and Schmid 2015). These are related to the raw materials and energy used in the production process, the commons where these raw materials are extracted, the water resources used in agricultural production activities, the forests as areas of wood production and harvesting, and the spaces where all these production-consumption practices take place. Although equal distribution of welfare is not only related to spatial interventions, revealing these production-consumption networks at different scales is an important step in questioning degrowth alternatives. These studies are carried out in the field of political ecology and economics (Dom`enech, March, and Saurí 2013; Creutzburg 2022). Planning should be the discipline that addresses the manner in which political and spatial interventions are operationalized. Degrowth policies in housing, infrastructure, transportation, the location of renewable energy production, spatial organization of these policies, and their socio-spatial impacts or outcomes began to be considered by the planning discipline (Wacher 2013; Krahmer 2022; Kaika 2023; Kębłowski 2023). This necessity also opens the door for conservation to be implicitly addressed in every step of planning.

Post-growth city researches and practices should include more concrete discussions about radical distribution of critical infrastructure and resources, water and food supply alternatives, and degrowth of carbon emissions. Also, post - growth planning should consider strategies on global and socio-ecological commons that affect urban metabolism, well-being and livability. Degrowth and post-growth planning policies and

strategies prioritise local and distributed development over regional competitiveness or new scalar fixes. This re-evaluates the planning role as a transformative force rather than a negotiator or implicator of a growth-based ideology. (Durrant et al. 2022; Savini 2021; Xue 2022).

"Commons planning" (Marcuse 2009) will now help planning to focus on commons and conservation. Planning needs to intervene in terms of what, how much and who will benefit from the commons (Marcuse 2009). In a situation where the new conservation understanding is more immanently included in (post-growth) planning practices that serve larger scales of segments that benefit from. In fact, basin, special environmental protection zone, ecosystem-based planning practices made within the borders of these natural areas with a focus on 'conservation' have the power to exceed and go beyond legal restrictions when necessary for the protection of these resources at least for Turkey. On the other hand, these studies are important in terms of questioning the necessity of allocations in important areas within these resources or the ecosystems to which they are connected for the protection of these areas and presenting the actual needs. The problem here is that economic interests or the interests of some certain sectors cannot be given up. Another problem is that, as mentioned before, rather than a 'green' transition, it is argued that 'green' investments create a capital accumulation area in addition to 'ungreen' economic activities (Apostolopoulou and Adams 2015). In fact, defining planning and protection boundaries at different scales by addressing "biodiversity impact chain" will be useful to restrict 'unlimited' development outside these boundaries (Bischer et al. 2022).

A biodiversity impact chain analysis was conducted that aims to examine the spatial inequality observed in both the northern and southern regions surrounding Mount Ida. It is investigated how conservation practices may contribute to the creation of privileged spaces and the potential emergence of new unequal spaces driven by economic development needs and the advent of a green economy. This endeavor represents an attempt to extract the metabolic networks of conservation at multiple scales. In practice, conservation serves a limited group within the area, while the periphery is utilized in ways that are, to a greater or lesser extent, destructive activities such as minig. The plans and strategies in question have the potential to exacerbate existing inequalities and contribute to further environmental degradation.

It can be seen that the the focus research area with its tourism, mining, energy production and agricultural activities, serves not only its own 'bioregion', but more

specifically beyond its larger region, first Çanakkale and Balıkesir city centers and then surrounding metropolitan cities. This encompasses the region's role in supplying food at the national level, providing raw materials at the national and international levels, and offering resources to external visitors through tourism.

There is no large settlement in this important socio-ecological area, but there is a city centers (Balıkesir-Çanakkale) at a higher scale that we cannot consider independently. On the other hand, although the needs of the focus research area is prioritized in degrowth alternatives because of water and air pollution, this is not possible to imply according to growth needs at the national level. However, the conservation of the research focus is an immediate need not only at local but also national scale due to significant ecological importance, both in terms of oxygen production and biodiversity.

Considering current situation about water pollution, rural and agricultural value of the area and the 'unique' ecosystem in the defined research area, indeed, strategies and actions should be focused on local welfare rather large-scale economic investments. The area is inalienable for agricultural production and food security in national scale. Water security and agricultural development strategies also related to social inequalities, water governance, and inequitable sharing of resources in local and global scale (Bakker and Morinville 2013; Dupuis and Goodman 2006).

In alignment with the emerging necessity for a paradigm shift in conservation approach in planning and commons planning proposals, the following points should be given due consideration within the framework of planning discipline:

1. The questioning of conservation boundaries and the determination of conservation scales that focus on the global commons at different scales and are considered in an integrated manner.

2. The transition of planning dicipline to a post-growth planning approach and the implementation of planning principles and practices with a focus on conservation.

3. The necessity for planning dicipline to analyze allocation, consumption, cycles and inequalities by taking into account these boundaries and connections at different scales, with different disciplines studies and make spatial decisions in this context.

4- Planning decisions should be to prioritize the locality, and then to analyze the stakeholders who benefit and suffer at different scales.

To illustrate, which practices are permitted within the confines of a designated conservation area? In which contexts are the carbon credits derived from these practices

utilized? What is the extent of the area's influence, and what value does it hold as a global common good?

Against to the conflicting objectives of benefits and harms at different scales, conducting planning processes with a common based, post-growth priority and taking into account BIC analyses of the impacts of policies at different scales can help to reveal and avoid the actual needs and harms that are manipulated and legitimized by power relations in participation processes. Because even ‘extended’ conservation can be also means to new inequalities outside of the boundaries. Even current partial conservation, there are socio-economic disparities around the Mount Ida National Park. On the other hand, mining activities continue intensively around the protected area and focus research area.

Moreover, it is possible that the defense of 'rights' may become a governance ‘fix’ in parallel with community-based conservation practices. It has been mentioned by Bakker (2009) that the defense of rights such as access to 'water' leads to the commodification of water as a commodity. For this reason the water problem should be defended and addressed with concepts such as 'water commons'. Similarly, community-based conservation practices also turning local people into waged labors to ensure ‘protection’ of the area within the framework of 'environmental rights'. In fact, it can be said that ecosystem services and carbon credits can be utilized in this way.

The success of commons practices has been systematized by Ostrom (2002). Nevertheless, while issues such as domination and power inequalities within the commons persist, the primary concern highlighted by Hardin (1968) the limitation of these rights and lack protection, actually provides a potential avenue for addressing and overcoming challenges in practice. The issue arises from the fact that Hardin's (1968) proposal entails the allocation of rights to use these areas. It is evident that this situation has resulted in the centralization and authoritarianism observed in conservation areas, with the failure to achieve the desired conservation outcomes. The profit-oriented utilization of resources, such as water, which is subject to the monopoly of these controlled companies, is not sustainable. Companies consistently generate greater profits on an annual basis, while the economic accessibility of water for the general public is constrained, leading to an exacerbation of water scarcity and crises.

It is necessary to scale up and transform common practices into a comprehensive understanding and policy framework. However, it is worth being cautious about the applicability and success of the idea that there should be no limits to commons practices

and conservation. Of course, the people who benefit from these commons may be reluctant to take more, thinking about how they will feed themselves next year. Or local knowledge and practices may be more useful than scientific/political interventions in managing crises and protecting the local ecosystem. However, both domination and power inequalities over the commons and external intervention/manipulation should not be forgotten. Beyond the democratic or inclusive credentials of any planning process and participation, the 'actual' need is obvious. For instance, the access to water commons, the prevention of pollution of limited resources is an emergence in and around Mount Ida. It is also evident how governance can be used to "balance" this economic and environmental need. In this process, planning must determine the priorities and the extent to which these commons will be utilized and the limits to their use taking into account the beneficiaries and sufferers of this allocation.

In defense of global commons, degrowth and post-growth alternatives can be promoted through protection against the threads of multi-crisis at various scales. Environmental concerns can move beyond mere local disamenities in defense of the "right to nature" by repoliticizing relationality. The fundamental aspiration underlying these efforts is the transformation of cities to ensure that opportunities and resources are accessible to all, beyond what is endowed to us with current "rights and freedoms" (Fainstein 1999; Harvey and Potter 2009).

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APPENDIX A

LEGISLATION ABOUT CONSERVATION, WATER RESOURCES AND FORESTS

Water Resources	Number	Date	Name
	831	28/04/1926	Law on Waters
	167	16/12/1960	Groundwater Law
	5686	3/6/2007	Geothermal Resources and Natural Mineral Waters Law
	1380	22/03/1971	Aquacultural Production Law
	6172	8.03.2011	Irrigation Associations Law
	4373	14/01/1943	Law on Protection Against Flood Waters and Floods
	28962	4.04.2014	Regulation on the Protection of Wetlands
	28483	30/11/2012	Surface Water Quality Management Regulation
	25687	31.12.2004	Water Pollution Control Regulation
	28257	17.10.2012	Regulation on the Protection and Management of Water Basins
	30224	28.10.2017	Regulation on the Protection of Drinking and Domestic Water Basins
	30208	12.10.2017	Drinking Water Supply and Distribution Systems Regulation
	30974	10.12.2019	Regulation on Water Allocations
	26047	1.11.2005	Wastewater Treatment Facilities Technical Procedures Communiqué
	29710	12.05.2016	Regulation on the Preparation, Implementation and Monitoring of Flood Management Plans
	30763	3.05.2019	Flood and Sediment Control Regulation
	29779	23.06.2016	Regulation on the Protection of Water Against Agricultural Nitrate Pollution
	26047	8.01.2006	Urban Wastewater Treatment

	28444	7/10/2012	Regulation on Preparation, Implementation and Follow-up of Basin Management Plans
	26005	26/11/2005	Regulation on the Control of Pollution Caused by Hazardous Substances in Water and Its Environment
	25730	17/2/2005	Regulation on Water for Human Consumption
	658	2.11.2011	Decree Law on the Establishment and Duties of the Turkish Water Institute
	3621	17.04.1990	Coastal Law
	Draft	Prepared first draft - 2012	Water Law

Conservation Areas and Forests	2873	9.08.1983	National Parks
	19309	12.12.1986	National Parks Regulation
	28358	19.07.2012	Regulation on Procedures and Principles Regarding Identification, Registration and Approval of Protected Areas
	2863	21.07.1983	Cultural and Natural Assets Protection Law
	4915	11.07.2003	Land Hunting Law
		8.11.2004	Wildlife Conservation and Development Areas Related Regulation
	21937	13.11.1994	Ramsar Convention
	28962	4.04.2014	Regulation on the Protection of Wetlands
	6831	31.08.1956	Forest Law
		13.08.1984	Separation Conservation Forests Regulation on the Related Administration
	5553		Seed Law
		31.07.2016	In the Forest Plant Seeds Market Authorization, Inspection and Forest Plant Passport Regulation
	2872	11.08.1983	Environment Law
		20.09.2006	Recreation Areas Regulation

	26778	5.02.2008	Forest Management Regulation - Ecosystem-based Functional Forest Management Plan Regulation
	20341	13.11.1989	Decree Law on the Establishment of the Presidency of the Special Environmental Protection Agency
	28242	23.05.2012	Regulation on Plans to be made in Protected Areas
	Draft	Prepared first draft - 2002	(Nature and) Biodiversity Protection Law

APPENDIX B

SPECIES INCLUDED IN THE IUCN RED LIST IN THE MOUNT IDA KEY BIODIVERSITY AREA

(Source Eken et al. 2006, 102-103)

Takson Adı	E	TE	Kırmızı Liste		Popülasyon Büyüklüğü	ÖDA Kriteri
			K	B		
Abies nordmanniana ssp. equi-trojana	I	0	NT	NT	Var	B2
Aethionema saxatile ssp. oreophilum	0	0	_	VU	Var	B1, B2
Alchemilla hirsutiflora	I	0	_	VU	Var	A1, A2
Allium kurtzianum	I	I	_	EN	Var	A1, A2
Aristolochia sempervirens - Batı Anadolu	0	0	_	VU	Var	B1
Armeria trojana	I	I	_	EN	Var	A1, A2
Asperula sintenisii	I	I	_	EN	Var	A1, A2
Astragalus idae	I	0	_	VU	Var	A1, A2
Bromus sipyleus	I	0	_	EN	Var	A1, A2
Carduus nutans ssp. trojanus	I	0	_	NT	Var	B2
Centaurea nydeggeri	I	0	_	EN	Var	A1, A2
Centaurea odyssei	I	I	_	EN	Var	A1, A2
Centaurea polyclada	I	0	_	VU	Var	A1, A2
Cirsium steirolepis	I	0	_	DD	Var	A2
Crocus candidus	I	0	_	NT	Var	A2
Crocus gargaricus ssp. gargaricus	I	0	_	NT	Var	B2
Digitalis trojana	I	0	_	VU	Var	A1, A2
Erysimum idae	I	0	_	_	Var	A2
Ferulago idaea	I	0	_	CR	Var	A1, A2
Festuca ustulata	I	0	_	EN	Var	A1, A2
Galium trojanum	I	0	_	DD	Var	A2
Hieracium idae	I	0	_	DD	Var	A2
Hieracium phaeochristum	I	0	_	DD	Var	A2
Hieracium scamandris	I	I	_	EN	Var	A1, A2
Hypericum kazdaghensis	I	I	_	EN	Var	A1, A2
Jasione idaea	I	0	_	VU	Var	A1, A2
Linum boissieri	I	0	_	EN	Var	A1, A2
Muscari latifolium	I	0	_	LC	Var	A2
Peucedanum arenarium ssp. urbanii	0	0	_	EN	Var	B1
Ranunculus pedatus ssp. trojanus	I	0	_	CR	Var	B1, B2
Saxifraga sancta	0	0	_	VU	Var	A2, B1
Sideritis athoa	0	0	_	VU	Var	A2, B1
Sideritis trojana	I	0	_	EN	Var	A1, A2
Silene bolanthoides	I	I	_	EN	Var	A1, A2
Silene sipylea	I	0	_	VU	Var	A1, A2
Thymus pulvinatus	I	I	_	CR	Var	A1, A2
Verbascum scamandri	I	I	_	EN	Var	A1, A2
Aquila chrysaetos	0	0	LC	LC	Nadir (Üreme)	C1
Bubo bubo	0	0	LC	LC	Var (Üreme)	C1
Circaetus gallicus - Avrupa	0	0	LC	LC	Var (Üreme)	C1
Coracias garrulus - Avrupa	0	0	NT	VU	Var (Üreme)	B1, C1
Dendrocopos medius	0	0	LC	LC	Var (Üreme)	C1
Dendrocopos syriacus	0	0	LC	LC	Var (Üreme)	C1
Emberiza caesia	0	0	LC	LC	Var (Üreme)	C1
Emberiza hortulana	0	0	LC	LC	Var (Üreme)	C1

Takson Adı	E	TE	Kırmızı Liste		Popülasyon Büyüklüğü	ÖDA Kriteri
			K	B		
Falco peregrinus	0	0	LC	LC	Var (Üreme)	CI
Hippolais olivetorum	0	0	LC	LC	Var (Üreme)	CI
Lanius nubicus	0	0	LC	LC	Var (Üreme)	CI
Lullula arborea	0	0	LC	LC	Var (Üreme)	CI
Sitta krueperi	0	0	NT	(NT)	850 Çift (1996 Üreme)	CI
Chionomys nivalis - Kaz Dağı	0	0	NT	LC	Var	B2, CI
Microtus subterraneus - Kaz Dağları	0	0	LC	LC	Var	B2, CI
Miniopterus schreibersii	0	0	LC	NT	Var	CI
Myotis blythii	0	0	LC	LC	Var	CI
Myotis capaccinii	0	0	VU	LC	Var	A1, CI
Myotis emarginatus	0	0	VU	VU	Var	A1, CI
Myotis myotis	0	0	NT	LC	Var	CI
Rhinolophus blasii	0	0	NT	VU	Var	CI
Rhinolophus blasii - Doğu Akdeniz	0	0	NT	VU	Var	B1, CI
Rhinolophus euryale	0	0	VU	VU	Var	A1, CI
Rhinolophus ferrumequinum	0	0	NT	NT	Var	CI
Rhinolophus mehelyi	0	0	VU	VU	Var	A1, CI
Triturus karelinii	0	0	LC	LC	Var	CI
Capoeta bergamae	I	0	_	VU	Var	A1, CI

APPENDIX C

TRANSFERRED MINING LICENSES

(Source: Madencilik ve Petrol İşleri Genel Müdürlüğü 2021, 1 Eylül https://mapeg.gov.tr/Uploads/Dosyalar/01092021/Uygun%20Bulunan%20Devir%20ve%20Tescil%20Talepleri%20(8%20ADET).pdf)

UYGUN BULUNAN DEVİR TALEPLERİ									
SIRA	MAHİYETİ	SİCİL	ERİŞİM	İL/İLÇE	G	K	CİNS	RUHSAT SAHİBİ (DEVREDEN)	DEVRALAN
1	DEVİR	201701164	3357906	AFYONKARAHİSAR - EMİRDAĞ	2	B	MERMER	DİYARBAKIR MARBLE MAD. İNŞ. SAN. VE TİC. LTD. ŞTİ.	MFC MADENCİLİK İNŞAAT OTOMOTİV PETROL GIDA SANAYİ VE TİCARET LİMİTED ŞİRKETİ
2	DEVİR	201901906	3387263	ISPARTA - YALVAÇ	2	B	MERMER	HÜSNÜ YILDIRIM	LİMAR MERMER MAD. İTH. İRC. SAN VE TİC. LTD ŞTİ
3	DEVİR	86919	3326065	ŞANLIURFA - BİRECİK	2	A	KALKER	DURGUN TAAH. HARF. İNŞ. NAK. TUR. SAN. TİC. LTD.ŞTİ.	BİRECİK MADENCİLİK SAN. VE TİC. LTD. ŞTİ.
4	DEVİR	202000367	3337525	KAHRAMANMARAŞ - TÜRKOĞLU	4		ÖN ARAMA DÖNEMİ	OSMAN İLKER ERYILDIR	BARİT MADEN TÜRK A.Ş.
5	DEVİR	86521	3381399	MALATYA - AKÇADAĞ	2	B	MERMER	ALACAKAYA MER.MAD.İŞL.TİC.VE SAN.A.Ş.	EZGİ MERMER MAD. NAKPETROL İNŞAAT GIDA SAN VE TİC LTD ŞTİ
6	DEVİR	20058150	3078068	ÇANAKKALE - YENİCE	4	C	KURŞUN	TECK MADENCİLİK SAN. VE TİC. A.Ş.	BAHAR MADENCİLİK SANAYİ VE TİCARET ANONİM ŞİRKETİ
7	DEVİR	20050238	3052939	BALIKESİR - EDREMİT	4	C	ALTIN GÜMÜŞ	TECK MADENCİLİK SAN. VE TİC. A.Ş.	BAHAR MADENCİLİK SANAYİ VE TİCARET ANONİM ŞİRKETİ
8	DEVİR	85384	3338137	BALIKESİR - GÖNEN	4	C	DEMİR	TECK MADENCİLİK SAN. VE TİC. A.Ş.	BAHAR MADENCİLİK SANAYİ VE TİCARET ANONİM ŞİRKETİ
9	DEVİR	20061432	1131641	BALIKESİR - GÖNEN	4	C	ALTIN	TECK MADENCİLİK SAN. VE TİC. A.Ş.	BAHAR MADENCİLİK SANAYİ VE TİCARET ANONİM ŞİRKETİ
10	DEVİR	200903325	3203642	BALIKESİR - GÖNEN	4	C	ALTIN	TECK MADENCİLİK SAN. VE TİC. A.Ş.	BAHAR MADENCİLİK SANAYİ VE TİCARET ANONİM ŞİRKETİ
11	DEVİR	201500688	3323435	MANİSA - SALİHLİ	4		DETAY ARAMA DÖNEMİ	NİL EGE MAD. NAK. TAR. ÜRÜN GIDA İNŞ. İTH. İHR. SAN. VE TİC. LTD. ŞTİ.	AYAR KARDEŞLER MAD. İTH. İHR. SAN. VE TİC. LTD. ŞTİ.

APPENDIX D

PROPOSED IV. GROUP MINING ACTIVITIES AFTER 2017 IN RESERCH FOCUS AREA

(Source: Preperad by author with EIA reports, institinutional reports, Mining License Digital Data, media search, and satelitte images)

District	Villages near Mine Sites	Licence Owner	Plant detail	Operation/ EIA area	Current Status	Land Use Characteristics and Impacts on Natural Resources	EIA Process	Detail
Çan	Kızılelma/ Çamyurt	DOĞU BİGA MADENCİLİK SAN.TİC. A.Ş./ ALAMOS GOLD ASSOCIATION		207,15	There is no operating license currently	Forests/ agricultural land / private property & treasury - possible water pollution in Bayramiç dam due to wastes during search facility	EIA was positive for the gold mine in 2012 (for 27.5 ha). Capacity increase proposal (for 207.15 ha) 21.09.2018 - Canceled in 2019.	There will be cyanide use. Gold search drilling was done Karaköy-Kızılelma. Struggle between villagers and mining companies. Karaköy villagers and the firm were sued. There are claims that the stream is polluted.
Çan	Söğütalan/ Ağı Mount	KUZEY/DOĞU BIGA MINING SAN. TIC. A.Ş. / ALAMOS GOLD ASSOCIATION		27,28	There is no operating license currently	Forests - possible water pollution in Bayramiç dam due to waste during search facility	EIA positive decision was given in 2012- There were litigation processes (Çanakkale Bar Association made a stay of execution decision), but the decision in 2012 was validated. In 2021, the EIA positive decision became invalid.	Gold exploration work was carried out. Project of Alamos Gold subsidiary
Çan	Dondurma	KOZA ALTIN İŞLETMELERI A.Ş.	S.58628&S.60813 GOLD AND SILVER MINING	30,00		Forest - Agricultural areas Within the Bakacak dam irrigation area	In 2 areas - Completion of EIA report deficiencies in 2015 / investor abandonment - cancellation in 2021.	Public reaction - Protest of information meeting
Çan	Helvacı - Altınkulaç	İÇDAŞ ÇELİK ENERJİ TERSANE VE ULAŞIM SAN. A.Ş.	HELVACI COLLIERY NO. S.68848	268,53	Has operation license. There is no activity visible.	Forest (66.2 ha) - unregistered/ Agricultural - Irrigation area Leasing - purchasing from individuals / Yenice-Çomaklı coal within the Çan Lignite Basin	The 2015 EIA not necessary decision was canceled in 2016. 28.06.2021 EIA is positive - 2022 - Çan environmental association filed a lawsuit, expert discovery - rejected.	Shipping for use in İÇDAŞ Biga thermal power plant.
Çan	Yuvalar	NAGIHAN TUNA	LICENSE NUMBER 201201366(ER:3139900) IV. GRUP MINE (IRON) MINE CRUSHING, SCREENING AND GRINDING FACILITY	21,47	There is activity in the field after the relevant decision. Forest loss	It is located in the Yuvalar Village 1065 m away - Forest area.	24.11.2020 - EIA is not required.	

Çan	Kumarlar	KALE MADEN ENDÜSTRIYEL HAMMADDE SAN. VE TIC. A.Ş.	KAOLIN FURNACE CAPACITY INCREASE	15,50	Active - operation license	Forest and agricultural land	2007 EIA is not required decision for kaolin quarry - 12.01.2018 EIA is not required for capacity increase.	
Çan	Çaltıkara	KALE MADEN ENDÜSTRIYEL HAMMADDE SAN. VE TIC. A.Ş.	CRUSHING AND SCREENING PLANT (398,000 TONS/YEAR)	24,96	Active operation license	The facility is in the old kaolin field, but permission was requested to expand the forest area	Regarding the existing Kaolin Field - EIA Not Required Decision in 2011. 11.06.2024 - requested to expand the forest permit area.	
Çan	Hacılar	STANDART MEDIKAL TEKSTIL MADENCILIK SAN. VE TIC. A.Ş.	IRON MINE WITH OPERATING LICENSE NO. 201001638 (ER:3242806)	24,84	There is no activity in the area yet.	Forest - Yuvalar village field / 50 trees will be cut down. Partially next to the previously burnt forest area	24.10.2023 - 15.08.2024 EIA is not required.	
Bayramiç	Halilağa-Hacıbekirler-Muratlar	TRUVA BAKIR MADEN İŞLETMELERİ A.Ş.	HALILAĞA COPPER MINE CAPACITY INCREASE, ORE ENRICHMENT FACILITY AND WASTE STORAGE FACILITY IN THE FIELD WITH LICENSE NUMBER 87513 - 89430	257,79	Tree cutting have started in the area.	580,21 ha EIA area / 52.09 ha for fresh water pond - 218.56 ha Forest land and agricultural areas) - Expropriation of villagers' lands for Hacıbekirler 1-2 irrigation pond	26.07.2021- EIA is positive/stay of execution appeal is closed - Application was made by combining the license area 26/08/2022. 14.03.2023 (EIA is positive). The case is ongoing. Çan Çevre Koruma derneği and TEMA sued.	Open Pit Copper Mine Operation areas and energy transfer A total of 133,952 trees will be cut. Not suitable in terms of hydrogeology, geology and forest engineering evaluation. The litigation process continues.
Bayramiç	Yanıklar	TRUVA MINING, COMMERCIAL AND INDUSTRY CORP. / TRUVA BAKIR MADEN İŞLETMELERİ A.Ş.	FELDSPAR QUARRY ON SITE WITH LICENSE NUMBER 20050053	6,05		Forest - property permit	14.05.2024 (EIA not required)	Tree cutting will be done.
Bayramiç	Aşağışapçı	TRUVA MINING, COMMERCIAL AND INDUSTRY CORP.	IRON FURNACE ON SITE WITH LICENSE NUMBER 20061700	3,50	There is no activity currently	Forest and treasury land	28.07.2017 - EIA application was done.	

Bayramiç	Sögütgediği-K.İbrahimler	TRUVA MINING, COMMERCIAL AND INDUSTRY CORP.	ON-SITE QUARTZ (SILEKS) QUARRY WITH LICENSE NUMBER 20054260	3,78			13.10.2021 EIA process was started. The Association of Madra and Kaz Mountains Municipalities and the Chamber of Agriculture filed a lawsuit against the decision that EIA was not required in 2015. The decision has been cancelled.	There are claims that companies are looking for gold mines under the name of Quartz quarry. Under Kirazlı mining area.
Bayramiç	Kuşçayırı	PARK TEKNIK ELEKTRIK MADENCILIK TURIZM SAN. VE TIC. A.Ş.	QUARTZ QUARRY ON SITE WITH LICENSE NUMBER 201200270	23,98		There are endangered species important for forest area/biodiversity	22.09.2022 - EIA process was started/ 4.03.2024 - EIA is required.	It was previously decided that EIA was not required for the company's mineral exploration projects in Bayramiç in 2015
Bayramiç	Yukarışapçı	PARK TEKNIK ELEKTRIK MADENCILIK TURIZM SAN. VE TIC. A.Ş.	QUARTZ QUARRY ON SITE WITH LICENSE NUMBER 201200256	1,05		Forest	18.12.2023 - EIA is not required.	
Bayramiç	Kuşçayır - Karaayı	CHESSER SEARCH AND MINING	GOLD/QUARTZ MINE		No active license		EIA is not required in 2012 / EIA Report was accepted with Positive Decision. The decision was canceled by stay of	A positive EIA decision was given for a gold mine project of the company in Lapseki. Canada based company
Yenice - Havran	Yenice / Havran	CVK MADEN İŞLETMELERİ SAN. VE TİC. A.Ş	ER:1074049 NUMBER IV. GROUP (LEAD-ZINC) MINE CAPACITY INCREASE	83,89	In the operating licensed area - previous mining activity have increased in 2020.	Forest area (Mount Ida forest mass) - in the Kalkım pond water collection basin with other projects. The activities seem to have started in 2010 and increased in 2020.	Capacity increase EIA is not required cancelled in 2016 / 18.07.2018 - 2021 EIA process has been stopped deficiencies	1609.14 ha in size. 3 waste stock area proposal
Yenice	Kalkım - Karaaydın	CVK MADEN İŞLETMELERİ SAN. VE TİC. A.Ş	LEAD ZINC-COPPER FLOTATION FACILITY CAPACITY INCREASE AND ADDITIONAL WASTE STORAGE FACILITY	4,99	In the current mining operation area - for the license detail exploration period	Agriculture and forest area	26.07.2018 EIA process started, deficiencies were stopped - 18/01/2022 03.07.2024- EIA process started again.	The proposal has been reduced from 8.64 ha to 4.99 ha

Yenice - Havran	Yenice - Karaaydın	CVK MADEN İŞLETMELERİ SAN. VE TİC. A.Ş	IR: NUMBER 20066206 IV. GROUP (LEAD-ZINC) MINE CAPACITY INCREASE, CRUSHING, SCREENING AND WASHING PLANT	893,34	24.5 ha area in 2011 - 2012 operating permit is available for 84.42 ha.	Forest	EIA is not required in 2011. 29.07.2019 - EIA process started - postponed by the investor	A portion of 893.34 ha has been determined as an EIA area, and it is planned to increase the annual average production amount through underground mining (gallery type) from 80,000 tons/year capacity to 300,000 tons/year capacity.
Yenice	Kalkım-Karaaydın	OREKS MADENCILIK LTD.ŞTI.	WASTE LANDSCAPE FACILITY REVISION / MINING WASTE STORAGE FACILITY REVISION AND CAPACITY INCREASE	11,23	It is currently located on an area of 2.36 hectares in the CVK license area.	Brown forest soil - unsuitable for agriculture area / 350 m east of Ilıada Hotel, 1,190 m west and within the borders of Karaaydın Village, the nearest settlement	07.11.2017 (EIA is positive) - project revision - 08.04.2019 EIA is positive.	698,000 m3 waste storage capacity It is planned to increase the waste storage capacity to 1,320,000 m3.
Yenice	Armutçuk	OREKS MADENCILIK LTD.ŞTI.	LEAD-ZINC-COPPER MINE CAPACITY INCREASE, ADDITIONAL ENRICHMENT FACILITY AND MINE WASTE STORAGE FACILITY	346,39	Currently there is an active mining area (34.5 hectares)	Forest and agricultural area - near handeresi and akpınar. There is no other mining around within the forest at the moment.	EIA was not required in January 2008 - activity have started in 2011. 22.03.2023 capacity increase - EIA process has started.	Increasing the working area from 34.5 hectares to 346.39 hectares - Increasing the capacity of underground mines and waste storage (also storage waste from other mining sites)
Yenice	Armutçuk	BAHAR MADENCILIK SANAYI VE TICARET A.Ş.	ON-SITE QUARTZ WITH LICENSE NUMBER 20055698	10,77	No activity.	Forest area	22.03.2024 - EIA process started.	40,000 tons/year (ore + waste) production - Gold is the second mine - drilling was done and gold was found
Yenice		TECK MADENCİLİK SAN. TİC. A.Ş.	LEAD FURNACE IN THE FIELD WITH LICENSE NUMBER 85184	12,02	MTA general search period area/no activity yet	Forest area - Yenice center / Bektan village service providing forest mass	08.04.2019 - EIA is not required 22.03.2024 EIA process started.	10,000 tons of material (waste + ore)/ EIA is not required for mineral exploration drilling and feldspar quarry. (Karaköy and Yeşilköy Location)
Yenice	Bekten köyü	TECK MADENCİLİK SAN. TİC. A.Ş.	QUARTZ (SILEX) QUARRY ON SITE WITH LICENSE NUMBER 20054257	5,96	Bahar minig has mining license in the area. / no activity yet	Forest area / Agricultural area	09.04.2019 (EIA is not required)	
Yenice	Soğucak	GPM PROJE GELIŞTIRME İNŞ. MAD. PET. ENERJI DAN. SAN. TIC. A.Ş.	LEAD-ZINC-COPPER-SILVER UNDERGROUND MINE CAPACITY INCREASE AND CRUSHING AND SCREENING FACILITY AT SITE NO. IR:2214	70,77	In Operation license, there is also the Nesko mining underground area. The activity has expanded after the EIA year.	Forest / partially private parcel - no mention of expropriation.	22.04.2021 - EIA is positive.	4996 trees will be cut down. Lead - Copper - Zinc - Silver underground mine. Mine workers have made resistance, activity dating back to before 2011. (The ore is used in İvrindi mine.).

Yenice	Hıdırlar	KÖMÜR İŞLETMELERİ A.Ş.	COAL MINE	5,02	Currently, the license is not visible on the map.	Forest within the Yenice-Gönen Dam long-distance protection area / Arap Creek	30.04.2020 - EIA is required.	
Yenice	Karadoru	ESAN ECZACIBAŞI ENDÜSTRİYEL HAMMADDELER SAN. VE TİC. A.Ş.	LEAD, ZINC, COPPER QUARRY IN LICENSE NUMBER RN.38401	6,55	Operating license - no activity on satellite.	Raw soil (personal) and forest / Not connected to the main forest mass in the south of Kaz Mountains.	18.09.2018 (EIA is not required)	
Yenice	Namazgah	KALE MADEN ENDÜSTRIYEL HAMMADDE SAN. VE TIC. A.Ş.	FELDSPAT MINE CAPACITY INCREASE	24,99	The mine is active in the existing forest area. The capacity increase proposal is again in the forest area.	Previously on a 24.01 ha mining area	20.12.2017 - EIA is not required.	EIA is not required for capacity increases for mineral exploration and quarries previously.
Havran	Büyükşapçı	BAHAR MADENCİLİK SAN. VE TİC. A.Ş.	IR: 20050068, IR: 59956, AR: 20053965 DEMİRTEPE GOLD MINE OPEN MINE, HEAP LECHING AND ADR FACILITY - AFTERWARDS DEMIRTEPE GOLD MINE CAPACITY INCREASE, ORE ENRICHMENT FACILITY IN THE FIELD	426,92	Operation lecense (formerly TECK gold mine, the capacity increase in 2019 is visible on the satellite). Operations have officially started (satellite - also drilling works are seen in 2013	Forest (red pine) and field / belonging to the treasury and the company / Değirmendere micro basin - Havran dam / Mount Ida forests contains many local endemic plant species.	03.04.2019 - canceled (report format) - 18.08.2020 EIA process started again / Opinions of the General Directorate of Forestry and the MAPEG. Accordingly, the process was cancelled.- 21.07.2022 final decision	EIA was not required for the 11.84 ha gold mine in 2010. 2018 - capacity increase, EIA is not required (TECK) EIA process for exploration has started. Due to olive growing activities it was stopped / TEMA warning pollution from cyanide use).
Havran/İvrindi		CVK MADEN İŞLETMELERİ SANAYİ VE TİCARET A.Ş.	ER:3290467 NUMBER IV. GROUP (GOLD-SILVER-LEAD-ZINC-COPPER) MINE	11,94	The license is not visible	Forest and agricultural lands	16.01.2019 - EIA process started 31.10.2019 - investor gave up on the project.	Underground gold mine, waste and drilling areas.
Balıkesir	Eğmir / Halılar / Büyükşapçı	AKSU MADENCILIK SANAYI VE ELEKTRIK ÜRETIM TIC. A.Ş.	EĞMIR IRON AND GOLD MINE OPEN PIT OPERATION AND ORE ENRICHMENT FACILITY	653,40	Operation license available. The existing iron pit has been operated by the company since 1998 (approximately 60 ha).	497.7 ha part is forest and 155.7 ha ha area is considered private land. - 3 km from Havran dam.	11.06.2020 - 18.10.2021 EIA processes will be started again after the technical processes. The process has been terminated by the investor.	2011 MTA / 2011-2015 additional search by company. A reserve was found and the mining gendarmerie asked for it to be moved. Eğmir TM will be moved. Canadian based consultancy firm firm

Balıkesir	Havran/ Hüseyinbeşeler	ORDU YILMAZ	IV-A GROUP MINE (SILEKS) MINE AND MILL FACILITY CAPACITY INCREASE (RN:46823 ER:2359444)	24,40	Capacity increase around the existing 2 quarry/ waste areas (It has been active since 2011.	Forest area (red pine)	19.04.2024 - 24.05.2024 (Cancellation and refund) - near the olive grove area	
Balıkesir	Kozcağız	ÖZDOĞU İNŞAAT VE TİCARET LTD. ŞTİ.	COPPER-MOLYBDENUM EXPLORATION BY CORE DRILLING METHOD (IR: 200709824 IN THE LICENSED FIELD)	171,83	Currently, the license area is not visible.There are licensed areas around it.	Exploration by drilling in 27 areas - forest area	02.10.2017- EIA not required.	Near the old abandoned copper mine. Operated between 2007-2018 (Özdoğu - Kuzey Ege Bakır enterprises). 170 meters deep mine pit. "acid mine drainage" rehabilitation efforts - 156 ha mine area.
Balya/ Gönen	Koyuneri / Çatak	METEHAN MAKİNA İNŞAAT MADENCİLİK HARFİYAT TAAH. TİC. LTD. ŞTİ.	AREA AND CAPACITY INCREASE IN COAL FURNACE AND CRUSHING-SIRVING-WASHING-DRYING FACILITY	23,72	Operating coal mine. Capacity increase (previous operation 126.09 ha)	Forest	2.01.2018 - EIA process started	The total area will increase to 149.81 hectares.
Balya	Orhanlar	TECK MADENCİLİK SAN. TİC. A.Ş.	QUARTZ (SILEX) QUARRY ON SITE WITH LICENSE NUMBER 200808423	12,81	Drilling activities have increased after 2020 - satellite.	Forest/ 2km close to orhanlar pond / 660 m of Orhanlar village. The nearest household is 220m away.	05.02.2019- EIA not required.	Suggestion of quarry, soil storage, waste dumping, ore stock and construction site areas. 135 Drilling and 20 Splitting - the EIA is Not Required decision in 2016. There was a protest from villagers.
Balya	Çukurcak & Aydoğdu	HB MADENCİLİK ANONİM ŞİRKETİ	200701393 LICENSE NUMBER ZINC - LEAD POT FURNACE	24,72		Forest (Oak)	25.11.2019-10.02.2020 - EIAis not required)	Excavation amount: 12,500 tons (5,000 tons of run-of-mine ore + 7,500 tons of waste)
Balya/ İvrindi	Çamucu/ Hüseyinoba	BAHAR MADENCİLİK SAN. VE TİC. A.Ş.	GOLD MINE IN THE FIELD WITH LICENSE NUMBER 20055698	24,90	An exploration license was issued on behalf of TECK.	Forest and agricultural area. Ayvacık and Göktepe state forest. - It is Yemşenli Stream located 110m. The nearest fountain is located 144 m. Taşkoyu Stream is within the EIA area.	05.04.2023 - EIA is required.	
Balıkesir	Bengiler	KAV MADENCİLİK İÇ VE DIŞ TİCARET LİMİTED ŞİRKETİ	CAPACITY INCREASE OF COAL FURNACE CRUSHING, SCREENING, DRYING AND PACKAGING FACILITY WITH LICENSE NUMBER 62	1762,00	There are already operation in the area of 71.4 hectares.	Kocaçay 350 meters, Çabun Stream 240 meters, Garipçe Stream 430 meters, Döllük Stream 300 meters.	05.02.2024 - EIA is not required	

Balya	Çakallar	ESAN ECZACIBAŞI ENDÜSTRİYEL HAMMADDELER SAN. VE TİC. A.Ş.	LEAD, ZINC UNDERGROUND MINE	14,64		Forest and field	27.11.2018 - EIA is not reuqired	
Balya	Kadıköy ve Patlak	ESAN ECZACIBAŞI ENDÜSTRİYEL HAMMADDELER SAN. VE TİC. A.Ş.	UNDERGROUND MINE CAPACITY INCREASE IN LICENSE NO. RN.20056770		There is already mining activity within the total license area of 1,572.82 hectares.	750 m away from Balya town / Forest - treasury / private property	09.05.2022- EIA is not required for capacity increase.	A positive EIA decision was taken for the lead mine in 2011. Mining is carried out in an area of 228 hectares.
Balıkesir	Havutbaşı	ESAN ECZACIBAŞI ENDÜSTRİYEL HAMMADDELER SAN. VE TİC. A.Ş.	HALLYOSITE CAPACITY INCREASE	15,64		Forest/private property (lease and purchase)	11.01.2021- EIA is not required	
Gönen	Sebepli	TÜMAD MADENCILIK SANAYI VE TICARET ANONIM ŞIRKETI	QUARTZ QUARRY ON SITE WITH LICENSE NUMBER 200706189	13,40		Forest area (in forest mass with no other activity around)	26.10.2023 - EIA process began.	
Gönen	Fındıklı	BAHAR MADENCİLİK SAN. VE TİC. A.Ş.	QUARTZ QUARRY ON SITE WITH LICENSE NUMBER 89262	8,40		Forest area - Household in Fındıklı Village, 370 m east of	10.04.2023 (EIA required) - 01.12.2023 - company cancellation request	In 2014, EIA was not required for the license area belonging to the TECK company.
Gönen	Sebepli / Çatak	LİNFA MADENCİLİK A.Ş.	COAL MINE AND CRUSHING AND SCREENING PLANT CAPACITY INCREASE	127,41		The current coal mine is 700 m away from Çatak village. The current coal mine activities date back to before 2011. Formerly forest according to satelitte and the	09.12.2020 - 30.12.2020 - EIA is not required.	In 2011, EIA was not required for the existing coal mine.
Gönen		PROTON MADENCILIK SAN. VE TIC. LTD. ŞTI.	COAL MINE AND CRUSHING-SCREENING AND PACKAGING FACILITY NO. S:201900515 (ER:3339214)	20,33	Operating license - A total of 1,084 m of drilling was done in 19 different locations. Search activities are observed	Forest and agriculture. There is no request for expropriation. /500 m to Küpçıktı settlement.	10.07.2023 - 05.12.2023 - EIA is not required.	There is a previously opened coal mine in the area next to mining operation license. Approximately 17 ha coal pond. It is not known whether the old one was abandoned or not. It dates back to before 2011.

Gönen	Küpçıktı	DURAKSAN SAN. HAFR. VE TİC. LTD.ŞTİ	COAL FURNACE CAPACITY/AREA INCREASE AND CRUSHING, SCREENING, PACKAGING FACILITY	8,00	Operation license available. Despite the EIA decisions, there is no activity on the satellite.	Agricultural land nd forest	22.09.2017 - EIA is not required.	It was decided that EIA was not required for the existing coal mine and facility in 2014 and 2017.
Gönen	Hamdiye/ Tütüncü	TÜTÜNCÜ MADENCİLİK LTD. ŞTİ.	COAL MILL CAPACITY INCREASE	51,27	Operation license. There is an existing coal mine. Activities date back to 2011. The area is partially undeveloped. activity increased (Total 428.1 EIA areas).	On forest and pasture. 100 meters to Tütüncü district.	30.04.2020 - EIA is not required.	In 2006-2007 and 2011, EIA was out of scope and EIA was not required decisions for the existing mine.
Gönen	Tahtalı	SANTRAL MADENCILIK A.Ş	ER: 3246881 and ER: 3283125 NUMBER IV. GROUP (LEAD-ZINC-COPPER) MINE	1,74	Operation license. No activity.	1.74 ha - 1800 m away from Tahtalı village and 1900 m away from Yolindi village. On forest area (forest mass, there is no other activity around)	20.01.2020 - 18.06.2020 - EIA is not required.	The Aegean and Marmara Environmental Union and the South Marmara Natural and Cultural Environment Protection Association's request for rejection in 2021. In 2015, EIA is not required for mineral exploration."
Biga	Değirmencik köyü	İÇDAŞ ÇELİK ENERJİ TERSANE VE ULAŞIM SAN. A.Ş.	COAL STORAGE SITE	2,50	Approximately 220 ha is currently used. 180 ha. before 2011.) The project was realized.	İÇDAŞ property and forest area. / 650 m in the project. 3rd degree archaeological site adjacent to existing facility. Residences in Değirmencik Village is 46 m away.	02.12.2021- EIA is not required.	The entire area of 248.8 hectares, including the project area, is İÇDAŞ Private Industrial Zone by Presidential Decree dated 26.06.2019
Biga	Kapanbelen - Dikmen	BIGA BAKIR İŞLETMELERI A.Ş.	MINERAL EXPLORATION BY DRILLING METHOD IN THE FIELD WITH LICENSE NUMBER 201600297		Detailed search period license - 39 locations / searches made.	There are streams close to the forest area / drilling areas. The closest drilling area to Çan Stream is 1,098 meters Nearest stream 126 m in the distance	11.05.2017- EIA is not reqired.	Nearly 10 hectares of forest loss
Biga	Işıkeli	KALE MADEN ENDÜSTRİYEL HAMMADDELER SAN. VE TİC. A. Ş.	FELDSPAT QUARRY	69,26	Operation license. There is no activity visible.	Forest / 1.5 km Biga stream / Işıkeli village 250 m	10. 26.2018 - EIA process began.	

APPENDIX E

EIA APPLICATIONS FOR GEOTHERMAL BASED FACILITIES IN FOCUS RESEARCH AREA

(Source: Preperad by author with EIA reports, institinutional reports, Mining License Digital Data, media search, and satelitte images)

License Owner	District	Village	Facility Detail	Licence Type	Status	Name	Land Use Characteristics	Other projects/details
BAKROM	Ayvacık	Büyükhusun	Search drilling	Operation	20.12.2019 - EIA not necessary. 17.11.2022 - EIA report was submitted. 29.08.2024 EIA is positive	DRILLING WORK FOR GEOTHERMAL RESOURCE EXPLORATION (IR.17/27)	Agricultural Land - Treasuary property	
ENTHER	Ayvacık	Kızılkeçili - Kocaköy	Geothermal drilling	Operation	Project Definition Report was submitted- 24.08.2023	AR 17/197 Kızılkeçili Geothermal Licensed Well Drilling (7 points)	Forest and heathland - Treasury land	Tuzla-Kösedere search drilling
ENTHER	Yenice	Akçakoyun & Kalkım & Hıdırlar	Geothermal drilling	Operation	10.07.2018 - EIA report began.	GEOTHERMAL RESOURCE EXPLORATION PROJECT WITH DRILLING IN THE AREA WITH LICENSE NUMBER IR 17/18 and IR 17/19 (12 points)	Agricultural land / private - Kocaçay and seed stands within the license area	
ENTHER	Ayvacık	Taşboğaz	Geothermal drilling	Operation	11.02.2019 - EIA is not required.	GEOTHERMAL RESOURCE EXPLORATION PROJECT WITH DRILLING IN THE SITE WITH LICENSE NUMBER AR 17/207 (2 points)	Agricultural area and Forest - Rented from a private party 1.4 km away from Çamköy pond	
ENTHER	Ayvacık	Tamış	Geothermal drilling	Operation	12.03.2019 - EIA is not required.	GEOTHERMAL RESOURCE EXPLORATION WITH DRILLING IN THE AREA WITH LICENSE NUMBER AR 17/208 (3 points)	Pasture / Rented privte property - near Tuzla stream	
ENTHER	Yenice	Hamdibey	Geothermal drilling	Operation	13.12.2017 - EIA is not required.	GEOTHERMAL RESOURCE EXPLORATION IN AR 17/113 LICENSE AREA (4 production/2 reenjection points)	Within the Asar Pond irrigation area - Agricultural land - Forest land - Yenice- Hıdırlar thermal toursim area - 60,000 m2 usage area	Greenhouse/ Tourism use

MTN Enerji	Ayvacık	Kocaköy-Babadere-Taşağıl	11 Search drilling	Operation	03.06.2024 'EIA is not required' decision canceled	IR: 17/15 LICENSE DRILLING WORKS FOR GEOTHERMAL RESOURCE EXPLORATION (11 POINTS)	Agricultural Land, Irrigation Area, Drinking and Domestic Water Medium Distance Protection Area, 3rd Degree Natural Protected Area -	Babadere JES / Capacity increase - EIA is not require.
MTN Enerji	Ayvacık	Tuzla, Babadere, Kocaköy, Gülpınar, Taşağıl ve	Energy production	Operation	28.10.2019 - EIA is not required (the decision has been canceled) / 12.09.2023 / EIA began again - 05.09.2024	BABADERE GEOTHERMAL POWER PLANT-2 (11.8 MWm/11.5 MWe) (33 points with alternatives)	Agricultural Area, Irrigation Area, 3rd Degree Natural Protected Area, within the Tourism Zone / Treasury and private land - allocation and	
EGEJEO	Ayvacık	Söğütlü - the Southern of the Ayvacık City Centre	2 Search drilling	Search	24.05.2019 - EIA is Not Required.	DRILLING ACTIVITIES FOR GEOTHERMAL RESOURCE EXPLORATION IN THE FIELD WITH AR-17/201 LICENSE NUMBER (2 points)	Ayvacık plain irrigation area - agricultural area / rental from private party	
TRANSMARK TURKEY GÜLPINAR YENİLENEBİLİR ENERJİ ÜRETİM SAN. ve TİC. A.Ş.	Ayvacık	Yukarıköy	Search drilling	Operation	25.04.2024 - EIA is Not required.	GEOTHERMAL RESOURCE SEARCH WITH DRILLING IN THE FIELD WITH LICENSE NUMBER IR-17/44	Pasture - Treasury land - tourism protection and development zone / Tuzla stream - regulator 240 m	Transmark JES (EIA not necessary decision for techmology change and
TRANSMARK TURKEY GÜLPINAR YENİLENEBİLİR ENERJİ ÜRETİM SAN. ve TİC. A.Ş.	Ayvacık	Yukarıköy	Energy production	Operation	27.08.2024 - EIA process began	Transmark GES-2 (15.8 MWm/15.8 MWe)	On agricultural and pasture land / privately rented land. / The wells located on important natural vegetation areas and are on the irrigation area	
Tuzla Jeotermal Enerji A.Ş.	Ayvacık	Tuzla	Search drilling		22.08.2023 - EIA process began	Resource Exploration Drilling for Geothermal Purposes in the License Area No. IR:17/25 (2 Points)	Agricultural land	Tuzla JES

YERKA ELEKTRİK ÜRETİM A.Ş.	Ayvacık	Acıdere			29.08.2018 - EIA is not required.	GEOTHERMAL POWER PLANT (11.75 MWe capacity)	Area to be Protected for Agricultural Quality, DSI Irrigation Area, Tourism Facility Area and Third Degree Resource Protection Area Border - partial expropriation will be carried out	EIA is not necessary decision for auxlarity source (solar energy)
YERKA ELEKTRİK ÜRETİM A.Ş.	Ayvacık	Tuzla köyü			08.03.2016 - EIA is not required.	DRILLING AND EXPLORATION ACTIVITY FOR GEOTHERMAL PURPOSES	Agricultural land - Ayvacık thermal tourism region - Tuzla plain irrigation area	
EZİNE GEYİKLİ BELEDİYE BAŞKANLIĞI	Ezine	Geyikli	Search drilling	Search	15.11.2021- EIA is not required.	Geothermal resource exploration drilling in the Exploration Licensed area numbered AR-17/192 (3 points)	Agricultural lands, infrastructure facility areas	Tourism purpose
NECAT İNŞAAT VE DIŞ TİC. SAN. AŞ.	Bayramiç		Search drilling	Search	22.11.2021 EIA process began. / 05.12.2022 Proje canceled by the company			
SERAMED TARIM VE SERACILIK A.Ş	Balıkesir - Gönen	Sarıköy - Ulukır Settlements		Search	07.07.2023- EIA is not required.	ARA10.00.2020. JEO.19 LICENSE NUMBER 19 GEOTHERMAL RESOURCE EXPLORATION BASED ON DRILLING (2 points)	Forest and pasture / property permit 4,5 km from Gönen Wetland and 16 km from Manyas Lake	
SERAMED TARIM VE SERACILIK A.Ş	Balıkesir - Gönen	Korudeğirmen - Kurtuluş Settlements		Search	11.09.2023 - EIA is not required.	ARA10.00.2020. JEO.15 LICENSE NUMBER 19 GEOTHERMAL RESOURCE EXPLORATION BASED ON DRILLING (6 points)	Forest Area, Agricultural Area and Irrigation Area (Gönen irrigation) By Lease - Two projects.	

Yağmur ÖZCAN CİVE

Academic & Research Experience

Sustainable Water Resources Scholar

February 2020 – 2024 / Council of Higher Education (YÖK) 100/2000 Doctoral Scholar Program

Researcher – FUSILLI Urban Food Planning Project

March 2023 – November 2024 / EU-funded Horizon 2020 Project to Foster Urban Food System Transformation through Innovative Living Labs

Education

PhD in City Planning

February 2020 – January 2025 / İzmir Institute of Technology

City Planning Graduate Program

September 2016 – July 2019 / İzmir Institute of Technology

Bachelor in City and Regional Planning

September 2011 – June 2016 / İzmir Institute of Technology – Faculty of Architecture

Internship

Planning, Programming and Coordination Unit Intern

2015 - İzmir Development Agency

Publications

- Futures (August 2024)

'Rethinking planning and nature conservation through degrowth/post-growth debates' (Adile Arslan Avar and Yağmur Özcan Cive).

- Habitat International (January 2024)

'Contextualising the housing problem of the Roma community in relation to counterurbanisation in Urla, İzmir' (Adile Arslan Avar, Fehmi Doğan, Yağmur Özcan Cive, Tonguç Akış).

- Food Policy (November 2024)

'Small wins in practice: Learnings from 16 European initiatives working towards the transformation of urban food systems' (Madhura Rao et al., including Yağmur Özcan Cive).

Conference Papers

- KBAM Symposium (December 2023)

'Türkiye'de yeni bir koruma anlayışı ile eşitsizlikleri aşmak mümkün mü?' (Yağmur Özcan Cive and Adile Arslan Avar).

- KBAM Symposium (September 2020)

'Karaburun Yarımadası'nda Doğanın Metalaşması ve Mülksüzleştirme Yoluyla Birikim' (Adile Arslan Avar and Yağmur Özcan Cive).

- AESOP Annual Congress (July 2019)

'Neoliberal Governance and Accumulation by Dispossession in Karaburun Peninsula, Turkey' (Yağmur Özcan Cive and Adile Arslan Avar).

- DAKAM Conference (February 2019)

'Neoliberal Environmental Governance and Environmental Degrading in Karaburun Peninsula' (Yağmur Özcan Cive & Adile Arslan Avar).

- Conference presentations, including AESOP, KBAM, DAKAM, ESA, and RGS events (2019–2023).