

IZMIR'S STRATEGY FOR LIVING IN HARMONY WITH NATURE

**2021
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FOREWORD

The impacts of the climate crisis and global pandemic on Izmir, as across the world in general, have rendered a reevaluation of the human relationship with nature a pressing imperative.

With regard to all the accumulated scientific studies undertaken in recent years, it appears absolutely clear that nature is not a peripheral or side-issue to humanity but rather that it is a pressing question that must be placed at the very heart of human life.

According to the United Nations, by 2050 two-thirds of the global population will be living in cities. With regard to Turkey, this proportion will be much higher, as 75% of the population in our country is, even today, already living

in cities. This proportion is anticipated to rise to 86% by 2050. According to the Izmir Transportation Masterplan, Izmir's current population of over 4,3 million is expected to reach 6.2 million by 2030. From the perspective of sustainability and resilience, this fact makes the reorganisation of our city a pressing necessity.

Izmir, like many of the other cities in the world, is struggling against global risks and emergent phenomena. Given the most recent two-year period commenced with forest fires and has continued with further natural disasters, such as a pandemic, an earthquake, a tsunami, floods and hurricanes, to minimise the effects of the climate crisis would be a grave mistake.

Since Izmir moved towards rapid industrialisation in the 1960's, it has become apparent that the conflict of city versus nature has reached a high level. Izmir's strategy of living in harmony with nature in the new period is working exactly to remove these contradictions, and rebuild within a framework of reestablishing the connectedness and reciprocal, cyclical relationships between the city and countryside.

The Izmir Metropolitan Municipality, through its efforts to make Izmir a resilient city, is developing a network that, on the one hand, conserves the city's natural ecosystems and biological diversity and, on the other, is developing comprehensive strategies for the growth of the city's economy. This report offers the opportunity for a refined relationship between the ecological and urban layers of the city's life. Motivated by the necessity of reestablishing the cyclical relationships between the urban and rural areas, it presents a road map for all of the work we are undertaking.

In respect of this, I offer my heartfelt thanks to all of my colleagues who have invested their work in this report, which will make a vital contribution to our goals of reconstructing our city to effectively combat the climate crisis and become a resilient, prosperous city that simultaneously protects biodiversity and conserves ecological cycles.



TUNÇ SOYER

Mayor of the Izmir Metropolitan Municipality

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1

Introduction





1. Introduction

The effects of the global climate crisis and pandemic has caused us to question and rethink the relationship between human beings and nature. According to a report by the Stockholm Resilience Centre biodiversity has passed safe thresholds in the areas of climate change, and nitrogen phosphate cycles. Within this, the loss of biodiversity is at the highest levels. It is known that one in four of all the species listed on the United Nations Red List is at risk of extinction, and that 85% of wetlands species, 30% of significant terrestrial areas and 75% of water species are on the verge of extinction. The World Economic Forum 2021 Global Risk Report indicates that, after climate change-related disasters and pandemics, the destructive effects of potential loss of biodiversity is ranked among the most serious global threats. 75% of the total energy consumption, 79% of greenhouse gas emissions, and 75% of the consumption of natural resources, as well as almost the total production of waste, is in the hands of the world's cities.

Thus, in the current era, living with the conflict between humans and nature means facing the disastrous consequences of this.

For all these reasons, the United Nations Sustainable Development Goals and various global organisations have accepted that nature is not an issue that can be left on the periphery of human concerns, but one which should be placed centre-stage. The creation and implementation of environmental policies has become global imperative which cannot be achieved without local administration.

Izmir, like many of the world's cities, is actively struggling with the totality of global risks and emergent phenomena. Recent examples of these are the increasingly common and violent natural disasters, extreme climatic conditions, and the pandemic. İzmir, with its population of 4.3 million, constitutes 5% of the population of Turkey and 40% of the population of the Aegean region.



Mahmut Koyos

The Gediz Delta is home to broad brackish freshwater swamps.

Izmir has undergone significant changes over the decades since the 1980's, after becoming a metropolitan municipal region, with its growing population and growing areas of service in line with the law.: In 1984, it had a population of 1.5 million and a provincial district municipality, in 2004, its service area increased sixfold, with a population of 3,7 million and 21 district municipalities, this service area further increased twofold in 2014 with a total of 30 district municipalities within the region's borders. According to the estimates of the Transportation Masterplan completed in 2018, the city's population will reach 6.2 million by 2030. This situation makes it imperative that the city be reorganised for the sake of sustainability and resilience.

Izmir is home to river basins that stretch out between mountains that plunge directly into the sea, and the deltas that form where these rivers meet the sea, with islands, peninsulae, and a long coast shaped by the combination of all these elements. All of Izmir's vegetation coverage and underlying physical structure have been formed as a result of its climate. The humid sea air moves inland along corridors formed by the river basins lying between the mountains. Thanks to this, the vegetation coverage and unique flora endemic to the Mediterranean region extend into the inland areas and the high mountains in Izmir's Eastern and Northwestern regions present unique, relatively cooler ecosystems.

Izmir is a maritime city, both with regard to its integral landmass, which brings together various river basins (the Bakırçay, Gediz, Little Menderes, Peninsula, and bayside basins) and the bay, which gives the city its fundamental character. On the one hand, there is a broad stretch of coastline where these bodies of water meet and influence each other and this, in turn, has played a major role in the particular biodiversity that has emerged in the city. Izmir, an ancient city



Ödemiş - Bozdağ deciduous forests.

with an 8, 500-year history, has succeeded in maintaining its historical geography and biogeography until the present day.

Since Izmir made the turn towards rapid urbanisation in the 1960s, it is apparent that the conflict between the city and nature has reached a peak. Izmir's strategy of transitioning to a more nature-based lifestyle in the new era is directly aimed at breaking this opposition and rebuilding on the basis of the interconnectedness of rural and urban life and reciprocal cyclical relationships.

The second chapter, which follows this introduction, deals with Izmir's natural characteristics. The third chapter describes Izmir's economy, while the fourth chapter goes on to discuss the four physical layers that stretch out from the bay to the rural environs. The fifth chapter sets out a summary of the work that has been prepared up until the present in pursuit of harmonising Izmir with nature, and the sixth chapter presents the essence of the city's nature-related strategies. The final chapter lays out the pioneering practices adopted by Izmir by describing the measures to be taken in the city's transition to a nature-friendly way of life.

2

Biogeography

2.1 Varieties of Ecosystem in Izmir

2.2. Izmir's Living Species





2. Biogeography

2.1. Varieties of Ecosystem in Izmir

With regard to Izmir's biodiversity, apart from the full spectrum of typical Mediterranean features, the region's range of elevation, going from 0-2000 metres, imparts it with a greater biological richness than many other Mediterranean cities. The high altitude of the Bozdağ and Aydın mountains surrounding the Little Menderes Basin enables it to host quite different varieties of fauna and flora other than the widespread species of the Aegean. In Izmir's North, the Madra mountains and Kozak Plateau also increase biodiversity. Especially the northern faces of these mountains comprise a deciduous forest belt, and harbour numerous naturally Black Sea tree species such as the chestnut.

Alongside its terrestrial biodiversity, Izmir also has a number of wetlands areas. The three great rivers of the Aegean; the Bakırçay, Gediz, and Little Menderes rivers, all flow into the sea and each one forms a broad delta. The largest of these wetlands is the Gediz Delta and 5% of the world's 10 Flamingo populations lives here. The Bakırçay and Little Menderes deltas are among the internationally significant wetlands areas.

Alongside these large wetland areas, there are also a large number of small and medium-size wetlands formed where small rivers meet the sea.

Izmir has a coastline of 629 kilometers. Other than the deltas along this coastline, there are numerous natural formations, such as beaches, islands, and cliffs descending directly into the sea. Each of these areas has unique habitats hosting species which are rare or at risk of extinction.

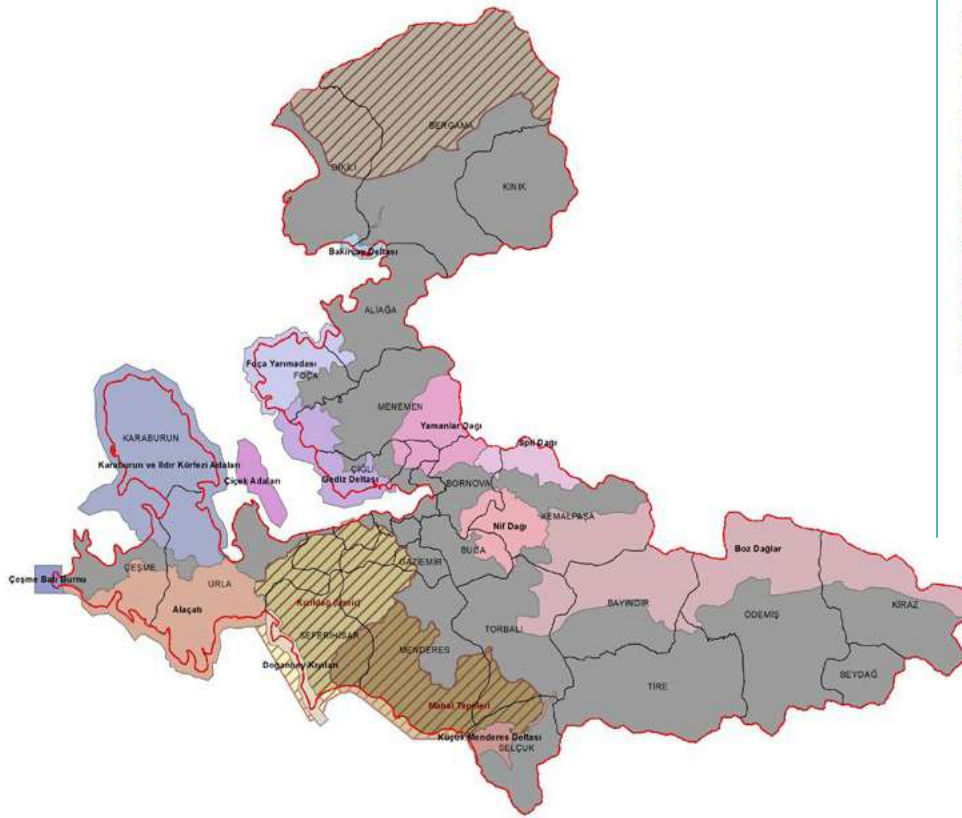
Izmir has 16 Significant Natural Areas of global importance (Figure 2.1). Surrounding Izmir like a Crescent, the Yamanlar, Dumanlıdağ, Spil, Nif, and Bozdağ mountains, whether with their forest ecosystems or extremely important high mountain steppe and Alpine ecosystems, occupy a prominent place among these Significant Nature Areas. The scrublands and bushlands on the Çeşme and Karaburun Peninsula, and in the region of Seferihisar and Foça, are vitally important living regions and the many species unique to these ecosystems form the essential elements of the Significant Natural Areas in Izmir.



Izmir's ancient pastures are home to a wealth of biodiversity.

IZMIR'S SIGNIFICANT NATURAL AREAS

Figure 2.1



Significant Natural Areas

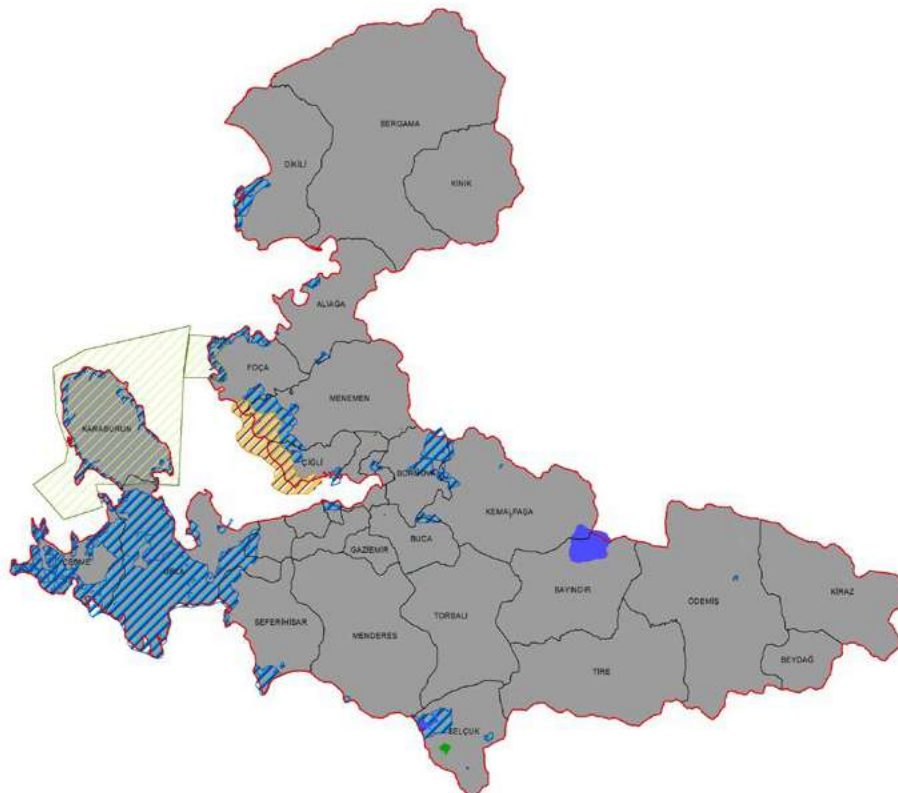
- Alaçatı
- The Bakırçay Delta
- The Boz Mountains
- The Doğanbey Coasts
- The Foça Peninsula
- The Gediz Delta
- The Islands of the Karaburun and Ildır Bay
- The Little Menderes Delta
- Mt. Nif
- Mt. Spil
- The Yamanlar Mountains
- Çeşme West Point
- The Çiçek Islands

Candidate Key Biodiversity Areas

- Kızıldağ (Izmir)
- Madra
- Mahal Tepeleri

IZMIR'S NATURE CONSERVATION AREAS

Figure 2.2



Symbols and Legend

- Izmir regional boundary
- Izmir district boundary
- Wildlife development area
- Nature park
- Nature monuments
- Ramsar area
- Special Environment Conservation Area
- Natural Site Area

Izmir's conservation areas, although many in number, comprise a narrow area and are especially concentrated in the Western part of the Peninsula (Figure 2.2).



Okyay Bulut

Kirdeniz Dalyanı, between Foça and Menemen, is home to a broad sea-bean swamp area.

Marine Significant Natural Areas form one of the fundamental components of Izmir's natural infrastructure. The Izmir Bay and Çeşme-Ildır bay areas are of global importance for biodiversity. The large number of large and small islands and rocky areas located in Izmir's seas, are, in a large proportion, under protection and serve as an important reservation for wildlife. Moreover, they are a major living space for endangered species such as the Mediterranean seal.

From wetland areas to rocky coasts, Mediterranean scrublands, olive Groves, red pine, and arid oak forests, as well as the high-altitude chestnut, deciduous forests, and open areas located even higher, referred to as "Alpine belts", Izmir brings together widely diverse ecosystems. The unique and delicate biodiversity of Izmir has come to make it one of the most valuable cities in the Mediterranean.

Izmir is also in a special position from the perspective of developing and experiencing a culture of nature that has formed between humans and the environment and is continuing to evolve in the present. The ancient relationship shaped by thousands of years of interaction between human beings and the geographical environment in the Aegean has resulted in the development of semi-natural ecosystems, further increasing biodiversity. In many parts of the city, there are Ancient Production Reservoirs, which bring together agricultural production and rare biological species. These Ancient Production Reservoirs, in contrast with conventional agriculture, largely utilise natural processes, and can be seen especially in the practices of olive growing in the scrublands and forest areas. As a natural extension of the Mediterranean forest ecosystem, these traditional agricultural methods also simultaneously support the practice of animal husbandry, especially the raising of sheep and goats.



Zafer Gökova

Izmir is home to a major population of one of the world's rarest mammals, the Mediterranean seal.

2.2 Izmir's Living Species

Marine and Coastal Ecosystems

The flagship species of Izmir's marine ecosystem is the Mediterranean monk seal (*Monachus monachus*). The Mediterranean monk seal, with its IUCN status of EN (endangered), is distributed globally along all of Turkey's Mediterranean coasts, and the coasts of Cyprus, as well as around the entire Aegean Sea, along the Adriatic coasts of Greece and Croatia, on the Portuguese island of Madeira in the Atlantic Ocean, and along the coasts of Mauritania and Western Sahara. Among the important havens of the Mediterranean monk seal on Izmir's coasts are especially the unspoiled and rocky shoreline of Foça and the islands, the Karaburun Peninsula, and the region stretching between Alaçatı and Sığacık. The habitats of the seals are under protection in

the Foça Special Environmental Protection Zone, and the Karaburun-Ildır Bay Special Environmental Protection Zone. Since the 1990s, both areas have been the subject of numerous research and monitoring activities carried out especially by the SAD-AFAG (Underwater Research Association Mediterranean Seal Research Group). It is estimated that a total of 35 individual seals live on the northern Aegean coast which includes the coasts of Izmir.

A number of bird species breed on the rocky cliffs and islands along the Izmir coastline. Among the species connected to these kinds of habitat are the European shag (*Phalacrocorax aristotelis*), Eleanor's falcon (*Falco eleonorae*), and Audouin's gull (*Larus audouinii*). Alongside these species, a number of pelagic seabirds are also found, such as the Shearwater (*Puffinus yelkouan*) and Scopoli's Shearwater (*Calonectris diomedea*).

The loggerhead turtle (*Caretta Caretta*) often enters Izmir Bay thanks to the particular abundance of food available on the shores of the Gediz Delta. Moreover, the discovery in 2011 that the loggerhead turtle was coming to Kabakum Beach in Dikili to spawn for the first time has been of the utmost significance with regard to Izmir's biodiversity.

276 species of fish have been identified off Izmir's coasts. Between the years of 1969 and 2008, 76 rare or uncommon species of fish were observed in Izmir Bay. A total of 54 fish species have been identified in the lagoons of the Gediz Delta in the bay and at the mouth of the Gediz river. Especially due to the Gediz Delta and its lagoons, Izmir Bay is among the most important fish spawning grounds in Turkey.



Siren Rocks, Foça

Emirali Kocalı



Biröl Hatinoğlu

the European shag incubates its eggs on Izmir's rocky coast and Islands.



Alper Tüydüş

In open parts of Izmir's sea, especially in the Spring, large flocks of shearwaters can be observed.

The Deltas

Bakırçay is located in the Northern section of Izmir's coastline. In its Southern and South-western regions, there are coastal swamps, sand dunes, open bodies of water, and scattered freshwater areas and reed marshes. In the area close to Çandarlı, there is also a small lagoon. Bird species favoring salt water, such as the flamingo (*Phoenicopterus roseus*), swordbill (*Recurvirostra avocetta*), and common shelduck (*Tadorna tadorna*) are found more commonly at this lagoon or in its environs. At least 10 breeding pairs of Kentish plovers (*Charadrius alexandrinus*), and 67 pairs of small terns have been reported in the delta. Because it is home to a number of endangered freshwater fish species endemic to Western Anatolia, such as the *Chondrostoma homwoodii*, *Capoeta bergamae*, and *Ladigesocypris irideus*, it is counted among Turkey's Special Environment Zones.

The Gediz Delta is one of the most important wetlands in Izmir and in Turkey and is located in the northern part of Izmir Bay immediately adjacent to the city. There are three lagoons in the delta, the Homa, Çil Azmak, and Kirdeniz lagoons. 300 bird species have been observed in the delta and it is among the richest areas for bird populations in Turkey. Along with Tuz Gölü Lake, it is one of two breeding grounds in Turkey for the flamingo, one of five incubation areas for the Dalmatian pelican (*Pelicanus crispus*), and one of three for the white pelican (*Pelicanus onocrotalus*). With approximately 50km of coastal swamp extending along the coastline, it contains Turkey's broadest and best-preserved swamplands. Just as the coastal swamps are a feeding ground for a great many varieties of birds, starting with the Flamingo, there are also numerous islets serving as breeding areas for species such as the Mediterranean seagull (*Larus*



The Gediz Delta in Izmir is one of three river deltas flowing into the Aegean Sea.



The swordbill is one of the rare bird species in Izmir's deltas.

melanocephalus), black-billed tern, and Caspian tern (*Hyprogne caspia*). Furthermore, due its shallow, labyrinthine structure, it provides an important habitat for young fish in Izmir Bay needing to hide and feed. The Gediz Delta is also home to 28 species of reptile, foremost among which is the globally endangered Chelonian tortoise. Mammal species, such as the jackal (*Canis aureus*), wildcat (*Felis silvestris*), hedgehog (*Meles meles*), fox (*Vulpes vulpes*), beech marten (*Martes foina*), ferret (*Mustela nivalis*) and wild pig (*Sus scrofa*) are also an important part of the delta's rich ecosystem. From time to time, the Mediterranean monk seal can also be seen on the shores of the Homa lagoon in the northern part of the delta.

At the 7,300 ha Çamaltı Saltworks, in the Gediz Delta, salt is produced by evaporating saltwater. Due to the high salt concentration, this area forms a habitat for the brine shrimp (*Artemia parthenogenetica*), Dunaniella, salt mosquito (*Chironomus salinarius*) and halophilic bacteria. The saltworks is also a breeding and feeding ground for the flamingo.

Located at the Southern boundaries of the Izmir region, the Little Menderes Delta is in the best condition of all of Izmir's deltas, particularly with regard to its sand dunes. The dunes extending out behind the Pamucak coast harbours a well-preserved population of sea daffodils (*Pancratium maritimum*). As the natural habitat of the sea daffodil is the shoreline, it is threatened by the fact that its living space is used as a bathing beach, with its flowers often being plucked and bulbs dug up. The delta is also home to saltwater habitats, reed marshes, and broad areas covered in Izmir tamarisk (*Tamarix smyrnensis*). 54 bird species breed periodically in the Little Menderes Delta, including the spur-winged lapwing (*Vanellus spinosus*), black-winged stilt (*Himantopus himantopus*), little bittern (*Ixobrychus minutus*), and stork (*Ciconia Ciconia*). The Gebekirse and Barutçu lakes in the interior of the delta is also the winter habitat attracting the largest numbers of the little gull (*Hydrocoloeus minutus*), a rare bird in Izmir.

The Ephesian rockfish (*Knipowitschia ephesi*), a freshwater species listed with the IUCN status of CR (critical) is globally confined to the Little Menderes Delta and river basin. Other important species observed in this area are the freshwater species *Capoeta bergamae* and *Chondrostoma homwoodii* endemic to our country as well as the narrowly dispersed roach-tailed dormouse (*myomimus roacheri*) listed with the IUCN status of VU (vulnerable).

Other than the large deltas touched upon above, the Güzelhisar Delta in the environs of Aliğa, is a wintering spot for small numbers of Flamingos, silver gulls, black-headed gulls and several species of duck. Due to urban build up around the Güzelhisar Delta, only a small part of the area is able to support the flora and fauna reflective of its natural character.

The Meles Delta is located in the city centre, directly adjacent to Izmir harbour. Although, due to human influence, the Delta has almost

completely lost its natural character, even in this state, it remains a regular wintering place for several bird species, such as the Eurasian coot (*Fulica atra*), black-headed gull, little egret (*Egretta garzetta*), and grey heron (*Ardea cinerea*), as well as the spurred lapwing, which is rarely seen in Turkey.

The Çatıldere wetlands on the seacoast are formed by a number of shallow swamps dominated completely by the sea-bean. During the winter months, this area possesses a relatively rich avian fauna, including many species of seabird, duck, and gull. Alaçatı Halici, with its shallow coastline, also possesses a number of saltwater habitats. Another of Izmir's wetlands areas is the Çakalburnu Lagoon, located on the Southern shores of Izmir Bay. This lagoon harbours suitable habitats for species such as the Eurasian teal (*Anas crecca*), Mediterranean seagull, common redshank (*Tringa totanus*), and common kingfisher (*Alcedo atthis*).



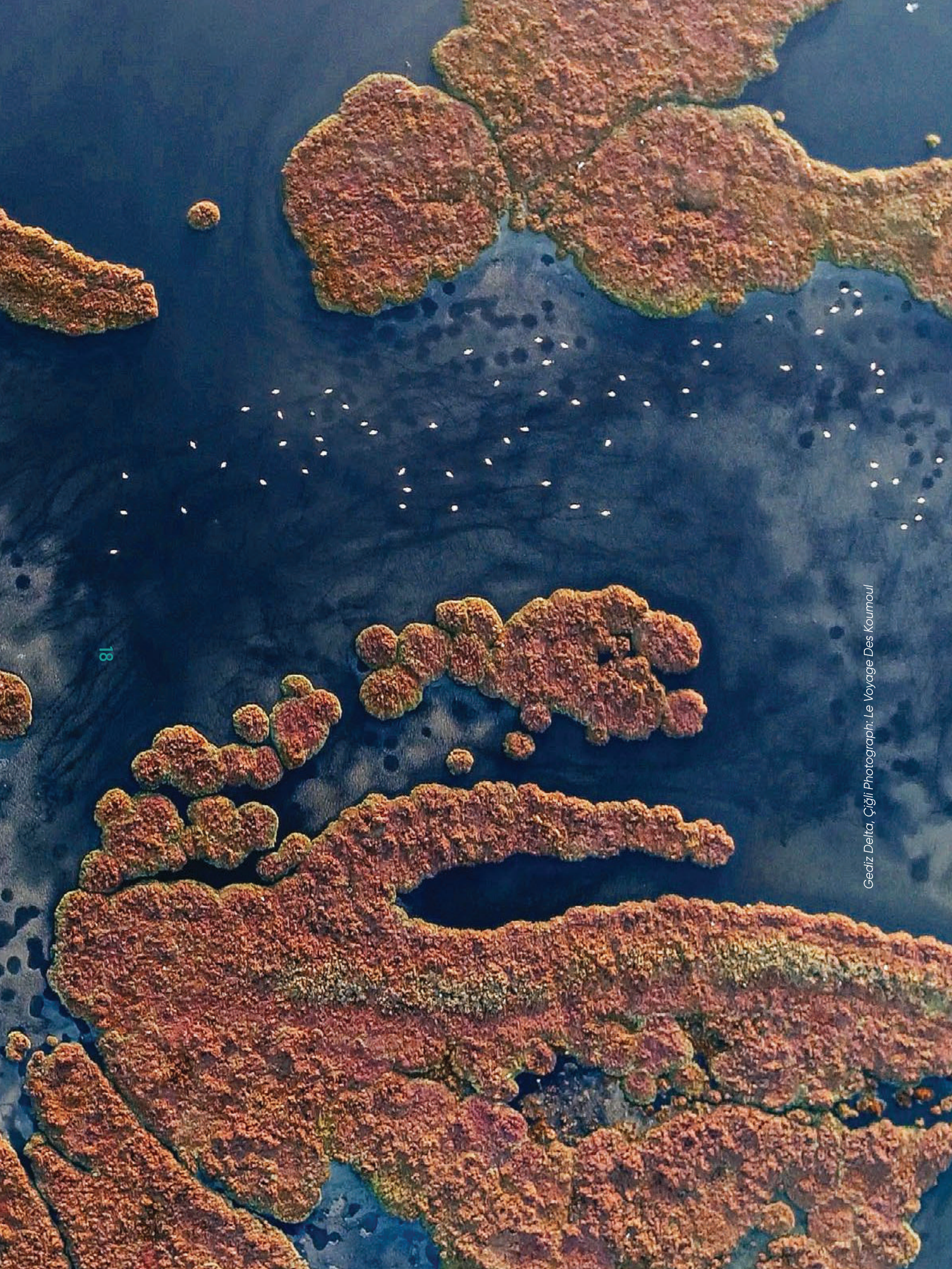
At the point where the Gediz Delta meets the sea, broad mudflats are formed by alluvial deposits.



Okyay Bulut

The reed borer and jackal are two common species found in Izmir's deltas.





The Forest Ecosystem

Izmir's flora is shaped by the phytogeographic features of the Mediterranean climatic belt, with its hot dry summers and mild, rainy winters. The humid sea air travels inland via the corridor regions formed by the river basins between the mountains, which descend directly into the sea. Thanks to this, plant species and forest types unique to the Mediterranean are able to extend inland. The essential element determining especially the variety of forest types is the altitude and facing of the mountains that form these basins.

Of the 1732 vascular plants identified in the taxonomy of the Izmir region, 146 are endemic to Turkey. These endemic species consist of 130 species in 83 genera and 25 families. 26 sub-species, and 20 varieties, consisting of a total 146 taxonomies. A large part of Izmir's endemic species is concentrated in the heights of the Bozdağ, Spil, and Nif mountains.

The most common species of tree in Izmir's forest areas are the red pine (*Pinus brutia*) covering 242 885.81 ha, the black pine (*Pinus nigra*) covering 26 861.57 ha, the Turkey oak (*Quercus cerris*) covering 38 364.3 ha, other oak varieties covering 15 557.8 ha, and chestnut trees (*Castanea sativa*) covering 4809 ha. The scrubland area covers 115 913.8 ha. This means that approximately 40% of the total Izmir region is covered in forests and scrublands with almost half of its forests composed of red pines.

The 700 000 ha of afforestation established in our country since the year 2000 features primarily the red pine tree species, and this tree accounts for approximately 40% of the total trees planted (1.8 million ha) in our country. These data indicate that the red pine has come to cover a far greater area outside its natural propagation zones, due to the support of tree planting activities. This



There are chestnut forests on the northward-facing cliffs of the Bozdağ and Aydın mountains.



The arid oak and wild olive forests on the Izmir Peninsula are used as olive pastures.

situation has reduced Izmir's resistance to forest fires. In some regions red pine forests have created a mixed cover with scrubland areas, and in these regions the species diversity is much higher than in pure red pine forests. The altitude-dependent black pine, however, grows above the red pine belt.

The most typical bird species in black and red pine forests are the Anatolian nuthatch and the coal tit (*Periparus ater*). In the forests located at the higher elevations of the Madra or Bozdağ mountains, another typical coniferous forest bird is the crossbill (*Loxia curvirostra*). In the winter months, the crossbill may descend to lower elevations, in fact it has even been observed in Kültürpark. The hydrangea woodpecker (*Leopicus medius*) and pied woodpecker (*Dendrocopos syriacus*) are the most common woodpecker species in Izmir. In more deciduous or mixed forests, the lesser spotted woodpecker (*Dryobates minor*) and European green woodpecker (*Picus viridis*) may be observed. The short-toed treecreeper (*Certhia brachydactyla*), one of the signs of a healthy forest ecosystem, can be found in forest areas con-

taining Izmir's old and natural trees. Raptors, such as the Eurasian sparrowhawk (*Accipiter nisus*) and common buzzard (*Buteo buteo*) nest in the trees of forest areas. The most common species of owl in Izmir's forests is the tawny owl (*Strix aluco*).

A major part of Izmir's forests is also composed of oaks and a number of factors may determine the mix of species composing oak forests, such as the varieties of soil, elevation and facing. One of the most important oak species found in Izmir is the Mt. Tabor oak (*Quercus ithaburensis macrolepis*). One of the most widely distributed oak species in the world, in Turkey this variety of oak has been used since antiquity as a dye plant. It is known that it was used by the ancient Greeks as a tanning material and also by the Sumerians as a dye plant. The acorns are still collected today for the same purpose. The acorn oak grows at altitudes of 30-1100 m, generally in siliceous and weak-floored soils. They may scarcely be found in the bushlands of Izmir's Seferihisar district or in some of the western parts of the Yunt mountains mixed in with other oak species

(*Q. cerris*, *Q. infectoria*, *Q. coccifera*) and terebinths (*Pistacia terebinthus*). Species such as the Jerusalem thornbush (*Paliurus spina Christi*), almond-leaved pear (*Pyrus spinosa*), downy oak (*Quercus pubescens*), and pink rock-rose (*Cistus creticus*) are also common in oak forests. With increased elevation acorn oaks cede their place to other oak species. For example, especially the North and North-West facing parts of the Dumanlıdağ mountain are dominated by the Turkey oak (*Quercus cerris*) and downy oak, at elevations from 500 meters almost all the way to the mountain's 1091 m summit.

One of the most special areas with regards to Izmir's oak forests is the northwards-facing cliffs of the Bozdağ mountains and, in particular, the valleys in this region. A striking feature is the predominance of downy oaks (*Quercus pubescens*), Turkey oaks (*Quercus cerris*), and Aleppo oak (*Quercus infectoria*). The oak groves in this region are sometimes pure but, in most cases, form a mixed vegetation with red Pines. Furthermore, this region, with its European-Siberian flora, such as the chestnut (*Castanea sativa*), linden (*Thilia sp.*), and rosehip (*Cornus mas*) is part of the Kemalpaşa Ovacık Wildlife Development Area and is invaluable in terms of wildlife. One of the most important characteristics of the area is that it is one of the rare habitats outside of the Marmara and Northern Anatolian regions of the

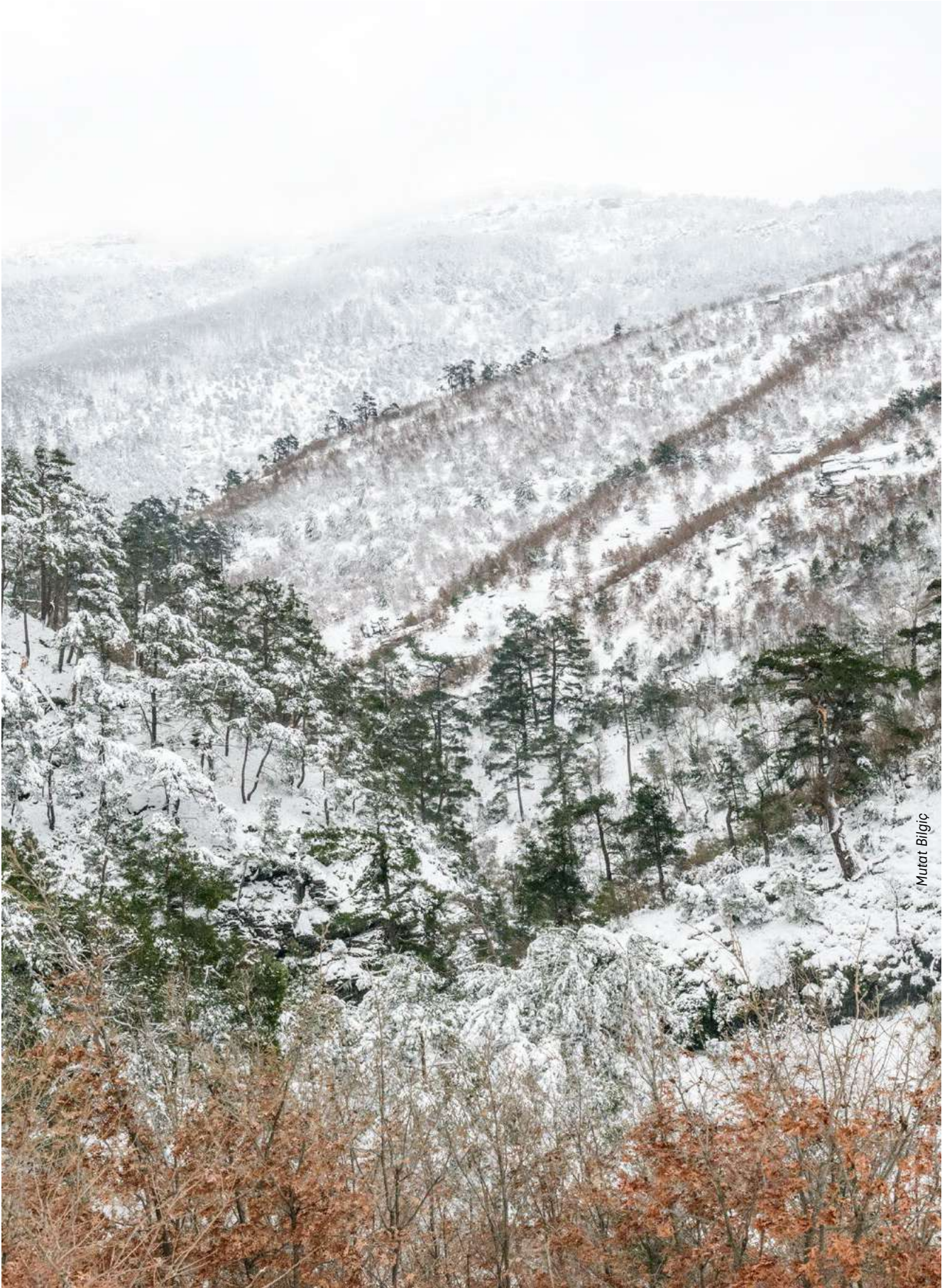
roe deer (*Capreolus capreolus*), a mammal species belonging to the forests of Europe and Siberia.

Terebinths in Izmir grow especially in Southern-facing areas at low altitudes. It is possible to see this tree from the coast inwards. Although it is mostly found in scrublands, it can also come together with acorn oaks to form mixed forests in certain locations between Aliağa and Bergama. One of the best places to see this tree in Izmir is at Şehitler Korusu in the Southeastern part of Kadifekale in the city centre, facing the Yeşildere Valley. Here the natural terebinths blend in with almond-leaved pear trees (*Pyrus sp.*) to create a mixed environment.

In Izmir's deciduous forests, the most typical bird is the Eurasian nuthatch (*Sitta europaea*). It is common where there are tree species such as various oak varieties, the wild plum tree (*Prunus sp.*), and almond-leaved pear tree. Also, the sombre tit (*Poecile lugubris*) can be observed in drier and more open forest areas, with oak groves, wild olive trees (*Olea europaea*), terebinths, and wild plum-almond-leaved pear tree forests. A common mammal species in Izmir's forests is the Anatolian squirrel (*Sciurus anomalus*) and it can be found in all kinds of gardens, parks, and forests. It also lives in Kültürpark in the city centre.



In the Yamanlar mountains, broad, natural Aegean forests form in the transition zones between red pines and arid oaks and other trees.



Mutat Bilgic

Due to the high altitudes of the Bozdağ forests, they contain a large variety of trees.

Scrublands and Bushlands

One of the most frequently encountered types of ecosystem in Izmir is scrubland and bushland. In most areas, the floor areas around red pines are formed from bushland, featuring elements of scrubland. In Izmir the dominant type of bush is the spiny burnet (*Sarcopoterium spinosum*). Some of the most common plants in the vegetation layer are the rock-rose (*Cistus crategus*), Spanish lavender (*Lavandula stoechas*), Cretan oregano (*Origanum onites*), and Mediterranean wild thyme (*Coridothymus capitatus*).

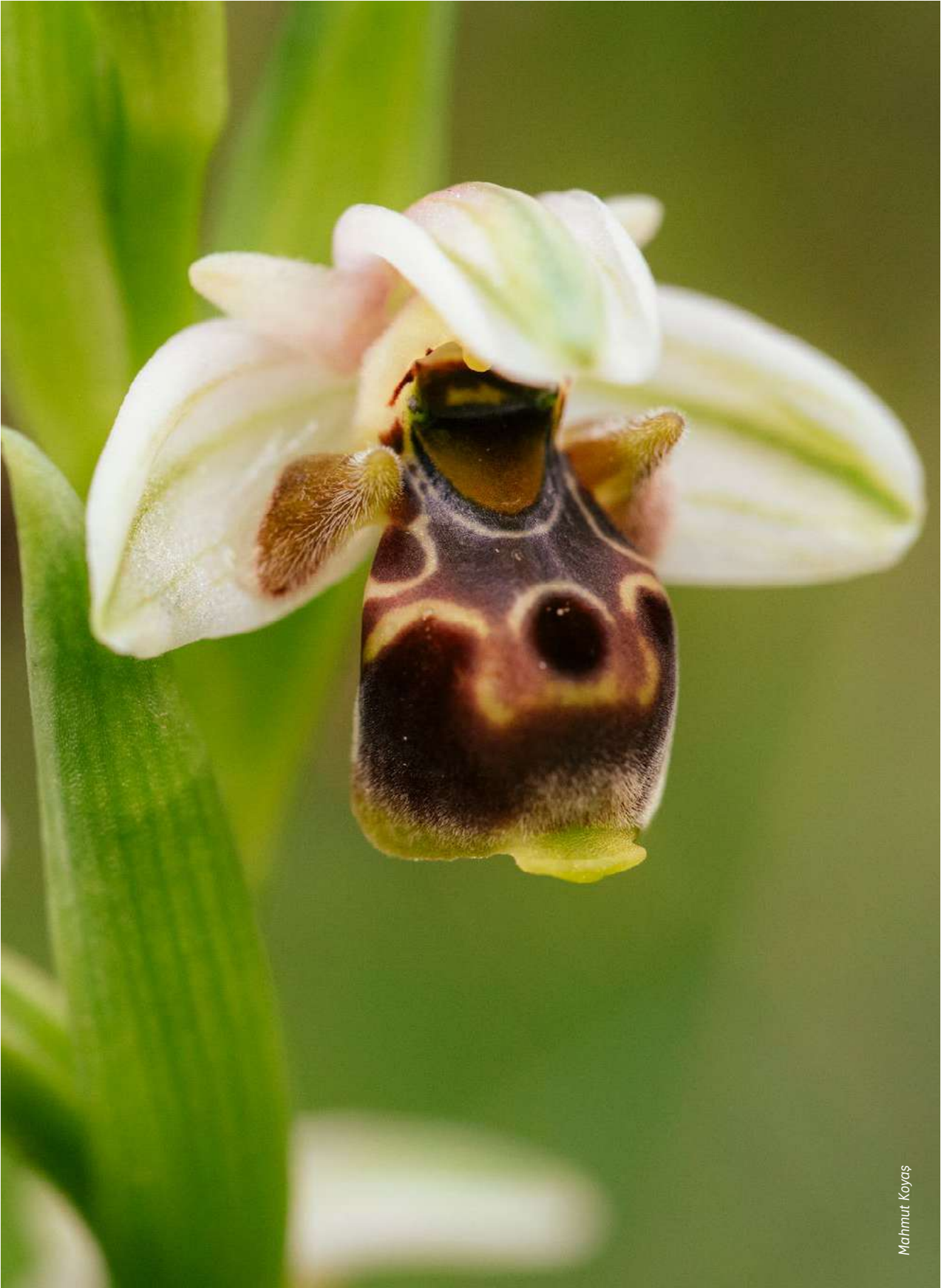
In Izmir, the dominant scrublands species is the kermes oak. The other most common plant species in scrublands areas are the wild olive, wild strawberry (*Arbutus unedo*), Greek strawberry (*Arbutus andrachne*), Phyl-

lyrea latifolia, mastic (*Pistacia lentiscus*), terebinth, bay laurel (*Laurus nobilis*), erica heather (*Erica sp.*), spiny broom (*Calicotome villosa*), *Styrax officinalis*, Jerusalem thornbush (*Paliurus spina-christi*), and juniper (*Juniperus sp.*). Because of the differing ecological needs among different scrubland species, the composition, or formation, of these plants can vary, especially according to altitude and facing. For example, whereas Northward-facing scrublands may have a greater preponderance of Greek strawberry, the kermes oak may be more widespread at higher altitudes. Scrubland species, whether woody plants, or grassy herbs, are very rich in variety. It is even possible to find many orchid species under the scrub cover or in the open among the vegetation.



Esin Deniz

Izmir's coastal regions comprise broad stretches of scrubland.



Mahmut Koyas

Izmir's scrublands are of great importance with regard to orchids.

High Mountain Steppes

In our country, depending on the region, the the sub-alpine belt in the high mountains begins at approximately 1800 m, and after approximately 2000 m continues with the typical alpine belt. The subalpine belt is a transition region where trees become rarer and low-lying undergrowth and damp meadow communities dominate.

In Izmir the only mountain exceeding a height of 2000 m is Bozdağ. Because of this, the parts of Izmir above the mountain forest-line are mostly of the subalpine belt. On Bozdağ, subalpine plant communities can be observed between 1400 and 1900 m above the forest line. Above this, the alpine belt dominated by Mediterranean high mountain steppe can be found. On Mt. Spil, high mountain steppe showing sub-alpine characteristics can be seen at elevations between 970 and 1500 m.

On Dumanlıdağ high mountain steppe with a sub-alpine character can be found after 900 m, and on Mt. Nif, at 1400-1500 m. Immediately to the East of Mt. Nif, the summit of Mt. Mahmut, which may be characterized as the start of the Bozdağ mountains, is rich in sub-alpine vegetation dominated by species such as the savin juniper (*Juniperus sabina*), milkvetch (*Astragalus angus-*

tifolius), *Dianthus* (*Dianthus erinaceus*), and rock cherry (*Cerasus prostrata*). *Dianthus*, which is very narrowly propagated and found only within the borders of Izmir and Manisa on Mt. Spil, Mt. Nif, Mt. Mahmut and Sarıkaya Hill-Mt. Bakır (Kırkağaç-Manisa) is endemic to Turkey.

Bozdağ is very rich in lichens, a life form between fungi and algae. The taxonomy of Bozdağ reveals 105 species and sub-species of lichen belonging to 49 genera. Some known varieties that are rare in Turkey include *Cladonia firma*, *Montanelia disjuncta*, *Ochrolechia aegaea*, *O. balcanica*, *Physcia albinea*, *Scytinum schraderi*, *Umbilicaria cylindrica*, *Tornata*, and *Xanthoparmelia mexicana*. Studies conducted in Izmir have identified taxonomies of 244 species of lichen and subspecies.

An important species for mountain areas and also forest ecosystems is the wolf (*Canis lupus*). This is one of the large carnivore species living within the boundaries of Izmir. Although the population is believed to be at very low levels, under the "National Biodiversity Inventory and Monitoring Project, wolf tracks and droppings have been recorded in the vicinity of Mt. Madra, Mt. Spil, Bozdağ, and Yeniköy in Seferihisar.



Ödemiş Bozdağ Plateau



Esin Deniz

In the treeless region above the black pine forests of Bozdağ the high mountain steppe and alpine vegetation cover take over.



Hohannes Dag Mayer

The eared lark is a rare species of bird seen in Izmir at altitudes of above 1600m.

The Little Menderes Basin is surrounded by high mountain chains.





Freshwater Ecosystems

The wetlands areas possessing freshwater ecosystems are the Karagöl, Belevi, Gölcük, Gebekirse, and Barutçu lakes and, together with the areas of flowing water, such as the Gediz, Little Menderes, and Bakırçay, as well as the deltas, are covered in reed marshes. İzmir's natural freshwater lakes are relatively small and slowly deepen as they move away from the coast. For this reason, almost all of these freshwater lakes, including the already shallow freshwater areas of the deltas, are covered in coastal reed marshes. From this perspective, Karagöl, located in the Yamanlar mountains at an elevation of 806m, may be considered an exception. The deepest point of this small lake, which covers an area of 3.38 ha, reaches a depth of 9m. Whether due to its elevation or rapid deepening, there are no reed marshes surrounding this lake. The presence of reeds in a wetlands area is

one of the most essential indicators of fresh water. In İzmir, the dominant reed species is the common reed (*Phragmites australis*) and the second most common is the bulrush (*Typha sp.*). Other common aquatic plants found in İzmir's wetlands are the corkscrew rush (*Juncus sp.*), scirpus (*Scirpus sp.*) and Sprengel's sedge (*Carex sp.*). Due to their sheltered features, freshwater ecosystems are a living space for many invertebrates. Dragonflies lay their eggs in these types of environments.

One of the most typical groups of life forms in freshwater areas are amphibians, and in İzmir, the most widespread species is the Levant water frog (*Pelophylax bedriagae*) and it can be found in almost all freshwater habitats. The tree frog (*Hyla orientalis*) is another common species in İzmir's wetlands.



Okçay Bulut

It is possible to encounter jackals in İzmir's well-preserved wetlands areas.



The bearded reedling is a bird species living in dense reed marshes.

The most common species of salamander is the smooth newt (*Lissotriton vulgaris*) and the Balkan crested newt (*Triturus ivanbureschi*). Both species are found in the Sazlıgöl Lake in the Gediz Delta. Other than this, the reed marshes have a vital importance as a breeding habitat for numerous bird species, such as the purple heron (*Ardea purpurea*), western marsh harrier (*Circus aeruginosus*), common moorhen (*Gallinula chloropus*), water rail (*Rallus aquaticus*), little bittern (*Ixobrychus minutus*), little grebe (*Tachybaptus rufficollis*), Eurasian reed warbler (*Acrocephalus scirpaceus*), Eurasian penduline tit (*Remiz pendulinus*), bearded reedling (*Panurus biarmicus*), and common reed bunting (*Emberiza Schoenicus*).

The Gediz, Bakırçay, and Little Menderes rivers, which flow into the sea in Izmir, make a large contribution to the region's biodiversity, both thanks to the deltas they form, and to the river ecosystem itself. The banks of all three rivers are dominated by the white willow (*Salix alba*), however, the vegetation cover also features the alder (*Alnus sp.*), elm (*Ulmus sp.*), and salt cedar (*Tamarix sp.*).

This vegetation creates a suitable habitat for birds using the trees on the river banks to breed in.

As the proportion of endemic species among freshwater fish is high, they have come to be one of Turkey's most important assets for biodiversity. There have been 409 freshwater fish species identified in Turkey. Of the species identified, 186 (45.5%) are natural, 29 (7.1%) are exotic, and 194 (47.4%) are endemic. Endemic species comprise 51.1% of the natural species. Studies carried out in Izmir's freshwater bodies have identified 37 species of fish. Of these, 17 (45.95%) are species endemic to Turkey. Additionally, there are a large number of marine species also able to live in freshwater and brackish environments.

The vast majority of endemic species found in Izmir are globally endangered due to their narrow range of propagation and numerous negative impacts on their habitats. For example, the *Squalius kosswigi*, listed by the IUCN as EN (Endangered) is found only in Izmir's Little Menderes and Tahtalı basins.





Urban Biodiversity

The city of Izmir is strongly influenced by numerous natural features, such as the mountains that surround it, its major wetlands areas such as the Gediz Delta, which is located right next to the city, the many rivers and creeks that flow into the bay, and areas such as Çakalburnu Dalyanı, which are also located inside the city. This increases the number of species which may be encountered on the periphery or inside the city.

Among the most commonly encountered bird species found within the city are the globally widespread carrion crow (*Corvus cornix*), jackdaw (*Corvus monedula*), barn swallow (*Hirundo rustica*), common house martin (*Delichon urbicum*), house sparrow (*Passer domesticus*), Eurasian tree sparrow (*Passer montanus*), common starling (*Sturnus vulgaris*), Eurasian collared dove (*Streptopelia decaocta*), rock dove (*Columba livia*) and silver gull. A part of these species nests in cavities in buildings, holes in walls, under the eaves of houses, under balco-

nies or rooves, and in the trees in parks and gardens. In the summer months, the common swift (*Apus apus*) and pallid swift (*Apus pallidus*) can be observed around Konak Square. Throughout the summer months, large numbers of both species can be found nesting in Izmir in the rooves and windowsills of apartments. In recent years, the laughing dove (*Spilopelia senegalensis*), which is found in many cities throughout Turkey, has begun to be seen in Izmir as well.

The silver gull (*Larus michahellis*) breeds in the rooves of the city. In winter months, the most common species of gull in the city is the black-headed gull (*Chroicocephalus ridibundus*). Fisher species such as the cormorant, black-necked grebe, and great crested grebe can easily be seen on the seashore, especially during the winter months. The Dalmatian pelican and white pelican can often be seen in the bay or at the Bostanlı and Mavişehir fish markets, or among the fishing boats. As the Gediz Delta, located



The Izmir Bay is a marine area where many animals, such as the Dalmatian pelican, live closely integrated with humans.



One of the world's rare cities where flamingos live in the city centre: Izmir

right next to the city, is a major breeding and wintering area for the flamingo, it is possible to encounter flocks of flying flamingos anywhere along the Izmir coastline. In the winter, the black-headed gull, flamingo, great crested grebe, and Eurasian coot are all common species on the shores of Bayraklı, and in the Meles Delta, where the mouth of the river meets the sea.

There are 53 bird species found at Kültürpark, in the heart of the city. A large part of this population consists of songbirds. Some of the bird species found in the forests on the city periphery, such as the European serin (*Serinus serinus*), European robin (*Erithacus rubecula*), Syrian woodpecker (*Dendroscopus syriacus*), common blackbird (*Turdus merula*), Eurasian wren (*Troglodytes troglodytes*), and grey wagtail (*Motacilla cinerea*) are also found in Kültürpark. Many of the exotic bird species found in major cities around our country, such as the rose-ringed parakeet (*Psittacula krameri*), and common myna (*Acridotheres tristis*) are also found in Kültürpark throughout the year. Other than birds, 6 mammal, 4 reptile, and 2 amphibian species have been observed in Kültürpark. Species such as the Eurasian squirrel (*Sciurus anomalus*), Greek tortoise (*Testudo*

graeca), worm snake (*Xerophytophlops vermicularis*), and Mediterranean house gecko (*Hemidactylus turcicus*) have been able to find habitats in Kültürpark. The calls of the Eurasian scops owl (*Otus scops*), a small species of owl that makes its home in Büyük Park in Bornova and in neighbouring gardens, as well as on the campus of Ege University, can be heard throughout the spring and summer months.

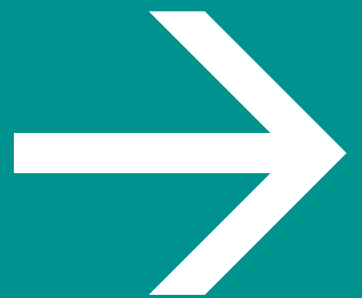


The dalmatian Pelican

3

The Economy of Izmir





3. The Economy of Izmir

As of 2020, Izmir, with a population of 4. 394 694, is Turkey's third largest city. It is comprised of 30 districts. In the past, the central district of Konak was accepted as the municipality of Izmir but this was later expanded to comprise not only the metropolitan area and the surrounding conurbation, but also the entire region.

Izmir has 9 universities and 138 University Research and Application Centres, 13 Organised Industrial Zones, 4 technoparks, 34 Research and Development Centres, and 4 design centres. Exporting goods to 191 countries and importing from 160, Izmir's total trade for 2018 reached 17 billion US dollars. Izmir is Turkey's second biggest destination for foreign companies and trade and has

a well-trained workforce (25% of the workforce has higher education qualifications). With regard to productivity, the city is in the third position in the country. Izmir is a growing centre of attraction for foreign investment. As of 2018, there are 2, 595 foreign business organisations in Izmir.

In terms of general employment, the share of employees in services and industry is higher, while the share of employees engaged in agriculture is much lower. Among the essential industries of the city are fabrication and textiles, food and beverages, brewery and tobacco products, iron and steel, petrochemicals, automotive, cement, olive oil, fertilizer, agricultural machinery, ceramics, and construction materials.



Emirali Kokal

Izmir Bay Harbour



Asansör, Karataş

In 2017, Izmir's regional share of GNP was 191.5 billion TL, placing it third in the country after Istanbul and Ankara. The inner-city services industry was the largest contributor to this number at 57.5%. Following this, come industry, at 37.6%, and agriculture, at 4.9%. On the national level, as of 2017 Izmir is the second region after Konya for agriculture, with share of 4.43%. Izmir has a 7.05% share of industry and comes third after Istanbul and Ankara. It also comes third, after Istanbul and Ankara, in services, with a share of 5.88%. In 2015, of the first 500 industrial enterprises in the country, 38 were from Izmir and these enterprises are registered with the Aegean Regional Chamber of Industry (EBSO). In this area, Izmir takes second place right after Istanbul.

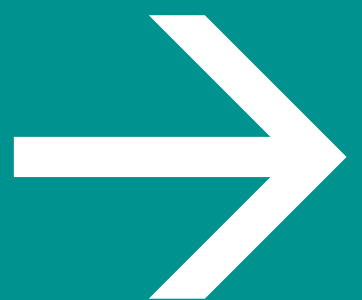
One fundamental characteristic of Izmir's economy is the balanced distribution of a number of different industries. With its balanced blend of services industries such as tourism, along with commerce, industry, and agriculture, Izmir has a powerful, rapid-growing economy.

Izmir Metropolitan Municipality, through its efforts to make Izmir a resilient city, has developed a comprehensive strategic network aimed at, on the one hand, protecting the city's natural ecosystems and biodiversity while, on the other, fostering the city's economic growth. This report contains a summary of this strategic network.

4

Izmir's Blue Green Transition Layers and Their Problems





4. Izmir's Blue Green Transition Layers and Their Problems

The first layer of the city consists of the land-sea intersection represented by the Izmir Bay, which is deeply tied to Izmir's development and destiny, along with its maritime areas, broad beaches and coastline, and its lagoons, deltas, and wetlands areas. The fact that the shores of the Aegean Sea form a second semi-enclosed gulf imparts Izmir Bay with a very special structure, from a geomorphic perspective. However, although this single feature itself renders the bay a world heritage asset, the main reason it is home to such a metropolitan area is that it forms a natural harbour. The freshwater sources provided by the mountains surrounding the bay, and the agricultural lands formed where the Gediz river meets the sea, are two other reasons why the city became established in this area.

Izmir Bay is one of the deepest inner bays in the Mediterranean and this characteristic is one of the major reasons for the city's existence. The historical geography shaped by the bay positioned Izmir as a focal point in the Mediterranean for the innovations that shaped the world's civilisations. In the 18th Century, Izmir Bay became one of the world's largest ports and, as the key juncture between Europe and Asia, came to be the principal maritime gateway to the Silk Road.

On the other hand, as the settled population has grown due to the semi-enclosed structure of the bay, sustainability has come under threat. The period of rapid urbanization between the Second World War and the 1980s occurred during an era when Turkey had very limited accumulated experience



The four main layers encircling Izmir



The bay area described as the first layer is located in the heart of Izmir.

and local administrations were especially weak. During this period, the city was forced to resort to ad hoc solutions to problems and the city environs became ringed with slum belts while, right up until twenty years ago, wastewater was discharged directly into the bay. The bay therefore lost its quality as a place to swim. Thus, since the mid-1980s, the rehabilitation of the bay has been among the most important items on the agenda for the Izmir Metropolitan Municipality.

The second layer comprises the biodiversity of the areas around the densely urbanized bay and consists of the shoreline strip, river corridors, and large city parks. While giving life to the city, the bay has also long been a centre of urbanisation from a historical-geographic perspective. Beginning in the late Neolithic era, in 6500 BCE, with small Neolithic settlements on the shores of the bay, the city of Smyrna, in Tepekule-Bayraklı, emerged in 3000 BCE. After Alexander the Great, a new city was established at the foot of Kadifekale in 300 BCE. Subsequently, the city continued to extend out, wrapping itself

around the bay and, from the middle of the 19th Century until the second half of the 20th Century, the city continued to develop on both shores of the bay (Konak, Karşıyaka). The rapid process of urbanisation following the Second World War also affected Izmir, and by filling in all the empty spaces in the inner-bay area, the city acquired a densely urban quality and broadening hinterland, as it was transformed into today's metropolis of 4.3 million inhabitants. While this situation negatively impacted the relationship of the bay with the sea, it also damaged the inner bay and the ecosystems of the intersectional areas between the land and sea as well as the hinterlands.

Despite having been continuously inhabited for 8,500 years and being currently heavily urbanised, Izmir retains considerable biodiversity. For example, rare bird species such as the flamingo and Dalmatian pelican have been living side-by-side with humans in the city for millennia. In this regard, Izmir is quite a unique metropolis.

The second layer around the bay is formed by heavily urbanised areas.





The second layer includes the heavily urbanised metropolitan centre. With regard to urban park spaces, there are 16.6 m² of active and passive green space in the city. There are, however, a large number of green space-deprived neighbourhoods in the most heavily populated districts, such as Buca, Karabağlar, Konak, and Bayraklı. The fundamental problems with regard to inner-city green space are the paucity of quality green areas, inadequate connections between these, and the typologies of different kinds of green area. Construction plans aimed at the ecological rehabilitation and protection of the city centre's largest green area, Kültürpark, have been completed.

The third layer consists of areas with characteristic biodiversity, such as the large regional parks located right on the fringes of the heavily urbanised city centre, tree plantations, and ancient production basins. These areas are among the most fragile, being at risk of transformation into suburban and, ultimately, fully urbanised areas. In the interests

of raising the city's resilience, it is necessary to lower the high costs of infrastructure on the city's fringes (roads, sewage, electricity etc.), minimising the impact on the environment (damage to agricultural areas, artesian water, and ecosystems etc.), keeping the human population at the minimum level without overburdening the capacity of the transportation system, and protecting collective living space while preventing social segregation (gated communities and villas).

In these areas, located 15-50 km away from the metropolitan centre, a number of important traditional agricultural practices that preserve a culture of nature and biodiversity assets, continue to be actively maintained. One area designated an "ancient production reservoir" is located right on the outskirts of the city in the Yamanlar. These regions continue to preserve agricultural practices that have endured since antiquity, in which people produce their food, not as the owners of the land but by behaving as part of the ecosystem, creating a way of life in harmony with the climate and biodiversity



Izmir's third layer is the transition region between the urban and rural habitation zones.



Mahmut Koyas

The fourth layer surrounding Izmir Bay includes ancient production reservoirs and pastures.

of the land. These ancient production reservoirs on the outskirts of the city also provided the inspiration for the recently conceived “Living Parks” in Izmir.

The outskirts of the metropolitan districts are directly under pressure from the city’s growth reflex. Especially due to the conditions imposed by the pandemic, the outer parts of the city are rising in demand. This has led to the parcelling up of land in the urban development areas in the region, increasing the fragility of the ecosystem through the use of land for construction, road expansions, petrol stations, depots and other non-agricultural uses, hobby gardens, and investments in large-scale highway infrastructure.

The fourth layer harbours the freshwater ecosystems with their large-scale valuable agricultural basins, forests, scrublands, bushland, and mountain steppes. The most important rivers in Izmir are the Gediz,

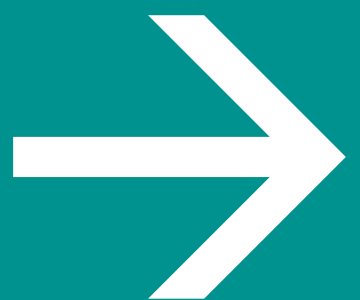
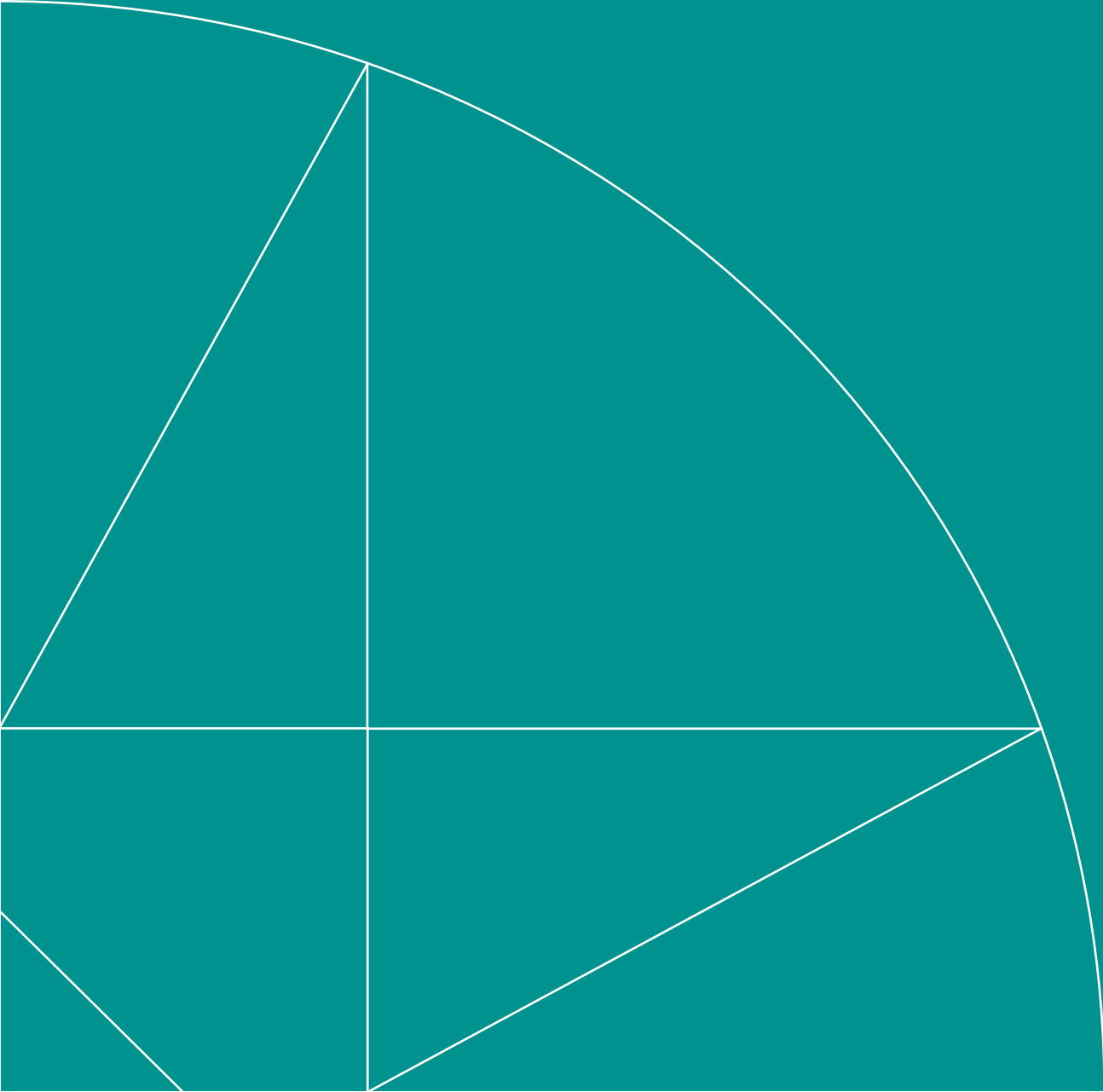
Bakırçay, and Little Menderes rivers, which flow into the sea from the North to the South. The region’s most important agricultural production areas are located in the basins, deltas, and plains of these rivers.

The most fundamental problem facing this fourth layer is the extreme water consumption due to agriculture. Academic studies undertaken in the Little Menderes Basin, where agricultural activity is particularly high shows a serious lack of water and high levels of pollution. The fact that the Little Menderes Basin is located entirely within the boundaries of Izmir increases the city’s burden of responsibility in this regard. The ecosystems in this layer are at risk due to their narrowly distributed endemic species, environmental pollution, drought, inappropriate afforestation, habitat destruction, and excessive hunting.

5

Strategic Documents and Action Plans





5. Strategic Documents and Action Plans

Izmir's strategies for living harmoniously with nature are growing and deepening rapidly with investments and implementation programs. Cities, as the major contributors of carbon emissions, are responding to the climate crisis through alliances and strategies aimed at reduction and harmonisation. Regarding the reduction of greenhouse gases in the city, in 2015 the Izmir Metropolitan Municipality aligned itself with the European Union initiative, the Covenant of Mayors, one of the most effective city networks in the world. In line with this, the "Sustainable Energy Action Plan" was published in 2016, and improvements were made, particularly in areas such as high budget sustainable transport investments, energy efficiency, and water purification.

With its areas of responsibility broadened to encompass the entire region under the new metropolitan municipality law, the Izmir Met-

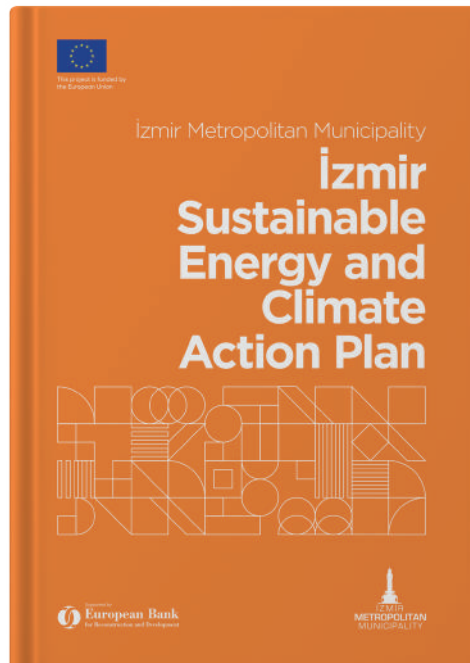
ropolitan Municipality completed its expansion plan in 2017, in line with the assumptions of the 1/25.000 scale Izmir Urban Region Master Zoning Plan (İKBNİP), in such a way as to include 3 basins, 13 districts and 428 rural settlements. Thus, it is aimed that the city be integrated with the green belt on the outskirts and the green corridors along the river courses in a way that strengthens the social and technological infrastructure of rural areas to support nature-friendly alternative tourism and agricultural production.

With regard to climate harmonisation, in 2017 it was decided to create the "Green Izmir Infrastructure Strategy" and the Izmir Metropolitan Municipality commenced the process by establishing an internal secretariat to support the adoption of nature-based solutions. In June 2017, the Izmir Green Infrastructure Experts' Workshop", attended by over 150 experts from all local and nation-



Hellio& Van Ingen

The tied lark is one of the rare birds found on Izmir's pastoral plateaus and in agricultural areas.



In 2021, Izmir's first green city action plan was published and the Izmir climate action plan was also updated.

al level organisations (Universities, public sector organisations, NGOs) was held. Suggestions were tabled under the headings 1) Planning and Administration 2) Water Areas 3) Corridors and Connections 4) Buildings, Wastelands, and Areas to Repair. In November 2017 focus group studies were carried out in order to develop the ideas proposed, assign duties and establish connections between themes, and plan the timetabling and relevant announcements and descriptions. The strategy was then announced in January 2018 at a meeting discussing the international experiences organised.

Furthermore, during this process, firm steps were taken towards partnering experience with European Union and other international projects and coordinating with research networks facilitating information exchange. These projects were intended as a vehicle

for testing solutions and proving and measuring their effectiveness. In 2017, the funding-approved “Re-Naturing Cities through Nature-Based Solutions- URBAN GreenUp” commenced. Urban GreenUp is a project supported under the aegis of the European Union Horizon 2020 program. With the aim of developing, implementing, and repeating city plans, the group of partner cities, both inside and outside Europe, have the aim of working in concert to reduce the impact of climate change, improve air quality, improve water management, and also develop innovative nature-based solutions. The five-year implementation period (2017-2022) is ongoing under the leadership of Izmir (together with Valladolid and Liverpool) as an international group of 25 partners. The heading of “nature-based solutions” comprises a large number of innovative practices, such as green cycling and hiking routes, parks and

urban agriculture facilities, the utilisation of smart soil and bio-filtration, and the deployment of sustainable drainage systems that reduce the effects of flooding/overflow.

Through EU funds, the “A Framework for Resilient Cities: Green-Focused Practices” project was carried out in the years 2017-2019, and a climate model was created for Izmir for the years 2050 and 2100, together with a guiding framework consisting of recommendations for climate adaptation. Moreover, under the aegis of Horizon 2020, the RURITAGE- Rural Renewal through Cultural Heritage-Based Systematic Strategies” project commenced in 2018 with an international group of 39 partners including transnational organisations such as UNESCO and ICLEI. With regard to the Izmir-Sea Project, a major part of the city’s green infrastructure strategy, all of the coastal areas along the outskirts of the bay have become public space, as part of strengthening the ties between Izmir residents and the sea.

For the five-year period, the Izmir Metropolitan Municipality has published its “2020-2024 Strategic Plan” centred on the United Nations Development Goals and Izmir’s priorities (17+10). Under the fifth of the seven strategic aims of the plan, entitled “nature”, Izmir has set out its goal of becoming a model city with regard to living in harmony with nature. Goals ranging from conserving biodiversity through to cleaning up the bay are laid out under different headings covered by this fundamental strategic goal.

The Izmir Metropolitan Municipality’s strategy for 2020-2024 takes a much broader approach to the definition of “infrastructure” than the traditional understanding. From this innovative perspective, green space is described as a focus of infrastructure. Just as buildings and roads require a well-maintained, earthquake-resistant infrastructure, green space is treated as a fundamental infrastructural element for the nature-based transformation of the city. Green infrastruc-

ture, just as much as roads, sewage, and access to water, is viewed as one of the fundamental rights of citizens.

The “Covid 19 Resilience Plan”, which will increase resilience in the face of the pandemic and other sudden events and raise the capacity of the Izmir Metropolitan Municipality in dealing with these, was published in June 2020. Izmir has adopted the approach of “crisis municipalism” as a response to the pandemic and similar crises and has organised to cover the monitoring and adaptation process.

In 2021, the Izmir Greater City Council approved two important strategic plans, the “Izmir Green City Action Plan” (Izmir GCAP) and “Sustainable Energy and Climate Action Plan” (Izmir SECAP), creating a framework for the development of international cooperation and harmonisation of Izmir’s efforts in the areas of nature and climate. These plans provide a road map for Izmir’s struggle against climate change and for harmonisation with nature and touches on many different industries. The Izmir SECAP, signed by the Izmir Metropolitan Municipality in line with the Pact of Mayors and EU Paris Climate Declaration of Intention, has set the goal of reducing greenhouse emissions by 40% by 2030. SECAP sets out areas of action to deal with fundamental risks and fragilities in various industries and, on the “biodiversity” axis, acts on extreme climate effects such as drought, and preventing the further loss of biodiversity.

In Turkey, Izmir is the first city to be included in the European Bank for Reconstruction and Development (EBRD) Green Cities Program. The aim of the Green cities Action Plan, prepared for the first time for Izmir with the support of a 300 000 Euro fund from the EBRD, is to create a vision and develop projects that will enable a greener future for Izmir by identifying environmental difficulties and taking the most urgent action based on the diagnosis of what is most necessary. GCAP pre-

sents a comprehensive action plan dealing with a series of urban problems comprising issues such as water, biodiversity, air, soil, and climate change.

On the issue of climate change, the promise made in 2015 by the Izmir Metropolitan Municipality to reduce greenhouse emissions to 20% has been renewed under the Izmir SECAP, in parallel with European Union targets, to reduce emissions by 40% by 2030 and to increase the resilience of the city in adapting to climate change. Although the final action plans, the GCAP and SECAP, were prepared separately, they comple-

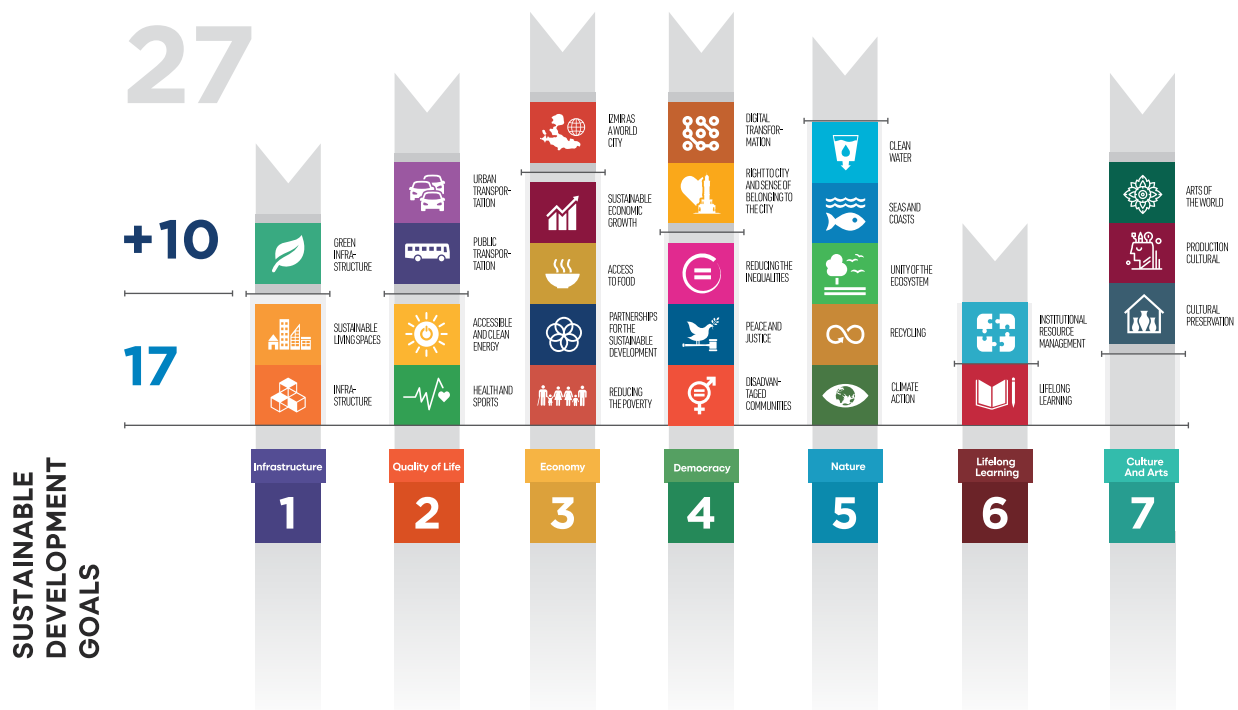
ment each other and the goals and actions of each plan have, as much as possible, been harmonised. Each plan consists of 61 actions covering land use, waste management, buildings, environment and biodiversity, energy, public health, civil defence and emergencies, water management, agriculture and forestry, and the tourism and transportation industries.

The common thread through all of these strategies is the aim of constructing a city resistant to natural disasters, increasing welfare, ensuring fair distribution, and conserving biodiversity.

A summary all of these strategies is presented in table 5.1.

2020-2024 VISION OF IZMIR

To become a city drawing power from peaceful coexistence in diversity , to learn from the world and to be a source of inspiration in turn, to imbue every moment in life with the prosperity, justice and harmony with nature.



Plan or Project	Timescale	Explanation	Relationship to GCAP and SECAP
IMM Strategic Plan 2020-2024	2020-2024	Izmir's strategies are founded on the vision of being a city that rises on its historical heritage, strives to strengthen the bonds of Eastern and Western society, and shapes the future on the basis of environmentally-friendly habits and social justice. The main goal of the strategy is to make Izmir one of the world's leading cities and to strengthen the city's natural wealth.	Priorities have been set in line with the IMM administration and the city's development. Environmental issues have been recognised. Attention has been given to prioritised and problematised actions.
İZSU Strategic Plan	2020-2024	The İZSU vision is to be a pioneering organisation, integrated into the Izmir identity, that prioritises science and up to date technology in managing the water ecosystem and seeks to pass on the natural wealth of the past to future generations in a way that does not harm nature and leaves behind a liveable future.	Actions are being developed in parallel with the Izmir Strategic Plan to increase sustainability in Izmir.
The Izmir Sustainable Energy Action Plan (SEEP) 2016	2016-2020	This was prepared as an extension of the Compact of Mayors (CoM) under the auspices of the European Commission. The aim of the plan is to reduce Izmir's greenhouse emissions by 2023 by at least 20%, with close attention to internationally embraced standards and procedures.	It enables the determination of sustainable green city actions such as protecting and increasing important green areas under threat of climate change and natural disasters. Relevant actions and measures are formulated according to the problems identified in the plan.
A Framework for Climate Change-Resistant Cities: the Green-Focused Adaptation Guide	2019	The aim of the project, in which the Landscape Research Association is a co-beneficiary, is to use, develop, and support the potential of the green infrastructure to create an urban space that is resilient vis-à-vis climate change.	The measures developed and problem areas identified by the project are reviewed and reflected in the recommended principal actions.
The Izmir Green Infrastructure Strategy	2017	This strategic document was prepared to reinforce and integrate with the IMM's in sustainable environmental investments and actions to create a sustainable transportation infrastructure, next-generation parks and recreational areas, and harmonisation with the sustainable energy action plan and actions to reduce the impact of climate change.	These form the basis of water management and green infrastructure areas.
The Izmir Integrated Solid Waste Management Plan	2018	This plan was prepared to enable mid- to long-term sustainable waste management and the formation of an appropriately funded integrated system.	This supports the proposals in the strategic plan related to solid waste management (such as adopting the most appropriate method in each district for the disposal of waste).
The EBRD & IFC Pilot Climate Change Adaptation Market Research Study-Turkey	2013	This study was carried out in order to better understand the needs of the Turkish private sector in creating resilience to climate change. It was financed by the EBRD and IFC and prepared as a partnership between the Turkish Association of Chambers and Exchanges (TOBB) and the Ministry of Environmental and Urban Affairs (ÇŞB).	It references market-based mechanisms indicating solutions such as smart buildings to combat climate change and taking the necessary steps required to increase the efficiency of water resources.
The IMM Covid19 Resilience Action Plan	June 2020	This report explains the actions commenced and precautions taken by the IMM in its new working model of "crisis municipalism". I) The preventative services offered at the moment of crisis by the Izmir Metropolitan Municipality. II) The current work being carried out in combating the pandemic. Iii) The monitoring and adaptation activities to be carried out during the normalisation period in the aftermath of the pandemic.	Aside from the opportunity to benefit from a green, more resilient return to health, the parallels to be drawn and lessons to be learned from the struggle against Covid 19 were noted.

Plan or Project	Timescale	Explanation	Relationship to GCAP and SECAP
The Izmir Transportation Master Plan (2017)	2015- 2030	The plan contains the long-term planning, decisions and principles aimed at dealing with the current and anticipated issues, in line with the zoning plans and with priority given to public transport.	Orientations and priorities such as transport actions, the development of the public transport system, reducing the use of private vehicles, increasing the number of electric vehicles, and increasing the use of bicycles in commuting are kept in the forefront.
The İZSU Drinking Water Master Plan (2017)	2050	The aim of this document is to develop a program to ensure a thorough examination of Izmir's drinking water procurement and distribution systems and determine the necessary systematic improvements to meet the current and future demand. This report is included within the İZSU Strategic Plan for 2015-2019 and 2020-2024.	By forming a basis for Izmir's future water management plans, it forms the foundation for water management under the GCAP-SECAP.
The Little Menderes Basin Flooding Management Plan	2019	This plan has been prepared to assess the flooding risk in the Little Menderes Basin, and to reduce the negative impacts of flooding on human health, the environment, cultural heritage, and economic activity.	The plan will be beneficial with regard to water supply, wastewater, and drainage.
The UPI Cycling and Pedestrian Action Plan	2017- 2030	The action plan aims for Izmir to become a pioneer city in the field of motorless transportation. The plan includes goals such as increasing the use of bicycles among residents and tourists, creating safe, central areas for pedestrian use, and reducing greenhouse emissions from transportation.	Transport actions such as increasing the use of bicycles in commuting are emphasised in this plan.
The Sustainable Logistics Plan for the Historical City Centre	2030	This plan has been prepared to provide sustainability and enable the planning of logistic activities in the city centre, while preserving the historical atmosphere and character of the market area.	This plan will be beneficial with regard to reducing carbon emissions and making a safe, comfortable environment for increased pedestrian traffic.
The Izmir Sustainable Urban Logistics Plan	2030	In this plan, solutions are proposed for identifying the heavy vehicles inside the boundaries of the IMM, and facilitating coordination, as well as diagnosing bottlenecks and providing solutions.	This will be beneficial in terms of developing proposals for the planning of rural, urban, and solid waste management logistics, forming low carbon emission zones, and establishing parking areas for heavy vehicles.
UrbanGreenUP	2017	This is a project prepared with EU support under the aegis of the Horizon 2020 Program. Its aims are to develop, implement, and approve a methodology for reorienting urban planning towards nature and, in line with this, to reduce the impact of climate change, improve air quality and water management, and increase the sustainability of the city through the adoption of nature-based solutions. The project is currently being implemented in three pilot cities: Izmir, Liverpool, and Valladolid.	This will form a basis in the areas of climate change, air quality, water management, and green infrastructure.

Boxed Insert 5.1 The Izmir GCAP and SECAP Methodologies

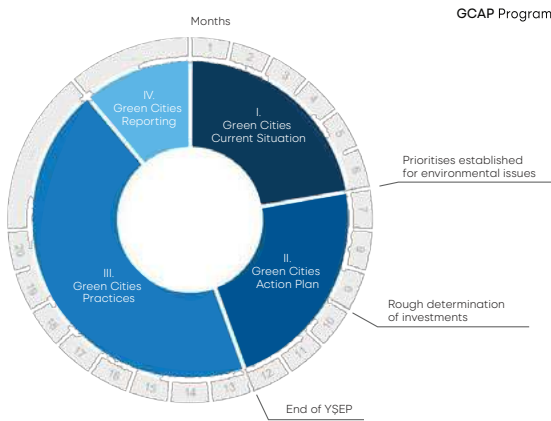


Figure 1: GCAP steps

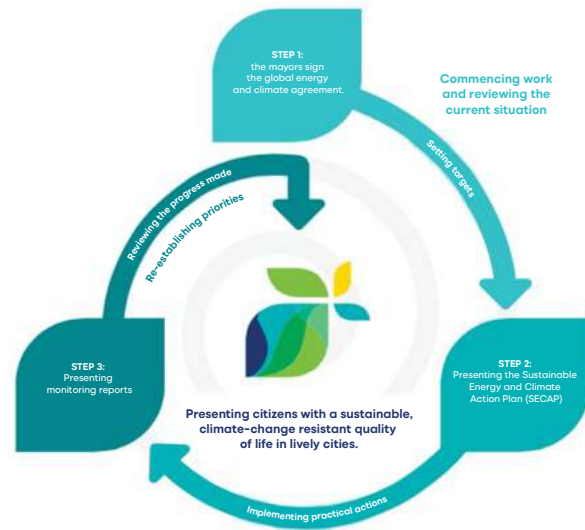


Figure 2: SECAP steps

The Green Cities process has been prepared according to a consistent methodology utilised by all the cities preparing and implementing GCAP. This methodology has been developed by the EBRD in collaboration with the Organisation for Economic Cooperation and Development (OECD), and International Council of Local Environmental Entrepreneurs (ICLEI).

The methodology consists of four main steps:

1. An evaluation of the current Green Cities status
2. The Green Cities Action Plan
3. The Green Cities implementation stage
4. The Green Cities reporting stage

The main lines of the process are set out in figure 2 according to the CoM methodology intended as a guide for all the local administrations involved in the development of SECAP in signature cities to the Pact of Mayors.

The first and second steps of this process fall under the aegis of SECAP. During this process managed in line with the Pact of Mayors reporting scheme and accompanying management report, there will be:

1. The creation of an inventory of current greenhouse emissions with an examination of the current situation including an assessment of risks and vulnerabilities.
2. The monitoring of practical actions undertaken in order to obtain more information concerning emissions, reduce emissions, and increase resilience vis-à-vis climate change.

The third step consists of implementation and monitoring. SECAP requires regular monitoring (once every two years) and should be revised when necessary.

Boxed Insert 5.2 Izmir's Greenhouse Inventory

Izmir's greenhouse emissions in 2018 were calculated 25 million 62 thousand 569 tCO₂e (equivalent to tons of carbon dioxide). The largest share of this was attributed to industry, at 31.4%. This was followed by transport, at 23%, domestic buildings, at 14.3%, and agriculture, at 8.2%.

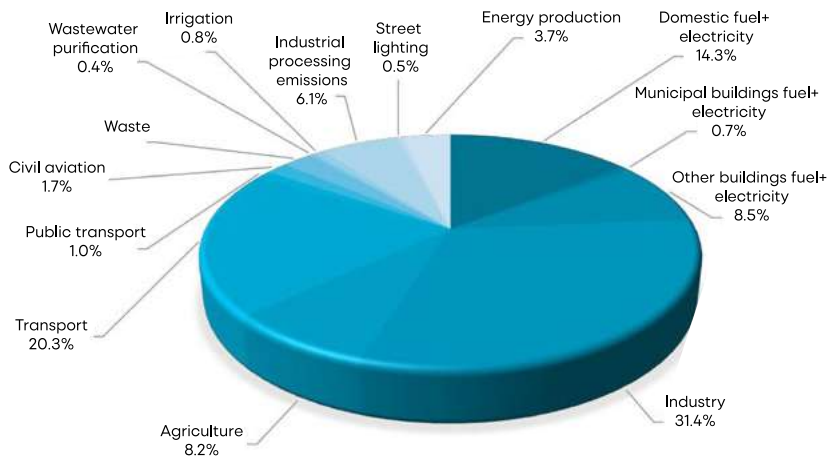


Figure 1. Izmir's 2018 greenhouse emissions by industry

As of 2018, Izmir's greenhouse emissions have been at 14.319.706 tCO₂e annually. According to a scenario in which everything continues on its current course (BAU), by 2030 Izmir's annual emissions will be at 17.691.125 tCO₂e.

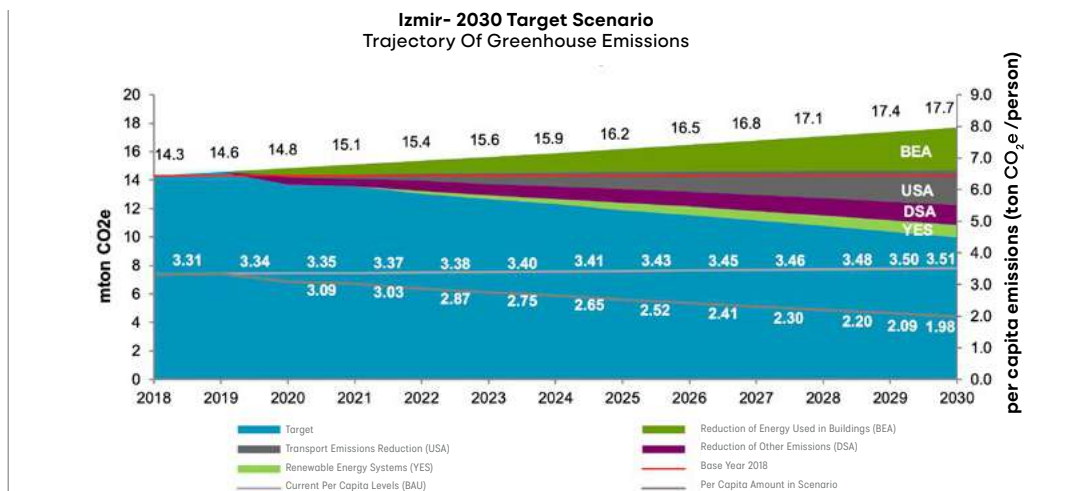


Figure 2. Reduction Scenarios

In the event that everything continues along its current trajectory (BAU), the current per capita emission rate of 3.31 tCO₂e will become 3.51 (an increase of 6%) by 2030. After the recommended reduction actions are taken, the per capita greenhouse emission rate in 2030 will be at 1.98 tCO₂e, with total emissions (excluding industry and civil aviation) at 9.973.640 tCO₂e. This will deliver a reduction of 40%.

6

Izmir's Strategy for Living in Harmony with Nature





6. Izmir's Strategy for Living in Harmony with Nature

The societies that preceded us were aware of nature's cycles and learned to act accordingly. However, in the last two centuries, with the rise of urbanisation and commercialisation, nature-culture relationships have come to be conceived of primarily within the context of urbanisation and the struggle with its problems. The perception of the city and countryside as separate has led to the characterisation of urban-rural relations as a clash of town and country in which the city spreads out to dominate the rural areas and attempts to bring nature under its control. In the Anthropocene era, in which the human-centred world view has reached its zenith, the overconsumption of natural resources, and the other crises this has brought on in its wake, has begun to stir the need for new approaches.

Consequently, the need has arisen for a new way of being within nature, in other words, for harmonisation with nature to take on new forms. New areas have opened up in our minds for reconceptualising and protecting our relationship with nature, in forms such as the CittaSlow and fair-trade movement, geographic origin labelling, and the slow food movement. However, what is called for in the present is beyond this and involves the overcoming of all of our perceptions based on the opposition of humanity to nature and re-founding life holistically, taking bold steps towards the radically innovative re-naturalisation of our cities and moving towards a nature-based lifestyle (Figure 6.1).

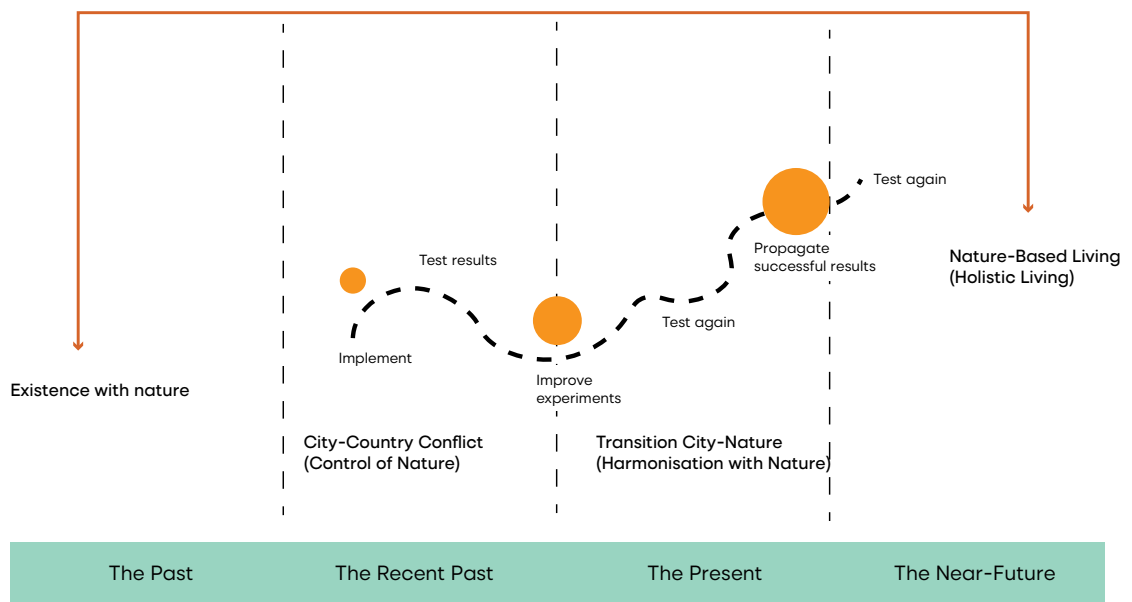


Figure 6.1 The development of the principles of a nature-based lifestyle

With this idea in mind, Izmir has characterised its essential strategy for combating the climate crisis and becoming a city in harmony with nature as “creating partnerships regarding physical, economic, and cultural plans for the administration of urban and rural areas”. Rather than referring to the

urban landscape and rural landscape as two separate parts, this will bring nature and culture together, uniting them within the flow of life. Izmir’s 2020 application for European Green City status also featured this essential strategy (Figure 6.2).

IZMIR’S ESSENTIAL STRATEGY

The Fundamental strategy of Izmir, a candidate European Green Capital aiming to combat climate change and become a city in harmony with nature, is:

To create partnerships regarding physical, economic, and cultural plans for the administration of urban and rural areas.



Figure 6.2 Izmir’s essential strategy for nature and climate action

Contrary to the inflexible traditional approach to city planning, Izmir aims to create a re-fined relationship between the urban and ecological layers of the city’s life. This holistic perspective encompasses not just the physical space but also the cyclical feed-back design of the relationships between the city and its economic and cultural aspects.

Izmir aims to actualise the cumulative emergence of three main results, in line with the principles of the essential strategy set out above:

- **To be a city resistant to natural disasters**
- **To raise prosperity and ensure fair distribution**
- **To conserve biodiversity**

This report, by presenting a summary of all the mentioned work undertaken in the above sections, presents the four fundamental steps of Izmir’s “nature and climate action”: (i) enabling the influence of nature on urban populations (ii), ensuring the human impact on rural areas be in harmony with nature, (iii) encouraging a cyclical feedback economy, and (iv) strengthening the bonds between urban and rural cultures.

(i) Enabling nature to influence the city

This step comprises proposals aimed at establishing mechanisms that, in contrast to models of urbanisation that pit nature against culture, enable the natural plants, animals, water sources and other natural entities to exert an influence on the city. To achieve this, a series of landscaping areas able to demonstrate ecological permanence, such as planting trees along streets and in gardens, and creating regional parks in open urban spaces, are to be connected. Inside the city, it is intended to use native Mediterranean plants and plants native to Izmir rather than exotic species. A comprehensive campaign was started in 2021 to ensure that the inner-city flora consist of climate-resistant local species.

(ii) Ensuring the human impact on rural areas be in harmony with nature

This step means opening the access of the urban population to the city periphery, while protecting its ecosystems, and creating a shared way of life. Although significant part of Izmir consists of nature parks, and special environmental conservation areas of varying statuses, the bonds between these areas and Izmir residents are yet to be forged. The necessary mechanisms have not yet been established for Izmir residents to enter these areas for relaxation, to experience nature, to introduce their children to nature, and to learn about healthy nutrition and the right to life of other living beings. This step comprises the design of various green areas and rural areas that enable people to form a relationship with wildlife, witness biodiversity, and gain experience of agriculture.



In Izmir's pastures, animal husbandry retains its importance as a means of subsistence.

(iii) Encouraging a cyclical-feedback economy

This step encompasses the goal of erasing the division between the city and countryside to initiate a number of nature-based, multi-functional planning and utilisation practices in rural areas for the sake of developing economic resilience. This heading comprises a number of activities such as simultaneously combatting drought and poverty in Izmir's agricultural areas, planning bio-regionally-based rural pools, adopting a nature-friendly approach to zoning in rural areas in planning what kinds of activities may be permitted, and in what form, and adopting recycling practices.

(iv) Strengthening the bonds between rural and urban cultures

This final step comprises bringing together the various separate communities by constructing physical networks connecting the 8500-year-old port-city and its metropolitan culture with the broad landscapes of the region. While doing this, the emphasis is on respect for nature, and ensuring low-ecological impact sustainable access, such as via pedestrian and cycling routes.

In the final instance, the aim of all these steps is to establish innovative and unifying relationships between nature and culture to render Izmir a resilient, prosperous city that simultaneously conserves biodiversity and natural cycles.

Izmir, which has an ancient cultural legacy and practical experience of living deeply integrated with nature, is both very enthusiastic and determined to share this accumulated learning with the cities of the world and to learn from them, in turn. This transformation may make it possible for Izmir to rediscover its ancient culture of living and interpret it in line with modern conditions. Izmir's fundamental motivation can be explained as the belief that more liveable cities are possible, not just for human beings, but for all forms of life..



Emirali Kokal

The Anatolian squirrel is commonly seen in Izmir's forests and olive groves.

7

Izmir's Climate and Nature Action





7. Izmir's Climate and Nature Action

The culture of living in harmony with nature demands that a transitional strategy be followed throughout all of the city's systems. This transition covers a long period of constructive effort within the city. In order to facilitate this transition, it is necessary that physical plans and thematic strategies for the testing and dissemination of new concepts be carried out holistically for the development of the above-mentioned strategies into projects and, tactically, as bottom-up practices.

The action plan was developed on the basis of the city's biogeographical regions and in

line with its prioritised integration targets. While doing this, the integration of the thematic strategies, projects, and other practices carried out over the last 5 years with those to be implemented in the future will be achieved. The action plan is on 5 levels, based on spatial, cultural, and economic integration and contains examples of 25 innovative projects and programs pioneering the testing of these strategic targets. (Figure 7.1) Other than these examples, the Izmir Metropolitan Municipality is implementing numerous programs and projects, and these are detailed in the GCAP and SECAP reports.



Traditional olive-growing in Izmir is a reservoir of ancient production practices extending back in an unbroken line for centuries.

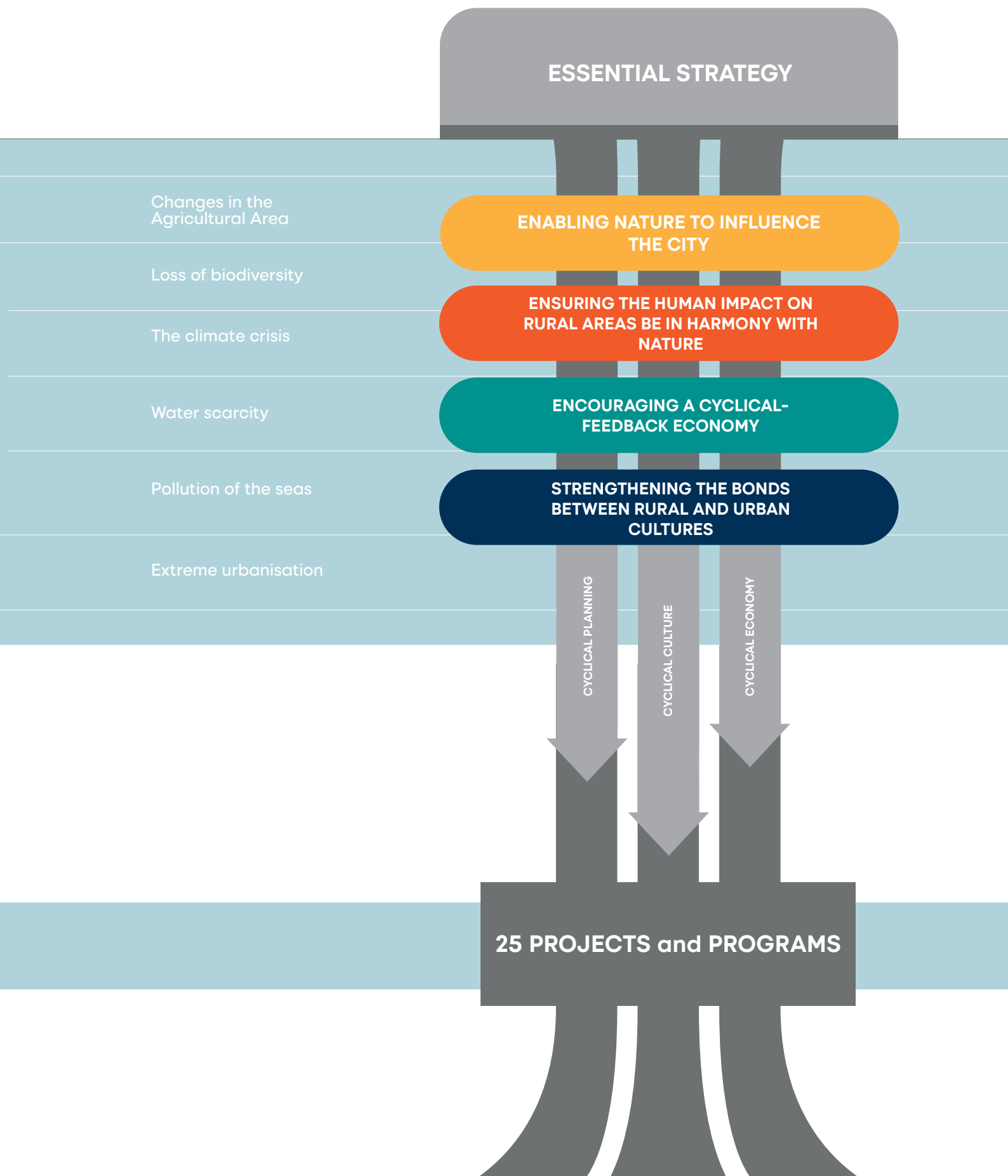


Figure 7.1 The action plan axes, principles and implementation areas

The Izmir Nature Atlas Project

LAYERS



Integrational axes:

- Enabling nature to influence the city
- ✓ Ensuring the human impact on rural areas be in harmony with nature
- Encouraging a cyclical-feedback economy
- ✓ Strengthening the bonds between rural and urban cultures

Explanation:

The aim of the nature atlas is to research Izmir's biodiversity. In line with this, research will be carried out on various groups of mammals, birds, reptiles, amphibians, fish, and plants following methodologies established by relevant experts. All of the data thus obtained will be transferred to 5x5 km squares to cover the entire area inside Izmir's boundaries.

At the conclusion of the study, Izmir's biological assets will be compressed and mapped on 5x5 km squares and, at the same time, a GPS digital database will be created. This will provide an invaluable resource for ensuring that every activity to be carried out within Izmir's borders, whether by public or private sector organisations, will be able to be planned and executed in a way that conserves the area's biological diversity.



Izmir is one of the few cities in Turkey where the Mediterranean seagull breeds.

The Natural Green Project

LAYERS

2

3

Integrational axes:

- ✓ Enabling nature to influence the city
 - ✓ Ensuring the human impact on rural areas be in harmony with nature
- Encouraging a cyclical-feedback economy
Strengthening the bonds between rural and urban cultures

Explanation:

In order for the city to regain its natural vegetation cover in its parks, local plant species will be used in inner-city practices. The aim is to propagate an approach to landscaping throughout the city that utilises plants with reduced water consumption requirements and are highly adaptable. Thanks to this project, there will be a full transition to the use of native plants in Izmir's parks and, thus, all the ecological assets of inner-city parks will be increased and water consumption reduced.



One of the trees to be cultivated in Izmir parks under the Natural Green Project is the acorn oak.

Forest Plantations resistant to Climate and Fire

LAYERS



Integrational axes:

- ✓ Enabling nature to influence the city
 - ✓ Ensuring the human impact on rural areas be in harmony with nature
- Encouraging a cyclical-feedback economy
Strengthening the bonds between rural and urban cultures

Explanation:

The reforestation methods used in forests destroyed by fire can be a cause of loss in forest species unique to the geographic area. At the plantation to be established in Torbalı, local tree species will be grown with the aim of conserving the natural diversity of Aegean forests. With its visitor's centre, sample terrace, seed spreaders, and tree repiculture areas, the plantation is intended to raise awareness of conservation in Aegean forests.



A plantation for fire-resistant trees is being established in Torbalı.

İzMiras Routes



LAYERS



Integrational axes:

- ✓ Enabling nature to influence the city
- ✓ Ensuring the human impact on rural areas be in harmony with nature
- ✓ Encouraging a cyclical-feedback economy
- ✓ Strengthening the bonds between rural and urban cultures

Explanation:

Five green corridors are being prepared to create an uninterrupted connection between the city centre and natural areas. These five routes are connected to each other by the İzmirDeniz coastal route encircling İzmir Bay. The İzmirAs Routes comprise the Northern Route between Bostanlı and Yamanlar, the Southern Route connecting Kültürpark, Kemeraltı, Kadifekale, and Kaynaklar Village, the Eastern Route between Bornova and Yeşilova Höyüğü (8500 years in 1 day), the North-Western Route connecting Bostanlı, Sasalı, and the Gediz Delta, and the Southwestern Route between İnciraltı and Yelki.

These routes will not only provide a green corridor enabling nature to influence the inner city, but will also serve as uninterrupted hiking paths enabling city dwellers to access natural areas, and will further strengthen the economic and cultural bonds between the city's various regions.





NORTHWEST ROUTE

Kuş Cenneti 

İZMİR
BAY

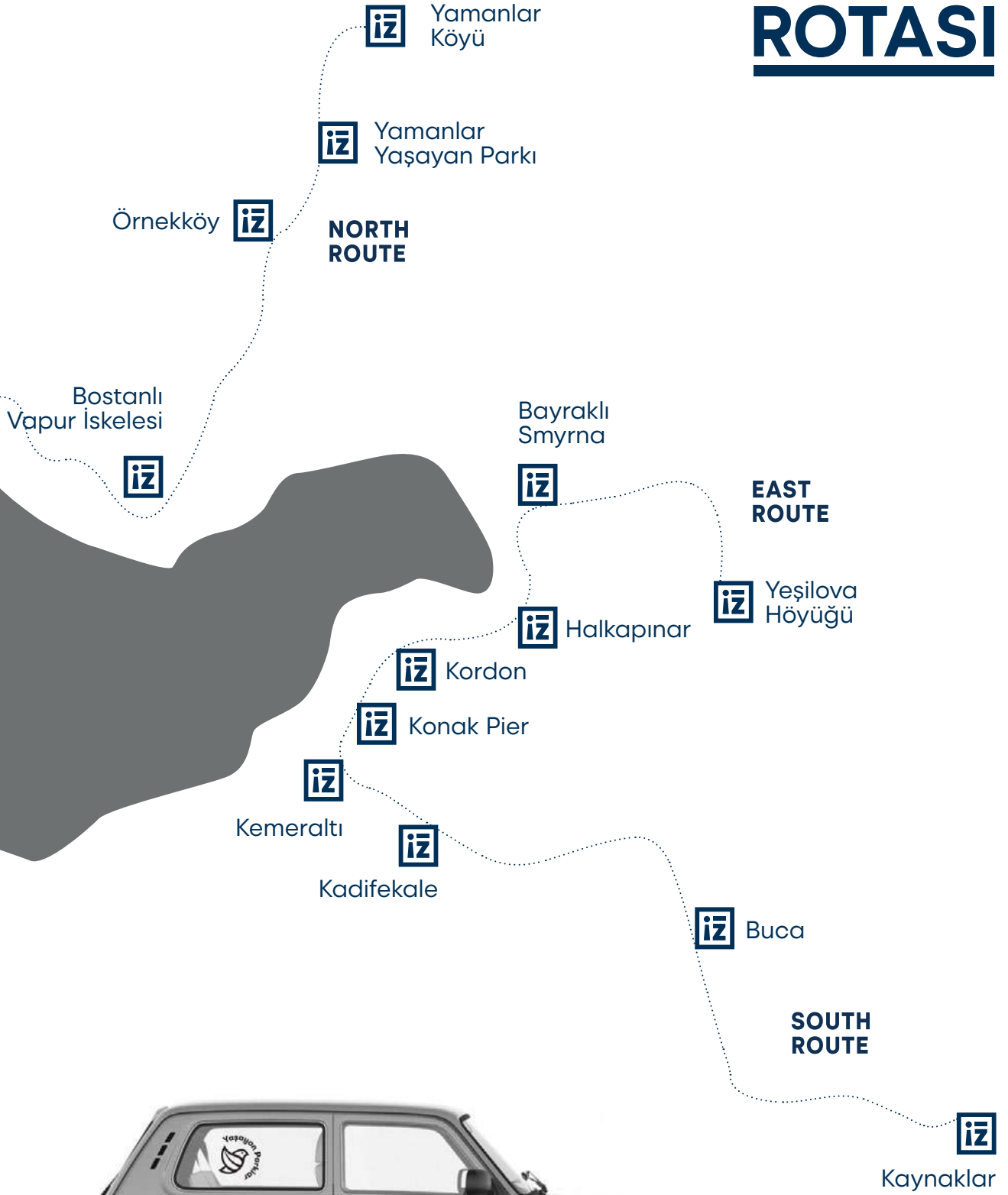

Kent Ormanı

SOUTHWEST ROUTE


Olivelo

There are five İzMiras Routes connecting the city centre with rural areas.

izmirāš ROTASI



The Izmir Living Parks Project

LAYERS



Integrational axes:

Enabling nature to influence the city

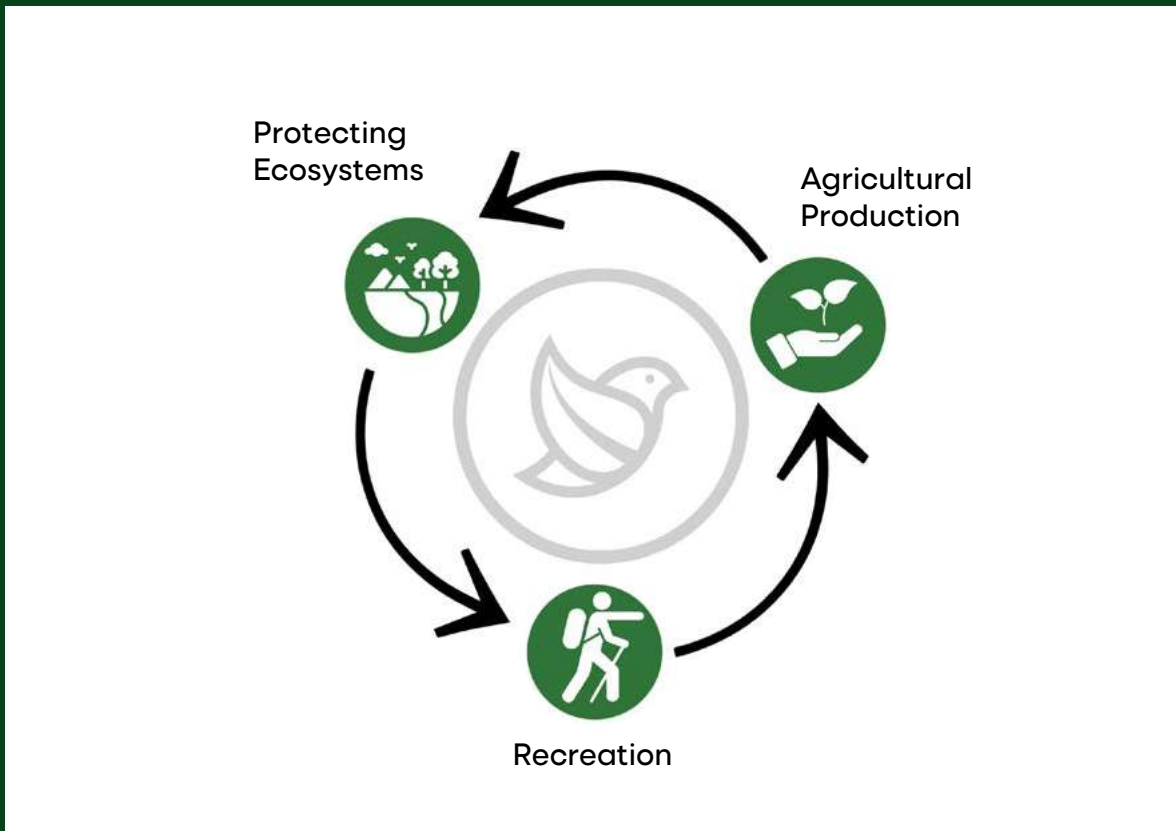
- ✓ Ensuring the human impact on rural areas be in harmony with nature
- ✓ Encouraging a cyclical-feedback economy
- ✓ Strengthening the bonds between rural and urban cultures

Explanation:

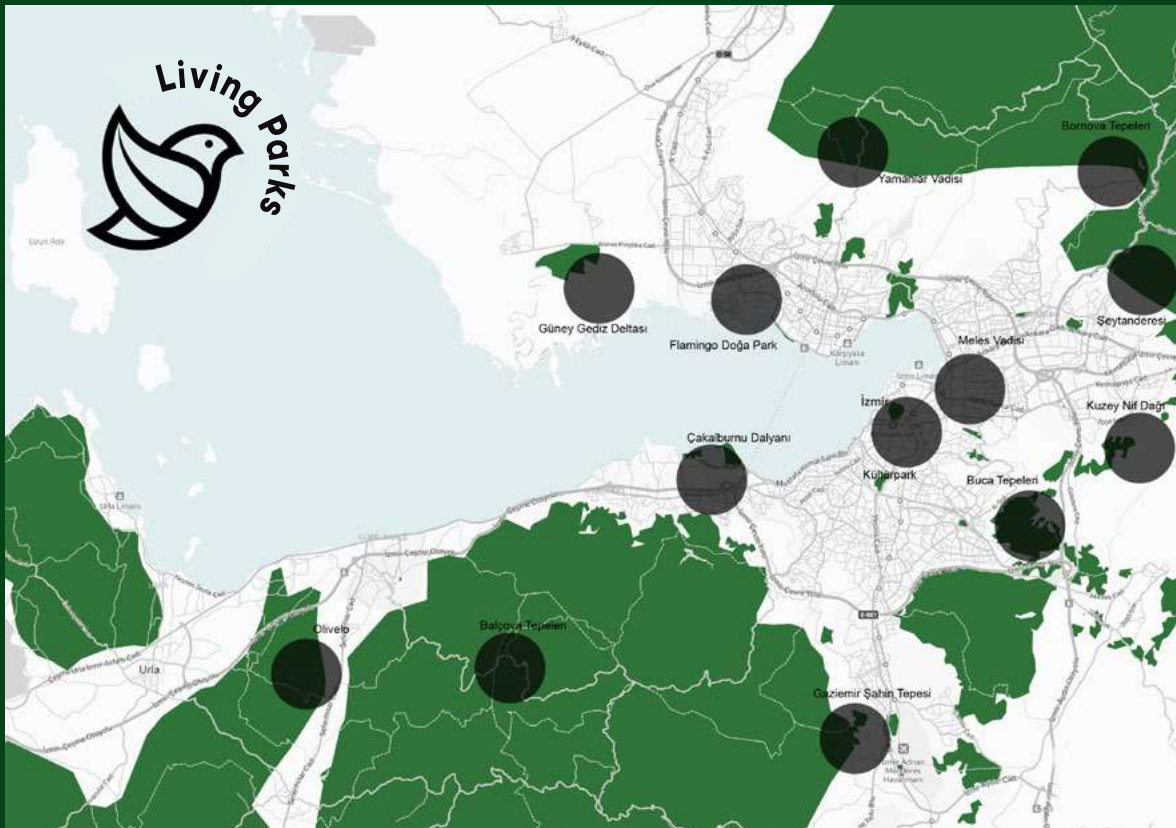
The Living Parks are the large-scale green areas located in rural and natural zones targeted for conservation on the outskirts of the city and connected to the city centre by İzMiras Routes. The living Parks bring together three types of land use normally treated as separate: ecological conservation, agricultural production, and recreational usage.

The Living Parks are a park model where the potential contained in a holistic urban/rural, and natural/cultural structure is expressed and experienced. In these spaces, the functions of meeting the recreational needs of residents and tourists, supporting ancient agricultural production methods and the branding of local products, and raising awareness and promoting the conservation of local flora and fauna, are all fulfilled. While visitors are enjoying recreational activities in the rural areas on the outskirts of the city, they will also be able to discover ways of experiencing nature and ancient agricultural practices. By 2024, it is aimed to have established 35 Living Parks in Izmir.





Each of Izmir's Living Parks performs three basic functions.



By 2023, 13 Living Parks will be established on the outskirts of Izmir. The total network of Living Parks may reach 35.

The Efe Road Project

LAYERS

3

4

Integrational axes:

Enabling nature to influence the city

- ✓ Ensuring the human impact on rural areas be in harmony with nature
- ✓ Encouraging a cyclical-feedback economy
- ✓ Strengthening the bonds between rural and urban cultures

Explanation:

A collaborative project realised as a partnership between the Izmir Metropolitan Municipality and Ege University and featuring the further partnership of the Governorship of Izmir, Izmir Regional Directorate of Forestries, the Efe Foundation, and the Izmir Foundation, the Efe Road aims to create an international route that showcases the natural beauty, and historical and cultural treasures of the Little Menderes Basin. The project is supported by the Izmir Development Agency.

Starting in Bornova, in the Belkahve region, the Efe Road is planned to pass through Kemalpaşa, Bayındır, Ödemiş, Kiraz, Beydağ, Tire, and Selçuk until finishing at the shrine of the Virgin Mary, and will connect 29 mountain villages with a focus on the cultural heritage of Izmir's Efe groups (rebellious, free-living bandits and warriors). The Izmir Development Agency-supported project is planned both to strengthen Izmir's rural tourism potential as well as creating an economic lever for the villages and districts along the route.



Lübbey is one of the major stops on the Efe Road.

Increasing Park Space in Green- Impoverished Neighbourhoods

LAYERS 2

Integrational axes:

- ✓ Enabling nature to influence the city
Ensuring the human impact on rural areas be in harmony with nature
Encouraging a cyclical-feedback economy
- ✓ Strengthening the bonds between rural and urban cultures

Explanation:

New parks are created in neighbourhoods in the most urbanised districts of the city determined to be green-deprived. This project will connect the newly-constructed parks to the green corridors wherever possible and will employ nature-based solutions in their execution. The Behçet Uz recreational area is the largest of these parks.



The Behçet Uz recreational area was established in the region where most green-deprived neighbourhoods in the Bornova, Buca, and Konak districts approach each other.

The Kültürpark Ecological Rehabilitation Project

LAYERS 2

Integrational axes:

- ✓ **Enabling nature to influence the city**
Ensuring the human impact on rural areas be in harmony with nature
Encouraging a cyclical-feedback economy
- ✓ **Strengthening the bonds between rural and urban cultures**

Explanation:

The Izmir Metropolitan Municipality, with the intention of developing the natural atmosphere of Kültürpark, one of the symbols of the city, to preserve it and ensure its place for the future in the memory of the city, has prepared the Conservation-Oriented Development Plan. In line with this, the Kültürpark Ecosystem Conservation Plan has also been put into effect to increase both the quality and quantity of the park's green space. The plan, while carrying out the essential work of rehabilitating the area by protecting the local fauna and flora, also comprises the integration of Kültürpark with the green corridors and other green areas. The Conservation Plan will increase the parks m^2 of green space and, by using indigenous plants for the establishment of these green areas, will also raise the park's ecological value.



The most important and largest park in the centre of Izmir is Kültürpark.

The Olivelo Ecological Common Living Area on the Izmir Urban Periphery

LAYERS



Integrational axes:

Enabling nature to influence the city

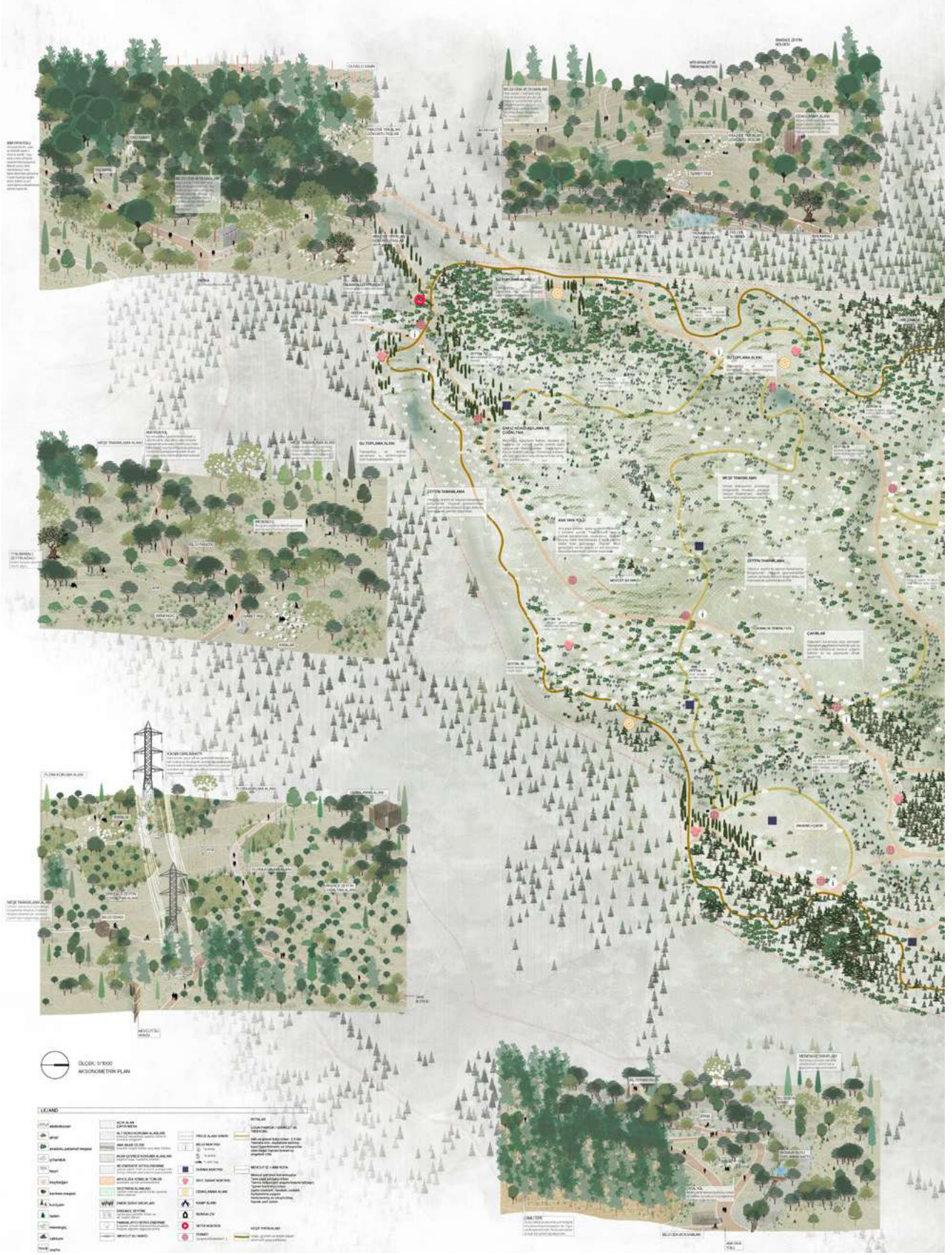
- ✓ Ensuring the human impact on rural areas be in harmony with nature
- Encouraging a cyclical-feedback economy
- ✓ Strengthening the bonds between rural and urban cultures

Explanation:

Yelki, with regard to its location and quality, forms a sensitive interface between the city and countryside and the project area is conceived of on the basis of seven patterns of networks (the social network, geographical network, knowledge network, user network, ecological network, perception network, and program network). The social network is the network defining all the actors in the near and remote environment who will contribute to the area's production activities, management, and documentation.

The Olivelo Project undertakes research on several levels through the knowledge network, bringing them together and documenting them for the benefit of people and nature, researching and sharing in cooperation with users. The users, by contributing to production, are defined as stakeholders capable of collectively editing, sharing, and developing the physical and cultural space around them. It is aimed that the ecosystem will develop and grow on its own, random situations will emerge, and new species supporting biodiversity will develop, conserving the natural environment. The perception network enables all the characteristic signs of the area and its environs to form a kind of mind map and for some places to be described as observation points while others are described as discovery points.

It is anticipated that, in a restricted region, using sustainable construction techniques and set in a quality rural environment, there will be facilities such as bicycle rental and repair, an information unit, library and archive units, educational workshops, a restaurant, an olive press, technical areas and depots, the Olivelo assembly area, and office space. A space employing minimal intervention has been designed as a nature conservation and development area, of which, a large part consists of hiking and cycling paths, and information units, together with focus- and eco-art spaces. The Olivelo Project was prepared via a competition and commenced in 2021.



The design for the OliVelo Living Park was obtained through a competition.

The Urban and Ecological Backbone: The Meles Creek and its Environs

LAYERS



Integrational axes:

- ✓ Enabling nature to influence the city
- ✓ Ensuring the human impact on rural areas be in harmony with nature
- ✓ Encouraging a cyclical-feedback economy
- ✓ Strengthening the bonds between rural and urban cultures

Explanation:

Two essential strategies have been identified for the Meles Natural Life Corridor based on the idea of rendering it a functional part of the infrastructure: (i) connecting it with the parks on the Izmir periphery by integrating the green space systems in the valley, and (ii) carrying out micro-interventions towards the restoration of the Meles Creek.

Designed through a competition, ten thematic park areas have been proposed along the Meles Natural Life Corridor. Each of these parks, programmed according to Izmir's history, biodiversity, and local needs, has been conceived of according to the principle of meeting the social, ecological, and structural needs of the neighbourhoods in which they are located. Through the openings created by micro-interventions, an ecological window will be opened in the impassable areas in the Meles and its nearby environs for the living things for which this currently forms a barrier. Thus, by developing the morphological structure of the river, it is aimed that the Meles will be reintegrated with the city as a living organism once again.

The proposed living park in the Meles Delta, where the Meles, Arap, and Manda rivers converge, shows how nature is able to repair itself despite all of the problems generated by urbanisation. Program proposals have been developed for bird watching spots in the marshlands and the targeted area for education on the delta ecosystems, eco-information stations, hiking and cycling connections, and experiential routes. One part of the project, the Şehitler Korusu Menegiç Reserve Area, will comprise an ecological conservation and education space with thematic routes such as a nature observation trail, and bio-hydrology trail, with nature workshops, observation points, and café units.



The Meles Delta Recreational Project.

The Sponge City Program

LAYERS

2

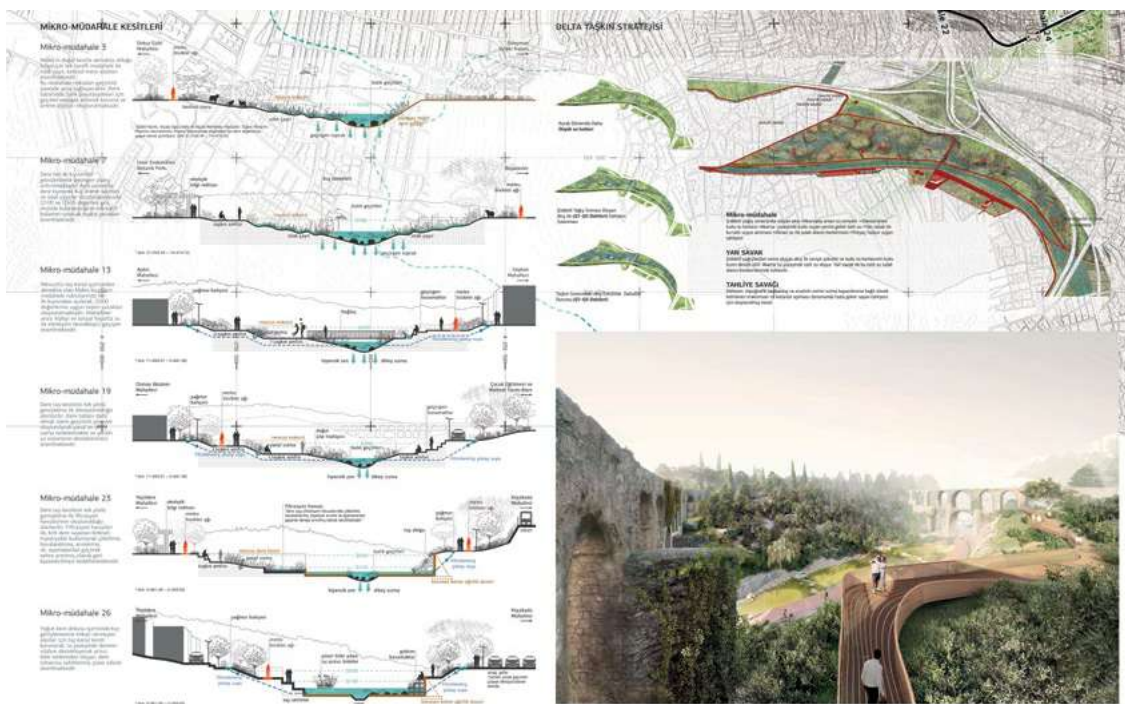
3

Integrational axes:

- ✓ Enabling nature to influence the city
 - ✓ Ensuring the human impact on rural areas be in harmony with nature
- Encouraging a cyclical-feedback economy
Strengthening the bonds between rural and urban cultures

Explanation:

In order to increase permeability to rainwater in heavily urbanised areas, the city's hydrological mechanisms have been remodelled. The sponge city approach has been implemented at the pilot level in Peynircioğlu River, the Meles Valley, Portakal Valley, the Uzundere Urban Renewal Area, and the Kadifekale Recreational Area.



The Meles Valley Ecological Restoration Project was established through a competition. It is anticipated that a great many activities and practices will be adopted in line with the sponge city approach.

The Nature-Based Solutions Project- Urban GreenUp

LAYERS



Integrational axes:

- ✓ Enabling nature to influence the city
- ✓ Ensuring the human impact on rural areas be in harmony with nature
- ✓ Encouraging a cyclical-feedback economy
- ✓ Strengthening the bonds between rural and urban cultures

Explanation:

Urban GreenUp is a 5-year project being undertaken by the Izmir Metropolitan Municipality and funded through the European Union Horizon 2020 program for encouraging the nature-based transformation of cities. The aims of the project are: (1) to alleviate the impact of climate change, and (2) to improve air quality and water management and increase its sustainability. In line with this, a number of projects are being implemented, such as installing pocket gardens, green coverage, and permeable surfacing (on the pedestrian, cycling, and vehicular roads) throughout the space stretching from the centre of Karşıyaka to the Gediz Delta, implementing bio-boulevard water canals, pollinator (insect) houses, biochar (smart soil), a production unit, and planting trees and carbon-sequestering plants, as well as installing inclined greenable permeable surfaces (terramesh), green pavement, green fences, and fruit walls.

In order for the nature-based solutions implemented during the course of the project to be propagated across the city, awareness-raising activities will be carried out along with the establishment of local ecosystems and developing the practice of working together in implementation-production.



At Sasalı, a centre has been established for implementing, researching and planning product design for the practice of climate-crisis resistant agriculture.

The Rural Renewal Project-Ruritage

LAYERS 4

Integrational axes:

Enabling nature to influence the city

- ✓ Ensuring the human impact on rural areas be in harmony with nature
- ✓ Encouraging a cyclical-feedback economy
- ✓ Strengthening the bonds between rural and urban cultures

Explanation:

This project is being implemented in 6 European cities, including Izmir, and embraces 6 main areas: “Food in Rural Areas”, “Art and Festivals”, “Migration”, “Faith Tourism”, “Resilience”, and “Landscape”. Actions commenced towards meeting all of these targets in February 2020, in 9 action areas: geological road map and inventory, researching forest agriculture to increase economic resilience, developing ethnobotanical activities, creating a sound map for the musical heritage of the Bakırçay Basin, improving the pedestrian-cycling axes of the routes connecting natural and cultural heritage, capacity-building for eco-tourism activities, reviving handicrafts, such as basket-weaving, that are on the verge of being lost, consolidating the region’s natural and cultural heritage with nature discovery activities such as the nature school, and developing and branding the regional culinary culture.

As the work currently focused on the Bergama-Kozak area becomes more widespread, it will transform into a comprehensive local development project for the North of Izmir.



Mahmut Koyuş

The Kozak plateau is of great importance for pastoral activities and animal-husbandry.

The Project for Bringing a Public Space Character to Unused Areas

LAYERS 2

Integrational axes:

- ✓ **Enabling nature to influence the city**
Ensuring the human impact on rural areas be in harmony with nature
- ✓ **Encouraging a cyclical-feedback economy**
Strengthening the bonds between rural and urban cultures

Explanation:

The Project for Bringing a Public Space Character to Unused Areas, motivated by a sustainable design approach, aims to reevaluate design and implementation practices in order for the “wasteland areas” in the city centre and surrounding areas abandoned or ruined and lost their natural functions or character due to human structures, such as the transportation network or riverbeds, to be able to make a contribution to the city and its inhabitants.

The project, which will be piloted in the environs of the Halkapınar Transit Station, will integrate currently unused and problematic areas into the city’s ecological network by means of ecological restoration methods, eco-design solutions, and green infrastructural applications, in order to regenerate and repurpose these areas.



The Nature-Based Rural Development Program

LAYERS 4

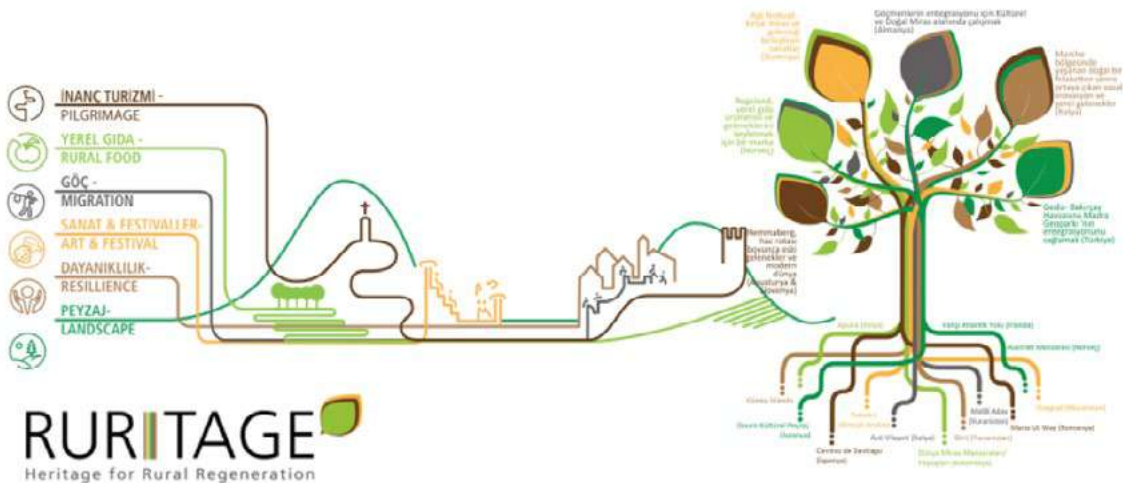
Integrational axes:

Enabling nature to influence the city

- ✓ Ensuring the human impact on rural areas be in harmony with nature
- ✓ Encouraging a cyclical-feedback economy
- ✓ Strengthening the bonds between rural and urban cultures

Explanation:

The program aims to conserve the natural and cultural heritage of rural Izmir and raise rural prosperity by developing tourism strategies that promote ancient cultures of production and the social fabric of rural life. In line with this, design and implementation guides will be developed based on unique planning principles that observe the different needs and potential of various rural communities. Appropriate spatial plans and legal mechanisms will be developed. Thus, a development model that conserves rural Izmir's natural and cultural heritage will be implemented.



The Cittaslow Metropolis Project

LAYERS 2 3

Integrational axes:

- ✓ Enabling nature to influence the city
- ✓ Ensuring the human impact on rural areas be in harmony with nature
- ✓ Encouraging a cyclical-feedback economy
- ✓ Strengthening the bonds between rural and urban cultures

Explanation:

The aim of the Cittaslow Metropolis Project is to implement the Cittaslow philosophy, which was founded in 1999 in Italy and subsequently disseminated to 30 countries, in large metropolises. The purpose of this project is to improve quality of life for the majority of the world's population, who live in cities, by supporting the natural and historical heritage of cities, as well as local producers. Under the project, operating as a partnership between The International Cittaslow Association and the Izmir Metropolitan Municipality, the prominent cities of our era and their approaches to good living were examined and evaluated with 60 stakeholders in Izmir. The results of the study were used to form a set of criteria under the headings; "the urban ecosystem", "the economy", "good management", "eco-transportation", "food", "urban resilience", and "community". In the neighbourhoods selected for piloting under the Cittaslow Metropolis Project, a number of developments are being planned to increase capacity in the areas of health, education, green space, employment, and culture, and on replacing cars with human-centred practices.



The Izmir Sustainability Centre (S-Hub)

LAYERS 2

Integrational axes:

- ✓ Enabling nature to influence the city
- ✓ Ensuring the human impact on rural areas be in harmony with nature
- ✓ Encouraging a cyclical-feedback economy
- ✓ Strengthening the bonds between rural and urban cultures

Explanation:

The Climate and Sustainability Centre (S-Hub), as one of the first examples of SECAP's low-carbon structures, will be designed with zero-energy, and innovative solutions. S-Hub, together with the units of the municipality and other dynamics in the city, will form an organisational structure for carrying out studies on climate change and sustainability. The impact of S-Hub will not be limited to its own physical building in terms of its work on sustainability but will become an organic centre for the work of various different disciplines under a single roof.



The Sustainability Centre will carry out plans for thenature-friendly management of terrestrial and marine ecosystems.

The Izmir Bay Ecological Rehabilitation Project

LAYERS 1 2

Integrational axes:

- ✓ Enabling nature to influence the city
 - ✓ Ensuring the human impact on rural areas be in harmony with nature
- Encouraging a cyclical-feedback economy
Strengthening the bonds between rural and urban cultures

Explanation:

This project will ensure the separation of wastewater and rainwater, and develop the existing water infrastructure to separate, store, and recycle rainwater. Together with removing pollutants from the bay, this will also raise water quality and improve biodiversity. Under this project, 373 km of rainwater piping will be constructed as the main skeleton of the water separation system for Izmir's metropolitan area. The implementation reservoirs for the project are as follows:

- The Meles Reservoir (Part of Karabağlar and Konak, Buca, Gaziemir)
- The Southwestern Collector Reservoir (Part of Konak and Karabağlar, Balçova)
- The Bornova-Bayraklı Reservoir
- The Karşıyaka-Bayraklı-Çiğli Reservoir
- The Narlıdere-Güzelbahçe Reservoir



The rainwater separation projects to be implemented in the areas around Izmir Bay will enable the cleaning up of the bay area.

Izmir Agriculture- the “Another Agriculture is Possible” Program

LAYERS

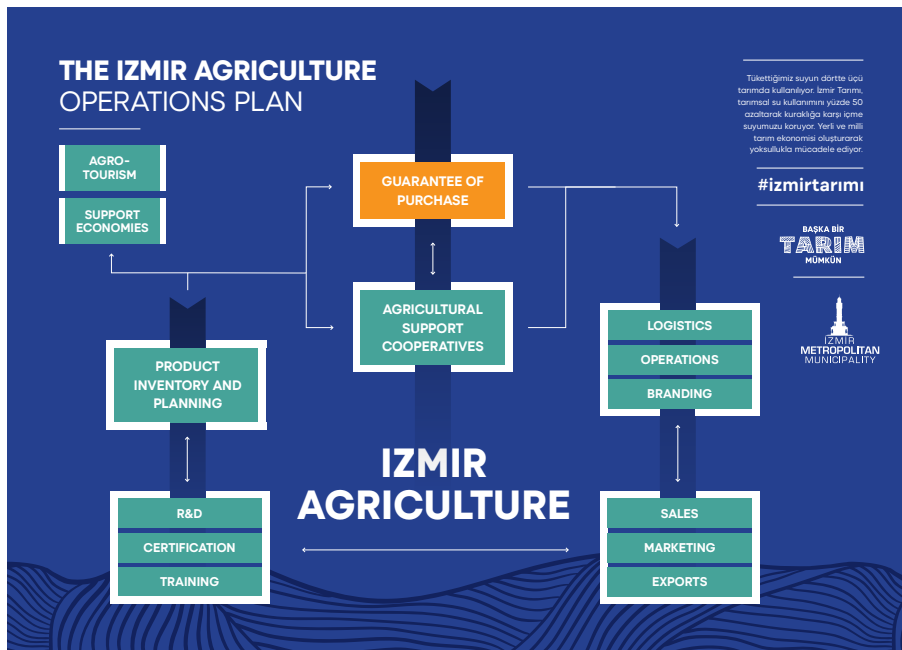


Integrational axes:

- ✓ Enabling nature to influence the city
- ✓ Ensuring the human impact on rural areas be in harmony with nature
- ✓ Encouraging a cyclical-feedback economy
- ✓ Strengthening the bonds between rural and urban cultures

Explanation:

What distinguishes the “Another Agriculture is Possible” vision and the Izmir agricultural program from the agricultural policies followed in Turkey up to the present is the twin focus on the struggle against “drought” and “poverty”. In recent years, the negative effects of the climate crisis have come to be felt as an imminent and constant part of life and have created a serious drought risk. On the other hand, the pandemic has also deepened levels of poverty. The steps taken with Izmir Agriculture is delivering concrete solutions in the struggle against these fundamental issues. Created under the “Another Agriculture is Possible” vision, what makes Izmir Agriculture different is its six-step process: “Product Inventory and Planning”, “Agricultural Support”, “Logistics, Operations, and Branding”, “Sales, Marketing, and Exports”, “R&D, Training, and Certification Processes”, and “Creating Support economies such as Agrotourism”. Under Izmir tourism, high-feasibility products, from both an ecological and economic perspective, have been identified and receive support from the Izmir Metropolitan Municipality.



Izmir Agriculture is founded on the basis of a cyclical logic comprising six steps.

The Sustainable Urban Enlivenment Program

LAYERS



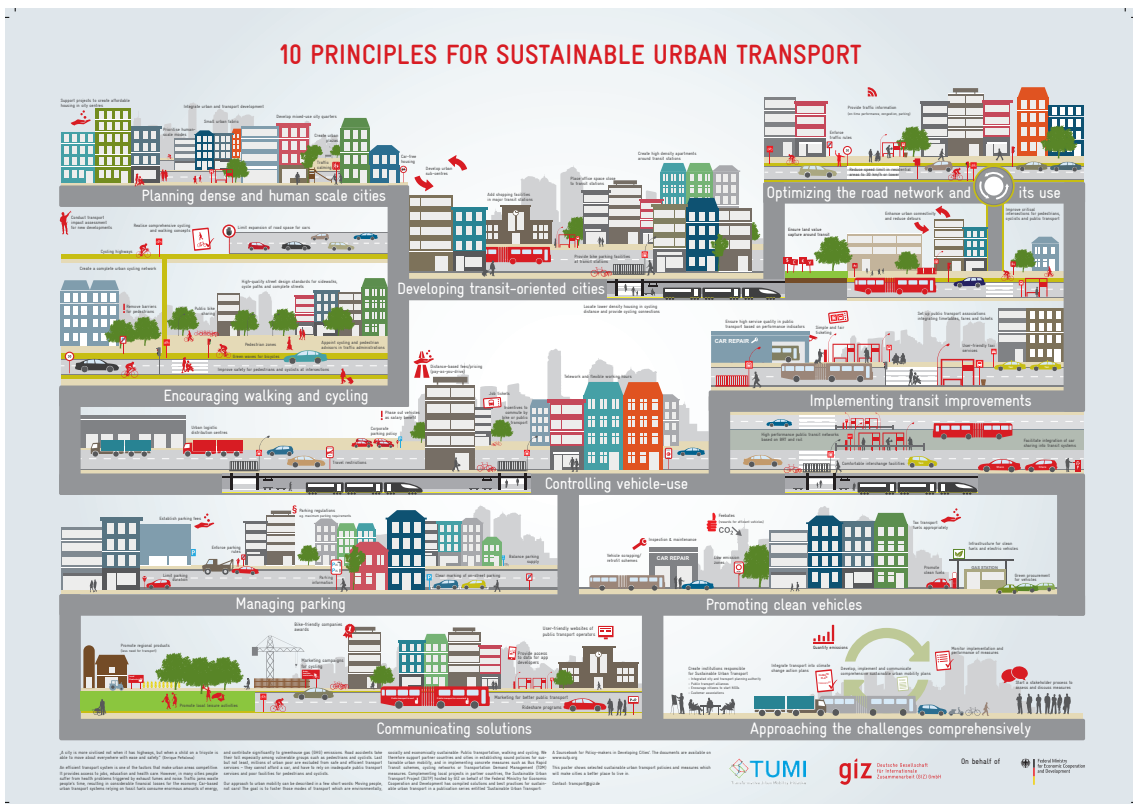
Integrational axes:

- Enabling nature to influence the city
- ✓ Ensuring the human impact on rural areas be in harmony with nature
- ✓ Encouraging a cyclical-feedback economy
- ✓ Strengthening the bonds between rural and urban cultures

Explanation:

The alternative forms of transportation given below will be strengthened to enliven the city while reducing traffic congestion and enabling low-carbon transportation options. The “Park and Go On” system will become more widespread in line with the transportation Master Plan. Pedestrian routes will be increased until 2030 in the districts of Narlıdere, Balçova, Konak, Buca, Karşıyaka, and Çiğli, while the İzmiras routes connecting the city with rural areas will also be established.

The cycling infrastructure will also be improved and broadened. By 2030, the length of the cycling routes will be extended from 67 km to 402 km.



Spreading the Use of Solar Energy

LAYERS

2

3

Integrational axes:

Enabling nature to influence the city

Ensuring the human impact on rural areas be in harmony with nature

✓ **Encouraging a cyclical-feedback economy**

Strengthening the bonds between rural and urban cultures

Explanation:

The Izmir Metropolitan Municipality's investments in renewable energy have enabled the establishment of solar energy plants in buildings such as the Ekrem Akurgal Life Park, ESHOT Gediz Workshop, the Selçuk Solid Waste Transfer Station, the Seyrek Dog Shelter, the Aliğa Fire Station, the Bergama Slaughterhouse, the Uzundere Multi-Purpose Hall, and the Çiğli Family Consultation Centre. Additionally, by utilising renewable energy sources in purification facilities and the existing and newly-planned buildings belonging to the municipality, considerable energy savings will be achieved.



The electricity requirements of ESHOT buses will be supplied by solar generation.

The Program for Reducing the Effects of Urban Heat Islands

LAYERS

3

4

Integrational axes:

- ✓ **Enabling nature to influence the city**
Ensuring the human impact on rural areas be in harmony with nature
- ✓ **Encouraging a cyclical-feedback economy**
Strengthening the bonds between rural and urban cultures

Explanation:

Under the Program for Reducing the Effects of Urban Heat Islands, actions such as the propagation of nature-based solutions, increasing the numbers of plants and trees, green rooves, creating cool, generally reflective, surfaces, utilising cool pavements (reflective or permeable), developing a shade strategy for urban areas, and efficient water management in public space.



Asphalt parking areas in the city centre are being reorganised as landscaping zones.

Increasing the Number of Electric and Low-Carbon Vehicles

LAYERS

2

3

Integrational axes:

Enabling nature to influence the city

Ensuring the human impact on rural areas be in harmony with nature

✓ Encouraging a cyclical-feedback economy

Strengthening the bonds between rural and urban cultures

Explanation:

ESHOT is planning to increase its existing electric bus fleet of 20 vehicles to 100 by 2022.

The purchase of electric buses will both renew the Izmir municipal bus fleet, and also contribute to the implementation of the low-carbon transportation policy.



The Izmir Metropolitan Municipality is planning to increase the number of electric buses in the city fleet to 100 by 2022.

The Recycling Program

LAYERS 2 3

Integrational axes:

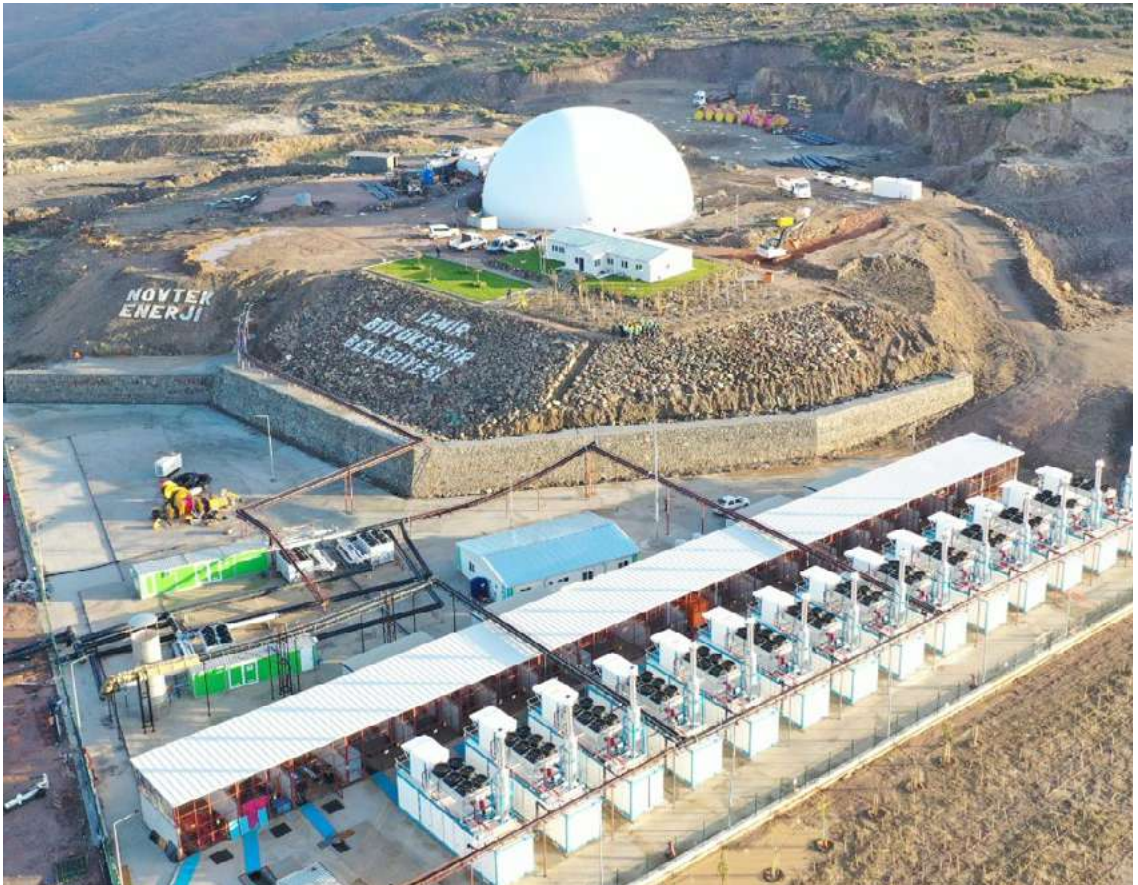
Enabling nature to influence the city

- ✓ Ensuring the human impact on rural areas be in harmony with nature
- ✓ Encouraging a cyclical-feedback economy

Strengthening the bonds between rural and urban cultures

Explanation:

In addition to the rehabilitation of the Harmandalı Regular Solid Waste Storage Site, there are also plans to establish facilities for the recycling of waste and also for utilising waste in energy generation in the city's axes of growth. In line with the goals set out in the 2018 Integrated Solid Waste Management Plan, space for the existing and planned infrastructure necessary to meet the need for accomplishing the separation and recycling of waste, and developing its use in composting, is to be increased.



The Harmandalı Regular Waste Storage and Biogas Facility, Çiğli.