Hungarian University of Agriculture and Life Sciences

Institute of Landscape Architecture
Urban Planning and Garden Art

Bir el-Bey Forest
Urban Park Development

Thesis Report

Student: Firas Ben Youssef
Tutor: Dr. Almási Balázs
N5HREH

2024

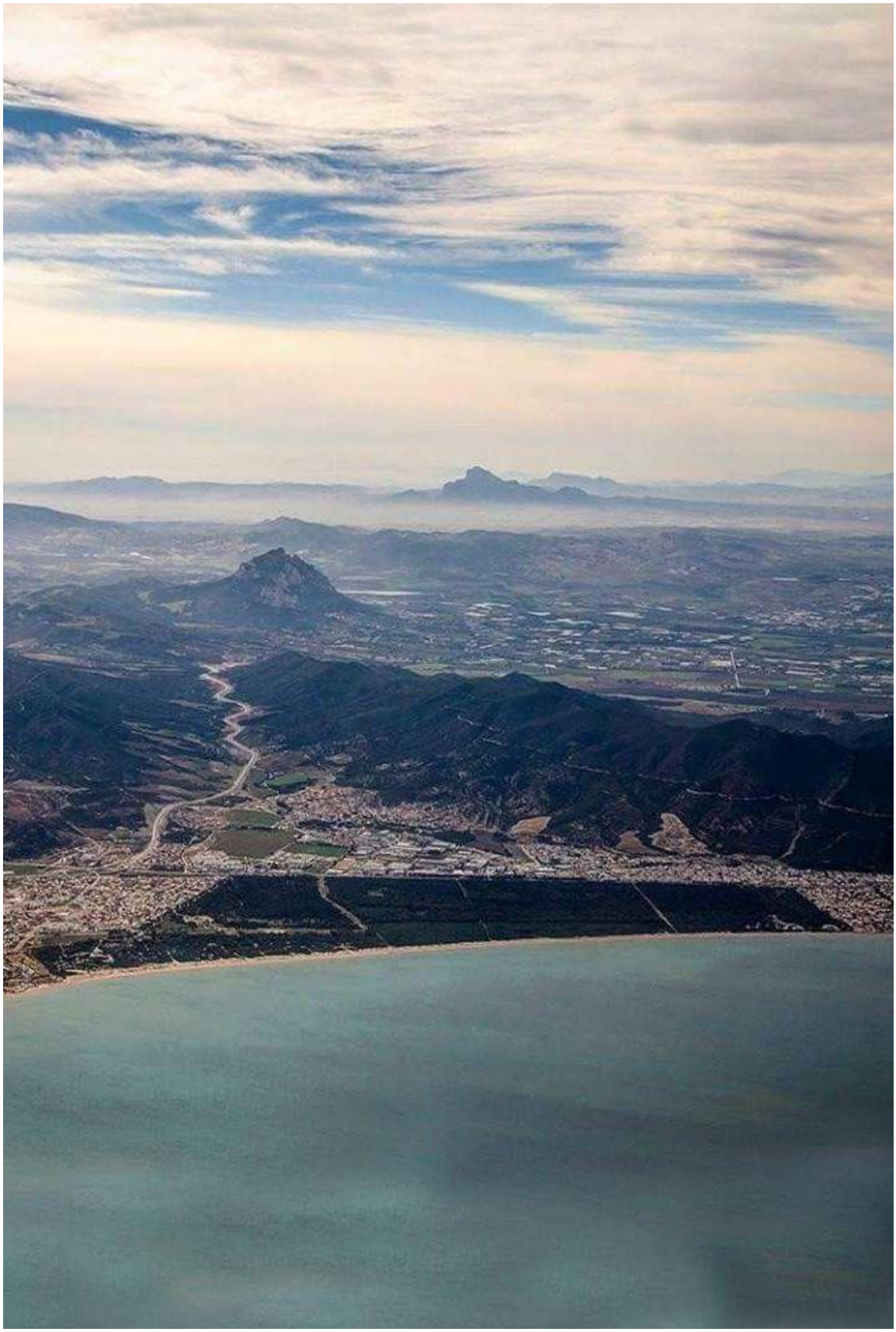


Figure 1 : Plane view on the southern suburbs of "Greater Tunis" – "Bir elBey" forest, "Bougarnine" mountain…

Table of contents:

I/Methodology:

The main objective behind the elaboration of this thesis is a reflection and a response, established to several degrees, concerning an urban and environmental situation, both current and to be anticipated, which we assume to be "problematic" characterizing the peri-urban territory of the southern suburbs of Tunis, particularly that of the open green space located around the cities of "*Borj Cedria*", Erriadh *City*" and "*Hammam Chatt*", called "*Bir el-Bey*" forest.

In light of this, we propose in the first chapter, a general analytical reading, in which we will present an overview of the southern suburbs of Tunis from a historical perspective through the indication of its location and the chronology of the development of its agglomerations along the last decades, then, a macro-scale analysis dealing with the characteristics of the study region, such as the climate, the topography, the water system, the connection of neighboring governorates and cities, the land use, and the urban/landscape character.

In the next part of this chapter, we will approach the mesoscale analysis of our study site (the forest of *Bir el-Bey*), and this via the determination of its dimensions, immediate context, accessibility, topography, structure, existing functions, green cover, and legislative status of the forest. At the end of this part, a synthesis will be established to highlight the problematics as well as the potential deduced from this phase which will subsequently contribute to the determination of the conceptual process of the project in the coming stages.

The 3rd chapter will be devoted to the reflection and the design process of the site. The conceptual aspect will be addressed once the previous data are identified. We work on this approach through the determination of the strategy and the goals of the intervention in the first step, then the translation of these ideas into a bubble diagram, a proposed circulation hierarchy structure, and some initial sketches visualizing the first sketches.

After determining the main guidelines according to which the dispatching of the functions will be organized along the master plan, a series of "Focus" plans & sections will be developed to understand furthermore the design process within more detailed scales. Plant species, materials, and details will be underlined in the following phases, and for the last part of the design chapter, we will conclude with the presentation of photorealistic visualizations transmitting the atmospheres and ambiances of the most iconic parts of the project.

Finally, we tie up this work with a general synthesis that features our vision of the impact of the proposed project on the region and demonstrates to what degree this park will be able to improve the quality of life of the inhabitants as well as the development and the protection of the remaining green spaces in the southern suburbs of *Tunis*.

II/Introduction:

Tunisia, the coastal north African country, was referred to in some historical references during the past centuries as the "*Green Tunisia*" for being characterized by the omnipresence of forests that covered more than half of its territory, starting from the center of the country to the northern parts of it.

Nowadays, as several cities are witnessing a demographical explosion, urban agglomerations, particularly in" *Greater Tunis*", are sprawling rapidly at the expense of green covers all over the territory, leaving the remaining natural environments under the threat of numerous alarming situations.

Such is the case in our area of study, as the southern governorate "*Ben Arous*" of the capital "*Greater Tunis*" above all, has shown during the last two decades, a noticeable lack of natural and open green spaces dedicated to public use, and that's in terms of numbers and superficies while the populations are in permanent growth and the demand on such environments is accentuating incessantly. These circumstances are visible in reality as well as throughout recent statistics that have shown unbalanced ratios between urbanized areas (91%) and natural environments (9%). http://www.investintunisia.tn/Fr/ben-arous-en-bref_114_421

The southern suburbs, a component of "*Ben Arous*" governorate, where our focus area is situated, are manifesting in turn, a similar urban and environmental conflict. The "Bougarnine" Mount and "Bir-elBey" forest are the two emblematic remaining natural areas of this region, covering a total surface of around 2000 hectares. However, despite the presence of these considerable natural green areas along the urban fabric, something that is considered unique compared to the other cities of the capital, and within a peculiar and contradictive situation, these natural environments have rarely been frequented by public users, and inhabitants of these regions have been deprived of any decent mean of accessibility or use in within for a long time, a thing that prompts us to raise many question marks.

III/Analysis:

III-1/ Preview of the southern suburbs of "*Tunis*":

III-1-1/ Location:

The southern suburbs of "*Tunis*", geographically, and as an administrative entity, belong to the governorate of "*Ben Arous*". Being situated within these coordinates: Latitude: "36.7531, Longitude: 10.2189 - 36° 37′ 60″ North, 10° 15′ 0″ East, this governorate is located 10 kilometers from the capital and is surrounded by the governorates of "*Zaghouan*", "*Manouba*", and "*Nabel*". It covers an area of 761 km² and had a population of 712,170 as of the 2019 census. It is spread along a coastline (Gulf of "*Tunis*") measuring 15km long to the northeast, bordered by mainly sandy beaches that include the country's main commercial port, "*Radès*".

Figure 2: Geographical satellite map of the Northern part of Tunisia

III-1-2/ History & Chronological growth:

"*Ben Arous*" is one of the first urban centers of "*Grand Tunis*" which has witnessed a remarkable spread of its urban fabric since the beginning of the 20th century. Indeed, it continues to record urban growth taking place in the form of subdivisions often to the detriment of sensitive natural areas.

The urban growth of this governorate is part of the spatial spreading process of "*Tunis*". The capital, formerly made up of the medina and the European city has spread to the old neighboring buddings. Thus, from the 1940s, the most isolated cores of the southern suburbs saw their areas, traditionally reserved for agricultural and forestry activities, replaced by housing, public facilities, industrial zones, and transport infrastructures. This was the case of numerous delegations, among them, we mention "*Ben Arous*".

While on the eve of Independence, a vast internal migratory movement took place towards the capital, since the 1980s, there has been a clear change in the direction of migratory flows: the role of "*Tunis*" is diminishing and the towns mainly in the northern and southern suburbs became the first centers of urban concentration.

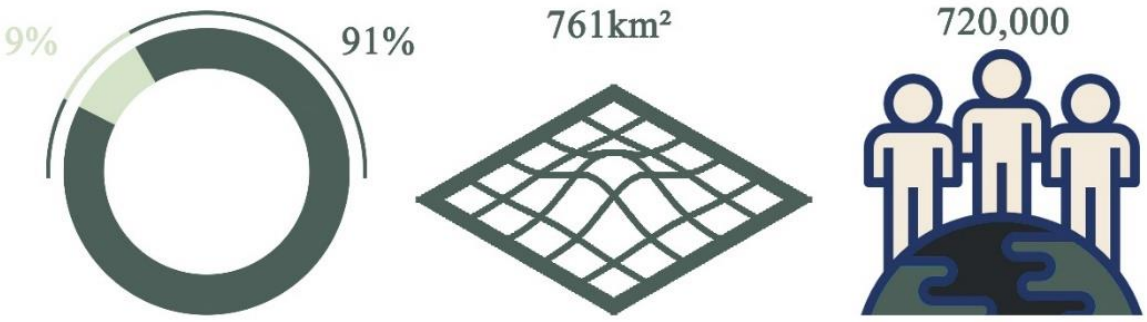


Figure 3: "Ben Arous" Demographic data according to the 2019 Census survey

The urbanization of this governorate, in particular at the level of the southern suburbs, took place gradually towards all directions through all physical natural constraints (hills, forests, mountains...) including the forest of "*Bir elBey*", which spawned a noteworthy narrowing of its boundaries. Mizouri M., Mtimet A. Pression urbaine sur les terres agricoles peri-urbaines du grand Tunis.

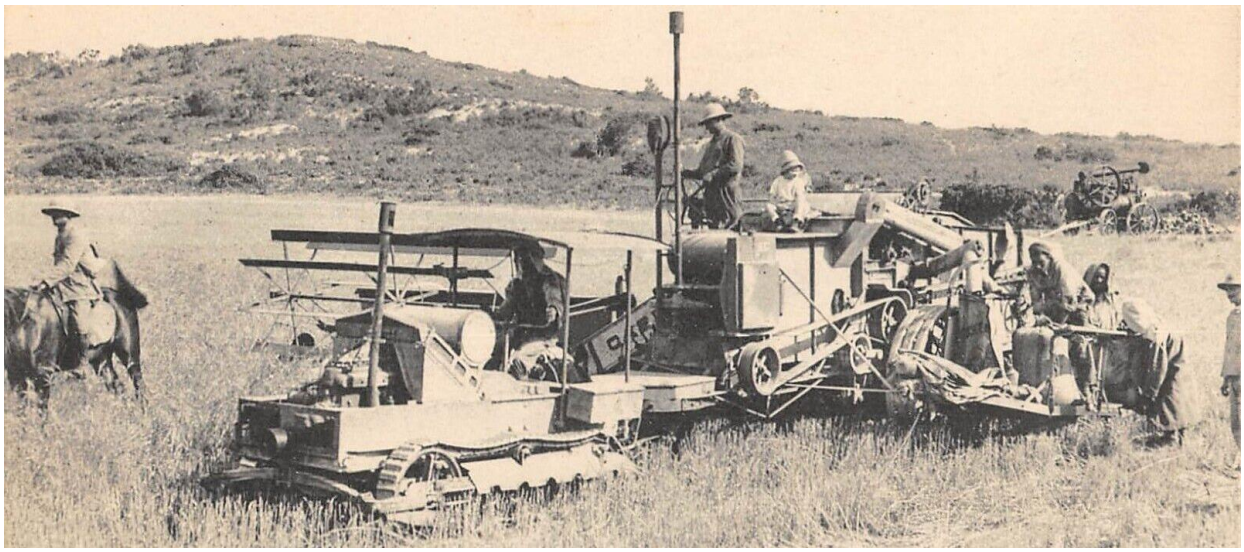


Figure 4: Photo of the former agricultural "Elysée" domain at "Bougarnine" Mountain foot – "Bir elBey" – Colonial era

III-2/ Macroscale: Characteristics of the area:

III-2-1/ Climate:

The region of "*Tunis*" and its governorates, including "*Ben Arous*", enjoys a Mediterranean-type climate characterized by mild temperatures that are sometimes cold in winter and very hot in summer despite the softening caused by the proximity of the sea.

The average temperature ranges between (11.4) degrees Celsius in winter and (30.5) degrees Celsius with rarely recorded values in January of minimum (- 2) degrees Celsius and maximum temperatures recorded in August at (47) degrees Celsius. The variation of the temperature is remarkably mild between winter and summer, occasionally marking sharp transitions in spring.

The precipitation regime is characterized by its irregularities, (annual rainfall is 285–535 millimeters), rainy in winter and dry in summer with an annual average of around 470 mm spread over a hundred days over the months of October to March, the wettest month is October with an average of 66.1 mm. Conversely, the summer months of July and August register an average of one to two days of rain with very low averages (less than 2.5 mm).

In spring the prevailing winds are from the North and North-West sector with East and North-East trends. In summer, the winds are from the eastern sector with northeast and even northwest tendencies.

the southerly winds and the frequent south-westerly and south-east sirocco in summer contribute to the rise in temperature in summer between June and August, up to (47) degrees Celsius as mentioned before.

Due to the proximity of the sea, relatively high humidity in "*Ben Arous*" recorded an annual average of 68.2% varying from 46% to 78%.

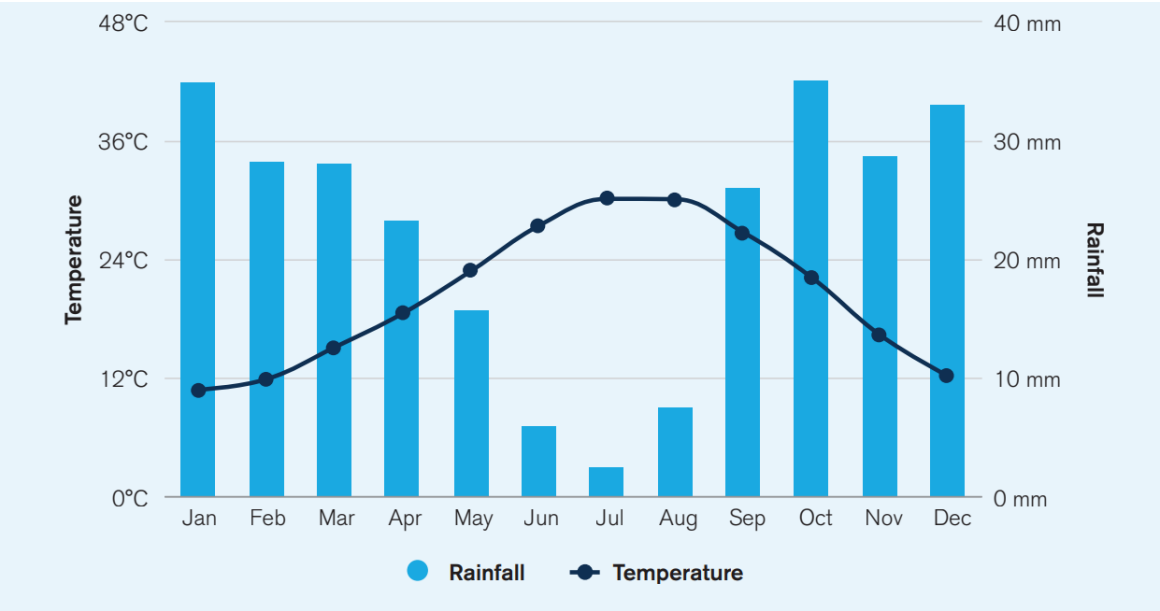


Figure 5: Average monthly temperature and rainfall of Tunisia for 1991–2019 - climateknowledgeportal.worldbank.org/

III-2-2/ Topography and water system:

"*Ben Arous*" is estimated to be spread at 21 m height above sea level, most of its territories are relatively flat and dominated by an agricultural (South – West) and urban character (North), except for the south-eastern side of it, where the mountain range "*Sidi Salem*" extends with a peak reaching a height of 501 m, and Mount "*Jabal al-Rasas*" with a height estimated at 750m, as well as Mount "*Bougarnaine*" with a summit of 576 m high, extending adjacently to our study area within approximately a kilometer of range.

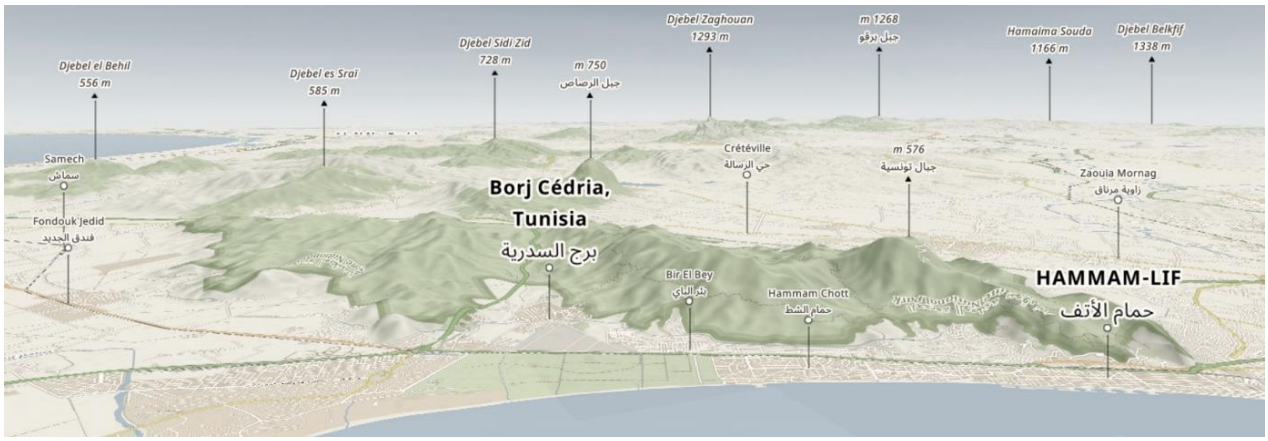


Figure 6: 3D Simulation of the general topography of the southern suburbs of "Tunis"

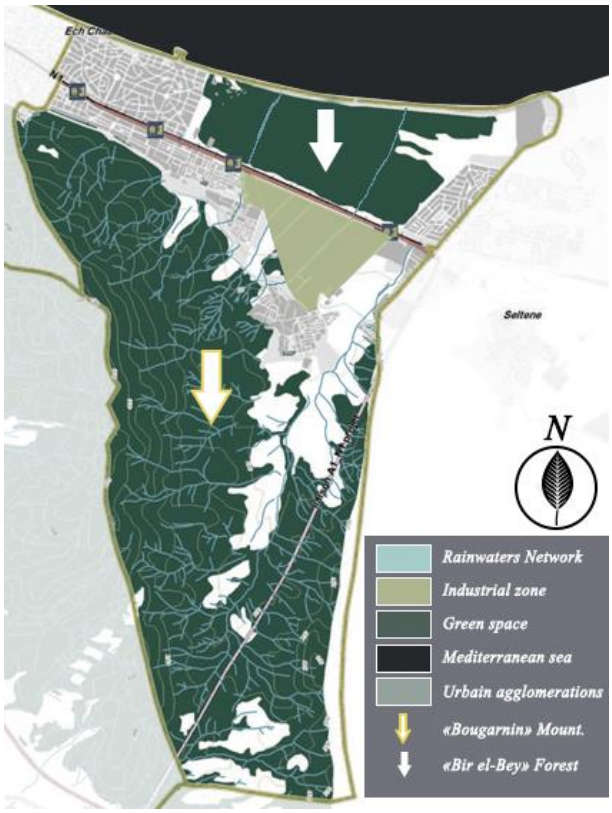


Figure 8: Map of rainwaters network in the eastern banks of "Bougarnin" Mountain and "Bir el-Bey" Forest

Considering the direct context of "*Bir elBey*" forest, the mountain "*Bougarnine*" represents the principal conductor and waterways channeler of the southern suburbs mainly from its northern side (as shown in the figure), supplying therefore, nearby cities like "*Hammam Chatt*", "*Borj Cedria"*, and "*Erriadh*" with rain waters that, following the topography of the area, end up being versed into the sea after penetrating over the lands in between, inclusive of "*Bir el-Bey*" forest. At this level, we can detect several creeks running in both orthogonal directions.

Figure 7: Photo of the main water Canal running through the northern bank of "Boukarnin" Mountain

III-2-3/ Urban network connections (Governorates/Cities):

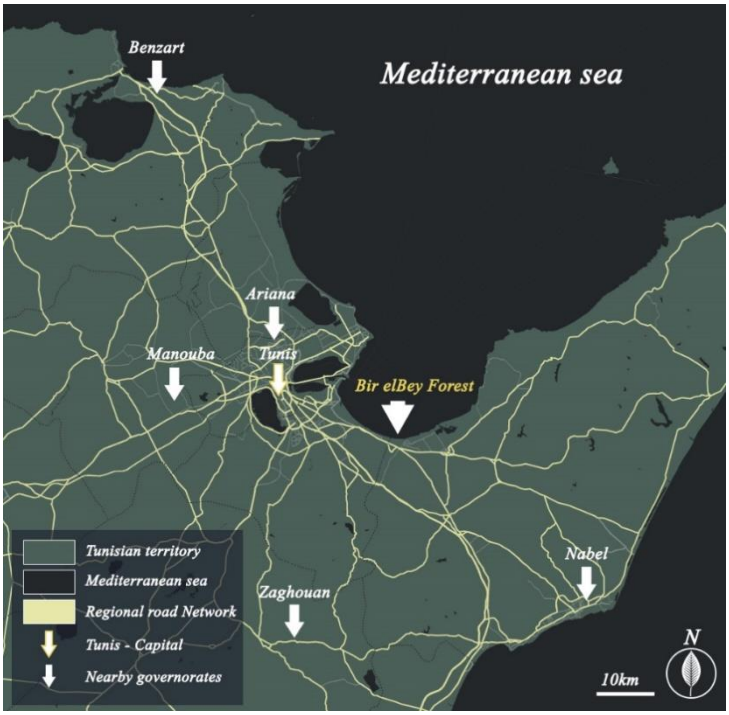


Figure 11: Map of the main surrounding governorates – By author

Figure 9: Photo of the A1-R34 Mountain-Road

Figure 10: Photo of the RN1 Road

Being a transit zone with excellence and constituting one of the entrances to the capital, the southern suburbs are presented as a node of exchange between the North and the South of the region as well as of the entire country as it stands 10 km away from "*Tunis*".

By draining road flows from and towards the capital, the road network supports interregional and inter-municipal traffic and sub-regional flows (including bus & train lines). The RN1 is the main link in the road system of the southern suburbs as it crosses over 22.6 km and records around 300.000 vehicles daily passing through the main urban centers: "*Mégrine*", "*Ezzahra*", *Hammam lif*", "*Hammam Chatt*" and "*Borj Cedria*" where our study site is located. It is connected furthermore to a section of the A1 motorway (Crossing Mount "*Bougarnine*"), regional roads, and local roads as well. (See figure).

Regarding railways transport, the *S.N.C.F.T* (National Railway Company) has established a line along the southern suburbs' coastline from "*Tunis*" to "*Erriadh*" on a 46 km itinerary serving 16 stations, in particular, the localities of "*Hammam Chat*", "*Bir elBey*", "*Borj Cedria*" and "*Erriadh*".

This daily means of transport is ensured by over 130 trips carrying about 100,000 travelers a day. Atlas Du Gouvernorat De Ben Arous - 2010 - Page 47.

III-2-4/ Natural and Urban Landscape character:

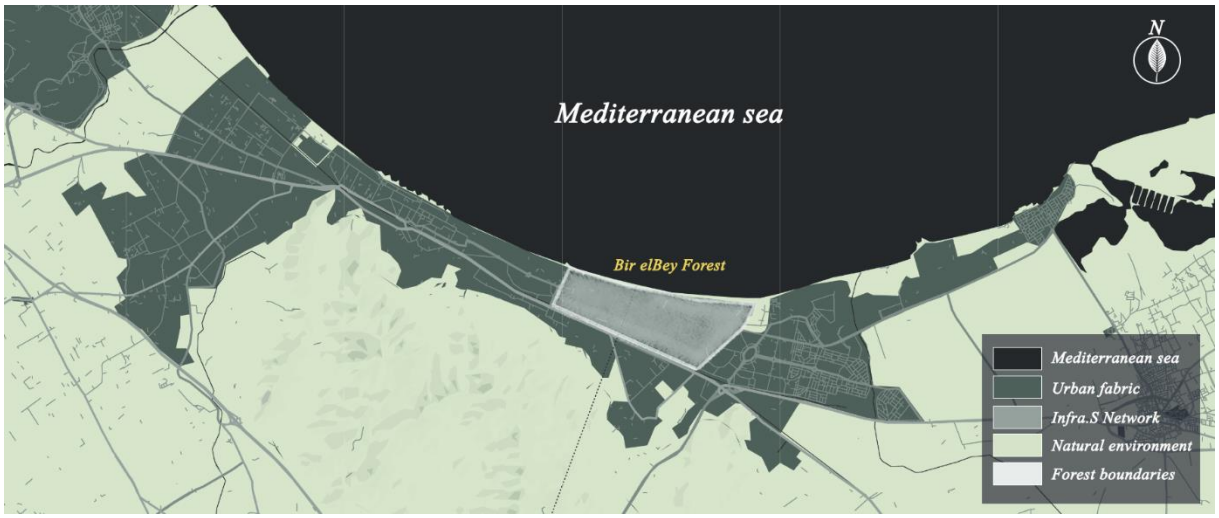


Figure 12: Location of "Bir el-Bay" forest within the southern suburbs

Besides its slightly dense urban fabric, our defined studied area is distinguished by the presence of 3 characteristic natural components that can barely be found met together elsewhere in Tunisia: the "*Mediterranean*" sea and the Mountain "*Bougarnine*" (576m) which are spread along the North-West / South-East axis with an in-between distance of around 1km, and within this narrow spatial interval, cities like "*Hammam Lif*", "*Hammam Chatt*", "*Bir el-Bey*", and "*Borj Cedria*" have been developing along an 8km naturally made corridor at the expense of what used to be a vast agricultural and forest area… what is left of it nowadays is the so-called *"Bir elBey"* forest covering only 3.5km² in total.

Figure 13: Photo of the general landscape took from "Bougarnine" Mount.

Figure 14: Photo of the National Road RN1, the railways line and "Bir el-Bey" Forest

Parallel to the linear urban fabric were established both, the train line and the RN1 national road. These two infrastructure elements, while relating the capital to the southern regions of the country, are simultaneously dividing the cities of the southern suburbs longitudinally leaving a few transitional and connecting points that are often suffering from traffic issues.

In addition to the engendered disruption between "*Bir elBey*" forest and the mountain, the expansion of the urban fabric has created a sort of interruption in the green infrastructure of the southern suburbs overall, in fact, the closest park/forest ("*Rades*") to our focus area is about 11km away and the second closest parc/forest is at a distance of 16km to the west. In general, the entire governorate contains only 2 public parks with a very narrow and limited surface (2.1km² and 0.3km²) compared to the occupied urban territory (716km²) and its population of more than (712.170) inhabitants.

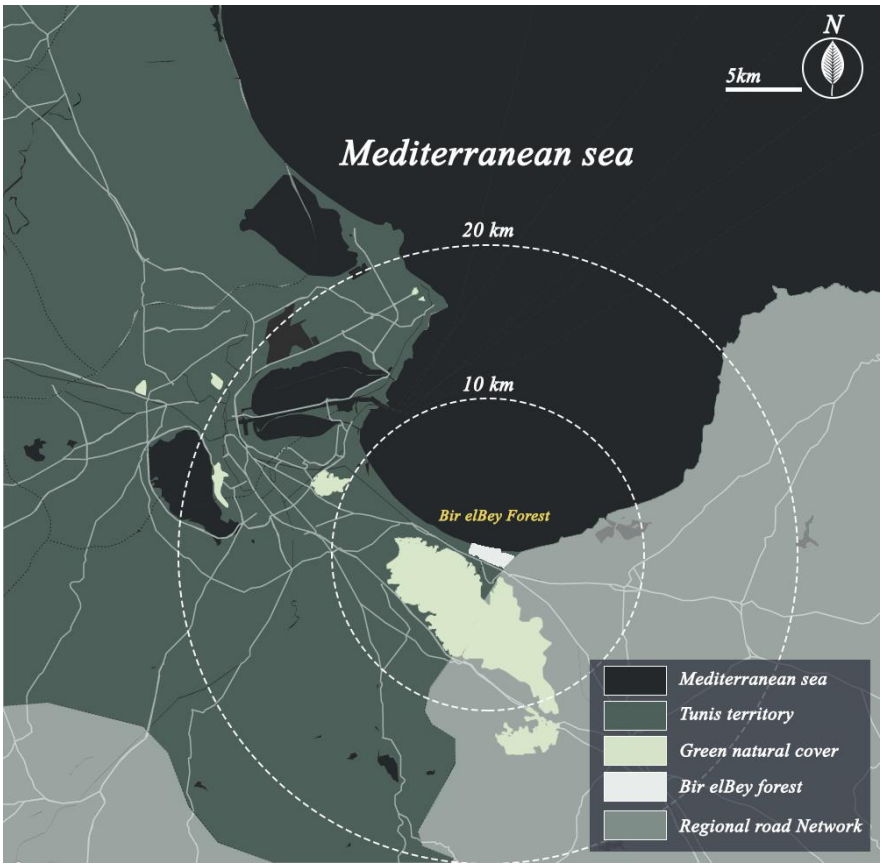


Figure 17: Location of "Bir el-Bey" Forest compared to the green areas within the southern part of the Capital

Figure 15: Train station of "Borj Cedria"

Figure 16: Bridge Connection above the RN1 Road

The surrounding agglomerations are essentially residential, regrouping individual housing units (G+2 floors maximum) and collective residential units (G+5 floors maximum), with dispersed commercial centers, an industrial zone in "*Borj Cedria*" and a tourist zone (Hotels) located on the coastline of "*Erriadh*" city, aside from several educational institutions, governmental establishments, hospitals, and sports facilities.

III-3/ Meso-scale: the selected site:

In this part of the analysis, we will give prominence to the justifications behind our site selection from urban, social, environmental, and legislative perspectives, later on, we will underline the properties of the site through a mesoscale lecture.

As mentioned previously in the introduction, the two likely potential natural sites capable of receiving an intervention project are "Bougarnine" Mountain and "Bir elBey" forest, nevertheless, urbanely speaking, both sites are manifesting some dysfunctions.

The main factor contributing to the inaccessibility of the regionally most iconic mountain, "Bougarnine" is the relatively unsafe nearby neighborhoods (spontaneous agglomerations, social instability, etc…), in addition to several restrictions declared by the authorities after successive arson attempts during the last couple of years. Moreover, the actual vocation of "Bougarnine" mountain territory is classified as "Public state domain" besides being a national reserve which doesn't easily allow, within these circumstances, any intervention or project establishment in this particular area.

On the other side, lays the "Bir elBey" forest, a unique urban green cover occupying 3.5km² of surface, unfortunately, devoid of any public leisure facilities for the inhabitants of the city despite its substantially large area. This forest offers an attractive landscape in contrast with the urban space that surrounds it and manifests as a potential destination for the citizens. This site is going to be the subject of our proposed project.

Figure 19: View of Bougarnine Mountain from "Bir el-Bey" side

Figure 18: View from "Bir el-Bey" Forest

III-3-1/ Size and direct context:

The forest presents a means of access to the sea mainly for the inhabitants of "*Bir el-Bey*" agglomeration, as it adjoins the coastline along more than 2000m from the north side, "*Hammam Chatt*" city along 800m to the west, and the city of "*Erriadh* with its residential and touristic vocation, along 1000m of linear boundaries to the east. From the southern side, where the industrial zone of "*Borj Cedria*" is located, extends both the national road RN1, the southern suburbs railway line, and the interlocal/regional bus lines, granting the forest the privilege of being connected to the traffic network through 5 train/bus stations along 2.5km.

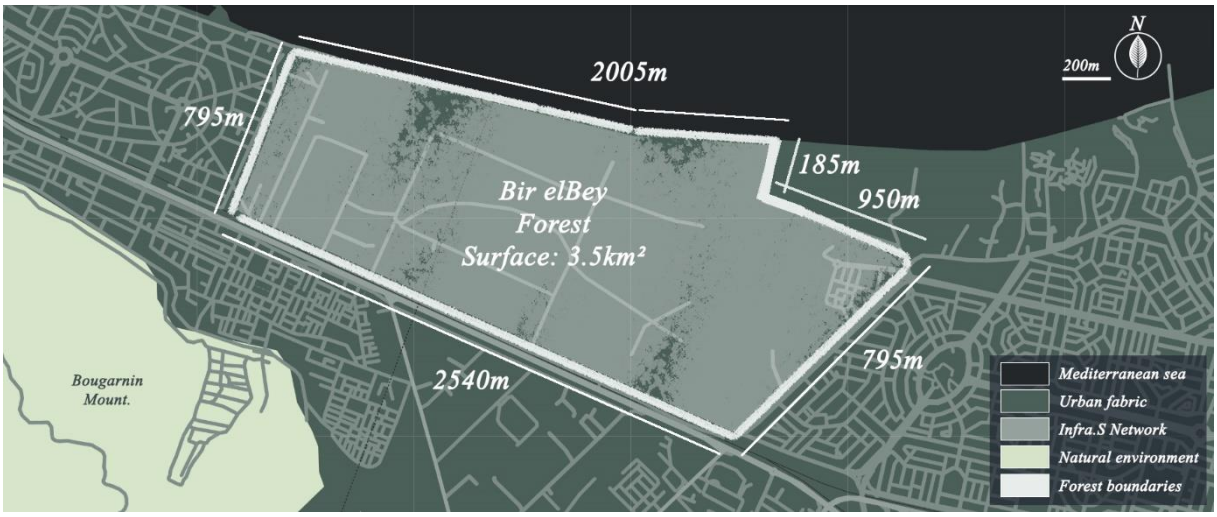


Figure 20: Dimensions of "Bir elBey" forest

III-3-2/ -Accessibility:

The site is totally open from the seaside, unlike its western side, where the "*Institute of Animation for Youth and Culture*" is established, as it is entirely fenced with a 2.5 m height wall. As for the eastern side, part of it is fully open to the neighborhood along 700m, yet the other part is fenced and allows access only through 4 entrances that lead to the "*National Team Football Training Academy*" and to the "*International Scout center*".

Figure 21: Institute of Animation's Southern Gate

Figure 23: Western wall of the forest

Figure 22: View from the Northern side of the forest

Concerning the southern side, although it contains no clear access, it is entirely exposed to this direction while aligned with the existing creek and railways. The presence of the ground railways and the RN1 road, in addition to the few numbers (2) of transitional elevated pedestrian paths (bridges), has reduced the access possibilities to the forest for the inhabitants of "*Bir elBey*" and the frequenters of the industrial zone of "*Borj Cedria*".

Figure 24: Site accessibility Map

III-3-3/ - Topography:

Figure 25: "Bir el-Bey" forest topography

The contour lines of the site show a variation of about 10 to 15 meters of altitude measured along about 800m between the southern boundary and the northern one (sea line).

A few high points are spotted by the south, 2 creeks crossing longitudinally, and a few shallow points where rainwaters accumulate during rainy seasons.

III-3-4/ - Structure of the site and existing functions:

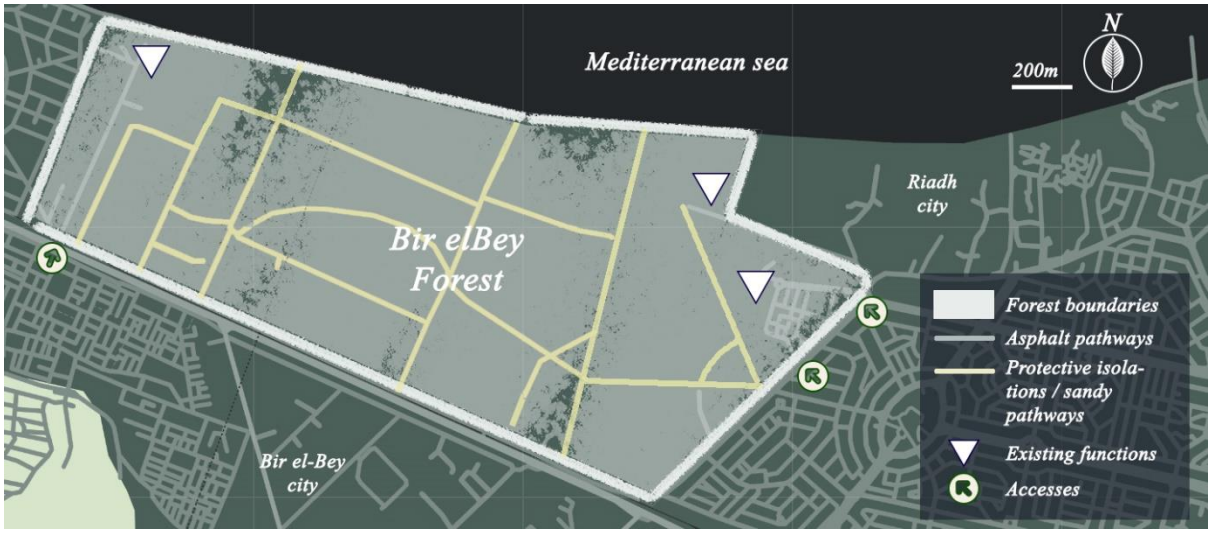


Figure 26: "Bir el-Bey" forest Circulation Structure & Functions Map

Only 3 facilities exist within the domain's boundaries: The "*National Team Football Training Academy*" in addition to the "*International Scout Center*", both occupy the north/eastern corner of the domain. To the opposite corner, we find the "*Institute of Animation for Youth and Culture*". We may consider these functions to be semi-private, as, aside from the absence of attractive points or spaces, access is generally not granted for the public to frequent such facilities, except for the scout club since it offers a few tracks for short promenades within its limits, otherwise, inhabitants of the region can barely be seen around.

Figure 27: Photos of the Institute of Animation, the Scout center gathering point and the Football Academy

The paths leading to the mentioned facilities are asphalted with an average width of 3-4m, but deep in the forest, it is easily possible to detect some sandy pedestrian pathways that the few frequenters of the place use. They were initially created by the municipality for either protective

purposes, as it helps to prevent fire spreading and easy control, or following the creek courses for occasional checking missions. For such a reason we cannot perceive a precise logic behind its structure in terms of open space design.

From a satellite view, these pathways are characterized by their linearity, generating rigid green fragments as they create an orthogonal structure system with a few exceptions, but generally speaking, the lines are either parallel or perpendicular to the railways.

Figure 29: Photo of a Sandy pathway

Figure 28: Photo of a narrow asphalt pathway

Figure 30: Photo of a narrow asphalt pathway

III-3-5/ - Green cover:

The green cover within the site is heterogeneous in terms of density rates and species as they vary from one spot to another. The northern part of it, being close to the beach, is mainly a low and a medium level green cover as it is composed of shrubs and steppes such as Ammophila arenaria ssp. Arundinacea, Calycotome spinosa, Pistacia lentiscus, Quercus coccifera, Halimium halimifolium, Halimium halimifolium, etc… Concerning the rest of the forest, Trees, and a few species of shrubs and herbs are the dominant type of vegetation: Pinus pinea, Acacia podalyriifolia, Pinus Halepinus, Olea europea, Pistacia lentiscus, Myrtus communis, Calycotome villosa, etc…

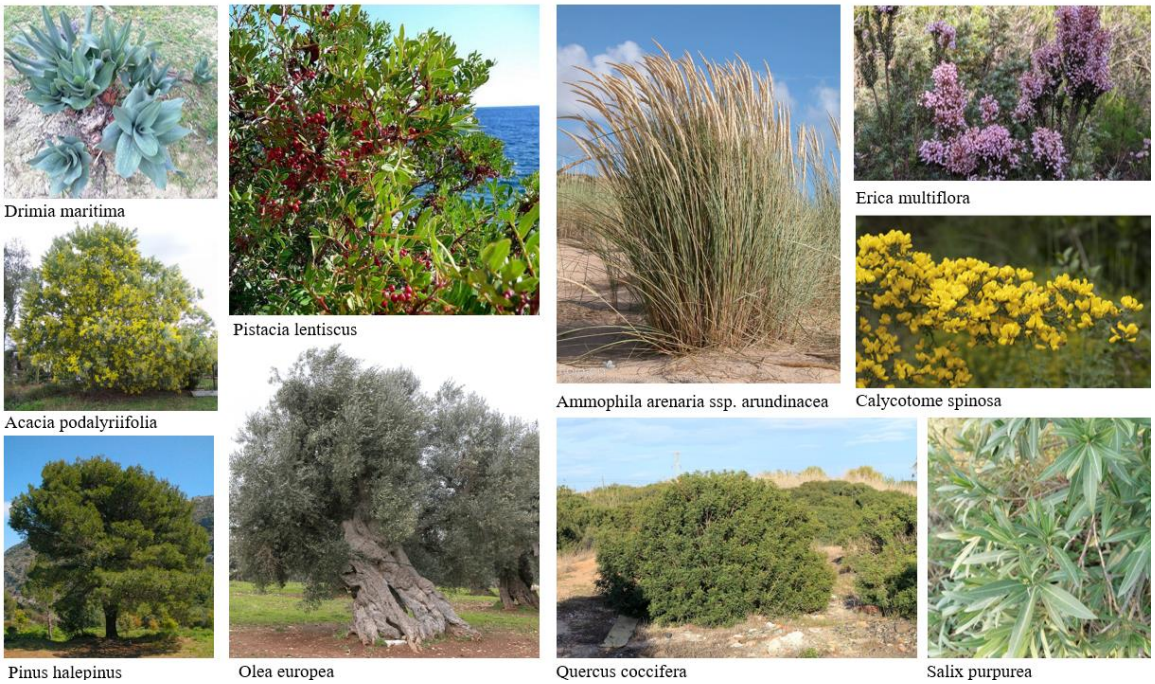


Figure 31: A selection of the existing plant species

Figure 32: Distribution of green cover types along "Bir el-Bey" forest

"*Bir el-Bey*" Forest boasts a composition where 81 percent is enveloped in dense forest cover, nurturing diverse ecosystems. Open meadows and unplanted zones contribute 16 percent of its expanse, offering vital breathing space amidst the dense tissu. Approximately 12 percent of the area comprises steppes and coastline green cover, creating a transition between land and sea habitats. Despite its natural dominance, the forest accommodates around 1.5 percent of built elements.

Figure 35: Shoreline green cover

Figure 34: Dense green cover crossed by a sandy pathway

Figure 33: Glades – poorly vegetated area

III-3-6/ - Legislative framework for prospective intervention:

According to the document "*Strategy For Development And Sustainable Management Of Forests And Rangelands - Regional Action Plan 2015 - 2024*" published in December 2015 by the " *General Directorate of Forests* ", one of the administrative constituents of the "*Ministry of Agriculture, Hydraulic Resources and Fisheries*", the Tunisian state has defined the forest areas concerned by a new strategy aimed at enhancing the Tunisian forests along the country, in particular those most sensitive and most threatened by factors as both urban and environmental. It is within this framework that the forests of "*Ben Arous*" governorate fit, and in particular, the forest of "*Bir el-Bey*".

This strategy consists, among other things, of protecting forest areas as well as their development on the environmental, social, and economic levels through encouraging the establishment of recreational projects to improve the quality of life for the concerned residents, as well as by attracting activities of an ecological aspect, such as eco-tourism centers, natural reserves, protected areas, and public parks.

P2: Optimisation de la contribution du secteur au développement socio-économique	Appui à l'organisation et au développement socio-économique des populations (GDA, SMSA) autour de la cogestion des forêts aménagées dans les zones prioritaires	- La mise en œuvre de cette tâche est soumise à des contraintes d'ordre législatif (accès aux ressources..). - Besoin d'identifier les options de cogestion et de les réglementer.	• Orienter la cogestion des forêts aménagées vers les ONG et GDA dans les zones prioritaires. • Orienter la cogestion des parcours vers les ONG et GDA dans les zones prioritaires.
	Appui au développement des filières forestières et pastorales; notamment le liège, le bois et l'Alfa :	Les filières sont spécifiques aux régions. A titre d'exemple on cite le bois, le liège, les pignes, le myrte, le lentisque, le champignon, etc. Un tel appui se fera à travers de : - la vulgarisation et l'organisation. - l'amélioration des opérations sylvicoles. - la diffusion de l'information (étude, brochure…) par les services centraux de l'AF.	
	Valorisation des ressources forestières et pastorales dans le domaine de l'économie verte	- Accompagnement à assurer par les arrondissements forestiers. - Besoins de partage l'information sur l'économie verte avec les arrondissements forestiers et de fournir la formation.	• Optimiser la valorisation des produits forestiers et pastoraux non ligneux.
	Banque de projets pour les forêts et parcours à l'attention des promoteurs	- Elaboration des études de projets. - Besoin de transfert du savoir-faire aux régions. Rôle que les services centraux sont appelés à assumer.	• Etablir une banque de projets spécifiques régionaux pour chaque priorité.
	Développement du Partenariat Public-Privé et promotion de l'économie verte	- Avis des arrondissements est indiscutable dans le développement des PPP y compris l'accueil, l'information et l'orientation.	
	Valorisation des AP gérées et des paysages naturels par l'écotourisme et le tourisme naturel	- Les AP et les paysages naturels qu s'apprêtent à l'écotourisme dans les régions sont: o Les aires protégées. o Les massifs ayant une valeur paysagère très importante. o Les zones côtières très riches (paysage, richesse faunistique et floristique) qui sont encore peu exploitées - Parmi les contraintes qui avaient entravé l'octroi des concessions forestières, le groupe note : o Le cadre législatif: la loi de 2005 relative aux concessions dans le domaine forestier de l'état o Textes d'application en vigueur inadéquats	
P3: Maintien et amélioration des fonctions et services environnementaux des ressources du secteur	Conception du système de surveillance ou de veille pour la prévention et la protection des forêts contre les feux et la protection sanitaire	- Besoin de décentraliser le système de veille sanitaire tout en impliquant l'INRGREF. - Instauration d'un système de surveillance qui comporte des mesures d'accompagnement impliquant les services régionaux.	• Consolider et créer un centre de protection régional. • Projeter la création d'un centre départemental (inter-gouvernorats) de protection des forêts.
	Mise à niveau des infrastructures de prévention et de protection	- Renforcement des équipements et infrastructures. - Renforcement des capacités (moyens humains et matériels). - Formation. - Meilleure complémentarité entre les services forestiers aux niveaux central et régional permettant au personnel régional de participer au marché d'acquisition de tous types de matériels et de recevoir la formation nécessaire.	• Assurer que les plans d'aménagement prennent en charge de la mise à niveau des infrastructures.
	Elaboration/révision et la mise en œuvre de nouveaux plans d'aménagement forestier sur une superficie de 320 000 ha	- les priorités de la région en matière d'aménagement des forêts sont : o Les forêts non aménagées ; o La forêt de chêne liège ; o La forêt de tétraclinaie ; o La révision des PV périmés. - Besoin de garantir la participation des services régionaux à la validation des PV d'aménagement - Besoin de créer des unités régionales pour la préparation et la mise en œuvre de PV d'aménagement - Renforcement des moyens financier, du personnel et de la formation.	• Recenser les forêts à aménager. • Elaborer de nouveaux plans d'aménagement et réviser ceux qui sont périmés.
	Entretien des aménagements en cours sur: 307000 ha	- Retard dans l'entretien des aménagements dû au manque des moyens personnels et financiers.	
	Mise en œuvre du programme de développement durable de la subéraie	- Les problèmes associés au développement de la subéraie : o Dépérissement ; o Vieillissement ; o Manque de régénération ; o Manque de la Main d'œuvre qualifiée pour l'opération de démasclage.	
	Elaboration et mise en œuvre de plans d'aménagement et de gestion durable des AP	- Les priorités de la région pour l'élaboration et la mise en œuvre de plans d'aménagement et de gestion durable des AP sont les aires protégés qui ont des PV d'aménagement, et créées par décret. - Cependant, cette tâche peut faire face à des contraintes d'ordre financier et humain. - Le défi pourra être levé par le biais du PPP, avec l'appui des bailleurs de fonds et par le recrutement et la formation du personnel.	• Elaboration et mise en œuvre de plans d'aménagement des aires protégées. • Identification des sites naturels qui s'apprêtent à l'investissement dans la valorisation des aires protégées et l'écotourisme.
	Amélioration et suivi de l'efficacité de gestion des aires protégées	- Nécessitant un renforcement des capacités.	
	Fournitures de l'information, sensibilisation du public et amélioration de la communication autour des AP	- Les arrondissements ne sont pas suffisamment outillés pour jouer un rôle dû au manque d'information.	• Intensification de la communication autour des aires protégées.

Figure 36: Legislative extracts from the : « stratégies de développement et de gestion durables des forêts et des parcours » document

III-4/ Synthesis:

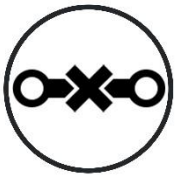
As a conclusion of the analytical work established through the previous chapters, we will bring out the outlines while classifying them according to two points of view:

III-4-1/ Problematics:

A- Besides the existing functions dedicated to limited users, the forest doesn't contain any appealing set of functions for public use.

B- The forest is presenting, in most parts, an urban obstacle for the surrounding cities due to inadequate connectivity to its instant context.

C- The green open space shows increasing degradation rates due to abundance, lack of maintenance, and inappropriate use.



D- The forest is no longer connected to the green network.

III-4-2/ Potentials:

A- The location of the forest regarding the urban fabric is a very important factor in the success of the future project.

B- The different landscape characters within the forest can be promising for various ambiances and atmospheres.

C- The forest is already connected to the transportation network.

D- The functions surrounding the forest regroup numerous categories: hotels, industrial areas, universities, schools, and residences, therefore, a variety of targeted users can be expected.

IV/ Design phase:

IV-1/ Strategy & Intervention goals:

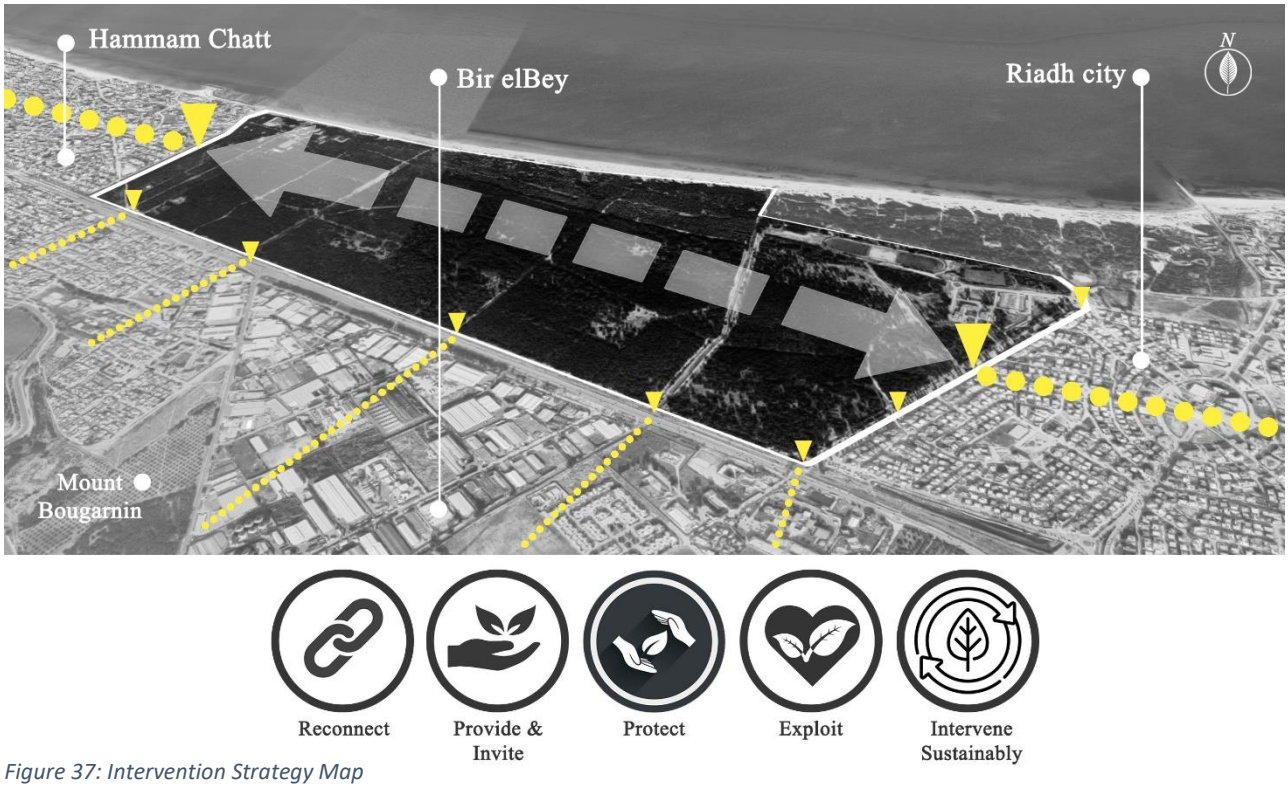


Figure 37: Intervention Strategy Map

The main intervention goals and strategy principles are defined as follows:

A- Reconnect the cities (mainly "*Erriadh*" & "*Hamma Chatt*") by a "green corridor" crossing the forest and aligning with the 2 existing urban axis in both cities ("*Avenue de la Liberté"* from *"Hammam Chatt"* side, and *"Avenue de Tunis"* from *"Cité Erriadh"* side*)*.

This Step will allow citizens of both agglomerations to make use of a shorter itinerary through a green and refreshing atmosphere along 2.7 km. The longitudinal transition through this green space will not be authorized for vehicles, only public buses will be used as some stations might be installed within this new axis.

Regarding the lateral reconnection, between the city of "*Bir el-Bey*" and the coastline, it will be translated through the increase of the connecting pedestrian-bridges numbers from 2 to 5, with an average distance of 0.5km instead of 1.9km between each transitional point, and this, to offer more options for the users and to minimize the longitudinal distances between the bridges.

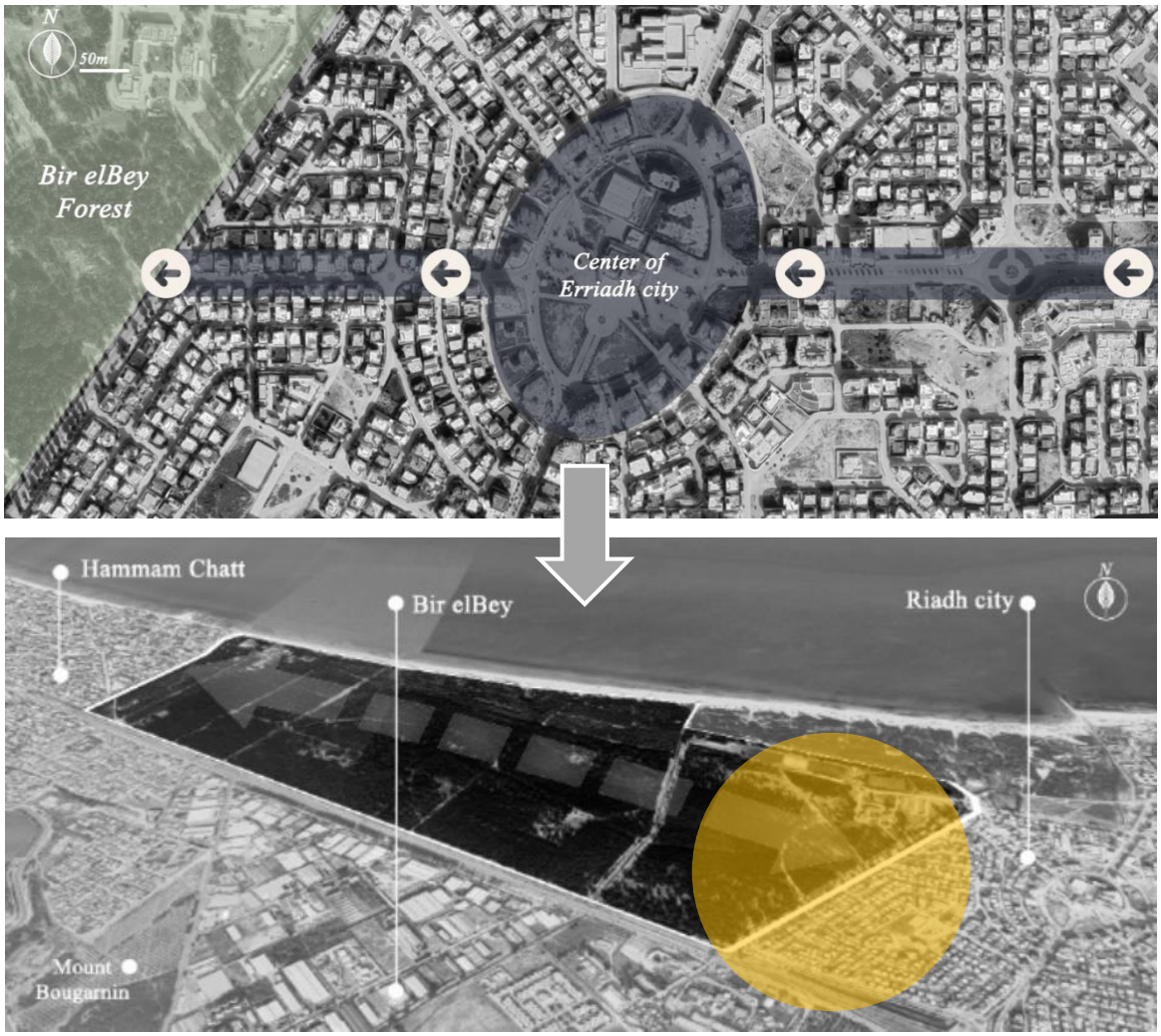


Figure 39: « Erriadh city » reconnection Map

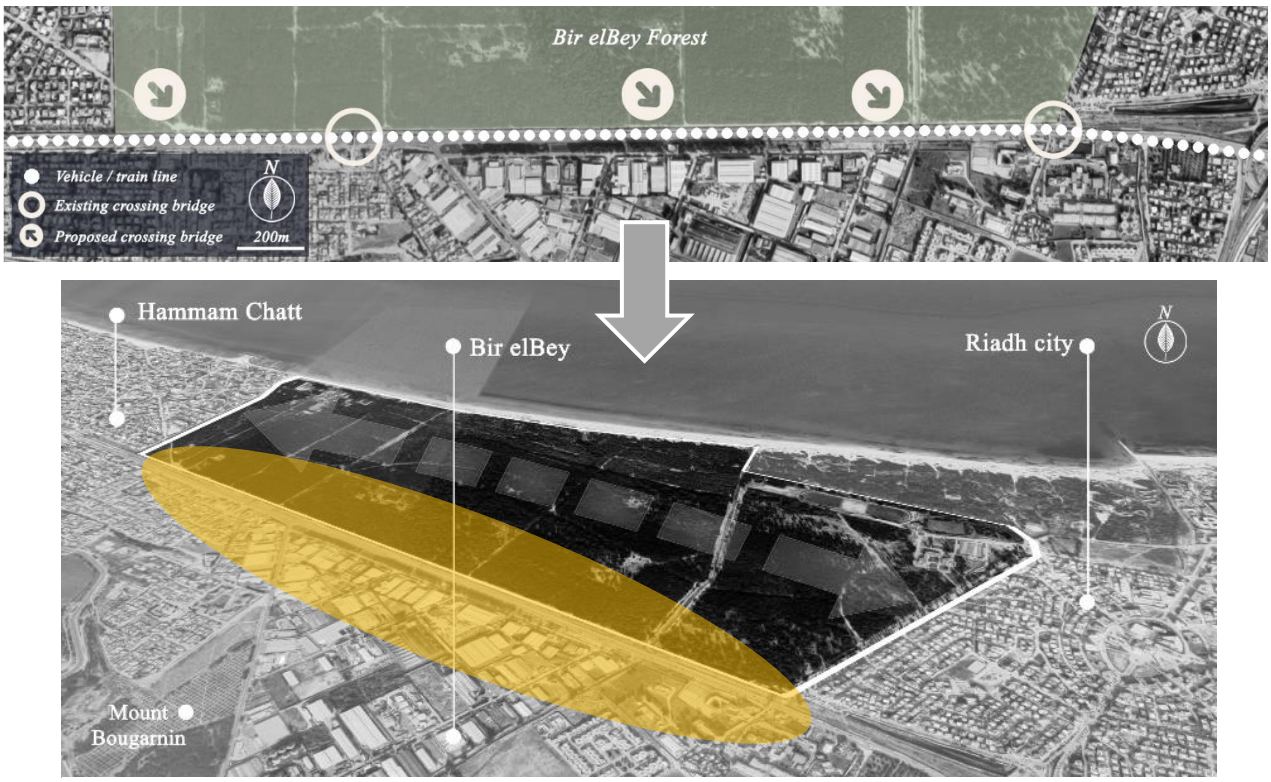


Figure 38: « Bir el-Bey city » reconnection Map

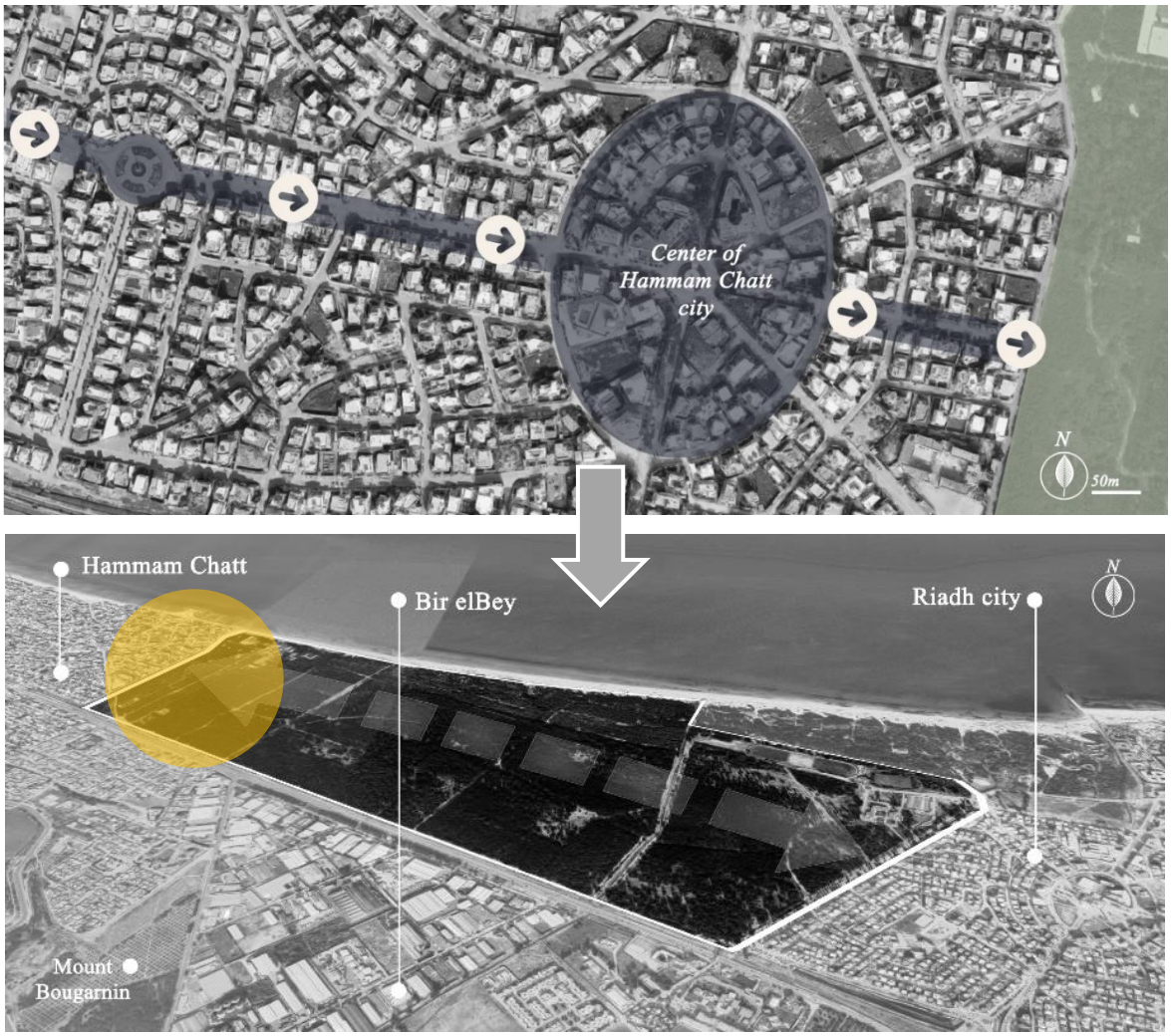


Figure 40: « Hamma Chatt » reconnection Map

B- Provide & Invite the citizens to enjoy the natural environment by creating appealing functions within the perimeter of the green space. The targeted users vary as the forest is surrounded by different vocations such as residential units, industrial zones, educational institutions, hotels, etc… Therefore, the expected targets are students, workers, tourists, casual citizens, bikers, athletes, and so on.

The distribution of the proposed functions will take into account the proximity of each vocation. As the forest is spread over a considerable surface, the accessibility to the designated area or function by the concerned type of users should be studied and traced in a reasonable approach.

Figure 41: Map of vocations repartition (existing) around the forest

Figure 42: Proposed functions per user category

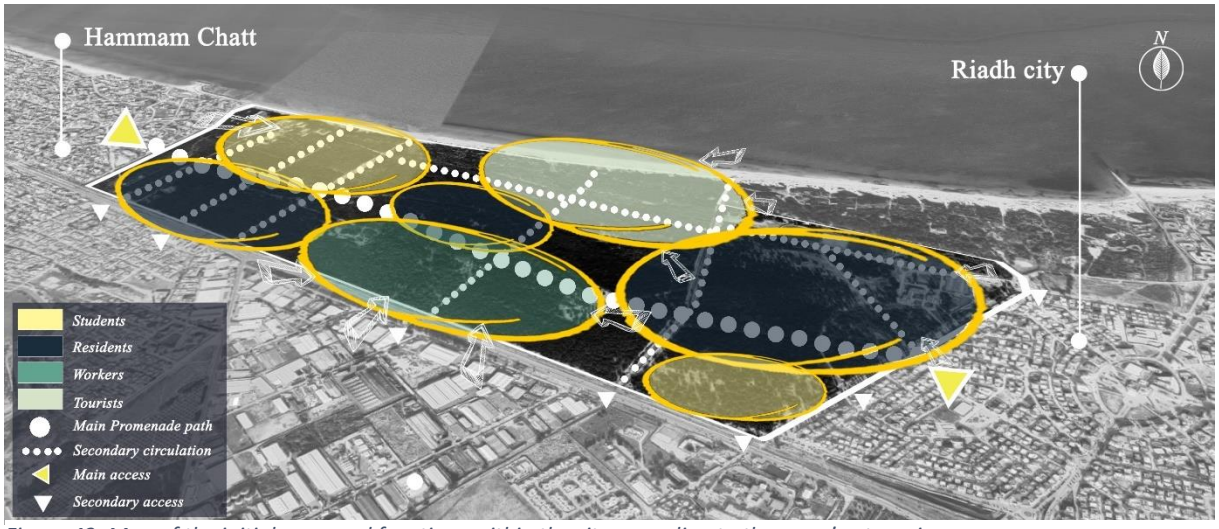


Figure 43: Map of the initial proposed functions within the site according to the users' categories

C- Protect the forest from vandalism and aggressions on the green cover and equipment by involving the inhabitants in the conservation policy and that's via strengthening the affiliation sense (The forest is a regional landscape value to preserve).

High attendance increases safety and preservation based on the principle that says "*the more the eyes are on the park, the safer it is"*. Therefore, a set of involvement strategies aiming for the protection and the creation of a sense of ownership and responsibility toward the park can lead the different intervening parties to participate in this action, and that's through numerous methods:

*** Volunteer Programs**: Establish volunteer programs where residents can contribute their time and skills towards park maintenance, monitoring wildlife, or assisting park staff with various tasks.

*** Educational Outreach**: Offer educational programs and interpretive signage within the park to raise awareness about its ecological significance, biodiversity, and the importance of conservation. Encourage the kindergartens, schools, and universities in the area (around 30 educational establishments spread within a 5km ray around "*Bir el-Bey*" forest) to incorporate field trips to the park into their curriculum and programs.

*** Partnerships with Local Organizations**: Collaborate with local & regional community groups, environmental organizations, and associations to organize joint conservation initiatives or fundraising campaigns for park improvements. Many organizations have been actively working on such aims like the "*Eco Tourism Environment" (ETE+)"* Association, *"The Tunisia Ecology"* Association*, "The Tunisian Permaculture"* Association*, and the "Tunisian Association for the Protection of Nature and the Environment".*

*** Citizen Science Programs**: Engage residents in citizen science projects focused on monitoring wildlife, tracking biodiversity, or assessing environmental indicators within the park. Provide training and resources to enable residents to participate effectively.

*** Youth Involvement**: Empower young residents through youth leadership programs or environmental clubs focused on park conservation. This point can be assisted with the presence of the "*International Scout Center*" which is well known for its strong implication in such orientation.

*** Inclusive Decision-Making**: Involve residents in the decision-making process for park management through public consultations, surveys, or participatory planning workshops. Ensure that their voices are heard and considered in shaping the future of "*Bir el-Bey*" park.

By implementing these strategies, park authorities can effectively engage inhabitants in the protection and conservation of "*Bir el-Bey*" forest and the proposed park, creating a stronger sense of stewardship and community ownership over this valuable natural asset.

D- Exploit the different potentials of the site like creek lines, low areas for potential rainwater catchment and water features creation, elevated grounds for viewpoints towards the sea and the mountain, promenade circuits along the shoreline and the existing pathways, dense parts of the forest (functions that require shade) open parts (functions that tolerate direct sun), etc ...

Figure 44: Location of the various aspects and atmospheres of the landscape within "Bir el-Bey" forest.

The variety of atmospheres that "*Bir el-Bey*" forest can significantly enhance the quality of a future park in within through several ways:

*** Aesthetic Appeal**: Different atmospheres within a forest offer diverse scenic beauty. This variety can create visually stunning landscapes, attracting visitors and providing them with unique experiences.

*** Biodiversity**: Forests typically host a wide range of plant and animal species, contributing to biodiversity. This diversity can create opportunities for educational experiences, wildlife observation, and appreciation of natural ecosystems within « *Bir el-Bey*" park.

*** Therapeutic Environment**: The existing various forest atmospheres, such as the dense woodlands, open clearings, and tranquil creeks, can offer therapeutic benefits. Visitors can find solace and relaxation in different natural settings, contributing to mental well-being and stress reduction.

*** Recreational Opportunities**: The variety of forest atmospheres can cater to different recreational activities. For example, dense woodlands may be ideal for hiking or birdwatching, while open meadows may be suitable for picnics or outdoor sports. Providing diverse recreational options increases the "*Bir el-Bey*" park's appeal to a broader audience.

*** Educational Value**: Valuable opportunities for environmental education can be offered thanks to the diversity of the atmospheres within this forest. In connection with the previous strategic point (C-Protect), visitors can learn about different ecosystems, plant & animal species, and ecological processes through many related functions.

*** Habitat Preservation**: By preserving diverse forest atmospheres within the park, habitat for various plant and animal species is conserved. This contributes to overall ecosystem health and resilience, ensuring the long-term sustainability of the park's natural resources.

*** Inspiration for Design**: This option is crucial since it may present a source of inspiration for the coming design phase of the park. The natural charm of “Bir el-Bey” is an important part that helps create engaging and innovative recreational spaces.

E- Sustainable intervention

essentially by reusing existing paths within the proposed circulation network and avoiding as maximum as possible, green cover removal. It's crucial to adopt a holistic approach in this matter, and this involves conducting thorough environmental assessments to understand the ecosystem's needs and limits

It is also fundamental to work on upgrading the existing pathways with eco-friendly materials that can minimize environmental impact while enhancing visitor experiences all along the forest.

The sustainable aspect will be also underlined through the exploitation of existing water sources presented by the creek lines for example, which can be integrated into the water management system of the park through the connection to the irrigation systems of the plants, to the proposed water features such as fountains, fish ponds and mainly the artificial lake which will occupy a very convenient spot within the park.

Figure 45: Photos of an open meadow and a sandy pathway spotted in the forest

IV -2/ Bubble Diagram

Figure 46: Functional bubble diagram

The translation of the highlighted strategy points will be noticeable, in the first step, through a Bubble diagram that expresses the initial dispatching of the proposed functions according to the previously mentioned criteria: the topography, the targeted users, the existing green cover situation, the proximity of specific vocations, the position of the entrances and the additional landscape value of each spot along the park.

IV -3/ Initial sketches & Master Plan (Sc 1:5000)

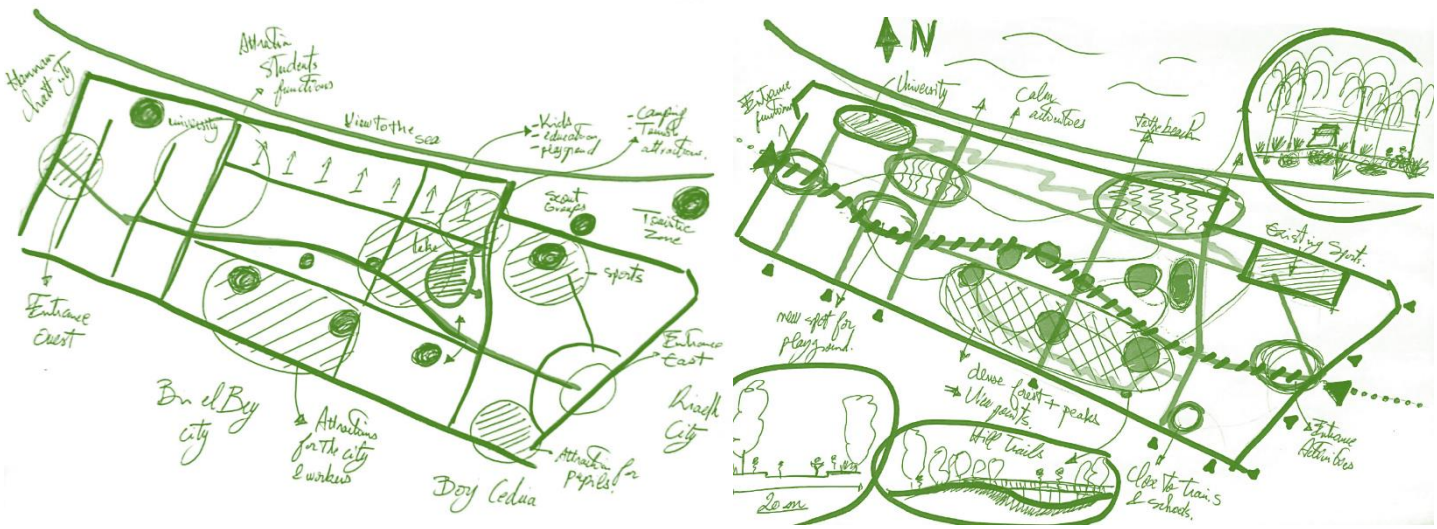


Figure 47: Initial Plans and drawings

Figure 48: Master Plan – Last Version

Moving from a preliminary bubble diagram to the meticulously crafted master plan of the park involved a comprehensive integration of various elements, guided by the existing pathways network, diverse landscape potentials, and an unwavering commitment to sustainability. The initial exploration of bubble diagrams allowed for the conceptualization of different zones within the park, each tailored to harness the unique features of its surroundings. The existing pathways network served as a backbone, dictating the flow of movement and ensuring accessibility throughout the park. Embracing sustainability principles, the design incorporated eco-friendly materials, water conservation strategies, and native plantings to minimize environmental impact and enhance biodiversity.

Distinct atmospheres emerged as a result, with elevated pathways weaving through the lush canopy in the southern part of the forest, offering visitors an immersive experience amidst the trees. To the north, winding bike trails hugged the coastline, providing scenic routes for cyclists and pedestrians alike. Open meadows were designated for fire camping and picnics, fostering a sense of community and connection with nature. An artificial lake became a focal point, encircled by playgrounds and restaurants, adding vibrancy and recreation opportunities for visitors of all ages.

Regular evaluations and feedback loops ensured continual refinement and enhancement of the design. User experience was paramount, prompting adjustments to pathways for better circulation, the addition of amenities to meet diverse needs, and the incorporation of innovative features to elevate the overall park experience. Through iterative refinement, the park's master plan evolved into a dynamic and inclusive space, inviting exploration, relaxation, and appreciation of the natural world.

IV -4/ Materials and plantation strategy:

Figure 49: Main used materials along the park

In the design of "Bir el-Bey" Park, sustainability and functionality will be paramount considerations due to its ecologically sensitive situation. For the shoreline deck and elevated forest pathways, we opted for wood panels combined with metallic structure and flooring. Gravel and sand were employed for certain pathways, mainly the narrow ones, providing permeability while seamlessly integrating with the landscape. Natural stone was chosen for larger pathways, adding a touch of rustic elegance and along most of the lake shoreline, natural rocks were artfully arranged to create a picturesque boundary that enhances the park's aesthetic appeal.

In designated areas such as the dog park and playgrounds, mulch made from organic materials serves as a soft and safe surface, offering comfort and protection for both pets and children at play. Furthermore, the use of tree trunks, water elements, mud, sand, and rocks in educational playgrounds fosters sensory exploration and environmental awareness among young visitors, turning playtime into a learning experience.

The plantation strategy was devised with two primary objectives in mind: By carefully integrating pathways and functions within the park, we minimized disturbance to the natural habitat while creating a seamless flow between different zones to preserve the existing green cover. At the same time, Native plant species were meticulously chosen for their adaptability and ecological suitability, ensuring that each area, whether it be the lake shoreline, steppe region, open meadows, or children's playground, thrives in its unique ecological atmosphere.

IV -5/ Circulation Hierarchy

Within the lush expanse of "Bir el-Bey" park, a distinct circulation hierarchy emerges, delineated by six types of pathways as demonstrated in the figure:

Dominating the landscape is the main axis (composed of a central paved road and 2 rows of pedestrian pathways), a grand thoroughfare that seamlessly links the forest's eastern gates to its western counterparts, serving as the primary conduit for visitors traversing the woodland.

Alongside this arterial route, existing asphalted pathways meander through the corners of the terrain (East & West), providing direct links to the Academy, Institute, and the existing Scout Center.

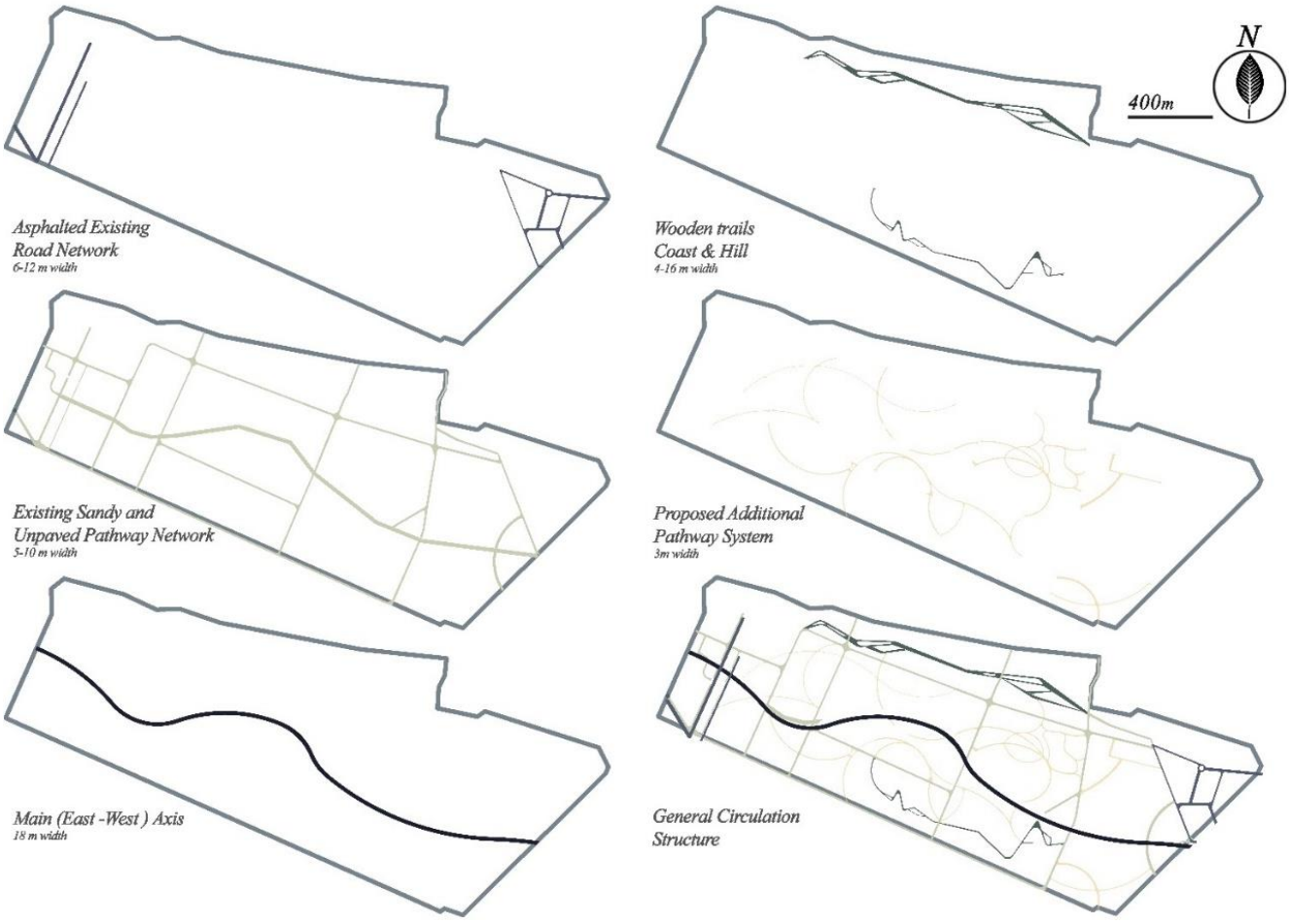
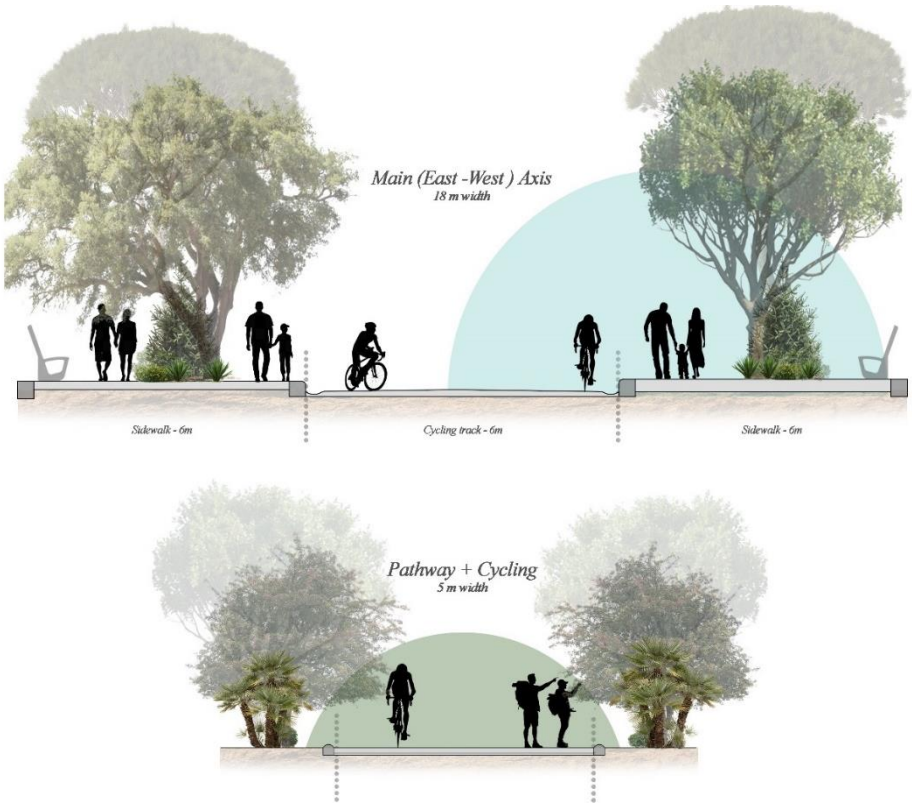


Figure 50: Decortication of the pathways network



Interspersed among them are sandy pathways, weaving through pockets of trees and shrubs, offering a more intimate connection with nature besides the already existing pathways, which, in addition to their protective purpose, are now playing a crucial role in connecting the different functions spread along the park.

The last type is expressed by wooden trails, either installed on the shoreline or elevated along the highest points of the southern segment of the park. The width of both types varies according to the proposed design, they can measure 2m in width and reach 8 m at some specific points where the design admits some curves and intersections. Together, these pathways form a cohesive network, guiding visitors through the scenic vistas of "Bir el-Bey" forest.

Figure 51: Sections of the different pathways

IV -6/ Focus sites (Sc 1 :1000) – (Sc 1 :250) - (Sc 1 :50)

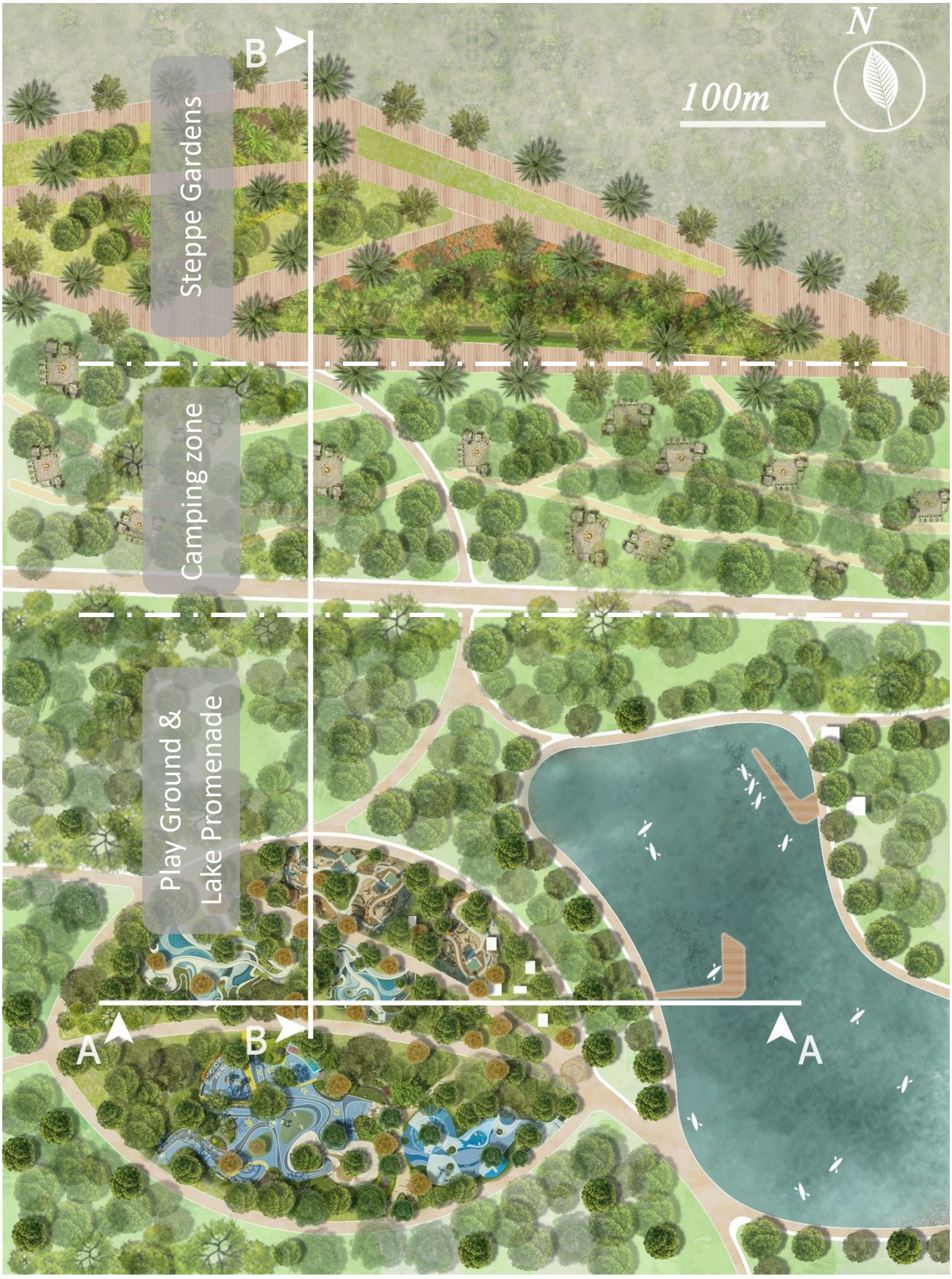


Figure 52: Focus Plan– Scale 1:1000 level – Play area, Lake promenade, Camping site and Steppe Gardens

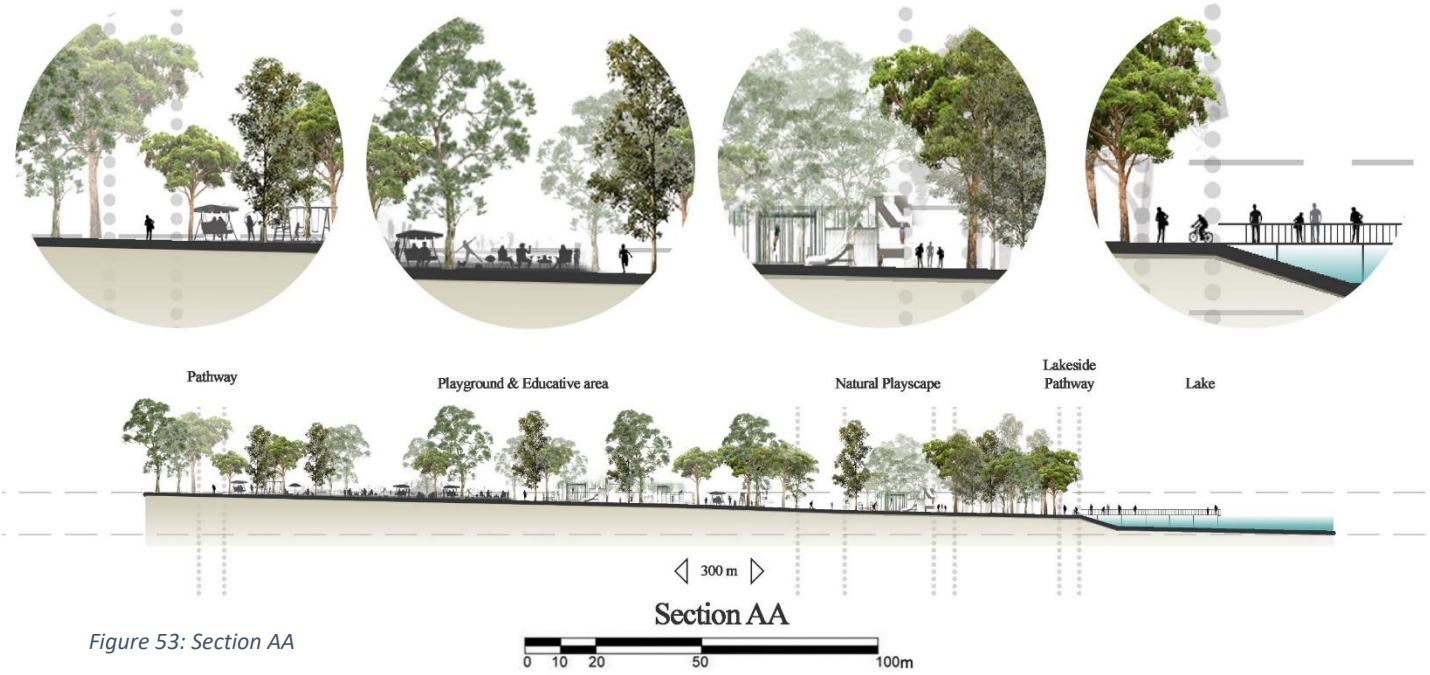


Figure 53: Section AA

In Section AA we can detect the inclination and the altitude variation along the West/East axis, crossing the different Playground areas, the pathways, and the lake shoreline with the wooden deck.

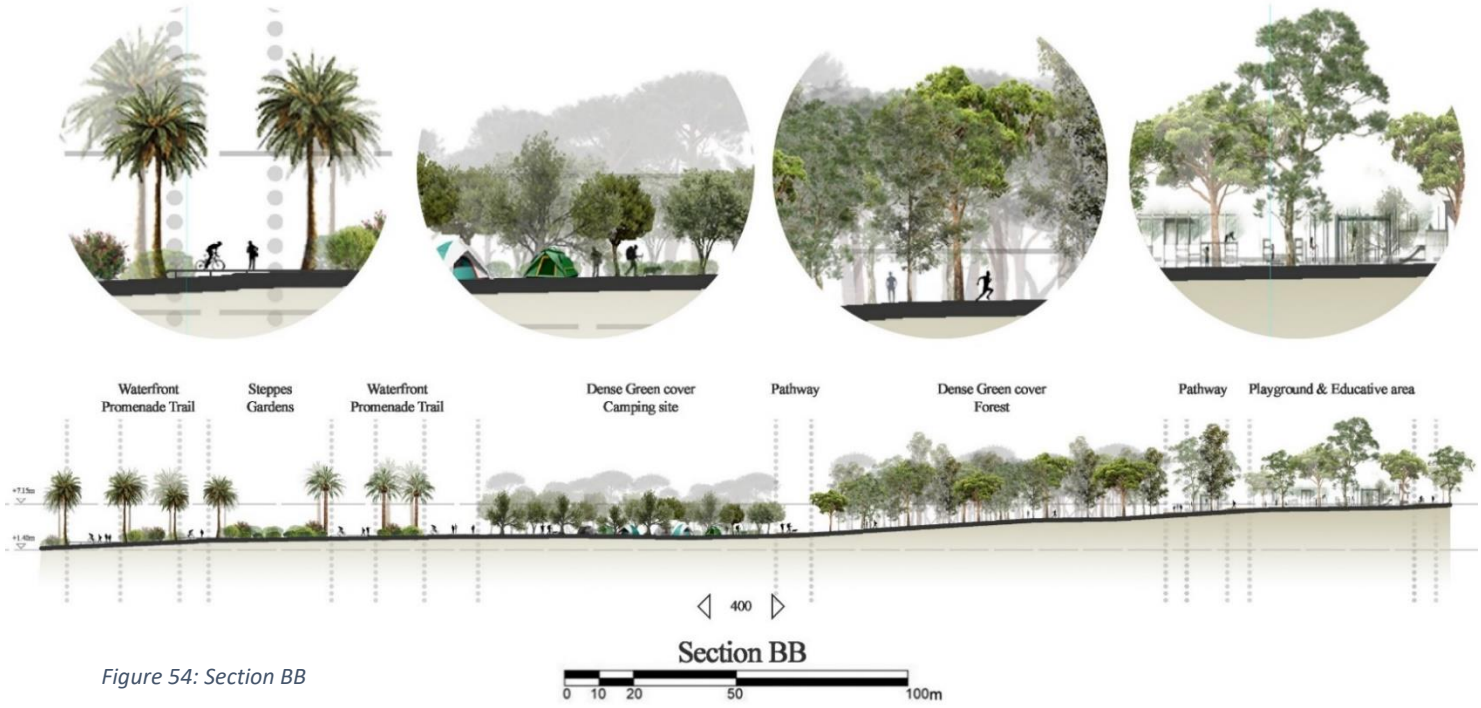


Figure 54: Section BB

Section BB also shows another direction of inclination towards the sea following the South/North axis, highlighting various spaces and functions such as the Educative area, a dense green tissue dominated by Pinus and Quercus trees, the camping area, and the beachfront wooden promenades along the steppe gardens.

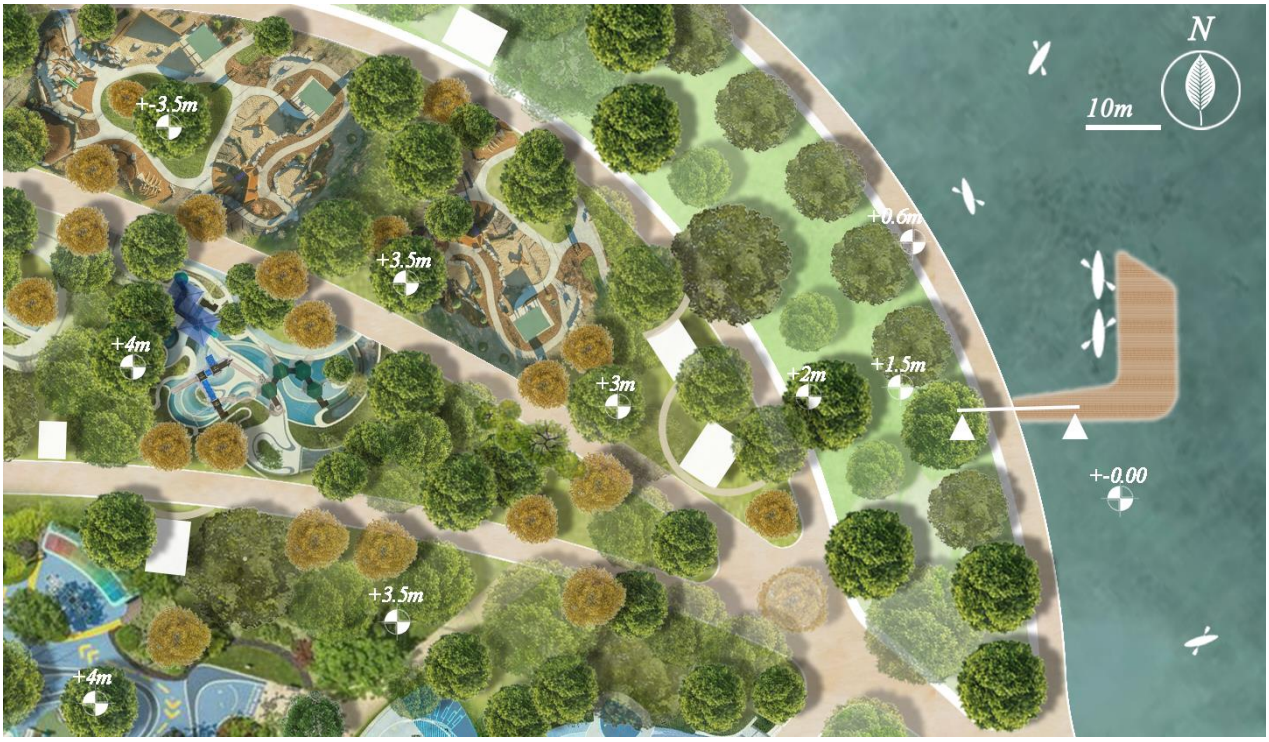


Figure 55: Focus Plan– Scale 1:250 level – Play area & Lake promenade

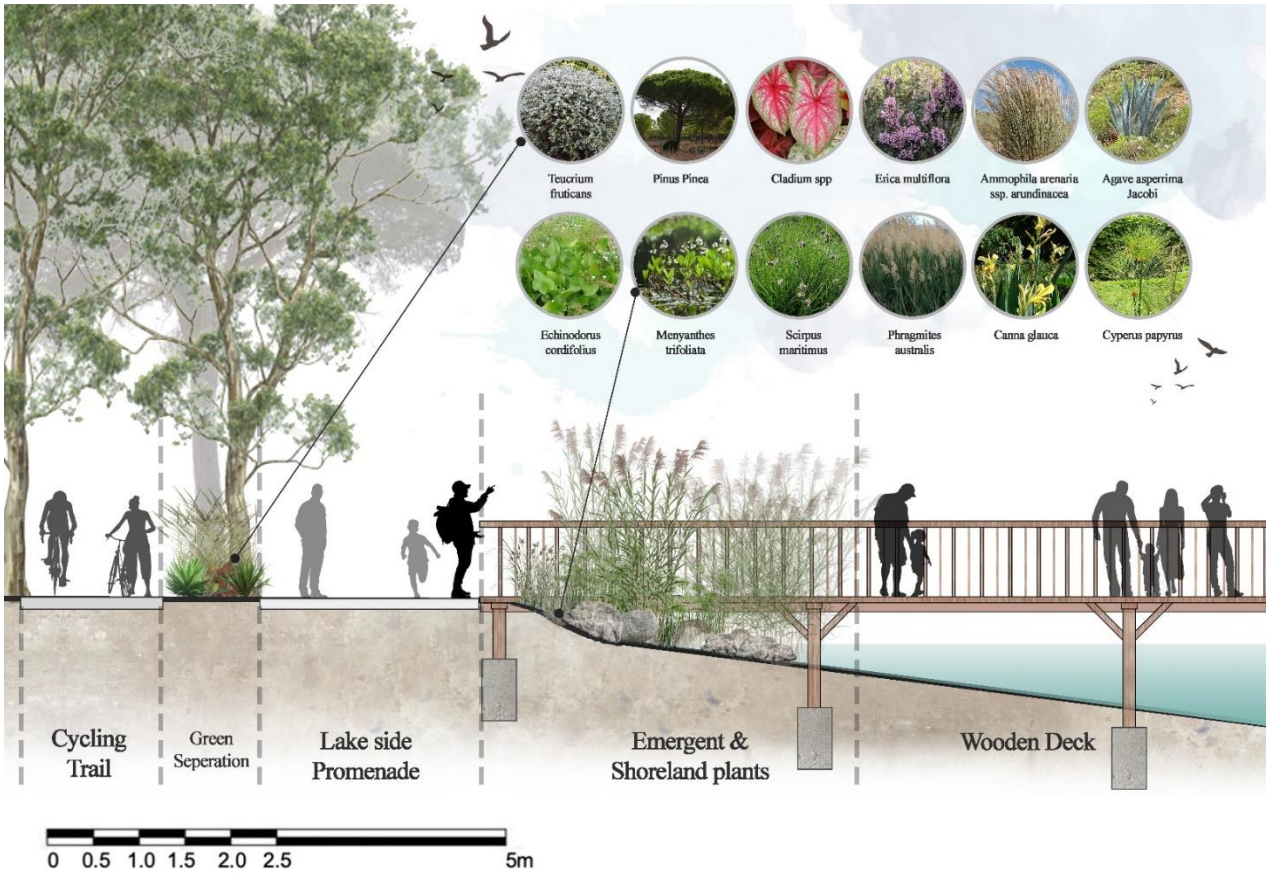


Figure 56: Detailed section and selected plant species – Lake promenade

The Section highlights some construction details of the lake's wooden deck, the plants used in this specific zone and the different circulation pathways dedicated for pedestrians and bikes.

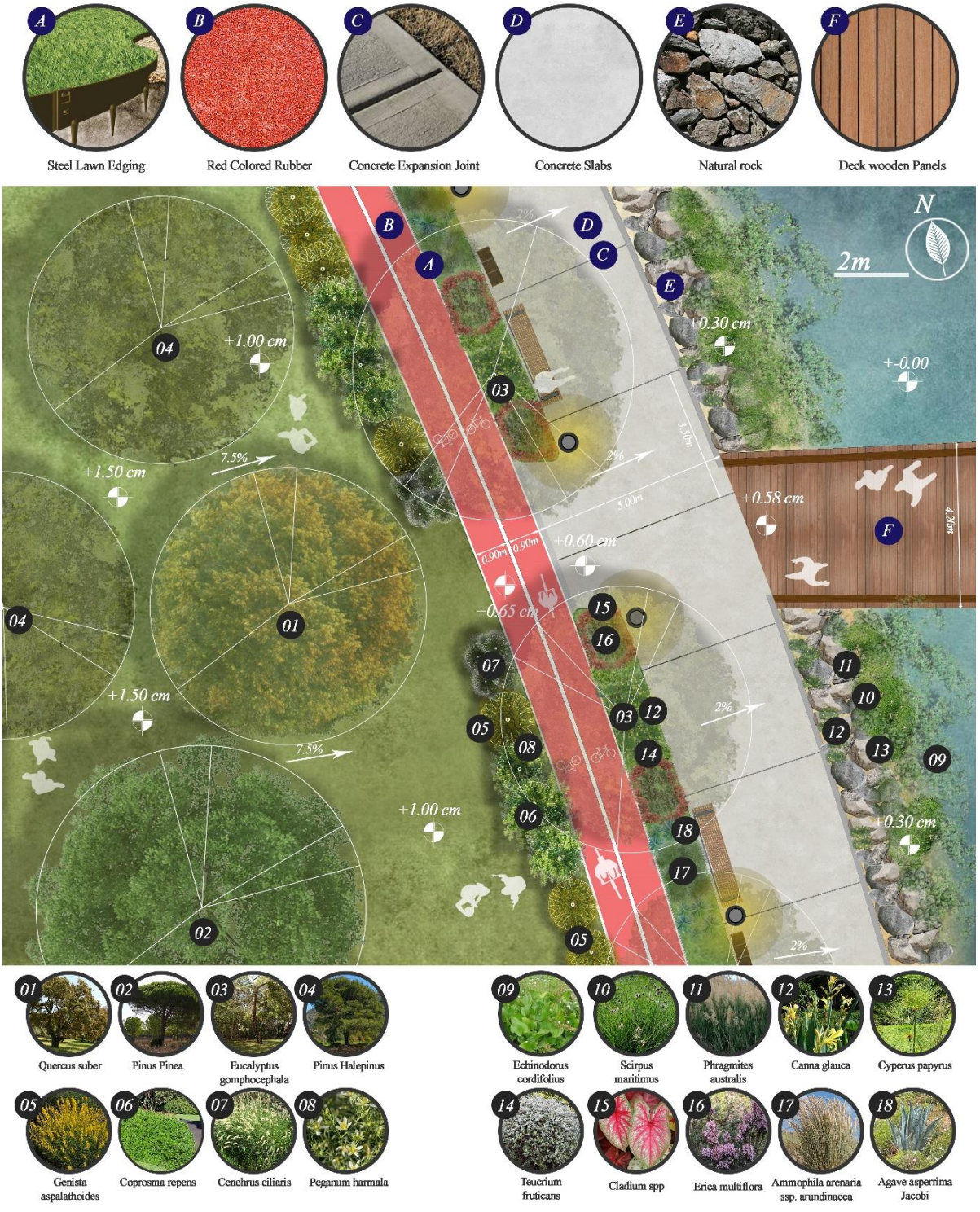


Figure 57: Focus Plan– Scale 1:50 level –Lake promenade

Through this focus plan, the 2 natural components (the lake and the green cover) are linked by a concrete-slabs walkway aligning the water element's boundary. On the sides, the transition is ensured by a layer of natural rocks and by a cycling rubber track spread parallelly along the perimeter.

Vertical lighting, benches, and trash bins are among the necessary amenities in such an area. As for the plantation, the selection of the plant species, including trees, shrubs, and low-level plants took into account the 2 natural environments: the lake and the surrounding shoreline.

Scientific name	Type	Max. Height	Water demands	Sun demands	Soil type	Flowering season
Quercus Suber	Tree	10-20m	Moderate Drought tol.	Full sun to partial shade	Well drained various types	Late spring to early summer
Pinus Pinea	Tree	15-25m	Moderate Drought tol.	Full Sun	Well drained Sandy/Loamy	Spring
Pinus halepensis	Tree	15-25m	Low to Moderate	Full Sun	Poor & Rocky soil tolerant	Spring
Eucalyptus gomphocephala	Tree	20-40m	Moderate	Full Sun	Well drained Moist/Loamy	Summer to early Autumn
Genista aspalathoides	Subshrub / Shrub	0.7m	Low Drought tol.	Full sun to partial shade	Well drained Sandy/Rocky	Spring to early summer
Coprosma repens	Small Shrub	1-2m	Moderate Drought tol	Full sun to partial shade	Well drained various types	Spring to early summer
Cenchrus ciliaris	Perennial Grass	1-1.5m	Low to Moderate	Full sun to partial shade	Well drained Sandy	Summer to fall
Peganum harmala	Herbaceous Perennial	1-2m	Low Drought tol.	Full sun to partial shade	Well drained Sandy/Loamy	Summer to early fall
Echinodorus cordifolius	Aquatic perennial	0.3-0.6m	Aquatic substrate	Full sun to partial shade	Moist to aquatic	Summer to fall
Scirpus maritimus	Perennial grass-plant	1-2m	Wet-tolerates inundations	Full sun to partial shade	Marshy/ waterlogged	Summer to fall
Phragmites australis	Perennial Grass	2-4m	wet- brackish water	Full sun to partial shade	Well drained various types	Late Summer to fall
Canna glauca	Perennial her. plant	1-2m	Moderate to high	Full sun to partial shade	Moist Well drained	Late Spring to fall
Cyperus papyrus	Perennial aquatic plant	3m	Wet-Aquatic conditions	Full sun	Wet soil	Summer
Teucrium fruticans	Evergreen shrub	1-2m	Low to Moderate	Full sun	Well-drained, alkaline	Late Spring to summer
Cladium spp	Perennial sedge	1-2m	Wet-Aquatic conditions	Full sun to partial shade	Well-drained, acidic	Summer to fall
Erica multiflora	Evergreen shrub	1m	Low to Moderate	Full sun to partial shade	Well-drained, acidic	Late Winter to Spring
Ammophila arenaria arundinacea	Perennial grass	1.5m	Moderate	Full sun	Well drained Sandy	Late Spring to summer
Agave asperima Jacobi	Succulent perennial	2m	Low Drought tol.	Full sun	Well drained Sandy/Rocky	Summer to fall
Quercus coccifera	Evergreen shrub/tree	1-3m	Low to Moderate	Full sun	Well-drained, poor soil	Spring to early summer
Calycotome spinosa	Deciduous shrub	1-2m	Low to Moderate	Full sun to partial shade	Well drained Sandy/Rocky	Late Spring to summer
Acacia podalyrifolia	Evergreen shrub/tree	2-5m	Low to Moderate	Full sun to partial shade	Well drained Sandy/Loamy	Spring to early summer
Salix purpurea	Evergreen tree	1-3m	High	Full sun to partial shade	Moist /well drained	Spring
Olea europaea	Evergreen tree	5-8m	Low to Moderate	Full sun	Well-drained, slightly alkaline	Spring
Pistacia lentiscus	Evergreen shrub/tree	2-4m	Low to Moderate	Full sun	Well drained Sandy/Rocky	Spring to early summer
Drimia maritima	Bulbous perennial	0.3-0.6m	Low to Moderate	Full sun to partial shade	Well drained	Late Winter to Spring

Figure 58: Plants characteristics table

IV -7/ Technical Details:

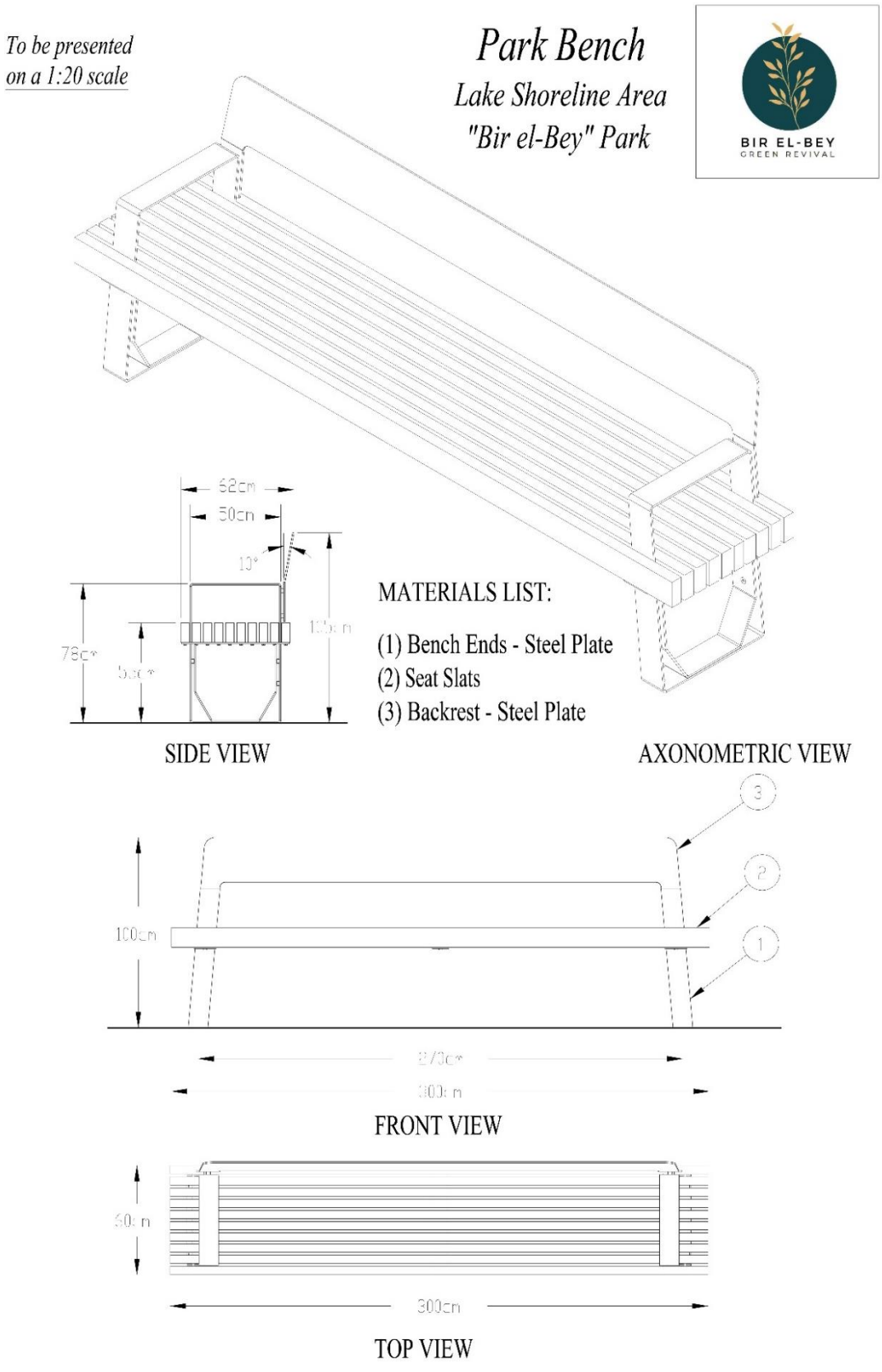


Figure 59: Park Bench Detail

IV -8/ Visualizations

Figure 62: Dense Forest pathway circuit

Figure 61: Kids Playground and Educative area

Figure 60: Open meadow and Picnic area

Figure 64: Theatre Area

Figure 63: Camping Area

VI/ Synthesis:

Besides the urban interest of creating a new link between the city of "*Erriadh*" and the city of "*Hammam Chatt*", the establishment of a park within "*Bir el-Bey*" forest heralds a multitude of advantages, resonating positively across various spheres. Primarily, it serves as a bastion for green cover preservation, protecting biodiversity, and mitigating environmental degradation in the region. Moreover, the park will become a sanctuary for residents, enriching their quality of life by providing recreational spaces for leisure, exercise, and communing with nature.

Its creation sets a precedent, inspiring the revitalization of other forests and green spaces in the southern suburbs of Tunis, fostering a culture of environmental stewardship and sustainable urban development. Thus, beyond its immediate impact, the proposed park in "*Bir el-Bey*" forest will stand as an icon of environmental and social progress at a time when inhabitants of the nearby cities are in major need of such green spaces.

Such a project will ensure the improvement of both the environmental and urban situation of the area, yet, a vision beyond its direct impact on the surroundings can be established as we may expect promising changes on larger scales and dimensions.

From this perspective, we intend, through this proposition, to initiate a model of an up-to-date and innovative urban park that can be reproduced elsewhere in the potential areas, and from this step, we may aspire to a future conceivable connection to the other close green systems, notably Mount "*Bougarnine*", to muster a larger valuable green network for the southern suburbs, or even for the entire governorate.

VII/ Bibliography:

Arnberger, A., Eder, R., 2012. The influence of green space on community attachment of urban and suburban residents. Urban Forestry and Urban Greening 11, 41-49

Beckley, T., 1995. Community stability and the relationship between economic and social well-being in forest-dependent communities. Society & Natural Resources 8, 261-266.

Björk, J., Albin, M., Grahn, P., Jacobsson, H., Ardö, J., Wadbro, J., Östergren, P., Skärbäck, E., 2008. Recreational values of the natural environment in relation to neighborhood satisfaction, physical activity, obesity, and well-being. Journal of epidemiology and community health

Boucher, I.; Fontaine, N. La Biodiversité et L'urbanisation, Guide de Bonnes Pratiques sur la Planification Territoriale et le Développement Durable ; MAMROT : Lac Saint Pierre, QC, Canada, 2010

Coley, R.L.; Sullivan, W.C.; Kuo, F.E. Where does community grow? The social context created by nature in urban public housing. Environ. Behav. 1997

Dynamique des groupements végétaux dans une aire protégée de Tunisie méridionale Cahiers Agricultures, 16 (2007), pp. 23-29

Ewing, R.; Handy, S. Measuring the unmeasurable: Urban design qualities related to walkability. J. Urban Des. 2009

Environmental protection and sustainable development in Tunisia: an overview Sustainable Development, 7 (1999), pp. 191-203

Effect of protection on plant community dynamics in the Mediterranean arid zone of southern Tunisia: a case study from Bou Hedma National Park - Land Degradation and Development, 24 (2013), pp. 57-62

Floyd, D. Race, Ethnicity and Use of the National Park System; U.S. Government Documents (Utah Regional Depository): Salt Lake City, UT, USA, 1999.

Harrison, C.; Burgess, J.; Millward, A.; Dawe, G. Accessible natural greenspace in towns and cities: A review of appropriate size and distance criteria–guidance for the preparation of strategies for local sustainability. Engl. Nat. Res. Rep. 1995

Hung, K., Crompton, J., 2006. Benefits and constraints associated with the use of an urban park - Hong Kong. Leisure Studies 25, 291-311

Kuchelmeister, G. Des arbres pour le millénaire urbain : Le point sur la foresterie urbaine. Unasylva 2000.

Kuo, F.E.; Bacaicoa, M.; Sullivan, W.C. Transforming inner-city landscapes: Trees, sense of safety, and preference. Environ. Behav. 1998

Matsuoka, R.H.; Kaplan, R. People needs in the urban landscape: Analysis of landscape and urban planning contributions. Landsc. Urban Plan. 2008

Mizouri M., Mtimet A. Pression urbaine sur les terres agricoles peri-urbaines du grand Tunis. In: Camarda D. (ed.), Grassini L. (ed.). Interdependency between agriculture and urbanization: Conflicts on sustainable use of soil and water. Bari : CIHEAM, 2001. p. 277-285 (Options Méditerranéennes : Série A. Séminaires Méditerranéens ; n. 44)

Mojiol, A.R. Public awareness on the importance of urban forest parks in Kota Kinabalu city, Sabah. Borneo Sci. 2018

Natural durability of four Tunisian *Eucalyptus* spp. and their respective compositions in extractives - De Gruyter September 7, 2019

Pataki, D.E., Carreiro, M.M., Cherrier, J., Grulke, N.E., Jennings, V., Pincetl, S., Pouyat, R.V., Whitlow, T.H., Zipperer, W.C. Coupling biogeochemical cycles in urban environments: ecosystem services, green solutions, and misconceptions. Frontiers in Ecology and the Environment 9

Peter, H. What Makes it Great and How to Get There - The Excellent City Park System - PUBLISHED BY The Trust for Public Land – 2003

Peters, K., 2010. Being together in urban parks: connecting public space, leisure, and diversity. Leisure Sciences 32, 418-433

Plant diversity in different bioclimatic zones in Tunisia - Volume 9, Issue 1, 30 March 2016, Pages 56-62

Plant species as indicators of the extent of desertification in four sandy rangelands
African Journal Ecology, 45 (2006), pp. 94-102

Plant salt tolerance: adaptations in halophytes
Annals of Botany, 115 (2015), pp. 327-331

Restoration and rehabilitation of arid and semiarid Mediterranean ecosystems in North Africa and West Asia: a review of Arid Soil Research and Rehabilitation, 14 (2000), pp. 3-14

Sonti, N.F.; Campbell, L.K.; Svendsen, E.S.; Johnson, M.L.; Auyeung, D.N. Fear, and fascination: Use and perceptions of New York City's forests, wetlands, and landscaped park areas. Urban For. Urban Green. 2020

Illustrations table

Appendix

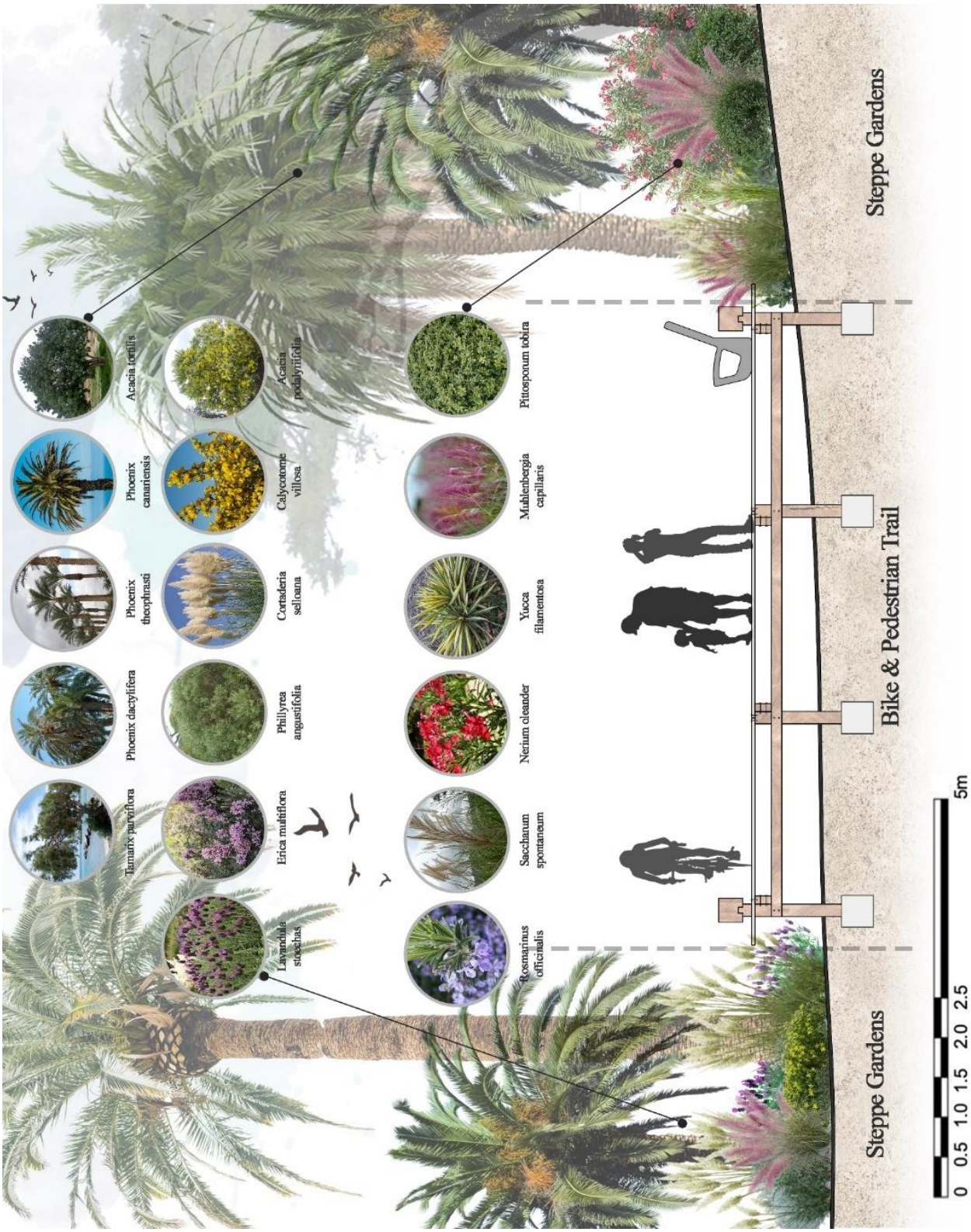
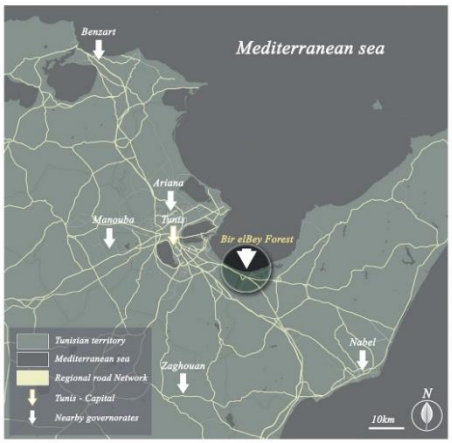


Figure 65: Detailed section and selected plant species – Steppe Gardens

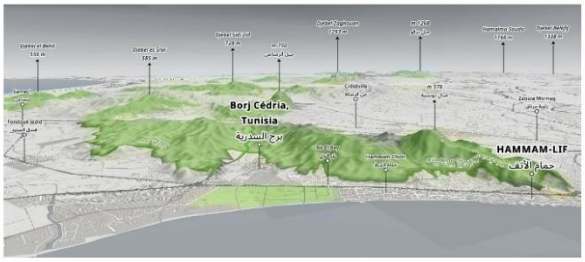
FIRAS BEN YOUSSSEF
SUPERVISOR: DR. ALMÁSI BALÁZS

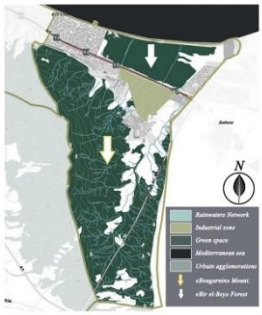
Macroscale Analysis: Characteristics of the area

Location, History and Topography and water system



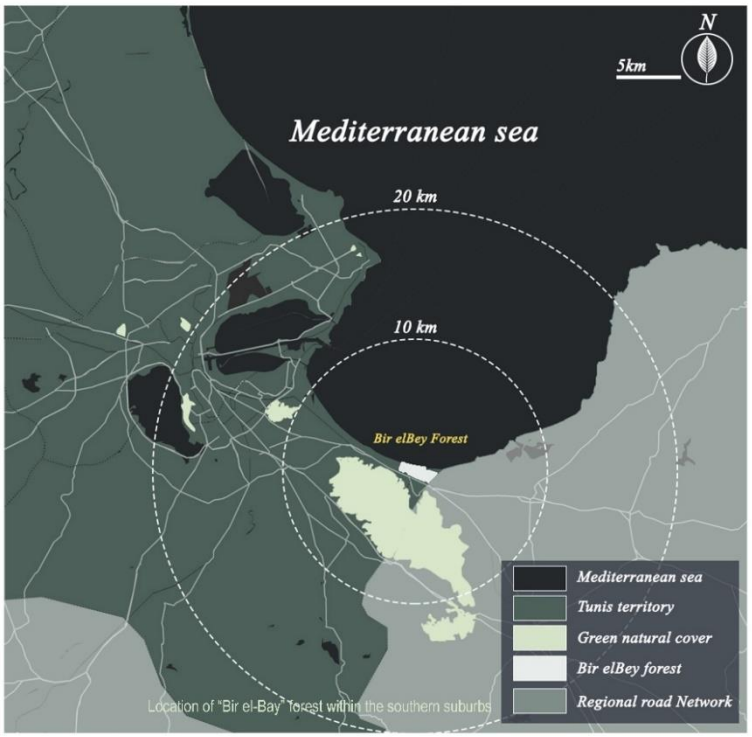
The southern suburbs of Tunis, within the governorate of Ben Arous, lie approximately 10 kilometers from the capital. Covering an area of 761 km², it is bordered by Zaghouan, Manouba, and Nabel. Urban expansion since the 20th century has transformed agricultural areas into residential and industrial zones. Ben Arous features flat terrain, with mountain ranges in the southeast, playing a role in water channeling. Bougarnaine Mountain, with heights reaching 750 meters, supplies rainwater to nearby cities. This hydrological network includes creeks flowing through the region's topography, influencing its environmental dynamics.





Natural and Urban Landscape character

Urban network connections (Governorates/Cities):

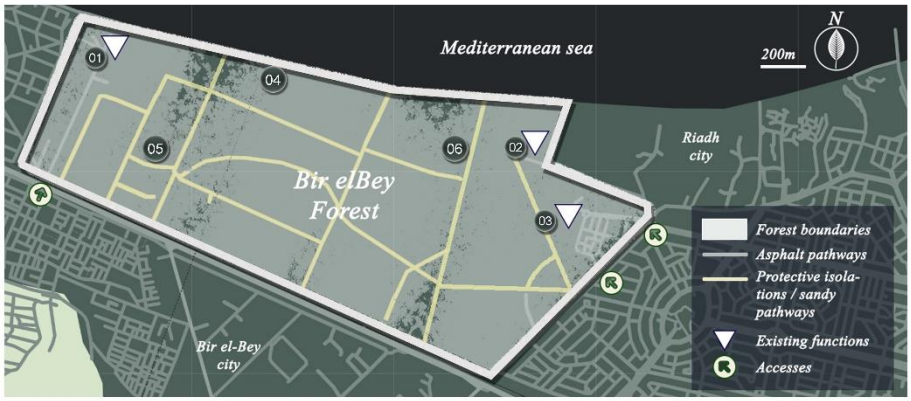


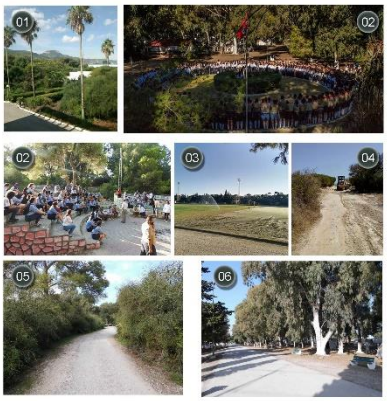
FIRAS BEN YOUSSSEF
SUPERVISOR: DR. ALMÁSI BALÁZS

MESO-SCALE: THE SELECTED SITE

Size, Accessibility & Direct Context

Structure of the site and existing functions





Green Cover Analysis

Synthesis

Challenges

Limited public access: Besides the existing functions dedicated to limited users, the forest doesn't contain any appealing set of functions for public use.

Urban obstacle: The forest is presenting, in most parts, an urban obstacle for the surrounding cities due to inadequate connectivity to its instant context.

Green space degradation: The green open space shows increasing degradation rates due to abundance, lack of maintenance, and inappropriate use.

Disconnected green network: The forest is no longer connected to the green network.

Potentials

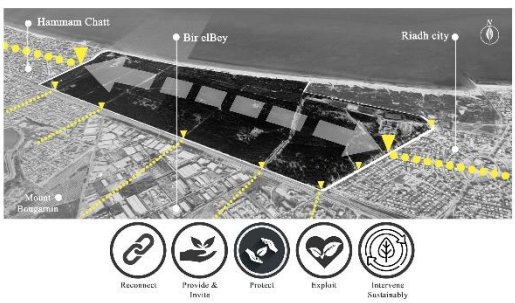
Ease of access: The location of the forest regarding the urban fabric is a very important factor in the success of the future project.

Varied landscapes: The different landscape characters within the forest can be promising for various ambiances and atmospheres.

Transport access: The forest is already connected to the transportation network.

Diverse user types: The functions surrounding the forest regroup numerous categories: hotels, industrial areas, universities, schools, and residences, therefore, a variety of targeted users can be expected.

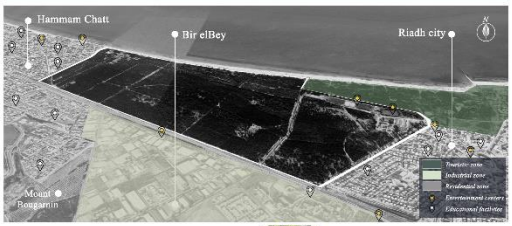
Strategy & intervention goals



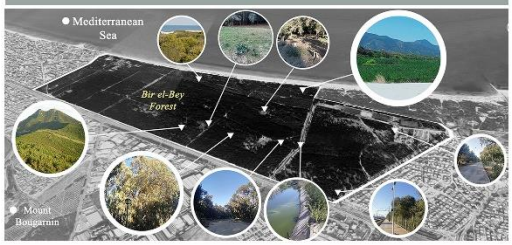
FIRAS BEN YOUSSSEF
SUPERVISOR: DR. ALMÁSI BALÁZS

DESIGN STRATETGIES

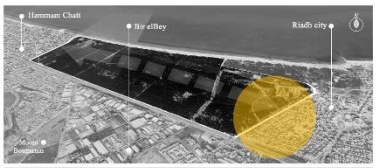
1-Provide, Invite, & Protect

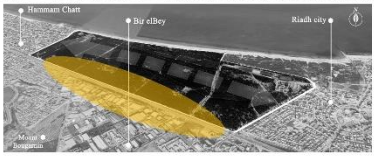


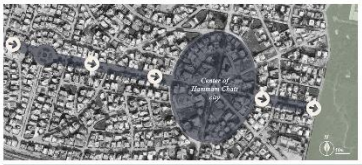
3- Exploit



2-Reconnect



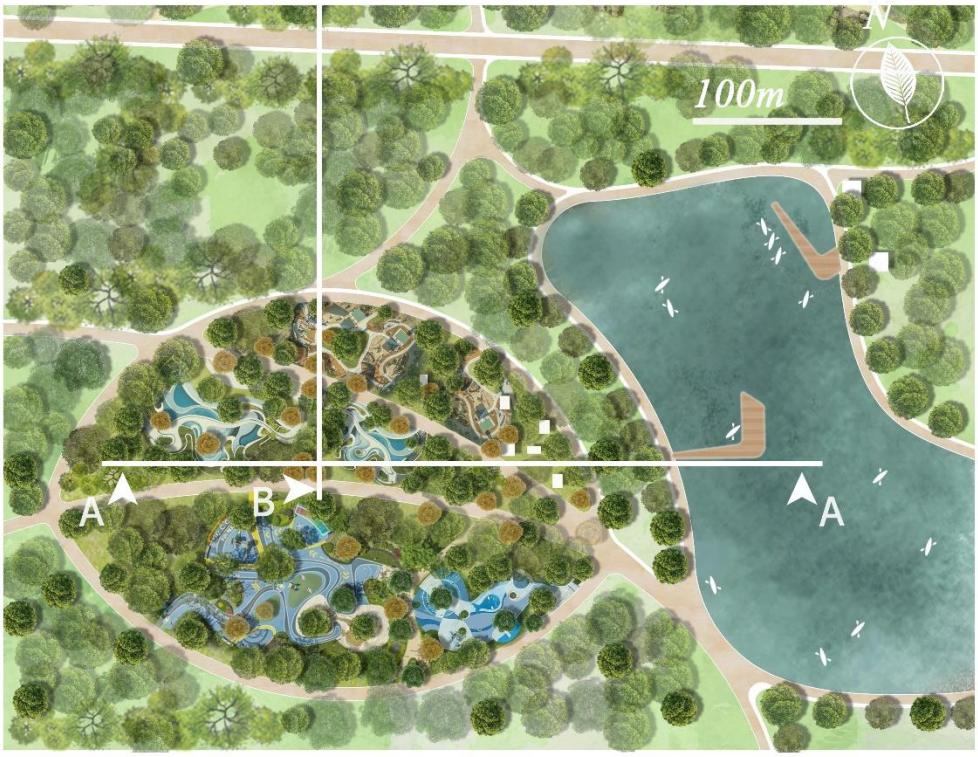


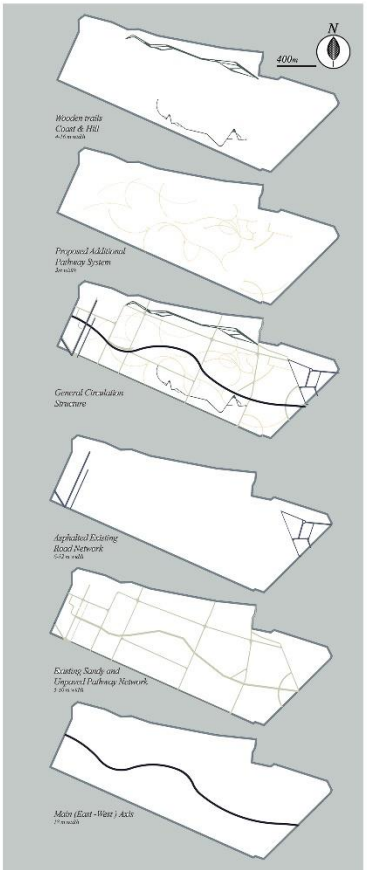


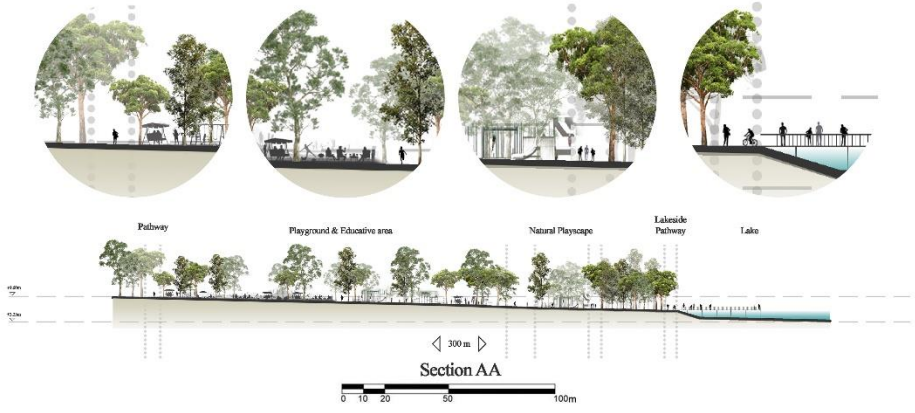
Size, Accessibility & Direct Context

MASTER PLAN

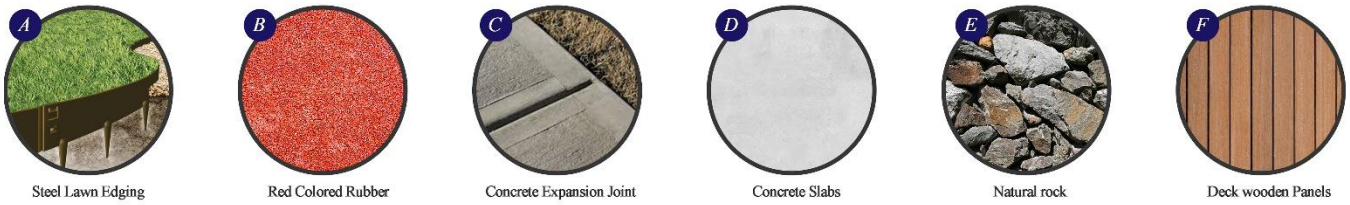
2D LAYOUT , SECTIONS & PATHWAYS TYPOLOGIES

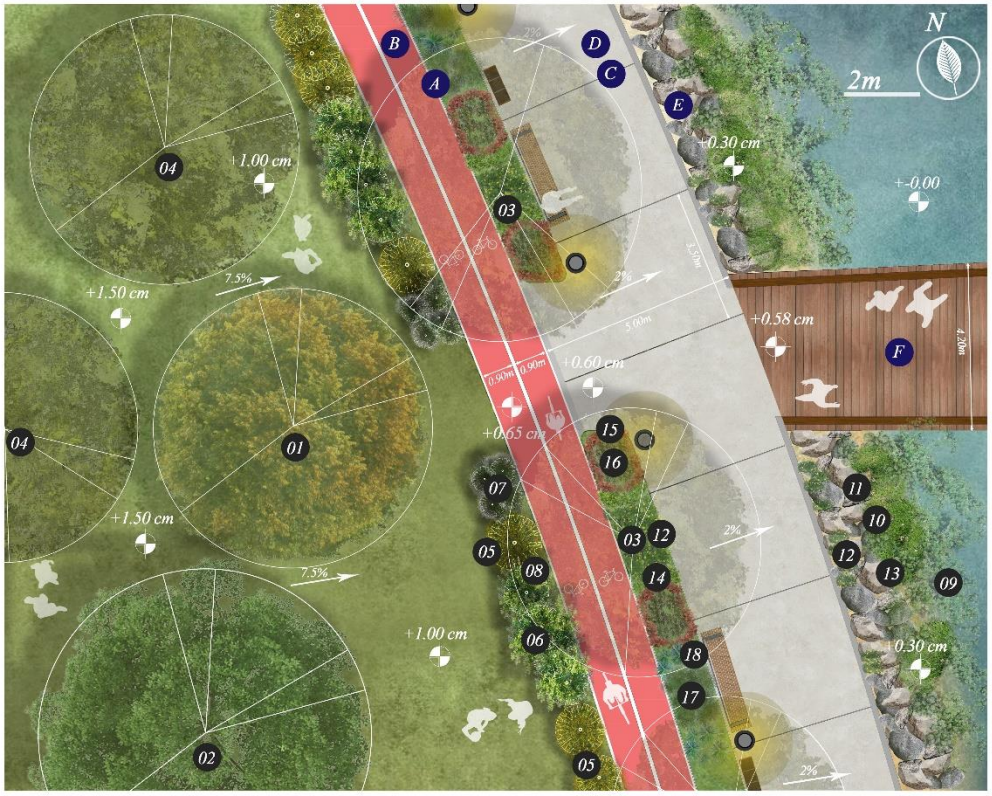






2D PLAN LAYOUT & DETAILS





SECTION & VISUALIZATIONS

DECLARATION

on authenticity and public assessment of final ~~essay/thesis~~/master's thesis/~~portfolio~~[1]

Student's name:	Firas Ben Youssef
Student's Neptun ID:	N5HREH
Title of the document:	Bir el-Bey Forest - Urban Park Development
Year of publication:	2024
Department:	Landscape Architecture, Urban Planning, and Garden Art

I declare that the submitted final ~~essay~~/~~thesis~~/master's thesis/~~portfolio~~[2] is my own, original individual creation. Any parts taken from another author's work are marked, and listed in the table of contents.

If the statements above are not true, I acknowledge that the Final examination board excludes me from participation in the final exam, and I am only allowed to take the final exam if I submit another final essay/thesis/master's thesis/portfolio.

Viewing and printing my submitted work in a PDF format is permitted. However, the modification of my submitted work shall not be permitted.

I acknowledge that the rules on Intellectual Property Management of the Hungarian University of Agriculture and Life Sciences shall apply to my work as an intellectual property.

I acknowledge that the electric version of my work is uploaded to the repository system of the Hungarian University of Agriculture and Life Sciences.

Place and date: Budapest year 2024 month 04 day 17

Student's signature

[1]Please select the one that applies, and delete the other types.
[2]Please select the one that applies, and delete the other types.

STATEMENT ON CONSULTATION PRACTICES

As a supervisor of *Firas Ben Youssef* (Student's name) *N5HREH* (Student's NEPTUN ID), I here declare that the final ~~essay/thesis~~/master's thesis~~/portfolio~~[1] has been reviewed by me, the student was informed about the requirements of literary sources management and its legal and ethical rules.

I recommend/~~don't recommend~~[2] the final e~~ssay/thesis~~/master's thesis/~~portfolio~~ to be defended in a final exam.

The document contains state secrets or professional secrets: ~~yes~~ no*[3]

Place and date: Budapest - year 2024 – month 04 – day 19

Internal supervisor

[1] Please select applicable and delete non-applicable.
[2] Please underline applicable.
[3] Please underline applicable.

Bir el-Bey Forest – Urban Park Development

Firas Ben Youssef

Budapest

2024