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# Environmental Impact Assessment of Child-friendly open urban spaces. Case study: An open urban child-friendly public space in the area of L building block 1413 of Municipality of Acharnes in Greece.

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**School of Environmental Impact Assessment and  
Sustainable Management**

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**January 2023**

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**VALIDITY PAGE**

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**Master's Thesis Title: Environmental Impact Assessment of child-friendly open urban spaces. Case study: An open urban child-friendly public space in the area of “Lathea A” building block 1413 of Municipality of Acharnes in Greece**

The present Postgraduate Thesis was prepared in the context of the studies for the acquisition of postgraduate degree at Neapolis University in Cyprus and was approved on ..... [date of adoption] by the members of the Committee of Inquiry.

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**DECLARATION**

knowing the consequences of plagiarism, I solemnly declare that this work entitled " Environmental Impact Assessment of Child-friendly open urban spaces. Case study: An open urban child-friendly public space in the area of “Lathea” building block 1413 of Municipality of Acharnes in Greece ", is the product of strictly personal work and all

The sources I have used have been appropriately stated in the references and references. The points where I have used ideas, text and/or sources of other authors are clearly indicated in the text with the appropriate citation and the relevant reference is included in the section of references with a full description.

The Declarant



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## **Summary**

With the continuous challenges faced by people and especially due to the increased demands that are evolving in the cities, the need of enriching the urban green community spaces is increasingly becoming a necessity, in a way that covers a wide range of needs, not only of the recreation but also is required to be the foundation for the social, economic, environmental and mental health of communities, including children. A typical case is Athens, as it is one of the cities with the least green in Europe.

In this context, the purpose and main question of the present study, is to highlight the importance of Environmental Impact Assessment of Child-friendly open urban spaces, by approaching and structuring research through a theoretical bibliographic investigation, but also through a case study, which focuses on an child -friendly open urban public space in the area of “Lathea” building block 1413 of the Municipality of Acharnes in Greece.

According to the conclusions of the project, the Theme Park under study was studied and proposed in a way that combines nature with an interactive methodology between balanced entertainment and education - learning for young ages and not only, estimating that it will have a high frequency of visits and multiple benefits for the community.

**Key words:** Environmental Impact Assessment (EIA), sustainable development, parks, friendly spaces for children, open spaces.

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## Abriviations

EC	European Council
EEC	European Economic Community
EIA	Environmental Impact Assessment
EU	European Union
HEGCS	Hellenic Geographic Coordinate System
GGHR	Government Gazette of the Hellenic Republic
MECC	Ministry of Environment and Climate Change
UNDP	United Nations Development Program
UNECE	United Nations Economic Commission for Europe
WHO	World Health Organization

## Tables

Table 1	Theme Park pitch siting coordinates
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## **Part A: Environmental Impact Assessment of child-friendly open urban spaces.**

### **Introduction**

The advent of the industrial era with the subsequent technological development and the over-concentration of population in urban centers, in combination with the increasing population and the reckless use of raw materials, have caused qualitative and quantitative degradation of the environment (Hanjra & Qureshi, 2010).

Over the years, interest has developed in the protection of the environment from further degradation and particularly on issues such as the planning, execution and management of development projects with relative effort to be in harmony with the environment and ecosystems. Gradually, the need arose for the introduction of new legislation regulating the type of relationships that will govern the environment and development, in the economy as a whole, with the aim and target to environmental protection. This initially began to be implemented, in 1969 in America (Wood, C., 2013). Subsequently, through international meetings and declarations, the concept of sustainable development was defined and established almost universally, accepted as an indicator of a state's development for its viability - sustainability, providing for the possibility of cooperation between Member States in order to handle issues of transnational scope (Brundtland, 1987).

In order to achieve projects on a public or private scale, already in 1985 under Directive 85/337/EEC, tools were proposed to prevent and respectively anticipate, mitigate or compensate for impacts with other measures. Thus, Environmental Impact Assessment study was established as the dominant solution worldwide, but with terms that may vary from state to state (Liordos2014). These institutionalizations are modified when deemed appropriate by the meetings of world organizations to provide solutions with the best and most effective protection of nature. Thus, by law, Directive 85/337/EEC established in all Member States the institutionalized legislative direction for the conditions of environmental study in projects and activities with mandatory application now and with oversight by international organizations. In particular, according to the Directive, an assessment must be carried out for the prevention of pollution or nuisance at source and not for its subsequent remediation (Council of European Communities, 1985).

After the advent of the 21st century with the Paris Agreement in 2015, the proclamation of children's rights was formulated, as due to the inability to represent children in international

meetings, it was not understood that well-being and sustainability in an urban environment depends on the healthy development of children. The United Nations in the same declaration also establishes as a priority of its Member States with the concept of intergenerational justice inherent in the concept of sustainable development and world peace (U.N., 2015).

Urbanization brought to the surface another huge problem for human health within the urban layers. Especially in the already populated large urban centers of the cities of long-term urbanized Europe, the need to create more open outdoor spaces was obvious (Doick, K.J., et al, 2014). The aim was to mitigate the adverse climatic conditions, but also the socio-political problems associated with their absence, with several proposals for their mitigation. The studies conducted from time to time for this purpose, often involve planting with a preference for tree planting to the greatest extent possible. Furthermore, the use of the water element, if it is possible to manage such creates conditions that greatly improve the unhealthy situation created by the problems caused by air pollution. Solutions such as the arrangement of plants in the site and the type of trees that are preferable to use for the desired effect, are also considered (Doick, K.J., et al, 2014).

Following the voice of children's representation with the proclamation of their rights by international organizations, new studies on children's safety in open spaces began to be formulated to better use these spaces (U.N., 2015).

In such a context, Environmental Impact Assessment as a knowledge tool that tries to give the best feasible solution to projects and activities related to interventions in the environment, contributes significantly to their better implementation in all these actions. As interventions in the environment affect the socio-political and cultural well-being of its inhabitants, offering a better standard of living and new jobs, they have a great impact on childhood, mainly for their health, but also for their more harmonious and smoother integration into the social life of the city.

In this perspective, the purpose and key question of the present study, is to highlight the importance of Environmental Impact Assessment of Child-friendly open urban spaces.

Methodologically, the topic is approached from both a theoretical and an implementation perspective, as reflected in the structure of the study. In particular, the study is divided into two parts. Part "A" explores and describes the Environmental Impact Assessment of child-friendly open urban spaces and Part "B" explores the Case Study: A child-friendly open urban public

space in the area "Lathea A" building block 1413 of the Municipality of Acharnes in Greece.

The project under study concerns a theme park, which will evolve around the turbulent life and the 13 (thirteen) feats - labors of Hercules, from the moment of his birth until his final transfer to Mount Olympus (12+1 which is the last labor of his deification and his co-habitation with the Olympian Gods). The proposed mythological park will not only be a recreational area, but targets to create an interactive space of learning, education and adventure. At the same time, it is an active energy source production unit, that will not only be self-sustaining but will also provide for the surrounding area in multiple ways, responding to multiple challenges that characterize the area, with environmental, economic and social impacts, such as the multidimensional problem of widespread flooding when heavy rainfall occurs.

In summary, the case study that follows, preparation of an Environmental Impact Study of a Theme Park, which aims to identify the main problems of the area and to implement proposals in relation to the planned project and its activity on the environment, comprehensively treat not only the problems of the area, but also create an elegant solution and provide a profitable management and successful maintenance of the multiple functions in it, aimed at its longevity.

### **Research methodology**

The aim of the thesis is to analyze the importance of open urban parks in the environment for the psychosynthesis, health and well-being of people and especially the children of a society. There is a review of the course in which the EIA process has now come to be considered of paramount importance to human existence within the urban network and human works. This was necessary as on one hand, any human intervention causes consequences to the environment and on the other hand it is constantly found that it is impossible to stop the projects or the activities. At the same time, emphasis is given to open urban parks that are child-friendly, because of the positive impact they have on the problems of modern urbanization. It is also known that by the creation of open-air parks, simultaneously creates beneficial environmental conditions and contribute to the development of other sectors that help modern humans to live in this environment in better conditions socially, culturally, economically, etc.

With regard to the first part of the theoretical literature review, in order to enhance the validity and documentation of the views supported herein, books and scientific references or articles were used, which they were systematically reviewed from work that had already been done by scientific analysts who have worked on the same subject.

For this purpose, information extracted from scientific journals or books available on google scholar, the scientific hub, or google network was used. Also, for the Greek legislation, data were drawn from the National Printing Office of Greece.

In the second part of this thesis, but equally important, the case study of an EIA child-friendly open park in the area "Lathea A" of the Municipality of Acharnes in block 1413 in Greece was carried out. The reason is the necessity that the area presents for places with child-friendly parks, as although it is the largest municipality in Greece, its population moves to neighboring areas to visit such places. Such a project would contribute in many other sectors, mainly in unemployment, as it could become a pole of attraction for visitors from neighboring Municipalities.

The study and data development were carried out through field research, in accordance with the knowledge gained for the EIA study, and with data gathered from other sources. The steps and their implementation mode are described in detail in the Part "B" of the work, as the steps followed for the environmental impact assessment for research and study. The detailed and in-depth exploration of the opportunities, benefits and challenges in implementing the study was concluded with the interpretation of the findings. Assumptions and evaluations are made about the projected outcomes and the results of the study are translated into recommendations for further research and collective social participation of citizens in the decision-making and approval process of the project. The data were found from google, as well as from the website of the Forestry Department of Parnitha, as well as from the website of the respective Urban Planning Office of the Municipality of Acharnes. Topographically, the site was designed using the data available from the National Cadastral - Land Registry, as it was impossible in terms of time and cost, to survey such a large area.

## **Theoretical Foundation / Literature Review**

### **A.1. The Institutional Framework for Environmental Studies Internationally**

Nowadays, most of the time, conferences are held and guidelines are given to deal with the rapid explosion of the technological revolution and at the same time the uncontrolled economic production combined with the alarming population growth (Gill, T. 2021). The aforementioned consequences of economic growth, have resulted in the degradation of the environment and its resources with severe alterations and consequently the unprecedented environmental

phenomena on the planet such as climate change and the greenhouse effect (Jacobs, C., et al, 2019). For the first time in America in 1969, the need for Environmental Impact Assessment in civil engineering projects was introduced, in order to ensure sustainability for the smooth integration of projects into the environment and their harmonious coexistence in it. (Chatzimikes, F. 1982).

The Stockholm Declaration of Environmental Principles in 1972, set out fundamental principles for environmental law. The text establishes the link between social and economic development and the protection of a healthy environment, as well as environmental degradation, which is directly linked to the inability to resolve environmental issues and underdevelopment (United Nations, 1972).

The definition of sustainable development, first emerged belatedly with the Brundtland report in 1987 as "development that meets the needs of the present generation without compromising future generations the ability to meet their own needs". (Brundtland, 1987).

In the process, the European Economic Community (EEC) decided to publish Council Directive 85/337/EEC on 27/06/85 stating that the best solution to environmental problems is prevention rather than subsequent remediation. This came about as the view was expressed that when prevention is done early and with proper planning and proper assessments, the more able it is to assess the environmental impact of public and private projects on the environment. Under this directive, it is widely accepted that legislative formulation should follow similar conditions between Member States, with regard to major public or private projects, likely to have a significant impact on the environment. The criterion is always the improvement of the quality of life and health, as well as the reproduction and sustainability in the biodiversity of the species in the ecosystem. This Directive shall not apply to military projects or where a work is constructed under specific state legislation. Also, in projects where there is transnational impact, information is passed on to other states in order to take the necessary measures, including consultation if necessary (Council of European Communities, 1985).

The Directive was subsequently amended by amendment 97/2011/EU (European Parliament and Council of the European Union, 2009) and in particular differentiates how best to ensure transnational relations between Member States for projects that have an impact in more than one state. Furthermore, in enriching activities in Annex II of the Directive, theme parks are included in the tourism and recreation chapter. Also, with amendments 2009/31/EC (Council



of European Union, 2011) and 2011/92/ EU (European Parliament and Council of the European Union, 2012), Annex III communicates the selection criteria and how to describe project elements.

Following this path and in this context of protecting the environment from interventions, the role of Environmental Impact Assessment was created, which was defined by the United Nations in 1991 as "the assessment of the effects of a planned activity on the environment" (UNDP, 1991).

Along the way taking into account the rapid population growth (Gill, T. 2021), the World Health Organization (WHO, 2012) stipulates that outdoor spaces should be equivalent to 9 m<sup>2</sup> per person. Likewise, the United Nations in 2016 in the context of the urbanization of the environment in Habitat III, determined the proportion of required open spaces that should be allocated per person in relation to the country they belong to, in order to have more sustainable urban societies in which there is interactive space for children to play and for older people to be entertained (UN, 2016). The maximum ideal distance for visiting parks in order for the indicator with the benefits they offer to be strong, is a distance of five minutes from the most remote residence (Agarwal, M. et al 2021). It is now understood that children's rights in today's society must also be fulfilled in all respects, as equal members, understanding the impossibility of representing them (Gill, T. 2021).

## **A.2. The institutional framework in Greece**

Concerning the Greek presence in the environmental impact assessment process, according to Liordos (2014), Greece is among the last Member States of the European Union to have legislated and implemented the EIA directives. More specifically, the first environmental impact assessments in the country, were prepared in 1977 for the benefit of the Public Power Supply Company, in order to assess the environmental impact for the construction of two dams on the rivers Aoos and Nestos.

The Law 743/1977 (Government Gazette 319a/77) on environmental protection, as well as Laws 947/1979 (Government Gazette 169a/79) and 998/1979 (Government Gazette 289a/79) on urban areas and woodlands respectively, played an important role in the implementation of the legislative principles for environmental impact assessment. It is also worth mentioning the provisions of Presidential Decree No. 1180/1981 (Government Gazette 188a/81), which provides for and requires environmental impact assessment studies on industrial, public and



private activities.

The approval of environmental studies and their preparation by the competent authority were established in Greece with the adoption of law no. 1650/1986 (Government Gazette 160a/86) on environmental protection. This law includes the criteria for the classification of projects into categories, the type of study required for each category, the contents of the studies, the stages, timing and parts of the environmental impact assessment process. This law played a decisive role in shaping legislation in Greece for the protection of the environment. According to this law, Environmental Impact Assessment issues are implemented, including the classification of projects and activities into categories, the Preliminary Environmental Assessment, Evaluation and Approval of Environmental Conditions Approval process and the Strategic Environmental Assessment process. Much later, and specifically in 1990, the implementation of the European Council Directive 85/337/EC in Greece started with the Joint Ministerial Decision 69269/5387/90 (Androulidakis & Karakassis, 2006).

Law 1650/86 which we have mentioned, regulates the institutional framework of Greek legislation. In addition, it is supplemented or amended by a series of other legislative provisions such as Joint Ministerial Decision KYA 69269/5387/24.10.90 on the "Classification of projects and activities into categories, content of EIAs and other relevant provisions, in accordance with Law 1650/86", (Government Gazette 678b/90). Another Law no. 3010/2002 entitled «Harmonization of Law 1650/1986 with Directives 97/11/EU and 96/61/EU", (Government Gazette 91a/02) which partially amends it. Also, Joint Ministerial Decision 15393/2332/2002 on the "Classification of public and private projects and activities into categories according to article 3 of Law 1650/1986 as replaced with Article 1 of Law 3010/2002", (Government Gazette 1022b/02), as well as its additions to date. Another provision is the Common Ministerial Decision 11014/703/F104/2003 on the "Procedure for Preliminary Environmental Assessment and Evaluation (P.P.E.A.E.) and Approval of Environmental Conditions" pursuant to article 4 of Law 1650/1986 as replaced by article 2 of Law 3010/2002, (GGHR 332 b/03). Finally, the Joint Ministerial Decision 107017/2006 on "Assessment of the environmental impact of certain plans and programs in accordance with the provisions of Directive 2001/42/EC on the assessment of the effects of certain plans and programs of the European Parliament and of the Council on the environment of 27/6/2001" (Government Gazette 1225b/06).

According to the Joint Ministerial Decision 1958/2012 (Government Gazette 21b/12), projects

and activities are classified into the following groups, regardless of the category in which they are included. These groups, according to the Ministry of Environment, Energy and Climate Change (MEECC), are land and air transport projects, hydraulic projects, investment projects, environmental infrastructure systems; mining activities, tourist and urban development projects, sport and leisure buildings, poultry farms, aquaculture, industrial and related facilities, renewable energy sources, fuel, energy and chemical transport and finally, special projects.

In Greece today, the provisions of law 4014/11 (Government Gazette 209a/11) are applied, for which a plethora of decisions have been approved, for the environmental licensing of projects and activities of the public or private sector, entitled "Environmental licensing of projects and activities, regulation of arbitrary in connection with the creation of an environmental balance and other provisions of competence of the Ministry of Environment". The law concerns the preparation of an Environmental Impact Assessment which is a prerequisite step in the environmental permitting process, for the realization of new or relocation of already existing category A projects. Public authorities, shall provide the project or activity operator with all the information at their disposal that can be used to prepare the environmental impact assessment. The planner must deliver to the competent environmental authority the study and all the information collected for its implementation, with explicit reference to the sources from which the information has been obtained. Law 4014/2011, according to the MEECC and for the purposes of issuing an environmental permit, classifies all public and private projects and activities into two categories, A and B, depending on their impact on the natural and man-made environment and into twelve groups, common to both categories of projects. For the above-mentioned categories, according to the MEECC, category A is subdivided into two subcategories, A1 and A2, and includes projects likely to cause significant effects on the environment. Subcategory A1 classifies projects and activities likely to cause very significant effects on the environment, while subcategory A2 classifies projects and activities likely to have significant effects on the environment. On the other hand, category B classifies projects and activities which are local in nature and which are not expected to have significant effects on the environment.

The content of the Environmental Impact Study and the accompanying documents per project category, are determined by ministerial decision and include at least (Annex II of Law 4014) the permitted land uses in the area of the project or activity, the description of the location of the project, the design and the technical characteristics of the whole project during the

construction and operation stages. The description, shall also include the main characteristics of the manufacturing processes, the nature and quantities of the materials used, as well as a description of the foreseeable types and quantities of residues and emissions, particularly to water, air, soil, noise, vibration, radiation, expected to result from the construction and operation of the proposed project or activity. A description and assessment of the alternatives, in particular with regard to their location, size and/or technology, including the zero option, examined by the project or activity promoter and a presentation of the main reasons for the choice of the proposed solution with regard to the effects on the environment, should also be provided. In addition, a description of the elements of the natural and man-made environment likely to be significantly affected by the proposed project or activity, including in particular population, fauna, flora, habitats, soil, water, air, climatic factors, material assets, including architectural, cultural and archaeological heritage, landscape; and a description of the interaction of these elements must be provided. Another necessary element is a description assessment and evaluation of the significant effects that the proposed project or activity is likely to cause to the environment, from the use of natural resources, the emission of pollutants, the creation of nuisances and the disposal of waste, the set of data and a description of the methods used to predict and assess the effects on the environment, by referring to the reliability of the methods and by indicating any difficulties encountered in obtaining the required information. A detailed description of the measures envisaged to avoid, reduce, remedy and compensate for the significant adverse effects of the project or activity on the environment is also a necessary element. An environmental management plan must also be implemented, to ensure the effective protection of the environment and the implementation of the proposed measures, which will include the proposed monitoring program. This plan mentioned, the implementation of which is committed by the project or activity operator, will include at least: a) the parameters with data and indicators of the environment to be monitored, b) the methods, location, time and frequency of recording, c) the measures to ensure the quality and reliability of the recordings, d) the schedule for updating the Electronic Environmental Register (as precisely defined in Article 18 of Law 4014/2011). Something else to be included is a non-technical summary of the information included in the Environmental Impact Assessment. Finally, one of the characteristics that should be included is the specialized studies that may have emerged during the stage of the preliminary environmental requirements identification procedure, if followed and are listed in an annex to the Environmental Impact Study.

### **A.3. Discussion**

For the purposes of this discussion, it was deemed appropriate to explore the Environmental Impact Assessment, starting with the issue of multiple definitions and then on the issues of necessity, structure and other dimensions of the Environmental Impact Assessment. In addition, the study focuses on the needs of the EIA for the urban park and in the process, the study focuses on the urban park that is designed in a child-friendly environment.

#### **A.3.1. Multiple EIA Definitions**

Speaking of the Environmental Impact Assessment, it can be seen that several different definitions have been given from time to time, but it is obvious that it is a cyclical process involving several stages that interact with each other and which varies from project to project but also from country to country.

In 1979 the EIA process was defined by Munn in his book "Environmental Impact Assessment: Principles and Procedures", as "the need to identify and anticipate the impacts on the environment and human health and quality of life from proposed laws, policies, programs, projects and operational procedures and to interpret and make public the information for those effects".

According to Randal and Jowett (2010), environmental impact assessment is defined as a "tool used to identify the environmental, social and economic impacts of a project before decisions are made". According to them, its aim is to anticipate environmental impacts at an early stage, the planning and design of projects, so that they can find ways and means to reduce adverse impacts, formulate plans that fit local environmental conditions and present forecasts and options to decision-makers in the most representative way.

According to the UK Department of the Environment in 1989, as described by Liordos in 2014, 'the term environmental impact assessment describes the technique and process by which information is gathered from the environmental effects of a project, from the commissioner and from other sources, which is taken into account by the planning services in order to form an opinion on the feasibility of carrying out the project' (p.2).

#### **A.3.2. Necessity and Conditions for an Environmental Impact Assessment**

Any project that is ready for implementation is required by Directive 85/337/EEC, to undergo

an environmental assessment procedure (Council of European Communities, 1985). This procedure, is applied as a precautionary measure before a project is implemented. At the initial stage of screening, it is considered necessary for each project to undergo an Environmental Impact Assessment (Liordos, 2014). It is a project and activity management tool, consisting of a specific structure of specifications and stages, but the legislative framework governing the process, as well as the methodology for carrying out the impact assessment, differ from country to country. Regardless of all this, however, it should be carried out at an early stage and at higher levels of planning, to help shape institutional innovations as well as to modify the decision-making process.

It is a process that seeks to balance economic, technical and environmental factors and the associated costs. For this reason, the selection of alternative project sites, which are at the core of the Environmental Impact Assessment, is not only made from an environmental point of view, but also for economic factors, such as the income and cost of a business, or even technical factors.

The process involves one or more scientific studies, namely environmental impact assessments, publicity and dialogue procedures, aiming at social consensus, but also a joint assessment of the results obtained during its conduct, in the context of decision-making, as well as relevant procedures for monitoring and implementing the remedial measures proposed.

The purpose of the Environmental Impact Assessment aims to alert the decision-maker, regulatory bodies and the public to the environmental impact of projects, so that these projects can be modified to avoid environmental degradation, avoid construction errors and avoid economic losses caused by negative side effects. It also gives information at an early stage to give the opportunity to experts, organizations and citizens, to express their views on any disagreements or objections to the project or activity, so that the decision by the competent authority can be made impartially. Among other things, its use is about maximizing the benefits, mainly by considering alternatives that could reduce the cost of construction, operation or environmental protection.

The purpose of the above, through the proper achievement of the project's objectives, is to highlight the environment during the decision-making process, for the implementation of a project or activity, with simultaneous and clear assessment of its environmental impact. (Glasson, J., & Therivel, R., 2012). The aim, is also to anticipate the environmental impact at

an early stage of the project design, in order to identify ways of reducing the environmental impact, to formulate projects that are appropriate to the local character of the implementation site and to present these provisions to the competent authority (Randal and Jowett 2010). In addition, an environmental study serves to control, prevent, identify, evaluate and assess the environmental effects during the execution, operation and completion of a project or activity, both in the natural and the anthropogenic environment. Finally, its concern is to make decisions and find methodologies and actions to address or avoid adverse and unwanted effects during the planning stage of each proposed project or activity (Glasson, J., & Therivel, R., 2012).

Perhaps the new development projects that are being created, generate waste, but on the other hand they may also create new jobs in areas with high unemployment rates, without this being the case in all cases. A project can be environmentally beneficial when, for example, it turns an abandoned arid area into a productive one. However, a development plan, can have negative social and economic effects when it puts pressure on community structures and increases conflicts and crime. Thus, it is concluded that the use of the environmental impact assessment procedure is linked to the achievement, not only of environmental, but also of economic or social benefits.

### **A.3.3. Environmental Impact Assessment Structure**

According to L. J. Walker and J Johnston, (1999), the assessment of environmental impacts includes both direct impacts, which are visible to all and indirect impacts, that can be both cumulative or interactive and should be defined in a way that can be separated. Thus, it creates the definition of indirect effects as follows: "Impacts on the environment, which are not a direct result of the project, often produced remotely, or as a result of a complex pathway. Sometimes referred to as second or third level impacts, or secondary impacts". Cumulative Impacts defined as: "Impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions parallel with the project". Finally, Impact Interactions are defined as follows: "The reactions between impacts of just one project that is close or between the impacts of other projects in the areas, that effect the project".

Furthermore, the preparation of an environmental impact study according to Liordos, (2014), is a structured process in which fifteen specific steps are followed.

As a first step, it defines the screening stage, during which it is determined by the planners, whether an EIA should be done, and the number of projects or activities required for the

preparation. Thus, it limits their application by categorizing them into projects that may have significant effects on the environment and others that do not have very serious effects. The selection of projects may be partially determined by legal provisions per country, such as each it is established by laws and there is a list of categorizations depending to the country (Liordos, 2014).

The next step is Scoping in which, at an early stage, the boundaries that the project is likely to have an impact are identified, including at the same time the definition of impact limits for each of its alternatives. (Liordos, 2014).

This is followed by the Impact Analysis/ Consideration of alternatives stage, where the impact assessment and development of alternative solutions or actions of the proposed project takes place (Liordos, 2014).

During the next step of the project/ development action description, the purpose and importance of the project and also its various characteristics (stages of development, location, procedures) are clarified (Liordos, 2014).

At the Description of the environmental baseline, the basic environmental status is described, without the realization of the project, taking into account the changes that may result from human activities or natural phenomena (Liordos, 2014).

The next step is the Identification of the key impacts in which the main detrimental or beneficial effects are identified and their prediction by gathering information from all previous stages (Liordos, 2014).

The Impact Prediction then provides for the determination of the magnitude and extent of changes in the environment after the completion of the project, compared to the situation that would have prevailed without the realization of the project (Liordos, 2014).

Considering the significance assessment, it is about assessing the severity of expected impacts to focus on the negative ones (Liordos, 2014).

Then, with the Mitigation step, alternative measures that are capable of reducing, compensating and/ or correcting the problems of the project's impact are proposed (Liordos, 2014).

The Public consultation and participation stage takes place whenever necessary, after the scoping step because, as mentioned, the impact assessment is a cyclical process. It aims to ensure the quality, understanding and effectiveness of the Environmental Impact Assessment,



as well as the participation of citizens the decision-making process for the approval of the project but also in the process of prevention of measures (Liordos, 2014).

A fundamental stage that follows, is that of reporting or environmental impact statement presentation. An important prerequisite at this stage, is the submission of a thorough report, containing the necessary information for decision-making, as presented to the agencies or in an open public consultation for the decision-making (Liordos, 2014).

This is followed by the Review step during which the Quality Control of the Environmental Impact Assessment is carried out (Liordos, 2014).

In the decision-making phase: the proposal is approved or rejected by the competent authority (i.e., whether or not the project or activity is approved or not) (Liordos, 2014).

The stage that is an important factor for the effective management of the project is the post-decision monitoring, because the impact caused by the project after its implementation is recorded (Liordos, 2014).

Last step is the Auditing stage. At this stage, using the data obtained from the recording in the previous step of project monitoring, a comparison is made between the actual and estimated impacts of the project initially predicted. In this way, the whole process for the quality of the study and the measures adopted for the mainly negative effects can be evaluated (Liordos, 2014).

#### **A.3.4. Dimensions and Challenges of the Environmental Impact Assessment**

In the view of Pope, J., et al, (2019), when preparing an Environmental Impact Assessment, the focus should be on the meaningful and active phase of the public participation process, as it was found if this were conducted very thoroughly, the assessment of the public opinion would be more effective in terms of social impacts and could become more beneficial to the local development, since they know better than anyone the local problems in the area.

The public participation stage was incorporated into the process with the implementation of the Aarhus Convention, which refers to the right of citizens to have access to environmental information and decision-making. Pursuant to this convention, citizens have the right to request and receive information from public authorities and public authorities are obliged to collect and provide the information, without special request from the public in accordance with the principal of transparency governing the process. It is necessary to minimize and avoid public



tensions and confrontation, since that approach contributes positively to the Environmental Impact Assessment process. Public participation plays an important role in boosting the effort to realize economic, social and environmental benefits (UNECE, n. d.).

Also, characteristic are the incomplete and superficial references at the beginning of the project, sometimes due to the fact that the study is carried out too early, either because resources are insufficient or the because mitigation planning measures cannot be developed. (Raissiyan, B., & Pope, J. (2012).

In any case, it is important to carry out the environmental impact assessment process, however time-consuming and costly it may be, because it assesses potential adverse situations and anticipates as much as possible the risks to a project or activity, thus avoiding unpleasant situations during construction and maintenance, resulting in its long-term viability (Glasson, J., & Therivel, R., 2012). It is now legally imposed, in almost all countries of the world as an established sustainability tool, in order to assess potential probabilities, either positive or negative, in order to have the most proper management of projects in possible situations that in another case might bring unpleasant results to development. (Pope, J., et al, 2019).

It should also be noted that although the environmental impact assessment process is clearly of a precautionary nature, its conduct precedes the approval or rejection of the implementation of a project or activity (Savvakis, N., 2012). According to Morrison-Saunders, A., & Arts, J. (2004) it is very regrettable to note that in practice it should not be limited to suggestions for moderation modalities, but should continue after the end of the project, in the phase called monitoring. In particular, although the prerequisite stages are quite serious for a project, the last stage, which is the monitoring of the project after its completion, concerns its maintenance and that is why it is very important. According to Szczepańska, A., & Pietrzyk, K., (2020), abandoning projects after their delivery, is an element that does not help in their long-term stay and this part of the process of an EIA is related to the duration of the project and correlates with its sustainable maintenance.

### **A.3.5. Environmental Impact Assessment for an Urban Park**

In our case, a proposal, for observation and monitoring of open parks, as shown by the same source (Szczepańska, A., & Pietrzyk, K., 2020), for the proper maintenance of a completed project, would have much better results if remote monitoring methods were used, but also in combination with on-site inspection when required. The in situ inspection is required as in some

cases the effectiveness of the remote monitoring method is not appropriate, because it depends on the clarity of satellite photos and also is not effective in some areas where there is insufficient lighting. Direct remote monitoring of the project when dynamic phenomena are created that may change and affect the project, even in cases of epidemics such that of covid-19 that the world recently faced, has proven to be effective. In the context of this research, on-site monitoring, combined with remote monitoring methods, prevails. The means of the method can work with satellite imagery in combination with the application "web Street View". Thus, the dynamic changes occurring in the project, can be dealt more directly, more economically, with fewer visits and quite effectively (Szczepańska, A., & Pietrzyk, K., 2020).

Looking at studies on the impacts of large urban parks, it is pointed out that these can often attract domestic tourism, which according to Pope, J., et al, (2019), is an energizing growth factor. Also, according to them, "responsible tourism" should be included in impact studies, which they say is "tourism that promotes responsibility for the environment through the its sustainable use, responsibility for the participation of local communities in the tourism industry, responsibility for the safety and security of visitors and responsible government, workers, employers, unions and local communities." In fact, five ways are proposed to ensure the successful contribution of the impact study in this area: a) Comprehensive without data deficiencies, b) Integrated into management systems to ensure that actions are properly allocated to the best outcome, c) Participation of the public concerned, d) System-focus for comprehensive monitoring of potential cumulative effects of actions on other interacting systems, e) Framework with broad consideration of impacts, including cumulative effects on other interacting projects.

Lawrence, D. P. (1997), in a small survey of ten different cases of open park evaluation - assessment studies, evaluates the effectiveness of these measurements. This was done by taking into account the following: a) whether the predicted impacts were obtained and whether the measures taken were considered effective, b) whether due attention was given to the proposals in the process in order to have the best quality proposals, c) whether benefits were enhanced and negative ones minimized for the environment, whether regulatory and environmental commitments have been met. According to this evaluation, it concludes that a review of the studies by professionals in the field, in order to better formulate the newer studies would be beneficial, as the scope for improvement of the studies is unclear with great scope for innovation and more insightful solutions. This could be done, if the Environmental Impact Assessment

studies were divided into sub-categories, for which there would be a database (information and studies database) to deal with them, which would be verified by knowledgeable inspectors of the kind and for different latitudes and longitudes, with exchange of experience, to develop in practice the course of the process.

In assessing whether the impact of a project or activity is significant or insignificant on the environment, parameters such as size, time of influence, severity and interaction between them are taken into account (Manoliadis, 2002). A methodological approach for measuring impacts in areas around open parks, on a scale from 1 to 5, was proposed by Cohen, P., et al, (2014), which is divided into three environmental domains related to climate, air pollution and noise. This includes the following stages: (a) measurements during the hot and cold months of the year, (b) analysis of measurement results, (c) data classification, (d) data evaluation and (e) classification of the evaluated data. With this method, it is possible at one scale to simultaneously calculate the effects of three dissimilar environmental components in a measurable way. Therefore, this could be applied to other components related to the environmental impact assessment in open parks, even though they relate to different sectors.

As far as open parks are concerned, it has long been known that temperatures in urban cities are much higher than in rural areas, which can reach a difference of  $0.1^{\circ}\text{C}$  to  $12^{\circ}\text{C}$  (Oke, 1997), while in areas with adequate vegetation, there is the possibility of a reduction of up to  $8^{\circ}\text{C}$ , provided that there are at the same time some additional technical factors which can help (Committee, 1987). This is due to the fact that the building materials are mainly mineral materials that retain the absorptive capacity compared to unstructured areas (Duarte, D. H. S. et al. 2015).

It is also accepted from previous studies that open urban parks, mitigate the negative impacts that emerged after urbanization on the climate, but also on the atmosphere in terms of microparticles and noises (Schnell et al., 2012). With urbanization, anthropogenic activities in the city are increased and are expected to become more intense in the future, with impacts on the health of its inhabitants according to a survey of London residents who were already fatally ill in the year 2014 and estimated to increase over time by (Doick, K. J., et al, 2014).

In fact, the larger the vegetation areas in combination with the way they are designed and with the appropriate type of plants, the more the temperature drop extends to the surrounding areas, in dependence on the way the urban network around it is structured and the climatic conditions

prevailing in the area (Yu and Hien, 2006). In fact, the closer to a sea area we are, the more the temperature becomes milder (Watkins et al., 2002). The following conclusions from Ng, E. et al., (2012) reached concerning the construction of open parks: a) in order to achieve a better microclimate in urban areas, it is beneficial to adopt ecological design from the outset, b) tree planting is preferred over that of lawn covering, and in general c) planting on rooftops is not more advantageous than on the ground (in the form of open parks) but only exist as an aid to add more energy. The research objective, according to Doick, K. J., et al (2014), is the targeted placement of urban thermal clusters - islands (construction of small open parks) in cities for the beneficial cooling of the inhabitants, with the appropriate type of plants (preference to European olea, Quercus ilex holm oaks and Phoenix canariensis), but also at short distances, that should be placed during the planning of urban cities, in order to achieve the best result (Doick, K. J., et al, 2014). The result, as a cluster of thermal cooling in the urban environment, also affects its urban surroundings peripherally and does not stand in isolation around the surrounding boundaries. This depends on the air mass transfers of each region as well as the percentage of evapotranspiration created by the plant type and soil quality (Chi-RuChang, Ming-Huang, 2014). According to them, it is considered that shading from the leaves of trees reduces radiation in urban cities by a large percentage and also, when we want during the day to emit the highest percentage of cold from the park with vegetation, then its paving should not exceed 50 % of its area and its trees should exceed more than 30 % of it. Alongside these percentages for open parks coincide with the theories of Ng, E. et al., (2012), who assert that tree planting in the city, should be 30 % of its area. In fact, vegetation is able to reduce even by 5.6 °C the temperature of the environment and the surface temperature by 47.5 °C (Vailshery et al., 2013). This according to Rosenfeld et al., (1998) implies energy savings during the warm months, which can be calculated even for the budget of a state.

In general, urban planting in cities such as the one in open parks, reduce temperatures and radiation on the surface and in combination with the evaporative cooling caused by plants the effect is clearly more pronounced (Duarte, D. H. S. et al. 2015). An important role for evaporative cooling, is played by the increased rate of retention of rainwater by existing vegetation (Emmanuel, 2005).

It should be noted here that, a major role in achieving such an objective, is whether the environmental pollution of the area allows and help the plants selected to grow, since urban pollutants from ozone, carbon dioxide and lead, act as a deterrent to the growth of trees, as they

are causes of defoliation, leaf discoloration and poor plant growth (Jauregui, E., 1990) Increase in temperature affects not only human life, but also its other living organisms, as it influences the growth of harmful microorganisms that are an unfavorable factor in the flora and fauna of any place (Tubby and Webber, 2010).

Given the climate change, planting as usual in open parks is one of the most suitable ways to mitigate weather conditions and climate, not only with the phenomenon of evaporative cooling during the day, but also because their foliage absorbs a large percentage of solar ray radiation and is considered one of the most suitable ways to mitigate weather conditions and climate (Cohen, P., et al, 2014). It is usually proven that, the creation of such parks within the urban coverage, also reduces microparticle pollutants and noises in the atmosphere. This makes cities more sustainable and enjoyable (Cohen, P., et al, 2014).

#### **A.3.6. Special Dimensions and Necessity of Urban Parks for Children**

Research conducted by Griffith University on children's understanding of what well-being means to them, by Geoff Woolcock, and Wendy Steele, (2008), concludes "that the natural environment reflects and determines children's well-being and gives children a very clear message about how they are valued (or not) within their community" .Academically, children's good relationship with the environment leads to spiritual progress, as evidenced in greener areas in Denmark, where young people had a 55 % reduced risk of mental disorders (Gill, T. 2021). Also, poorly planned high-rise areas show an indicator of poverty rather than prosperity, culminating in settlements, facing a host of additional problems, such as sewerage issues, lack of sidewalks, traffic issues (or even accidents), etc. (Gill, T. 2021). It is no coincidence that with the Declaration of the Rights of the Child, it was addressed by global organizations, as child-friendly open urban spaces are a bridge for the integration of the child into the interactive social life of the urban environment, without even creating divisions and age restrictions (Pitsikali, A., et al, 2020).

According to Gill, T. (2021), due to the lack of open child-friendly spaces, the obesity epidemic is greater (proportionally twice as high) in deprived areas, resulting in poor physique and balance of their bones and muscles, due to their deactivation. According to the same source, the problem does not remain at this level while they are more prone to fragility fractures and require more frequent hospital treatment and when they reach older ages, the situation becomes more unfavorable, thus burdening the state budget. The hypoactivity of children today is a

phenomenon that exceeds 80 % worldwide, compared to what they should be and in addition to childhood obesity, another phenomenon that also affects the budget of hospital care, is childhood diabetes.

On the other hand, open outdoor spaces contribute to better physical fitness, especially in early children (Gill, T., 2021). This is because playing outdoors, improves their movement skills by giving them dexterity in their movements. Hence, movement strengthens the body's defenses, and therefore health additionally leads to more creative imagination, the development of new abilities and the improvement of their endurance - stamina (WHO, n.d.). It also contributes to their mental health (WHO, n. d.). Also, as is commonly known to all, sun exposure even in the winter months improves the levels of vitamin D. which is co-responsible for bone health.

Furthermore, according to Gill, T. (2021), childhood faces environmental risks that have an impact on their poor health, such as pollution, noise, danger from traffic chaos, inactive psychosomatic exercise. For this reason, as per his arguments, one of the main fears of exposure to outdoor recreation areas of young or more adult children, is injuries or accidents. In fact, he concludes that quite often, this is the main reason for the rare exposure of young people to open spaces. That is why, according to his research, when constructing children's spaces, the risk of injury to any child while playing or cycling should be foreseen and carefully studied.

According to Agarwal, M. et al, (2021), a city with child-friendly open spaces, improves an urban structure when it meets the sense of safety, ecological thinking, interactive relationship with nature, but also with residents from the same or other areas that visit such, thus exchanging ideas and opinions between different ages. In other words, as the above-mentioned argue, the interaction should not only be interactive with the natural environment, but also between socialized individuals, increasing the indicator of well-being and development, with a healthier population that establishes a good relationship with its neighbors and with the natural environment by understanding it better. Moreover, it is a common belief that when the child is interactively active, as is the case during team play in an urban park, the ability to make decisions, socialize, adaptability, exchange, negotiate, and resolve disputes is developed. Through play, children build a sense of trust and manage to overcome their fears.

In any case, it is clear that these spaces must meet the requirements of safety spatially, proper organization, visual and aesthetic, accessibility and walkability, child-friendly installation materials, with durable quality and with a variety of options and in harmony with the natural



environment, away from urban pollutants (Agarwal, M. et al, 2021).

It is worth noting, that until recently, according to Agarwal, M. et al, (2021), the design of cities did not anticipate the needs of minors, but only indirectly created conditions for serving adults, (as they were themselves), without there being representative treatment for its young inhabitants. Of course, in this hasty design of the urban structure, residents (not only young people), inevitably would live in an inhospitable environment that leads children and adults to waste their time on the internet and television, alienation from nature, traffic congestion, epidemiological situations, as well as obesity since there is deprivation of physical activities. This of course has the alarming effect of affecting the mental health of the urban family, with an increase in crime (Agarwal, M. et al, 2021).

By exercising in safe open outdoor spaces, their mental horizons are broadened (Gill, T. 2021). The solution to the proper design of urban cities, is given by creating even a posteriori, in the potentially largest proportion, child-friendly open outdoor spaces (Gill, T. 2021), with philosophical, political, debating or entertainment and commercial purposes (Szczepańska, A., & Pietrzyk, K., 2020).

Luchs, A., & Fikus, M. (2013), conclude that outdoor game designers, should take into account existing structures whenever they are going to design an "outdoor game" as well as its features. In fact, as important as the physical part of exercise in games is considered, it is equally important to investigate, observe and evaluate its nature and to document its choice in natural environments, taking into account the fact that physical space changes, as do the needs in each society.

On the other hand, the question that arises for open outdoor spaces is that they are usually not controlled or are vast to be controlled and eventually end up as centers of accumulation of drug dealers and drug addicts, which are the main route of transmission of dangerous diseases children (Behnaz, A., & Dokhi, A., 2007). It would be advisable to have remote means of monitoring with competent responsible persons, not only for the above reason, but because this would serve to solve multiple environmental issues when and if they arise as it can give enough information in real time.



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## **Part B: Case study: An open urban child-friendly public space in the area of “Lathea A” building block 1413 of Municipality of Acharnes in Greece**

### **B.1. Necessity of creating the proposed Park at the proposed location**

The case study that follows is the implementation of an environmental impact study of a Theme Park, which aims to capture the basic problems of the area and to implement proposals in relation to the planned project and its activity on the environment. This will result the global treatment of both the problems of the area and the elegant and profitable management and maintenance of the multiple functions in it, aimed at its longevity.

The purpose of this theme park is on the one hand the economic development of the local community, the promotion of cultural activities offering older people the opportunity for recreation and physical well-being and on the other hand the balancing of ecological conditions in combination with teaching young visitors ancient history and mythology, in harmony with the natural environment.

The aim is to design an architectural study for the redevelopment of the entire area with a view to optimizing environmental elements, integrating bioclimatic design structures and adding new activities.

The aim of the study, therefore, is the qualitative and aesthetic upgrade of the above-ground space in combination with educational and cultural activities - recreation and play, so as to create a thematic space, a pole of attraction for all age groups, and a theme park on the labors of Hercules and interventions for the environment that upgrade the quality of life of the inhabitants.

The theme park of this study, captures empirical evidence of the needs of a specific degraded and densely populated area of Attica in the building block 1413 in the area "Lathea A" of the Municipality of Acharnes in Greece.

In order to substantiate the necessity of creating the proposed park, with the proposed features on the proposed site, arguments of the proposal from an environmental, urban planning, economic and social point of view are presented.

The ultimate goal is to address the main problems of the specific area of the municipality of Acharnes by implementing proposals that will upgrade the area. As the Olympic Municipality received a wave of huge population with the granting of athletes' residences to beneficiaries of



the Workers' Housing Organization, a large number of people who faced unemployment as a result of their relocation came to be added at the time of the Greek crisis in this large city. This of course also had an impact on the children of these families, even today after so many years they do not have sufficient outdoor spaces to play and as a result they go to neighboring municipalities. In connection with this relocation, the demand for markets and utility sites increased, resulting in residents solving these needs by visiting neighboring municipalities.

The project, along with the rainwater drainage facilities will decongest the central Avenue, which becomes a river with the slightest rain, will add another breathing lung to Attica. It will be open to visitors from all regions and ages, as a model space for actions, hosting at the same time activities of health interest, recreation, sports, cultural activities, learning history and art.

The project under study concerns a theme park, which will evolve around the turbulent life and the 13 (thirteen) labors of Hercules, from the moment of his birth until his final transfer to Mount Olympus. The labor<sup>13<sup>th</sup></sup> is his final that is not known to the common knowledge, that made gods to invite him to Olympus with them and is his manage to his deification. The proposed mythological park will not only be a recreation area but aims to create a space for interaction of learning, education and adventure. At the same time, it is an active energy source production cell that will not only feed itself but will also offer to the surrounding area in multiple ways, responding to multiple challenges specific to the area, with environmental, economic and social implications, for example, the multidimensional problem of widespread flooding when there is heavy rainfall.

In particular, the park includes indoor and outdoor spaces, facilities with open spaces of open-air markets, indoor dining areas, a library and internet connection, theater, etc., while at the same time it will evolve into an artistic artificial environmental landscape, with appropriate lighting, where trees and flowers will be planted that will reflect the Greek morphology and nature. Another important part of the project is the interaction that will be created with the water: streams, lakes, waterfalls and caves, as well as water slides and general sights and paths in nature, which will reflect with various effects both the history of the place and nature in general.

In addition, it will be an area that will generate income for the municipality concerned, which is facing sustainability problems and will provide new jobs for its citizens, thus increasing the well-being of the city's inhabitants and its children. Additionally, it is estimated that the creation of the park will contribute significantly the area, but also to the significant increase of its

economic value. It's no coincidence, that in large cities, the value of real estate increases when they are adjacent to a park, as it is now proven and widely accepted, that when residents live in a short distance and can approach on foot a park, especially a thematic one, this fundamentally and positively affects the quality of life of these on many levels (Crompton, J., 2001). Furthermore, the park will enhance the greenery of the wider region, and will contribute overall to the upgrading of Attica and the country, as Athens is the city with the less parks and green areas in Europe (Tessa Forte, 2017).

The Theme Park under study is proposed in a way that combines nature and an interactive methodology between balanced entertainment and education. The mythical theme of Hercules was chosen as the theme, because fascinates both young, old and people with different cultural backgrounds. That is, more specifically, the turbulent life of Hercules (Hercules is the "Hera's Cleus that means the Glory of goddess Hera". So, his labors were chosen as the main theme, whose labors reflect the symbolism of the ascension of the Soul and the evolutionary liberation of man from the shackles of passions. It also aims to strengthen the social cohesion of the area, through the cultivation of associations between the inhabitants and common references to the history of the region that at the ancient times used to build temples and worshipped the semi-god Hercules (Briefing News, 2018).

That is obvious in the post-Byzantine church of Agios Vlasios, where a column was found, by Hippotherides Acharneas, dedicated to Hercules (Avramides, B., n. d.).

The Sanctuary of Hercules has been associated with the Ancient Municipality of Acharnes and by Travlos and Arnaoutoglou that are persons that had occupied with the history of those times (Robertson, M., 1975), (Ustinova, Y., 2005).

Also played a role the fact of the glorification of Hercules in the area of Acharnes in antiquity, according to Pausanias (2nd century BC), the Acharnians honored and glorified the Goddess Athena Hippias and Hygeia, Apollo Agyeas, Dionysus Melpomenos and Kissos and especially Hercules (West Shore, 2014), (West Shore, 2015).

The whole dynamic route of Hercules, gives the interesting perspective of creating a thematic landscaping, which evolves between hills, caves, wet elements (pools, waterfalls, lakes, streams), but also through technological aids and visual - interactive - artistic effects through which winds, fires, sounds, clicks and so on are created, scenery that helps, sometimes the natural and sometimes the artificial environment.

At the same time, it responds to the main concern of this work to examine the importance of urban nature with the multidimensional character of a Theme Park, created for the well-being of citizens and for the sustainability of the area they inhabit. It is worth noting here that non-theme parks are considered slightly more inclusive than theme parks, but theme parks have a higher frequency of visits and bring, as it turns out below, more benefits to the community.

## **B. 2. Case study: Environmental Impact Assessment of an open urban child-friendly public space in the area of "Lathea A" building block 1413 of Municipality of Acharnes in Greece Environmental Impact Assessment**

### **B.2.1. Project Details:**

- Project Type:** Open Urban Child-friendly Public Space, Theme Park for Recreation and Education,
- Spaces:** Open and Closed Spaces: child-friendly, self-sustaining energetically,
- Location:** Area "Lathea A" Building Block:1413, of the Municipality of Acharnes, East Attica in Greece.
- Total Area:** Nearly fifty Acres (exactly 51.282,00 m<sup>2</sup>).
- Use:** Areas with public utility buildings, food and drink halls, a children's learning building with swimming pool, open recreation areas with a theme park, technical lakes.
- Face:** On main Road –Karamanli Avenue.
- Proximity:** Parnis Forest, Casino of Parnis, former Royal Estate of Tatoi.

### **B.2.2. Technical description of the project**

The present Environmental Impact Assessment concerns the process of identifying, predicting, evaluating and mitigating the biophysical, social and other relevant impacts in the development proposals for the creation of an open theme park before taking important decisions and making commitments, in relation to the proposed and under consideration project.

The purpose of this EIA was: 1) To ensure that environmental concerns are explicitly addressed and integrated into the decision-making process for the specific development, 2) To avoid and minimize any negative significant biophysical, social and other relevant impacts of the proposed project, and 3) To promote development that is sustainable and optimizes resource use and management opportunities.

The purpose of this EIA study is to identify the key environmental impacts likely to arise during the construction and operational phase along with the assessment of any adverse impacts and mitigation measures to be taken to minimize them.

The ultimate goal of this EIA report, among other things, is to prepare an Environmental Management Plan for the proposed project. Compliance with the provisions of mitigation measures for significant if there are negative impacts, will ensure the implementation of this project in an environmentally sustainable way, both during the construction stages and during the operation of the project.

The EIA report ensures compliance with all national and local regulations imposed in Greece, such as the requirements of the law on the protection of the environment of both Greece and the European Union in general.

This EIA report also examines the legal and administrative framework within which the EIA is prepared. A detailed description of the project is included in the EIA report along with a description of the basic environmental conditions and the actual environmental situation, at the proposed site for the specific project. This project is a theme park. Theme amusement parks are facilities that are located on limited areas of land, inside or outside residential areas and have a special tourist infrastructure to offer a variety of services to visitors around one or more thematic subjects and entertainment at the same time (GGHR 2086b/ 29-09-2009). So, this way is called the area, where the existing natural conditions are redesigned and reconstructed with the help of various methods and techniques of conventional and specialized Architecture, such as landscape and mechanical landscaping, thus creating an attractive theme in the environment for recreational populations.

It is an open urban public space, directly accessible and child-friendly, located in the "Lathea A" building block 1413 area of the Municipality of Acharnes in Greece.

The proposed site is located near the boundaries of the protection zone of Parnitha, which is one of the largest National Parks in Greece.

It has an area of about 51,282 square meters and belongs to the property of the Municipality of Acharnes, without there being a forest area in it.

Accessibility is already immediate, due to the increased traffic in the area not only from its residents but also from more remote areas, as it is located with facing a major avenue and near

basic roads that are main arteries of the road network that lead from the city to the top of the National Park.

This space can be designed as spacious and safe mainly because it is not active in traffic. It will be accessible, visible, friendly and adequately illuminated, aiming at green spaces, so that there are no unpleasant effects, due to age discrimination or other factors. As a space, it can be integrated into the social environment, to give value to the area.

As mentioned in the initial description - summary, this Project concerns a specially designed Theme Park, which does not focus on the creation of a simple natural park aimed at recreational amenities alone, but on the creation of a very epic new theme park model, a living microcosm, in which, through interaction between people, nature and technology, learning will be achieved through graded discovery that will also provide fun. In short, it will create a center for learning and deconstructing Greek Mythology and History in a way that visitors can live the events and historical elements they will experience, to be easily imprinted in memory.

### **B.2.3. Screening - brief description of the nature, size and location of the project.**

A careful selection of the type of project was made after studying the various problems and challenges faced by the area of the Municipality of Acharnes. During the selection process, the risks on the one hand and the benefits on the other were counted, after taking into account the specific criteria of the area, such as: the specific location, the traffic connection and traffic to and from the neighboring areas, the needs of the surrounding area and the population it is expected to satisfy, its functional purpose, the size of the plot, the general architectural structure of the city, the morphology of the soil, the climatic conditions, the configuration of rainwater flows, the seismicity of the area, the vulnerability to risks such as fire, floods, drought, etc.

The choice of location was made after research and after studying different possibilities. Because a large piece of land is required, at least 50 acres, in or near the center of Attica, the supply of such pieces is limited. Various areas were studied, such as Lavrio, Varkiza, Aspropyrgos and Koropi, where there are still large pieces of land. However, the plots identified were either far from the city and lacked population density, lacked easy accessibility, or had burdens (banking or state), or had urban use problems because they involved different services such as forestry or archaeology or other.

The specific piece of land selected for this project meets the basic requirements, such as: it is free of burdens, clean from urban planning problems, has a satisfactory size, has no forestry or archaeology problems, has easy accessibility, is adjacent to densely populated areas, is served by a good road network and most importantly, is located not too far from the city center and is in a place that has easy access from all the areas of Attica and the rest of Greece.

The area of the project and its peripherals, to this day, remains an abandoned area, in which all activity is avoided, as on the one hand it is in abandoned area, and on the other hand it is not at all passable, because until recently it was used as agricultural land by the owners who owned these properties (many of them have been compensated).

The location of the proposed project is in an Olympic city and is located very close to the Olympic village. This is already a serious reason to build such a project, which is undoubtedly expected to give life and value to the area with direct and indirect effects on both the Society and the viability of the Municipality.

Municipality of Acharnes became known particularly during the 2004 Olympic Games. After that, there was a strong relocation of new population in the houses of the Olympic village, which with the right strategy could be a serious parameter for successful sustainability, but which ultimately did not succeed as parameters of viability were ignored, (for example in terms of finding work but also in other sectors), resulting in its viability failing. The ignoring of those parameters are main reasons that many other Olympic villages had failed globally (Duignan & Pappalepore, 2021).

It should be noted here that also in 1986 in other parts of the same municipality, which were massively inhabited by beneficiaries of the Workers' Hearth, similar problems were faced and even today there is a lack of the necessary facilities, services and shops that could contribute to the sustainable operation of such a community, because this was not foreseen in the initial planning. The problem was exactly the same, similarly to the relocation of the beneficiaries of the Olympic Village after the 2004 games and still exist due to the lack of sustainable development planning.

In addition to the above, the Municipality of Acharnes is the third largest Municipality in Greece, with the high probability that in the long run another serious movement of new wave of population will be expected in the new planed areas of the city plan. It is therefore necessary, in the urban fabric of the area, to include a basic green lung, which will contribute to the

ecological and social fabric of the city. It is important to create a beautiful landscaped land, where both young people and children can be educated entertained, while older people will find a place of harmony and respite.

This project will significantly increase mobility in the area, which will attract interactive activities for all ages and visitors to other areas. Children will be able to play and create under the watchful eye of parents but most importantly, children and the elderly will be able to take part in the interactive functions, learning and education, thus creating common occupations between different ages, which can rebuild relationships in society, while improving their health and reflexes, in multiple ways.

It was examined and decided, on the basis of the results of the survey, the level and reason why the EIA is ultimately required for this project. The purpose of selecting the research data for this project focused on the need to analyze the individual parts of it and its related activities, as well as to examine possible alternatives in order to identify and address in the best way the potential problems of its community. Those potential environmental impacts have been identified as far as possible, and assessed so that future actions can be directed. For the purpose of better assessing the situation and assessing the necessity of the project, data collected for this purpose were taken into account and the following steps were as shows below:

a) Review of Documents that have been obtained and may be relevant to the Project: Titles of land parcels, special urban planning conditions, existing strategic plans of the Municipality for the surrounding area, published reports concerning the parks in general for the Municipality and the general area.

b) Project Area Reconnaissance Survey: The reconnaissance survey within this study was carried out on site of the project, to capture and understand the potential environmental and social impacts associated with the proposed project. During field identification, the main information on topography, soils, land use, surface water was considered, groundwater, flora, fauna, social environment, habits, work of the inhabitants of the surrounding area and uses of the buildings in the area around of the proposed project. The Hellenic Statistical Service was a helpful tool to obtain many of those parts of interest for indicators analysis.

c) Data collection: Both primary and secondary data were collected to achieve the objectives of the study. The primary data were collected by conducting field surveys as obtaining data from Public Services such as e.g., Town Planning Office, Land Registry, Forestry Department,



Ministry of Infrastructure, Meteorological Service, consultations with the local community. Also, at primary stage governmental documents as Laws, Regulations and Decisions nationally and internationally were examined. Secondary data were collected, both from the internet, or from published journals such as news that shows the area problems, occupation of the habitants, and business activities of the region.

d) Data Processing and Analysis: After collecting all the above data from the different sources, everything was analyzed and respectively, the results were presented herein, through tables, graphics / pictorial illustrations and bibliography.

Taking into account the data that have been summed up, and for the reasons given for the state of the Municipality and its viability, it seems that this is a degraded unused area. Thus, the project will undoubtedly create positive changes and impacts on all aspects of the physical, biological, social and economic environment. Important environmental services will be offered, namely the creation of a stable microclimate, an oxygen lung within the city, which cleans and renews air, filters the water, filters wind and noise of air. In addition, this enclave of natural life, will “filter” the wind and noise of city life, providing the sustainability of modern cities and the well-being of the dwellers, with vital social and psychological services. Therefore, an in-depth EIA was necessary to obtain an environmental permit.

As it was considered appropriate to develop the area, that is why the category to which this project should belong was examined along the way. With the amendment of Directive 85/337/EEC from Directive 97/2011/EU in Annex II, when enriching activities of the Directive, theme parks are included in the tourism and recreation chapter. Annex III also communicates the selection criteria and the way in which the elements of the project are described. According to article 2 of law 4014 /2011 (paragraph 1) the above project belongs to the tourism-recreation-theme parks sector and that is why it belongs to the high impact projects in category A. In category A projects, an environmental impact study approval procedure is required for licensing and issuance of a Decision approving Environmental Terms. The question is whether or not to clarify the necessity of constructing the project. For this purpose, one tool used is the following questionnaire:

**Questionnaire and answers establishing the necessity of the project:**

1. **Question:** Will there be a big change in the environmental conditions of the area with the construction of this park?



**Answer:** Only positive changes for the microclimate of the region.

2. **Question:** Will the new features be out of scale with the existing environment?

**Answer:** It will integrate harmoniously into the urban network of city life.

3. **Question:** Will the result be unusual in the region, in a way that neighboring areas and communities will need to be educated so that they learn to gain the maximum from the benefits offered by it?

**Answer:** They will be able to integrate smoothly and immediately into the life of its inhabitants without any effort.

4. **Question:** Will it be possible to extend the resulting result to the wider region?

**Answer:** It will positively affect the neighboring municipalities.

5. **Question:** Will there be any possibility of inter-municipal impacts on traffic, network burden, economy and neighboring businesses?

**Answer:** No negative impact will be created on the mentioned activities, and it will be beneficial in terms of the financial earnings of the municipality.

6. **Question:** Will a large part of society be affected by the operation of this?

**Answer:** Certainly, a large part of the population will have a better standard of living as a result of the benefits that will arise.

7. **Question:** Will other receptors of other types (such as fauna and flora of neighboring rural and forest areas, businesses, facilities) also be affected?

**Answer:** It will have a favorable development in terms of the sustainability of local species of flora and fauna.

8. **Question:** Will valuable or rare features of the area be affected, or will it disproportionately absorb resources?

**Answer:** It will not affect rare characteristics of flora and fauna as it is not an area of such interest. The resources generated by the project will be able to exceed its expenses, and will generate income from the shops, the indoor swimming pool, the theme park areas, the theater, and other activities. In terms of valuable features, the area is located within a city plan and is exempted from the requirement of approval of the Archaeological Service.

9. **Question:** Is there a risk of violating environmental regulations?

**Answer:** None.

10. **Question:** Is there a risk that protected locations, areas and features, such as the neighboring National Park, will be affected in a direct and / or indirect way?

**Answer:** No, as they are at a safe distance from him, but it will help to increase the rare species.

11. **Question:** Is there a high probability that there will be possible reactions due to a change in the local morphology?

**Answer:** No

12. **Question:** Will it be possible to generate data on acoustic or other pollutants during operation, in such a way that the environment will ultimately be harmed?

**Answer:** The opposite will happen after the end of construction, and it will be beneficial for pollutants in the environment.

13. **Question:** Will there be social reactions against this operation?

**Answer:** None, as it is not a Residential area from the one hand and at the other residents already complain that they have no recreation areas for their children.

14. **Question:** Will these reactions be able to continue for a long time?

**Answer:** No, there will be no reactions. The opposite will happen as is usual and it will be embraced by the Citizens.

15. **Question:** Will the result be able to be made permanent in a way that will be integrated into a smooth operation in the surrounding area?

**Answer:** There is certainly no such risk.

16. **Question:** Will the impact be continuous, increasing and expanding?

**Answer:** Yes, the beneficial benefits will increase over time

17. **Question:** Will it be difficult to avoid or reduce or repair or compensate for any negative effect?

**Answer:** If there are negative effects, it will not be difficult to deal with.

18. **Question:** Will it be able to be designed and operated with sustainable development in mind, be self-sustaining from energy and supplies, have enough resources for its maintenance and uninterrupted operation?

**Answer:** Yes, the result will be permanent and sustainable for many generations.

In the above questionnaire, the answers show that the project will be beneficial and will improve the living standards of its residents and visitors, as well as in the microclimate that will create

a positive impact on the environment. In addition, it is an environmental project of the utmost importance and supra-local beneficial character, as a zone of approximately 50 acres is created in the heart of the urban area of Attica. Such a site, after the completion of construction works is expected to employ about 100 permanent staff, not including those who will follow the responsibilities assumed by the municipality with its services. At the same time, many other job positions will be opened and along with new businesses, in catering, in the supply of products, in sports, and so on, will be independently helped.

The surface configuration and the mild regeneration of the above-ground space will contribute to the upgrading of the quality of life of the residents of the adjacent Municipalities, with the functional and aesthetic regeneration of the free public spaces.

At the same time, the philosophy for the creation of a theme park contributes to the spiritual development of the place, as it aims at informing, educating and developing the environmental consciousness of citizens, as well as entertaining them with a view to contact with nature and the environment, but also Greek history in general. In fact, it is a timeless project that with its proper maintenance will increase over time the benefits in the area.

#### **B.2.4. Scoping**

The proposed project develops the environmental impact assessment and the alternative environmental diagnosis, taking into account the terms of reference formulated by the environmental authority, the Municipal Community and the needs of the project itself. These Terms defined the intention, scope and content of the environmental study. Initially and after the screening process has examined the area to determine whether the project should start in order to be implemented or not, a pre-approval is requested for the environmental impact study of the park.

In accordance with Greek legislation and as stated in Article 2 of Law 4014/2011 applicable to environmental impact studies, in paragraph 2 and 3, the project operator, which in our case is the municipality of Acharnes, requests the consent of the Ministry of Environment for the project it intends to construct by submitting a dossier for "Preliminary Determination of Environmental Requirements". At this stage, the Municipality of Acharnes already has the opportunity to launch a public consultation, mentioning the technical characteristics of the theme park in order to have an initial picture of the environmental impacts it will have to face. The following characteristics should be justified in the pre-authorization dossier to be

submitted:

a) The alternatives: In the present study, the alternatives, including the zero intervention, are listed in the following steps.

b) In case that special studies are required, must be contained state justifiably which they are and the methodology to be followed to solve them: In our case special studies may be required during the excavation of rainwater tanks. There is the possibility that there is groundwater, so it will be necessary to use geotextiles and a special foundation with a revision of the existing study. However, the excavation will remain open and as a result it will require fencing. In any way fencing is necessary from the beginning so as not to have access to the site of people who are not relevant for the construction on the construction site, or stray animals, etc.

c) the main impact problems to be addressed: A key problem in the construction is the busy traffic on the central Avenue and there is the risk of an accident during the transport of personnel and materials. For this reason, special signs should be put in place, as well as traffic lights. Also, in the event that the excavations of the project take place during rainfall, there is a risk of flooding with a possible impact not only on the underground construction of reservoirs of the project, but even on the lives of the workers. That is why it should be avoided to start the excavation much later than the months of April to May. Another point of danger is the slavery zone of the Public Company of Electricity for the risk of electric shock to the workers, as the reinforcement of the underground tanks consists of iron which is a good conductor of electricity. The risk of electric shock increases in the warm months as with the expansion of the cables that are hanged the belly, they make due to their weight is larger and closer to the ground, but also in the rainy months due to lightning. It is recommended to avoid the construction of concreting reinforcement during the hot and rainy months. Also is need to avoid the use of reinforcement for its installation, perpendicular to the surface of the ground to avoid inductive phenomena.

d) to identify the bodies that are competent to be consulted after the consultation of the formal procedure: for the assent of the archaeological service that the area belongs to (specifically belongs to the Second Ephorate of Antiquities of Attica) which should designate a responsible person on site of the project, regarding the present study, in article 4, paragraph 2 of law 4014/2011. Based on the above article, approval is NOT required for this project as the location of the project is in an in-plan area. In particular, works which are all located in areas within a city plan or within the boundaries of settlements are not subject to the requirement of an

archaeological opinion, except in cases expressly provided for by the relevant legislation. For the same reason of the inclusion of the area in the city plan, approval by the forestry department is not required, in accordance with Article 2(5) of Law 4014/2011. Therefore, according to article 14 of law 4014/2011, the study is sent to the Directorate of Environmental Assessment at the Ministry of Environment, Energy and Climate Change, after an inspection by the supervising engineer appointed by the project operator itself, namely the municipality of Acharnes, and after the approval of the study by the municipal council. After examining the file, is made a recommendation to the Central Environmental Licensing Board set up for this purpose in the same Ministry." As the project is affected during its construction and after the end of it by the floods of Karamanli Avenue as analyzed below in a relevant paragraph, is necessary at this stage to have receive the approval of the section D19 Directorate of Flood and Reclamation Works of the Ministry of Infrastructure.

(e) the specific elements of the study direction to be included in the study: No specific guidance is required in this study.

(f) Annex with the opinions expressed: the opinions expressed will be recorded not only by the project stakeholders involved in the process, but also during a consultation. Also, possible proposals proposed and alternatives or corrections in addition to the problems posed, are within the scope of the consultation. The opinions expressed, will then be summed up and recorded by examining their significance. The process is cyclical and the consultation stage starts as early as this step. However, the process of this stage is described in detail below, as it is repeated until the Decision-Making stage whenever shows that is necessary.

Scoping is the stage that defines the scope and limits of the EIA and sets the basis for the analyses that should be carried out in each phase, where the important issues are identified and the terms of reference (ToR) and key issues and implications are prepared that may need to be further explored.

The scope determines a) the spatial and temporal limits, as well as b) any restrictions by the Municipality for the specific area and c) the important issues raised during the consultation as important impact factors to be determined.

According to the terms of reference, the analysis of the specific area under investigation includes abiotic, biotic and socio-economic factors and incorporates larger areas, from the surrounding Municipalities and neighboring mountain ranges. For the better study and

prediction of the operation of the project and its durability over time, the following data are considered:

**a) Spatial and Temporal Frameworks of the study:**

The Location, as mentioned above, is the "Lathea A" area of the Municipality of Acharnes. The maps of the project area are attached below to the data description.

For the Timeframes of Design, Construction and Control - Delivery, taking into account the studies to be prepared for the construction part of the project, they are provided as follows:

1. Environmental Impact Study, Architectural Study, Structural, Mechanical, Traffic Study, Budgets, Feasibility Study, Risk Assessment, Investment Proposal, Quantity Survey and Administrative Control: 8 months
2. Licensing: Environmental, Urban Planning, Traffic etc.: 8 months
3. Quotes, Contracts, Material Orders, Workforce, Planning and Start of Construction: 6 months
4. Construction and Monitoring: 22 months
5. Project audit and initial impact comparison during preparation, construction, delivery and acceptance of the project: 4 months

So, the project is therefore to last 4 years, i.e., 48 months.

It is important to define a Time Plan and the duration of its construction till the complete and to avoid the risks during the works that may have an impact on the project, for the reasons of flood or fire.

**b) Location of the Property-Location of the project in terms of land use-Urban planning status and building conditions of the area:**

The location of the project is commonly accepted that it cannot be an arbitrary act, but should be compatible with the general development planning of the city, as defined in the development plans and programs of the State. The criteria for siting should be the predetermined use of an area (Residential Control Zones, Spatial and Urban Plans, etc.) and the desired type of development for each area, in order to ensure both development and environmental protection.

For the plot of the project, the following building conditions of the "Lathea A" area apply, according to the Presidential Decree of 13/10/1986 and GGHR 1102 d/14-11-1986, following the decision of the Prefect with the number: 24309/T - 1832/90:

Less field area size: 400m<sup>2</sup>



Minimum Face on road: 10m

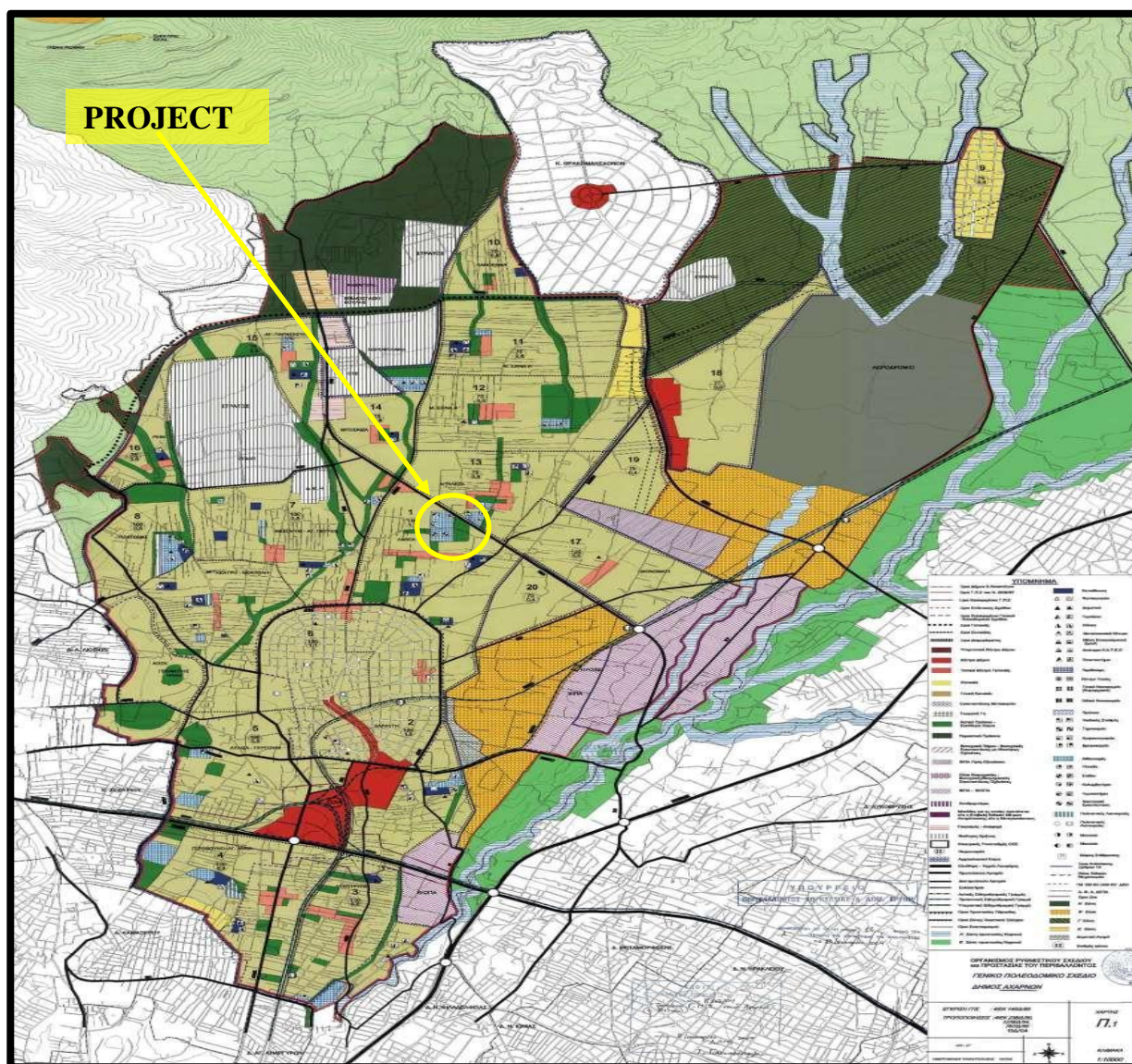
Building efficient: 0.80

Coverage allowed area: 50% for fields larger than 400m<sup>2</sup> and

Height: 11.00 m.

Number of floors according to the Law 4067/2012(GGHR 79a/ 09-04-2012)

As far as land use is concerned for the building blocks 1390-1587 it is pure residence for the rest it is a general residence as it appears in the general Urban Plan concerning this Municipality according to GGHR 13d/2004.



**Figure 1:** Map of the General Urban Plan of Acharnes

**Source:** <https://www.acharnes.gr/content/xartes-polis>

For the Building Coefficient and the land use of the area, it is necessary to take into account paragraph 8 of article 4 of Law 2508/1997. In figure 1 is shown the map with the existing land uses that require the Building Service of the Municipality of Acharnes, where it is evident that the use of the project is compatible with the specified land use of the Urban Planning Map, that it was intended to be area of parks, buildings of common benefits, athletics and swimming pool. This is a project with buildings and sites of public benefit and sports facilities, as well as outdoor amusement parks. More specifically, the area of 39.783 m<sup>2</sup> with the cadastral number 050283019001 must be characterized from buildings of public benefit, swimming pool and athletics, and the area of 11.499 m<sup>2</sup> with the cadastral number 050283019002 with open parks.



**Figure 2:** Piece of Land and National Cadastral Area Map

**Source:** <https://maps.gov.gr/gis/researchProd/?KAEK=050283019002&ticket=52A9517F597A91C1EBCE20BAE2AF05A9D59A3FC4&returnurl=https://ktimatologio.gov.gr/Professionals/Inquiry/Main/viewResults/050283019002-0-0&username=58361>

<b>TABLE OF COORDINATES IN SYSTEM HEGCS '87, IN THE PROJECT AREA WITH THE CADASTRAL NUMBERS 050283019001 (AREA 39.783 m<sup>2</sup>) &amp; 050283019002 (AREA 11,499 m<sup>2</sup>)</b>		
<b>POINTS</b>	<b>X</b>	<b>Y</b>
A1	477468.7805	4216494.6918
A2	477612.2226	4216483.8862
A3	477635.1747	4216463.3572
A4	477685.2835	4216418.5384
A5	477671.3602	4216211.2642
A6	477619.9878	4216237.2716
A7	477588.9476	4216246.0186
A8	477532.7946	4216260.0276
A9	477486.5758	4216263.1589
A10	477447.2325	4216258.8909

**Table 1:** Theme Park pitch siting coordinates



The parcel and its location are shown along with its peripheral areas in figure 2 of the National Cadastral map by satellite. As far as the characteristics of the area are concerned, the project is located within the urban fabric but is relatively remote from the city center, and sporadically still a place of vegetation and agricultural activities.

The table 1 shows the coordinates in the HEGCS 87 coordinate system, that accurately identifies the outline of the Building Block 1413 on which the project will be built. The field of the topographic diagram has a total area: 51,282m<sup>2</sup> with face on the central avenue: 270 m, and the wide of the other perimeter streets is 8m.

### B.2.5. Description of the environmental baseline:

For the successful design of the project, the above are important data that constitute the primary factors to be checked and the basis of the existing data that should be taken into account and properly established. In addition to those mentioned, the information concerning the current state of the environment, must be also in order, and mainly the parameters that will be affected both during the construction and during the operation of the Project.

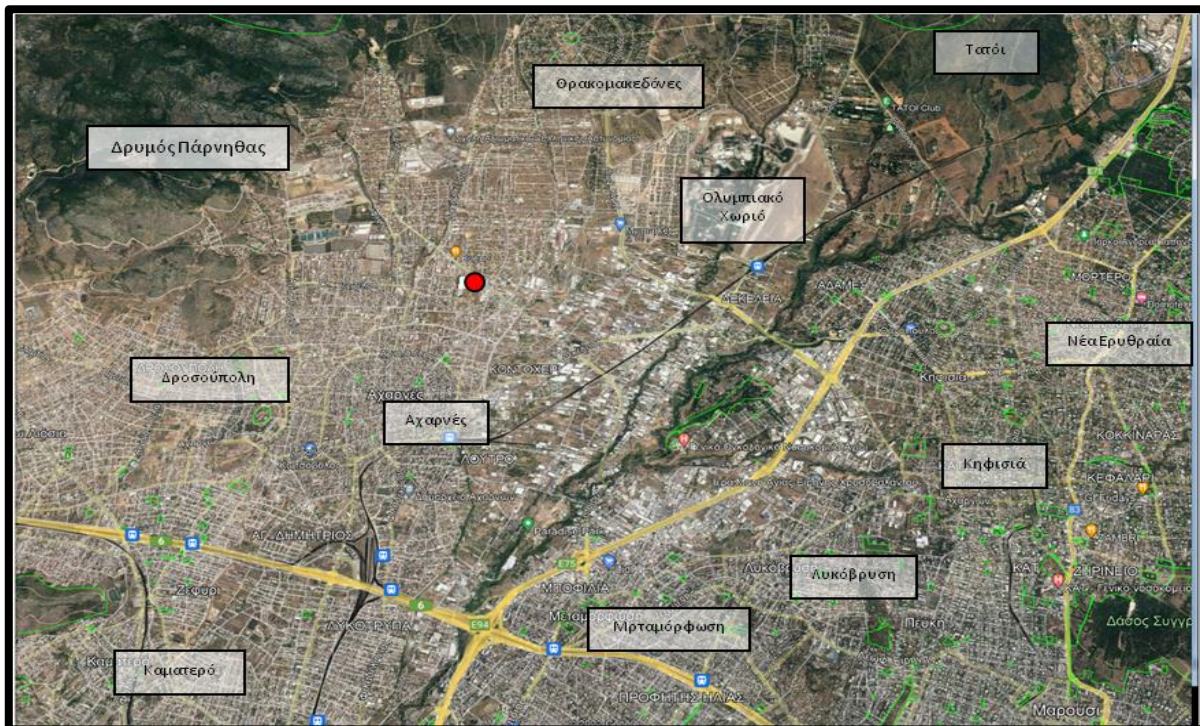


Figure 3: Project location and the relationship with the surrounding area ●

Source: Google earth

This piece of land is located at the location "Lathea A" of the Municipality of Acharnes, Eastern Attica, which is the fourth largest in area and the 16th largest population in the country as a whole according to the Greek statistical authority. The project is located very close to the foothills of Parnitha and the Royal Estate of Tatoi and specifically has a long frontage on Karamanli Street. Also very close is the National Park of Parnitha that is the green area on North, and houses rare species of flora and fauna, as is clearly obvious at figure 3.

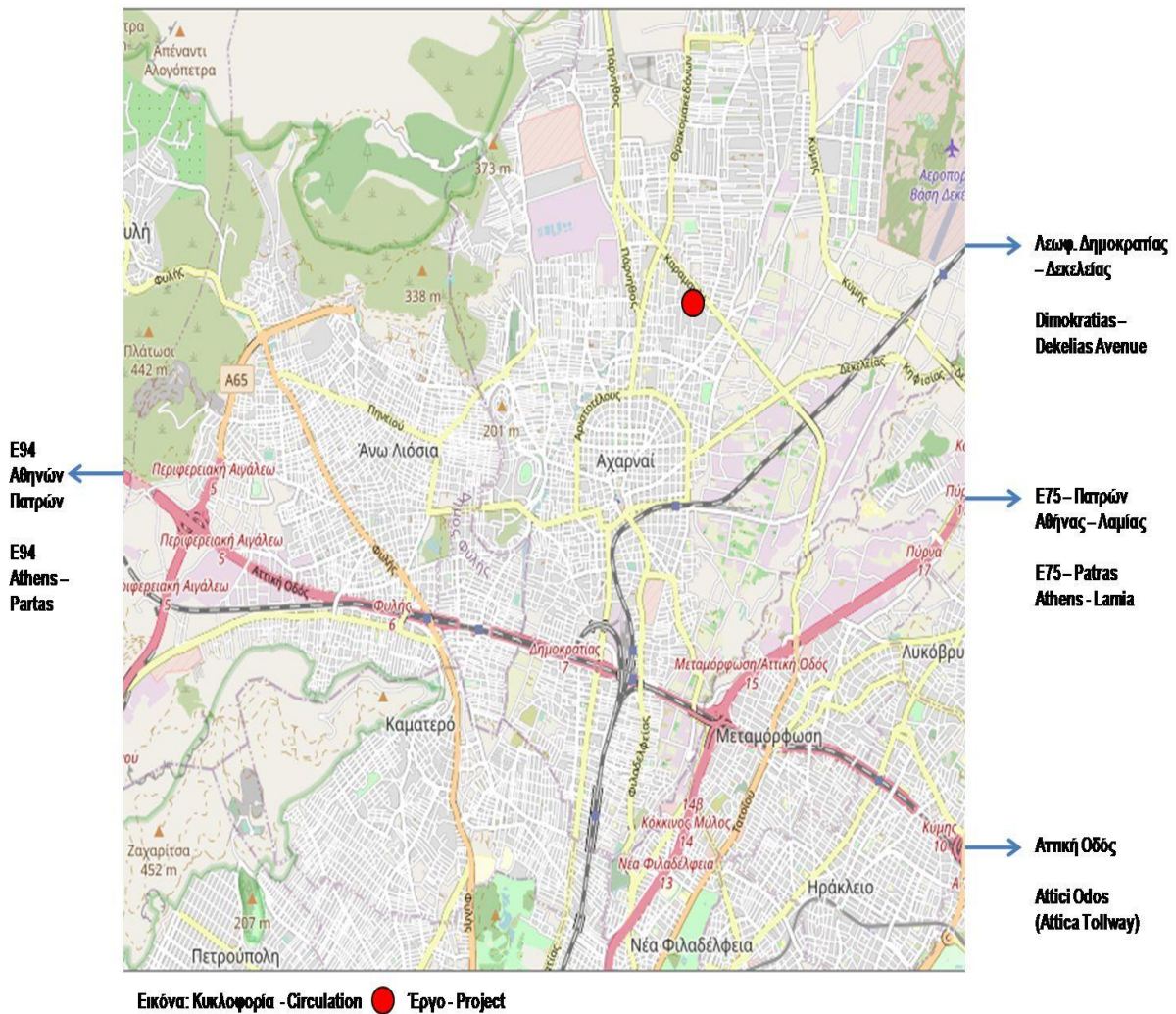
#### **Distances from the Main Centers & Traffic/Road Axes:**

The distances from the Project to the main nodal points of reference, indicate that the location point of the Project is very close to very important reference points, not only from the various regions of Attica, but also from other areas of Greece and Europe, such as the national axes, the airport and the port of Piraeus, not only from the various regions of Attica, but also from other areas of Greece and Europe, without need to enter the busy center of Athens, thus covering a wide range of areas.

As shown in the map of the Figure 4 below, the project is located very close to the main arteries of Attica, such as the National Road Patras, Athens-Lamia (E75), the Attika Road, which leads to the International Airport, the ring roads of the City of Athens as well as the European road E94 (Athens Corinth) which connects the Peloponnese with mainland Greece, which are road axes belonging to the international network of European roads and cross the Greek territory.

- Center of Acharnes : 3.3 km
- Parnitha Park : 5.9 km
- Athens-Lamia National Road : 4.7 km
- Node of Attika road-Lamia National Road : 6.5 km
- Attika road : 4.5 km.
- Kifissia : 4,7 km
- Pre-urban railway of Acharnes : 6,4 km
- Center of Athens : 15,0 km
- Athens International Airport : 35,0 km
- Piraeus Port : 25,0 km





**Figure 4:** Illustration of main traffic arteries

Source: <https://www.stigmap.gr/umap20614-leoforos-kifisias-ellada.html>

**Transportation/Transportation**

It is also important to mention that on Karamanli Street there is a Bus stop right in front of the plot, which communicates with the suburban railway stop, the "Acharnes" stop and other areas of the Municipality.

**Protected Areas of Natural Environment:**

As shown in figure 5 below, the location of the point is very close to the protection zone of the national park of Parnitha, followed by the protection zone of Mount Egaleo and Penteli. It is essentially enclosed by these three protected green zones that enclose the Attica region thus, it is expected to create an intermediate home for protected species that believe they can self-house in the area to be created, next to the green zones they were used to until recently.

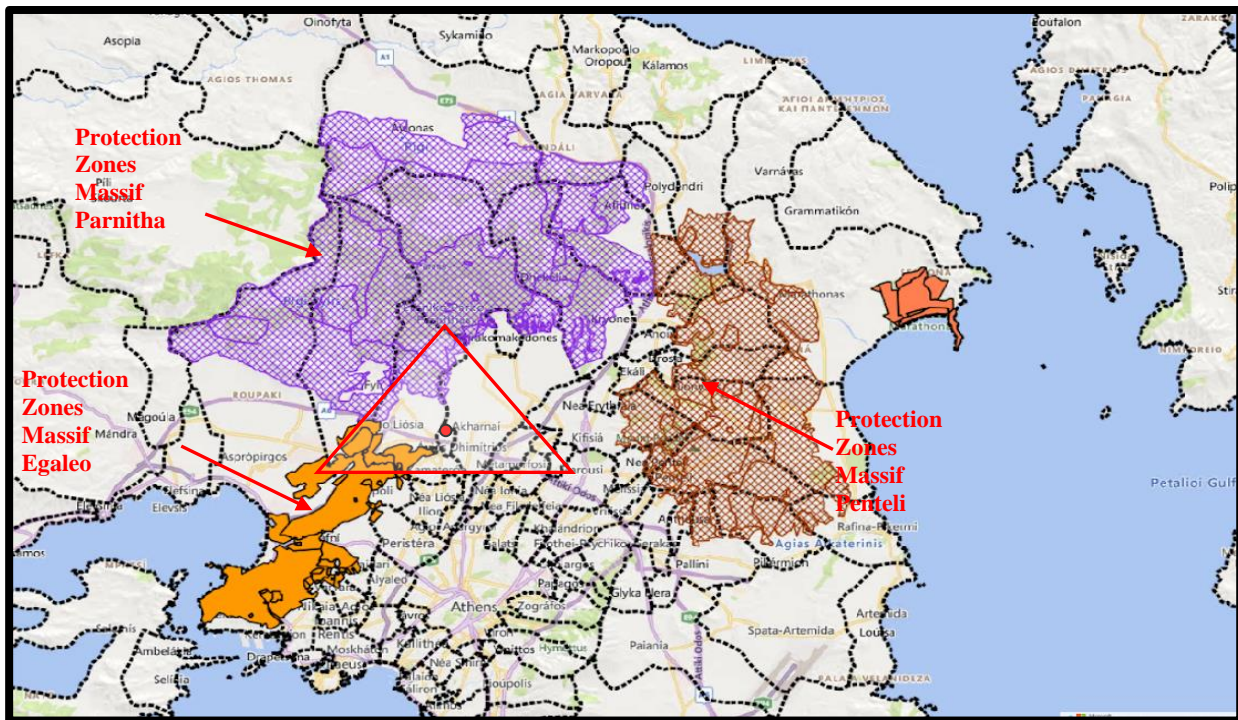


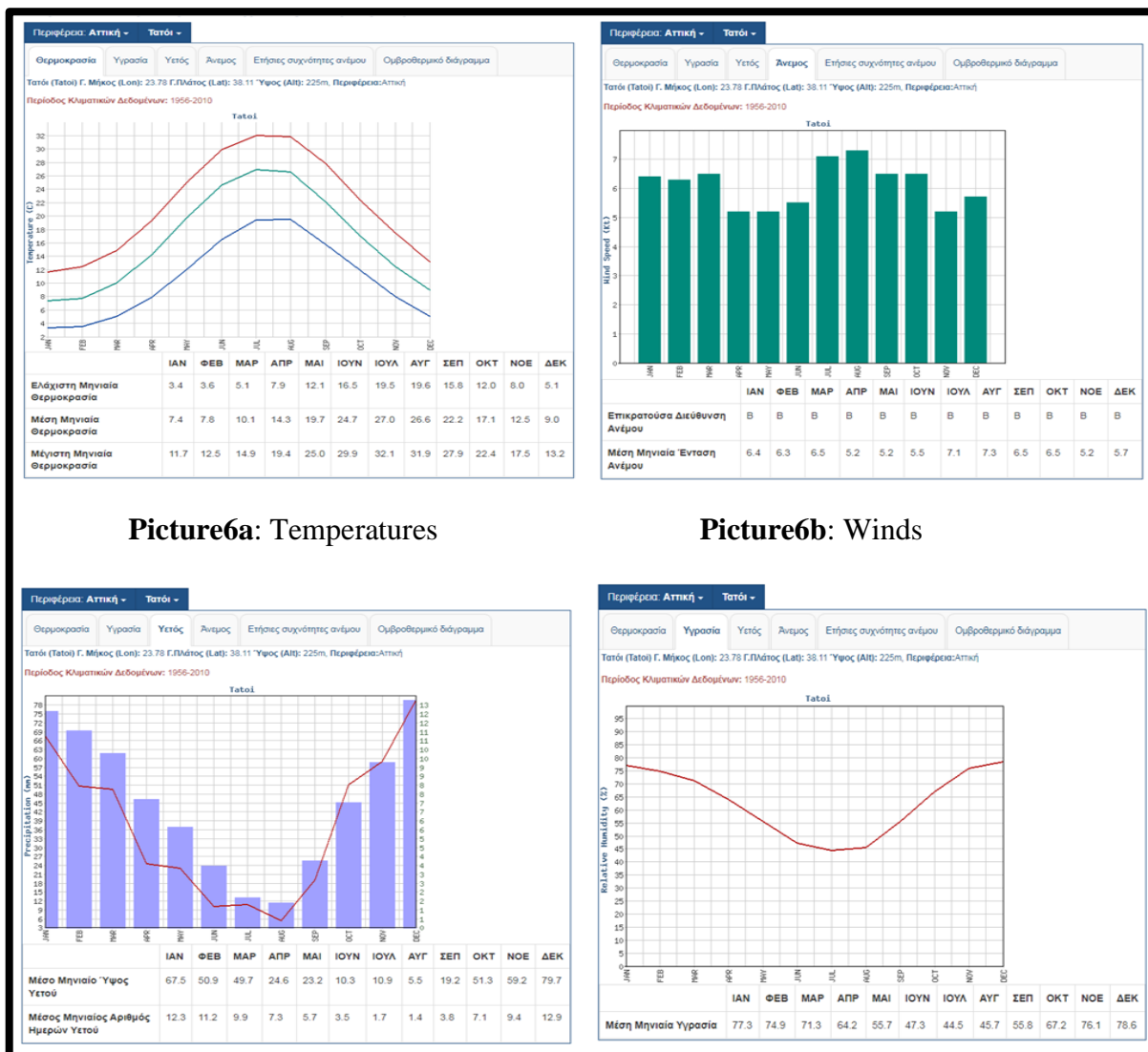
Figure 5: National Park Protection Zones/ Project ●

Source: <http://geodata.gov.gr/maps/?locale=e> and own processing

### Climatic - Meteorological data of the region:

The project is located in the center of the triangle of protected areas of Attica, Parnitha (North), Egaleo (West) and Penteli (East), as shows at Figure 5. This means that is at high risk in relation to the likelihood of fires and floods. For this reason, very careful measurements of air, humidity and rainfall in general are needed, that should be tested empirically for at least one (1) year, which was not feasible to do for the purpose of the thesis. The above tables depict the climatic conditions of the semi-mountainous area of the former Royal Estate of Tatoi, which is located northeast and at a slightly elevated level (350 - m from sea level) from area where is very close the specific plot intended for the park is located.

At the following figure 6, depict the climatic conditions of the semi-mountainous area of the former Royal Estate of Tatoi, located very close from the specific plot intent for the park. The area of Tatoi is located northeast and at a slightly elevated level (350 - m from sea level) and since that meteorological station is located that close from the suggested park, we can assume that the climate conditions at the station, are similar to the studied area.



Picture 6c: Precipitation

Picture 6d: Humidity

Figure 6: climatic conditions of the region.

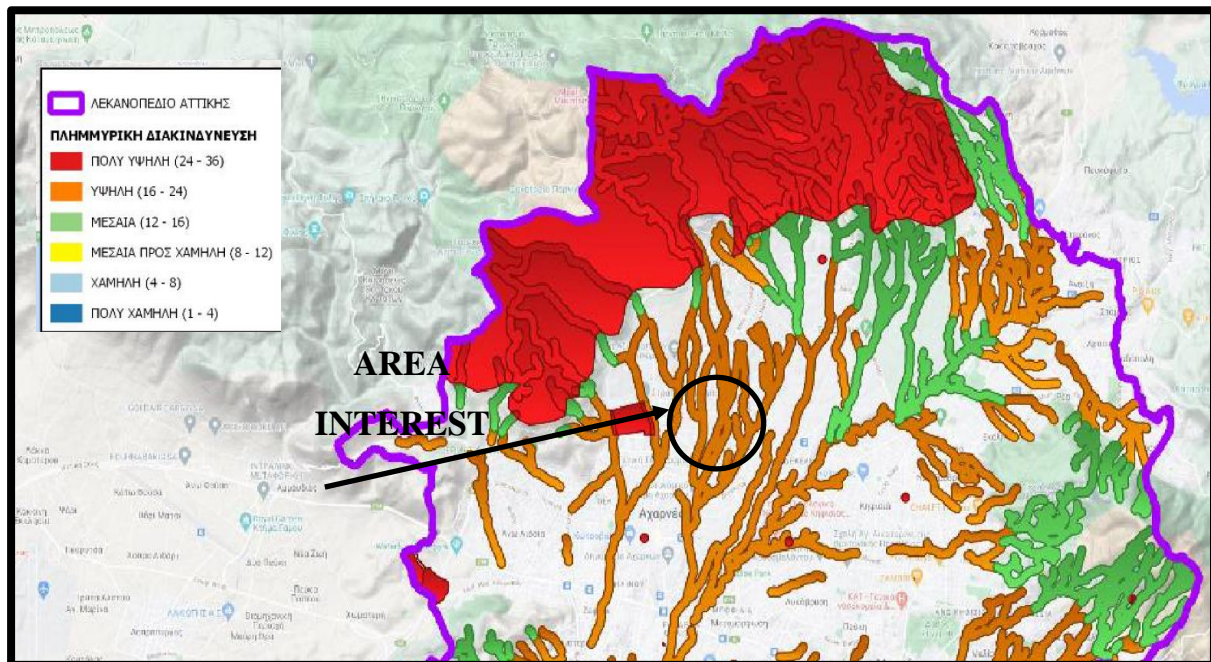
Source: [http://www.emy.gr/emy/el/climatology/climatology\\_city?perifereia=Attiki&poli=Tatoi](http://www.emy.gr/emy/el/climatology/climatology_city?perifereia=Attiki&poli=Tatoi)

### Flooding Risk

In the Attica basin, the prevailing climatic conditions, combined with the form and lithological composition of the relief as well as the extent of the watershed of the hydrographic network, do not allow the creation and development of large rivers to decongest rainwater. The main watershed that defines the Attica Basin follows the ridge of the regional mountains. In the area under consideration, the main hydrographic network is the Kifissos River, which flows east of the area where the property is located, and very close to the studding area.



The Project Area is considered to be at high risk for flooding, as the stream network faces multiple problems that result in delay and obstruction during the flow to Kifissos. On figure 7 the map shows the danger from flooding in the area.



**Figure 7:** Prioritization map of environmental criteria in terms of their significant impact on flood risk

**Source:** Ministry of Infrastructure & Transport

Kifissos River serves the flood protection and urban development of the Western, Northern and Eastern region of Attica. Many surface and underground streams channel the large volume of water resulting from the rainfall of the plain and the mountainous parts, which embrace the Attica basin. However, because it is considered that the river is saturated, it is proposed to store rainwater in tanks for own use to the maximum possible. The study will provide for rainwater storage of at least  $500\text{m}^3$ . Therefore, a special study of protection from rainwater and runoff of the streams in the area is needed for the project. It is noted, however, that with the large underground tank of  $500\text{m}^3$ , there will be for enough the capacity to collect rainwater and channel it to the satisfaction of the project needs itself.

### **Earthquake Potential**

The area of Acharnes is characterized with a risk level of 2 in relation to the reactivity of the area. A little further, on the north, the Rift of Thrakomakedones - Parnitha is known. The memories of the devastating earthquake on September the 7 are still alive from the year 1999, when there was an earthquake of magnitude 6 on the Richter scale in the area of Parnitha, during

which 143 people lost their lives, 1,600 were injured and 50,000 were left homeless! Map 8 below shows the seismicity of the area in the year 1999.



**Figure 8:** The active and possibly active seismic faults of Eastern Attica in the year 1999 - project area. ●

**Source:** Newspaper “To Vima”, 2009.

It is considered that the rift is still active. In the figure 8 is shown the project area next to the rift. Taking into account the vulnerability and risk of the area due to seismic factors, both buildings and open spaces should be properly studied and methods of escape and protection should be created. Also, the construction materials and the design as a whole should meet the needs of such a vulnerable area which will have such a large number of visitors and employees.

### **Geology & Soil Morphology**

The soils are fertile and mainly clay with a visible water presence with no steep slopes and almost no the presence of boulders, as it was mentioned that the landscape was formed and is used as a cultivable area that even today is partially used as agricultural land. Practically, this category of clay soils, due to the substrate that exists under them, makes them practically impervious for tree planting although they may appear porous and plastic and also create land movements and streams. (Bergonzoni M., et all, 1995).

In order to achieve the desired goals, we take into account the geological and morphological

characteristics of the soil such as water grooves and ditches, etc., with attention both to their preservation and to the necessary corrective measures to maintain and improve their stability for their smooth management. We must also take into account watercourses and groundwater, and the water regime in general, aiming to upgrade and protect it from pollutants. This can be done by emphasizing the gradations of the soil in order to maintain the fertility it had when cultivated at the same time with the appropriate arrangement of the new elements that make up the landscape, not only in terms of planting but also including the modern architecture that will be applied.

This means that the new buildings will be of architectural and typological interest, aiming at the harmonious coexistence in the new landscape with the expectation of general acceptance as a space and the general exploitation of space in the maximum possible way.

We must also take into account the flora and fauna of the place. Although it is not considered a place protected by the conditions of the world map, it may sometimes be home to rare birds that mainly live in the national park of Parnis. This will also affect the fauna of this area as the birds carry seeds. Therefore, tree planting should be in harmony with the nearby areas of the park that host these rare species.

### **Biological Environment - Biodiversity**

The Protected species under the network "Natura 2000" and of special natural Parnitha Park and the Former Royal Estate, beauty (Decision 25638/ 1269 of the Ministry of Forestry Agriculture), which due to non-public origin was transformed into a natural habitat, are now important areas of fauna and flora (Aplada, I., 2005).

The ecosystems and natural formations found in the wider area of the mountainous part of Parnitha, the streams, the caves, the chasms, the rock formations and the Gorge of "Keladonas", are not only of inestimable ecological value but also can be a serious example during the construction of this theme park, which will be designed reflecting the natural environment where hero Hercules lived, fought and raised as semi-god (this is the "thirteenth" labor of Hercules that made gods invite him to Olympus).

In particular the Forestry Office of Parnitha, in the relevant website of Ms Aplada. I., (2006), mentions the flora of Parnitha has occupied many researchers since ancient times. As an example, Professor Ch. Diapoulis is been mentioned, who recorded in the mid-1950s, about 800 species and subspecies of plants (Aplada. I., 2006). Remarkable postgraduate thesis of Ms. Aplada of the Department of Biology, University of Patras, published study in 2003, and



entitled "Vegetation zones and ecological evaluation of the core of Parnitha National Park", resulted 120 new reports on the flora of the mountain. According to this study, but also based on the research conducted by the Forest Service of Parnitha, the flora of Parnitha includes almost 1,100 taxa (with this term we include the species and subspecies together), that is, what all of Scandinavia has totally! In addition, of these 1,100 taxa, 92 are Greek endemic. In fact, two species are exclusively endemic to Parnitha, that is, they are not found in any other part of the earth: i.e., a) the bell (*Campanula celsii* ssp. *parnesia*) which grows in limestone rocks making incredible purple lawns and b) the wild carnation of Parnitha (*Silene oligantha* ssp. *parnesia*), which blooms around mid-June (Aplada. I., 2006).

As far as fauna is concerned, the area of Parnitha remains among the richest in Attica and despite adversity and anthropogenic interventions and influences, it retains a significant number of red deer (*Cervus elaphus*), which together with the few deer found in the Rhodope Mountains, constitute the only populations of this species in Greece. In addition, in Parnitha live, 23 species of birds, 12 species of mammals (mainly bats) and 12 species of reptiles and amphibians, which are included in the "Strictly protected" fauna species of the Bern Convention (Aplada. I., 2006), (Legakis, A., 2007).



**Figure 9:** Ecological environment of the plot

**Source:** Google Earth

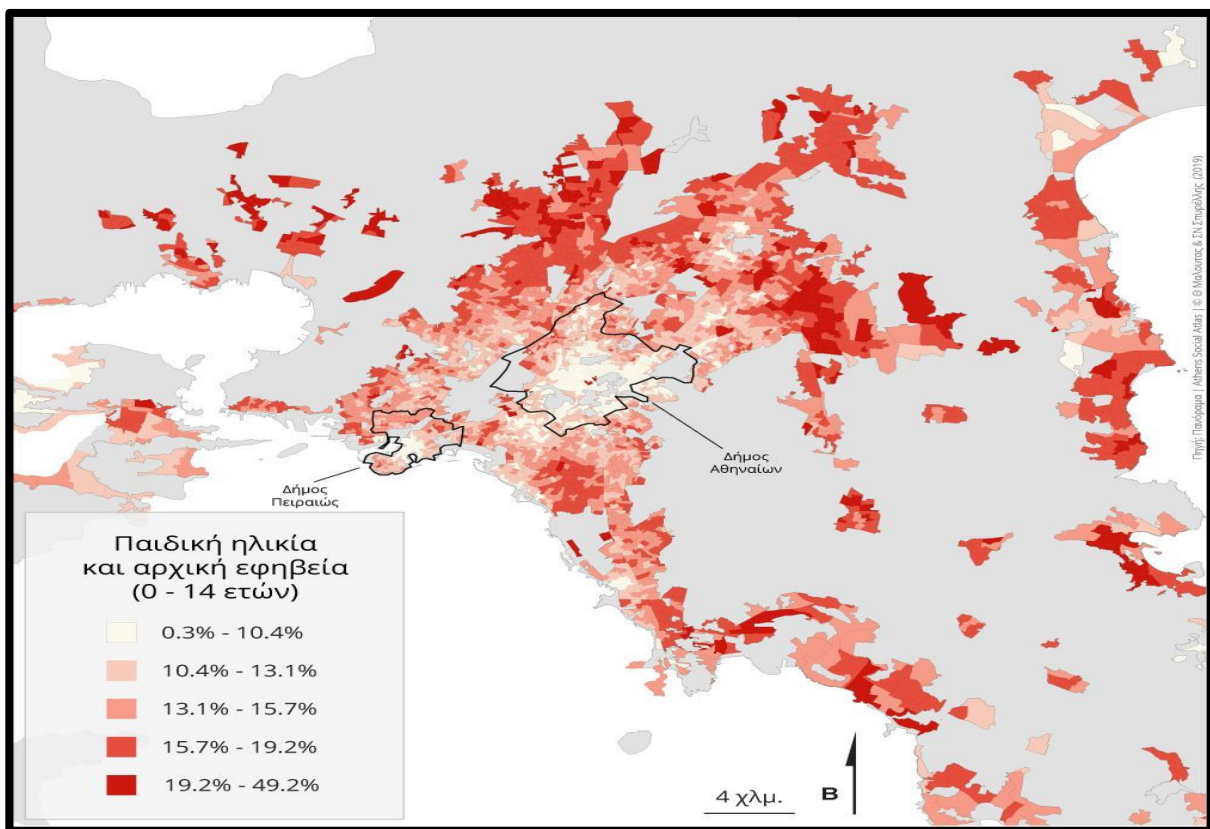
In short, near the project, there is a huge botanical garden with souvenirs of natives, rare plants and animals. In total, the surrounding area also occupies a relatively fertile valley, which until today, is cultivated by family units.

In the area of our study, special ecological features regarding flora and fauna are not found due

to the fact that this plot is located within the city and the surrounding area has been built. Simply because of its size and non-use, it evolved a form of grassland vegetation. Some part of it is still cultivated. The ecosystems found are mainly found in the nearby streams that run through the area and in the above mountains, which embrace the wider area. On the West side there is a clump of trees, but again without special features. In figure 9 is shown the project place and the side areas, and the existing optimal present conditions of the agricultural land, that are capable to develop the plantation that is suggested at the project.

### Population Counting and Density

Forming a radius of about 10 km around the project, and taking into account the measurements of the Hellenic Statistical Authority in the year 2021, approximately 800,000 - 1,000,000 inhabitants are counted in the areas that include part of the Northern Center of Athens. In the Western, Eastern and Northern Suburbs section, children density is about 28 % of and primary adolescents between 1 and 14 years of age, according to the office of statistical service. This means that there is quite a lot of children population coverage in order to be able to be the safe base for potential young visitors. Figure 10 shows the density, with the young age groups in the position of interest of 28%.



**Figure 10:** Childhood within a radius of 10km- Age Groups of Attica

Source: <https://www.athenssocialatlas.gr/>

### **Socio-economic characteristics:**

Domestic conditions, Work, Education and the heterogeneity of the region (Gypsies and Migrants), will be a challenge for the success of the project. From 1960 to about 1990, the population in the Acharnes region increased by 265% compared to 71% in South Attica. Compared to the 2001 census, it seems that there is still an upward movement of populations with an average of about 15-20 %. This movement is due to:

- a) The settlement mainly of repatriated Pontions, from countries of the former Soviet Union as well as Northern Epirus repatriated political refugees, or repatriates from various other countries.
- b) The recent years large mass of immigrants or gypsies.
- c) The relocation of the beneficiaries of the “workers' residence” in the Olympic Village and
- d) The low cost of buying land and renting accommodation.

Regarding the labor dynamics, it should be noted that the Municipality of Acharnes and the other neighboring Municipalities have always had residents with low economic strata, mainly workers and manual workers. A significant portion is also recorded of family businesses engaged in trade in the construction and food industry. The massive influx and the settlement of repatriates from the countries of the former Soviet Union without the parallel protection and education by the State, led to the unregulated evolutionary course of the region.

Unemployment has been on the rise since the past. Especially after 2008 and the crisis that hit vertically the construction activity in which the majority of the active residents of the area were employed, brought the sharp increase in unemployment, which continued to increase to alarming levels until today, resulting in an increase in crime in the area. Added to this was the new crisis, with the closure of businesses due to the issues that evolved around the health crisis of the last three years that was named “crisis of covid-19”.

Also, the permanent settlement of a large mass of Gypsies in shacks, helped to significantly degrade economically and culturally the surrounding areas. Added to this is the unregulated influx of illegally imported immigrants, which creates a completely disorganized environment.

The interaction of the cultural and social norms of the indigenous population with the new settlers, created and continues to create confrontations between them. Sometimes, however,

they also create the conditions for the cultural evolution of the population, but without the necessary and elementary strategically studied evolutionary planning.

The level of education and incomes is one of the lowest in the Attica basin and as it is currently formed, it is now one of the lowest levels in Europe, to an extent that exceeds the levels of poverty as can be seen from the posts of the Hellenic Statistical Authority.

### **Historical and Archaeological elements of the Place and its Cultural Heritage.**

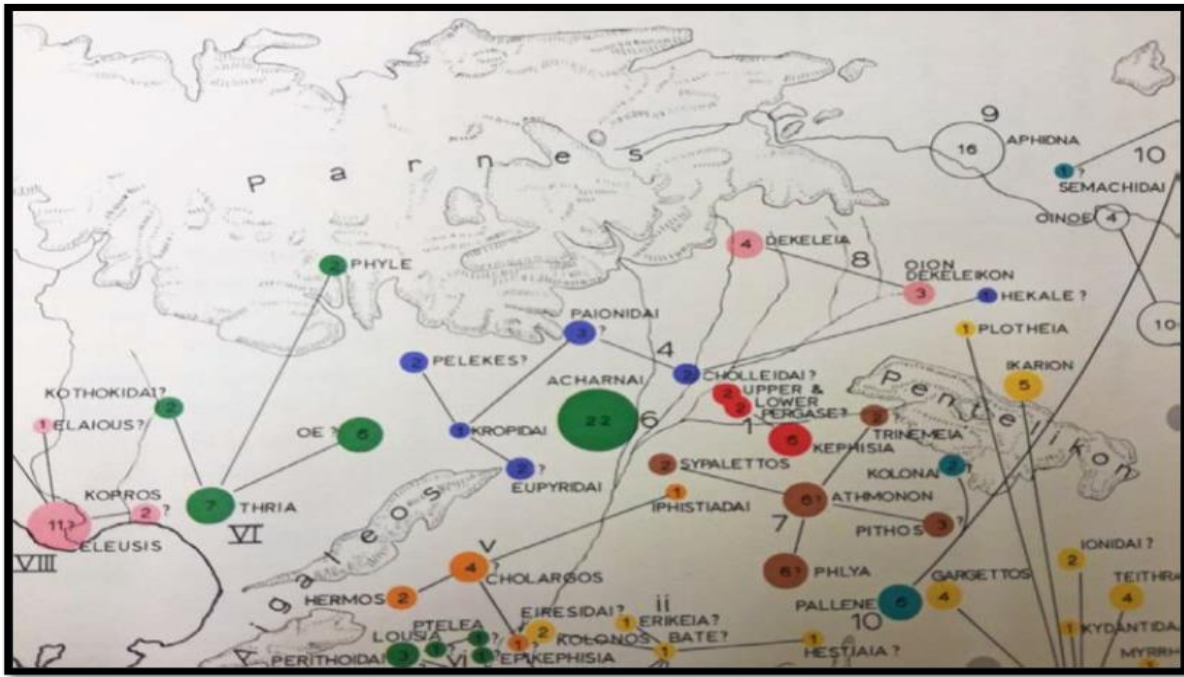
The area where this project has been selected to be based, took into account during its research the historical importance of the area of Acharnes. The name "Acharnai", according to one version, comes from the ancient name of the homonymous mythical hero "Acharneus", founder of the city, from whom Acharnes took their name, as happened with many other ancient cities. It is also important the prefix "Ah-" which is also converted as "Ag" which is used in relation to water (which also arose in Latin agua- water) due to the many waters in the area (the 2nd version of the name is associated with "Acharnos" a species of fish of the grouper family). It is also possible that the name has a pre-Hellenic origin and is associated as an anagram with Archanes in Heraklion, Crete (Stasinou Christos, 2022).

The Acharnes claimed to be indigenous, that were born according to history from Gaia herself. According to the historian Thucydides, the ancient municipality of Acharnes belonged from the 6th century BC to the Onida race and Tritty IV of Mesogaia and was the most populous Municipality of the City - State of Athens. The location of the ancient municipality is identical to the current one. In figure 11 below, as shown in the detailed issue of the author Avramides, B., (n.d.), professor of the Department of Archaeology and Historical Research of the Municipality of Acharnes, the location of the municipality on this map is approximately the same as the current location of the homonymous Municipality, and therefore the project is located within the zone with no. 22. That means, Acharnes is one of the oldest municipalities in Greece (Kassotaki, H., & Ioannou, P., n.d.).

In fact, according to the words of Thucydides, Acharnes had a large number of armed soldiers (3,000 that was the 1/10 of the whole army) Acharnes and mentions that they had 22 representatives in the Athenian parliament that is more than all the other Attica municipalities. Also mentions about the cavalry army who fought on the side of the Athenians during the Peloponnesian War. At those times, Acharnes thrived from the agricultural cultivation of the fertile plain between Acharnes and Athens, as well as the exploitation of timber from



neighboring Parnitha, which was the core of the wealth of the locals. Their first organized life in the area seems to have begun in the 14th century BC and since then continues to show continuous habitation. (Kassotaki, H., &Ioannou, P., n.d.).



**Figure 11:** The location of the ancient Municipality of Acharnes. Trail, Demos,  
**Source:**<https://arxaiologikoacharnes.files.wordpress.com/2019/12/ce91cf81cf87ceb1ceafceb5cf82-ce91cf87ceb1cf81cebdceadcf82.pdf>



**Figure 12:** The part of the ancient theatre of Acharnes that was discovered in 2007 in the area.  
**Source:** <https://www.acharnes.gr/content/arxhaiologikoi-xoroi>

Another important area was the coal trade, which is why they were also known as "Carbons". They were considered robust, rugged and militant, and according to Plato, faithful to the ideals

of the fatherland. (Stasinou Christos, 2022).

An important find in the area of the "Red Mill" is the Vaulted tomb of Acharnes (14th - 13th century B.C.), which is the most imposing and best-preserved Vaulted Tomb - Tomb in the area of Attica. Also, from ceramic findings, a local Mycenaean Kingdom emerges (Kassotaki, H., & Ioannou, P., n.d.).

During the Peloponnesian War (431 - 404 BC), it suffered terrible looting, destruction and damage by the Spartans. In the 4th century BC from the many findings it turns out that prosperity flourished to such an extent that it was named as the "Golden Age" of Acharnes. At that time, a very important project, the "Acharnaicos culvert", was constructed for the irrigation of the Acharnaic land, while parts of the Hadrian's Aqueduct have been found in the Olympic village of the Municipality (Striftou-Vathi, S., & Giotas, D., 2009).

At the same time, it seems that the Theater was built (see figure 12), which is one of the most important buildings of the city and was discovered in recent excavations on Salaminos Street, at the site of Karavos (Kassotaki, H., & Ioannou, P., n.d.).

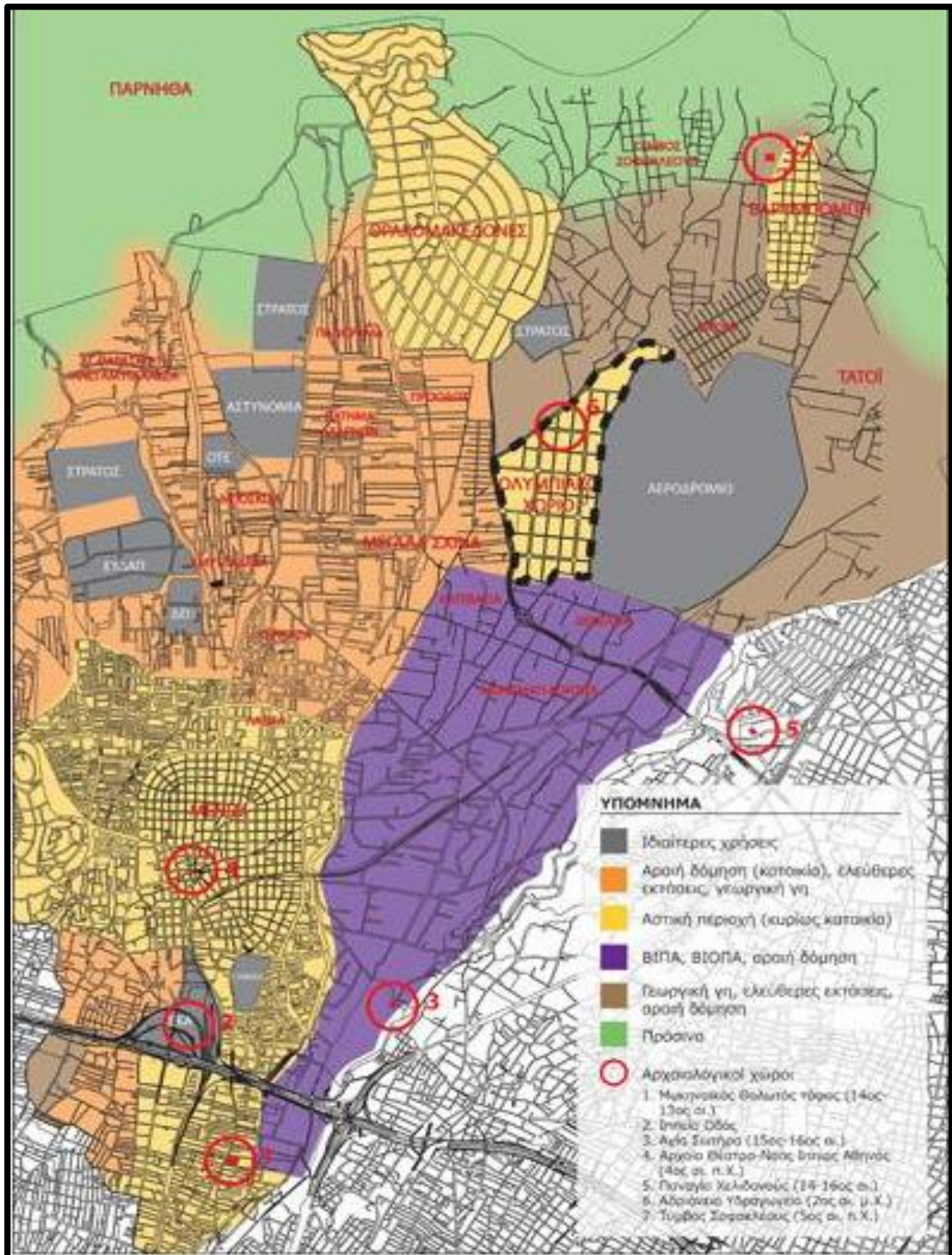
In addition to the mentioned, at the area of Varibobiin Acharnes archaeologists attributes the Tomb of the Ancient Philosopher Sophocles and the family funerary monument dating back to classical times in 400 BC. The tomb included three marble sarcophagi with pedimented covers and its location is shown in map 12. (Platonos-Giota, M., 2004).

The following figure 13 shows the main archaeological excavations that found in the city, included those of post-Byzantine era. In more detail:

1. Mycenaean vaulted tomb (14th-13th century BC).
2. Hippias Avenue (2nd century BC)
3. Saint Sotira (15-16th century AC)
4. Theatre-Temple of Hippias Athena
5. Panagia Chelidonous (14th-6th century AC).
6. Aqueduct of Hadrian's (2nd century AC)
7. Tomb of Sophocleous (5th century BC)

The relief representation on a marble bust of the Acharnes horsemen on the central front of Thissio of the Acropolis, and also many other indicators that characterizes the Acharnes strength and their cultural life on the ancient era.





**Figure 13:** Archaeological sites in the municipality of Acharnes.

**Source:** <https://www.acharnes.gr/content/xartes-polis>

### **B.2.6. Description of the project/development action:**

The landscaping and redevelopment of the area attempts to create a modern model park, of supra-local character, enriched with various activities and functional units, such as playgrounds, sports areas, bicycle paths, water slides, refreshments, walking - sports paths, event spaces, specialized landscapes, extensive green areas, seating areas, etc.

An important element of the architectural composition is the architecture of outdoor spaces - landscaping, specialized design with bioclimatic criteria, which will have as its primary goal the saving of energy, the self-sustaining and independent as far as possible - energy coverage of its needs and the improvement of the microclimate of the area in the context of sustainable development. The park will be landscaped with great respect to the natural environment and the surrounding area and will be created with art a special landscape, similar to the natural of the surrounding area. In this park, endemic plants will be carefully cultivated, in order to create a continuity with respect to the depiction of the remarkable historical course of the area.

#### **Format: description of project sites and topographical mapping of activities;**

Figure14 below (the figure is the conversion of the design plan into an image), shows the location of the activities in landscape as listed below:

#### **A. General Areas:**

- 1a North Entrance and Ticket Cutting / Exit
- 1b South Entrance and Ticket Cutting / Exit
2. Shops and Restaurants
3. Area of Stores of Sanitary Interest
4. Conference room
- 4a. Outdoor restaurant
- 5.a General Parking Areas
- 5.b Coach Parking
6. Water elements: Swimming Pools, Rivers, Lake, Waterfalls, waterslides
7. Kiosks
8. Sports venues
9. Indoor swimming pool, for the learning of young children,
10. Waiting area, Administration Offices, Warehouses
11. Observatory



12. Library - Center for Technology and Three-Dimensional Representations

13. Biological Cleaning

14. Tank

**B. The Theme Park:**

- A. The Nativity, Hera the 2 snakes,
- B. His education and his life,
- C. Crossroads of Virtue & Wickedness
- D. Kills his Wife Megara & his 3 Children (Offspring)



**Figure 14:** Mapping of the Plot and Floor Plan of Space Allocation.

**Source:** Convert a drawing to an image from the same edit

- E. Open Air Theatre - Oracle of Delphi - 1st & 2nd time
  - a. The man-eating horses of Diomedes
  - b. The capture of the Bull of Crete
  - c. The golden apples of the Hesperides
  - d. The golden-horned deer of Artemis
  - e. The Nemean Lion
  - f. Hippolyte's belt
  - g. Erymanthian Boar
  - h. The Lernaean Hydra
  - i. Stympheian hens
  - j. Cerberus the guardian of Hades
  - k. The cleaning of the stables of Augeas
  - l. The red oxen of Geryonis
- A. 3 Years as a Slave in Eurystheus
- B. Poisoned Chiton
- C. Deification - Throne on Mount Olympus

#### **Venues: Description of Materials, Styles and Technologies of the project**

The movement of vehicles in the existing area is limited only to the organized parking spaces, which are provided. Only emergency vehicles (fire brigades, ambulances, maintenance and catering vehicles) are the exceptions.

For coatings of premises where it is required, the use of hard surfaces will be avoided, as a rule. In the extensive areas of the greenery, there will be a floor alignment with comfortable traffic zones, where the visitor will be able to make a stop in the organized green areas. The traffic zones with the appropriate choice of natural materials - paving construction, will have a life time that will withstand daily heavy use. The materials proposed are mainly natural, such as stone, wood, gravel, dirt paths (with special treatment – addition of fixing admixtures), cold bioclimatic materials such as cobblestones. The project will include a sports route along with bicycle paths around the redevelopment area.

Along the entire length of the redevelopment that is ordered bicycle path, there will be almost parallel sports and walking, two-way with wide 1.80m in total, as well as a zone for the unhindered march of people with reduced mobility.

In the landscaping and where hard surfaces are required, natural materials of local origin will be selected. A significant presence will have coatings with wooden surfaces.

All equipment elements of the surrounding area (lighting fixtures, living rooms, wastebaskets, signs, etc.) will be tasteful, of simple design.

Along the paths, tall trees and lighting poles are planted, which delimit the route, which is marked with a special-colored floor mat, marking on the traffic lanes, a warning deceleration system at intersections with vertical pedestrian streets. A roundabout - possibility of changing direction, as well as bicycle parking spaces with special equipment are provided at specific locations. An area of 30m<sup>2</sup> is foreseen for a reception area with an automatic rental system of 50 bicycles.

It will also include outdoor relaxation - adult sports areas in green areas, where fitness instruments will be placed, in order to complete a sports program in an open space - natural landscape.

Furthermore, there will be recreation areas with refreshments and canopies, which will be provided in selected locations (near playgrounds, sports facilities, communal green zones of the urban fabric), which will consist of buildings of about 15m<sup>2</sup> and canopies in the outdoor area with table seats, with an area of about 20m<sup>2</sup>. The canopies are wooden structures, which will have a platform on the floor and will have photovoltaics to produce energy from solar radiation and consume it for the operation of the park.

Nearby will also be included from time-to-time public toilets.

Phytotechnical interventions are provided for at specific locations as shown in the plans accompanying the study. Planting will be done with preference to the European olea 900pcs, the Quercus ilex holly 500pcs and the Phoenix canariensis 25pcs, Ramnos 353 pcs, Myrtia 353 pcs, Tefkrio 353 pcs, Oleander 355 pcs, Rosemary 705 pcs, Ligustro 353 pcs. Pefkithalassia 29pcs, Acacia Konstantinos 4pcs, Tzitzifia 17pcs, Eucalyptus 1pcs, Platano 1pcs, Mulberry 3pcs, Pikrodafni 13pcs, Daphne Apollonos 20pcs, Schiano 22pcs, Ramno 5pcs, Elaiagno 16pcs. Tree planting will exceed 30% of the area. For the purpose of draining groundwater, eucalyptus will be used. To purify the air and produce increased oxygen, the giant bamboo will be used.

It is calculated the whole environment to be planted with native plants and trees of the flora of the area of Parnitha, as well as to be enriched with plants such as eucalyptus to dry and stabilize the many groundwater that floods the area during the rainy months as well as the giant bamboo, which also helps stabilize the soil, but also helps in filtering the air and in the production of

oxygen.

There will also be gardens with aromatic and flowering plants and herbs, canopies, living rooms, green zones of high and low planting so that its overall picture refers to a large park "lung" of walking, recreation and educational activities, perfectly integrated into the natural landscape, with bioclimatic elements such as photovoltaic canopies, ground geo-exchangers, cold environmentally, friendly flooring materials aiming at low energy consumption.

It will also include a specially designed innovative greenhouse system that will produce edible food and aromatic plants and herbs, using the hydroponics method, to meet the needs of the restaurants as well as the production of small plants - flowers - seedlings, which will be needed for planting at the change of seasons.

It will also include elements of facilitation such as signs, ramps, roads, etc.

The theme park itself, was studied and proposed to be designed as a live interactive and contemporary art scene with its own identity. Art will be able to be embodied in artificial nature, it will be able to be part of passages, buildings, objects, lighting, sound, taste and so on. A combination of natural stones and the "Rock Art" technique will be used, which is used to create spectacular landscapes and external stony sceneries in Hollywood and elsewhere. During this creation, on the stony levels, works of art embedded in the environment can be created as a natural continuation and with the right lighting, they can become unique artistic imprints. In short, an artistic attraction can be created, where artists can also create beautiful landscapes everywhere

The lighting will be graded and uniform along the entire pedestrian route, with the placement of lighting masts at regular distances and with a unified spirit of location using luminaires of high anti-vandal standards, low energy consumption and "oriented" lighting.

There will be elements of urban furniture, such as pedestrian seats, garbage bins, etc.

Flooring with non-slip materials, high strength, uniform style, which will characterize pedestrian movements, based on the technology of cold materials capable of contributing to the formation of thermal comfort conditions and obeying the optimal combination of reflection of solar radiation and heat capacity.

The restoration of the landscaped stream will be done with tall greenery and bushy riparian vegetation.



Linear plantings of large trees with proper support and group plantings of low bushes at a sufficient density are proposed, so as to create a single and dense flowerbed, which will give the character of greenery and will give the area the advantages of a large planted green space.

Covering the soil surfaces created with flowering low shrubs and perennial herbaceous, restores the landscape aesthetically and ecologically and gives color alternations to the entire surface of the soil covered by these species.

It will include a playground for young children and this area will be fenced with a controlled entrance - exit.

There will also be a playground for older children, which will be located in a high green area with scattered original games of balance, climbing and will be a continuation of the park but will not be fenced.

It will also feature creative, unique, imaginative toys and fully harmonized in the natural environment with constructions original from natural materials, rope toys, tree houses, trunks, sand pits, hills with tunnels, climbing the spider with ropes, etc.

Perimeter lighting with masts 3 - 4.5 m high is planned on the site so that there are no dark areas.

They are arranged freely in an extensive area with trees, scattered small seating areas on natural ground. On the site, lighting with masts with a height of 3 - 4.5 m is provided.

There will be 342 parking for passenger car and 12 bus parking.

An area of 4.078,49m<sup>2</sup> is planned for the formation of a playground with water slides.

In invisible and inaccessible to unauthorized persons, medium voltage electromechanical installations will be installed where necessary, which will be located in houses measuring 3m x 2m with a height of 2m, and will include safety systems panel and a voltage-raising transformer.

The new buildings will be of light construction (use of metal, wood and crystal). The construction materials used will be natural, environmentally friendly, recyclable and, as far as possible, of local origin. The buildings are designed and calculated based on bioclimatic design principles. There is a full response to energy behavior regulations. The buildings and generally the morphological characteristics of the intervention elements are integrated into the character

of the protected area, introducing elements of innovation and orientation, without reproducing trivial models of imitation of traditional elements. The main concern of the building constructions is the preservation of the natural environment as much as possible and any construction will be done provided that the environment, the landscape and the habitats will not be degraded.

There will also be an enclosed swimming pool only for young children to learn, as for the elderly and adults there is an Olympic-sized tank close to this area into the Olympic village. The indoor swimming pool building for young children which will have two small children's swimming pools (10 x 12.50 m). It will also include waiting room, w.c., stands, changing rooms (locker rooms), office, bleachers, warehouses.

In the area there will be a building that will be used as a reception center, environmental information and orientation. The building will be a ground floor bioclimatic architectural building with No.: 7. This building will include the following uses: 1. Reception - Information Office, for the promotion of the area, its history, its cultural characteristics, the environment, the flora and fauna and the development program of the property itself, with the sale of souvenirs, 2. WC sanitary facilities, 3. Outdoor seating areas that are covered with pergolas, 4. Observatory on the roof of light construction, covered with a pergola, for the observation of birds of the wider area during the day with a telescope or binoculars and at night an observatory for asteroids, 5. engine room with medium voltage substation.

Materials on the prohibited list, such as lead, neoprene or anything containing formaldehyde, will not be used and will not be allowed.

This environment was designed to match the morphological needs of the project. It was created with artistic methods, such as the creation of permanent sets in theme parks, with special concrete and artistic configurations combining natural and artificial parts of rocks, pits, artificial hills. It will depict the Mount Olympus or the Kyrenia mountain between Arcadia and Achaia, Pindos and other reference points, such as caves and underground facilities to capture the underworld for Hades. Also, it will depict the labor with Cerberus and Charos, with lakes and streams designed to create the natural environment, with special effects for the diversion of the rivers Pinios and Alpheus in Ilia, such as Lake Stymphalia in Arcadia for the Stymphalian hens, Lake Lerna in Argolis for the Lernaean Hydra, the Black Sea for the Hippolyte Zone. In addition, it will depict lands such as Crete for the labor with the bull and plains such as Thrace

for the Horses of Diomedes, the stables of Augeas in Ilia, the Garden of the Apples Hesperides etc.

### **B.2.7. Impact Analysis**

The construction of the project will achieve the strengthening of the role of the Municipality in a position in relation to competitiveness and financial support through the project that will highlight it as a pole of attraction in regional municipalities but also in terms of other development axes. Also, ensuring the protection of the natural and cultural environment and making it a factor of development through the sustainable management of activities, but also the effective management of natural resources and promotion of recycling. The most important achievement in this project is better adaptability to the impacts of climate change in the region. Analyzing the impacts as shown in the table of advantages below, the project has only beneficial characteristics as an impact and there are likely to be minimal negatives only during the construction of the project such as the usual effects of each construction site.

Throughout the face of the project to the main avenue of Karamanli Street, there are cables for overhead transport of electricity with a slavery zone wide on the face of the plot 270m. This particular Avenue serves a large percentage of heavy-duty vehicles but also visitors from all over Attica who want to visit the National Park, and of course the residents of the city which statistically is one of the most populous Municipalities in the country. So, during the works are expected to exist an impact on traffic mainly during the entry and exit of the construction site vehicles for the transport of materials and personnel. For this reason, a traffic light should be put on the main traffic line.

Also, measures should be taken for the risk of electric shock due to the high voltage current belt passing on the façade of the main avenue. As mentioned earlier, the time when the reinforcement will be placed should be preferably in months without much rain or heat. The transfer of the reinforcement should in no case be done perpendicular to the surface of the earth, in order to avoid an inductive phenomenon of electric shock.

In order to be able to build such a large-scale project, a shift of water supply networks for electricity and communications will be required. The Contractor should investigate, before the commencement or during the construction of the project, the proper operation of the networks and their exact location around the project, with appropriate exploratory studies and applications to the competent bodies. All required detours, displacements and network

restorations should be done in consultation with the competent Services, and upon request and approval of the relevant works. The Contractor must ensure the safe construction of the project and will take all the necessary measures required for this. The constructions of the project should be done in accordance with the approved designs and the provisions of the Relevant Study. With regard to the projects to be constructed, the Contractor is obliged to comply with the dimensions of the projects provided for by the approved study, unless otherwise requested by the Supervising Technical Service of the Municipality of Acharnes. The temporary constructions will be carried out under the responsibility of the Contractor, in accordance with the relevant articles of Technical Specifications and the requirements of the competent Town Planning.

As the use of the site as agricultural crops until recently, absorbed until recently a huge volume of rainwater, in the case of construction with buildings and paving will be quite altered. In the area of the works there is not yet a constructed stormwater drainage network, only some local pipelines. The pipelines will be adapted during construction so that they flow into the closed water collection pipe and from there into the sewer tank where they will be properly treated for the needs of the project. The National Water Commission according to decision 706/16-7-2010 entitled "on the definition of the river Basins of the country and the designation of the competent Regions for their management and protection" should validate the Water Basin in case of overflow of rainwater from the reservoirs. There should also be its agreement for the use of rainwater on the central Avenue for the water needs of the multiplex. There should be a study for the closed culvert that will be built underground of the project that will serve to channel water to the artificial lake but also for watering the rest of the park after artificial drainage. The contribution of the water collection pipelines to the reservoirs of the project will be made with reinforced cement pipes. Also, visiting wells will be installed at all locations of change of cross-section of the culvert, either change of direction, or change of its longitudinal slope and at the junctions of secondary pipelines. In secondary pipelines, manholes are also provided. It is expected that the widening works of the central Avenue will be implemented in at the same time as the construction of the project and therefore there should be appropriate duct sockets in compatibility with the widening study of the Avenue, so that they can be implemented. That is why the studies concerning the neighboring project must be taken into account as they affect not only the project but also the effective protection of the nearest settlements and businesses from flooding. Also, in order to avoid accidents due to downpours with a risk of human lives,



the way of connecting to the project should be extensively examined by the competent infrastructure authority at the request of the project operator which is the municipality of Acharnes. The solution to such a big issue is to channel this water into underground reservoirs which will be used to pump water into the streams and artificial lakes that will be built for the project or for watering the park. Thus, a huge volume of water that until recently could not be channeled into the basin of the Kifissos river due to its overflow, now from the underground storage tanks will be used for park issues. For the proper functioning of the underground tank, pumps will be used where necessary.

The redevelopment projects, during the formulation of the project, will be studied and constructed within the framework of the contract, based on the proposals of the existing redevelopment study and will use the water from the irrigation network for the maintenance of the plant zones. There will also be an irrigation system that will be supplied by the Water Service. In parts, with the formation of appropriate holes, the supply of the surface ditch to the underlying lake will be channeled. The configuration of the surface ditch - stream, which will collect the local surface rainwater runoff, will lead them intermittently to the underlying main recipient-closed culvert, which is part of the redevelopment along the coronation of the pipeline of the underground stream to be built. In those areas where it is not possible to build the surface ditch, water collection inlets are provided. The adjustable section created in the event of an overflow of the lake will go below the Traffic Avenue and therefore water collection inlets should also be provided there, which must be provided for in the widening project of the Avenue.

The main project for the collection of surface runoff is mainly carried out through a surface runoff ditch, which is formed along the cross-section and which will be run by an open trench of stone band resembling the form of a streambed (stream), which will collect the local surface rainwater runoff and channel them to the artificial lake. The final configuration of the redevelopment works requires embankments and on either side of the moat - stream will be created green spaces, high and low vegetation, pedestrian street.

Rainwater tanks are expected to be a long-range construction due to their large volume, and workers during the construction should take appropriate measures to avoid accidents with special protective clothing (helmets, shoes, etc.).

Visiting wells should be placed at all locations of cross-sectional change of the culvert, or at a

change of its longitudinal slope and at the junctions of secondary pipelines in order to be able to repair them. In secondary pipelines, visiting wells of circular cross-section are provided.

Because the cultivable area was not inhabited, it is beneficial as it will not create a nuisance to the inhabitants of the surrounding areas, nor will a traffic bypass be required.

The fact that the area was previously a place of cultivation (in fact, in parts of it it is still cultivated), is a beneficial component on the one hand because the planting of the park will be done with a more favorable background and on the other hand due to its agricultural use there are no permanent constructions that will delay the smooth arrangement of the works. It is required to remove the surface – plant embankments mainly within the swimming pool installation field, and redistribute the surplus of earthworks within the field in order to form the final surface.

The construction site should be fenced to avoid accidents to passers-by or stray animals and not to allow entry to people unrelated to the construction of the project.

For the commencement and implementation of the project, the expropriation of the plots of approximately 50 acres within it is required.

As far as water needs during construction are concerned, these will be covered by the Water Company upon request. Until these supplies are implemented, the project can be served initially by aquifers vehicles. After the completion of the construction, there will be a water supply network throughout the area and for drinking water, both for firefighting purposes and for watering the plants in case the water from the underground installation is not enough.

Depending on the prevailing geotechnical conditions, the project area will be the most appropriate configuration of the soil in the most artificially correct way to create the embankments or layers of excavation products and the artificial works provided for such as the pipes for the restoration of various networks and cement pipes with water collection wells for the flood protection of the area.

The construction of the project will require the rehabilitation or relocation of several networks, the operation of which is interrupted by the conditions of the constructure. The relocation or rehabilitation of sewage/water pipes or their re-construction is planned. Also, the construction of a water supply network, power supply networks and telecommunications. In addition, the construction is located at the opposite side of the main avenue where exist the pipeline's duct,

in distance of 20.00 m., and therefore, no provision is required for the natural gas supply pipeline, located near the construction and along Karamanli Avenue. In any case nevertheless, the excavations near the Avenue will be done with the instructions of the Pipeline Management service.

The overhead power grid can create suitable conditions for the power supply of installations where required.

The infrastructure for water supply, energy and telecommunications, already exists as in every city of the Attica basin. However, the network in this area on the south side of Karamanli Avenue presents additionally a slavery zone for overhead electricity transmission, which includes a lane 20m wide from the properties in question. The promotion of energy production units from Renewable Sources such as photovoltaics that will be placed on the roofs of constructions is a strategic choice of the energy policy of this study with respect for the environment and the fight against climate change. The transmission of energy becomes easier to the network due to the slavery zone that passes through the area of space reserved for the project. In general, the exploitation of solar energy is an energy resource that does not pollute the atmosphere either from greenhouse gases or with microparticles or other gaseous pollutants. It also reduces the municipal electricity supply costs of the facilities by a fairly large percentage, given the sunshine of the area, resulting in a more favorable economic development of constructions in the area with lower operating costs.

During the construction of the project, the working staff should temporarily have chemical toilets at their disposal for hygiene reasons for as long as the constructions are made to remove the liquid waste. When the construction is finished, a connection will be established with the main sewerage pipe of the Water Company for the removal of the visitors' liquid waste.

Park wastewater is divided into solid and liquid. Of these, the first will be under the responsibility of the competent cleaning office of the Municipality of Acharnes as it already exists and operates. For liquid waste, a 90cm cross-section sewage pipeline will be constructed, where required according to the technical reports and drawings that will accompany the building works of the park, and will be connected to the existing sewerage network. As for the solid waste that will be generated during construction, it will be removed in recycling bins.

Gathering information, the table below compares the multiple advantages and limited challenges will be created after the end of the construction and operation of the specific project.

Advantages	Proposal Description
Reduction of Unemployment	The launch of such a Theme Park will create 100 jobs.
Important business links	Many commercial and consulting firms will merge, increasing trade of related products, handicraft fairs, farmers' markets or even local showcase businesses, which achieves access to additional revenue streams and new customers.
Daily physical activity	Theme Park usually involves a much higher degree of traffic than other work lines
Concluding privileges and discounts	Working in the theme park offers opportunities for solidarity activity that interacts and therefore at the same time profits from participation in joint activities.
Local Community and other areas from Greece and abroad	It is a place of encounter and interconnection between communities, new friendships are formed.
Greater capacity to receive referrals	This activity has to do with referrals, which can be a very effective way to attract and retain new customers. It is critical to create through proper administration, an excellent referral program, through opium to motivate visitors to tell their friends about what they will experience in this space
Location is everything	When running a physical storefront, the location often speaks for itself and serves as its own marketing tool! It is important that this particular location was chosen, in this already degraded area but with a high population density, which needs such a project, which will easily ignite curiosity and bring people to their door.
Human connection space with face-to-face interaction -	It will be the perfect reference point where human interaction can thrive, mix all ages and create interests in, all family members. It can help virtually all members of the community to come together, to build a better sense of unity and reduce feelings of isolation.

Advantages	Proposal Description
Fun, Learning, Sports: like Aristotle's Peripatetic Lyceum	Multiple activities, which help and complement each other, such as learning, sports and entertainment, can be an important point of reference for many other regions in Greece. It could be the basis for creating similar ones for all the important events of Greek history, such as the Argonaut Campaign, the Minoan Civilization, the Pelasgian Civilization, Theseus, Troy, the Odyssey, Iliada, and so on.
Artificial intelligence, monitoring and optics	The well-crafted natural environment will be contrasted with three-dimensional illustrations with visual effects. This will create the interactive interaction and activation - coordination of all the senses, in an enjoyable but at the same time constructive journey through space-time. Clicks, noises, odors, colors, visual effects, holograms and three-dimensional illustrations, journeys to the bowels of the earth and all the elements of nature (Fire, Air, Water and Gaia).
Repeated visits, transforms the space as a hangout, in which strong memories that stand the test of time are imprinted.	In order for the visitor to be able to experience all the activities, he should make multiple visits. And each time he will discover something more and more spectacular.
Promoting community well-being	A short time walk in the park will have a significant impact on Body, Soul and Spirit Health.
Encouraging activity in children	When children play outside, is commonly known that the activities have positive effect of skills such as: <ul style="list-style-type: none"> <li>•Better scores in schools</li> <li>•Better cognitive function</li> <li>•Fewer behavioral problems</li> <li>•Fewer signs with attention deficit hyperactivity disorder</li> <li>•Improved discipline</li> <li>•Encouraging Social Skills in Children</li> </ul>
Air purification	The creation of the green lung at this point, with the contribution of liquid elements, the materials to be used, and the proper design, will contribute not only to the reduction of air pollution, but will also achieve the production of fresh air - oxygen.

Advantages	Proposal Description
Reduction of temperature shock.	As climate change pushes temperatures higher in summer, finding rest from the heat becomes even more critical. The park will have a lower temperature in the day than the surrounding area by 2 <sup>o</sup> - 3 <sup>o</sup> Celsius while in the evening the difference will increase. Cooler air will leak from the park into the surrounding neighborhoods, helping residents stay more comfortable, even on summer steam nights.
A business model	The theme park has the advantage of a simple business model, but in which starting and building a business is more seamless.
Improvement of property values	Property values will increase the closer they are to the park. At the same time, people are also willing to spend more when they are adjacent to or overlook the theme park, helping to boost the local economy and adding value to the green spaces in the area.
Reduction in crime	In the long run, it can help reduce crime. Various studies have shown that, when people have access to green spaces where there is a strong community presence, it can prevent crime in the neighborhood. This creates positive feedback, as reducing crime will further increase park activity and help people feel safer in this space. Due to the fact that it will have attractive features (it is equally important), it will inspire pride in the community. When residents feel strongly that they will maintain their recreation area and use it frequently, they will help take care of it and increase the feeling of community.
Powerful advertising tool for the Municipality, neighboring businesses and Greece in general	Through proper advertising, many other parallel businesses can be helped, such as tourism, entertainment, education, sports and in general to be an important pocket of economic growth and robustness.

### B.2.8. Consideration of alternatives:

Thinking about the alternatives, we must always take into account the limitation of the land use of the area that exists by the competent authorities. Therefore, one version is that a simple park could be created in the proposed space, as the uses that can be applied are limited. Simple parks are known to people of all ages and genders for walks and cycling, stadiums, playgrounds, etc. They provide outdoor fun, entertainment and walks. One can come across, water slides, places for respite or reading and many other features. There may also be food shops establishments

offering food. There can be several sections in a simple park containing different routes and attractions. All of them, however, are also available in theme parks. The dominant feature of both these venues is that they are intended to offer uninterrupted entertainment, entertainment and recreation to visitors. The difference is that theme parks incorporate a theme or story that puts visitors in the process of feeling the underlying theme when they enjoy its various features, as if they were experiencing it at that moment. Therefore, a theme park includes what a simple park, but with the difference that a central theme can be felt as it still remains an open-air space for the recreation of the people. Thus, the theme or feeling remains with the visitors inside the park but when they leave it is also captured in their minds better and in a more entertaining way. So, theme parks are more interesting for a wider segment of society. This theme park with the labors of Hercules can offer knowledge of mythology to children and adults, however, giving them the feeling within the space of the hero's life, but also the opportunity (with simulators machines) to represent the labors themselves, capturing them in their memory better. For this reason, they attract a larger section of the population and can be an option for visitors from farther places, unlike the simple parks that are scattered everywhere. Therefore, theme parks have approximately similar economic costs and construction duration, the same environmental impact, and durability, but they have an advantage over simple ones because they attract more people from different places, resulting in faster financial depreciation and greater prosperity for the municipality they belong to.

### **Comparative data in Simple Park (A) & Theme Park (B):**

It is examined which of the two cases (park A or park B) has the most positive effects "X" in terms of effects on the environment:

1. Soil - Construction - Cost - Maintenance

A: Less construction, less time, cost and maintenance needed

B: More construction, time, cost and maintenance

2. Air - Odour - Dust Emissions

A: No odours, dust and CO<sub>2</sub> emissions

B: With the special proposed construction, odors and the emission of toxic gases are avoided, both during construction and during operation. During excavation, limited dust may be created, which with the right technique and the use of technology, can be reduced and / or eliminated.

3. Drainage works

A: In a simple park, there are no uses for large volume, other than watering. There is not



much room for rainwater drainage, beyond the basic internal drainage design. However, as described above, the area collects a large volume of water.

B: The rainwater is channeled and stored in a large tank of 500 m<sup>3</sup> and which is used both for feedback - balancing of waterfalls and swimming pools (more during the summer months due to evaporation), as well as for watering, cleaning of buildings, etc. In the same tank will be channeled the rainwater collected from the roofs of the buildings during the rainy months.

#### 4. Flora - Planting - Green

A: Increased planting should be done as there is no heterogeneity and originality in uneven configurations of the site.

B: The theme park, although it also has areas that will be built, will not be deprived of greenery, on the contrary, due to the peculiarity of creating hills (due to artificial underground caves, etc.), natural pools that look like lakes with vegetation and islands that will equally have greenery, in the end, the special outdoor architecture - landscaping, will create almost the same area of greenery as the simple park.

#### 5. Fauna

A: Butterflies, Birds, reptiles and some rodents are expected to be attracted

B: In the case of the thematic, in addition to the above, due to the lakes, a natural environment will be created for amphibians and more birds, insects, etc. which will make it more attractive to visit the site.

#### 6. Waste Generation

A: Reduced production

B: Increased production of organic waste. However, in order to resolve this issue, the creation of a biological treatment plant as well as a small center for processing organic waste into composting and using the produced product as fertilizer in the crops of the park has been foreseen. Therefore, waste generation will be negligible. On the contrary, organic waste itself could be used for the benefit of the project for better plant development.

#### 7. Burden on energy networks

A: Reduced use as minimal with increased operating self-maintenance costs.

B: Increased use, however, as for rainwater, for which provision is made for storage and use, the same will be done for the consumption / production of electricity. For the buildings and facilities, as described above, energy production units will be installed, so that the project is self-sustaining and independent of the grid, with reduced operating costs.

#### 8. Noise

A: Reduced to negligible

- B: Increased but with the morphology of the soil as it will be specially designed, the special noise entrapment cells that will be incorporated in the plan, the planting and the fencing, the noise will be isolated and mitigated to a minimum.
9. Traffic and Parking Spaces
- A: Relatively smooth and beyond the locals, without extensive attraction of foreign visitors who can go to any of their neighboring parks.
- B: Spectacular will attract a large number of visitors, not only locals but also foreigners and even tourists. For this reason, an extensive traffic study will be carried out and a forecast will be made of a future basement multi-storey automated parking space, which will be able to be integrated later, after the density of traffic begins to stabilize and the final needs will be clarified during its full operation.
10. Human Health
- A: Positive approach
- B: In addition to the simple positive approach of the above simple park, undoubtedly and as shown below, the creation of the interactive thematic - educational - historical park, which combines recreation and educational activities, helps in many ways physical, and mental health.
11. Cultural Interest
- A: Reduced to no
- B: With the core of the Labor of Hercules, both from historical, as well as from symbolic, philosophical and other decoding of the historical route, will create multiple activities where teachers, scientists, visual artists and citizens will be able to share lectures, lessons, presentations, studies, theatrical performances, etc. this project will be able to play an important station of cultural interest in society.
12. Attracting foreigners
- A: Reduced
- B: Increased
13. Aesthetics
- A: Good
- B: Hyper-increased
14. Recreation
- A: Good
- B: Over-increased
15. Construction Cost
- A: Low

- B: Increased, but with the possibility of immediate depreciation from the revenues that the project will present during its operation to a superlative degree. It is possible to assign it for financing a private entrepreneur on loan until the depreciation of his cost.
16. Construction Time  
A: 2 years  
B: 4 years
17. Maintenance  
A: Low
18. B: Increased, but with the possibility of offsetting from the activities, as mentioned above in the individual issues, with the right design, the maintenance (cost and labor) will be controlled and will not significantly increase the maintenance costs, because the space will be designed mostly self-sustaining.

Comparing the above, it is obvious that the choice of installing the Thematic-Historical-Educational Park over the simple amusement park prevails. Although the creation of a simple green space is positive for the local society, the creation of the theme park has positive effects both on the local society and on the wider society as at the same time it brings many benefits, not only to visitors but also to the Municipality itself. It has direct and indirect effects on neighboring businesses due to increased traffic, and helps to improve the health of visitors, and employees of the area and beyond.

In the other case that the space is used with facilities of buildings of sports character and public benefit purposes other than the uses of the theme park mentioned in the study, then it will be addressed to a limited portion of the public and they will not be able to ensure a variety of actions for a larger audience. The image that the space will give will not differ in any way from the other cement-built buildings in the area, which have an adverse impact on the environment in contrast to the harmonized in nature space of the theme park as shown in the attached plan. What is certain is that if flood protection works are not provided for in this case, the situation with rainwater will become much more difficult, as a large amount of it is currently absorbed by the unformed soil and crops that exist. After all these, the operational cost would be increased in large scale without the possibility of enough self-profits

In the case of the zero solution, the site will remain a vast inaccessible area, with the risk that as time goes by, expropriations will be lifted by the owners who have not been compensated and in the future, it will be transformed into a structured district, which has in no way to offer the benefits offered by this study.

### **B.2.9. Mitigation measures**

In order to mitigate the traffic problem already faced by the area and to avoid accidents, it is proposed to install a traffic light and create a pedestrian bridge with an elevator in order to facilitate access to the opposite side of the road. Also, for the protection of mainly young children, in order to avoid accidents due to frequent traffic, a perforated but thickened frieze will be placed on the pedestrian street of the Avenue that will have the façade of the project.

In order not to use the water with confiscation, the rainwater will be used for watering and for the needs of the swimming pool and the shops that will operate in the area, decongesting at the same time the sewerage network of the Avenue. For this purpose, rainwater drainage tanks will be created. Regarding the connections to the main pipeline of Karamanli Avenue and the water uses within the site, will be followed the technical reports and drawings of the respective electromechanical designs that will be carried out for that purpose.

The area is located at the foot of Mount Parnitha and water from higher areas accumulates after the inclusion in the plan of the above areas and their relocation. With the infrastructure works regarding the water reservoirs in cooperation with the competent department of land reclamation and flood protection works Infrastructure Service for flood issues, rainwater drainage tanks of the project itself and the water that gathers on Karamanli Avenue will be used.

### **B.2.10. Cumulative impacts:**

Also, the project will benefit from environmental studies of the Municipality of Acharnes and the Ministry of Development that are going to be implemented, in conjunction with this project and will have a favorable impact affecting it significantly, without being restrictive for it. Some of them are listed below:

a) Operational Program of the Municipality of Acharnes, 2021 – 2023:

<https://www.acharnes.gr/sites/default/files/%CE%A3%CF%84%CF%81%CE%B1%CF%84%CE%B7%CE%B3%CE%B9%CE%BA%CF%8C%20%CE%A3%CF%87%CE%AD%CE%B4%CE%B9%CE%BF%20%CE%91%CF%87%CE%B1%CF%81%CE%BD%CF%8E%CE%BD.pdf>

b) Operational Organization of the Municipalities for the Civil Protection & the confrontation of natural & environmental risks:

[https://home.asda.gr/PdfFiles/Publications/FysikoiKindynoi/03\\_epixeirisiaka\\_sxedia\\_ektakton\\_anagkon\\_2010.pdf](https://home.asda.gr/PdfFiles/Publications/FysikoiKindynoi/03_epixeirisiaka_sxedia_ektakton_anagkon_2010.pdf)

c) Update of the "Master Plan" of Flood Protection Works of Attica:

<https://mpattiki.etme.gr/index.php/el/>

d) A beneficial effect of impact on the on the project will result from the interaction of the widening of Karamanli Street in the project as it will clearly help the traffic of the project. The project of widening Karamanli Street, at the same time as this construction, will act as an auxiliary as it provides for technical works such as culverts or bridges at intersections of the road network, which are not included in the planned for the present works, but affect it and help in the future for the better exploitation of the construction as this Avenue is provincial and is a key road network of the city.

### **B.2.11. Identification of key impacts:**

The survey was conducted on the basis of the following questionnaire that identify the key impacts:

A/N	QUESTIONS	YES	MAYBE	NO
1.	<b>GROUND:</b> The proposed project will cause:			
	a) unstable soil states or changes in the geological arrangement of rocks?	...	...	<b>X</b>
	(b) decompositions, displacements, compactions or overshoots of the surface layer of the soil?	<b>X</b>	...	...
	(c) changes in the topography or relief features of the ground surface?	<b>X</b>	...	...
	(d) destruction, overlapping or alteration of any unique geological or physical characteristic?	...	...	<b>X</b>
	(e) any increase in soil erosion by wind or water, in situ or away from that site?	...	...	<b>X</b>
	f) changes in the creation of additional embankments, in the deposition that can change the relationship of the site with the neighboring roads?	...	<b>X</b>	...
	(g) risk of exposure of people or property to geological disasters such as landslides or mud, subsidence, floods, or similar disasters during the construction and/or operation of the project?	...	...	<b>X</b>



A/ N	QUESTIONS	YES	MAYBE	NO
2.	<p><b>AIR:</b></p> <p>The proposed project will cause:</p> <p>(a) significant emissions into air or deterioration of air quality (a) during construction?</p> <p>(b) during its operation?</p> <p>b) unpleasant odors?</p> <p>c) change in air, humidity or climate movements or any change in climate either locally or to a greater extent?</p>	<p>...</p> <p>...</p> <p>...</p> <p>...</p>	<p><b>X</b></p> <p>...</p> <p>...</p> <p>...</p>	<p>...</p> <p><b>X</b></p> <p><b>X</b></p> <p><b>X</b></p>
3.	<p><b>WATERS:</b></p> <p>The proposed project will cause:</p> <p>a) changes in currents or changes in the course or direction of movements of all kinds of surface fluids?</p> <p>(b) changes in the rate of absorption, drainage pathways or rate and amount of soil leaching?</p> <p>(c) changes in the flow pattern of water from floods?</p> <p>d) changes in the amount of surface water in any water body?</p> <p>(e) discharges of liquid waste into surface water or groundwater with a change in its quality?</p>	<p>...</p> <p>...</p> <p>...</p> <p>...</p> <p>...</p>	<p><b>X</b></p> <p>...</p> <p>...</p> <p>...</p> <p>...</p>	<p>...</p> <p><b>X</b></p> <p><b>X</b></p> <p><b>X</b></p> <p><b>X</b></p>

A/N	QUESTIONS	YES	MAYBE	NO
	<p>(f) change in the direction or flow of groundwater?</p> <p>(g) a change in the quantity of groundwater either by the direct addition or abstraction of water, or by obstructing a groundwater feeder in sections or excavations?</p> <p>(h) a significant reduction in the amount of water that would otherwise be available to the public?</p> <p>(i) risk of exposure of people or property to water disasters, such as floods or other?</p>	<p>...</p> <p>...</p> <p>...</p> <p>...</p>	<p>...</p> <p>...</p> <p>...</p> <p>...</p>	<p>X</p> <p>X</p> <p>X</p> <p>X</p>
4.	<p><b>FLORA:</b></p> <p>The proposed project will cause:</p> <p>(a) a change in the variety of species or in the number of any plant species (including trees, shrubs, etc.)?</p> <p>(b) a reduction in the number of any unique rare or endangered plant species?</p> <p>(c) introduction of new plant species in an area or preventing the normal renewal of existing animal species?</p> <p>(d) reduction of the area of any agricultural crop?</p>	<p>...</p> <p>...</p> <p>...</p> <p>...</p>	<p>...</p> <p>...</p> <p>...</p> <p>...</p>	<p>X</p> <p>X</p> <p>X</p> <p>X</p>

A/N	QUESTIONS	YES	MAYBE	NO
5.	<p><b>FAUNA:</b></p> <p>The proposed project will cause:</p> <p>(a) a change in the variety of species or in the number of any animal species (birds, animals including reptiles or insects)?</p> <p>(b) a reduction in the number of any unique rare or endangered species of animals?</p> <p>(c) introduction of new species of animals into an area or preventing the migration or movement of animals?</p> <p>(d) deterioration of the natural environment of existing fish or wild animals?</p>	...	...	<b>X</b>
6.	<p><b>NOISE:</b></p> <p>The proposed project will cause:</p> <p>a) increase in the existing noise level?</p> <p>(b) exposure of humans to a high noise level?</p>	...	<b>X</b>	...
7.	<p><b>LAND USE:</b> Will the proposed project cause a significant reduction in current or planned future land use?</p>	...	...	<b>X</b>

A/N	QUESTIONS	YES	MAYBE	NO
9.	<p><b>RISK OF ABNORMAL CONDITIONS:</b></p> <p>The proposed project will cause:</p> <p>a) Risk of explosion or escape of hazardous substances (including, but not limited to, petroleum insecticides, chemicals, or radiation) in the event of an accident or abnormal conditions?</p>	...	...	X
10.	<p><b>POPULATION:</b> Will the proposed project change the establishment, dispersion, density or growth rate of the human population of the project establishment area?</p>	...	X	...
11	<p><b>HOUSING:</b> Will the proposed project affect the existing dwelling or create a need for additional housing in the project establishment area?</p>	X	...	...
12.	<p><b>TRANSPORT / TRAFFIC:</b></p> <p>The proposed project will cause:</p> <p>a) creating significant additional wheeled drive?</p> <p>(b) impact on existing parking spaces or the need for new parking spaces?</p> <p>(c) a significant impact on existing transport systems?</p>	X  X  ...	...  ...  X	...  ...  ...

A/N	QUESTIONS	YES	MAYBE	NO
	(d) impact on existing parking spaces or the need for new parking spaces?	...	...	X
	(e) a significant impact on existing transport systems?	X	...	...
	(f) changes in current ways of movement or movement of people and/or goods;	...	X	...
	(g) changes in sea, rail or air traffic?	...	X	...
	(h) increase in traffic risks?	...	X	...
13.	<b>ENERGY:</b> The proposed project will cause:			
	a) use of significant amounts of fuel or energy;	...	...	X
	(b) a significant increase in demand for existing energy sources or a requirement to create new energy sources?	...	...	X
14.	<b>PUBLIC INTEREST:</b> The proposed project will contribute to the need for significant changes in the following areas of general interest:			
	a) electricity?	...	...	X
	(b) communication systems?	...	...	X
	(c) water supply	...	...	X



A/N	QUESTIONS	YES	MAYB E	NO
	d) sewers or septic cesspools?	...	...	X
	e) rainwater drainage?	...	...	X
	(f) solid waste and its disposal?	...	...	X
15.	<b>HUMAN HEALTH:</b> The proposed project will cause: A) creation of any risk or likelihood of danger to harm human health (not including mental health)? B) exposing people to potential risks of harm to their health?	...	...	X X
16.	<b>AESTHETICS:</b> Will the proposed project cause obstruction of any view of the horizon or any public view or will it result in the creation of an aesthetically unacceptable landscape, accessible to public view?	...	...	X
17.	<b>RECREATION:</b> Will the proposed project have an impact on the quality or quantity of existing leisure opportunities?	X	...	...
18.	<b>CULTURAL HERITAGE:</b> Does the proposed project result in the change or destruction of an archaeological site?	...	...	X

A/N	QUESTIONS	YES	MAYBE	NO
19.	<b>PROTECTED AREAS:</b>  Will the proposed project be located in a protected area according to article 21 of Law 1650/86?	...	...	<b>X</b>
20.	<b>SYNAGOGUE OF IMPORTANT FINDINGS:</b>  Does the work in progress have the potential to cause adverse effects on the environment?	...	...	<b>X</b>

#### B.2.12. Prediction of impacts:

The management of hazardous waste during the construction of the project must be carried out in accordance with the applicable legislation. For this purpose, Joint Ministerial Decision No. 36259/1757/E103, entitled "Measures, conditions and program for the alternative management of waste from excavation, construction and demolition" (GGHR 1312b/24-08-2010) has been written. The aim is to:

1. Proper planning of works to ensure the run-off of surface water. Care must be taken during excavation work to ensure that rainwater is adequately drained.
2. The sites of the construction sites should be away from wetlands so as not to create nuisance, both from dust and from the noises of machinery and passing heavy vehicles to the wildlife and avifauna of the area.
3. During the construction works, prohibit any maintenance work on the sites of the mechanical equipment and vehicles. If necessary, such work must be carried out in appropriately licensed facilities. The same applies to the operational phase.
4. To prevent surface run-off from construction sites burdened with suspended solids, hydrocarbons and heavy metals.
5. To take the appropriate measures to prevent leakages of oils, lubricants, fuels, etc. from the project's machinery and to have available the appropriate means (e.g., sorbent oil-binding

materials) to deal with emergency leakage incidents. f. Take all necessary measures to prevent dust from being transferred from construction sites to sensitive water bodies.

. During the works, appropriate fire protection measures should be taken.

6. The project supervisor must ensure that the maintenance of cleanliness in the intervention areas. The uncontrolled disposal of any kind of waste to a soil or water receiver is prohibited. The management of any kind of waste must be carried out in accordance with the applicable legislation.

7. After the completion of the works, the removal of all kinds of construction sites, machinery, as well as all kinds of surplus materials and the restoration of the intervention areas.

Therefore, in order to achieve the desired goals, we take into account the geological and morphological characteristics of the soil such as water grooves and ditches, etc., with attention both to their preservation and to the necessary corrective measures to maintain and improve their stability for their smooth management. We must also take into account watercourses and groundwater, and the water regime in general, aiming to upgrade and protect it from pollutants. This can be done by emphasizing the gradations of the soil in order to maintain the fertility it had when cultivated at the same time with the appropriate arrangement of the new elements that make up the landscape, not only in terms of planting but also including the modern architecture that will be applied. This means that the new buildings will be of architectural and typological interest, aiming at the harmonious coexistence in the new landscape with the aim of general acceptance as a space and the general exploitation of space in the maximum possible way.

The project should provide for the use of materials and tools for small demolition works, dismantling and restorations, paving, pipeline visit wells, water collection wells, waterproofing, drains, waterproofing membranes with geotextiles mainly in the construction area of the artificial lake, use of flexible waterproofing tapes or metal or wooden structures.

The following table summarizes the main important elements for prevention to be taken into account in the project:

<b>PREVENTION RECOMMENDATIONS</b>	
<b>Prevention</b>	<b>Description- Recommendations</b>
Increase in traffic	Although this particular "Karamanli" avenue is wide and comfortable, a good traffic study will be needed for at least 10 years from the day of opening.
Movement and Population Growth	The unregulated relocation will bring the opposite results to what was expected. There should be a serious partnership between the State and the Private Sector, because there will be a burden on the existing Networks, the traffic, the need for housing, schools, etc.
Motivation of Workers	If the goal is the sustainable healthy development of the new biotic cell in the city, a comprehensive assessment of the turning points and vulnerabilities should be made, in order to study the ways of immediate intervention. A competent sale, marketing, promotion team should be created and challenges should be constantly evaluated and solutions promoted immediately. Finding creative ways to motivate the large mass of people - consumers, can be a challenge. It is important that the company is able to offer great incentives and a good working environment for its employees.
Low profit margins	Gross profit margins for theme parks range between 35-40%, which can make it more difficult to generate new expenses and maintain profitability. For this reason, various other activities should be added through which profits can be generated in the park, such as additional events in the theater, art, history, ancient Greek and modern Greek courses for foreigners, production - sale of handicrafts and works of art, Greek cuisine lessons history from ancient times, etc.
Action	A very careful preparation is needed to produce the energy that the premises will need, both during the summer and winter months. Innovative solutions for energy production have been provided. However, they should be carefully monitored and the media corrected or even enriched during operation.
Maintenance	The premises will need constant supervision and maintenance. If this issue is underestimated, the losses are huge and will quickly bring negative results.

<b>PREVENTION RECOMMENDATIONS</b>	
<b>Prevention</b>	<b>Description- Recommendations</b>
Warehouse	It is also very important to diligently, carefully monitor and record the of various preservation products, food, uniforms, etc. The nature of the project, because it combines many different activities, should with the help of artificial intelligence create a monitoring software that will help and protect during operation
Probability of increasing crime and crime management temporarily, safety and security.	The large influx of young people into a deprived area without the necessary security and operational measures can increase crime, for a while, instead of reducing. For the special part of precaution and direct intervention at the base, a careful plan should be studied and elaborated that investigates the psychological, economic, cultural, cognitive parameters, so that, in parallel with the construction of the buildings, the right supporting structure of the State is created, in order to avoid the problems of the future.
Necessary State Measures for the improvement of Flood Protection, Fire Brigade, Seismic Shielding	Due to the expected large number of visitors, the State should prepare in conjunction with the Administration of the Theme Park for any emergency that may cause abrupt changes - crises and that need immediate intervention. Citizen, Business and State, should jointly be trained to deal with emergency weather and other needs.

### **B.2.13. Evaluation and Assessment of significance**

With the construction of the project, the financial support of the Municipality will be achieved, which will contribute to the role of competitiveness as it will highlight it as a pole of attraction in regional municipalities and other development axes. Also, ensuring the protection of the natural and cultural environment and making it a factor of development through the sustainable management of activities, but also the efficient management of natural resources and the promotion of recycling. The most important achievement is better adaptability to the impacts of climate change and the region's energy needs.

The theme park is distinguished by a philosophy that aims to inform, educate and develop the historical consciousness of citizens and especially young children, as well as their interactive entertainment with the corresponding games / labors in the order in which they took place and with a view to contact with nature and the environment. The purpose of the theme park, among



other things, is not only the qualitative and aesthetic upgrade of the space but the combination of the above with educational activities, so that they are better reflected in the memory. The model park that will be created will become a pole of attraction for all age groups, but especially for children of learning age, who will memorize these achievements faster and more graphically.

In conclusion, comparing the advantages and challenges that will be faced during the construction and operation of the park, it is obvious that the benefits of this theme park create the prospect of making it irresistible to visitors. Also, from the results of the survey, it is obvious that it will be the only important option for the residents of the area not only, to enjoy nature, but to be active, and educated.

In addition to the various amenities and privileges, this community - thematic and social park of recreation and learning, is beneficial in many other ways because it contributes to the identity of the municipality as a landmark of the place and enhances human relations, provides Active and Passive opportunities for interactive recreation, learning and sports to the participants, in the contributes to the health, well-being and prosperity of the Community, improves the environment, and creates valuable green space.

This particular park is certainly beneficial for humans for many reasons and is also beneficial for plants and animals. Especially since it is an urban area within a populous city, the park will be an effective area to encourage native flora and fauna to develop. This will also make the area more welcoming and safer for wildlife enjoyment.

The success factors of this Theme Park in the context of the concept of sustainability are essential during the design, due to many aspects with specific criteria. The factors of resilience and sustainability, have a synergistic effect when dealing with the situations of the park in urbanization, based briefly on a) Environmental factor, b) Economic factor and its sustainability, c) Social impact and d) Cultural and Human Impact.

This theme park is able to gather and educate residents and visitors in general in Greek history, to increase social awareness, responsibility and solidarity, while entertaining them.

The creation of such a thematic - pedagogical park, will undoubtedly help raise the level of the region, create new jobs, create new consumer flows, population mobilizations and continuous commercial operations, which will create a new chapter in the overall development of the region.

#### **B.2.14. Public participation**

Public consultation is a stage that should take place starting parallelly with the scoping process and up to the decision-making stage in all steps of the process if is necessary. This term includes public participation thus making the involvement of stakeholders more interactive. It is an opportunity for those directly or indirectly affected by the project or activity to express their opinion on the proposal and the impact it may have. In this part of the process, the public, in addition to being an informant of the local conditions, may also be involved as a recipient of the information, providing them with the details of the proposed projects or activities for the expected impacts. Although active public participation in information is not explicitly required, this can be quite significant, allowing affected groups to prepare for the impact of the project, and to propose their own proposals or solutions, or to anticipate for information impacts aspects unknown to the initiators of the process who do not know the area.

In the present work it is impossible during the research process of the impact of this study to be carried out, as this requires the involvement of the Public Authority, a meeting with the public and a discussion recording of the proposals. This is a long-term Public Consultation and Publication of the results, which also requires several financial resources. For this reason, the next steps that depend on it are descriptive. Therefore:

The public can be informed by local newspapers such as the Acharnaika news or West Bank or websites of the area such as the official website of the municipality <https://www.acharnes.gr/#> or the newspaper Menidiatis <https://menidiatis.blogspot.com/> or the free forum of Acharnon <https://eleftherovima.wordpress.com/> broadcasting media that can make the result better are not excluded.

Of course, the information should be given in time at least one month before the date of the appointment, with a clear indication of the place and time of the meeting and now one could use modern media in case one cannot participate in person, such as videotaping the consultation and posting it on the information networks offered. Similarly, in case someone is not able to express his views on the spot of the consultation, in modern ways and for a specific period of time each time, the public should be given the opportunity to submit his opinion in writing, to appropriate document reception bodies, either through a protocol of the Municipality, or by e-mail, or by having an email to submit opinions.

Public participation is essential for the full development of citizens' individual capacities. Also

particularly important in this case is the creation of opportunities for citizens to enhance their understanding and to participate in collective decision-making on issues that are an expression of democracy in terms of transparency in decision-making.

The objectives of public participation should be the following:

- Informing interested parties about the proposal and its possible impact.
- To express their views and concerns.
- To take into account the information and views of the public in making a decision.
- The acquisition of knowledge and information that may be useful for decision-making.
- Measures to be taken to mitigate the advantages and disadvantages that facilitates the examination of alternative solutions.
- Ensuring that there are no significant impacts and that benefits are recognized and maximized.
- Providing the opportunity for the public to influence project design in a positive and transparent way, improving the transparency of the decision-making process, and
- Increasing public confidence in the Environmental Impact Assessment process.

After each consultation of the public, a careful questionnaire should be created, through which general opinions can be collected about a large mass of people and of all ages. The way in which all aspects of the issue will be covered, from environmental, cultural, recreational, sports, educational, etc., will be effective enough so that the activation of citizens in favor of this project will be effective to the maximum. Thus, the possible negative consequences will be eliminated to the extent possible and it will be possible to turn the project into a real Public Good, which will serve the needs of the region, so that it will have success and longevity.

#### **B.2.15. Reporting or Environmental Impact Statement presentation**

All of the above mentioned in Part B should be listed as a reference report including what was discussed at the consultation stage in order to have a transparent and clear picture of the public's opinion on the project. That report shall be sent to the competent authorities.

#### **B.2.16. Review**

After the consultation, the report is prepared and follows the stage for review in order to carry out the quality control of the Environmental Impact Assessment. At this stage, the competent

Authority must check the project by evaluating what has been reported in the previous stages, taking into account the information in the report. The correct information indicated in the report is important for the competent authority deciding whether to permit the project. Also, at this stage, additional data and information about the project can be requested from the team responsible for assessing the exposure. Therefore, in addition to the above, during the evaluation, the competent authority identifies the errors and omissions that may exist. According to law 4014/11, the project is classified in subcategory A1 where projects and activities likely to cause very significant effects on the environment are classified. As mentioned earlier, theme parks are included in the tourism and recreation chapter in accordance with Annex II of Directive 97/11/EU (case 12e). In this case, the competent authority for the control of the specific project is the Department of Infrastructure where a competent committee is appointed, as described in detail in the next paragraph below. A well-written report enables the competent authority to make more correct decisions about the forecasting needs in the project. Each competent authority through which the impact assessment report passes has the possibility to add, correct or supplement omissions that it considers important. It also has the ability to request additional information related to the project.

#### **B.2.17. Decision making:**

A decision is taken on the project or activity under consideration which includes the approval or rejection of the proposal by the competent authority (i.e., whether or not the project or activity is approved). For this purpose and according to article 13 of law 4014/2011 from the beginning "a Central Council for Environmental Licensing is established at the Ministry of Environment, Energy and Climate Change". Also, according to Article 14 of the same law, a Directorate of Environmental Assessment is established in the same Ministry. It is responsible for recommending to the Central Licensing Council, but it also has the competence, as shown in case 2c of Article 14 of the same law, before sending the Environmental Impact Study to the Central Council for a decision, to decide in advance itself or to supplement if it deems it necessary taking into account what was stated in the report, drawn up after the consultation process, in order to have a pre-control. The completeness specifications of the file are set out in Joint Ministerial Decision 107017/2006 (GGHR 1225B/2006). To this Directorate, the file is sent by the Municipal Council of the municipality of Acharnes, which also has the ability to examine whether something needs to be completed or corrected before its approval, also

checking its completeness in accordance with article 11 of law 4014/2011. For the completeness of the file in accordance with this article will require:

1. The summary description of the project,
2. The summary description of the alternatives, including the zero activity.
3. The description of the report indicating the main impact issues expected, with what methodology the issues of the assessments will be addressed, the delineation of the extent to which the project is estimated to have an interaction as an impact, the duration of the impacts and the specific studies that will need to be done.

The decision becomes final if the Central Licensing Council of the Ministry of Environment decides.

#### **B.2.18. Monitoring/Auditing:**

This stage is an important factor for the effective management of the project, because the recording of the effects caused by the project after its realization is carried out. It is an important step in the process where an ongoing impact assessment and review takes place after final adoption. They check whether the impact levels are within what is foreseen in accordance with the legislation and whether the mitigation measures have been implemented and are functioning properly. The aim of monitoring is to compare the foreseeable and actual impacts, in particular if the effects are significant or the scale of the effects cannot be accurately predicted. The results of monitoring can be used to manage the environment, to highlight particular problems early on so that action can be taken. The range of impacts requiring monitoring can be wide or narrow and will come from the 'forecasting and mitigation' stage of the EIA. Monitoring may reveal the need for more intensive impact assessment of some projects or activities. The information derived from monitoring can be extremely useful not only to provide information in future studies, but also for the next stage that follows.

It is proposed that there should be an official responsible for the park, preferably an engineer (mechanical engineer or civilian) of the municipality, who will be able to control the action of the site in general and will be responsible for all disciplines. It may be located if there is a possibility in the project in question with parallel responsibilities of another kind that will be related to the project and its activities. Monitoring can be done by remote means, and by other types of electronic means such as the use of qgis, and other appropriate equipment for the

temperature of the water and its purity. He will also receive reports from citizens in case of complaints, in order to better deal with them, and every month there will be an on-the-spot check and inventory of the changes observed (positive or negative). Besides these, will be able to inform about the need's maintenance of the project, in order to contribute to the longevity of the construction.

Using the data obtained from the recording in the previous step of the project **monitoring**, the same employee can compare between the actual impacts in relation to the estimated impacts of the project that were initially predicted, each end of the year as a report. This step is called **Auditing** and the whole process can be evaluated for the quality of the study and the measures taken for the mainly negative effects. It is essentially the self-check for the correctness of the study, in order to avoid similar errors in future in subsequent projects. However, if the study is evaluated successfully, it could also be used as a model for subsequent studies.

### **C. Results – Conclusions**

With regard to the first part of this report, it emerges that the Environmental Impact Assessment now provides for the legislative proposal of solutions for residential development, as well as the development of infrastructure and networks. Environmental Impact Assessment is, as is commonly accepted, a widely recognized environmental management tool for integrating the environment into development projects and in many countries, it is imposed as a mandatory community tool of law. A key step in the process, is to compare both the situations, one with the project and one without the project, for each solution in terms of the main positive and negative effects on the environment, public health and amenities of the residents and users of the area concerned by the study. The submission of a substantiated finding on the degree and severity of the effects of the project, should be provided individually and cumulatively, as this substantiates whether the project should not be promoted for serious reasons relating to the protection of the environment and public health.

Where an environmentally acceptable solution exists, documented, justified and feasible proposals and suggestions for measures and programs to eliminate, mitigate, prevent, avoid, minimize or, where possible, remedy or replenish the adverse effects on the environment, amenities and health of the inhabitants or users of the area, which will be identified and manageable must be submitted. Otherwise, the project and its objectives should be proposed to be differentiated in terms of the materials to be used, the alternative spatial - locations,



architectural or technological options, the way of construction and operation, the options to ensure the required space for the project, for the route and the construction, geometric characteristics and standards. Consideration should also be given to its modification in terms of the use, composition, maintenance, and capacity of the project, as well as possible replacements that may be needed, with a possible need for reinforcement with slopes and retaining walls. At the end, provision should be made for site restoration, additional accesses arrangements, traffic management and vehicle control measures, etc.

The purpose and main question of this report, is to highlight the importance of Environmental Impact Assessment of Child-friendly open urban spaces, approaching and structuring research through theoretical bibliographic investigation, but also a case study, which focuses on “An open urban child - friendly public space in the area of “Lathea A” - building block 1413 of the Municipality of Acharnes in Greece”.

In other words, the aim of this thesis, is to analyze the value of Environmental Impact Assessments, the value of open parks in urban cities for young and old and the combination of these two valuable aspects, in the implementation or better cities and happier residents. It presupposes an understanding of these aspects, from both socio-ethical and legislative perspective.

In Part "B" of the procedure, it was limiting to apply the public participation stage in practice, as it is a lengthy and costly procedure on the one hand and on the other hand, the competent Authorities should have been initiated and involved to carry it out and such was not possible to happen for the purpose of the thesis. Also, from the screening stage and onwards, the formal procedure includes the approval of the competent Authorities, in accepting the study to evaluate it for any deficiencies or corrections. As for the monitoring/ checking - auditing stage, what happens in the project is recorded by observation, in order to compare the results with the ones that were estimated. Therefore, during this stage of the project, real activities and results are needed to be gathered and be evaluated, it concerns the actions to be carried out after the implementation - finalization of the project. Therefore, this stage can't be written before the finalization of the construction.

Another limitation to this study was the topographical mapping of the site of the project, which is also time consuming and expensive. For this purpose, we accepted the data that have been recorded as final since 2018 in the national cadastral for the property in question, as it was

recorded all those passed years during which they are accepted by the site administrator, which is the Municipality of Acharnes.

To summarize, the legal obligation to prepare an Environmental Impact Assessment before each project has arisen from the increasing awareness of the mankind, regarding the protection of the environment, which has led to the continuous increase of interest in methods aimed in recording and reducing negative impacts on the environment.

Literature worldwide, has extensively reported on the importance of studying environmental considerations at an early stage of a project's implementation, as well as on the importance of open parks in cities not only from a climate point of view, but also from a psychological point of view, as well as cultural-tourist point of view. All these factors together influence the well-being of a place and therefore the development of urban environment. These, may be considerations that depend on the empirical skills of the planner, but the existence of methodology and tools, such as in this case the given methodology of the specific structure of an Environmental Impact Assessment, also helps to better predict the assessments, as they develop the potential for more data for safer prediction and treatment.

It is worth noting that there has been a shift in the common understanding of the necessity of the Environmental Impact Assessment during the passage of the times, which could be argued to have passed with the maturing of conditions overall on environmental issues. In particular, initially, the Environmental Impact Assessment was considered as a process aimed at identifying and assessing impacts, following a systematic and formal compliance with the Directive. Environmental Impact Assessment is now understood as a tool that can contribute to the achievement of sustainable development, as it allows the timely examination of sustainability issues, the adoption of criteria, targets and indicators that serve this direction but also the evaluation and selection of the most sustainable alternative for the environment and human health.

As shown by the findings of the study, it is essentially a process of identifying the effects on the geophysical environment, biodiversity and human health from the implementation of projects. It is also emphasized that it is a preventive tool for sustainable development and the formulation of development actions, so one of the main advantages of the Environmental Impact Assessment is that the environment is taken into account at an earlier stage in the planning and decision-making processes.

As a particularly important dimension of the Environmental Impact Assessment, it is underlined that it provides for and supports participatory planning processes, as it enables public involvement and participation at critical stages of its development, in order to jointly make more effective and informed decisions on human health from the implementation of projects. Prompt and well-designed participatory planning, is a key instrument for involving and informing the direct and indirect interested and affected parties, by an Environmental Impact Study. Through simple and interactive such processes, critical issues can be identified and effective and up-to-date strategies can be formulated. However, in some cases it is considered that these may be financially inaccessible or delayed by timeframes, thus failing to succeed in finding a common solution or incorporating several elements of subjectivity.

After all, the methods intended for impact assessment vary, depending on the scale, nature, subject matter and country in which the project is carried out. In other words, the availability of data and knowledge of either direct or indirect impacts and the available timeframe of the Environmental Impact Assessment, contribute to determining the methods to be used.

As a consequence of the above, but as can be also seen from more than twenty years of my professional experience in the field, in practice there is a significant differentiation in the level of quality of different environmental impact studies, which makes it imperative to check the quality of environmental studies. Therefore, it would be advisable to evaluate the environmental studies, so that there would be some kind of control by experts in the field on the quality and adequacy - completeness of the study. It also helps to better check its compliance with the original terms of reference and existing legislation as well as to assess its suitability i.e., whether it can help in deciding on the licensing of the project. The proposal put forward for this purpose, was how the information data base bank that would include individually ranked projects as a model, could contribute to be used by other new studies, which would supplement or correct any errors or omissions after the evaluation. The assessment of environmental studies, includes the investigating the degree of completeness and adequacy, to determine whether it serves the purpose for which it has been prepared. The need for the evaluation of environmental studies is evident through the legislative framework. The evaluation can be carried out by officials from government departments, municipal authorities, non-governmental organizations, individual scientists and scholars in order to help control the quality of environmental studies, thus contributing to raising their standard. In fact, members of the Environmental Studies Evaluation Committee, could advise the planners of the Environmental Impact Assessment, even before

issuing the opinion and approving the environmental studies.

Focusing on the urban parks, as shown by the findings of the study, outdoor urban parks help mitigate the problems of the microclimate in the cities, which is responsible for many people's health issues and, on top of that, are a burden on the state budget. Consequently, to the frequent fictitious dilemma, of whether or not to invest resources in a qualitative Environmental Impact Assessment, the answer certainly includes the argument that it is better to allocate this money, to prevent problems in advance, rather than afterwards, which, in addition to health problems, accumulates a whole host of collateral - site effects, created by socialization in cities without proper planning.

In this perspective, the proposed open-air theme park provides solutions focused on the needs of the area from an environmental, social and economic point of view, i.e., responding in essence to the triptych of pillars of sustainable development. Simultaneously, as it is a theme park, it is estimated that the benefits are estimated to far outweigh the potential challenges. With the timely and proper cooperation of the State, the Entrepreneur who will be activated within the process and the Citizen, the right strategy of safe operation, timely problem solving and ensuring quality, safety and long-term operation can be created. The aim of such project implementation, is to also provide added tourist value with central reference to the ecological management of the place, reversing the current image of abandonment and degradation of the site.

The Theme Park under study, was planned and proposed in a way that combines nature with an interactive methodology, held between balanced entertainment and education - learning of young people and not only, considering that it will have a high frequency of visits and multiple benefits for the community. Thus, visitors to the site, shall have the opportunity to navigate within the site in two ways, depending on the mood they have each time: a) participate in the experience of traveling within the theme park, while b) take daily walks in the park, with access to coffee shops and outdoor areas or pedestrian roads. The project also contributes to create a differentiate identity of the municipality by creating a landmark with the project at the exact place and strengthens the human relations. It also provides active and passive opportunities for interactive recreation, learning and sports facilitates to the participants. It is commonly known that as a park it contributes to the health, well-being of the individuals and of the Community in general and improves the environment, by creating a

valuable green space.

In any case, the need for remote means of monitoring the park with appropriate planning and the involvement of public safety agencies is underlined, as it is not uncommon for uncontrolled open spaces to be converted into centers for the accumulation of drug addicts and dealers that are the main route of transmission of dangerous diseases. This should be a precautionary measure, that is underlined here, as it is also a park that is also addressed to children. In addition to this, resources for overall monitoring of the impact study are required, as if not given adequate attention, there is a significant risk of failure to maintain the project. After all, as our ancient orator Demosthenes used to say and that teaches us to today, "it is more difficult to maintain the goods you have built than to create them".

Extending the findings of the study from this urban park to urban parks in general, it can be reasoned that by creating outdoor parks, humans come closer to their natural environment, from which they have become alienated. In the already established societies, there are few spaces offered for this purpose and the need to build them, is becoming greater every day. Moreover, the matter has stimulated several scientists to deal with and create information related to the improvement - solution to the problem.

Therefore, it is obviously necessary and a pilot project consisting of specialists of this kind, to create such spaces is proposed, which is capable to offer outdoor activities within and around large urban centers. These activities could be extended to forest areas and in fact, they may provide the opportunity to learn how to produce local products as well. In this way, nature could work in exchange and the benefits would become multiple, giving the young members of the societies the opportunity to come closer to the natural environment, to understand its value in order to take care of it.

In conclusion, the establishment of the Environmental Impact Assessment, is very important and crucial and must be taken into account before any major project, as it seeks sustainable development and environmental protection, while its main objective is to improve human-nature relations, through the promotion of cultural, educational and recreational activities related to the enjoyment of the environment.

Finally, the Environmental Impact Assessment becomes even more valuable because the project concerns children, who are the future and for whom humanity must respect the fundamental principle of sustainable development, which is the principle of intergenerational equality.







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