

Presenting Geodesign Approaches in Practice: Case of Çırpıcı and Kamil Abduş Urban Parks in Istanbul, Turkey

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Abstract: Geodesign emerged as a new era for landscape architecture profession, which seeks to analyze landscapes in geographical context and works with different data sets in various layers to propose the most suitable land utilization and function. The notion of Geodesign and how it is implemented in the Turkish context will be presented in this work. Two case studies from the City of Istanbul will be studied with in the framework of Geodesign. Gains and constraints will be discussed regarding implementation of such techniques to a larger context. The present work can set an example of Geodesign based landscape design process not only for Turkish cases but all around the world.

Keywords: Geodesign, design process, urban park design, Istanbul, digital design

1 Introduction

Comprehensive landscape analysis is essential for creating a communication between the mass of data and revealing the key issues that will lead designer to define the goals of the project. Even though, the quantitative data gives very clear understanding of the phenomena at hand, the design team has to complement this knowledge with some qualitative facts such as culture, religion, class, education, politics or age (MCELVANEY 2012). Subsequently, an analytical interpretation of the analysis could be challenging due to range of issues and complexity of data. Designing with science based data (STEINITZ 2012) gives designer the ability to provide a quantitative perspective to identify and resolve problems and to reveal the uniqueness of the area which is so important to define the design goals, purified from personal perspectives and background to make the wisest decisions possible. Geodesign promises a value based as well as science based design, while becoming a powerful tool facilitating a holistic approach in decision making process.

In developing countries, landscape analysis is one of the challenging steps of the design process due to lack of available data, institutional communication, and time. This fact is demonstrated in a case study from Turkey: Figure 1 illustrates the typical analysis process in public green space landscape design in the country. In this process, technical data are being provided by institutions, while cultural, ecological and social analysis is gathered by design team. In a typical case, analysis part references only to technical sheets, while synthesis studies is becoming inefficient to reveal design goals, hence yielding arbitrary design decisions.

Geodesign can set a framework and become an efficient tool to promote more objective and sound approaches to landscape design. In this endeavor, the framework proposed by Steinitz consist of two levels as; assessment (representation model, process model, evaluation model) and intervention (chance model, impact model, decision model). While the questions of the assessment part leads designer to search for the historical and current landscape character in

geographical context, it ensures to reveal the unseen data that defines the key issues of design goals.

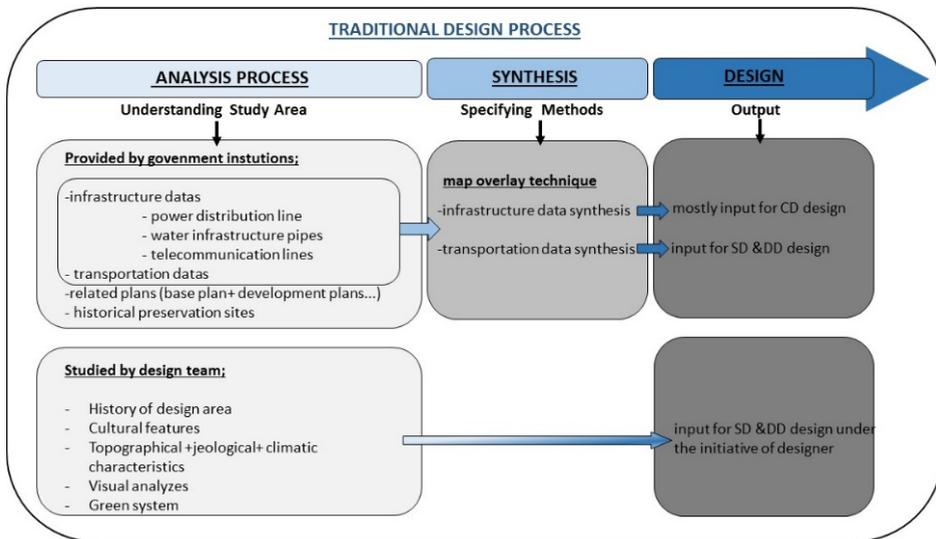


Fig. 1: Traditional landscape design method

In order to improve the aforementioned design process, we propose incorporating Steinitz’ assessment framework to the traditional landscape design process. The outcome of this effort can enable rational synthesis of site dynamics and development of design goals. The proposed framework is tested in two cases from urban green space design in Istanbul, Turkey.

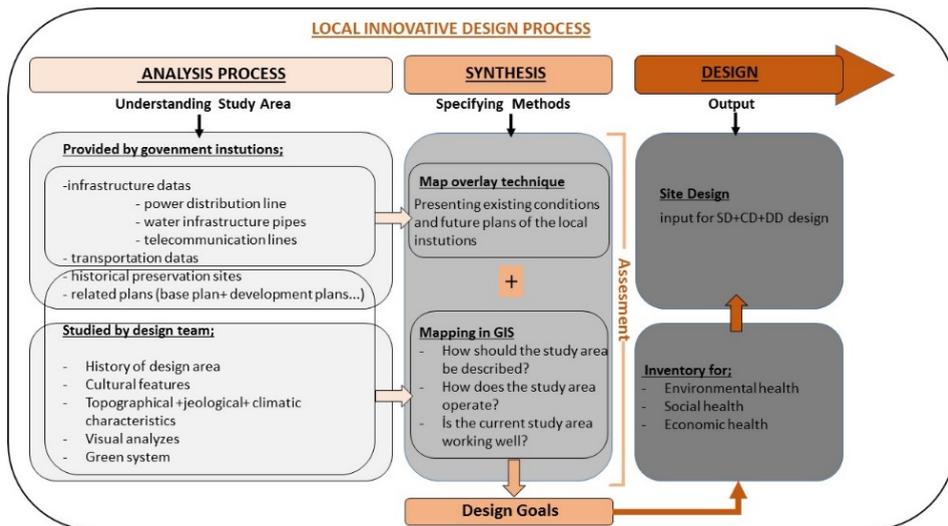


Fig. 2: Proposed framework for Geodesign based landscape design

In this paper; Kamil Abduş Lagoon Park and Çırpıcı Meadow Park will be presented as case studies. The outcomes of traditional design framework and proposed geodesign based framework will be elaborated. More specifically, the paper demonstrates;

- How geodesign could be used in analysis process,
- What type of goals and objectives are gathered from the analysis process, and
- How these goals and objectives are reflected to design.

2 Two Urban Green Space Design Cases in Istanbul, Turkey

Kamil Abduş Lagoon Park and Çırpıcı Meadow Park are located in the Asian and European parts of Istanbul, respectively. Both sites were ecologically sensitive and viable once upon a time, however their habitat qualities have been significantly altered due to urbanization and industrialization in these areas around 1970s and 1990s. Currently, the City of Istanbul is seeking designs to transform these areas as urban parks.

2.1 Çırpıcı Meadow Park

Çırpıcı Meadow was a significant cultural site with its seasonal festivals, textile and leather craftsmanship, and ecological qualities during Byzantian and Ottoman times. Later in the Republican era, the area became a hub of industrialization in Istanbul mainly housing textile and leather industries at global scale. The site has lost its importance in 1990's due to removal of such industries outside of Istanbul. Istanbul couldn't use the chance of transferring these factories to post industrial uses, hence losing significant part of its industrial heritage. Remnants of this heritage still exist in the proposed park area.

First of all, in Çırpıcı Meadow Park, map overlay technique was used together with the post classification comparison technique to reveal changes in the meadow habitat due to industrial developments. The results revealed that, initially, natural habitats, and then, agricultural lands were diminished due to industrial expansion on the site; however, around 1990's industrial uses were also abandoned. Open spaces of the site were fragmented. Meadow characteristic was damaged. Moreover, the building density, road network and number of parks in surrounding area of the site increased in last thirty years.

Second, current land use maps were overlaid with the hydrological data and flood map of the area. The results showed that the project site was consisting two canalized stream corridors, and the water table was high in the area. Moreover, considerable area of the project site was under the risk of flooding. These analyses defined the initial considerations such that the area should operate based on the flood risk and the design should be developed for resilience. Also, the site's industrial heritage and cultural memory and characteristics should be demonstrated through this design (Figure 3, Figure 4).

Within this scope, the main design approach was structured in the titles of industry, culture, energy and infrastructure. And design goals were developed as below;

- Generating “a sustainable park model” which is able to produce its own energy. Creating a self-sufficient park in terms of energy resources.

- Designing the park as “a carbon absorbent reserve area” that will balance the carbon budget of the traditional industrial uses on the site. Creating meadow system by using C4 plants.
- Re utilizing existing industrial buildings for many activities as part of the park program.
- Providing ecological, infrastructural connections and reclamation.

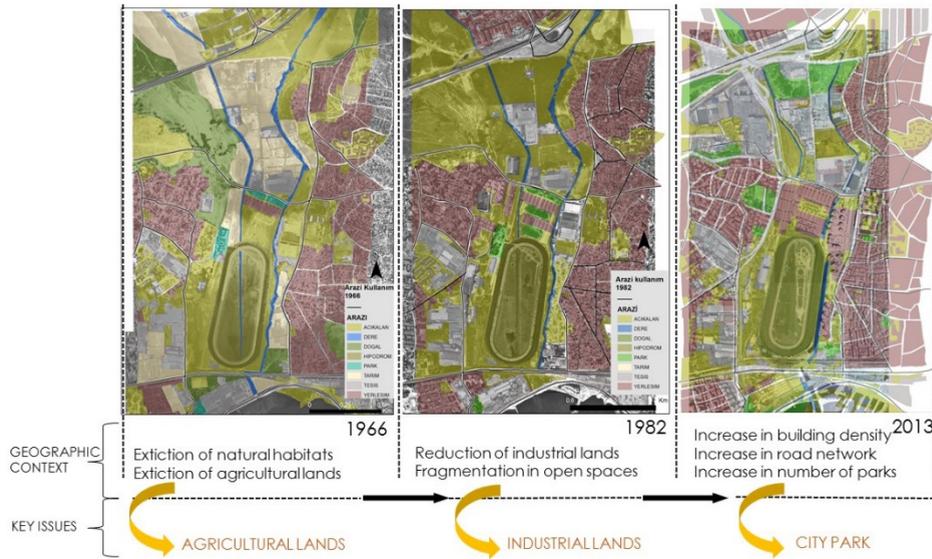


Fig. 3: Monitoring land use change of Çırpıcı Park by satellite photographs in GIS

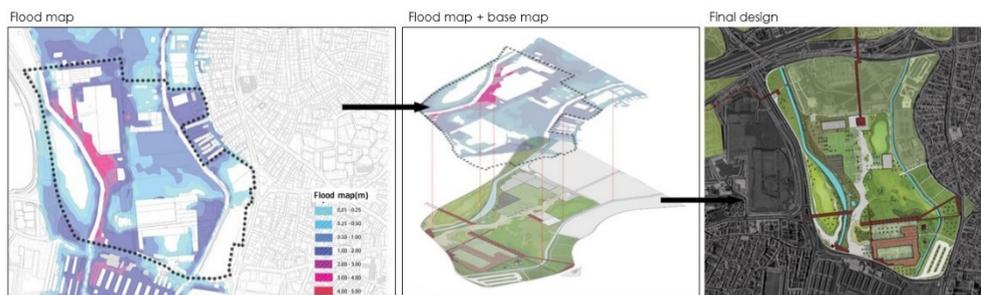


Fig. 4: Design propose stage; superposing water levels of Çırpıcı park

Figure 5 shows two design examples for the same area. Traditional design method has yielded a landscape pattern which is not fully benefitting from the ecological and cultural potential of the site. Whereas, the work produced via Geodesign approach has yielded a park with flow and energy patterns. While the 1st design came up with ordinary concepts such as sports area, recreational park, playgrounds etc.; the 2nd design had more sensitive program fed from the landscape character instead.

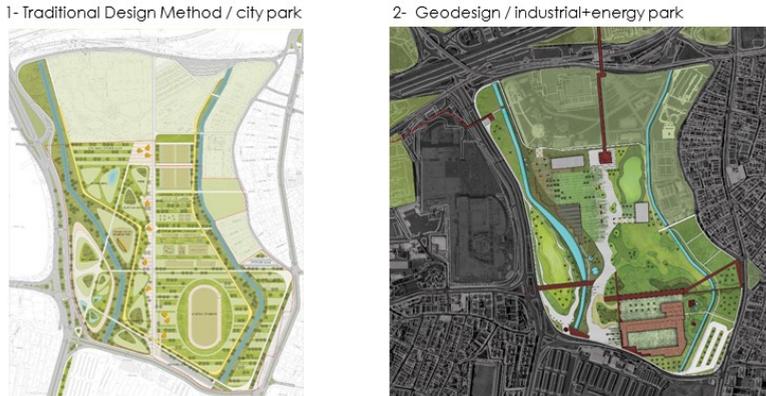


Fig. 5: Different outcomes of compared methods; while designing with traditional method leads the project area turn into a city park with no traces from past; geodesign helped to understand the landscape and projected area to turn into a industrial+energy park

2.2 Kamil Abdüş Lagoon Park

Kamil Abdüş Lagoon was one of rare lagoon habitats in Istanbul. However, in 1970's a major ship yard was located at the mouth of this lagoon and the area were rapidly industrialized since then. During 1990's the lake has died and there were some attempts for ecological rehabilitation, though it was limited to the bringing sea water and creating some islands as bird habitats. Subsequently, the ecological qualities of the lake never improved. The sensitive ecological conditions of the site required the use of Geodesign and other appropriate tools such as CAD, graphic design and 3D modelling software. Geodesign especially was used for finding out of the ecosystem of lagoon. Without understanding ecological structure of the lagoon, design decisions would be abstract and unrealistic. The most significant task was to explore the changes in sea and lake coast and also changes in land cover (Figure 6). The use of GIS was very important especially in the assessment of ecological condition of the lagoon.

By the synthesis of data, we clarified the design goals and decisions as below (Figure 7);

- Increase the bird diversity in the lagoon (Promote landscape heterogeneity, Increase demolished marsh cover, Protect and enhance the trees and the maquis cover)
- Provide fresh water entrance to the lagoon as well as control salty water entrance from Marmara Sea to restore ecological qualities
- Represent industrial and agricultural past of the site through some park programs and park objects.

Preliminary design work began with some GIS task to depict the changes in land cover, road network and coastal line. Also, traditional agricultural and industrial uses on the site were scrutinized and their impact on the project site was mapped. As a final step, interpretation of these data with some regulations and population data helped in refining the spatial decisions (Figure 8). Conceptual design process was finalized by photorealistic images and 3D models. Figure 8 displays the comparison of the outcome of traditional design approach and Geodesign approach. Traditional design method yielded market oriented, marina type of uses, while the Geodesign based approach yielded a program and phasing based on sustainable design of the park environment.

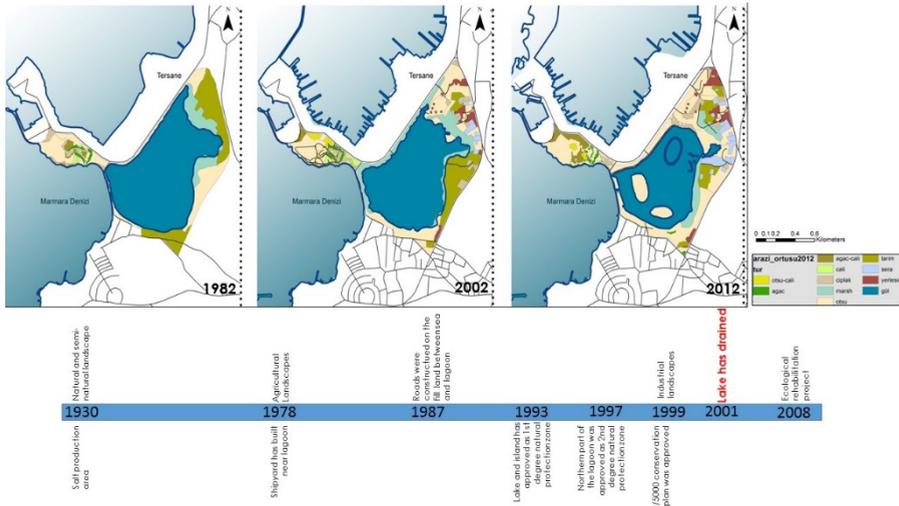


Fig. 6: Chance detection in Kamil Abduş Lagoon’s geography and habitat

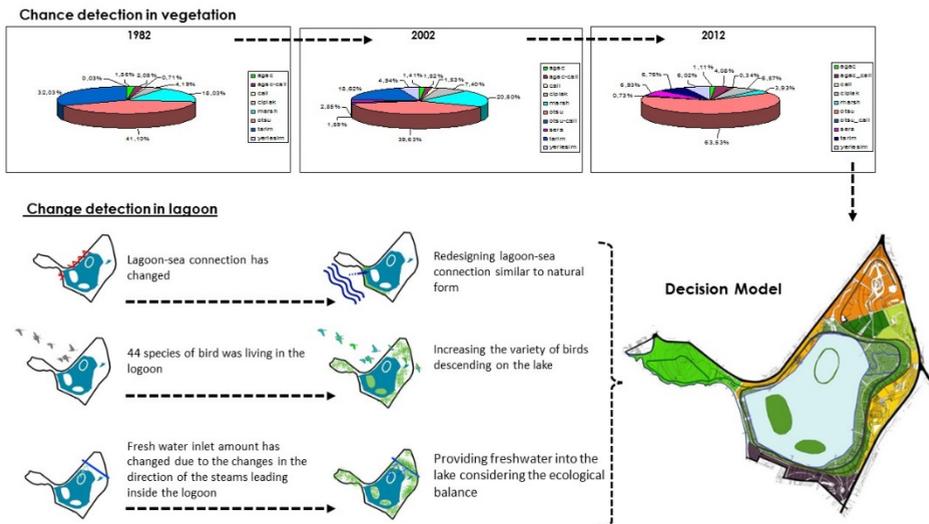


Fig. 7: Changes on natural system of Kamil Abduş Lagoon

1- Traditional Design Method / Marina



2- Geodesign / Natural+ Archeological park



Fig. 8: Different outcomes of two designs; while designing with traditional method lack in sensitive design solutions and programs to the site, Geodesign based landscape design proposed environmentally sound alternative

3 Discussion and Conclusion

Proposed framework is a combination of software applications and traditional methods to solve complex design issues. Geodesign process and techniques helps in understanding landscape dynamics and coming up with design ideas to restore the integrity of these lands while providing benefits in terms of recreation and well-being.

Here are some arguments stemming from the presented experience: These issues are not indigenous to Turkish case but most probably also relevant in other developing countries.

Gains of new proposed methods include:

- Education of institutions and public; institutions has the key role as decision-makers in design process. Geodesign is a successful tool to convince the city officials to seek innovative and ecologically sound design ideas inspired by the landscape character. After construction, the public will understand historical, natural and social contribution of the area to whole city system, hence promoting awareness.
- Awareness; Generally, GIS is preferable in the analysis phases of regional and neighbourhood scales. In proposed design, GIS outcomes makes designers to seek for the unseen geographical data of landscape, different than traditional design process. In both cases, main design ideas come up with the evaluation models of Geodesign.
- Spatial outcomes; while studying a site scale area, Geodesign allows designer to understand the area's ecologic, social and economic connection with the whole system.
- Socio economical outcomes; In Turkey all city parks are operated by same facilities run by local municipality while proposed city parks are designed with unique socio economic facilities reflecting their uniqueness.

Constraints of the proposed method include:

- Lack of experience; since it is not common to study with Geodesign in landscape design in Turkey, there are not enough experts in institutions to master the whole design process. Designers are in such a dilemma with aim to put forth science based study without any support.
- Lack of data; there is not enough data to study in Geodesign based landscape design. Modern database structures, software and hardware and also collaboration between institutions are essential to overcome this limitation.
- Extra budget; since the institutions are not familiar with the system, they don't reserve allowance for Geodesign, therefore the process can be deterrent for the design team who has to put extra time and budget on it.
- Social context damage; focusing on too much to work with ecological design may cause loss in social aspects of design
- Current regulations; Geodesign outcomes may be contradictory to the status quo. This is not the failure of the Geodesign, but the outdated institutional environment.

Landscape design starts with understanding how a landscape works as an ecological system and pursues through searching historical maps and aerial photos until a path to existing forms and functions paved. Geodesign provides a platform for holistic design and communication different than traditional design process. Designer can easily link seemingly not so related data into a cohesive, and therefore, a very powerful graphic language by using GIS, CAD and other visualization technologies and techniques. Final work helps community members, government and municipality officials, and NGO's to understand the drivers and the consequences of a particular design, hence building support to find funding to realize such design proposals.

In Turkey, some deterrent issues are part of Geodesign based landscape design process as mentioned in the constraints part. And yet, institutions have the key role to encourage the Geodesign becoming widespread. Providing technical support, allocating extra budget, rearranging rules leading design process are the key issues to support the designer to design with Geodesign. Outcome of all this effort is the formation of a sustainable design approach representing natural, social and economic dimensions.

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