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# Urban stream enhancement - Revisiting urban streams of Istanbul

**Fatma Ayçim TÜRER BAŞKAYA**
*Istanbul Technical University, Faculty of Architecture, Department of Landscape Architecture, Istanbul, TURKEY*

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**Abstract:**
Capturing more than one hundred streams, stream network of Istanbul has got a noteworthy landscape potential. However, within the last fifty years, rapid urbanization and industrialization have brought about devastating impacts on the urban streams and suppressed their landscape potentials.

Considering these suppressed potentials, this study aims to develop regenerative landscape planning strategies for urban streams of Istanbul by gaining a multi-layered understanding of the interplay between historic watercourses and urbanization. Within this context, this study handles five major streams in Istanbul which are Kagithane, Cirpici, Kurbagalidere, Baltalimani and Goksu streams. These urban watercourses are selected as case studies, regarding their notable places in the urban memory and the diverse land cover types they have got in their impact areas.

By utilizing GIS technology and multi-criteria analysis, ecological, socio-cultural and economic potentials of the selected streams are evaluated according to six major parameters as size, necessity for intervention, land cover, accessibility, scenic potential-visibility and proximity to the features of urban memory.

In order to cope with the challenges of 21$^{st}$ century, cities should provide themselves with interdisciplinary studies and welcome innovative solutions to chaotic environmental issues. This study focuses on urban water courses in Istanbul as one of these chaotic issues and highlights that even the most degraded of landscapes are worthy of our stream enhancement efforts. Urban streams have a power to improve not only the environmental quality but also the quality of life in Istanbul and this study is an attempt to highlight the importance of regenerative landscape planning for urban streams and for the benefit of Istanbul megacity.

***Keywords:*** *Urban streams, urban stream enhancement, landscape planning, Istanbul.*

## 1. Introduction

Istanbul has got more than one hundred streams. This stream network has provided the city with its unique ecological, socio-cultural and economic

features, throughout the history. However, within the last fifty years, rapid urbanization and industrialization have brought about devastating impacts on the urban streams and suppressed their noteworthy landscape potentials. Considering these suppressed potentials, this study aims to reveal landscape management strategies for the urban streams of Istanbul.

As a significant coastal city locating on two peninsulas, Istanbul has always been a rich city about waterfronts. During the Ottoman Period, these waterfronts but especially the stream fronts had been key components for the open space system of Istanbul. Public green areas traditionally called “mesires” and “meadows” existed along the riverfronts and acted as the socio-cultural centers of the urban life by welcoming citizens from different social classes, ranks and ages. Today most of these historical “mesires” and “meadows” along the urban streams were physically superseded by the other land uses or covers, but more or less their places in the collective memory are still alive. Besides the cultural issues, environmental and economic issues related to the urban streams are also problematic in Istanbul (Turer Baskaya, 2012). Ozturk (2009) indicates that floods occurring between 2000 and 2009 caused an economic loss of 2.8 billion Turkish Liras.

Undoubtedly, cultural requirements and natural properties meet directly at riversides in the urban areas of the 21st century. Hence, sustainable development needs knowledge of the interrelations between urban conditions and the state of waters as well as instruments and techniques for their management. This is especially true for the industrial nations where much of the population live in the urban areas (Schanze et al, 2004). UN (2011) indicates that between 2011 and 2050, the world population is expected to increase by 2.3 billion, passing from 7.0 billion to 9.3 billion. At the same time, the population living in urban areas is projected to gain 2.6 billion, passing from 3.6 billion in 2011 to 6.3 billion in 2050. Thus, the urban areas of the world are expected to absorb all the population growth expected over the next four decades while at the same time drawing in some of the rural population. These expectations bring about big concerns about future of urban rivers.

As running waters occupy the lowest-lying areas on the landscape, they integrate the effects of land-use change and thus are very sensitive to urbanization. As land is cleared of vegetation and replaced with a large amount of impervious surface such as asphalt, concrete and rooftops, the amount of run-off entering streams increases; the hydrology and geomorphology of receiving streams are fundamentally altered; and the consequences for ecological changes can be severe and complex (Wolman, 1967; Walsh, 2000; Paul and Meyer, 2001 as cited in Bernhardt and Palmer, 2007).

Noticing the vulnerability of watercourses, several bodies from local to international are nowadays seeking to minimize current urban pressures on water surfaces. As the main instrument of the European Water Policy, European Water Framework Directive (WFD) is an important cornerstone to avoid further deterioration on water surfaces. Major environmental objective of this directive requires the promotion of all surface water bodies into good quality, together with the preparation of river basin management plans by the year 2015. Within this context, urban watercourses can be considered as a special category as they are particular at least 4 points of view: narrowness

of the stream fronts, diversity of land uses existing inside their buffer areas, existence of suppresses ecological functions due to the conflicts between different land uses and tendency to modify water courses physically.

There is an urgent need for further interdisciplinary studies like European Commission 5th Framework Program, Key Action 4 "City of Tomorrow and Cultural Heritage" in order to reveal sustainable ways to enhance urban streams (Turer Baskaya, 2012). France (2008) indicates that ecological issues and environmental problems have become exceedingly complex. Today, it is hubris to suppose that any single discipline can provide all the solutions for protecting and restoring ecological integrity. We have entered an age where professional humility is the only operational means for approaching environmental understanding and prediction. As a result, socially acceptable and sustainable solutions must be both imaginative and integrative in scope; in other words, garnered through combining insights gleaned from various specialized disciplines, expressed and examined together.

In most urban settings standing under the pressure of rapid urbanization, watercourses have been straightened and culverted to prevent flooding and make more land available for human use. In the case of Istanbul megacity, there is an urgent need to revisit urban streams. This study is an attempt to reveal potentials of urban streams and highlight the importance of regenerative landscape planning for urban stream enhancement.

## 2. Materials and methods

This study aims to develop regenerative landscape planning strategies for urban streams of Istanbul by gaining a multi-layered understanding of the interplay between historic watercourses and urbanization. Within this context, this study handles five major streams in Istanbul which are Kagithane, Cirpici, Kurbagalidere, Baltalimani and Goksu streams. These urban watercourses are selected as case studies, regarding their notable places in the urban memory and the diverse land cover types they have got in their impact areas.

Within this study, a buffer area with a radius of 250 meter is identified for each of the streams as the impact area to study. However, it is evident that environmental functionality and perceptibility of the streams vary according to several factors as width of the stream, bank shape, topography and built-up space configuration. This assumption brings about another term which is called "stream front". Based on the definition of "riverfront" generated by Silva et.al. (2004), this study interprets "stream front" as the direct contact area between the stream and the first line of buildings together with the transportation lines. Figure1 illustrates the streams examined within this study and their buffer areas.

Courses of the selected streams and urban landscape components pertinent to their buffer areas are scrutinized within this study by utilizing the GIS technology and ArcGIS 9.3 software. 1/5000 scaled digital maps and aerial photographs dating 2006 are obtained from Istanbul Metropolitan Municipality. Digital contour map of Istanbul is provided from Istanbul Metropolitan Planning Centre. Maps and aerial photos are first rectified and then registered to UTM coordinate system with ED1950 datum (Zone 35N). Supported by the field surveys conducted from February to April 2012,

1/5000 scaled maps and aerial photos are used to prepare current land-use maps for the buffer areas.

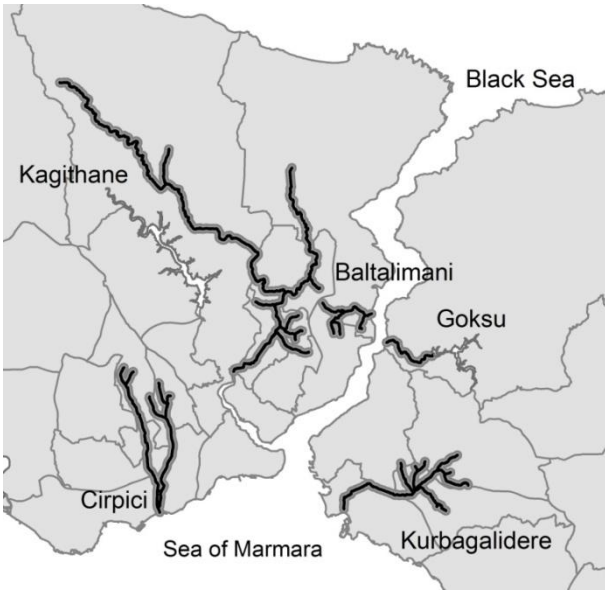


***Figure 1.*** *Dispersion of the urban streams investigated within this study and their buffer areas.*

For the crosschecking of the courses of covered and moved streams, historical aerial photos (dating 1982 and 1966) are obtained from the official web page of the Istanbul Metropolitan Municipality. In order to focus on the suppressed statuses of the urban streams within the last 50 years, an online newspaper archive dating back to 1950 is utilized for collecting more data about the selected streams.

Further information on the watercourses' efficiency in the Ottoman urban culture, international approaches about regenerative landscape planning and developing innovative landscape strategies for urban streams are gathered from the scholarly and government literatures in order to build the method of this study.

Environmental decisions are often complex and draw upon multidisciplinary knowledge bases which incorporate natural, physical social sciences, politics, and ethics (Huang et al., 2011). This multidisciplinary context highlights the existence of multi-criteria analysis as one of the most frequently used methods in ecological economics. In order to address complex environmental questions, multi-criteria analysis enables combination of quantitative and qualitative criteria based on ecological, social and economic concerns pertinent to various disciplines. According to Garfi et al. (2011), multi-criteria decision analysis is considered to be one of the most flexible methods since it can be made site as well as time specific, considering qualitative and quantitative attributes simultaneously.

By providing multi-criteria decision analysis, this study evaluates 5 major streams of Istanbul and their buffer areas according to 6 main parameters. Figure 2 illustrated these main parameters which are size, necessity for intervention, land cover, accessibility, scenic potential- visibility and proximity to the features of urban memory. Different coefficients for the ecological, socio-cultural and economic evaluations are assigned to these parameters prior to their digitization by the GIS technology. Following to the digitization, quantitative data obtained for these parameters are transformed into five-point Likert Scale in order to evaluate ecological, socio-cultural, economic and total potentials of these urban streams Figure 3 illustrates the evaluation process used in this study for developing landscape management strategies for these watercourses.

## 3. Results and discussion

Within the landscape architecture point of view, urban streams have dynamic interactions with their surrounding areas. Thus, planning or rehabilitation of the urban streams can be solely done by the detailed examination of the surrounding areas (Turer Baskaya, 2012). Within this

study, a buffer area with a radius of 250 m is accepted for each of these cases. Total size of this buffer area represents the direct impact area corresponding to the length of each watercourse involving both the main channel and the accompanying sub channels. Among 5 of the cases, Kagithane, Cirpici, Kurbagalidere, Baltalimani and Goksu are the urban streams capturing highest amount of buffer areas, respectively. When we deal with the numerical values related to stream fronts, the order between the streams alters as Kagithane, Kurbagalidere, Cirpici, Goksu and Baltalimani. Figure 4 illustrates the numerical values of buffer areas, open spaces and stream fronts.

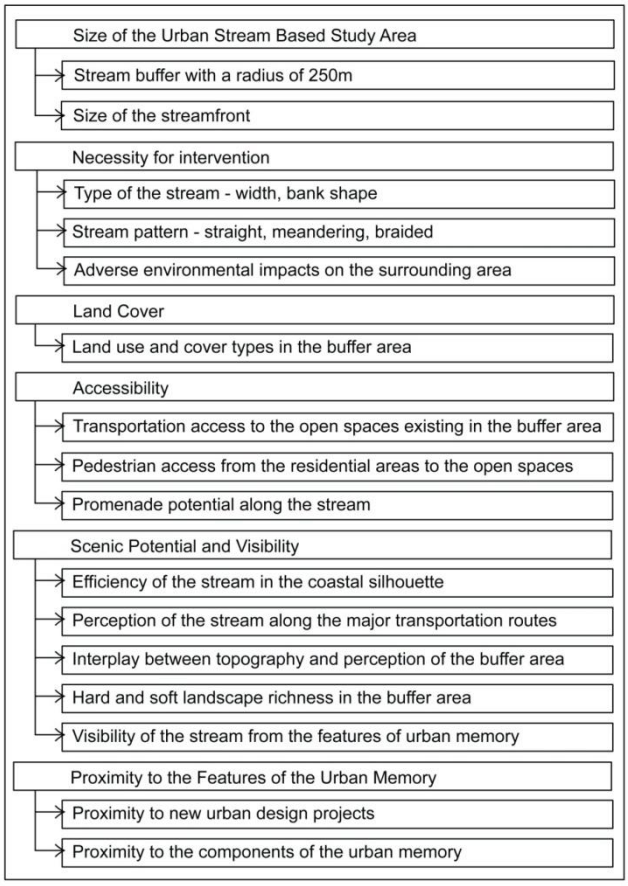


***Figure 2.*** *Parameters used within this study.*

Stream fronts are the indicator areas for the quick response of the water network to proposed landscape interventions. Therefore, the ratio between the buffer area and the stream front is representative to the capability of the watercourse to regenerate initially. Table 1 illustrates the urban streams capturing highest RBS amount as Kagithane, Goksu, Kurbagalidere, Baltalimani and Cirpici, respectively. Stream front is the direct contact area between the open stream and the first line of buildings together with the transportation lines. Buried portions of the streams are not taken into account for the stream front studies. Cirpici, Baltalimani and Kurbagalidere are the ones where buried channels exist in huge amounts. These channels are buried mostly due to the transportation based infrastructure studies. Regarded as natural boundaries, major streams have been determinative at the identification of district borders in Istanbul, as in the cases of Cirpici, Baltalimani and Kurbagalidere. Due to the impact of dense urbanization, these watercourses have been buried and new or promoted transportation lines have been erected on them. This process has brought about the drastic decline in stream fronts. Capturing highest RBS values, watercourses of Kagithane and Goksu are connecting sea and large fresh water bodies together as they pass from both the built-up spaces and vast green areas.

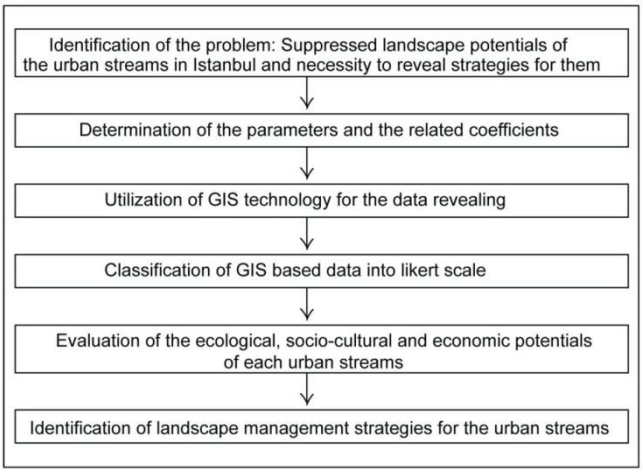


***Figure 3.*** *The flowchart representing the evaluation process used in this study (Turer Baskaya, 2012).*

The numerical difference between the amount of open spaces and the stream

front indicates the potential to establish a green network by combining the fragmented open spaces following to planning studies. Within this study, ratio between the open spaces existing outside the stream front and the total open spaces is expressed as ROT. Table 1 illustrates the urban streams capturing highest ROT amount as Cirpici, Baltalimani, Goksu, Kagithane and Kurbagalidere, respectively.

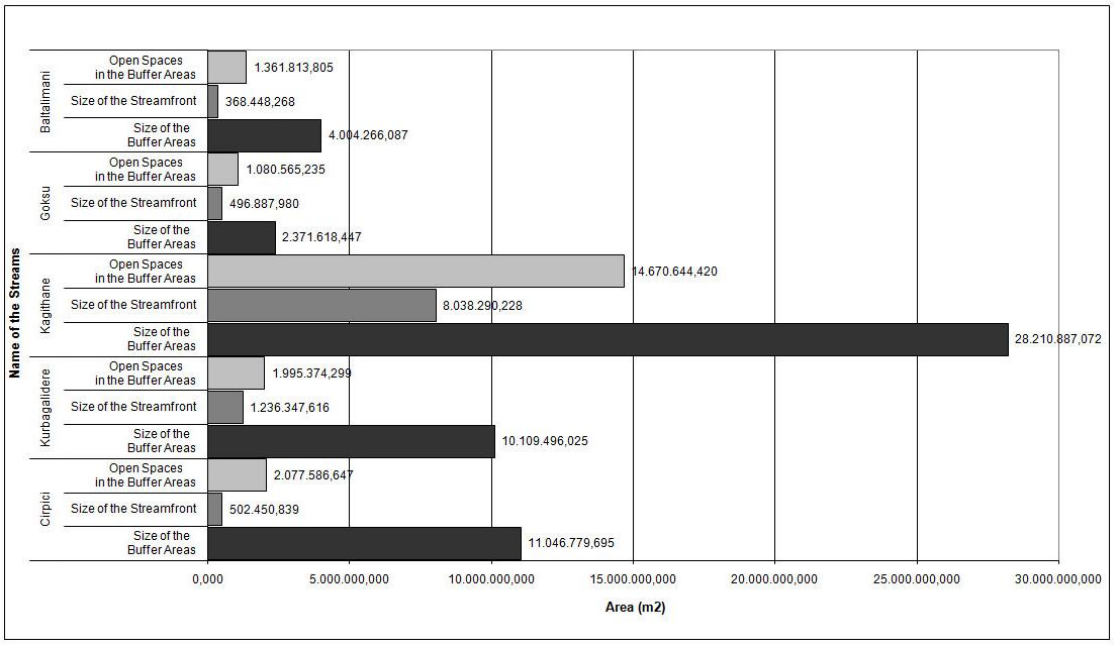


***Figure 4.*** *Numerical values of buffer areas, open spaces and stream fronts for urban streams.*

***Table 1.*** *Dispersion of defined ratios according to urban streams.*

| | Baltalimani | Goksu | Kagithane | Kurbagalidere | Cirpici |
|---|---|---|---|---|---|
| RBS | 09,20% | 20,95% | 28,49% | 12,23% | 04,5%5 |
| RBT | 34,01% | 45,56% | 52,00% | 19,7%4 | 18,81% |
| ROT | 72,94% | 54,02% | 45,21% | 38,04% | 75,82% |

RBS: Ratio between buffer area and size of the stream front

RBT: Ratio between buffer area and total open spaces

ROT: Ratio between the open spaces existing outside the stream front and the total open spaces

Although they have got limited stream fronts, Cirpici and Baltalimani streams have large amount of open spaces in their impact areas. For the Baltalimani case another important issue which is lowering not the amount of stream front but the open spaces is the pervious spaces hidden inside the land uses as in the cases of university campuses, military sites and residential areas. These pervious spaces are not open spaces regarding to social context but they have a great ecological potential to become component of a proposed green infrastructure.

Type and pattern of the urban streams are the other key issues that are determinative on both the existing buffer area land uses and the prospected interventions. Attributes such as width, sinuosity, opened or covered form,

vertical or trapezoidal form of the streams are related to the sub-parameter of “type and pattern” within this study.

Stream pattern refers to the plan view of a channel as seen from above. Water does not typically follow a straight course unless it encounters extremely erosion resistant rock or human-made obstructions or channels. Natural streams are rarely straight over a distance of more than 10 times the width of the channel. The curvature of a stream is called sinuosity and can be describes as straight, meandering, braided (IWLA, 2006).

Within this study, type of the stream is defined as cross-sectional area of the stream involving width and bank shape. In our cases, bank shapes vary as natural, asymmetric, trapezoidal, vertical and culverted. Two urban streams capturing similar lengths but different types and patterns will inevitably have different land covers, impacts on their surrounding areas and regenerative potentials.

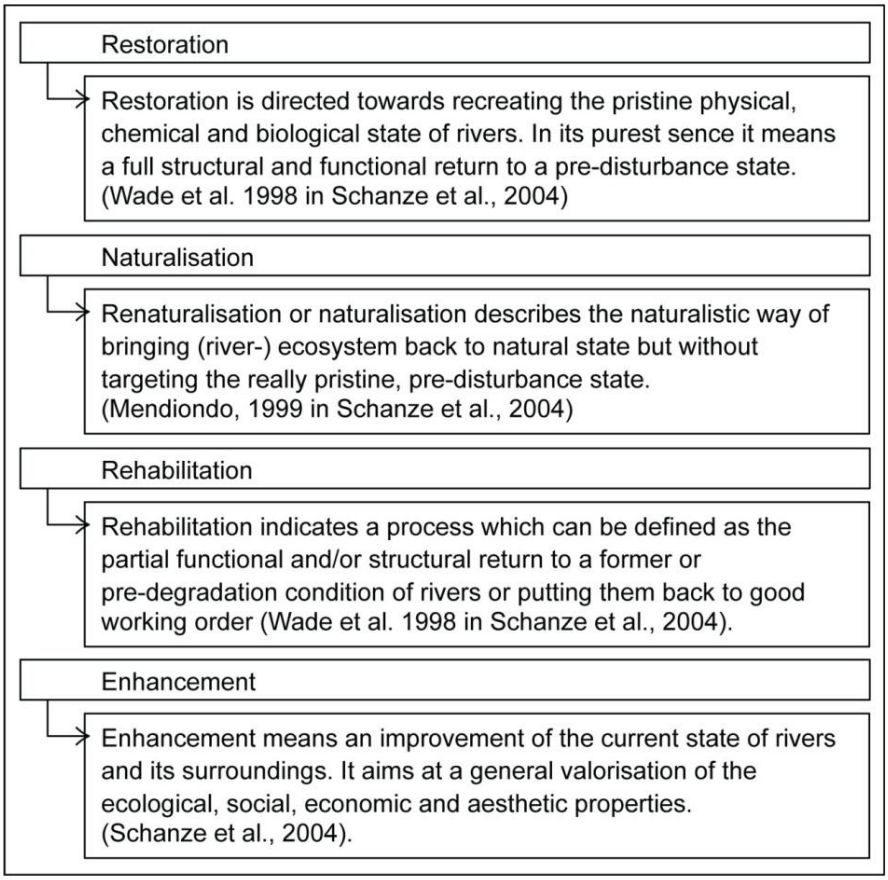


***Figure 5.*** *Terms related to the interventions to the urban rivers and streams (Turer Baskaya, 2012).*

Parameter of “necessity for intervention” considers adverse environmental impacts of the streams on their surrounding areas. Hence it will be decisive about the type of intervention (Turer Baskaya, 2012). Focusing on the type of interventions, Schanze et al. (2004) highlight the existence of a terminological confusion related to the urban streams. Figure 5 illustrates

these basic terms and defines them in order to prevent a terminological confusion.

According to Schanze et al. (2004), two terms are seen as the most important ones for the urban rivers and streams: one concern is the “rehabilitation” as the overall perspective of a partial functional and/or structural return to former or pre-degradation conditions. The further is “enhancement” as the wider perspective including the social, economic and aesthetic properties. The term rehabilitation is better suited to the inevitable constraints for urban rivers than the term restoration. A return to a pristine state of rivers in towns and cities may not be achievable. According to Bernhardt and Palmer (2007), a key scientific and management challenge is to establish criteria for determining when the design options for urban river restoration are so constrained that a return towards reference or pre-urbanization conditions is not realistic or feasible and when river restoration presents a viable and effective strategy for improving the ecological condition of these degraded ecosystems. Schanze et al. (2004) indicates that if rehabilitation of urban waters is put in a comprehensive understanding of sustainable urban development the term enhancement is used. In this case the ecological, social, economic and aesthetic multifunctionality of urban waters with their riparian areas are regarded.

In the light of the information above, it is apparent that the terms of “enhancement” and “rehabilitation” suit the idea of revealing potentials of urban streams in Istanbul for the benefit of a sustainable urban green network (Turer Baskaya, 2012). In order to reveal the total potentials of the streams to react planning and green network studies, considering land use types and ROT becomes crucial. Although they have got similar ROT values, Cirpici and Baltalimani watercourses have got significantly different numerical values for land use types. Dominancy of industrial, commercial and transportation based infrastructure uses exist in the buffer area of Cirpici while dominancy of educational-military land uses and passive green areas exist in the buffer area of Baltalimani. Most of the open areas pertinent to Baltalimani are the ones that are not open to public use but ecologically important passive green areas and the pervious spaces existing inside different land uses. These areas are not fragmented and thus capable of transforming into components of a green network. Table 2 illustrates that Cirpici stream has got a high amount of sport areas inside its buffer area as it hosts the hippodrome of Istanbul. Cirpici water course which is surrounded with a dense built-up space structure has a recreational potential rather than an ecological one and it is problematic about day lighting concept. Pinkham (2000) defines day lighting as a compelling concept having potential to change the urban context as it is the act of exposing a stream and allowing it to flow on the earth’s surface again. Within this study, day lighting is accepted as one of tools for stream enhancement studies.

Parameter of “accessibility” is dealing both with the social issues and functional diversity. Functional diversity comes from the capacity of urban streams to serve “promenade and boat opportunities” along their courses, which is not particularly common for the urban streams of Istanbul. Owing to their stream types, Goksu enables 1250 m and Kurbagalidere enables 490 m range for boating along their courses. Among the five urban streams, Baltalimani and Cirpici are the worst ones respectively about the promenade potential. Baltalimani has got only one public green area, luckily close to the Bosporus but no other significant public ones. Although they are extremely

limited in quantity, open spaces of Cirpici stream are splitted into three bodies due to the existence of the hippodrome and industrial facilities in between them. Road-sea transportation" and "pedestrian accessibility" are the secondary parameters related with the social issues. Pedestrian access from the residential areas refers to the local usage while road-sea transportation refers to the citywide usage of the open spaces (Turer Baskaya, 2012).

***Table 2.*** *Open space types and urban streams.*

| | Baltalimani | Goksu | Kagithane | Kurbagalidere | Cirpici |
|---|---|---|---|---|---|
| Parks | 56.691,25 | 36.906,07 | 550.402,78 | 212.992,30 | 256.117,63 |
| Sport Areas | 20.889,65 | 6.114,86 | 67.885,19 | 178.463,31 | 607.025,33 |
| Forests-Groves | 198.666,57 | 597.709,55 | 8.419.455,32 | - | - |
| Agriculture Areas | - | 133.621,84 | 2.412.419,27 | 61.821,09 | - |
| Cemeteries | 6.660,88 | 49.499,69 | 305.833,55 | 9.843,75 | 22.599,59 |
| Fresh Water Bodies-Wetlands | - | 72.103,51 | 142.227,75 | - | - |
| Military Areas | 628.326,75 | - | - | - | 26.619,46 |
| Passive Green Areas | 431.748,14 | 146020,44 | 1.005.193,42 | 773.747,15 | 691.817,03 |
| Empty Areas | 4.574,06 | 38.589,24 | 864.778,64 | 747.061,84 | 389.749,29 |
| Open Quarries-Excavation Areas | - | - | 902.448,46 | - | - |
| Brownfield Destruction Areas | - | - | - | 11.444,81 | 83.658,29 |
| Others | 14.256,45 | - | - | - | - |

Coastal areas are strategic places for promoting urban identity (Turer Baskaya, 2011a) With a history dating back to 660 BC, Istanbul has always been a remarkable coastal city with a unique urban silhouette (Turer Baskaya, 2011b). Therefore for the case of Istanbul, parameters of "scenic potential and visibility" and "proximity to the features of urban memory" are quite important. Throughout the history, coastal areas of Istanbul have always been the most attractive areas for the urbanization process. Number of features belonging to urban memory increases inside the stream buffers when the watercourses are close to coastal areas and passing through the historic urban setting of Istanbul. Urban watercourses having large steam fronts close to coastal areas have strong impacts on the coastal silhouette.

Among the five urban streams, the worst one is Cirpici pertinent to the "scenic potential and visibility" while Goksu and Kagithane are the best ones with a remarkable difference from the others. Contrary to the expectations Baltalimani provides very limited place for its users to examine scenery related to Bosporus. However its un-fragmented passive green areas take place in the total image of the Bosporus.

Parameter of "proximity to the features of urban memory" refers to the distinctness of the site which enables people to remember the area. Besides, people coming to the related sites for examining the features of the urban memory can also be easily motivated to promenade along the stream front. Urban streams locating close to the features of urban memory" carry a significant responsibility for the durability of the urban identity. Although all of the urban streams selected for this study are connected with the historical

Ottoman concepts of “meadow” and “mesire”, Kagithane and Goksu streams followed by the Baltalimani and Kurbagalidere streams have got remarkably high potentials pertinent to this parameter (Turer Baskaya, 2012).

Besides the proximity to the historical landscape features, proximity to the new urban design projects is also a significant determinant on the socioeconomic potential of the site as they highlight the investment potential pertinent to the study area. Kagithane and Goksu appear to be the distinctive streams among the other studied ones, due to the existence of Cendere Valley Urban Design Project and Rope Factory Lofts Project focusing on the landscape potential and character of the urban streams (Turer Baskaya, 2012). There are great many on-going fragmented projects along the Kurbagalidere stream which inevitably increase the land values. However, these projects are not focusing on the design potential of the Kurbagalidere stream, but mostly disregarding this water course and burying it.

Evaluation method developed within this study sorts the streams according their total potentials as Kagithane, Goksu, Baltalimani, Kurbagalidere and Cirpici respectively. Kagithane and Goksu are noteworthy streams capturing the highest scores from the ecological, socio-cultural and economic potentials.

Historic Kagithane stream is the longest one among all the streams. Examining both the advantages and disadvantages of its length, it captures diverse land uses ranging from industry to mining, agriculture to forest, residential to cultural. By capturing a great amount of forests and agricultural areas, it owns the highest RBO with a value of 52.00%. Regenerative landscape planning of its temporary land uses like open quarries is determinative on the establishment of a multifunctional green infrastructure. According to France (2008), postindustrial landscapes represent our common history and it makes eminent sense to move toward redeveloping them into end-use common spaces for the public. In case of turning brown fields into new land uses within a holistic view, stream enhancement studies of Kagithane may capture a big success, attracting nationwide visitors.

Possessing the least deterioration, Goksu stream captures best scores from all parameters and gets quite high ecological, social and economic potentials. Due to its short watercourse, it fits the enhancement concept easily and is responsive to both short term interventions and long term regenerative planning studies. Even with short term interventions, it may work as a multifunctional green infrastructure to increase public consciousness on stream enhancement issues.

Existing in a large open space network, Baltalimani stream contrary to the expectations can capture a low total potential due to its stream type, distance from the public places and deficiency of reserve open areas for investments. However, enlargement of its stream front and its day lighting are possible by small interventions which may reveal a great ecological potential and build green infrastructure there.

Among the potentials of Kurbagalidere, socio cultural and economic ones are significantly stronger than the ecological potential. As illustrated at table 2, Kurbagalidere captures its highest amount of open space from the empty areas existing in its stream front. Due to the high land prices, these open

spaces are under the great risk of development which may lower the evaluated potentials drastically. Day lighting is critical for Kurbagalidere although it may be problematic and be implemented only partially.

Cirpici captures the lowest scores from all of the potentials. Although total amount of open space in its buffer area is similar to the Kurbagalidere, Cirpici has got a very limited stream front. As it exists in a district severely lacking public open spaces, it is essential to use this buffer area for the social benefit and implement techniques to enlarge its stream front. However, huge infrastructures for transportation exist on the long buried portion of this watercourse which brings about the impossibility of day lighting. There is a similar trend in the case of Cirpici as in Kurbagalidere about the transformation of empty areas to built spaces. Although it is problematic to establish a green network along the whole course, Cirpici may have a great recreational potential for the local people if its empty areas and brown fields are integrated into the current green structure.

This study proves that each urban stream is unique due to the varying characteristics and potentials of the watercourses. When we benefit from their potentials in a sustainable way, these urban streams have a power to improve not only the environmental quality but also the quality of life in Istanbul.

## 4. Conclusion

These analyses mentioned above compare the streams according to their potentials and underline their strong landscape features for the identification of landscape management strategies. Although Istanbul Metropolitan Municipality pays a huge amount of money to rehabilitate streams (IMM, 2012), the destructive interplay between the people, city and stream network still continues. Thus, projects concerning urban streams as the single units to rehabilitate are no longer valid (Turer Baskaya, 2012).

In most urban settings standing under the impact of rapid urbanization, watercourses have been straightened and culverted to prevent flooding and make more land available for human use. However, in order to cope with the challenges of 21$^{st}$ century, cities should provide themselves with interdisciplinary studies and welcome innovative solutions to chaotic environmental issues. This study focuses on urban water courses in Istanbul as one of these chaotic issues and highlights that even the most degraded of landscapes are worthy of our enhancement efforts. Urban streams have a power to improve not only the environmental quality but also the quality of life in Istanbul and this study is an attempt to highlight the importance of regenerative landscape planning for urban streams and for the benefit of Istanbul megacity.

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**Kentsel dere zenginleştirmesi – İstanbul'un kentsel derelerini yeniden değerlendirmek**

İstanbul Kenti'nde 100'den fazla derenin bir araya gelerek şekillendirdiği bir dere ağı mevcuttur. Önemli bir peyzaj potansiyeline sahip olan bu dere ağı, son 50 yıl içerisinde gerçekleşen hızlı kentleşme ve sanayileşme ile birlikte baskı altına alınmış ve kentsel dereler tahribata uğramıştır. Derelerin bastırılmış peyzaj potansiyellerini dikkate alan bu çalışma, İstanbul kenti tarihi dereleri ile kentleşme arasındaki etkileşime dair çok katmanlı bir anlayış geliştirerek bu su kaynaklarına yönelik canlandırıcı peyzaj planlama stratejileri geliştirmeyi amaçlamaktır.

Bu çalışmada Kağıthane, Çırpıcı, Kurbağalıdere, Baltalimanı ve Göksu olmak üzere kentsel bellekte yer etmiş olan 5 adet dere peyzaj potansiyelleri açısından incelenmektedir. Seçilmiş olan derelerin ekolojik, sosyokültürel ve ekonomik potansiyellerinin saptanmasında coğrafi bilgi sistemi teknolojisi ve çoklu kriter analizinden yararlanılmaktadır. Bu kapsamda dereler; boyut, müdahale gereksinimi, arazi örtüsü, erişilebilirlik, manzara potansiyeli – görünürlük ve kentsel bellek öğelerine yakınlık olmak üzere 6 adet temel parametre ve 16 adet alt parametreye göre değerlendirilmektedir.

İstanbul kentine ait dinamikler dikkate alınarak belirlenmiş olan parametrelere ilave olarak bu çalışma yoğun kentsel doku içerisinde yer alan derelerin peyzaj potansiyellerine dair yeni tanımlar geliştirmektedir. Bu tanımlar, kentsel derelerin peyzaj müdahalelerine kısa ve uzun vadede yanıt verebilme potansiyelleri ile yeşil ağ oluşturabilme güçlerini irdelemektedir. Çalışma kapsamında geliştirilen değerlendirme yöntemi, toplam peyzaj potansiyelleri açısından dereleri; Kağıthane, Göksu, Baltalimanı, Kurbağalıdere ve Çırpıcı olarak sıralamakta ve her bir dere için kısa ile uzun vadeli peyzaj planlama stratejileri önermektedir.

Kentsel dere ağının bileşenlerini tekil öğeler olarak ele alan ve peyzaj boyutunu göz ardı eden müdahaleler nedeniyle İstanbul'da kent ve dere ağı arasında yıkıcı bir etkileşim süregelmektedir. Hızlı kentleşme süreci içerisinde olan kentlerde, insan kullanımına elverişli alanların arttırılması veya sel kontrolü gibi sebeplerle kentsel dereleri kanallar içerinde almak, yer altına indirmek veya değişik akış hatlarına yönlendirmek gibi mevcut peyzaj potansiyellerini indirgeyen çeşitli müdahaleleri gözlemlemek günümüzde hala mümkündür. Ancak 21. yüzyılın beraberinde getirdiği kaotik çevre sorunlarının üstesinden gelebilmeleri için kentlerin kendileri için bütüncül bakış açıları geliştirmeleri ve disiplinler arası çalışmalar çerçevesinde çevre sorunlarına yönelik yaratıcı çözümler üretmeleri gerekmektedir.

Bu çalışma, yukarıda belirtilen kaotik çevre sorunlarından biri olan yoğun kentsel doku içerisinde kalmış olan derelere odaklanmakta ve ne kadar tahribata uğramış olursa olsunlar derelerin peyzaj potansiyelleri çerçevesinde zenginleştirilmelerinin mümkün ve gerekli olduğunu vurgulamaktadır.