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Natural Urban Heritage and Preservation Policies: the Case of Kyoto's Waterways.

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Abstract

The value of natural heritage within urban areas is nowadays gaining recognition, but there are still no clear reference frameworks to confront the complexities of their management. In this discussion, the challenges of the association of historical preservation and urban nature are explored through the analysis of the management of Kyoto's waterways. The conflicts caused by the rapid modernization of Japan at the end of 19^{th} century find in Kyoto a remarkable expression in the tensions between renovation and conservation, providing a fertile frame for discussion. Relevant achievements and shortcomings of Kyoto´s experience are here analyzed, considering how the preservation of historic landscapes affected the protection of urban rivers, the relationship between sustainability and heritage, and the new environmentally aware approaches to river improvement.

Keywords

Urban waterways; Heritage and Sustainability; Natural heritage

1. Introduction

Kyoto's natural and historical heritage

The ancient capital of Japan stands out from other urban centers of the country because of its rich historical heritage and unique natural setting. The city is located in a basin surrounded with mountains to the North (Kitayama), East (Higashiyama), and West (Nishiyama), with numerous rivers running through its millenary layout. Since the 8th century, its remarkable natural scenery inspired members of the imperial court to build palaces and gardens that blended with the surrounding nature, complementing the countless temples and shrines scattered in and around the city. This blend of historical sites and remarkable landscapes have become trademark of the city and it is said that they even saved it from the bombings of World War Two. While in most Japanese cities the limited green areas have contributed to the motto 'Rich Japan-Poor Japanese' (Sorensen & Funk, 2007), Kyoto has been relatively favored by its strong preservation policies that have promoted maintenance of its natural areas.

One of the natural features more prevalent across the city are its waterways, which are deeply associated to its culture and traditions. Within Japan, Kyoto was known for the quality of its ground and underground water, which was believed to be the reason behind the outstanding quality of its vegetables, its sweets, and its sake. The water from Kyoto also gained the reputation of having purifying and magical properties. One the most celebrated temples

of the city, the Kyomizudera (Pure Water temple), still carries the legend of the cleansing and wishing granting powers of the streams that run through its precincts, attracting tourists and locals in search of a change of luck. Once a year, during the renowned celebration Gion Matsuri, the portable shrines of the procession are purified with the waters of the city´s main river, the Kamo River (or River of the ducks).

As in many other cities, commercial and industrial activities gathered around water sources that were essential for the life and economy of the city, and this way, many of Kyoto´s waterways became intrinsically linked with urban areas of historic relevance. Rivers provided water for households, industries, and agriculture, as well as serving as transportation routes. However, contrary to most European urban rivers, the shallow banks and irregular flow of Kyoto´s watercourses were not suitable for transportation in their natural state. This situation, together with the frequent floods, prompted the early engineering and modification of river courses and the creation of channels since its early history. For example, the Horikawa canal was dug during the 9th century with the main purpose of carrying goods along the city, and eventually, to Osaka through the Yodo River (Kyoto City Municipality, 2010). The canal was also used as means of flood control of its tributaries, to create the moat of the city´s castle (Nijo), to feed the ponds of the gardens of shrines and temples of the area, and as water supply for the renowned textile industry of Nishijin district.

In 1868 the capital of Japan was transfer to Tokyo, and Kyoto, the old imperial capital, started to suffer an economic decline. Renovation and modernization measures were taken to confront this issue. One of the most important renovation works was the Lake Biwa Canal. This unprecedented project, carried out by Tanabe Sakuro, became internationally renowned for its ingenuity and engineering prowess. The twenty kilometer canal provided running and irrigation water for Kyoto city and its surrounding areas, and it fed the turbines of the first public hydroelectric generator that powered Kyoto´s flourishing industries, its street lights, and the first electric trams of Japan. The Canal also brought new waterfront landscapes to the city along its main branch, heart of the Okazaki district, and along its secondary branches that created new public spaces, as the promenade of the Philosopher's Path.

The rapid modernization that Japan experienced at the end of 19^{th} century radically changed many of its cityscapes. However, the natural and historic values of Kyoto helped defined the city´s character as the keeper of traditional culture. Although the economic pressures of development have been a constant challenge for the preservation of both natural and built heritage, the protection of these values was always important for the city managers who were aware of the importance of the touristic industry for the city´s economy. In 1898, Naiki Jinzaburo, the first major of Kyoto, established the urban priorities that would define the city´s later development: gather the commercial activities in the south, maintain the historical districts and its traditional industries (as the textile industry or the production of sake), and preserve the natural landscapes of the east of the city.

However, the natural areas protected were mostly those associated to historic places, and the protection of isolated natural features as rivers and canals was not considered. By mid-20^{th} century the condition of urban streams and canals in non-historic areas gradually declined because the loss of their original functions and the effects of urban growth. In the suburbs, several water courses were buried or just disappeared. Several of Kyoto's rivers were piped during the city's modernization as a measure against floods, and following the industrial growth, a severe water pollution anticipated the environmental crisis of the 1960s. As a result of the 'Urban Stream Syndrome' (Walsh, et al., 2005) experienced by Kyoto's rivers, citizens turned their backs on the deteriorated streams. It was not until the 1970s and 1980s when the application of strict national and regional regulations led to an improvement the water quality of Kyoto's urban streams, and contemporary shifts in values are increasing the awareness of the potential of urban watercourses.

In the following sections, some aspects Kyoto's management of nature and waterways as natural heritage will be discussed, considering how the preservation of historic landscapes affected the protection of urban rivers, the relationship between sustainability and heritage, and the new environmentally aware approaches to river improvement.

2. Aesthetic landscapes, tradition, and sustainability

Files The preservation of natural areas has a long tradition in Kyoto. The first measures for the preservation of natural areas in and around the city begun in 1930 with the designation of the Scenic Landscape Districts. This first measure considered mainly the natural areas located at the limits of the city near the surrounding mountains and some patches of green areas within the urban fabric. All the protected green areas were related to places of historic importance as palaces or temples, as the Kiyomizudera located in the Eastern mountains (Kyoto City Bureau, 2016). Among the few protected green areas of Kyoto that were not associated with built heritage were the banks of Kamo River, the main river of Kyoto that has been for long one the city´s most popular public areas.

The extraordinary growth of the city after World War 2 put under test Kyoto´s preservation measures, but a number of new policies helped confront the situation. In 1964, what began as a dispute over the conservation of the forests of Kamakura city near Tokyo —the Oyatsu Dispute— ended in the Ancient Capitals Preservation Law of 1966, which provided Kyoto's municipality with more legal tools to protect the historic landscapes from the growing urbanization (Asano, 1999).

Preservation measures could not always be applied efficiently, and because of the pressure of land development they needed constant updates. In the following years, several amendments and new policies were created to improve the protection legislation, as, among others, the Act on Urban Green Space Conservation (created in 1973 to be valid in all Kansai region) created to protect suburban greenery, the Kyoto City Ordinance on Conservation of Natural Landscape (enacted in 1995) to protect the view of the mountain ranges from the city, and special regulations for specific areas as the Riverside Aesthetic Landscape District (2005) made to control the development the areas near the margins of urban and suburban rivers.

Although today the preservation of urban natures makes emphasis on sustainability and on the benefits of nature for the citizens, the protection of Kyoto's urban natures has been traditionally related to cultural and aesthetic interests. It is for that reason that one of the most important conservation tools was, and still is, the protection of views (or vistas). The protection of urban and natural views is certainly not unique to Kyoto or Japan. Vancouver for example has protected view cones to guard the mountain landscape as appreciated from the city, while in London, protected views corridors were established since the 1930s to protect the views of important landmarks as the St. Paul's Cathedral (Karaga, 2015). In Kyoto, there are thirty-eight officially recognized vistas under the Vistaed View Creation Ordinance (all of which include natural features) that were selected out of 597 options taken from literature and citizens choices (Kyoto City Bureau, 2007). Despite the predominantly aesthetic emphasis of this approach, the city's rivers and its waterfronts have nonetheless greatly benefited from these measures that have protected the green areas along the main urban rivers. The new ordinance includes the category of Views from Waterfronts, which includes the Hori River, the Uji River, and the Lake Biwa Canal Sluice, as well as the 'pleasant views' of the Kamo River from its Bridges (Kyoto City Bureau, 2007).

In Japan, the protection of views is associated with the traditional gardening design concept of borrowed landscape or shakkei (Taylor, 2006). When applying this concept, the distant natural background is used in combination with the nearer features of the landscape to create the illusion of continuity. Unlike the protection of the landscape as the object to be appreciated, shakkei focuses in the interaction of the different layers of the landscape. In Kyoto, the intrusion of unwanted objects in borrowed landscapes is considered a major loss, as in the case of the garden of the Entsu-ji Temple, which is said to be now ruined by the construction of housing buildings that interrupt the illusion of a continuous nature. To prevent this from happening elsewhere, there are strict height restrictions in the areas surrounding buildings of historical importance, as the Kamigamo Shrine in the North of the city and in the traditional district of Gion near the city center (Figure 1). At several points along the Kamo River for example, the protected views have helped maintain the illusion of a surrounding nature that hides the city behind the greenery (Figure 2).

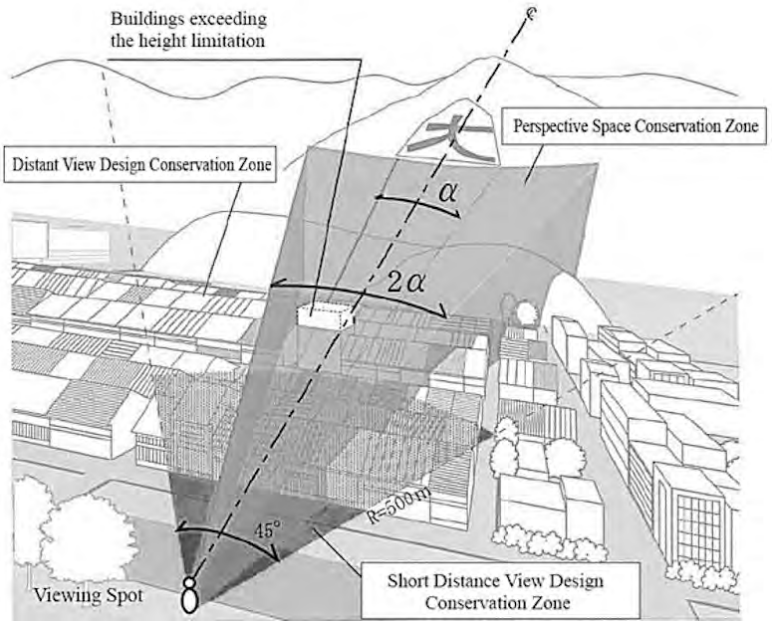

Figure 1. Heights limitation to protect mountain views Source: Kyoto Landscape.Kyoto City Bureau

Figure 2. View of Kyoto from the Kamo River Source: Taken by author, 2018

Due to the abundance of natural values in Kyoto and its close relation to built heritage, the preservation policies of the city are in close agreement with the Historic Urban Landscape, which as defined by the UNESCO, is the resulting landscape of the historic layering of cultural and natural values and attributes. In the 2011 recommendations for Historic Urban Landscapes, the UNESCO suggested that heritage conservation should be integrating into the broader management goals of the city, including sustainability. Preserving existing resources is an essential part of sustainability, and therefore, the conservation of natural and built heritage is now considered a necessary task of sustainable urban management.

But the relation between sustainability and heritage is not restricted to the preservation of resources. The compatibility of traditional practices and sustainability is a well-recognized fact in practices as varied as food production or architecture (Parham, 2017; Moor, 2017), and this agreement has also proven to be manifest in urban planning. In the case of Kyoto, a good example in this respect are the measures taken in the historic Togetsukyo Bridge, that crosses the Katsura River in the protected area of Arashiyama. The current bridge was built in 1934, before the enforcement of laws promoting the use of lighting equipment, and therefore lights in the bridge were banned once

the bridge reached the heritage status. However, after long negotiations, the installation of lighting on the historic bridge was finally accepted after proposing a sustainable solution that included a small hydraulic power generator powered by the flow of Katsura River (National Small-hydro Council, 2015). The installation began in 2005, and it became the first micro-hydropower system to be installed in one of the major rivers of Japan, illustrating the promising potential for the application of environmentally friendly strategies in historical areas.

On the other hand, the increasing environmental awareness has also led to the modification of some of Kyoto´s traditions, as in the case of the practice of 'Yuzen Nagashi'. This old tradition was the final stage of the dyeing process of fabrics, in which silk stripes were placed along the rivers of Kyoto to clear them of excessive glue and dye, creating the effect of a multi-coloured water. In the 1940s, because of the growing concerns with water pollution, this practice was gradually discouraged until it was eliminated under the Water Pollution Control Law of 1974 (Diet Library Database, 2010). Today, a modified version of this practice is recreated for special festivals during the summer, using non-polluting colorful fabrics placed along some of the rivers and canals of the city.

Since the protection Kyoto's rivers and their environments has been driven mainly by their association to historical heritage and aesthetic values, the waterways that have received more attention over the years have been the Kamo River and its margins, the Takano River in the North of the city, the Shirakawa River, particularly the section that runs along the historic protected area of Gion, and the Lake Biwa Canal. However, for most of the 20th century, minor rivers and streams without an apparent scenic value that could justify its protection have disappeared or deteriorated.

For example, the Horikawa canal, which once had a tremendous importance for the activities of the West of the city, once it lost it original functions it was gradually covered in most of its course and, as a measure of flood prevention, its water source was cut soon after the Second World War. It was not until 1985 that a group of citizens formed the Horikawa beautification group to try to restore some of its former aesthetic qualities. After years of negotiations, a restoration plan was presented in 1995, and the canal that had been buried and dried for fifty five years was brought to new life with a plan that combines flood prevention, amenity, and recovered heritage (Kyoto City Municipality, 2010)(Figures 3 and 4). This change of attitude towards urban watercourses is the reflection of a worldwide trend of renewed environmental awareness that leads contemporary citizens to increase the demands for the improvement of the natural infrastructure of cities, which is helping to build a more diversified approach to the management of urban natures.

Figure 3. Horikawa canal during the early 1990s Source: Kyoto City Official Website

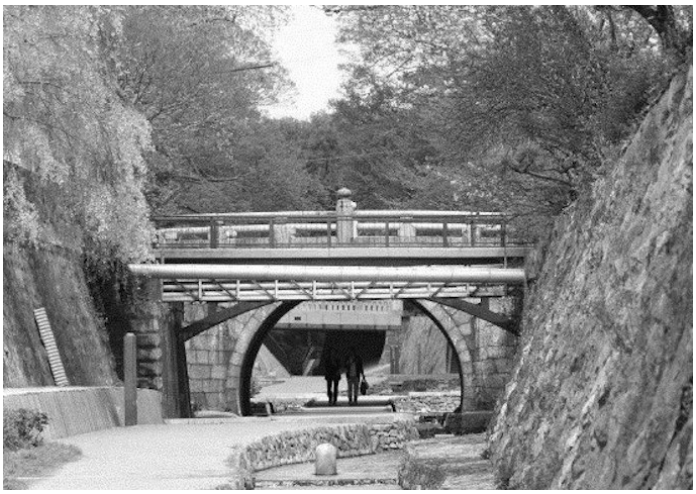

Figure 4. Horikawa canal in 2013 Source: Biglobe News 2013/04/23

3. New approaches to the management of natural heritage

Besides the protections of rivers through the preservation of the natural urban landscapes, national and regional legislation for the management of rivers. However, the goal of these legal measures has traditionally been the control of floods, which is a priority of Kyoto's municipality. Historically, floods have cause great damage to the city and its surrounding, specially along the courses of the Kamo, the Katsura, and the Uji Rivers, where many historic protected areas are located (Figures 5 and 6). Measures against floods started as early as the 9^{th} century, but the changing conditions of factors affecting the flow of rivers, as the construction of dams, forestation or the surrounding mountains, and weather conditions, keep testing the improvements made in flood prevention. For example, the heavier rains occurring during the last years have caused serious problems since the infrastructure was not fit to bear the new precipitation levels. During the typhoon Man-yi of 2013, more rain fell in one day than in the average of the month (Masaki & Kono, 2015), prompting the flood of the Hozu-Katsura River in the historic area of Arashiyama, and causing considerable harm to the area. In 2018, the effects of the Typhoon Prapiroon forced the evacuation of hundreds of Kyoto citizens living near the major rivers while the currents wrecked the city´s riparian infrastructure. Improved flood prevention measures have greatly improved safety, and, since the risk of flood is cannot be completely eradicated because of the mutable nature of rivers, policies are focus on reducing flood damage (Waley, 2000).

Figure 5. Traditional street Pontocho, 1936 flood. Source: 1936, Flood Report, Kyoto City Hall

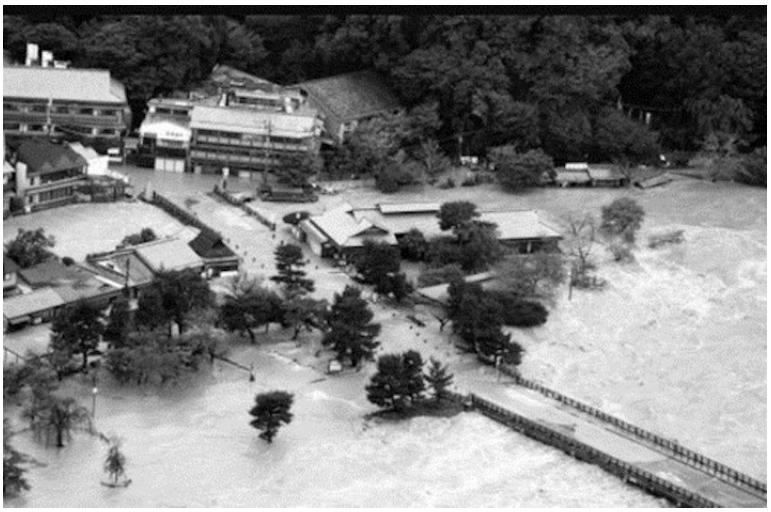

Figure 6. Togetsukyo bridge, Arashiyama, 2013 flood Source: Asahi Journal News Portal, 19/01/2018

Although flood prevention is still one of the main priorities of national and regional river administration, the approach of the River Law amended in 1997, has added water use and river environment protection as equally important purposes of river administration (Ikeuchi and Kanao, 2003). The full ecological potential of urban rivers is being explored and exploited only recently. A previous measure from 1990 from the Ministry of Land, Infrastructure, Transport and Tourism established a policy called Nature Oriented River Works, and with the amendment of the River Law this measure took new force and nowadays is slowly reaching urban rivers minor urban streams.

In addition to the increasing attention paid to river environment quality in legal measures and official administration, contemporary awareness on environmental issues has led to a growing influence of the Japanese preservation movements, which are now reaching urban grounds. Traditionally, the efforts of environmental activists manly targeted the wild and hard-to-find nature, located as a rule in areas distant from urban centers (Asano, 2007). However, the interest in smaller ecosystems, as the ones that might exists within cities, is gradually increasing. The interest in the creation and preservation natural areas within urban contexts is broadening the approach to the management of water environments, expanding the initial safety and aesthetic concerns into a more systemic view that considers its ecological aspects. Until recently, the way in which the manmade natural riverbanks were conceived tended to be uni-layered, focusing mainly in visual aspects, and therefore created meagre environments for biodiversity. Today it is understood that the natural areas along urban rivers can be managed as 'bio-highways' (Taylor & Patrick, 2006), since they are the most propitious areas within urban environments to promote rich and complex ecosystems.

It has to be noted that, when it comes to Japanese urban watercourses, the categories of man made and original natures are extremely blurred. As pointed out before, Kyoto's rivers have been tamed since its foundation in the 8^{th} century for purposes of irrigation, transportation, or flood protection, and countless canals have been created, rearranged, and removed. Within the contemporary Landscape Plan of the city of Kyoto, the Riverside category of the Aesthetic Landscape Districts includes mainly engineered rivers and man-made canals as the Takase River, a transportation canal dug in the 17th century, or the famous Biwa Lake Canal, which was designated as Modernization Heritage in 2007 because of its importance for the history of Kyoto. The urbanized riversides of these canals might contrast with some sections of the landscaped margins of the Kamo River designed to look natural, but it has to be considered that both of these contexts are equally planned and deliberately crafted (Figures 7 and 8).

The category of historic urban landscape includes built heritage as well as natural heritage in its border sense (without considering the level of human intervention), but when dealing with environmental issues the distinction between of original and modified nature (as in a natural stream or a designed canal) becomes more complicated because of the association with the debates on which natures should be preserved and how (Baldwin, De Luce, & Pletsch, 1994).

Without attempting to address the ethical or philosophical implications of the debates regarding original and modified environments, some basic facts of nature within urban contexts need to be clarified. First, what is generally classified as natural in urban planning differs from the definitions used in environmental discussions dealing with wilderness, and considerations about original states of nature or rewilding approaches are not always suitable for the urban contexts. Urban natures refer for the most part to areas where the majority of the integrating elements are living natural features, category which includes from relatively untamed urban forests to the most cultured versions of nature as parks or gardens. Secondly, the action of preserving or creating natural environments within cities has usually a different purpose than the protection of nature in areas uninhabited by humans. Within urban contexts, the role of nature as an amenity usually takes priority over the concerns on ecosystems, which is a relatively new concept that is only beginning to be included in the discussions of urban nature.

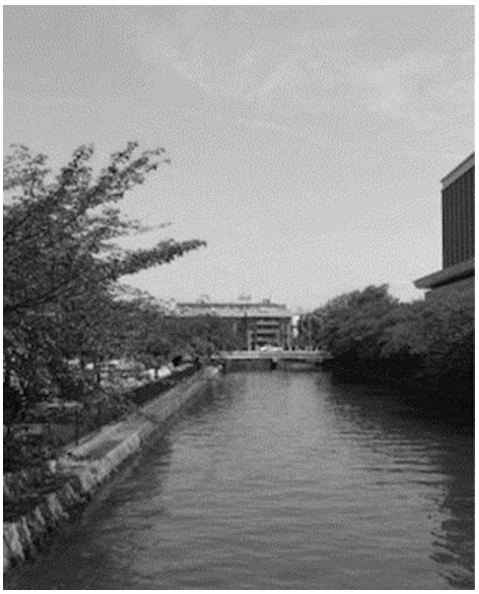

Figure 7. Lake Biwa Canal, Okazaki district Source: Taken bythe author, 2015

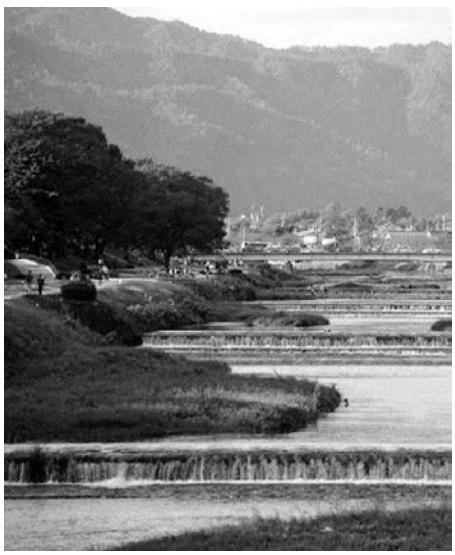

Figure 8. Kamo River landscaping, Kita guard Source: Taken by the author, 2015

The expansion of the approach to river protection in Kyoto is being achieved through the integration of the civil society into the management process, while also considering the local history and traditions, measures which are also in line with the suggestions of UNESCO for the preservation of Historic Urban Landscapes from 2011. Within Japanese urban planning, the national and regional governments were traditionally seen as mere managers of infrastructure (Sorensen & Funk, 2007), without real engagement with the improvement of the urban quality of

life. According the Japanese scholar Shun-Ichi J. Watanabe (2007), a new urban environmental administration with a bottom-up style of planning is currently growing in Japan thanks to the Machi-zukuri movements (which literally translates as City Making). These civic associations grew out of the combination of the traditional neighborhood associations and the environmental movements of the 1960s and 1970s that confronted government strategies that favored economic growth over quality of life. Since the collapse of the bubble economy in the 1990s, there have been important political readjustments, and local groups have been increasingly involved in the governance of urban space (Sorensen & Funk, 2007).

The current River Improvement Policy of the city of Kyoto has integrated the concept of River making (Kawa-zukuri) and Waterfront making (Mizube-zukuri) into its measures to manage the city's watercourses. In Japan, these concepts have been applied since 1990s as pilot projects promoted by the Ministry of Construction´s River Bureau to approach the re-landscaping or rivers with natural materials, minimizing when possible the use of concrete, which was for many decades the predominant material used to in the river interventions (Waley, 2000). The idea behind the integration of civil movements with municipal activities in the particular case of Kyoto is to complement the complex tasks of flood prevention, which need to be carried out by the government, with other responsibilities that can be executed by citizens and local businesses, as landscaping, cleaning, and maintenance of riversides (Kyoto City Bureau, 2012).With the integration of River making programs, smaller rivers of areas that were not considered significant from the perspective of Kyoto's official history are being renovated with a systemic approach. Many of these projects are part of an effort to merge existing watercourses and flood control, but contrary to the infrastructural projects of the previous decades, current developments consider the cultural and ecological context, as well as the aesthetic factor. Some examples of these projects are the improvements of the Arizu River, or the Nanase River, where a layered project placed the flood prevention measures underground liberating the surface to create a landscaped park (made by Tanaka Survey and Design Office, Figures 9 and 10).

A significant aspect emphasized in the River Improvement Policy is the importance of recognizing the history and cultural meanings associated with the water course. The policy points out that the original scenery of the river and its margins should be considered in the renovation projects (Kyoto City Bureau, 2012). It has to be noted that in the case of Kyoto, as elsewhere in Japan, references to the original state of the river as in its natural state or to the way the river environment was before human intervention, are not as common as references to the condition of the river before the late 19th century modernization. Many renovation and re-landscaping projects in Kyoto and other cities place educational images of past epochs (mainly Edo period) showing the local traditions, industries, and activities that took place in and around urban rivers.

The new approach recognizes the social relevance of watercourses of all sizes, acknowledging that rivers are an integral part of the material fabric of the city, and of Kyoto's local cultures. In the new policy, it is argued that the loss of contact with the water has caused the loss of the common wisdom on how to control flooding and manage watercourses, and the improvement plans include measures to restore the familiarity of the society with the rivers, a concept called shinsui, that even considers the consciousness to 'fear' water (Kyoto City Bureau, 2012, p. 20). Many restoration projects are using the concept of shinsui park, and create designs that allow the public to approach and interact with the water instead of creating an environment that only allows to see the watercourse from the distance, and also include many features of traditional Japanese gardens as waterfalls, bridges, and the creation of little islands (Walley, 2000). Although there are some critics of this landscaping concept in Japan, shinsui parks in Kyoto, as the one designed for the renovation of Horikawa canal, have proven to be extremely popular, particularly for children.

River making associations come in many shapes and administration styles (Kusakabe, 2013). The participation of civil societies in city planning is not always easy, and there is it is concern that the alleged participation could be reduce to a mere supply of information on the official plans. Still, the involvement of non-governmental entities as the Kyoto Environmental Activities Association (KEAA) that promotes the public interest in the environment, the volunteer groups that clean the riverfronts, or the association of Kyoto Hotaru (fireflies) dedicated to study of these popular insects, has propitiated a more comprehensive approach to the urban river management.

Figure 9. Nanase River, before intervention Source: Kyoto City Official Website

Figure 10. Nanase River, Layered plan Source: Kyoto City Official Website

4. Final considerations

Although environmental concerns have entered the legal framework of river management relatively recently, Kyoto's interest on the preservation of the natural values of the city, particularly the interest on landscapes and vistas, have aided the protection of the city´s watercourses and its environments. Unfortunately, the emphasis placed on historic relevance and aesthetic values to determine the landscapes to preserve led to the neglect and deterioration of most secondary streams and canals of the city, dedicating all the protection efforts to a few privileged examples as the Kamo River or the Biwa Canal. There is still much room for improvement, however, recognizing the historical and cultural dimension of the natural and engineered urban streams, even when they have no touristic value, has helped Kyoto's municipality to improve the urban landscape while generating new and valuable ecosystems.

The contemporary awareness on the importance of the protection of the environment by citizens and officials, have made sustainability a concept as valued as tradition in the management of Kyoto's heritage, as shown in the case of the Togetsukyo bridge where new sustainable solutions coexists with age-old heritage. At the same time, this new consciousness of the importance of the environment has created a new sensibility towards nature that led to the reexamination of past solutions for flood control, and the concrete casements of urban streams are gradually being remodeled into landscaped urban parks.

The current tendency in Kyoto's management of rivers is to create fine grained policies, each one adapted to the local characteristics and circumstances. Despite the skepticism about the real power gained by civil society in the decision-making process of urban planning, the advantages of sharing efforts have been so far a positive experience. The evolution of the protection and management of Kyoto's urban rivers reflects the changing attitudes of society towards the natural environment. Civil movements and researchers are addressing countless dimensions of the

complex environment of urban rivers —as the influence of sound and light pollution, or the user's interactions with the local flora and fauna— that could further enrich current practices. The citizen's interest in environmental issues, together with the public acceptance of sustainable measures as a suitable complement of traditional settings has potential that is worthy of exploration.

5. Acknowledgments

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6. References

1. Asano, T. (2007). Citizen´s movements to protect the water environment: changes and problems. In A. Sorensen and C. Funk (Eds.) *Living Cities in Japan* (pp.189-205). London: Routledge.

2. Baldwin, A. Dwight, J., & Carl P. (1994). *Beyond Preservation: Restoring and Inventing Landscapes.* Minneapolis: University of Minnesota Press.

3. Diet Library Database (2010). Collaborative Reference Database. Retrieved from: http://crd.ndl.go.jp/reference/modules/d3ndlcrdentry/index.php?page=ref_view&id=1000074226.

4. Grapard, A. G. (2011). Kyoto Journal. Nature and Culture in Japan. Retrieved from: https://kyotojournal.org/the-journal/culture-arts/nature-and-culture-in-japan/.

5. Immergluk, D., & Tharunya B. (2018). Sustainable for whom? Green urban development, environmental gentrification, and the Atlanta Beltline. Urban Geography 39 (4) 546-562.

6. Ikeuchi, K., & Kanao, K. (2003). The approach to conservation and restoration of river environments in Japan. *Ecological Civil Engineering,5* (2) 205-216.

7. Japanese Ministry of the Environment. "Cabinet Order to revise the Enforcement of the River Law." Revision of River Management. 29 06 2018. Retrieved from: http://www.env.go.jp/press/1191-print.html.

8. Karaga, K. (2015). *Urban Skyline Planning Strategy Analysis*. London.

9. Kusakabe, E. (2013) Advancing sustainable development at the local level: The case of machizukuri in Japanese cities. *Progress in Planning* (80) 1-65.

10. Kyoto City Bureau. (2016). "Footsteps of Kyoto Landscape Policy." In *Landscape of Kyoto,* 27-28. Kyoto City, 2016.

11. Kyoto City Bureau. (2012). *Kyoto city river improvement policy.* Kyoto: Kyoto City Bureau.

12. Kyoto City Bureau. (2007). The Landscape of Kyoto.

13. Kyoto City Bureau. (2014). Kyoto City Program of Global Warming Countermeasures. <2011-2020>. Kyoto: Kyoto City Bureau.

14. Kyoto City Bureau. (2010). Horikawa waterfront environment project0000070401.html improvement

15. Masaki, M., & Kei, K. (2015). "Typhoon Heavy Rain and the First "Emergency Warning"." *NHK Broadcasting Culture Research*. January Issue.

16. Moor, T. (2017). *Reinventing an Urban Vernacular*. New York: Routledge.

17. National Small-hydro Council (Zenkoku ko suiryoku riyō suishin kyōgi-kai). "Arashiyama Hydroelectric Power Victory". J-WatER. http://j-water.org/result/case01.html (accessed 9 June 2018)

18. Nocca, F. (2017). The Role of Cultural Heritage in Sustainable Development: Multidimensional Indicators as Decision-Making Tool. *Sustainability,9* (10) 1882.

19. Parham, J. (2017). Sustenance from the past: Precedents to sustainability in nineteenth-century literature and culture. In A. Johns-Putra, L. Squire and J. Parham (Eds.) *Literature and sustainability: Concept, Text and Culture* (pp.33-51) Manchester: Manchester University Press.

20. Sorensen, A. and Funk, C. (2007). *Living Cities in Japan*. London: Routledge.

21. Taylor, P. (2006). *The Oxford Companion to the Garden*. Oxford: Oxford University Press.

22. Taylor, S. J., & Findlay, M. P. (2006). Why rehabilitate urban river systems? Area. *Royal Geographical Society,38* (3) 312–325.

23. UNESCO. (2005). *Basic Texts of the 1972 World Heritage Convention*. Paris: UNESCO.

24. UNESCO. (2011). Recommendation on the Historic Urban Landscape.

25. United Nations. (2017). *New Urban Agenda.* Quito: United Nations.

26. Waley, P. (2000). Following the flow of Japan´s river culture. *Japan Forum,12*(2). 199-217.

27. Walsh, C. J., Roy, J., W Feminella, P. D Cottingham, P. M Groffman, & Morgan, R. P. (2005) The Urban Stream Syndrome: Current Knowledge and the Search for a Cure. *Journal of the North American Benthological Society,24*(3) 706-723.

28. Watanabe, S. (2007) "Toshi Keikaku vs machizukuri: emerging paradigm of civil society in Japan, 1950-1980." In A. Sorensen and C. Funk (Eds.) *Living Cities in Japan* (pp.189-205). London: Routledge.