

Mythology and Morphology of Urban Rivers in Bishkek

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1. Introduction

Rivers always played a very important role in the arid climate of Central Asia. People settled near water because they needed it for their everyday needs and farming. The city of Bishkek is also strategically located between two rivers: Ala-Archa and Alamedin.

Soviet planners created an elaborate system of irrigation that would help drain the swamps and effectively use water from rivers for irrigating the city and farming fields around it. Rivers also became corridors for channeling fresh air from the mountains across the city. Roads and sidewalks along the rivers provided residents of the nearby residential areas with spaces for leisure walking, jogging, socializing. In the memories of many long-term city residents, rivers played a very important role.

During the 1990-s, people and companies encroached into the territories along the rivers by extending their plots, by building new properties, and in a number of segments completely blocking the access for cars and pedestrians. People, who lived close to the rivers, began throwing their trash there. Loss of river territories as a public space and their regular irresponsible trashing by the nearby residents, led to a very quick deterioration of the rivers and until now, not much has changed.

In the context of environmental crisis and significant shortage of public spaces in Bishkek, rivers could and do play an immensely important role by carrying water to irrigate Bishkek's greenery, by bringing coolness during warm days, by serving as channels for moving fresh air from the mountains, and by providing paths for leisure walks and sport activities and public spaces for recreation.

This research focuses on two different, but complementary aspects of Bishkek rivers: their mythology and morphology. The urban mythology of rivers is about their historical and socio-cultural features: what role rivers played in the lives of city residents in different periods of Bishkek's history, how citizens and city agencies perceive and envision the rivers, how rivers are used by people, how they are depicted in media, films, and literature, etc. The morphology of rivers analyzes the physical form and shape of rivers and their physical components: riverbanks, riverside passages, bridges, buildings adjacent to rivers, greenery and public spaces.

The research employs a number of multidisciplinary research methods: interviews with city residents, experts and city authorities, GIS mapping and analysis, drone photography, and spatial morphological analysis.

1.1 Goals and Objectives of the Research

The main goal of this project is to study, analyze and depict the mythology and morphology of Bishkek urban rivers. Reaching this goal will help us build the ground for reaching three practical objectives:

1. To bring Bishkek rivers into the focus of public attention by developing public discourses on their place and role in the city, their past, present and future, on the problems around rivers and potential solutions. To prepare public consciousness to the change of the status of rivers in the life of the city, to challenge the traditional view of rivers as simply utilitarian physical objects.
2. To develop the conceptual vision of rivers as a unique cultural and natural phenomena in the city. The vision incorporates various aspects of rivers' life: their historical,

cultural, social, recreational, ecological and economic significance, physical conditions, spatial characteristics and aesthetics.

3. To develop a set of practical recommendations as steps in the materialization of the conceptual vision. We propose developing two types of recommendations: the more generic ones for the overall treatment of rivers all across the city and more specific recommendations and design solutions for different segments and different types of spaces along the rivers.

1.2 Research Questions, Research Problematic and Rationale

There are two main research questions:

1. How are rivers perceived, lived and managed by city residents and city authorities? (Urban mythology of rivers).
2. What are rivers made of? What form, shape, and size do rivers have in different parts of the city? (Morphology of rivers).

This project is a continuation of two previous research projects. The first project was conducted in 2016 together with a group called Urban Initiatives and support from the German development agency DAAD. The project was called “Socij-Cultural Life of Rivers in Bishkek”. It studied Ala-Archa, Alamedin and Big Chui Channel on their entire length in the city. We used physical observation and survey with residents to study the physical conditions of rivers, access to them and most importantly, their use by the city residents, particularly those living close to rivers. We then used GIS (Geographic Information Systems) to map the results of the survey analysis. This helped us visualize the most problematic and the most advanced segments of the river. The results of our study confirmed that rivers still play very important role as places for recreation and socialization of city residents, but unfortunately, only along certain segments of them.

The second project was called “Dariya Riverwalk” and it was conducted in 2015-2017 as a part of team class exercise with our students at the AUCA course titled Redesigning the Commons. Students were engaged in working with the community of residents living along the segment of Alamedin River located next to the Kok-Zhar micro-district between Akhunbaeva and Mederova streets. Students first conducted a survey with residents on how the river is used and how they envision its use in the future. They then organized a series of meetings with residents to talk about rivers in their lives and on the ways to improve the territory next to the rivers. This is when the idea was born to create a Dariya (river in Kyrgyz) River-walk. Students worked with two professional architects who helped them visualize the residents’ ideas and design the river-walk. The team then wrote a grant proposal and was able to raise \$12,000 from the AUCA and Soros Foundation for the realization of project ideas. The project was very successful. Students received very positive feedback, residents are actively using the park and until now we maintain very good relations with them.

So, this research is not an isolated stand-alone project. We build on previous research findings and experience of working with the river community and we perceive this research as a part of a long-term effort towards returning the rivers to people and turning the territories along them into well-designed public spaces with potential for recreation, socialization, sports and mobility.

This research is expected to help us establish the platform to engage city residents, city administration, activists, and professionals to start thinking about the place and role of rivers in Bishkek. At the moment, rivers are hardly mentioned in the news, public discourses, and city projects. We need to bring rivers into the focus of public attention, to encourage the city to face rivers.

The project will also help us propose the conceptual vision of rivers. This vision does not claim the status of the only right vision, but the one to work with. It can be used by the city administration as a basis for any further projects on the rivers.

Finally, the research produces specific practical recommendations developed on the basis of a conceptual vision. These include specific recommendations for city policy, community engagement, ecological concerns, infrastructural improvements, but also a series of prototypical design solutions for various segments of rivers.

1.3 Research Design and Methodology

The research employs a multidisciplinary approach. It will use the results of a survey conducted in 2016, when we surveyed the opinions of 200 people living in the territories next to rivers. This data is still relevant, since not much has changed in the last four years. This data will be complemented with more in-depth qualitative information and visual-spatial morphological analysis.

- In-depth interviews – with the residents of nearby areas, with long-term residents of Bishkek, who remember the old Soviet times, and with experts and city officials.
 - Interviews help us reconstruct a historical perspective on the rivers and depict how city residents perceive rivers, how much they value them, what associations they have with rivers, what memories they related to rivers, etc.
- Physical observation
 - The team of researchers walked the banks of all rivers and canals in Bishkek and registered the physical form and shape of rivers and their physical components: riverbanks, riverside passages, bridges, buildings adjacent to rivers, greenery and public spaces.
- GIS mapping and analysis of territories next to rivers.
 - We used GIS (Geographic Information Systems) mapping tools to map and analyze territories along the rivers using information collected during observations and information available in Google maps.
- Spatial morphological analysis of different segments of rivers.
 - Visual information collected through observations, mapping and aerial photography helped us to conduct the morphological analysis of rivers and nearby territories. The results of this analysis included the visual typology of spaces and river elements.

The research team collaborated with architects, ecologists and city officials.

2. History of Bishkek Rivers

The city of Bishkek is located on the planes of Chui valley at the feet of Tyan-Shan mountains. The mountains border the valley in the South. The name of the valley comes from the name for the Chu

River running from East to West and collecting all rivers and streams flowing across the valley from the mountains. For almost two millennia, the valley was a home to the routes of the ancient Silk Road crossing it in the East-West direction and settlements were established at the intersections of the Silk Road with the rivers (See Figure 1).

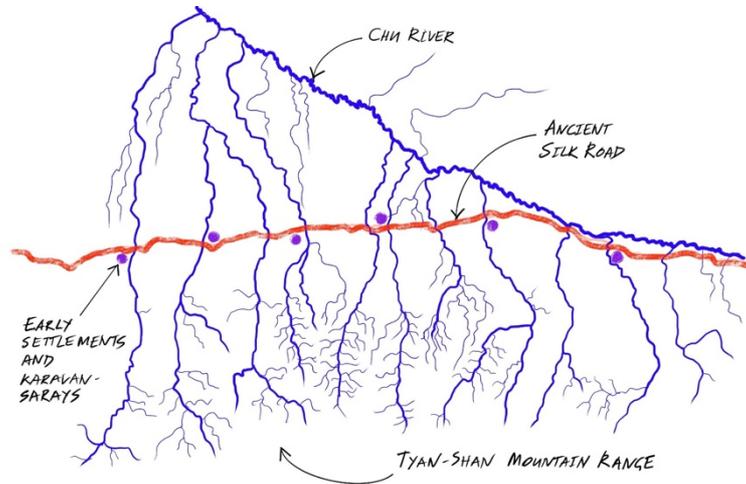


Figure 1: Early settlements located at the intersection of the ancient Silk Road and rivers in the Chui Valley (map by the authors)

One of such settlements was the medieval settlement Dzhul located next to the river, which is nowadays known as Alamedin (Figure 2). Dzhul was established approximately in the 7th century CE. It was an important trading and resting location for merchants traveling along the Silk Road. By the 15th century, Dzhul lost its significance and declined.

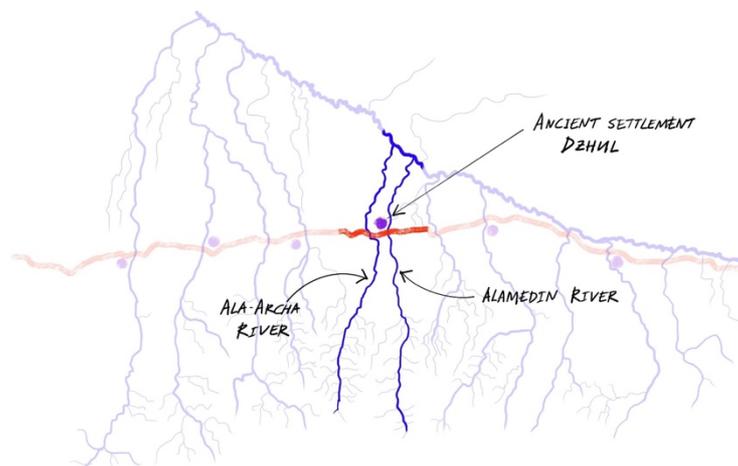


Figure 2: Location of Dzhul settlement (map by the authors)

In the beginning of 19th century, the valley was occupied by the Kokand Khanate army led by Lyashker Kushbegi. Several fortresses were built including the Pishpek fortress in the location not too far from the original location of Dzhul settlement. Kokand emissaries imposed tax on the nomadic Kyrgyz tribes of Chui valley and Pishpek served the strategic military and defense purposes. The fortress had two layers of protective walls and a trench filled with water from Alamedin river. The fortress functioned for 40 years (1925-1965).

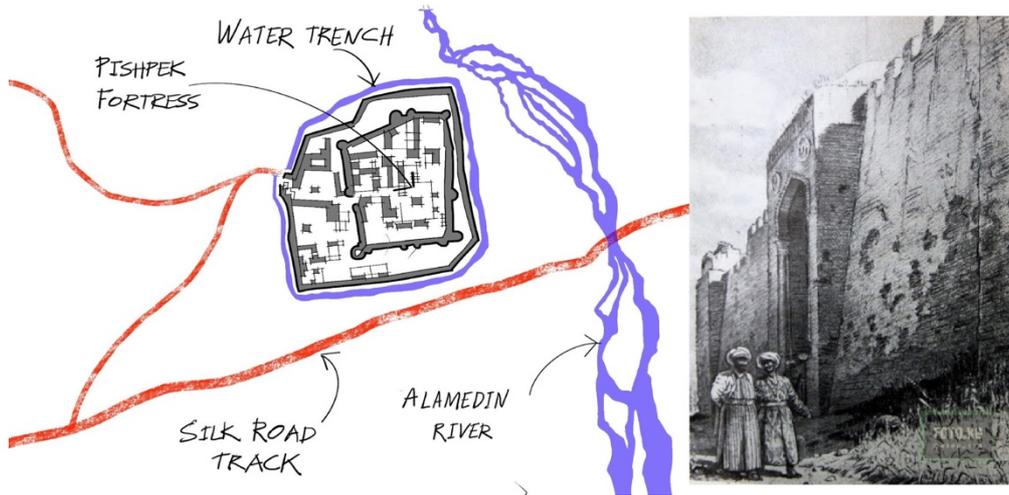


Figure 3: Pishpek fortress located along the Silk Road track and Alamedin River (map by the authors, illustration from the Foto.kg¹)

In 1865, the fortress was attacked and occupied by the Russian Tsarist army. The Russian administration preserved the original name Pishpek, but the fortress was destroyed and a new town was built. It stretched to the West and occupied the entire area between Alamedin and Ala-Archa rivers. There were five other streams of water flowing through the city and town planners had fill in the spaces between the streams (Figure 4). The Silk Road track acquired a new name Tashkent track. It served as the Northern border of urban fabric; area North of tracks was used for planting gardens. The area East of town, just next to Alamedin River was turned into an important market place serving the needs of town residents nearby settlements. So, we could suggest that already more than a century ago, the riverbank was an important public place.



Figure 4: Russian city of Pishpek (1865-1918) (redrawn by the authors from Foto.kg²)

¹ Foto.kg, last accessed at <http://www.foto.kg/istoricheskie-dokumenty/page,1,60,2191-u-sten-kokandskoy-kreposti-pishpek.html> on Dec 20, 2020

² Foto.kg, last accessed at <http://www.foto.kg/maps/535-karta-pishpeka-nachalo-xx-veka.html> on Dec 20, 2020

In 1918, the Tsarist administration was replaced by the Soviet administration and Bishkek became a part of the Turkestan ASSR and in 1926, it was renamed into Frunze. Over 73 years, the city has significantly expanded its boundaries. Rivers used to be the Eastern and Western boundaries of the city became were now dividing the city into three more or less equal parts (Figure 5).

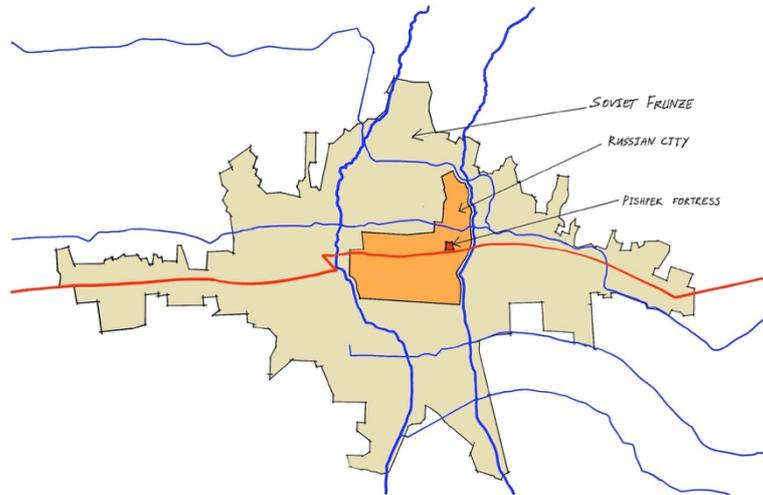


Figure 5: Soviet Frunze (1918-1991) (map by the authors)

One of the main tasks that Soviet urban planners and engineers had for Frunze was to dry the area from excessive water. They achieved this by creating a very elaborate system of irrigation. Two main technical solutions were introduced. First of all, four canals with concrete banks were built – all running from East to West: Southern, Eastern, Western and Small (Figure 6). The largest of four was the Western Big Chui Canal. The purpose of the these canals was to collect water flowing from the mountains and redistribute it through the network of irrigation ditches across the city. This engineering project was very successful and not only Soviet planners managed to dry the place, but also to turn the city into one of the greenest cities of the Soviet Union.

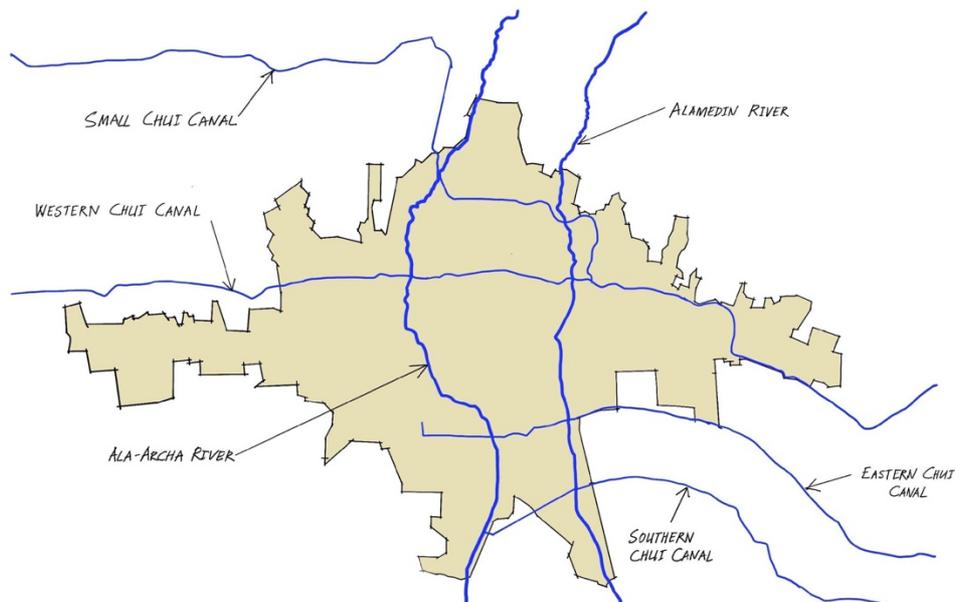


Figure 6: Rivers and canals in the Soviet Frunze (map by the authors)

The second engineering solution was to reinforce the banks of both rivers with concrete and build a system of cascades made of dissipation walls placed at 60-80 m from each other along the entire length of both rivers.

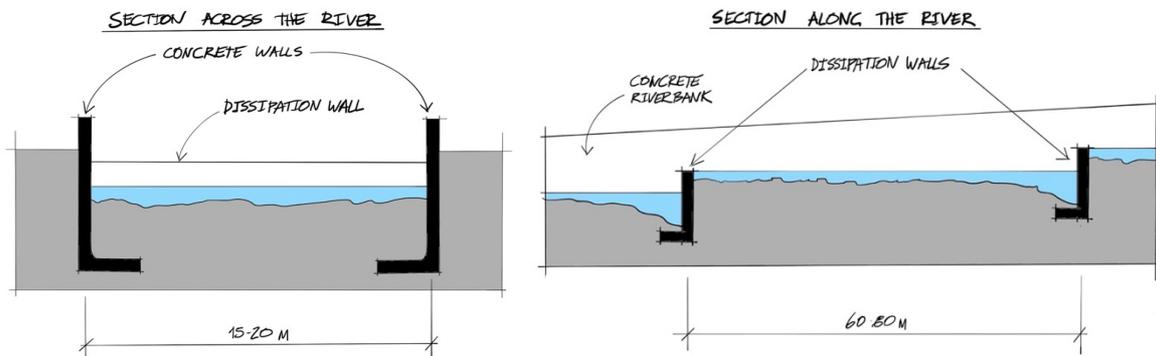


Figure 7: Concrete banks and dissipation walls along the rivers (drawings and photo by the authors)

In addition, a very elaborate system of dams was built channeling the water. Residents could regulate the amount and direction of water from rivers and canals for irrigating their neighborhoods.



Figure 8: Bridges and regulatable dams on the Ala-Archa River (photos by the authors)

During the Soviet times, rivers obtained the status of technical engineered urban objects. Their purposes were to safely channel water through the city during floods and to effectively distribute water for irrigation. Rivers were placed under the control of the Ministry of Emergency Situations (MChS) and a 150 m “red” corridor along the river was established that banned any form of capital construction. Rivers were supposed to have an uninterrupted for access for MChS machinery through

the entire length of the river. In addition, sidewalks were built along almost the entire length of both rivers and some canals.

Unfortunately, not all Soviet irrigation projects in Frunze were brought into completion: e.g. the Southern Chui Canal was not finished and not all sidewalks were built on the Northern segments of Alamedin river when in 1991, the Soviet Union broke up, Frunze became the capital of independent Kyrgyzstan and was renamed into Bishkek. The decade of 1990-s was the decade of “bardak” (chaos) and corruption that penetrated into all layers of administration, including the Mayor’s Office. This was the time of little or no control over land distribution and private companies and individuals began occupying the land adjacent to rivers. As a result, in many places, the access to rivers was partially or completely blocked, in some places – on both sides (Figure 9). In the early 2000-s, the river legislation changed too. The Chief Architect of Bishkek reduced the 150-m “red corridor” no construction requirement to only 6 m from the riverbank. However, even that requirement was often completely ignored.



Figure 9: Access to river is blocked on both sides (photo by the authors)

Another major problem was the absence of control over residents and companies trashing the river banks. Partly because the waste collection agency was not working properly, it became common for residents of nearby neighborhoods to throw their trash into the river. Also, individuals and some companies were bringing their construction debris into the rivers. As a result, many segments of the river lost their original riverbanks’ forms and even became sanitary hazard zones (Figure 10).



Figure 10: Construction debris and garbage on the banks of Alamedin River (photo by Urban Initiatives)

One other type of activity had a strong negative effect on rivers and their conditions. It became common for construction companies to bring excavators and dig riverbeds for stones for construction

purposes. Excavators would pile up the slopes for themselves and for trucks to ride into the riverbeds and take large amounts of stones from there. This heavy machinery often destroyed the reinforced concrete banks and the dissipation walls and they depleted rivers of their foundations. This created conditions for the erosion of rivers and for the collapse of riverbanks. There is a number of segments along both rivers, where the physical conditions of rivers are very hazardous.



Figure 11: Hazardous conditions of Ala-Archa and Alamedin riverbanks (photos by the authors)

To summarize the historical overview of this report, we can conclude that rivers were always very important elements in the history of the city: from ancient and medieval times until present days. Both Dzhul settlement and Pishpek Kokand fortress were located at the intersection of ancient trading route and Alamedin River. The Russian city expanded and occupied the area between Alamedin and Ala-Archa river. The Soviet city expanded further beyond both rivers and Soviet engineers developed a very elaborate and intricate irrigation system: they reinforced riverbanks and created a system of canals. Unfortunately, their vision was not accomplished because of the collapse of Soviet Union and since independence rivers and territories around them suffered significantly from people and companies occupying adjacent territories and trashing the rivers and from the erosion of riverbanks. Today, rivers need urgent attention of city administration and planners.

3. Accessibility and Social Use of Rivers

This section summarizes the results of research conducted jointly with the Urban Initiatives group on the accessibility and use of Alamedin and Ala-Archa rivers and of the Western Big Chui Canal (BCC). It is based on the survey of 200 residents living in the areas close to the rivers and BCC.

The survey shows that rivers and BCC are quite popular: 30% of respondents come to the river at least once a day, 18% - 2-3 times a week, and 14% - 2-4 times a month. Only 12% do not come to water at all. One fifth of respondents (20%) spend near water less than half an hour, one quarter – 30-60 minutes and 14% - more than an hour. The most common activities on the rivers is walking (67%), meeting friends (20%) and sports (11%). Almost half (47%) of respondents come to the rivers themselves, 39% with family members and 28% with friends.

The map on Figure 12 shows that the frequency of visiting the rivers differs for different rivers and their segments. The most well attended are segments in the central part of Ala-Archa river. To some degree this is explained by the access to the river as mapped in Figure 13: the most frequently attended segment also has proper sidewalks or at least a path along the river. The map also reveals a number of segments (in red) where access to the river is completely blocked.

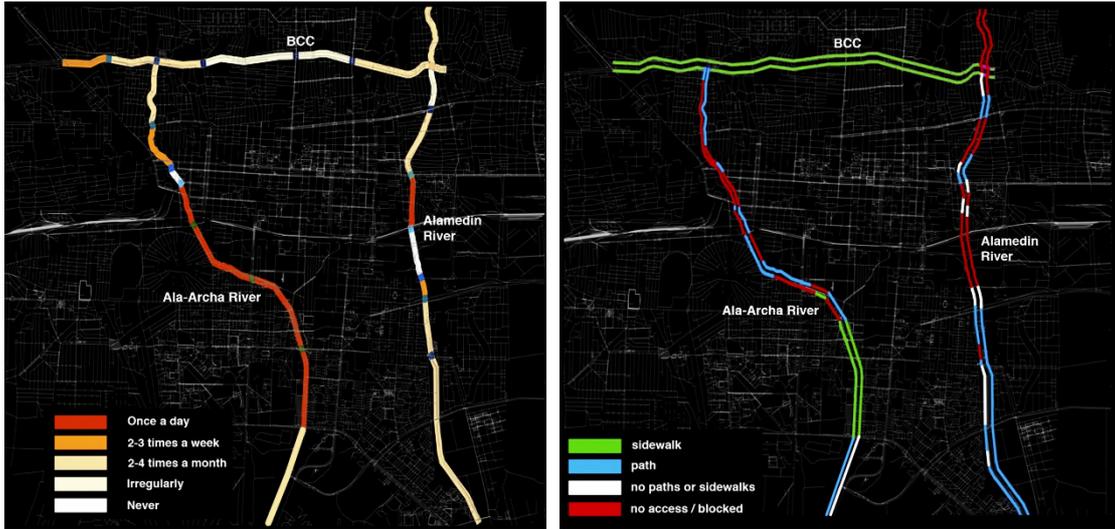


Figure 12: Frequency of coming to rivers and BCC (GIS map by the authors).

Figure 13: Access to rivers and BCC (GIS map by the authors)

While the majority of respondents evaluate rivers and nearby territories as average, evaluations are skewed towards negative. Nearly half of respondents perceive them as “bad” or “terrible”. The map reveals which segments are better and which worse (Figure 14). It confirms correlations revealed in two previous maps.

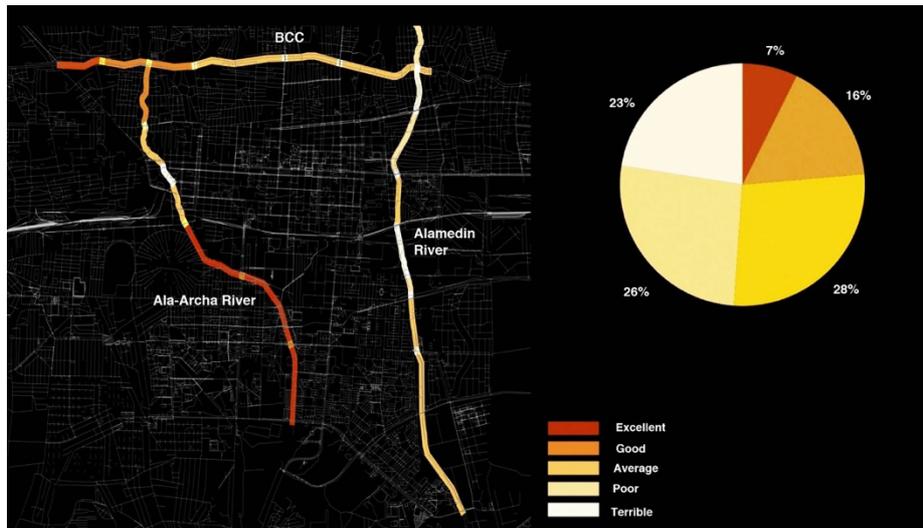


Figure 14: Evaluation of rivers and nearby territories (GIS map by the authors)

The main thing that attracts people to rivers is the water itself (27%): its coolness, movement, sound, ability to reflect the surroundings and generate sparkles of lights from the sun. Water can help calm down and feel better. Secondly, rivers are attractive as places for recreation and socialization and as places with clean air. Rivers serve not only as channels for moving water, they are also the main paths for clean air flowing to the city from the mountains. Also, all kinds of greenery growing in the rivers and next to them are also main attractors Figure 15.

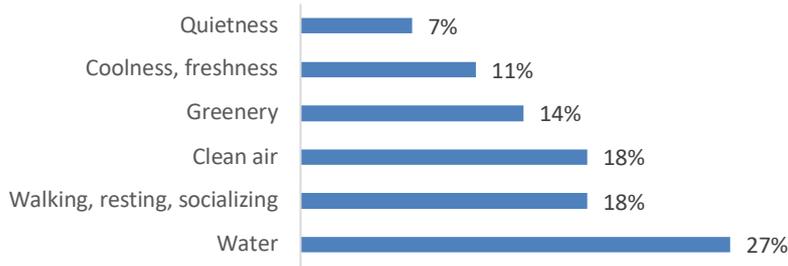


Figure 15: What attracts residents to rivers

At the same time, for three quarters of respondents, the main thing pushes them away is trash and bad smell (Figure 16). There is a number of segments along both rivers, which have become places for dumping waste. When riverbanks have poor conditions for walking and recreation or when passages are blocked, riverbanks become abandoned by common city residents and may attract people who bring alcohol and misbehave (Figure 18), which further pushes others away.

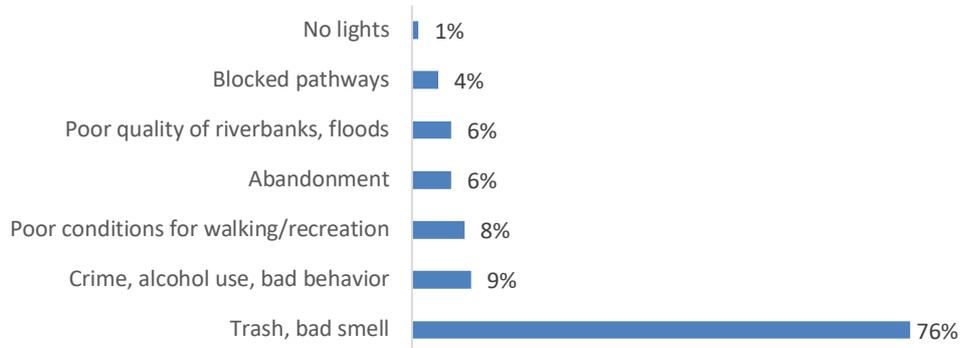


Figure 16: What pushes people away



Figure 17: How trashed river segments are (GIS map by the authors)

Figure 18: Areas with crime, alcohol use and bad behavior (GIS map by the authors)

The analysis of survey brings us to the following conclusions. People really like and value rivers, but depending on where they live and depending on the quality of riverbanks and spaces along the river,

the descriptions might range from "a piece of mountains, nature" and "favorite walking route" to "backyards, no man's place". If territories are landscaped and there is access to the river, riverbanks are popular among the townspeople, who frequent them for walking and relaxing. The most popular and most frequently used segment is that of Ala-Archa river – from Yuzhnaya Magistral to Prospect Mira. The least popular and most problematic is Alamedin river down the stream from Mederova Street. It is much more trashed, riverbanks are in poor conditions, there is no good infrastructure for walking and recreation, many passages are completely blocked and people are afraid of criminal activities, alcohol use and misbehavior. Overall, we can conclude that the recreational, economic, social and cultural potential of Bishkek rivers is not used and large segments of rivers are "excluded" from city life.

4. Morphology of Ala-Archa River

Considering the limited scope of this research, for a more detailed morphological analysis, we decided to focus on just one river – Ala-Archa. This chapter consists of three subchapters: the analysis of land-use and connectivity along the river, morphological analysis of spaces along the river, morphological analysis of the river itself.

4.1 Land-use Analysis

Ala-Archa river originates in the Ala-Archa Gorge of Tyan-Shan mountains at some 40 km from Bishkek. While in the gorge, it collects water from numerous mountain streams (Ak-Sai, Top-Karagai, Teke-Tor, Tuyuk-Suu, Adygine, Jindi-Suu)³ running down the glaciers and melting snow, before it starts flowing through the plane of Chui Valley. The overall length is 78 km (60 km on a straight line). After it passes through the city, it ends in the Ala-Archa water reservoir. Nearly one third of its length is inside the city boundaries (Figure 19).

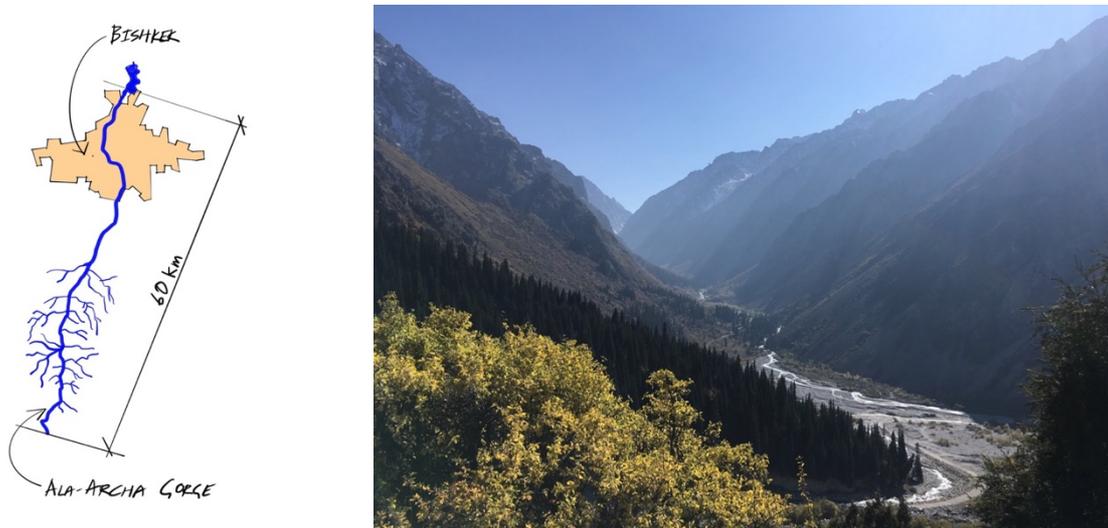


Figure 19: Map of Ala-Archa River and photo of Ala-Archa Gorge (map and photo by the authors)

Once the river enters the city it goes through a number of different urban zones with their own unique characteristics. We can distinguish five main zones: 1) eco-zone, 2) high-density residential (micro-

³ [https://ru.wikipedia.org/wiki/Ала-Арча_\(река\)](https://ru.wikipedia.org/wiki/Ала-Арча_(река))

districts), 3) industrial, 4) commercial and 5) low-density residential. The land-use diagram on Figure 20 depicts these five zones and various land-use categories within each zone. Each zone has its own way it treats the river and different ways the river connects to the adjacent territories.

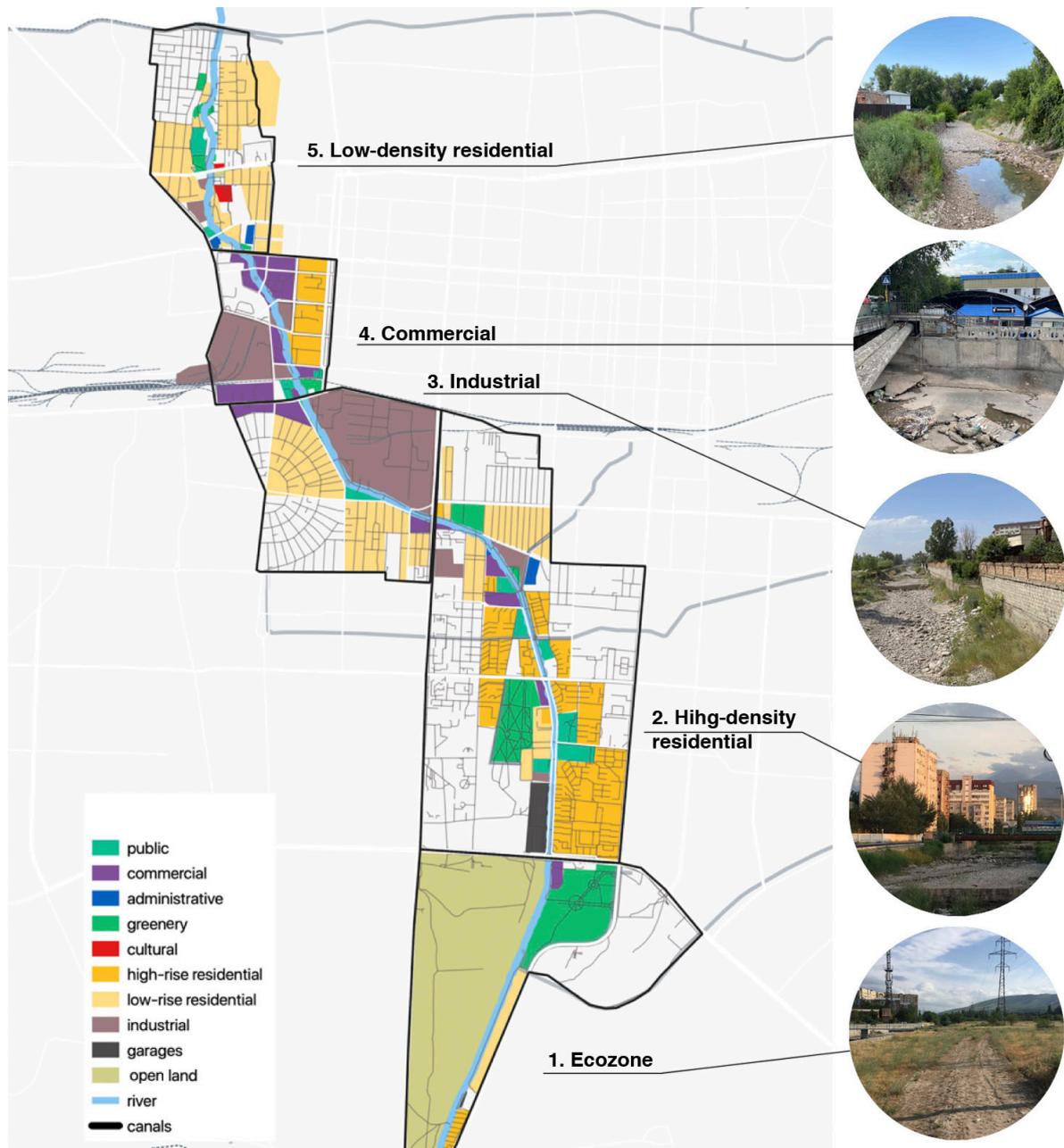


Figure 20: Land-use diagram of territories along Ala-Archa River (map and photos by the authors)

In addition, if we pay attention to the green color, we can see that there is a number of green zones attached to the river. The deeper analysis reveals several categories of urban green spaces: 1) natural or authentic green, 2) parks, 3) open public green spaces, 4) private green spaces, and 5) public spaces, which are currently not accessible (Figure 21). **Natural authentic green areas** are located in the so-called eco-zone. These are unirrigated, unmanned areas with grass and small trees. Our recommendation is that their authentic character must be preserved. There are several **public parks**, which are very popular among city residents and we recommend creating better connections with the river in order to enhance the recreational opportunities for residents and give them a chance to

combine their walks in the parks with the walks along the river. In addition, there are several **smaller scale green public spaces**, which are well-connected to the river. These include green spaces inside the nearby apartment buildings, public schools, university, kindergartens, and somewhat accidental open spaces emerging between the river and nearby buildings. There is also **greenery in the private low-rise houses** adjacent to the river. While they are not accessible to public, they do help creating shade for the by-passers. Finally, there are some green spaces, like that of a Botanical Garden on Gorkogo Street or of Kyrgyz Cinema, which are close to the river, but currently closed for public. We highly recommend opening these green spaces for public.

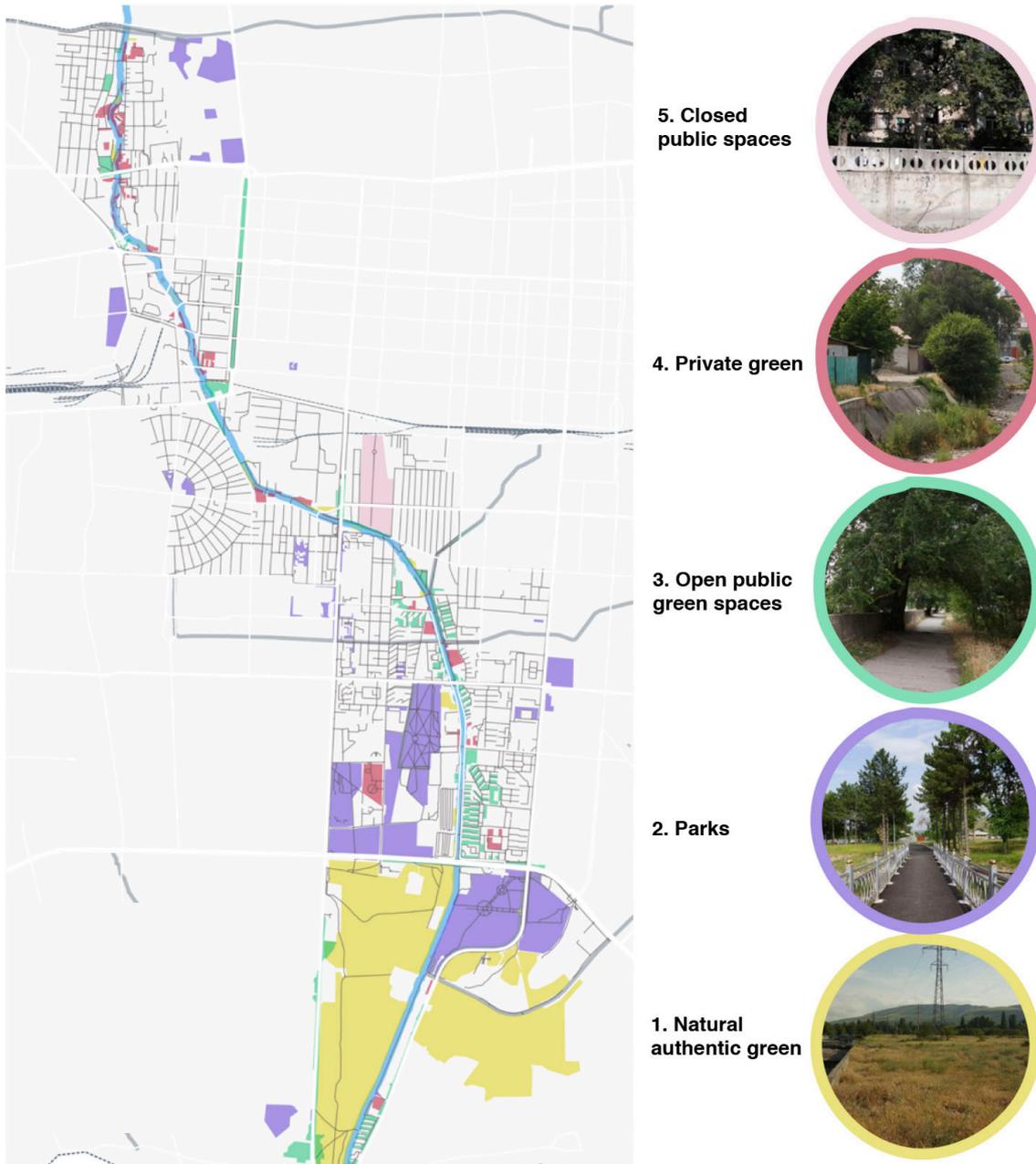


Figure 21: Typology of green spaces along the Ala-Archa River (map and photos by the authors)

Land-use analysis shows the diversity of land-uses along the river, which has the great potential for experiencing the city through traveling along it. However, besides traveling along the river, it is also important to understand how easy it is to travel across the river. This is done in the next section on connectivity analysis.

4.2 Connectivity Analysis

One of the main infrastructural elements of the river is bridges connecting the opposite banks. We can distinguish at least five categories of bridges: 1) railway bridges, 2) junctions, 3) car bridges, 4) mixed car and pedestrian, and 5) pedestrian (Figure 22). Railway bridges serve only the purpose of trains passing, there is no space for cars and pedestrians; however, pedestrians regularly walk along the railway trucks. Bridges for cars are made mostly at the main Bishkek roads running in the East-West direction. Pedestrian bridges are often placed separately next to the car bridges or they are mixed with a short barrier separating the traffic from pedestrians. Finally, there is quite a variety of pedestrian bridges ranging from those made of concrete and very simple metal bridges.



Figure 22: Typology of bridges (map and photos by the authors)

The analysis of connectivity using the GIS 10-minute walking isochrones shows that the two banks of the river are quite well connected. As you can see in the Figure 23, residents can reach a bridge within just ten minutes almost anywhere along the river. The only major exception is a large segment (2.6 km) between Yuzhnaya Magistral and Gorodok Sovmina in the South of the city that doesn't provide any chance to cross the river.

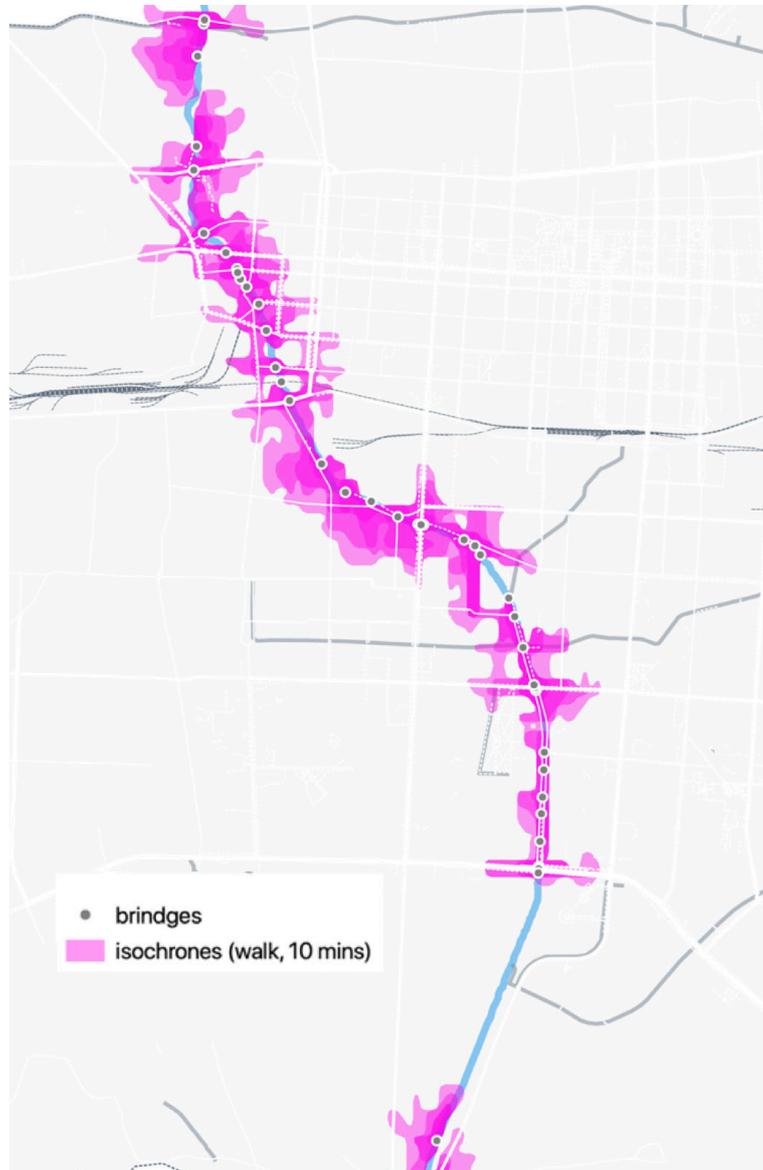


Figure 23: Bridge connectivity along Ala-Archa River (map by the authors)

Having analyzed land-use and connectivity of territories along the river, we move on to the analysis of urban fabric.

4.3 Morphology of Urban Fabric Along the River

This section analyzes the morphology of urban fabric: buildings and open spaces in five zones identified during the land-use analysis. We analyze each zone and develop recommendations for each zone individually.

4.3.1 Eco-zone

This is the area where Ala-Archa river crosses the urban boundary and enters the city. Its urban journey starts with the Gorodok Sovmina residential area, consisting of eight multi-floor apartment buildings constructed in the Soviet times and located on the Eastern side of the river. A small pedestrian bridge connects the neighborhood with a vast open space on the other side covered with grass and small trees. There is a high-voltage electricity line with tall electricity poles running next to the river, which is probably the main reason why this space remained unbuilt until now and why it is going to stay in such way. Residents of apartment buildings actively use this open space: walking, playing with children, and doing sports. The eastern bank North of apartment buildings is occupied by low-rise residential area. However, this area is not really connected to the river and there are no bridges to cross the river to the open space across the river. In the middle of the zone, river crosses the Southern Chui Canal and to the North of it on the Eastern bank, there is Victory Park, which is extremely popular, particular in the evening times (Figure 24).



Figure 24: Eco-zone (map by the authors)

A more detailed analysis of the building fabric reveals several interesting typologies. The very first building has an open-book form which opens to the river and to the green space across the river (Figure 25).

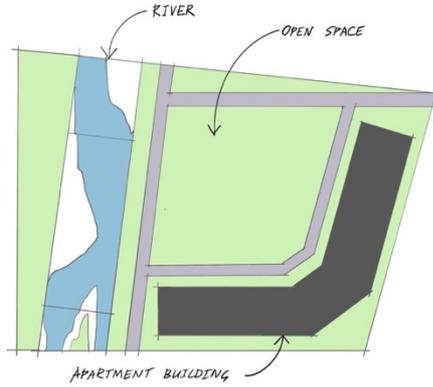


Figure 25: Open-book shape apartment building open to the river (map and photo by the authors)

Seven other apartment buildings are located at approximately 75 degrees to the river and their yards open to the river (Figure 26).

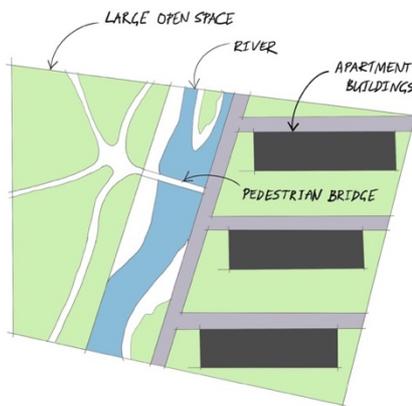


Figure 26: Apartment buildings at 75 degrees to the river and pedestrian bridge (map and photo by the authors)

Finally, there is low-rise housing area that doesn't have any access to the open space across the river. Residents attempt to appropriate the river space. The photo below shows how someone created a concrete platform in the river, placed a bench on it, made the stairs to go down to it from the bank and even made a fence with a lock to ensure his or her ownership (Figure 27).

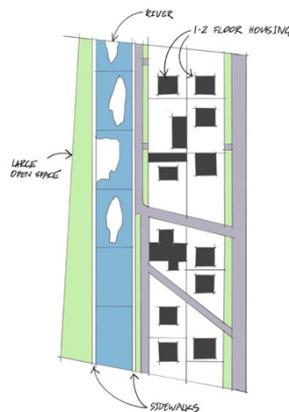


Figure 27: Low-rise housing and appropriation of river space (map and photo by the authors)

Our recommendations for the improvement of this river segment include following:

- Preserving the authentic wild nature of green space on the West bank
- Improving the quality of walking path along the West bank
- Creating the activity/socialization/recreation anchors along the path
- Building two new bridges
 - Next to the low-rise residential area
 - Next to the Victory park

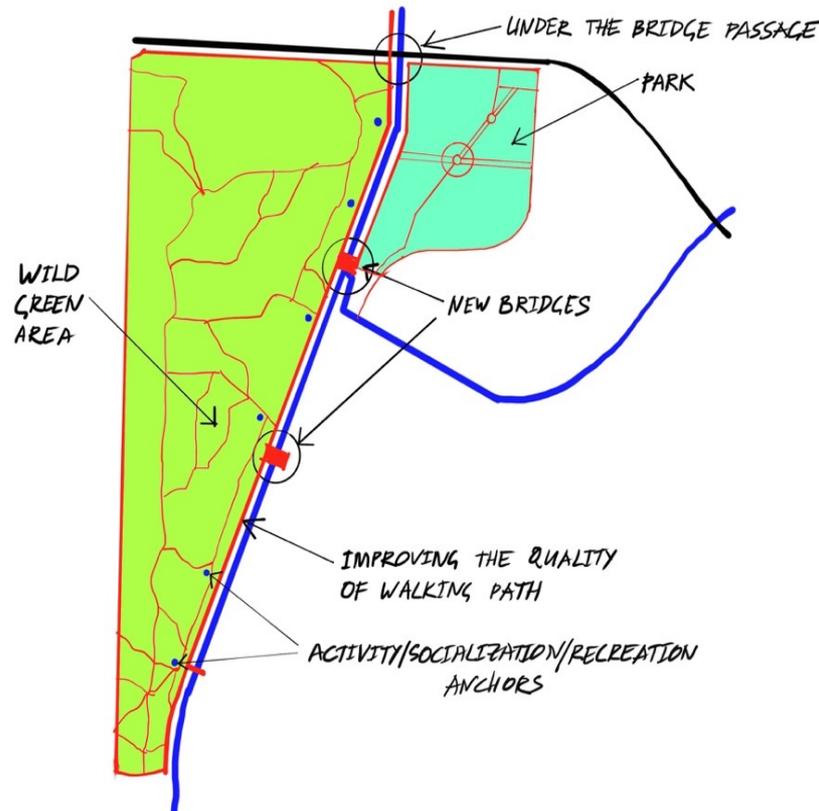


Figure 28: Recommendations for the improvement of Ecozone segment (map by the authors)

4.3.2 High-density Residential Area (Micro-districts)

Once the river passes under the Yuzhnaya Magistral, it enters the area of high-density residential area of micro-districts. Maps on the Figure 30 show nearly 100 multi-floor apartment buildings and many open and green spaces located along the river. According to the survey results discussed in the previous section, this is the most popular segment of both rivers. It has proper sidewalks on both sides of the river and it is actively used by residents as the area for walking and recreation. It provides very nice views onto the mountains and the quality of riverbanks, dissipation walls and the riverbed itself is quite good with one exception – near the KGUSTA university, where trucks used to dig stones (Figure 31). Roads on the both sides of the river were recently renovated on the money from Chinese grant and the sidewalks along the river were paved with new stones. However, in the process of renovation, a large number of trees located along the river were cut and not replanted. This makes the river-walks very unfriendly and uncomfortable during hot summer days. Another problem is the presence of two visual barriers: casino built on the river and a bridge turned into a billboard for advertising (Figure 29). These obstacles kill the view to the mountains and break the smooth flow of air along the river.



Figure 29: Visual barriers along the Ala-Archa River: casino and billboard (photos by the authors)

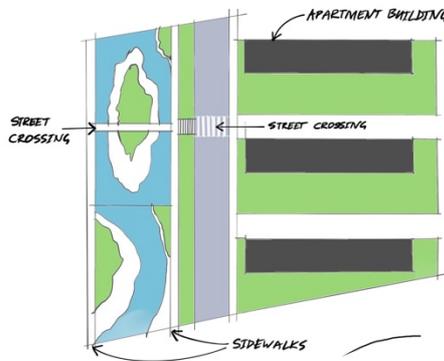


Figure 30: Buildings, open spaces and roads in the Micro-districts (maps by the authors)



Figure 31: Ruined riverbanks and dissipation walls near KGUSTA (photos by the authors)

The morphological analysis of buildings reveals several interesting typologies of urban fabric. There is a number of buildings, which are perpendicular to the river. Roads have proper pedestrian crossings and stairs to the sidewalks along the river.



Another typology includes buildings located on approximately 30 degrees to the river. This creates very interesting green spaces between apartment buildings and the river (Figure 32).

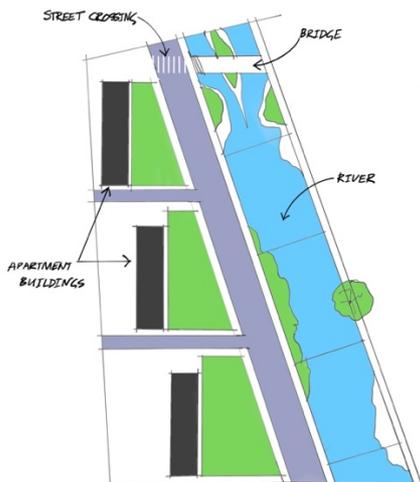


Figure 32: Apartment buildings located at the angle to the river (map and photo by the authors)

There are also buildings, which stand both parallel and perpendicular to the river and there is nice green area with a lot of trees next to the river. This is perhaps the nicest segment of the river. Considering that there is a small marketplace next to it, the space is very actively used by residents at different times of the year.

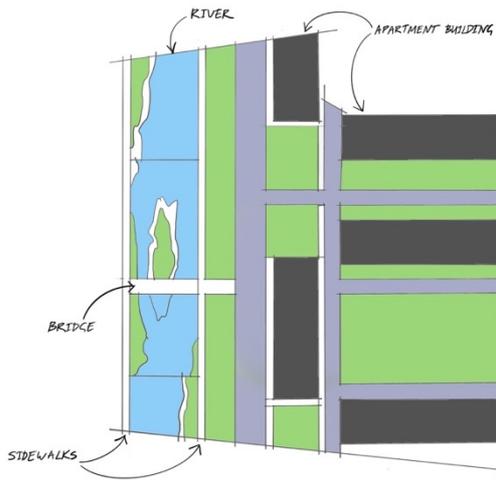


Figure 33: Apartment buildings parallel and perpendicular to the river (map by the authors, photo by Urban Initiatives)

Finally, there is one other unique typology of space: that of various educational institutions located along the river. These include three public schools (#48, #61, and #62), one private school (Ilim) two kindergartens and Kyrgyz State University of Construction, Transport and Architecture (Figure 34). Soviet urban planners were very strategic in locating these educational institutions along the river: they all have open spaces that face the river, thus they are well ventilated. In daytime, these open spaces are school-children and students and in the evening time, they are actively used by residents of different ages: from little kids to pensioners who make circles around the school stadium. The proximity of river makes the experience of recreation in these public spaces particularly pleasant.

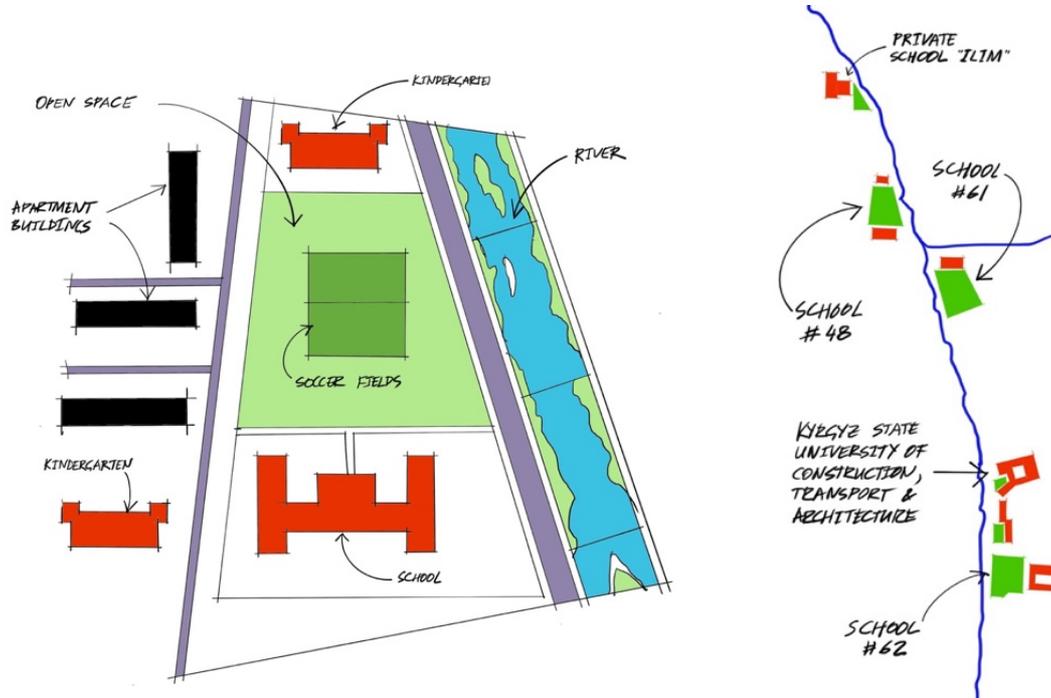


Figure 34: Open spaces of various educational institutions located along Ala-Archa River (maps by the authors)

The project makes following recommendations for this segment of the river (Figure 35):

- Planting trees on the Western bank;
- Removing visual barriers (Casino and billboard);
- Rehabilitation of a damaged segment (riverbank and two dissipation walls) close to KGUSTA;
- Creation of activity/socialization/recreation anchors along the river.

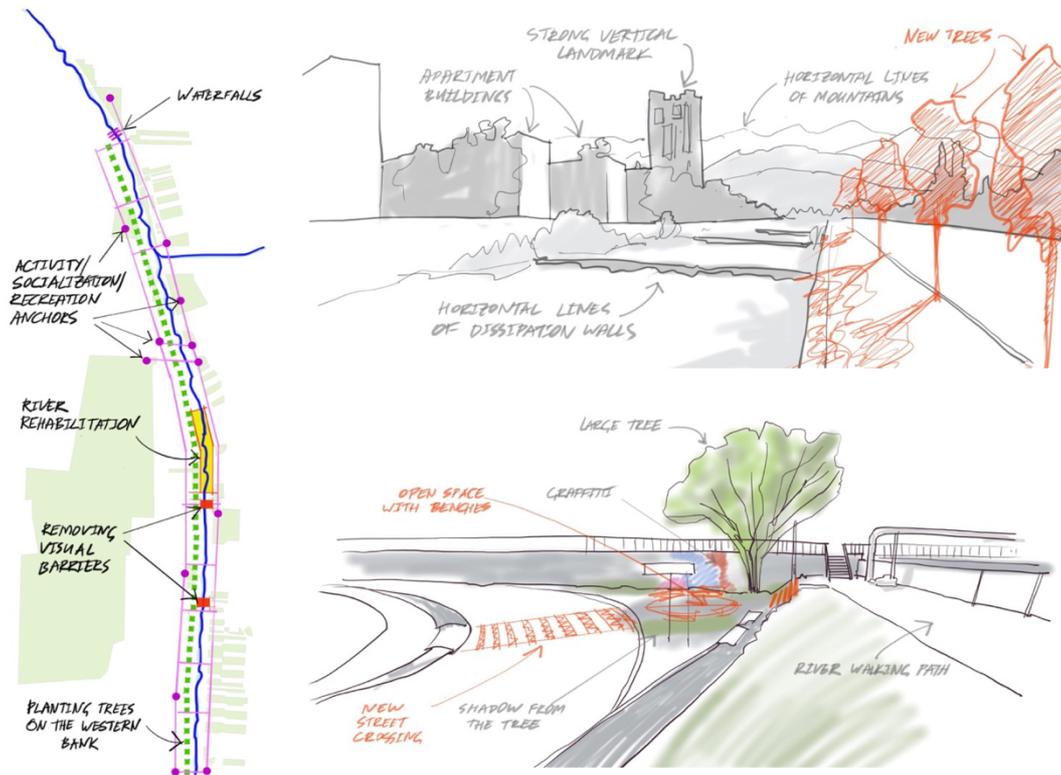


Figure 35: Recommendations for the improvement of Micro-districts segment (map and sketches by the authors)

4.3.3 Industrial Zone

In Bishkek, the industrial zone is located along the railway lines that cut through the city almost in the middle of it. So, as the river approaches the city center, it passes through the industrial territory. Figure 36 shows how large industrial buildings are located on the right bank of the river, while its left bank is occupied by the low-rise housing of Rabochi Gorodok neighborhood (Working Class Town). This segment of the river has several major features. Perhaps the most important one is its ruined character. Since most of Bishkek industries stopped working already in the 1990-s, the fences are collapsing and no one cares to fix them. Secondly, this is another part of the river, where trucks used to come a lot to dig out stones. They destroyed the dissipation walls, deepened the riverbed, which then quickly eroded and resulted in the collapse of concrete riverbanks. So, the river and its banks are in a very hazardous condition (Figure 37).



Figure 36: The industrial zone and low-rise residential area (map by the authors)



Figure 37: Ruinated character of riverbanks and riverbed (photos by the authors)

Another feature is one-sided pedestrian passage: it first runs on the right bank of the river, while the left bank is completely taken over by residential houses (Figure 38), then the path crosses the bridge and runs on the left bank while the right bank is completely blocked by the industrial zone (Figure 39).

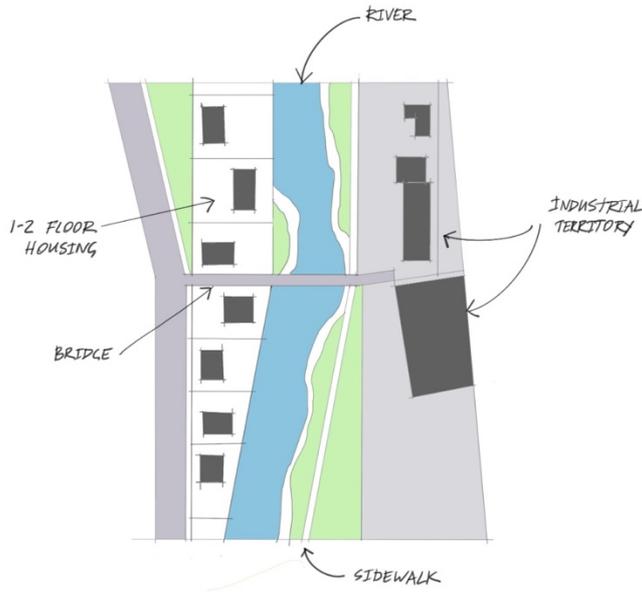


Figure 38: Narrow passage on the Eastern side of the river, left side passage is blocked (map by the authors)

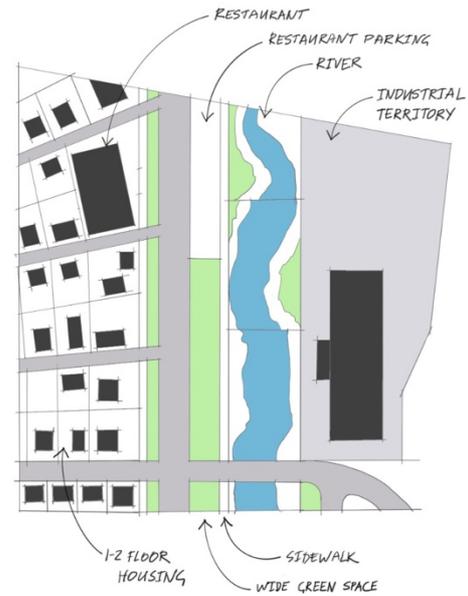


Figure 39: Passage on the left bank, the Eastern side passage is blocked by the industrial zone (map by the authors)

The last segment of this area has industrial buildings on both sides of the river (Figure 40). There is a nice green space separating river from the road, which currently is not looked after very well, but has good potential as a public space.

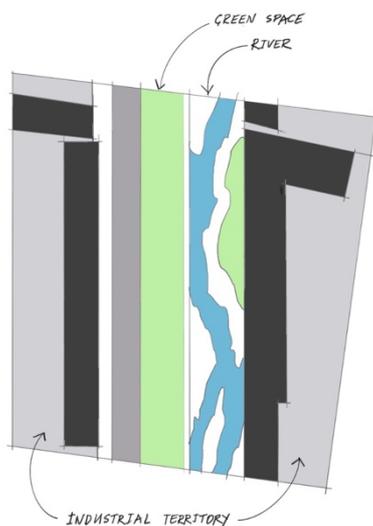


Figure 40: Industrial buildings on both sides of the river and strip of greenery (map and photos by the authors)

Authors generated following recommendations for this segment of the river (Figure 41):

- Building two under-the-bridge passages to allow uninterrupted movement for pedestrians and bikers;
- Opening the entrance to the currently closed Botanical garden;
- Pushing the fence to broaden the currently extremely narrow passage;
- Restoring the riverbed and riverbanks, which are in a very hazardous condition;

- Building a new bridge to connect residents of the newly built residential apartment complex (inside industrial area) to the green space on the other side of the river; and
- Finally, building an amphitheater (or the so-called affordance landscape in the actively visited area across the large shopping mall (Figure 57).

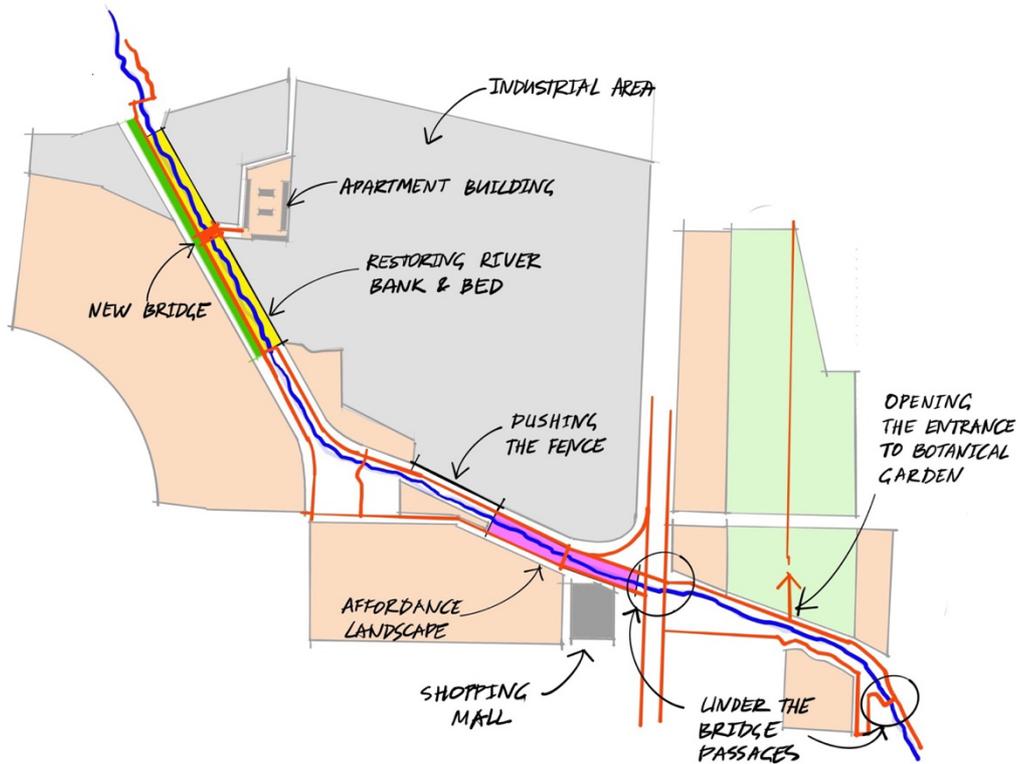


Figure 41: Recommendations for the industrial segment of the river (map by the authors)

4.3.4 Commercial zone

After passing through the industrial zone, the river enters the area of a very dense commercial zone where one of the largest Bishkek’s markets – Osh Bazaar – is located (Figure 42, Figure 43).



Figure 42: Roads and pedestrian paths in the commercial zone of along Ala-Archa River (map by the authors)

Figure 43: Building fabric and green spaces in the commercial zone of along Ala-Archa River (map by the authors)

There is a small and not well looked after park at the beginning of segment. Quite a lot of people pass through this park on the way from Molodaya Gvardiya Boulevard to Lev Tolstoy Street and with proper care this park could become an important public space. Then, the river passes under the railway lines. There is no proper way to cross the railway tracks and this crossing is rather abandoned. Because of this and because of central heating pipes running next to railways, the place became very popular with homeless people, who sleep next to the river under the bridge (Figure 44).



Figure 44: Beddings of homeless people sleeping under the bridge (photo by the authors)

After the railways, the river enters one block of residential apartments and we can observe one unique typology of space: apartment buildings directly facing the river. Unfortunately, these residential yards along the river are not really used as public space for residents; most of the space is used as parking for some of the residents' cars. The Western bank does not have a passage, it is blocked by the industrial plot and plots of low-rise housing.

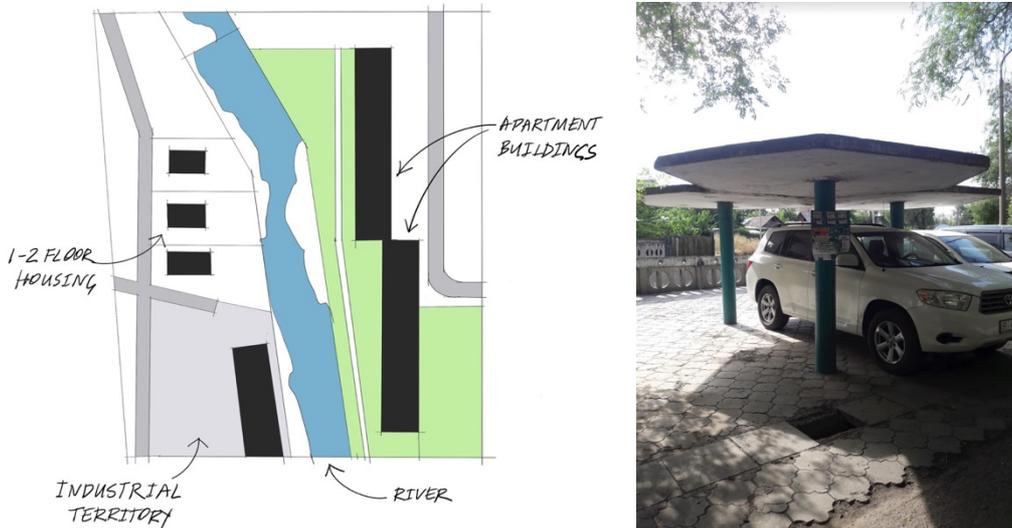


Figure 45: Apartment buildings directly facing the river (map and photo by the authors)

Beginning from Moskovskaya street, the river enters the very densely built commercial area of Osh bazaar and for three blocks, the passage along the river is completely blocked on its both sides by commercial structures of the bazaar. The only way to keep going along the river is inside the bazaar.

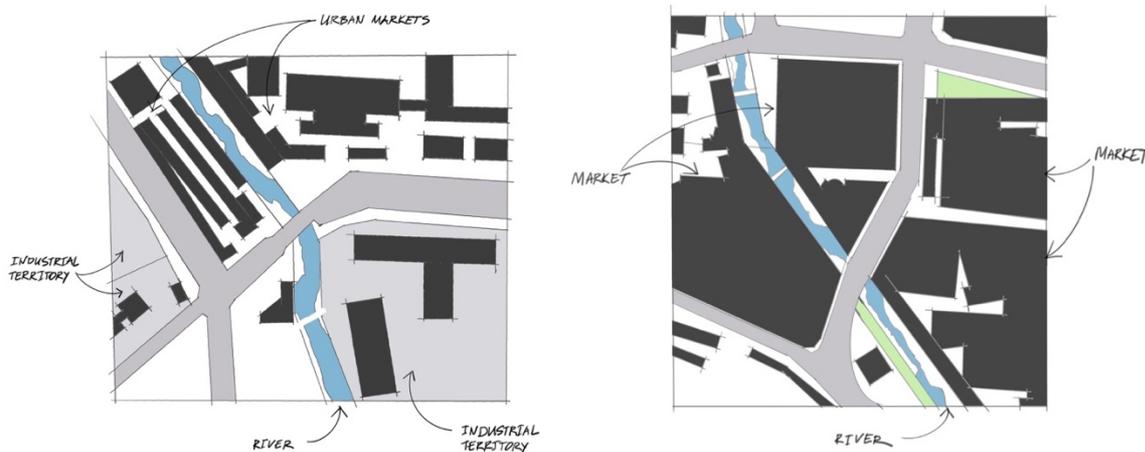


Figure 46: River passing through Osh Bazaar. (maps and photos by the authors)

Finally, after the commercial zone the river passage goes through a very densely built low-rise mahalla (neighborhood built in traditional Central Asian style). This is the area of the city that has not changed much since it was established almost a century ago and in several places the passage is blocked and one has to enter the meandering streets inside the neighborhood to come to the river again.

Our list of recommendations (Figure 47) for this segment of the river include three main points:

- Opening the passages at least on one side of the river as it passes through the market and through mahalla to allow an uninterrupted movement along the river. This might require removing existing blocks and pushing through existing fabric.
- Reorienting the market buildings along the river to face the river rather than having their back to it.
- Reclaiming/reactivation/beautification of few existing green spaces, which are currently abandoned or blocked by fences.

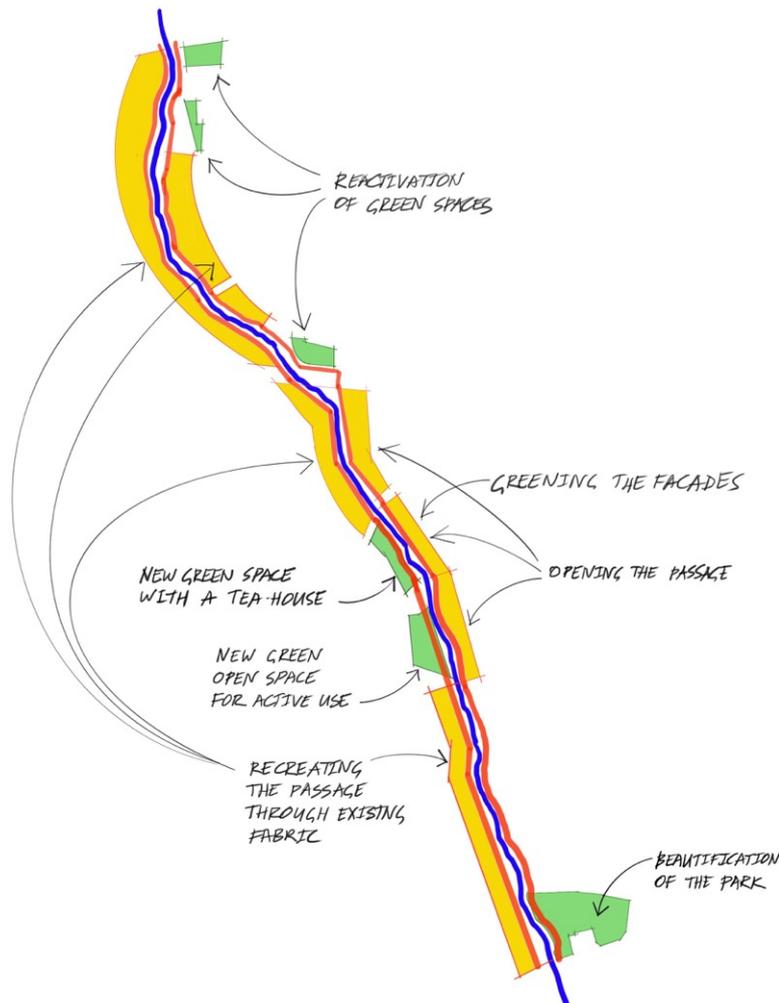


Figure 47: Recommendations for the commercial zone (map by the authors)

4.3.5 Low-density residential

In its last urban segment, Ala-Archa River enters the area of low-rise housing.



Figure 48: Building fabric, roads and green spaces in the low-rise residential area along Ala-Archa River (map an photo by the authors)

The river itself becomes much smaller as it nears the end and often there is not much water left. Besides housing, the area also has Kyrgyz Film company and a military compound, both located along the river. However, both are closed for public access. We can see a number of potentially great green spaces along the river. However, many of them are closed and not used by people (Figure 49).



Figure 49: Green space along the river between low-rise housing and Kyrgyz Film company (map and photo by the authors)

Then, there is a section of the segment where river flows just through the quiet residential area on both sides.



Figure 50: River flowing through quiet residential area (map and photo by the authors)

The project recommendations (Figure 51) for this last segment of the river include:

- Improving quality of walking paths;
- Installing lights along the paths;
- Breaking through blocked areas to create a continuous walking route;
- Designing a promenade;
- Preserving the wild character of greenery;
- Creating better access to green spaces;
- Making some areas of Kyrgyz Film accessible to public.

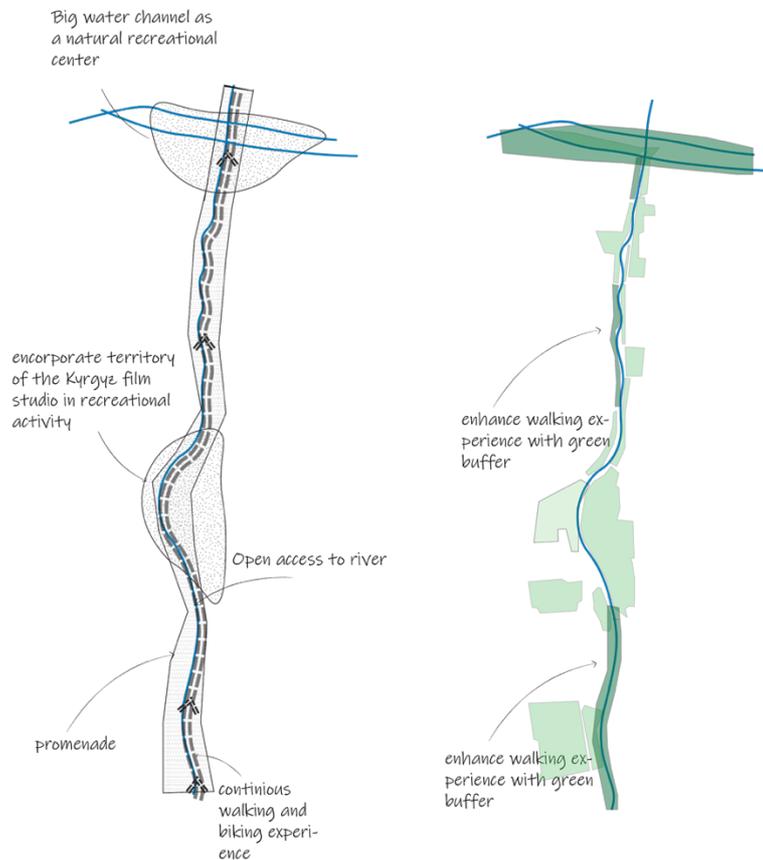


Figure 51: Recommendations for the low-rise residential segment of Ala-Archa River (maps by the authors)

4.4 Morphological analysis of Ala-Archa River

This section focuses on the physical shape of the river and creating typologies of river cross-sections. The analysis shows that we can distinguish three main categories: river inside high-density residential zone, river inside industrial and commercial zones, and river inside the low-rise residential zones. For each cross-section we focus on three important physical features: 1) Orientation of nearby buildings, which preferably faces the river, 2) amount of greenery on the banks and 3) walkability along the river.

4.4.1 River inside Micro-Districts

This is the most successful type of cross-section. Buildings are well oriented towards the river, there is plenty of greenery, and there are walkways on both sides of the river (Figure 52).

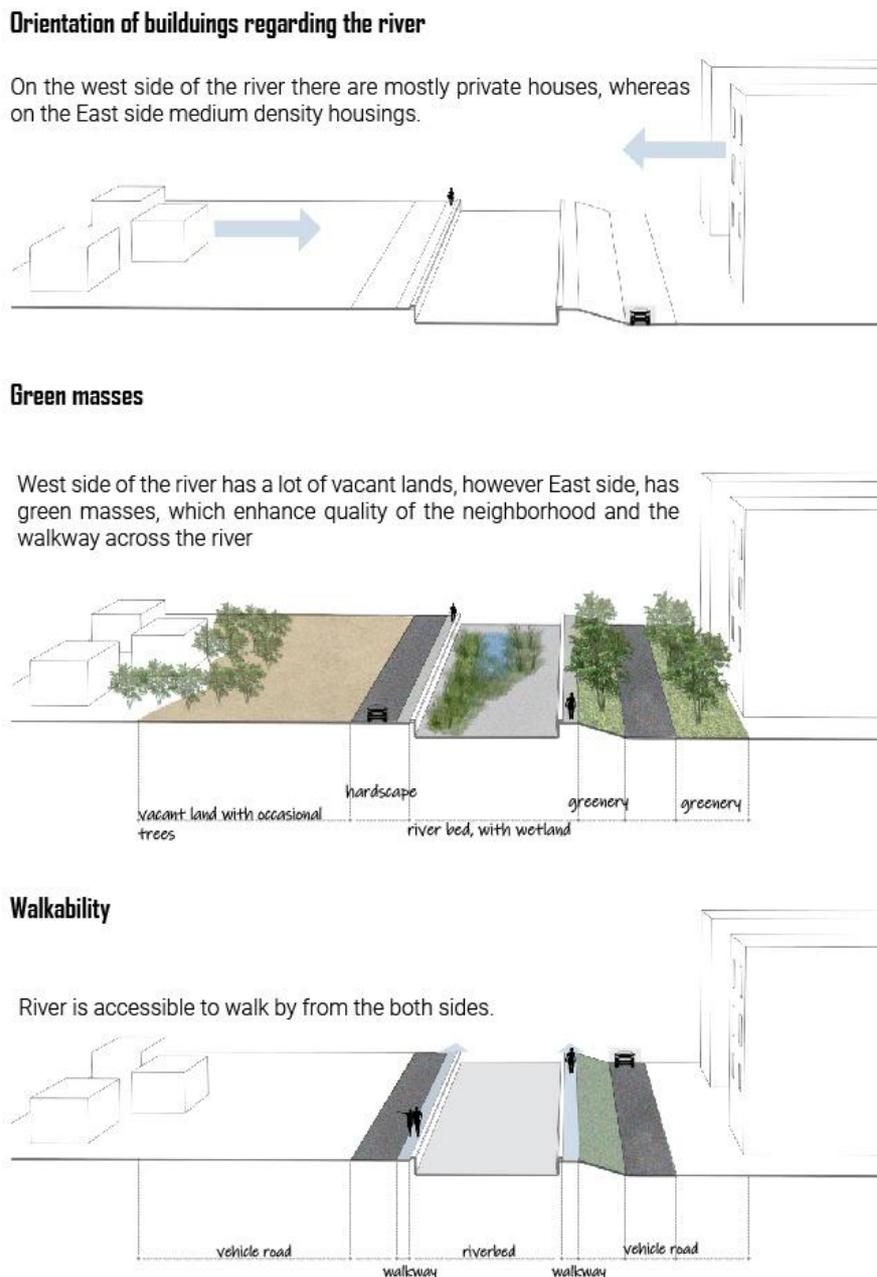
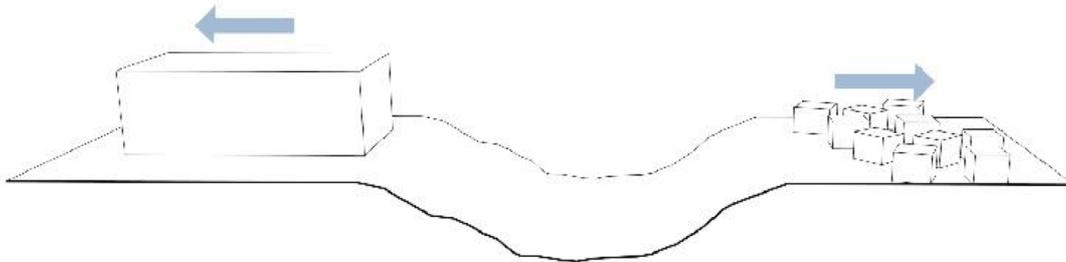


Figure 52: Cross-section of Ala-Archa River inside micro-districts

4.4.2 River inside Low-rise Residential Zone

The cross-section of river inside low-rise residential areas are not as good and people oriented as in the micro-districts. It usually has plenty of greenery, however, building are located with their backs or fences to the river and in most cases, walkways at least on one side of the river (in some places on both sides) are blocked.

Orientation of buildings regarding the river



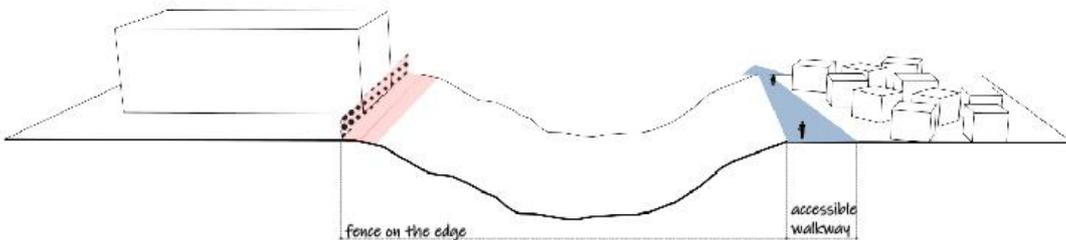
On the West side of the river there are mostly administrative and residential buildings, whereas on the East private housings. All builings are oriented backwards the river.

Green masses



Riverbed is filled with wild greenery. Gabion wall serves as retaining wall.

Walkability



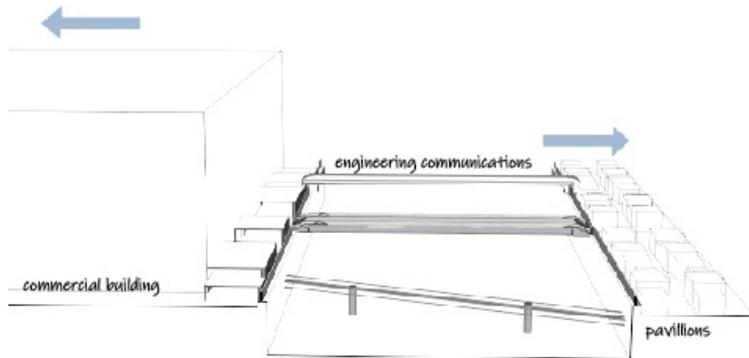
West side of the river is inaccessible because of the fence on the edge of the river, however East side has a potential for a promenade.

Figure 53: Cross-section of Ala-Archa River in the low-rise residential zones

4.4.3 River inside Industrial and Commercial Zones

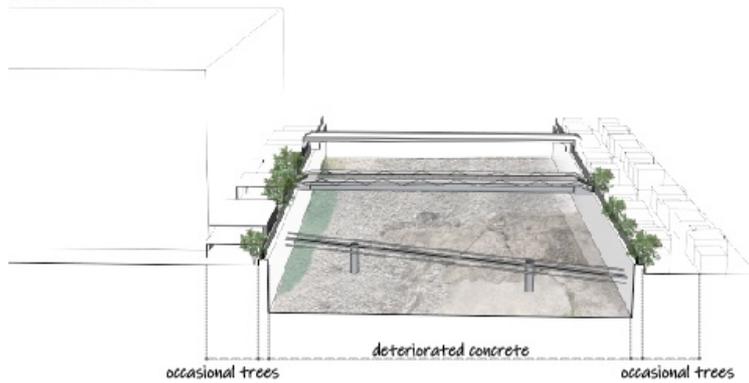
This is the third and by far the least successful and most problematic type of river cross-sections. Buildings are oriented away from the river, there is very little greenery, and there are no passages on either side of the river (Figure 54).

Orientation of buildings regarding the river



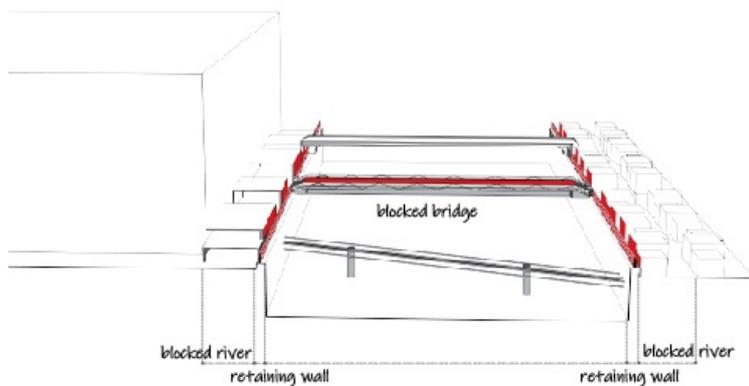
Light construction pavillions are oriented backwards to the river, which at the same time block visual and physical access.

Green masses



Existing river bed has occasional wild greenery.

Walkability



Orientation of pavillions and fence do not allow to access river, existing bridge is also blocked.

Figure 54: Cross-section of Ala-Archa River inside commercial zone

This analysis gives us an additional explanation why certain segments of the river are well-perceived and actively used by the residents, while others are abandoned. It also gives us clues as to what, where and how can be improved. Thus, aided with our findings from this and previous analytical sections we can move to the chapter on project recommendations for Bishkek rivers.

5. Project recommendations

Project recommendations include a broader conceptual vision of rivers in Bishkek and solutions necessary for the realization of this vision.

5. Conceptual Vision of Rivers: Bishkek Eco-Belt

The basis of the project’s larger conceptual vision of rivers is so called Bishkek Eco-Belt. It includes a series of green open spaces connected via walkways and bike-paths running along Bishkek rivers and canals. Currently, all green, such as Botanical Gardens, various parks, Karagachovaya Rosha, and authentic wild green spaces exist in isolation. However, as the diagram on Figure 55 shows, almost all of them are located next to or in the near distance from the rivers and canals. Thus, rivers and canals can become infrastructural elements that connect them all together into one ecological network of greenery and water – two major ecological components of urban environment.



Figure 55: Conceptual vision of rivers – Bishkek Eco-Belt

Creating a city-wide ecological network of spaces is particularly important in the context of acute ecological crisis in Bishkek: for the last three years, the city has been continuously rated in the top three cities with the most polluted air. Bishkek Eco-Belt can become the basis of a more developed network of walking and biking routes that can serve as alternatives to cars. In addition, Eco-Belt can provide many more recreational and exercising opportunities for city residents. The perimeter length of the Eco-Belt would be 26 km.

One of the international examples that served as an inspiration for Bishkek Eco-Belt vision was the Atlanta Beltline project that used a former railway corridor and railway easements around the core of the city of Atlanta, Georgia, USA to create a 22-mile loop for pedestrians and bikers. The project was very simple in its vision, yet, it was very successful and led to all kinds of new developments taking place along the Beltline. It has 5 open trails and it connects 7 public parks and 45 neighborhoods.

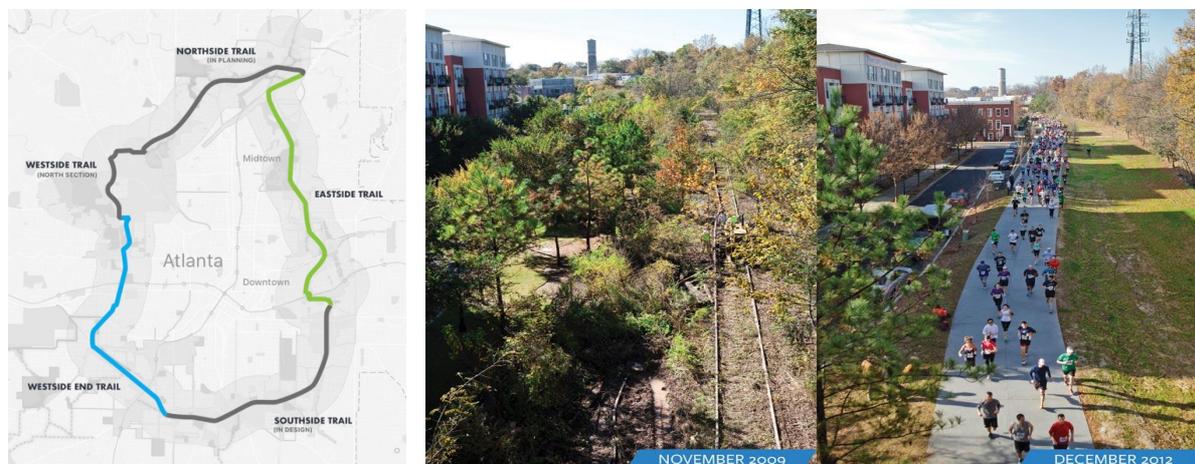


Figure 56: Atlanta Beltline⁴

Similarly to Atlanta Beltline, the Bishkek Eco-Belt can become a city-wide recreation and socialization space that brings together city residents from various neighborhoods and diverse social groups. Its simplicity, boldness and city-wide scale can serve as the vision that can help generate funding for various smaller scale projects necessary to implement this large conceptual vision. We have developed several more specific recommendations for the Bishkek Eco-Belt vision implementation. These are presented in the following three categories of recommendations: urban planning, urban design and urban art.

5.1 Urban Planning Recommendations

We propose several main urban planning recommendations:

1. **Creating the continuous uninterrupted passage for pedestrians and bikers along the entire length of both rivers and canals.** Two measures are necessary for this:
 - a. **Clearing the blocked passages.** The project has identified several segments of two rivers, where passage along the river is completely blocked by various properties that occupied the space next to the river. This is illegal because according to the law, there must be a 6-meter distance between the river and any kind of property boundary on

⁴ <https://www.adaptationclearinghouse.org/resources/case-study-of-the-atlanta-beltline-adaptation-aspects.html>

both sides of the river. The strong political will is necessary to reinforce this law and push back the properties that encroached into the municipal land.

- b. **Creating the under-the-bridge passages.** Currently, there are several bridges on both rivers, where people walking along the river must make lengthy detours in order cross the street at traffic lights. This makes the passage longer, inconvenient and less safe. That is why we identified a number of locations, where the under-the-bridge passages would make it so much easier and faster both for walkers and bikers to cross the street on their uninterrupted journey.
2. **Restoring ruined riverbeds and riverbanks.** The research identified a number of locations, where current physical conditions of riverbeds and riverbanks is very hazardous. The main reason why this happened was heavy machinery digging rivers for stones. Machinery destroyed the concrete banks and dissipation walls and depleted rivers of stones, which led to the erosion of riverbeds and collapse of several concrete banks. Further digging rivers for stones must be completely forbidden, while the hazardous segments must be restored to their original conditions.
3. **Reorienting buildings to face rivers.** The successful examples from micro-district show that when apartment buildings face the river or their yards open to the river, this creates good conditions for connecting the building fabric with the river. However, there are several types of places along both rivers, where buildings have their backs to rivers. We highly recommend that their orientation must be reversed to face the rivers. This is important if rivers are to become aesthetically pleasing and socially and economically engaging urban elements.
4. **Diversifying the social, cultural, economic and commercial activities along the rivers** is necessary to make rivers attractive for city residents and to make their recreation more engaging.
5. **Improving the quality of sidewalks along the river.** The research identified segments of both rivers where walking paths are either missing or not paved. Sidewalks should be paved properly to be suitable for pedestrians, people on wheel-chairs, residents with baby-strollers and bikers.
6. **Enhancing the quality of existing green and open spaces along rivers.** Research revealed a number of existing open spaces that are currently abandoned or in poor conditions, but can become important anchors of recreation and socialization. Such elements of street furniture as benches, children playgrounds, bars for sport exercises, etc. can enhance the recreational component.
7. **Planting trees along the river.** This is absolutely crucial element of riverbank treatment. If we want the river-walks to be actively used, trees are very important for creating shades and make the walking experience pleasant.

5.2 Urban Design Recommendations

Members of research team who are professional architects proposed several design solutions for treating rivers and riverbanks. These could be grouped into three categories: designs for the internal sides of riverbanks, designs for bridges and designs for sidewalks.

5.2.1 Designs for riverbank interiors

Currently, riverbanks do not have any infrastructural elements for people to go down to the river. If one decides to reach water, he or she has to jump from the riverbank wall or search for existing stones. We observed how in several locations, residents themselves created such stairs and even concrete platforms inside the river. The research team thought of several aesthetically interesting and functional ways for people to go down to the river. An example of such design is an amphitheater, like the one on Ala-Archa river across from Asia Mall shopping center. The steps to the river also become the steps for people to sit, have lunch, rest and socialize (Figure 57).



Figure 57: Proposed amphitheater or affordance landscape (photo-collage by the authors)

5.2.2 Designs for bridges

We propose to create multifunctional bridges, that not only. Serve the purpose of crossing the river, but also become spaces of representation. They can have multiple levels and can help people to go down to the river as well. We envision them as made not of concrete, but of light structures and materials.





Figure 58: Design solutions for multifunctional and multi-level bridges (designs Meder Akhmetov)

5.2.3 Designs for sidewalks

Finally, architects proposed some designs for sidewalks. These mostly include landscape design solutions for the choice of paving materials, shape and color of sidewalks, design of street furniture (e.g. benches, light-poles, etc.).



Figure 59: Design of a promenade along Ala-Archa river in the low-rise residential zone (collage by Jamilya Baiborieva)

5.3 Recommendations for using public art along the rivers

One of the main reasons why the Atlanta Beltline was successful – it actively used various forms of public art all along the loop for graffiti and murals on the walls to various sculptures placed along the loop. Our research team also sees the great potential in using art for enhancing the aesthetic qualities of the river and filling the river space with some additional meanings. Below is a collection of visions on how art can be used in the Ala-Archa River by the architect and artist Meder Akhmetov.



Figure 60: Coloring the columns at the place where river enters the city (collage by Meder Akhmetov)



Figure 61: Using rock-art on the large river stones, creating symbiosis of organic and inorganic (collage by Meder Akhmetov)



Figure 62: Sculpture «Listening to the River» (collage by Meder Akhmetov)



Figure 63: Observation/meditation balconies on the river