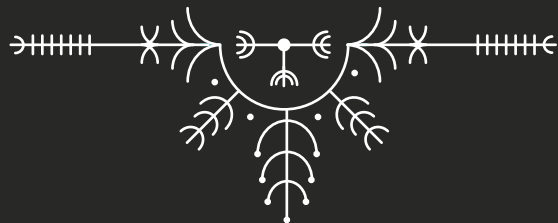


# PEACE IN THE PIPELINES

HYDRO-SOCIAL INFRASTRUCTURE  
DEVELOPMENT IN BOSNIA'S  
URBAN BORDERLAND

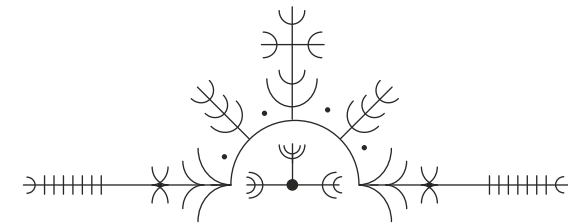


RIBA DISSERTATION  
NOMINATION 2020

On the 25th anniversary of the end of the Bosnian War, this dissertation asks - can water infrastructure development progress long-term peacebuilding efforts in contested territories?

Although water is Bosnia's most abundant natural resource, less than 65% of the population are connected to public water utilities. As international investment pours into the state water infrastructure sector, Sarajevo's subterranean water network is used as a lens to investigate tripartisan ethno-national governance, yearning for pre-war normality, social customs of ethnic division and the psychology of dealing with individual and collective trauma. Capitalising on the grid's horizontal and vertical span across geographical, political, social and cultural spheres, this research investigates what a truly 'sustainable' water infrastructure development could contribute to the splintered city of Sarajevo.

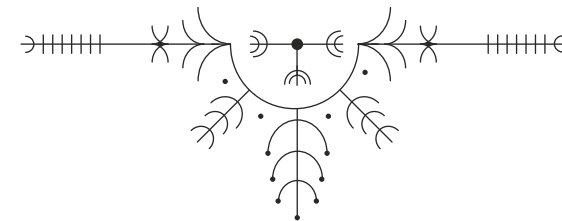
In light of the current global health crisis and the growing impacts of climate change, the research empowers the politically underrepresented domestic end users, whose voices often go unheard. The research was informed by seven months of immersive fieldwork conducted in Sarajevo, while collaborating with the NGOs Project 1948 and the Post-Conflict Research Centre.




**PEACE IN THE PIPELINES:  
HYDRO-SOCIAL INFRASTRUCTURE  
DEVELOPMENT IN BOSNIA'S  
URBAN BORDERLAND**

**RIBA DISSERTATION  
NOMINATION 2020**

**This dissertation is the result of my own work and includes nothing which is the outcome of work done in collaboration, except where specifically indicated in the text.**







“Water, over time, renders every substance soluble and mixes it with that which it already contains. Solubility, both physical and metaphorical, means the capacity to assimilate anything and everything into a context where all can coexist. This fundamental property of water provides us with yet another model for our own lives - that of the ideal integrated community.

Water is a source of inspiration for those who wish to live in a free, civil, multicultural and multi-ethnic society, in that it incorporates everything and respects its diversity. Chemists have discovered that the dissolution of substances in water is a creative process that tends towards equilibrium, towards a high level of symmetry. The same holds true for the constituents that mix together in any community

Water, Pure and Simple:  
The Infinite Wisdom of  
an Extraordinary Molecule  
Paolo Consigli (2008: 38)



WITH THANKS TO

**INGRID**  
For her guidance and provision of space,  
which has allowed me to grow resilient and find my voice.

**AMY**  
For a three year friendship  
adorned with subversive feminine strength.

**ARAM, CONRAD & JAMES**  
Whose questions, stories and knowledge have  
given life to my work, and meaning to my architecture.

**HANNA**  
Who has taught me how to make my words heard.

**DAVID & RACHAEL**  
The stone and anchor to my rope.

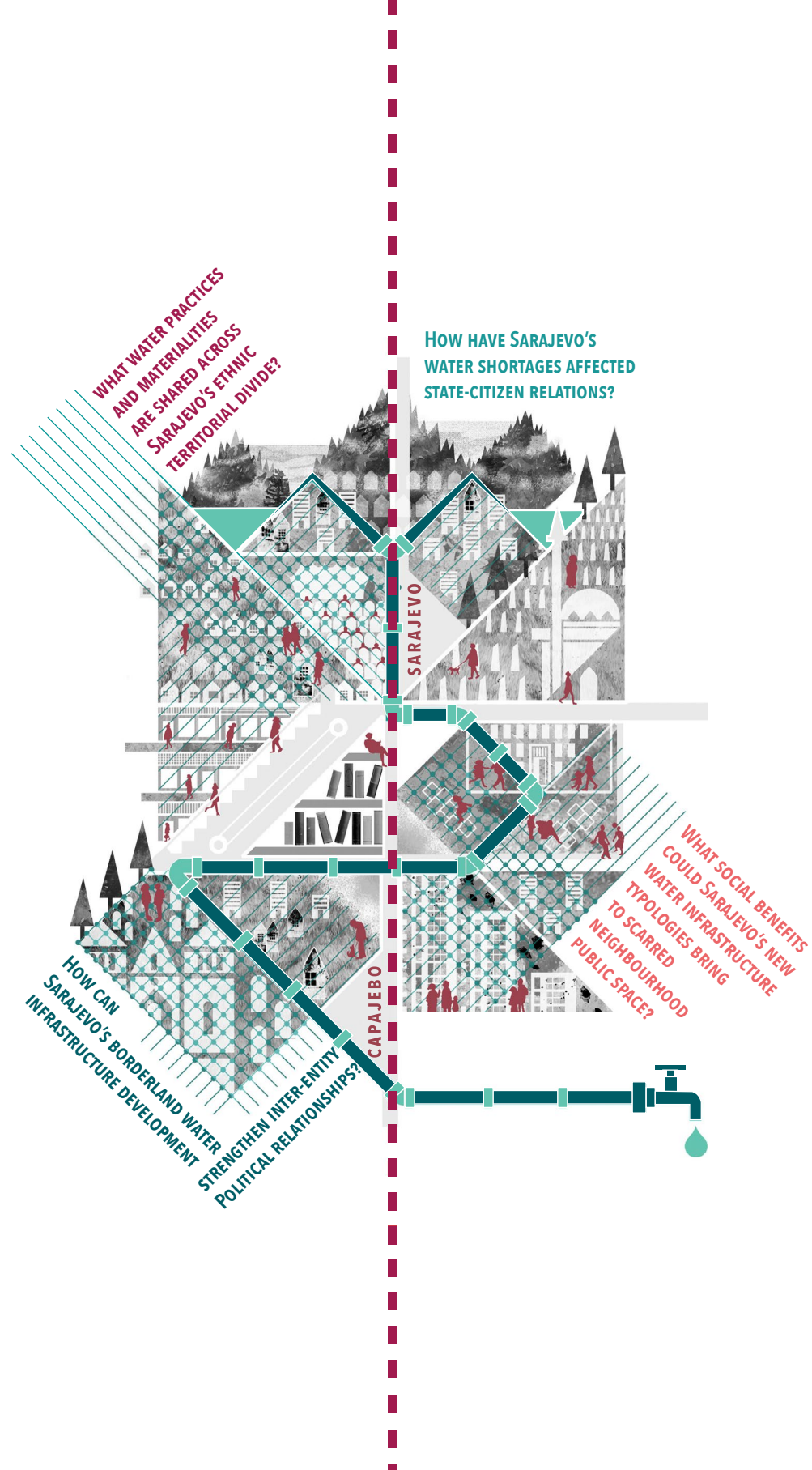
**CHRIS, MARWA, TANVI, ALFRED,  
KHENSANI, REBECCA, PATRICIA & PEDRO**

Who have proven that studio is not the room,  
but the people willing to constructively share  
their time and energy with others.

**AND TO THE WOMEN OF SARAJEVO**

**VELMA, TATJANA, AMRA  
ELMA, BRANKA, BOBA  
& BERINA**

Who have survived civil war, like myself,  
my sister, my mother and my nannies.  
May our inherited resilience and resistance  
continue to guide us through the inter-generational  
chaos of living in these peculiar edges of Europe.



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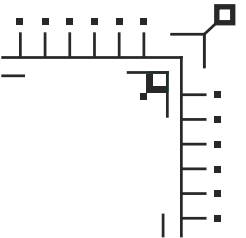
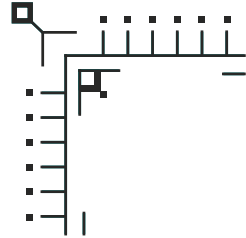
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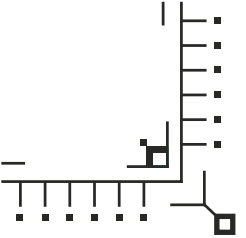
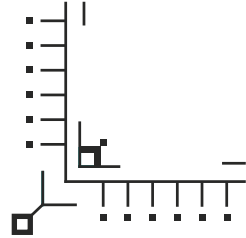
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# INTRODUCTION







Sarajevo's water infrastructure development plays a role in perpetuating the damaging political, social and spatial legacies of the Bosnian War (1992-95). Much has been written about the legacy of the conflict, and the nation's peacebuilding process. However, this work takes a nuanced approach, using the lens of water infrastructure to explore themes of opposing ethno-nationalist governance, yearning for pre-war normality, ethnic division<sup>1</sup> and coming to terms with the past in Bosnian society. The development of Sarajevo's poorly maintained water network is one in a sea of municipal projects to be awarded international funding for sustainable maintenance and grid expansion. This thesis argues that in order for these numerous spatial plans to be truly sustainable, they must address water's societal 'hydrosocial' dimension of its post-conflict context, as well as its hydrologic principles. The term hydrosocial cycle is used to theorise and analyse water-society relations. Based on the hydrologic cycle, it is modified in important ways. While the hydrologic cycle has the effect of separating water from its social context, the hydrosocial cycle deliberately attends to water's social and political nature (Linton and Budds 2014). Sarajevo's unique urban borderland<sup>2</sup> is an appropriate testbed to explore how the water network's span across the river-basin, city, neighbourhood and site scale can spatially contribute to peacebuilding efforts.

Water is more than a utility resource within Bosnian communities. The nation's most abundant natural resource is an historical, cultural, social and psychological asset that is used in public spaces to strengthen individual wellbeing and group belonging. This work explores the ethnic acceptance of various social norms of water use amongst Bosnia's peoples and institutions. The design thesis argues

---

<sup>1</sup> The Dayton Accords (1995) entrenched the conflict's ethno-national territorial division by establishing two separate entities. The demographics of the Federation of Bosnia and Herzegovina (FBiH) is predominantly Bosnian muslim (Bosniak) and Bosnian Croat (Roman Catholic), while the Republic of Srpska (RS) is predominately Bosnian Serb (Serbian Orthodox).

<sup>2</sup> The Inter-Entity Boundary Line runs through the suburbs of Sarajevo, dividing it into two homogeneous territories - Canton Sarajevo (FBiH) and East Sarajevo (RS).

that the geographical and governmental scales of these vast projects have the potential to strengthen inter-entity trust and citizen pride in a shared national identity, while enhancing social cohesion, citizen wellbeing and quality of life on both sides of the divide. The impact water infrastructure development may have on such wide-ranging social issues within this challenging political climate maybe ambitious. However, the thesis sets out to establish the design project's peacebuilding potential, and possible obstacles that could diminish it. To this end, the essay flow will be as follows:

## **1 WATER'S MANAGEMENT AS PEACEBUILDER RIVER BASIN SCALE**

Flowing water cannot be controlled by shifting political boundaries that are plotted without consideration of groundwater parameters, like Bosnia's Inter-Entity Boundary Line (IEBL). Such divided territories become co-dependent on their shared river basins, which are essential to sustaining their societies. This chapter asks, how can Sarajevo's borderland water infrastructure development strengthen inter-entity political relationships? This chapter contributes a new case study to the growing body of research into 'post-conflict hydropolitics'. This field investigates the peace-building role of water management in a river basin shared by former adversaries. The chapter will begin by addressing how Bosnia's post-Dayton political apparatus effects national and borderland water management. Next, the distinct characteristics of Canton Sarajevo's urban borderland will be examined. The findings of this section will drive an analysis of relevant post-conflict transboundary case studies, to explore how the existing inter-entity relationship can be strengthened by water infrastructure development, or weakened by it. Finally, the design implications of how the chapter's findings could shape Sarajevo's water infrastructure development will be explored, highlighting potential political roadblocks, and raising questions to be answered by the design project.

## **2 BLUE CIVIC COMMONS INTERFACES CITY SCALE**

Different types of water politics can be identified by their differing domains, stakeholders and forms of engagement. This chapter will continue to examine the post-conflict state

by transitioning from 'hydropolitics' to 'everyday politics', asking, how have Sarajevo's water shortages affected state-citizen relations in the fragile post-conflict context? The term 'state-citizen relations' is defined to include the ability of citizens to demand services and hold state actors to account, and the extent of the state's responsiveness to their demands and needs. It also includes citizens' rights and responsibilities towards the state, and the level of trust they have in the state (Osofisan 2011). This work will analyse these forms of social contract by first exploring how everyday politics concerning water access have been practised in the city, during a decade of water shortages. Next, the effects of the water shortages on the citizens' everyday lives will be examined. The chapter will analyse how they have reacted, and reveal what spaces and practices they have come to be associated with state failure. Finally, we will investigate what responsibilities state and citizens are fulfilling, and how this is impacting society as a whole. The design implications of these findings will be examined, opening topics to be explored in the following chapters.

## **3 VISIBLE SPACES OF RESILIENCE NEIGHBOURHOOD SCALE**

The exploration of socially 'unblackboxing' the civic water infrastructure will be further addressed in chapter 3, examining how Sarajevo's communities could benefit from the spatial 'unblackboxing' of their neighbourhood water infrastructure sites. Jefferson and Letteri (2017) outline how the 'unblackboxing' design process benefits can innovatively enhance public space. The definition of this design process involves bringing parts of the hidden water infrastructure system to the foreground of public space. This design approach is of use in Sarajevo's post-conflict context, because it proposes innovative solutions that can be applied across the city, to problems that are typically resolved through banal design responses. Therefore, this chapter asks what social benefits could Sarajevo's new water infrastructure typologies bring to neighbourhood public space?

This chapter will add to the small but growing body of research that argues that blue and green public spaces have the most significant psychological public health benefits of all urban natural spaces. In a post-conflict city like Sarajevo, mental health issues are rife due to socio-economic difficulties and war trauma.

Although daily practices of well-being, including spending time in nature, are being encouraged by internationally funded localised mental health initiatives, limited neighbourhood green space is accessible to residents due to informal post-war urban development. The chapter first analyses the spatial and social properties of Sarajevo's current water infrastructure sites. The public health benefits these sites could potentially provide to both state works and neighbourhood residents will then be explored. A case study analysis of the 'unblackboxing' infrastructure design process will open questions to be explored in the final chapter.

#### **4 BOSNIAN MEANINGS AND MATERIALITIES OF WATER SITE SCALE**

Water and people are connected in a provisional sense but also experientially, culturally and metaphorically. Anthropological literature has drawn attention to the cultural practices encoded in public blue spaces, whose spatial materiality is also distinct to locality (Strong 2004; Wright 2008; Hastrup and all 2015; Watson 2019). This chapter will address the final question of, what shared water practices and materialities exist in public blue spaces across Sarajevo's ethnic territorial divide? The findings will inform the design project experiments through spatial programming, with the intention of creating inclusive inter-ethnic spaces that support community interaction. The material spatial characteristics of these spaces will aim to create neutral environments that will make all peoples feel uncomfortable, to enable such interactions to take place.

The chapter will begin with an analysis of how Sarajevo's public space has developed since the siege to build new ethnic communities following the shift in population. Following that, it will analyse how public blue spaces are perceived by Sarajevo's residents. The level of inter-ethnic interaction that happens in these blue public spaces will be analysed, to determine if similar spatial programmes could be adopted into the multi-purpose water infrastructure sites, to create spaces that attract both communities to interact. The thesis will close with a material analysis of Bosnia's sacred and memorial blue spaces. This will determine common trends of materiality in spaces designed to strengthen group identity.

## **RECENT HISTORICAL CONTEXT**

In Bosnia and Herzegovina, the legacy of the Dayton Agreement has been the successful establishment of peace by means of segregation. The Inter-Entity Boundary Line has geographically enforced ethno-national differences between Bosniaks, Serbs and Croats. Focusing on the frontier city of Sarajevo, this essay unearths the problematic effect segregation has on the reconciliation process within the urban context, which will inform an architectural intervention to enhance social cohesion within the city. Opposing collective identities have become engrained within the urban fabric as a result of two homogenised populations, the influence of political and international players and the legacy of accidental and intentional memorialisation of war.

Bosnia and Herzegovina was celebrated as the most ethnically heterogeneous region of the former Socialist Federal Republic of Yugoslavia (Markowitz 2010). Following the Republic's dissolution, it was this character of plural 'urbanism' as a mode of living (Wirth 1938: 10) which came under attack in the Siege of Sarajevo (1992-95) during the Bosnian War (1992-95). Tactics of territorial gain and ethnic cleansing occurred throughout the country between Serbs, Bosniaks and Croats. However, Sarajevo became a target of 'urbicide' (Stevenson 2010) due to its reputation as a beacon of diverse repositories of cultural identity (Pullan and Baillie 2013: 6). The attack successfully transformed the melting pot of religious tolerance and ethnic diversity into a segregated city, with divided homogenised populations.

The Dayton Agreement brought peace to the country. This was in-part through the implementation of an internal border along ethnic war-time partition lines. The Inter-Entity Boundary Line (IEBL) divides the country into two entities: The Federation of Bosnia and Herzegovina and the Republic of Srpska, which are both equally recognised as second tiers of government. This principal of peace through segregation was driven by the belief that conflict can regularly occur alongside high levels of intergroup contact, as seen in similar situations such as Belfast during the 1970s (Mac Ginty 2001). Bosnia and Herzegovina has not reverted to violence within a decade of peace, unlike almost half of post-conflict societies (Högbladh 2006). Therefore, enforced segregation which has reduced intergroup contact, can be acknowledged as a successful measure for short-term peace building within the country.



However, the long-term effect of geographical division along ethno-national lines undermines the establishment of lasting peace and cohesion. The IEBL runs through the suburbs of Sarajevo, transforming it into a 'frontier' city. The border divides the homogenised populations of Canton Sarajevo from East Sarajevo (Velimir 2016: 55). Their opposing collective identities have been engrained into the urban fabric on both sides of the divide. This has occurred due to homogenised demographics, the post-war reconstruction of exclusive cultural buildings and forms of accidental and intentional memorialisation. Herein lies the irony of the Dayton Agreement's aims. Territorial separation has enforced and stabilised ethno-national divisions, rather than restoring the multinational heterogeneous state which existed before the war.

During post-war reconstruction, the urban fabric has been shaped by collective identities. The opposing cultural stereotypes and differences between Bosniaks and Serbs have taken a spatial form. Current and future generations are moulded by the segregated collective identity imposed upon them by their surroundings. The prolonged effect of such territorial segregation in the urban environment can breed ignorance, introversion, intolerance and prejudice (Forbes 1997). In order to counter this, it has been proven that contact improves intergroup relations once a respective amount of time has passed since the conflict (Allport 1958). As recent studies show, positive contact between divided groups reduces social distance (Pettigrew and R. Tropp 2000), prejudice (Pettigrew and Tropp 2006), sectarianism (Hayes and others 2007) and increases the desire to have ongoing interactions (Gaunt 2011). As ethnic identities become territorially entrenched within the city, opportunities for cross-group integration are even more important for long-term reconciliation.

## **METHODOLOGY, POSITIONALITY & TERMINOLOGY**

Growing up as a child of the peace process in the Northern Irish borderlands informed my decision to immerse myself in the field. As an outsider, this was fundamental to gaining insight and credibility into the sensitive and nuanced local knowledge of Sarajevo's post-conflict society, and its hydrosocial politics, history and customs. I conducted two weeks of fieldwork during July 2016 and September 2017, equally dispersed between RS and FBiH settlements across the country. This trips informed my decision to move to Sarajevo for 6.5 months between May - November 2018 to conduct qualitative research. Due to the sensitive nature of water infrastructure and national security, it took this time to gain access to experts within the local water company and to arrange a tour of their infrastructure sites. I visited and photographically recorded seventy-six local, national and private water spaces, mainly in the Sarajevo region. I then immersed myself in these photographs by extensively coding their social and spatial conditions to highlight the themes and anomalies presented in chapters 2, 3 and 4. As this process of image-making was integral to the research method, a selection of images have been intentionally included in each chapter to communicate a sense of place, society, locality and materiality that cannot be captured through text.

To gain insight into Sarajevans' perceptions and meanings of water shaped by their social and spatial environment, I collaborated with the NGO Project 1948 on a photo-voice project. This methodology enriched my research, revealing political, social, cultural, historical and psychological needs of Sarajevan's water practices. Nine Sarajevans from different ethnic backgrounds were debriefed and gifted cameras to capture water conditions within their environments of meaningful value. A semi-structured interview was conducted a week later, in which the participants shared the encoded local knowledge framed by their photos. A public photo-voice exhibition of selected images was held in Sarajevo's Post-Conflict Research Centre, to empower participants to share their water related experiences with policymakers and fellow citizens. Participants photo-voice images, first names and direct quotes have been used throughout the thesis, to continue the methodology's empowerment agenda.



Throughout the fieldwork period, thirty-seven structured and semi-structured stakeholder interviews were conducted and qualitatively analysed for themes. Interviewees included Sarajevo citizens, local experts and state employees involved in Canton Sarajevo and East Sarajevo's water infrastructure development and siege survivors who have been made anonymous. Unfortunately due to bureaucratic difficulties, it was not possible to speak directly to state employees of East Sarajevo's water company. However, where possible interviewee findings have been triangulated with other sources. Oral history interviews were sensitively conducted to widen cultural understanding of local water meanings, with the ethical guidance of Sarajevo's Post-Conflict Research Centre. Interviewee demographics were unfortunately limited to those who spoke English or the availability of a translator, due to the author's inability to fluently speak the local languages. The language barrier unavoidably restricted the age and social demographics of voices represented. The thesis does not contain a separate literature review, but addresses relevant existing research continually throughout each chapter. Due to the relatively broad range of topics covered, some connected issues, while acknowledged, have been set aside. This includes capitalisation of global financing on new build projects of neglected infrastructures in chapters 1 and 2, and the contested roles of Bosnia's memorials and narratives of memorialisation in chapter 4. Analysis of a breadth of contemporary and historical international, European and local context-specific case-studies are presented in each chapter, engaging the project in broader field related design discussions.

For readability, Bosnia and Herzegovina is referred to as 'Bosnia' throughout the thesis. The nation's two political entities of the Federation of Bosnia and Herzegovina and the Republic of Srpska are referred to as FBiH and RS. Throughout the thesis, the entities, cantons and municipalities have been referenced with ethnic labels. Such terminology is regrettable shorthand for categories that are often imposed rigidly by others but are experienced more subtly and fluidly than their labels convey. It must also be acknowledged that the entities are not entirely homogeneous, with varying minority ethnic demographics vary.



## 1.1 DAYTON'S ENTITY-LEVEL WATER MANAGEMENT SPLINTERS THE NATION

During the Bosnian war, control of territory, infrastructure, and natural resources were weaponised to secure ethno-national interests. In post-Dayton Bosnia this tactic has evolved. Armed militia have been replaced with spatial plans for entity development. Under the Dayton Accords, Bosnia was reshaped into a decentralised state (fig 1.1), assigning the entities of FBiH, RS<sup>1</sup> and the Brčko district the government function of spatial planning and regional development (UN 1995: 64). Without a national development department, each entity advances its agenda in isolation, devoid of apparatus to permit inter-entity collaboration<sup>2</sup>. The implementation of separate planning strategies has created a nation of 'splintered' infrastructures. This term, coined by geographers Graham and Marvin (2001), theorises how infrastructure development can produce different standards within a city, depending on socio-economic zones. Upon application, splintering occurs in Sarajevo across the IEBL. Uneven standards of infrastructure maintenance and development occur across the boundary, as different entities govern the territories. In this context, we expand the meaning of 'splintering' to include fracturing between homogeneous ethno-national entities. As such, settlements in the IEBL borderland are geographical enclaves that are bypassed as development occurs on the other side, further segregating the urban landscape. With each entity receiving funding for development independently, uneven rates of economic growth, environmental protection and standards of living occur across the divide.

Bosnia's once unified national water management was also splintered between the entities under the Dayton Accords. This governmental style

**1.** Both entities are equally recognised as second tiers of government, but due to their powers appointed by the Dayton Accords, their influence surpasses the primary tier of national governance. FBiH controls 51% of Bosnia, while RS controls 49%.

**2.** In the FBiH, policy and development is within the jurisdiction of the canton, while the municipality controls urban planning (Reményi et al. 2016: 6). The RS's decentralised model lacks administration at the canton level, which increases the influence at local and entity level (Korjenić 2015: 64).

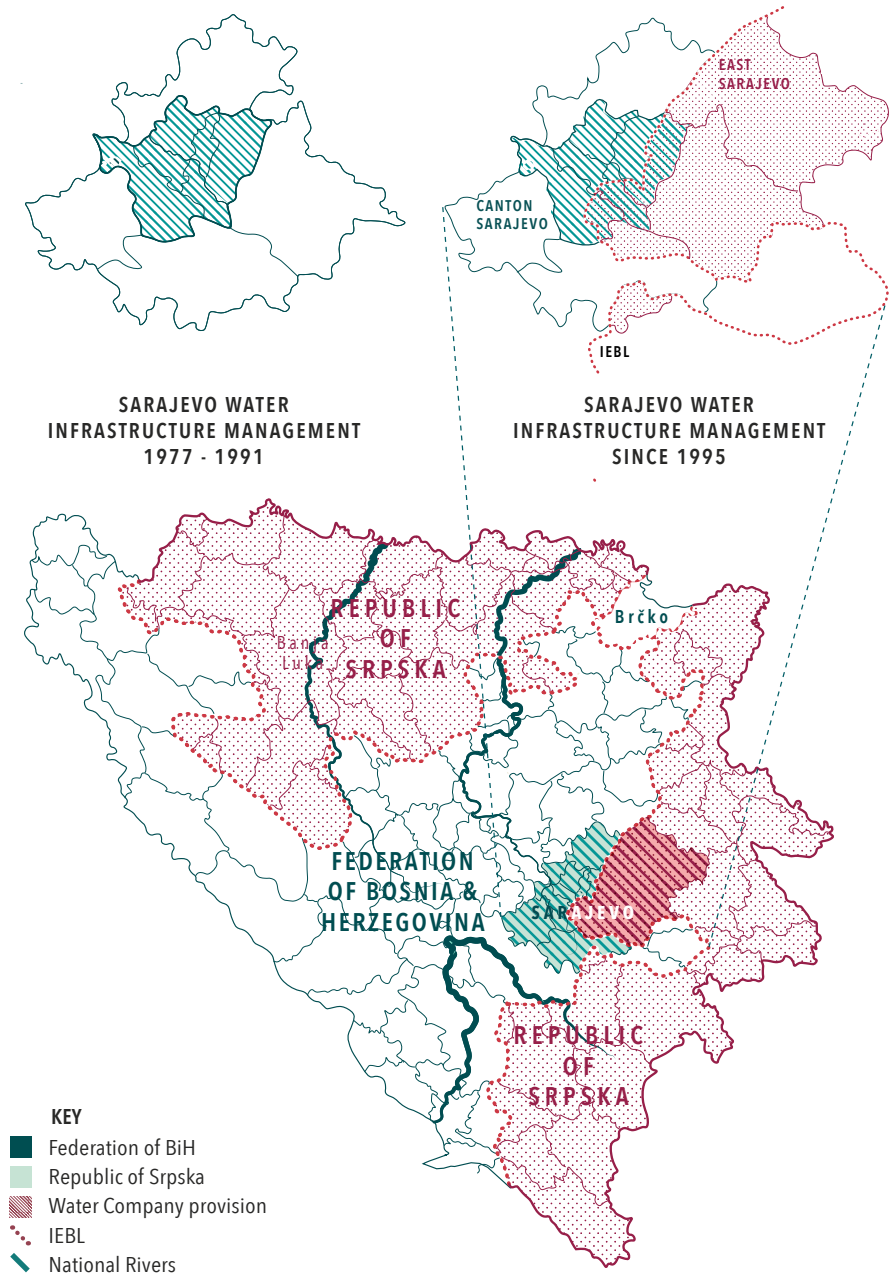


Fig 1.1 Bosnia's decentralised water infrastructure management. Author's map - 20.12.19.

of service delivery and infrastructure development produces noticeable discrepancies of infrastructure development in the urban IEBL borderland regions, such as Canton Sarajevo (FBiH) and East Sarajevo (RS). Both public water utility companies share the Bosna river basin's hydrologic cycle. However, different public companies control their grids and implement water infrastructure projects independently (fig 1.2).

Furthermore, as their water infrastructure was laid during the Austro-Hungarian and Yugoslavian era, their physical water networks and resource flows remain interconnected and co-dependent. The findings of Janáč and Van der Vleuten (2016: 287) reveal that even with the disintegration of a political regime, there is a surprising path dependency of subsequent infrastructure expansion across a splintered region. According to Bichsel (2016: 367), water networks remain unchanged because they have been constructed from robust, durable materials. Also cost-intensive technical work is required to redirect the system, making complete splintering an unlikely expenditure. Rather than collaborating on joint initiatives, the three planning departments work in reaction to the other entity's policies after their publication (Bassi 2013: 85). At this scale, the IEBL functions as a 'boundary' (Gould 1995) which outlines the limits of territory to be strengthened and defended. Cross-border policies do not exist to prevent wasting resources, or to uphold environmental standards or even to improve the standard of living for all residents regardless of ethnicity. Instead, development occurs without considering the impact upon the other entity's resource supply, making both networks vulnerable to uneven levels of water stress and failure.

A relevant case is the GrCF: Sarajevo Water Project, which will develop Canton Sarajevo's (FBiH) water network but leave East Sarajevo's (RS) infrastructure in a state of stress. Funded by the European Bank of Regional Development, this project falls into their 'Green Cities Framework' portfolio. However, the sustainable aims of the framework are limited to the prevention of water contamination

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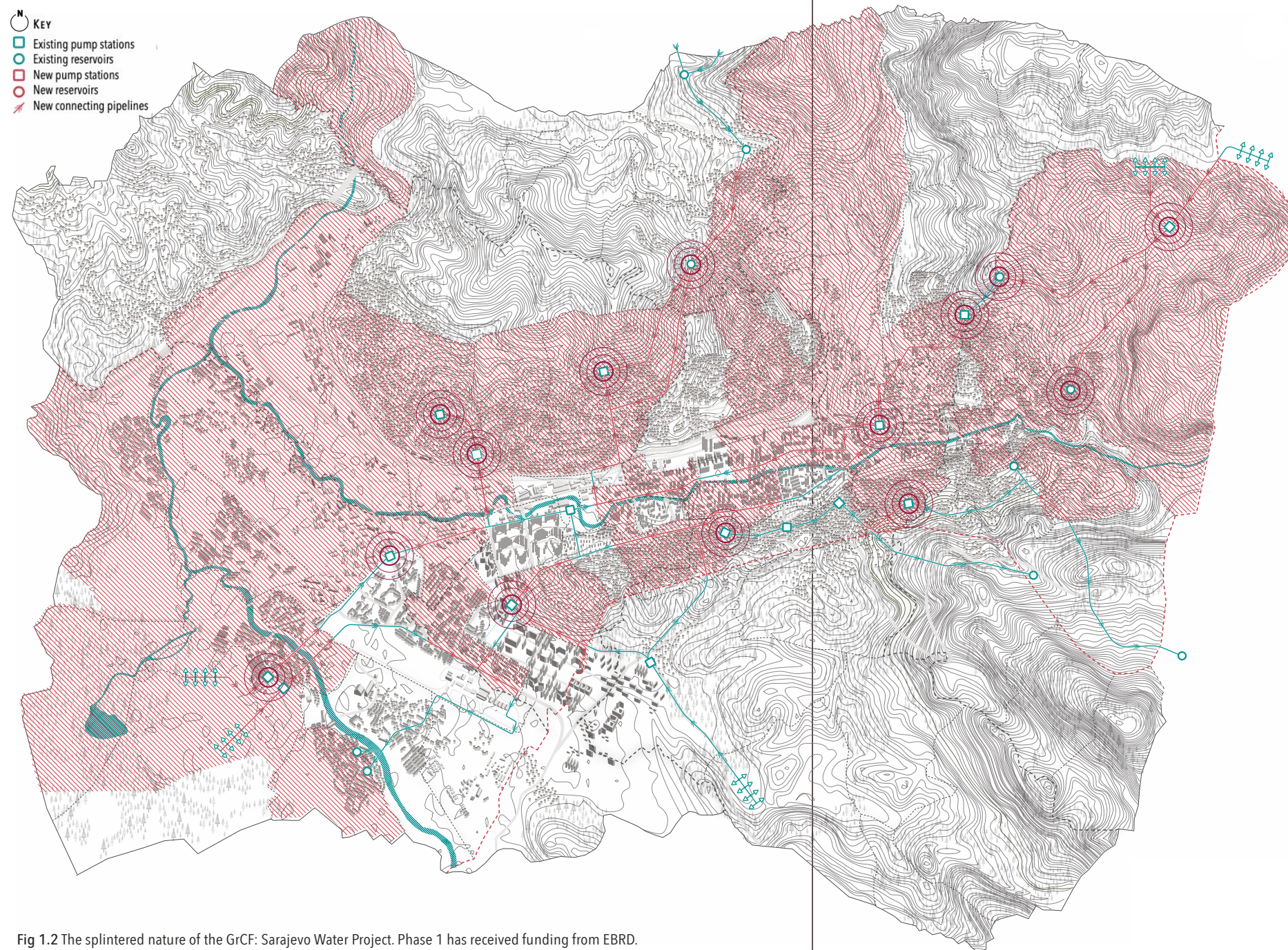
3. The author critically analysed the project in the Implementation Essay 4.

during construction works. The project scope ignores the International Water Associations (IWA) water-wise principals for settlements sharing a river basin. IWA advises financiers and government leaders to adopt a collaborative vision for development, as their settlements potential to thrive is intrinsically dependent on their shared river basin (IWA 2016: 5). Policymakers are advised to enable co-dependent settlements to collaborate on developments, to secure water resources, protect ecological health and prepare together for, and respond to, extreme events. By working together, the development goals of both entities could be equally considered and funded. This collaborative planning and development process is most efficient for the Bosnian nation, with the exchange of ideas allowing the socio-economic needs of both sides to be fulfilled as much as geographically possible. Instead, the European Bank of Regional Development is responsible for funding uneven standards of water access between Canton Sarajevo's and East Sarajevo's<sup>3</sup> (fig 1.3). This project misses an opportunity to strengthen their co-dependent network efficiently, and in the process, strengthen inter-entity political relationships and peacebuilding efforts.

Between 2020 - 2031 Canton Sarajevo's water company will receive a €75 million loan to fund a priority investment strategy to replace leaking pipes and pumps. This funding will end a decade of water shortages caused by the systems 70% water loss. Another €100 million will be used to construct twenty-two pump stations and reservoirs to ensure network resilience as the city grows (Sweco FS: 10). As sizeable quantities of East Sarajevo's water infrastructure were laid after 1996, maintenance investment is not required. However, its usual harvest is reduced to 40% during periods of low rainfall, leaving the system incapable of fulfilling the territories demand. East Sarajevo's water company (Vodovod i kanalizacija: 2019) have publicly announced that a new groundwater extraction source is required to end the shortages. However, as the entities are unable to collaborate on development projects, this requirement was not accounted for within the scope of GrCF: Canton Sarajevo project. East Sarajevans will be subjected to prolonged periods of water shortages, surpassing that of their borderland counterparts, until funding is secured to implement the works. East



- KEY**
- Existing pump stations
  - Existing reservoirs
  - New pump stations
  - New reservoirs
  - New connecting pipelines



**GrCF: SARAJEVO WATER PROJECT 2020 - 2032**

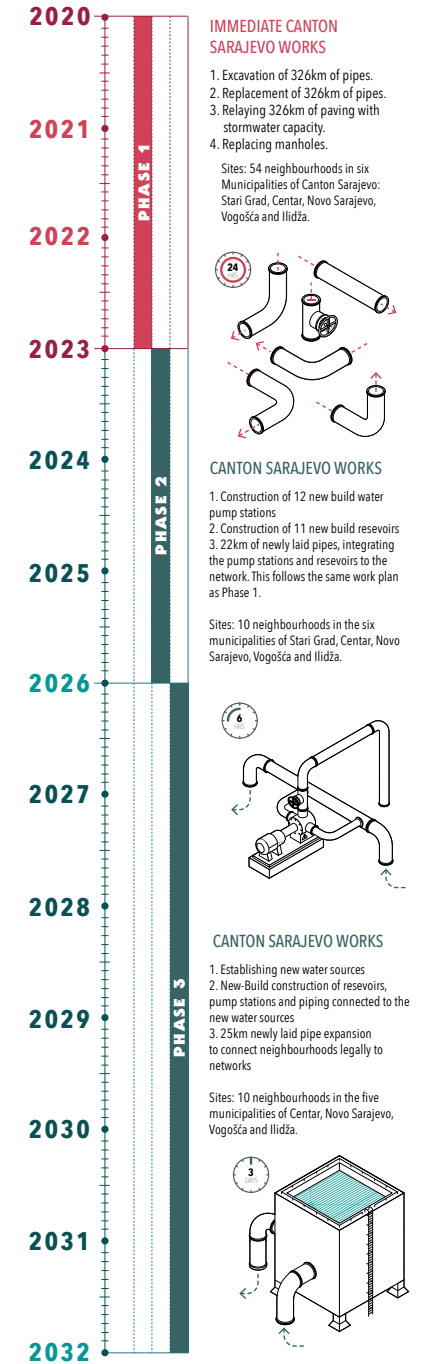


Fig 1.2 The splintered nature of the GrCF: Sarajevo Water Project. Phase 1 has received funding from EBRD.  
 Author's Map - 20.12.19.



Sarajevo's water woes may even worsen, as Canton Sarajevo constructs eleven new reservoirs without forecasting the impact on East Sarajevo's water supply. The reservoirs will remove extra volumes of water from their shared hydrological cycle, which could put East Sarajevo's network under increased stress.

## 1.2 SARAJEVO'S WATER INFRASTRUCTURE AS INTER-ENTITY SPACES OF TRANSACTION

Although the Dayton Accords prevent water management collaboration at the entity level, the local level cross-border relationship between Canton Sarajevo and East Sarajevo is strong. Transactions of knowledge (Interviewee 2), skill-sharing (Interviewee 8) and water exchange (Interviewee 7) occur across the IEBL. This public-public partnership is made possible due to the companies interconnected subterranean network, shared hydrological conditions and interwoven history. Transactions across the IEBL increase when unexpected disruptions diminish the system's ability to function. During times of crisis, the co-dependent relationship between the water companies is publicly revealed. Both companies are safeguarded by the exchange, as disruption at one point in a co-dependent network could have unforeseen consequences on the other side (Little 2002: 111). Collaboration has strengthened cross-border relations between Canton Sarajevo and East Sarajevo's water companies, diminishing the network's historic use as a tool of ethno-political violence.

This rare occurrence of inter-entity transactions between Canton Sarajevo and East Sarajevo is only possible because the two urban territories were divided by the IEBL. This soft border is a geographic edge, only visible on maps. As defined by Sennett (2015: 8), the IEBL marks the 'limit of territory' between the two entities (fig 1.4). The boundary divides Canton Sarajevo's south-eastern suburbs. Further along, it predominantly traces the natural boundary of the lowest ridge of Mt Trebević, which was the historic frontline of Sarajevo's besiegement (fig 1.5, 1.6, 1.7). The once heterogeneously populated region was divided by the boundary, which now separates the territories of two homogeneous populations. The 2013



Fig 1.3 The Inter-Entity boundary is invisible, and the periphery border sites it passes through have been largely left untouched since the Siege of Sarajevo. Author's photo - 04.11.18.

Fig 1.4 The hilltop cliff face of Mt Trebević is perceived as the inter-entity boundary by Sarajevans. Author's photo - 04.11.18.



Fig 1.5 These ruined burnt out buildings sit exactly on the IEBL, acting as a gateway for walkers who transition from one entity into the next. Author's photo - 04.11.18.

Fig 1.6 View into Sarajevo valley from a ruined army barracks depict how the territorial division during the siege was legalised under the Dayton Accords, entrenching ethno-national divisions. Author's photo - 04.11.18.

census of Canton Sarajevo's show that 82% identify as Bosniak, while 94% of East Sarajevo's identify as Serb (Velimir 2016: 55). Frozen in time since the siege, only empty land lies along the invisible boundary draping Mt Trebević. The view into the Canton valley is lightly screened with trees and forgotten ruins. Undeveloped and neglected, both territories have turned their back on this space. However, the wider surrounding urban areas of Canton Sarajevo and East Sarajevo make up the IEBL borderland. Prescott (1990) highlights the distinct transitional phenomenon of the borderland. Sennet (2016: 3) expands further, describing the urban borderland as a porous space that permits exchange between the two territories. While Morehouse (2004) emphasises the place making importance of the transactional nature of these spaces. She argues that the borderlands acquire their fundamental identity from interactions which take place across the boundary, between the divided peoples and institutions. It is this phenomenon of Sarajevo's borderland, along with the spatial characteristics of friction and negotiation (Meeus and others 2019), that the region's water infrastructure functions within. Therefore, the network to some extent either perpetuates or minimises the damaging legacy of ethno-national division established by the conflict.

Bosnia's IEBL is defined as a 'subsequent boundary' (Konrad and Nicol 2016) that divides territories and peoples which were previously united. As water flows were not considered when plotting the IEBL, it was geographically impossible to entirely splinter the network after 1996 (fig 1.8). The FBiH territory contains the majority of Canton Sarajevo's sources. However, the East Sarajevo water company supplies 11% of the Canton's water from its Jahorina source on Mt. Trebević (Sweco 2017d: 35). After the war, the newly founded East Sarajevo water company took over management of the infrastructure and resources within RS territory. However, it was geographically impossible to connect all residents to the entity's water network branch. Upon formal agreement, RS became responsible for supplying water to the FBiH village of Novakovici. In exchange, Canton Sarajevo agreed to provide RS residents within the Vraca pass (Vodovod i kanalizacija: 2019). Meters were installed





### A SHARED RIVERBASIN

BORDER ACTS AS A POROUS MEMBRANE  
ALLOWING TRANSACTION OF WATER, SKILLED WORKERS  
AND KNOWLEDGE



#### KEY

-  Primary Water pipes - Canton Sarajevo
-  Primary Water pipes - East Sarajevo
-  IEBL
- Local community state administration:
- 1** Vrelo Bačevo water spring supplies 80% of Canton Sarajevo water
- 2** Vrelo Moščanica water spring supplies 9% of Canton Sarajevo water
- 3** Vrelo Jahorina water spring supplies 11% of Canton Sarajevo water, and 100% of East Sarajevo's water

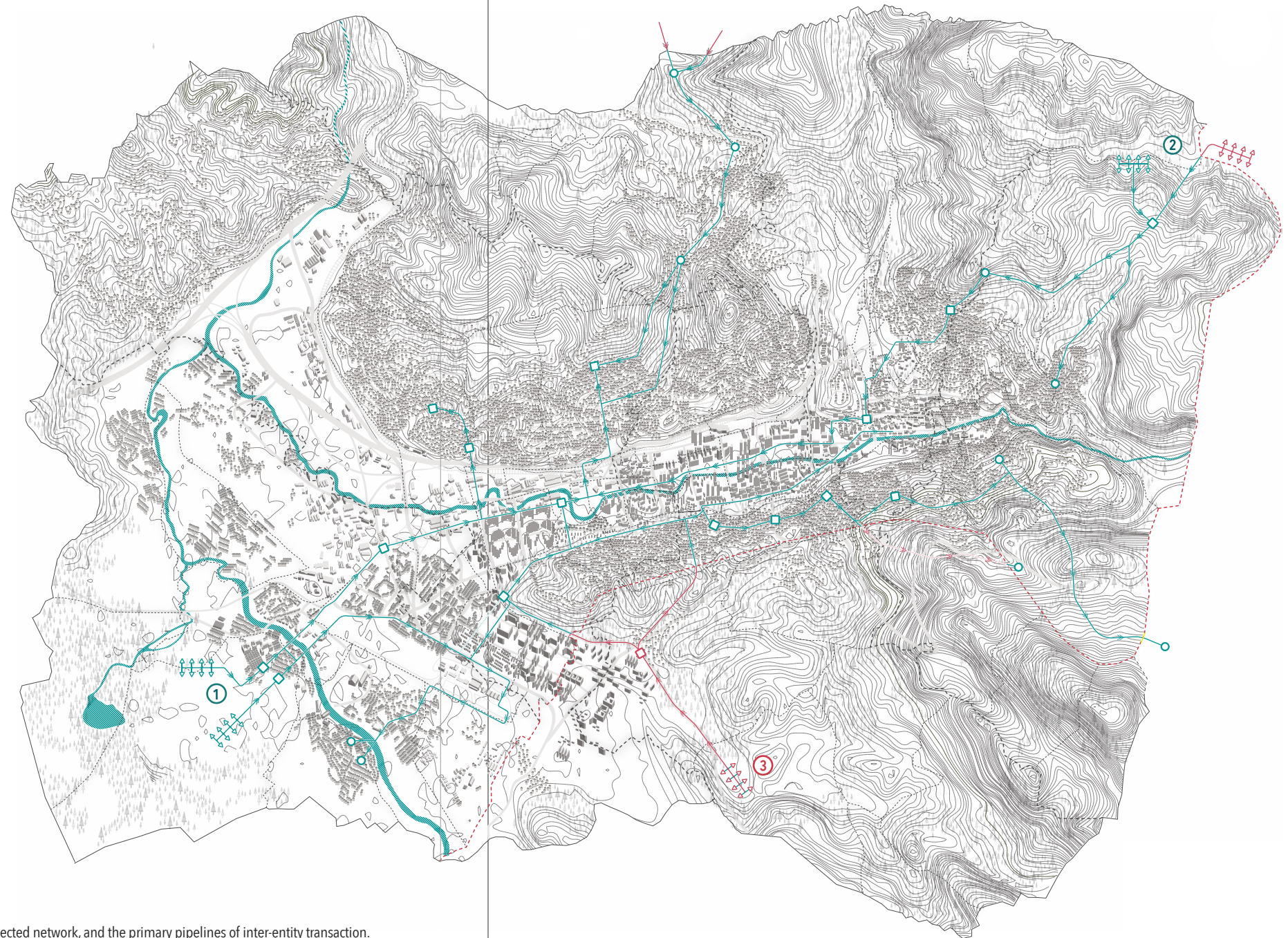


Fig 1.7 Canton Sarajevo and East Sarajevo's interconnected network, and the primary pipelines of inter-entity transaction.



above ground and read monthly to monitor the transaction of water flowing through the pipelines beneath the IEBL (Interviewee 2). Other partnership instances include solving an electrical system failure in 2018 that disrupted East Sarajevo's network. Onsite collaboration between members of East Sarajevo's water company and visiting electrical engineers from Canton Sarajevo solved the issue (Interviewee 8). The pragmatic nature of the work permits continual negotiation, facilitating peacebuilding efforts at the local level that the Dayton Accords failed to legally facilitate at the entity level.

When a crisis hits, the transaction of water across the IEBL becomes public knowledge. During the most disruptive period of Canton Sarajevo's water stress, a formal agreement was established for East Sarajevo to sell its surplus water across the IEBL (Sarajevo Times 2017). The Djukic Potok pipeline that connects both territories networks had been dormant since 1996, but between October 2017 - May 2018 the pipe was reinstated to alleviate Canton Sarajevo's water stress (Interviewee 9). The public were favourable of the partnership, which brought to attention the mutual benefits of a good working relationship between the entities. However, when East Sarajevo's water stress began, public opinion escalated with residents blaming the shortages on transactions with Canton Sarajevo. East Sarajevo's water company publicly disproved the claims, explaining the shortages were due to the unprecedented dry season. This situation highlights that public-transparency around inter-entity transactions are paramount to prevent the co-dependent networks being used to escalate ethno-political tensions.

Water infrastructure spaces functioning as critical sites of inter-entity mediation dates back to the Siege of Sarajevo. The Bosnian Serb militia used the city's water infrastructure to bring about 'strategic paralysis' (Graham 2009: 266) upon residents of the besieged city. The sources which fed Sarajevo's water infrastructure network lay in the aggressor territory, at the springs of Vrelo

Fig 1.8 People on their way to collect drinking water, across the Zrinjskog Bridge on the river Miljacka, photographed from the south side. Half of the bridge can only be crossed along a steel beam. Johnny Saunderson 05.06.93.







Bosne and Mt Trebević (Interviewee 2). The source facility taps were turned off for months at a time to dampen Sarajevo's morale and to smoke out residents into the eye-line of snipers (fig 1.9; Burns 1992). Besieged residents spent hours every week risking their lives to collect water from community-run pumps, or informal rainwater collecting systems (Interviewee 31, Interviewee 30). However, during hot weather, community pumps and rainwater collectors ran dry. During such seasons, militia leaders from both sides communicated across the otherwise impermeable siege line to strike a deal to prevent Sarajevo's from dying of thirst (Interviewee 34). After these negotiations, residential taps that had run dry for months suddenly began to dribble with water. Both warring sides blamed each other for the prolonged shortages. To investigate the problem, UN negotiators accompanied staff from Sarajevo's besieged water company to the source facility on the other side of the siege line (Interviewee 9). This episode demonstrates that even in the most volatile times, the technical and essential nature of Sarajevo's water infrastructure sites permits them to function as neutral ground for collaboration, communication and exchange.

### 1.3 TRANSBOUNDARY WATER INFRASTRUCTURE AS A PEACEBUILDING ASSET

In 2009, the Peacebuilding Commission and the United Nations Environment Programme published a pioneering report entitled 'From Conflict to Peacebuilding: The Role of Natural Resources'. The report framed the primary ways in which natural resources can be managed to support peacebuilding. As Troell and Weinthal (2014) argue, water management across borders has been a critical mechanism for promoting ongoing cooperation between riparian neighbours. Since the early 1990s, a great deal of literature in the field of international water management has focused on the connection between

Fig 1.9 Women washing clothes in the River Miljacka with the burnt out shell of the National Library in the background. There were frequent ceasefires during the siege, which lasted from a few days to a few weeks and the women were quick to take advantage. Johnny Saunderson 9th August 1993.



conflict and water scarcity (Gleick 1993; Grover 2007; Priscoli 2010). However, as international water management has matured over the past few decades, more nuanced studies have examined how water can facilitate peace (Conca and Dabelko 2002; Abukhater 2013). Although issues of conflict and scarcity have overshadowed the potential role of water management in peacebuilding, some studies (Haddadin 2013; Vardanyan and all 2013) focus on the role of institutions in helping to foster cooperation and reconciliation. Some researchers have also begun to examine the role of transboundary water basin institutions as mechanisms that may help resolve conflict by building trust and confidence through joint management and technical cooperation (Conca and others 2006). In countries that have undergone political partition, like Bosnia, transboundary water management becomes a tool of state-building (Mehyar and others 2014; Čolakhodžić and all 2013). Although a challenging and time-intensive process, using water management to state-build encourages cooperation, trust and confidence-building among former adversaries.

The International Water Association (2016) encourages an integrative paradigm of transboundary water management, assigning political agency to water. Discourse, water allocation and management occur as a political process between local, regional and national governing bodies that share a river basin. Political relationships between contested territories have benefited from this integrative paradigm. The discourse's technical nature provides a neutral ground for agreement, as demonstrated by Nicosia's bi-communal sewerage project (fig 1.10, fig 1.11). Development of the city's sewage network came to a halt in 1974, following the following the Buffer Zone's implementation (Brouma 2013: 229). The Turkish and Greek Cypriot communities were divided to end civil violence. Each side denied the political existence of the other, leaving no authority responsible for recommencing the shared sewage project (Brouma and Ezel 2010: 77). The desperate sewage situation was eventually solved at the local level. The two local mayors worked for four years on an agreement to establish a project framework of collaboration. They overcame political resistance by convincing their parties of the mutual long-term benefits.

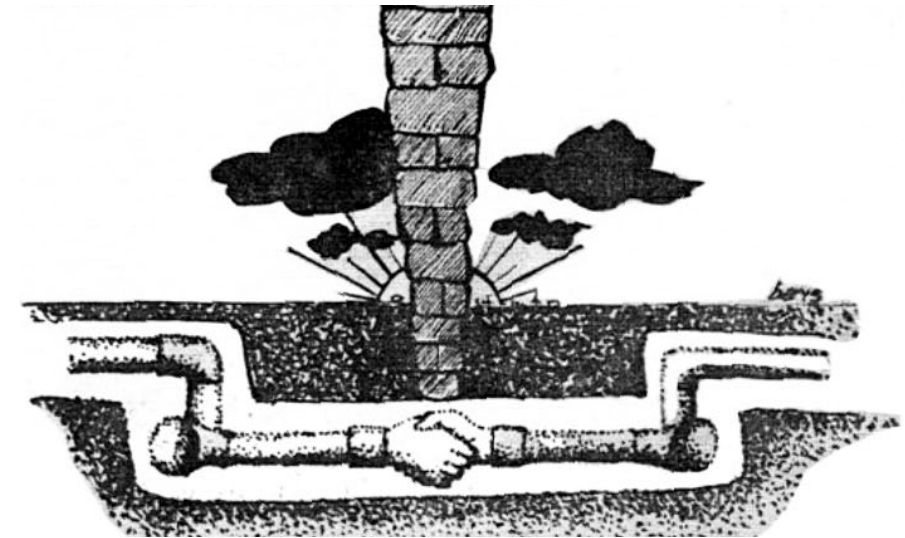


Fig 1.10 Depiction of municipal agreement from the Turkish Cypriot Newspaper 'Yeni Duzen' on the 28th January 1979.

Fig 1.11 The representatives of the Greek Cypriot Community Mr. Lellos Demetriades and of the Turkish Cypriot Community Mr Mustafa Akinci agreeing on sewage matters in the Greek Cypriot weekly 'Satiriki' on the 20th September 1978.

Although a slow process, the project started a journey towards reconciliation and mutual trust (Foka 2015: 8-9). The two water companies adopted an integrative management approach, and a bi-communal masterplan was implemented. The project success built confidence between the divided communities.

Countering this is the Palestinian conflict, where water mismanagement is escalating political tensions. Israeli authorities are using the water network to dominate Palestinian settlements in the northern West Bank. The inequality dates back to the Oslo Agreement, which granted Israel access to 71% of the water table, but only 28% to Palestinians (World Bank 2018: 4). Since the West Bank occupation in 1967, few Israeli permits have been granted for Palestinian water infrastructure maintenance and development (Amnesty International 2017). A revision of the water policies was supposed to happen after five years (Amnesty International 2017). This revision never materialised, and the policies have become long-term drivers of inequality (fig 1.11). To alleviate water stress, West Bank residents use one-fifth of their salaries to purchase water from informal vendors (Corradin 2016). Israeli policies propagation of poor utility services has forced Palestinians to leave their communities, contributing to Israel's coercive land take over.

Distrust and such threats of political violence as experienced by Palestine deters Bosnia's entity leaders from committing to a centralised water management agreement (Interviewee 1). However, as the Nicosia case study demonstrates, equitable integrative water management is a paramount safety measure in politically divisive regions to protect river basins and settlements. Establishing integrative management during times of stabilisation safeguards Bosnia's future, whether governance remains unchanged, becomes centralised or undergoes dissolution. The EU, Bosnia's largest international investor (EEAS 2017), is promoting the security benefits by offering Bosnia accession funding incentives for infrastructure projects that strengthen national governance. If done well, centralised water management could strengthen political inter-entity relationships. This outcome would contribute to Bosnia's

peacebuilding process, making future inter-entity violence less likely.

However, in the future event of the IEBL becoming less porous, avenues of communication permitted through technical matters such as water management will be equally important. Integrated water management has successfully strengthened political relationships between conflicted nations through transboundary initiatives. Such is the case of the Irish and Northern Irish governments, which have collaborated on a €3.5mil project to maintain Lough Erne. One of the island's eight transboundary river basins, the water body serves territories north and south of the British border (Gaines 2017). The initiative has also mobilised grassroots political action. Community-run focus groups have united farmers, foresters and residents across the territories. The 'Hands across the Foyle' and 'The Far Side of the Lough' pressurise both governments to improve conditions while commemorating their regions shared culture, landscape and history (Campbell 2016: 173). Bosnia is even part of a regional precedent for transboundary collaboration. Following the dissolution of Yugoslavia, the once national Sava River became international. The formerly warring parties had an opportunity to build a new regional co-operative institution to manage the basin collaboratively. The Sava River Basin was commissioned, aiding peacebuilding efforts between the post-Yugoslavian nations.

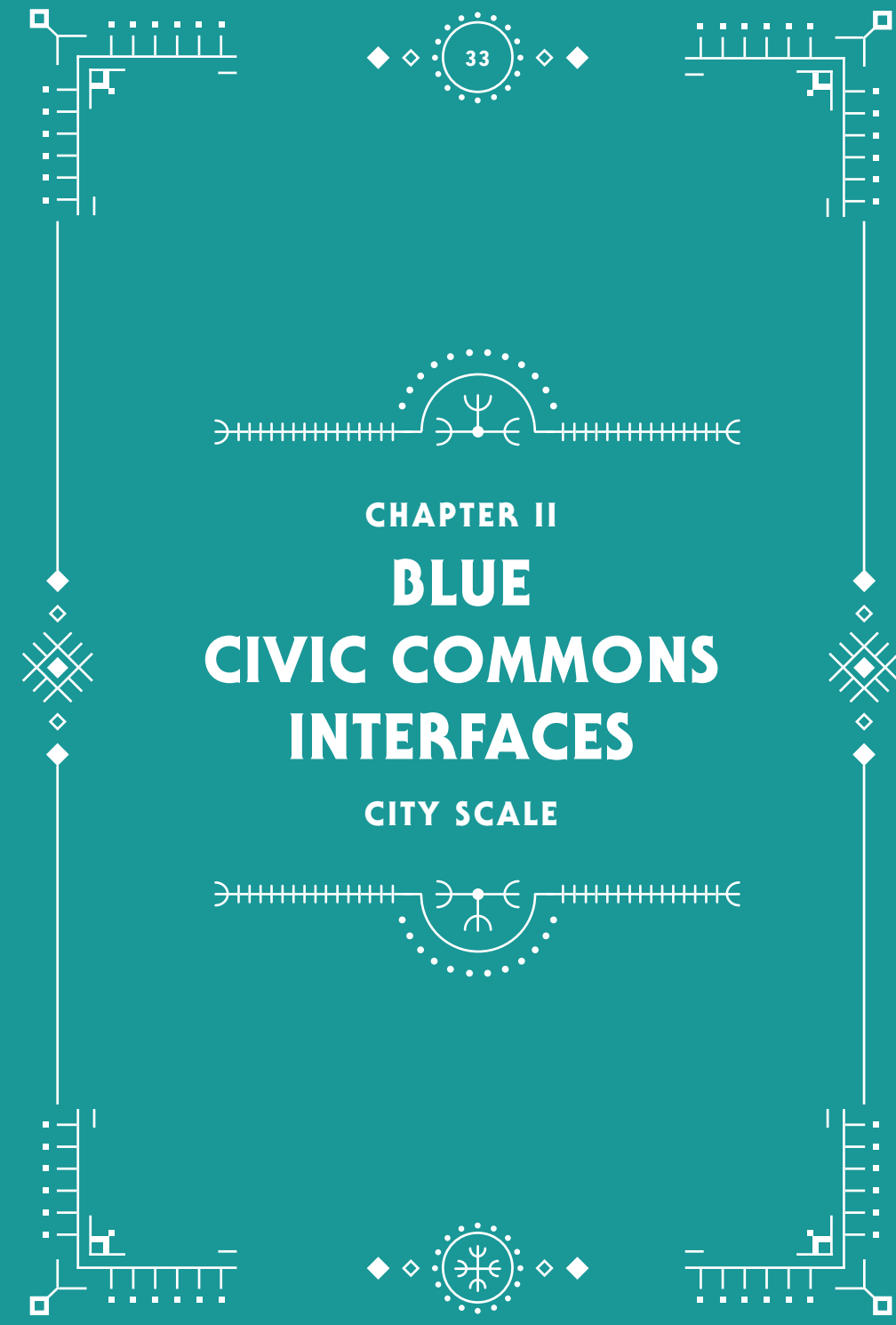
Although no state apparatus permits it, strong relationships already exist between the ministers of water governance for FBiH, RS and the Brčko District. The ministers are collaborating on centralised legislation to harmonise their management and enhance state resilience (Bogdanovic 2014: 377). The legislation will decrease the state's climate change vulnerability, which is predicted to unevenly increase seasons of water stress and shock across the country in the coming decades (Hadžić 2019: 8). This technical legislation will be a peacebuilding asset to the Bosnian state, ensuring ethno-national political tensions are not inflamed by increased periods of water shortages and flooding. The entity departments of Environmental Protection have already embarked on a joint water initiative. Thirty-two municipalities across

FBiH and RS are collaborating on the 'Clean Water of Sarajevo Basin' project. Both sides are financing the purification of the river's water, in an effort to fulfil shared environmental goals (Sarajevo Times 2018). The collaborative efforts have received support from European bodies, with funding awarded by the European Investment Bank (2019) and the EU. The additional investment will finance the construction of a dam on Sarajevo's Milijacka river, from which electric boats will travel along the river's central stretch. Bosnian society and tourism industry benefits from the extra funding secured by the inter-entity collaboration. There is an economic incentive for the entities to work together, allowing the project to be politically, socially and environmentally sustainable. Although the collaborative funding will be advantageous to the city's tourism industry, it is debatable to what meaningful extent Sarajevo society will benefit from the boats. The following chapters will explore how funding that rewards collaborative entity efforts of reconciliation can transcend to meaningful societal initiatives that strengthen grassroots peacebuilding and reconciliation endeavours.

#### **1.4 PEACEBUILDING A RESILIENT RIVERBASIN**

The Dayton Accords have caused uneven rates of water infrastructure development between Canton Sarajevo and East Sarajevo. The independent development leaves the region's inter-connected networks vulnerable to failure and political tension, as development occurs without considering the adverse implications upon the other territory. However, at the local governance level, the borderland conditions and interlinked networks exemplify how both societies can benefit from a working inter-entity relationship - especially during times of crisis, and even during periods of political violence. The case study findings reveal that even though joint initiatives between former adversary territories with conflicting state-building agendas can be drawn out, a compromise is eventually settled on to fulfil both needs. The collaborative approach decreases the likelihood of

uneven service development between the territories. Joint water infrastructure initiatives in post-conflict societies often start at the local level, where stakeholders have a vested political interest in providing citizens with functioning utility services and improving environmental conditions. However, their success transcends to strengthen political relationships at higher levels of governance, building trust and opening opportunities for other collaborative initiatives that further the peacebuilding agenda. If Canton Sarajevo and East Sarajevo adopted a similar strategy, it is hoped that its peacebuilding would benefit. However, it is paramount that the supporting policy is carefully considered to ensure neither side's water safety becomes threatened. Local governance, policymakers and industry experts would also have to share a resilient and efficient development vision. As these collaborative plans take time to negotiate, they are not suitable during times of immediate water crisis, as they would prolong disruptions to residents. Bosnia's inter-entity collaboration on Balkan motorway projects has proven this, like the V/C motorway segment (Marić 2012: 96). While the entities took two years to decide on a route for the 'Peace Highway' motorway project, finally compromising after considering sixteen alternative proposals (Andrejić 2019). Although collaboration is a politically challenging process, the long-term water security benefits are high. If the water network continues to splinter the borderland, the region is vulnerable to a rise in ethno-national political tension during dry seasons. Additionally, negligent development may adversely affect the other territory's water network, and the region's water resources will continue to be inefficiently overused.



CHAPTER II  
**BLUE  
CIVIC COMMONS  
INTERFACES**  
CITY SCALE





## 2.1 DAILY SOCIAL PROCESSES AND SPACES OF CANTON INTERACTION

The last chapter revealed the large geographical span of construction works required to improve Sarajevo's service delivery. As so many neighbourhood pipelines, pump stations and reservoirs are performing poorly, access to water is a suitable tool to examine state-citizen relationships. When Sarajevo's water infrastructure functions normally, turning the kitchen tap on goes unnoticed. As Stephen Graham (2009: 2) elaborates, infrastructures are taken for granted and normalised as citizens perform daily tasks (fig 2.1). However, these invisible networks are crucial to the functioning of civic life. Water infrastructures are hidden, either buried underfoot or encased in walls. These physical attributes diminish public awareness of the vast network that sprawls across their city, and the multi-level systems of governance that provide their utility service. However, as Bruce Mau (2004: 3-4) expands, residents prolonged dependency on such vast and elaborate networks creates inevitable vulnerabilities. It is only when the taps run dry due to the Canton's failings that citizens daily encounters with the state become 'visible'. One of the eight characteristics of infrastructures as defined by Star and Ruhleder (1996), is that they become visible to residents upon breakdown. This social process is known as 'unblackboxing' (Massaro 2018: 131) to sociologists of technology. The complex political and technical systems which are usually only visible to specialist engineers and policymakers are revealed to residents upon the network's breakdown. Sarajevo's domestic and public spaces of failing water infrastructure become visible representations of the state. This social process unveils Canton governance to a level of public scrutiny that the Dayton political apparatus does not accommodate.

For over a decade, Sarajevo's water shortages have made the network 'visible'. As Olivier Coutard (2008) elaborates, the degree to which infrastructure services are taken for granted varies dramatically between places. In Sarajevo's post-conflict setting, the uncertain political circumstances render even essential services like water infrastructure uncertain (McFarlane and Rutherford 2008).

Fig 2.1 A roma mother and child drink water from Baščaršija Sebilj. Author's photo - 23.09.18.



The shortages have noticeably disrupted Sarajevo's daily life, triggering public discourse concerning the Canton's mismanagement of a commons resource. The Canton's prolonged inability to solve this technical issue has heightened public outrage. Instead of fixing the failing network, development plans have been used as a pawn in Cantonal political games. Stef Jansen's (2015) anthropological account uncovers that Bosnia's Post-Dayton governance is ill-equipped to fulfil its role as a state, particularly at the national and local level. Dayton's complex political apparatus has engrained a voting system which prioritises ethno-national rhetoric. This agenda eclipses the need to appoint political candidates committed to implementing policies that will improve Sarajevo's living standard (Dzidic 2014; Falatar 2019; Hopkins and Hall 2019). To adopt Jansen's phrase, the 'elusive state' effect leaves citizens to feel abandoned and exasperated by state bureaucracy when their public services fail.

In such places of political instability, insight into state-society interactions can be gleaned beyond electoral politics, through everyday experiences and discourse concerning access to water for drinking, washing and household needs. This approach of 'everyday water practices' encompasses collection, usage, public discourse and activism (fig 2.2). The state is framed as a social relation, rather than specific institutions functions separate from society (Painter 2006). This alternative approach focuses on understanding the relationship between Sarajevans' and the state, outside Bosnia's under representative political process (Meehan 2013). This form of 'everyday and lived citizenship' is practised not through voting, but as people move through their daily lives and different spaces - whether the domestic kitchen, the public fountain or the Canton leisure complex (Staeheli and others 2012). Following from this, canton infrastructures that deliver essential services like water from the tap, sink or shower serve as physical sites of everyday encounters with the state (fig 2.3) (Rodina and Harris 2016). An analysis of the situation provides an opportunity to spatially address social and political perceptions

Fig 2.2 Sarajevo's store water for bathroom use during shortages. Author's photo - 15.06.18.





perceptions of Cantonal and Sarajevo rights and responsibilities in the post-Dayton era.

## 2.2 EVERYDAY CITIZENSHIP PERFORMED THROUGH WATER PRACTICES

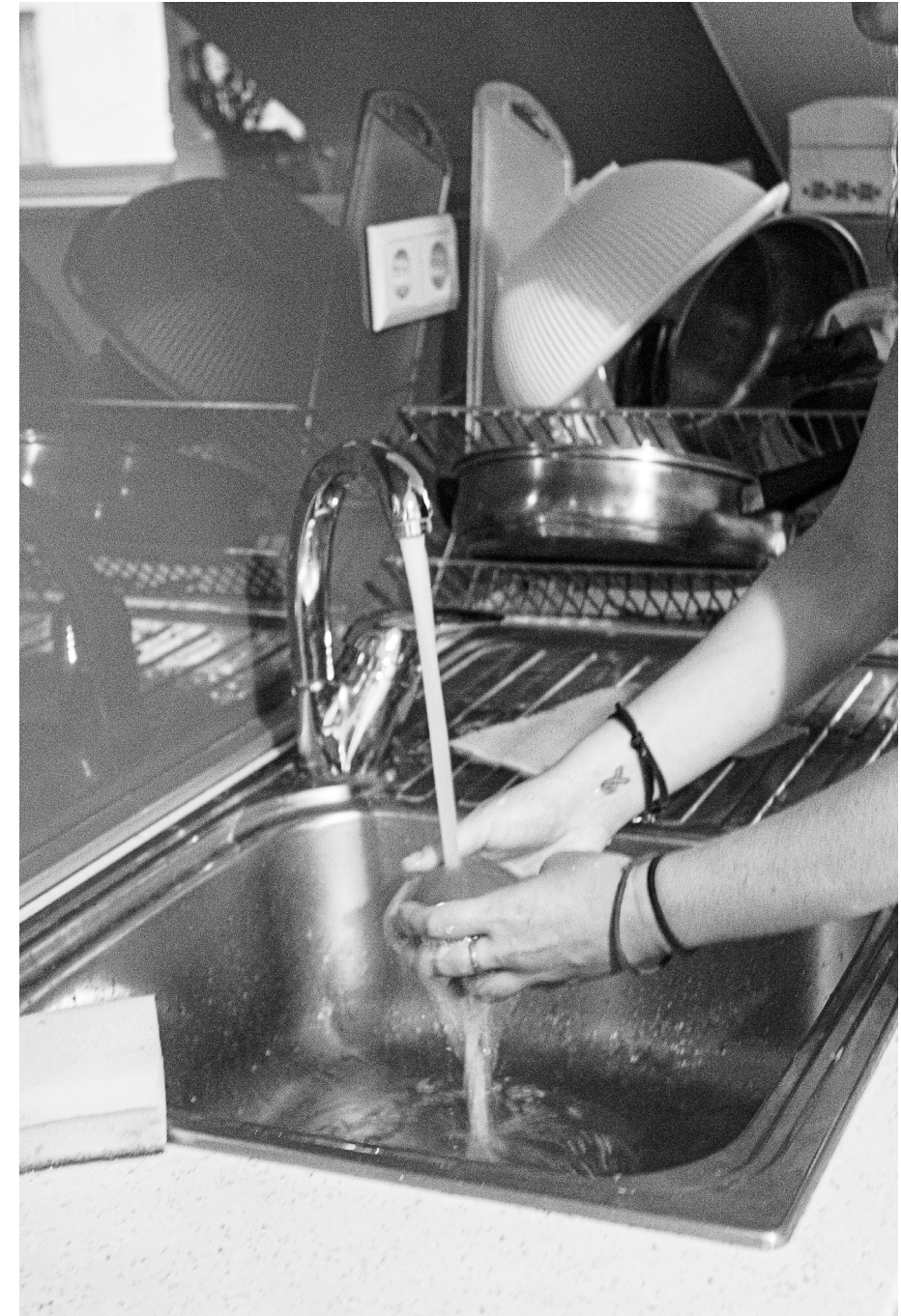
The photo-voice participants perceived water as a commons resource, belonging to all Bosnian people and their shared landscape. The Canton's incompetent gridding angered the participants, as their households and family businesses were disrupted. Everyday politics concerning the water shortages dominated urban life and resident discourse, as their daily routines, income and expenditure were affected. Velma describes how the restrictions

**"Stopped you from having the liberty to do things when you wanted to do them. It brought back memories of the water shortages during the war, when there was no state control. I mean, we live in Bosnia's capital city, water is our richest natural resource, they lied to us about the reason for the shortages, and we were quite pissed with the politicians."**

Participants were also concerned about sector privatisation of their commons resource. This trend has swept through post-Yugoslavian states to bolster their transitional economies. Sarajevo's believe their water utility bills are expensive, although their price tariffs are below the eastern-European average (Danubis 2015). While further Cantonal distrust was detectable through the publicly accepted rumour that the water companies implemented the shortages during times of peak prices, and that supermarkets also benefitted by marking up their bottled water.

Amra described domestic and public spaces where she encountered the Canton's failures during the shortages. She depicted these spaces through photo-voice images of her kitchen and bathroom sink, as well as her local

Fig 2.3 Bosnian woman's encounter with the Canton at the kitchen sink, while preparing dinner. Author's photo - 23.06.18.





fountain and gym. When the water shortages began, Amra started to take note of her neighbourhood fountain on her way home. If it was dry, that meant there would be no water until 11pm (fig 2.4). She would have to wait until then to flush the toilet, wash up after dinner and brush her teeth (fig 2.5). The shortages upended her daily routine, and she would either go to bed late or wake up early in the morning to bathe and perform household chores. Eventually, she and her neighbours started performing domestic practices in public spaces, including taking daily showers in their local gym and using cafe toilets (fig 2.6). care is predominantly the woman's responsibility within Bosnian society (fig 2.10). The experiences of the photo-voice participants also revealed the shortages had a gender bias effect. The participants mainly described how the disruptions affected the daily routines of female family members (fig 2.8; 2.9). The role of housekeeping and family. Women's domestic chores of washing dishes and clothes piled up. It was mainly women who bought extra water supplies or collected rainwater to aid household upkeep (fig 2.10) The participants reported that on the whole, the water shortages caused less disruption for men. Safet only mentioned how the shortages prevented him from performing his ablution rites at the mosque before prayer (fig 2.7). This exclusive male experience starkly contrasts the domestic upheaval experienced by women.

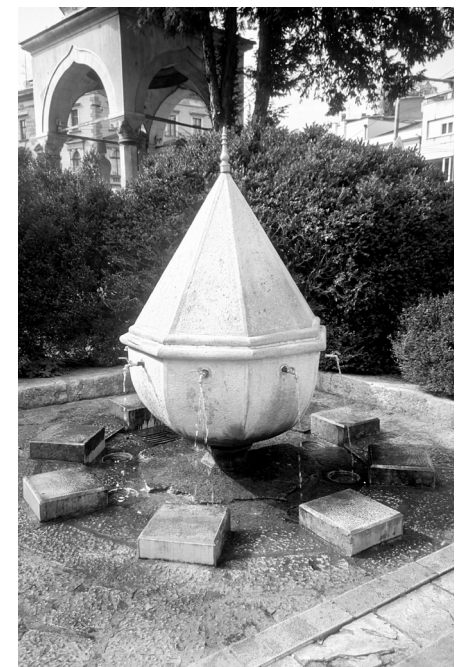
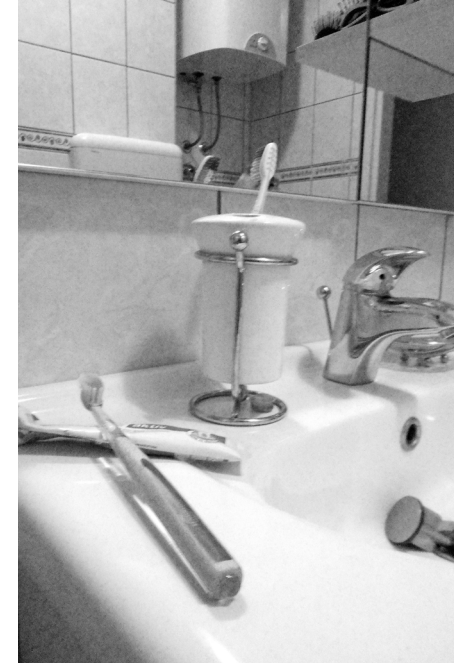
These gendered everyday water practices reflect a greater trend of gender inequality ingrained in Bosnia's post-Dayton state. Before the war, gender equality was boosted by the socialist agenda. From the outset, women were granted equal legal status, the right to own and inherit property, generous maternity and child-care benefits, and equal access to education, employment and eventually abortion (Morokvasić 1986; Ramet 1999; Woodward 1985). As women gained education and employment in wage labour outside the home, their dependence on husbands and families decreased (Helms 2003: 51). However, women had to balance their new career opportunities with caregiving

Fig 2.4 Amra's photo-voice of her local fountain. When it runs dry she knows there will be no water at home.

Fig 2.5 Amra's photo-voice bathroom sink, which has no water to brush her teeth during the shortages.

Fig 2.6 Amra's photo-voice of her local gym, where she goes to shower during the shortages.

Fig 2.7 Safet's photo-voice of his local Mosque's Šadraven, where he is unable to perform Wudu during the



for the young and the elderly. Following the dissolution of Yugoslavia, equality between women and men was enshrined in Bosnia's constitution (WFD 2019).

**"In Yugoslavia, we were equal to men. During the war it was the same thing. But after the war, the religion became more important and the women became less important... I as a little girl – I didn't need to fight because we had rights. I find it so bizarre that I have to fight now. I really do not accept that I have to fight. I think that it's really the misery of society, to have to fight, a century later."**

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Fig 2.8 Sarajevo woman waters household plants. Author's photo - 4.08.18.

Fig 2.9 Sarajevo woman washes food before cooking dinner. Author's photo - 13.08.18.

Fig 2.10 Sarajevo woman washes bakery. Author's photo - 29.09.18.

Fig 2.11 Sarajevo woman buys water during the shortages. Author's photo - 24.09.18.







# KJKP Vodovod i kanalizacija

Vodovod i kanalizacija  
1.2 ★★★★★ (220)  
Water utility company

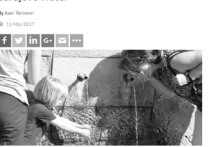
Alja P  
3 months ago  
(Translated by Google) In a city that has plumbing before many European centers, such as Vienna, Paris, London, today's management has led to the breakdown of water supply on a daily basis! Everything is cast!

(Original)  
U gradu koji ima vodovod prije mnogih evropskih centara kao kao sto su Bec, Pariz, London danasnji menadzment je jovo do toga da svakodnevno ima prekida u vodopokrivi? Svaka Sva cast!

adnan bilanovic  
Local Guide · 16 reviews  
★ ★ ★ ★ ★ 2 years ago  
I would give 0 stars if possible. Disaster company full of criminals. Thanks to them no water in Sarajevo during nights and often in day time.

European Bank  
Local Guide · 16 reviews

EBRD provides €25 million loan to Sarajevo water



Uroš Kovačević  
Local Guide · 24 reviews  
★ ★ ★ ★ ★ 2 years ago  
This is the 21st century. We live in a capital city. The war ended more than 20 years ago. There is no running water in the afternoon. There is no running water during the night. It's a disgrace. To take such a long time to fix something that should be prioritized. Incompetent, lazy people.

Amin Babić  
Local Guide · 48 reviews  
★ ★ ★ ★ ★ 2 years ago  
(Translated by Google) Nothing Positively Can Not Say Disaster In The Twenty-First Century Of This Reduction This Behavior And Bottom Bottom Business I Have No Comment On Disaster

(Original)  
Ništa pozitivno nemogu reci katastrofa ...

Sabit Bilic  
Local Guide · 43 reviews  
★ ★ ★ ★ ★ 8 months ago  
(Translated by Google) Saturday, three o'clock in the afternoon NO WATER!!!!!!

(Original)  
Subota ,tri sata popodne VODE NEMA!!!!!!

## Review summary



## BalkanInsight

Albania Bosnia and Herzegovina Bulgaria Croatia Kosovo Macedonia Montenegro  
All the News Premium Single Video In Pictures Archived  
10/17/2015 Balkan Transitional Justice Paper Trail: EBR in the Balkans, Turkey and the Balkans. The Balkans and the

Sarajevo Demands Solution to Water Woes  
Bosnia's Federation MPs has approved a deal with the European Bank of Reconstruction and Development, EBRD, that aims to resolve water supply issues in the Bosnian capital, which have left Sarajevo without continuous running water for a least a decade.



After the house of people of the parliament of Bosnia's Federation entity approved a 25-million-euro loan deal with the EBRD on October 30, the road is paved for decade-long troubles with the water supply in the Bosnian capital to be resolved.

Some residents in Sarajevo complain that while the city could survive a siege during the war, life in peace is still a struggle.

"Even when the water finally comes it is full of mud and I need to keep it running, making my bill even bigger. Nothing makes any sense," 63-year-old Sadeka Basic told BIRN.

Uroš Kovačević  
Local Guide · 24 reviews  
★ ★ ★ ★ ★ 2 years ago

This is the 21st century. We live in a capital city. The war ended more than 20 years ago. There is no running water in the afternoon. There is no running water during the night. It's a disgrace. To take such a long time to fix something that should be prioritized. Incompetent, lazy people.

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30 Million EUR for Reconstruction of the Water Supply Network in Sarajevo



The Council of Ministers of Bosnia and Herzegovina approved the initiative by the Ministry of Finance and Treasury for the leading of negotiations on the conclusion of a Contract on Loan worth 30 million EUR for implementation of the Project of reconstruction of the water supply network in the Sarajevo Canton between BiH and the European Bank for Reconstruction and Development.

The project will include reconstruction of dated distribution and traffic pipes where the losses of water have been registered, which will result in increased security of water supply and the reduction in the losses of water from the network.

Implementation of the project in Sarajevo would create conditions for gradual improvement of efficiency of services and operations provided to the citizens of Sarajevo by the Canton Public Utility Enterprise "Water Supply and Sewerage Network Sarajevo".

Repayment period is 15 years, including three years of grace period and a favorable EBRD/IBRD interest rate allocated on FBiH - Sarajevo Canton, and the end user of the funds is the enterprise "Water Supply and Sewerage Network Sarajevo".

However, women had to balance their new career opportunities with caregiving for the young and the elderly. Following the dissolution of Yugoslavia, equality between women and men was enshrined in Bosnia's constitution (WFD 2019). Sarajevo's natural resources can supply the system with four times the amount of water that its population requires (Koldzo 2017), meaning the shortages were solely due to state gridding failures. Public discourse focused on the vertical and horizontal systems of cantonal governance that were failing to provide them with a basic human need (fig 2.12). Many of the photo-voice participants have described how the legacy of the shortages have inflamed distrust between affected residents and the Canton (Interviewee 25; Interviewee 19; Interviewee 31), and even contributed to residents' relocation to other cities (Interviewee 17).

Although the shortages received public criticism, most Sarajevan's have refrained from political activism to demand their right to water provision. When Elma describing how here hairdressing business was affected by the shortages, she shrugged her shoulders. "This is Bosnia, this is our normal" she explained with an exasperated smile and raised eyebrows. Resigned to the situation, Elma has accepted and adapted to the shortages like many other Sarajevans (Interviewee 35; Interviewee 36). It only confirms their perception of politicians and government workers as immoral, corrupt and irresponsible, which does little to fulfil their needs (Interviewee 34). This social inaction is a symptom of the socialist era, in which those who voiced their discontent with the state through participation in public action were met with political repression and persecution. However, a growing body of Sarajevans are holding the Canton accountable. Boba photographed a sticker of 'Voda Sarajevo' [Water Sarajevo] on the back of a cafe's toilet door to demonstrate how activists have been raising public awareness around the issue (fig 2.13). During the siege, Boba recalled how access to water for drinking and wawshing defined her as a 'citizen' of Sarajevo, a sentiment that resonated with other survivor testimonies (Interviewee 35; Interviewee 36). As Elvis described,

Fig 2.12 Public discourse and media coverage addressing Sarajevo's water woes. Scenshots taken 15.12.19.

“Getting used to living without electricity is not such a bad thing. But, without water is - it stops you from doing so many things. It paralyses life. It makes you feel non-human... Basically you need water to stay alive and to wash yourself... Of course, to drink is an instinct shared with animals but to wash yourself is what separates us.”

It was a public rumour that Sarajevo’s water shortages were the result of war damage (Interviewee 34). Although the infrastructure incurred destruction and was unmaintained throughout the siege, this is not the cause of its present failure (Interviewee 8). A substantial grant from the international community restored the network and re-established the public institutions. By 1998 a reliable service was reinstated, and billing recommenced (Interviewee 9). The Canton benefits from the blame being attributed to those ‘on the other side of the mountain’, as it limits their culpability and furthers ethno-national rhetoric. However, in reality the network’s stress is a symptom of the poor state management and inadequate maintenance during the pre-war and post-war periods (Interviewee 2).

### 2.3 SARAJEVAN’S SUFFER FROM CANTON MISMANAGEMENT

Sharon Mattern (2018) theorises how public maintenance of technical infrastructure is comparable to the social infrastructure roles of caregivers, therapists and stress is a symptom of the poor state management and inadequate maintenance during the pre-war and post-war periods (Interviewee 2; Fig 2.15). Sharon Mattern (2018) theorises how public maintenance of technical infrastructure is comparable to the social infrastructure roles of caregivers, therapists and nurses. Both sectors perform ‘caring’ roles for society, whether sustaining the mind and body, or the home and neighbourhood. It is the post-Dayton state’s inability to care for its citizens’ most basic needs that the water shortages have brought into focus. Over the last eight years, five directors with no prior experience have been appointed to manage the public water company, by the Canton’s ruling

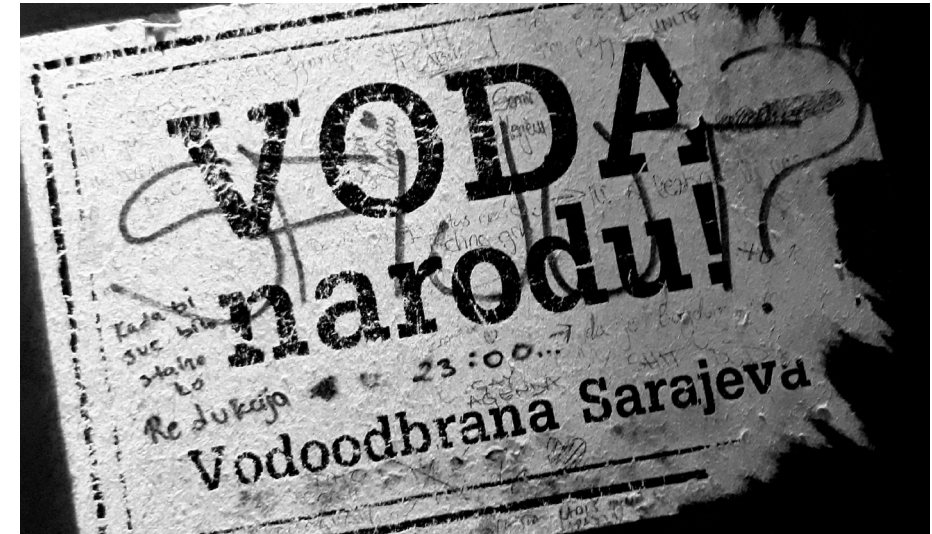


Fig 2.13 Boba’s photo-voice of activists raising public awareness in bathroom stall. Sticker reads ‘Water to the people! Water Defense of Sarajevo’.

Fig 2.14 Almost 300 people protest in Sarajevo on 17th October 2017 demanding a full-time water supply.



political party. Under their management, 76% of water is unpaid for as it is transported from the source to the consumer (Sweco 2017d: 43). This loss rate far exceeds the 20% loss of Bosnia's most resilient city, Zenica (Interviewee 2). Huge physical losses of water occur through leaking pipes, joints and pumps. The illegal tapping of informal neighbourhoods constructed after the war also contributes. Utility operations are also responsible for losses due to meter reading errors and poor customer billing. Seasons of scarce rainfall have made the director's negligence and mismanagement visible to the public. Restricted public water access lasting for months have been a last resort to alleviate the infrastructure's dire levels of water stress. It would be inefficient for the network to hold an unnecessary amount of excess water. However, it is the role of the water company to ensure it manages seasonal fluctuations, which should be of capable in a water abundant landscape.

City centre residents have been the worst affected. Water shortages have been a daily occurrence during dry seasons since 2011 (BH Putovanja 2017), hitting peak disruption between May 2015 - June 2017 (RFEBS 2017). Regulated by the water company, the shortages occur between 7am - 11am and 10.30pm - 6.35am (Interviewee 17; Interviewee 19), disrupting residents morning and evening routines. Residents in the periphery have been unaffected by the shortages (Interviewee 15; Interviewee 15). As water travels a shorter distance from the source to their taps, less water leaks from the network (Interviewee 2).

Another reason is that periphery neighbourhoods were informally constructed in the post-war era. Forty-eight kilometres of illegal community regulated water networks were installed (Sweco 2017d: 91). Some of these neighbourhoods share water extracted from wells on a resident's territory (Interviewee 15), while others have tapped into the Canton's network illegally (Interviewee 2). By taking responsibility for mechanical management of the communities'

Fig 2.15 Delayed water infrastructure maintenance works start to become an informal neighbourhood. rubbish bin. Photo taken 23.09.18.







water systems, these residents adopt the responsibility of maintaining their upkeep, which has surpassed the provisional efforts of the Canton.

The GrCF: Sarajevo Water project is the Canton's solution to the network's technical failure<sup>1</sup>. The project was signed for ahead of the 2010 general elections (Sweco 2017d: 8), instilling voter confidence to re-elect the Canton Prime minister's political party. However, the project was cancelled by the water company's board ahead of the 2014 general elections, in a successful move to oust the Canton's Prime minister. Consequentially, the following four-year term saw unprecedented levels of water stress. The water infrastructure was further manipulated for political gains by intermittently stopping the shortages ahead of elections, Ramadan and the Sarajevo film festival (Interviewee 17). During these periods the Canton's governance was under scrutiny by the local and international media, and the tourist industry. Towards the end of the Prime minister of Canton Sarajevo's term, he publicly denounced the state nepotism responsible for the infrastructure's mismanagement (Interviewee 21). A new expert-led team was appointed, and the GrCF: Sarajevo Water project was reintroduced. Once again, the loan was signed for ahead of the 2018 October general elections in a renewed effort to instil public confidence (Interviewee 1).

Sarajevo's community activists are not only fighting for proper water infrastructure management but also sustainable environmental management. Boba's photo-voice image of polluted water bodies shows a broader citizen concern about the environmental conditions of the city's sources (fig 2.16). Over the past ten years, the protected zone around the Vrelo Bosne groundwater source that provides 80% of Sarajevo's water has reduced from 12km to 3km (Interviewee 3). Canton administrators altered the planning policy for elite Sarajevan's, who wanted to construct second homes in the picturesque water-rich periphery. The

<sup>1</sup>. The scope of the GrCF: Sarajevo Water project is explained in chapter I. The author also critically analysed the project in the Implementation Essay 4.

Fig 2.16 Boba's photo-voice depicting pollution of Sarajevo's water resources.



homeowners did not connect their sewage to the waste-water network, leaving it to seep into the groundwater which supplies the masses (Podic 2010).

## 2.4 SOCIETAL CONSEQUENCES OF UNFULFILLED CIVIC RESPONSIBILITIES

The city's water stress also highlights Sarajevo's societal responsibilities, which are necessary to maintain the water infrastructure. Sarajevo's right to access the Canton's water network comes with responsibilities, that are understood through place-specific social and political norms, laws and policies (Staehele et al. 2012). In a city with high unemployment rates, poorly maintained public services and low trust towards local governance, it is a Bosnian social norm not to pay water utility bills. Although illegal, the action rarely results in consequences. Only 24% of the water extracted from canton sources is paid for, due to illegal tapping, stolen water, and unpaid bills (Interviewee 7). The financial loss from unfulfilled citizen responsibility reduces the water companies' capacity to raise enough funds for the future investment required to maintain the infrastructure. Hundreds of residents of Sarajevo's numerous socialist housing blocks share a single building pipeline and meter. When monthly bills are issued, residents can avoid paying for their water use without any repercussions, as they cannot be disconnected from the building's shared plumbing system (Interviewee 2). Furthermore, the informal houses that are illegally connected to the network cannot be billed for their water use (Interviewee 9). Therefore, the city's water rates are increased, which only serves to penalise and those who already pay their bills. Citizen anger is directed back to the Canton water company, which is ill-equipped to enforce bill paying (Interviewee 1). This cycle of mistrust disadvantages all Sarajevo's, diminishing the network quality that serves the society.

Fig 2.17 Provisional water supplies stored in a Sarajevo kitchen. Photo taken 15.06.18.

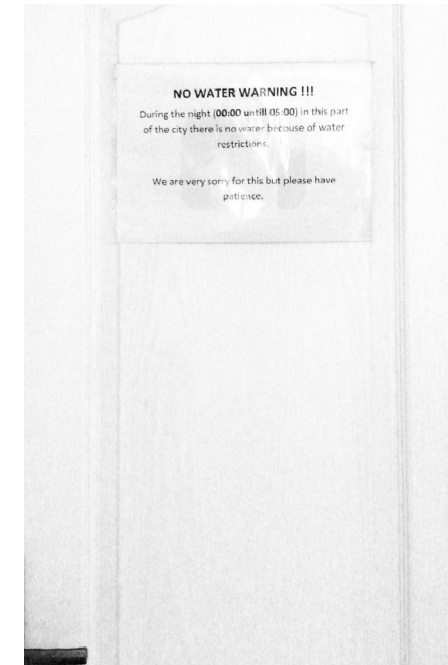
Fig 2.18 Large container outside a Sarajevo restaurant collects rainwater overnight during shortages. Photo taken 24.09.18.

It is a well-documented trend that the effects of failing water infrastructure are often unequally distributed amongst the population's socio-economic classes (Kirkby and others 1995). The livelihoods of the poor are systematically more negatively affected than affluent groups (Obertreis and others 2016: 170). The effects of Sarajevo's neglected network align with this trend. Residents in up-market central neighbourhoods have been unaffected by the shortages, due to their proximity to buildings of international and institutional importance. In some cases, this has been of public benefit, such as the continued supply to the city hospital's pipeline, and by effect, the surrounding neighbourhoods (Interviewee 16; Interviewee 28).

However, the Canton's directors facilitated other instances of immunity to international institutions for political gain (Interviewee 22). Exasperated by the Canton's prolonged failure to mitigate the crisis, other wealthy residents took matters into their own hands. Elite Sarajevan's have implemented micromanagement solutions to diminish the disruptions incurred to their homes and businesses. Wealthy residents and hotel managers have buried water tanks on their property (Interviewee 14; Interviewee 19). Filled ahead of the shortages, the tanks supply their household and clientele with water throughout the dry seasons. The elite's individual solutions often exasperate the problem for those of lower socioeconomic status. During East Sarajevo's water shortages in 2019, a resident illegally tapped into the system to siphon off water into his personal tank. This individual's action caused further disruption to the stressed network (Vodovod i kanalizacija 2019). The whole community suffered, as the shortages were extended to recover from the extra damage. The group's most adversely affected by the shortages have been Sarajevo's most vulnerable - the elderly (Interviewee 25), the physically sick and those with mental health issues (Interviewee 31; Interviewee 11). During the Canton Sarajevo shortages of 2017, Andrew (Interviewee 17) and his wife both broke

Fig 2.19 Sarajevan hostel informs visitors of shortages lasting from 00.00 - 05.00. Photo taken 13.08.18.

Fig 2.20 Grey water storage in Sarajevan bathroom. Photo taken 18.06.18.





their ankles. It became impossible to collect enough water to care for their potty-training son and new-born baby. Their extended family had to help for months, causing more disruption than experienced by non-disabled residents. Branka (Interviewee 30) meanwhile, is struck by overwhelming fear and anxiety when the water shortages occur. Like many other Sarajevan's who survived the three-year siege (Interviewee 22; Interviewee 28; Interviewee 29), her PTSD is triggered by turning on a tap that is running dry during the shortages. Other residents have resorted to collecting rainwater and stocking up on supplies as they did during the war. The citizens are responsible for improving the network as much as the Canton. Both Canton and citizens have responsibilities to fulfil, if they wish to maintain a functioning network in the future.

## 2.5 A BLUE CIVIC COMMONS FOR WATER-WISE CITIZENS

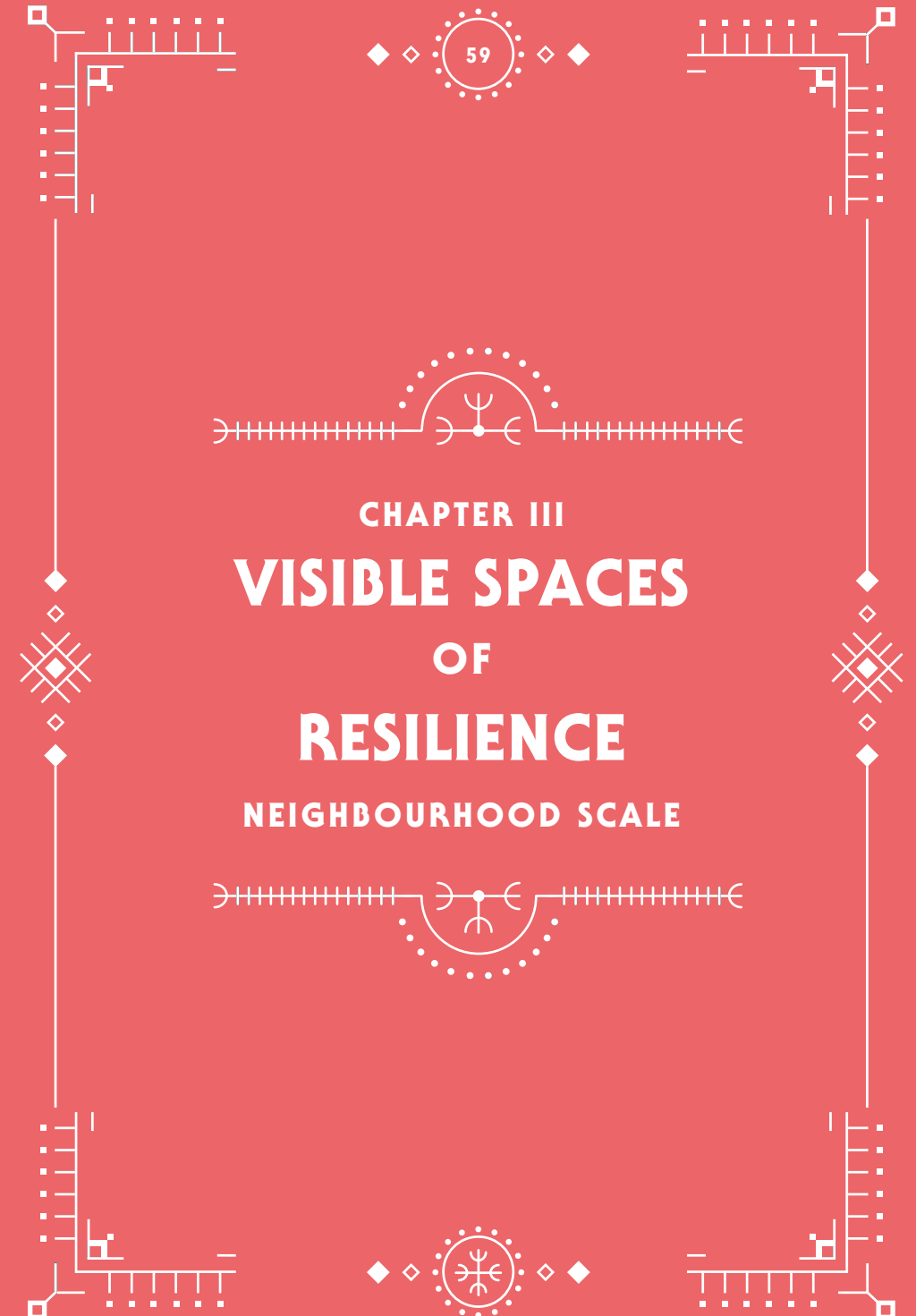
The photo-voice and interview findings reveal that Sarajevo citizens are highly dissatisfied with the canton water facilities and distrustful of the state's ability to fulfil citizen water rights. This public perception has even moved some to stop fulfilling their citizen responsibilities, by either stealing water or coming up with their own provision. The water shortages have triggered the social process of 'unblackboxing' the water infrastructure to make the public water institutions visible for scrutiny. However, what if there was a way to capitalise on this visibility to improve state-citizen relations, through urban design? The GrCF: Sarajevo Water Project discussed in Chapter 1 provides an opportunity to address poor state-citizen relations through urban design. New pump stations, reservoirs and fountains will be constructed in neighbourhoods throughout Sarajevo that require technical support. These spaces provide an opportunity to improve citizen-state relations if their typologies are adapted to fulfil the local social needs of the post-conflict context, along with the

Fig 2.21 Public state fountain of water provision, which enhances neighbourhood aesthetics and provides a public gathering space.



technical needs. If the masterplan's typologies are designed to be citizen-state interfaces that provide public space for social interaction, the perception of Sarajevo's elusive state presence could be addressed. Making the elusive state visible through its public neighbourhood presence could help to rebuild citizen trust and bring public reassurance that the development of their civic commons is being driven to serve the needs of the people, not private investors. This design driver raises a question to be answered in the next chapter. What context-specific social benefits could Sarajevo's new water infrastructure typologies bring to the neighbourhood public space?

The International Water Association (2016) argue that when water infrastructure sites are made visible to the communities they serve, citizens feel a sense of ownership and responsibility towards the networks upkeep. If this sense of ownership could be achieved in Sarajevo, both state and citizens could benefit from making the typologies visible and raise awareness of the importance of bill paying and sustainable water use to maintain the network. The photo-voice findings of the gendered impact of the water shortages, and the unrepresented voice of Bosnian women in positions of power to bring awareness to their plight opens up another design question. Could the new masterplan's typologies use a design tool - whether aesthetic, form or spatial programme - to make the women's voice of domestic service provision audible, and even inform the state's civic services of provision? This could increase public awareness around women's domestic water use and access rights by making their hidden domestic presence permanently visible in the public sphere, rather than only in times of dire stress. However, these design implications trigger another question addressed in the next chapter - who will fund these extra expenditures, and will the return warrant the cost?





### 3.1 SARAJEVO'S BLACK-BOXED WATER INFRASTRUCTURE SITES

It is local knowledge that the city's reservoirs and pump stations are underperforming (Interviewee 16; Interviewee 34). However, few residents associate these civic commons typologies with a spatial neighbourhood location of public state presence. Although informal temporary solutions such as rain collectors and water storage have been implemented by citizens, they remain reliant on the Canton grid. Unlike the blue spaces they interact with every day, such as their kitchen sink and public fountain, the water infrastructure typologies are 'blackbox' spaces which sit in the background of their neighbourhoods, unnoticed and undervalued. The spatial characteristics of this term, as defined by Stephen Graham (2009), means that community interaction does not occur with these mono-functioning sites. The sites are inaccessible to the public, and their architecture provides no understanding of the complex water networks they sustain. As Kaika & Swyngedow (2000: 122) explain, the material and spatial aspects of water infrastructure grids tend to populate a cultural substrate of the city. Their materiality's remain largely opaque, invisible, and locked into pipes out of public touch and view. Pike (2007) expands further, highlighting how water infrastructures often burrow underground, into the dark, dirty and dusty world of the subterranean city. Such subterranean water typologies increasingly become cordoned-off physically as well as imaginatively, with the historical legacies of earlier systems of social and cultural meaning buried below ground.

The above ground spaces of Canton Sarajevo's and East Sarajevo's water infrastructure are so banal that they go unnoticed by the average resident (fig 3.2). The most recent typologies constructed within the last 30 years, such as the Logavina reservoir and Hrastovi pump stations are built from concrete and brick. Their elevations are predominantly windowless, and their bland aesthetics communicate nothing of the building's function. The network's water is invisible buried within the building's secure concrete walls.

Fig 3.1 The banal architecture of a modern reservoir goes unnoticed by neighbourhood residents. Author's photo - 16.10.18.







Expanses of grassland, trees and water lie within the infrastructures secured boundaries, but are cordoned off from the surrounding neighbourhoods. Alipašić Most and Buca Potok I exemplify how, and why the predominantly green and blue resources of the city's water commons are secluded from the public. A majority of the technical equipment lies beneath ground to provide optimal control of light, oxygen and heat. Above ground, the secured site is mainly natural landscape, and a small amount of enclosed space. Public access is prohibited by 2m high boundary walls (fig 3.3) and fences (fig 3.4), guarded with security cameras and warning signs to prevent trespassing (fig 3.5).

Sarajevo's blue spaces of water provision weren't always designed to be purely technical. Before the Austro-Hungarian Empire implemented the blackboxed typologies, Ottoman sebiljs and česmas (fountain wells) adorned the city as multi-functional blue spaces of provision, whose design facilitated cultural, social and sacred local customs. These neighbourhood wells were the spatial heart of the community, and their construction was funded by philanthropic families. Women and men socialised on the Sebil steps, shielded under its canopy from the weather whilst performing domestic chores or the Wudu ritual of purification. The central sebiljs were most used by the public (fig 3.6). However, the Austro-Hungarian empire transformed water's civic presence from a public social resource into a domestic utility. Water was now perceived by the empire as a purely scientific resource to be tamed to further state interests, aligning with Allan's (2005) classification of the hydraulic mission paradigm. The network's design was assigned to the realm of engineers.

For the first time, water was transported from natural springs to kitchen sinks, across a vast subterranean grid. Anything other than technical need was

Fig 3.2 Monumental aesthetics of reservoir give no insight to its function. Author's photo - 17.10.18.

Fig 3.3 Boundary wall and fence prevents public access to reservoir and pump station. Author's photo - 16.10.18.

Fig 3.4 Exclusive site access permission is limited to Canton water company employees, at Reservoir Hrid. Author's photo - 17.10.18.

Fig 3.5 Secured site boundary of Crni vrh reservoir. Author's photo - 16.10.18.





Fig 3.6 The Sebilj of Sarajevo's central Baščaršija market. Ottoman identity is expressed through ornate Islamic wooden panels and canopy details, and the form of the raised limestone platform and domed copper roof.

Fig 3.7 The Vrelo Mošćanice reservoir, constructed in 1889 during the Austro-Hungarian era. The site's technical greatness is celebrated through the aesthetics of the 'masculine' sublime. Of note are the door, lamp, handrail, date stone and monumental limestone form. The interior is carved from large limestone blocks and the floor is tiled. Author's photo - 17.10.18.





discounted from the water networks new spaces. These new technical sites were perceived as superior to the social sites of water provision that existed before the empire's arrival. Water became a tool of industrial development that could support an increased population, advancing Bosnia's industrial society. The design of Sarajevo's new pump stations and reservoirs were what Nye (1996) describes as a celebration of the 'technological sublime' (fig 3.7). In contemporary Sarajevo, water infrastructure continues to be viewed by the Bosnian state in a solely technical capacity. The historical, cultural and social factors are ignored during network development. With social provision only considered in terms of network flow quantities and timings, the design is determined by engineering principles, prioritising functional and financial drivers.

Today, Sarajevo's water infrastructure sites continue to be designed for exclusive state access. This exclusivity is primarily to reduce security risks to the network from contamination and site defacement (Interviewee 9). Although an important safety measure, it erases Sarajevo's rich hydro-social spaces from each neighbourhood. Although Sarajevo's water customs have evolved with technological advancement, blue spaces remain of social, cultural and spiritual importance throughout the city. Predominantly used as spaces of resilience, residents visit blue sites for recreational and wellbeing purposes, to maintain their health. However, the pump stations and reservoirs have become so socially undervalued that they have become targets of vandalism. The social disregard of these neighbourhood utility sites has been made visible in Jekovac and Buća Potok II. Over the years, the metallic doors and stone and concrete elevations of the pump stations have been covered in graffiti (fig 3.8). The boundary fences have been jumped and damaged, while the landscapes are overgrown, and littered with rubbish and empty bottles following unauthorised access and delinquent behaviour. The security measures fail to deter unwanted attention, and the deserted sites that

Fig 3.8 Graffiti covers the limestone structure and metallic door of a reservoir, and its windows have been smashed. Photo taken 17.10.18.





are hidden from the community have become suitable spaces for anti-social activities. In part, concealing the network sites from the public has jeopardised the network's security rather than protecting it, at the cost of restricting the typologies resilience and social benefits from neighbourhood residents.

### 3.2 EXCLUSIVE STATE SITES OF RESILIENCE

Canton Sarajevo's green and blue infrastructure sites already function as spaces of resilience, but these benefits are exclusive to the state employees and bureaucrats who have access to the sites. A growing body of research within the therapeutic landscape studies is revealing that blue spaces have an edge over other natural environments, due to water's restorative psychological effect (Kaplan 1995). The BlueHealth research initiative is an innovative leader in the field, investigating the links between environment, climate, health and cultural perceptions of blue spaces. BlueHealth, among others, argue water's psychological effects are triggered by its sensory stimulations of water, whether through its rippling movement and reflective light, bodily touch and immersion, or its trickling and cascading sounds (Smith et al., 1995b: 40; White et al., 2010: 490). Karmanov and Hamel's (2008: 122-123) research into blue spaces in urban and natural contexts finds that these effects have stress-reducing, mood-enhancing potential, expanding mental attention and mood. For these reasons, the resilient benefits of green space are enhanced by the presence of flowing water in urban settings. Water's natural sound masks road traffic, helping to enhance the relaxing spatial ambience which decreases users' stress levels. Due to these effects, evidence is emerging that blue space is among people's most preferred places for restoration and relaxation (Roe and Aspinall 2011; White et al., 2013b). This opens an opportunity to integrate the network's water into the public space, positively contributing to the public's wellbeing in Sarajevo's civic body. Upon peering through the 2m high fence surrounding the Nahorevo reservoir's blackboxed infrastructure site, a small wooden hut with table and chairs can be seen next to a water fountain that flows into a stream under a decorative bridge



Fig 3.9 Nahorevo reservoir exclusive garden. Photo taken 17.10.18.

Fig 3.10 Bačevo reservoir overspill water feature, which fills up during periods of heavy rainfall. Author's photo - 17.10.18.



(fig 3.9). A similar garden water garden feature has been created within the grounds of the Bačevo reservoir and source complex, creating a garden gnome house within a water overflow basin (fig 3.10). These landscape features have been created by staff members who spend twelve-hour shifts onsite for three days a week, monitoring the equipment. Edin, an onsite engineer, describes the importance of taking his breaks in these spaces. To break up the monotony and isolation of his day, he sits next to the water feature during smoke and coffee breaks and mindfully watches neighbourhood life beyond the fence.

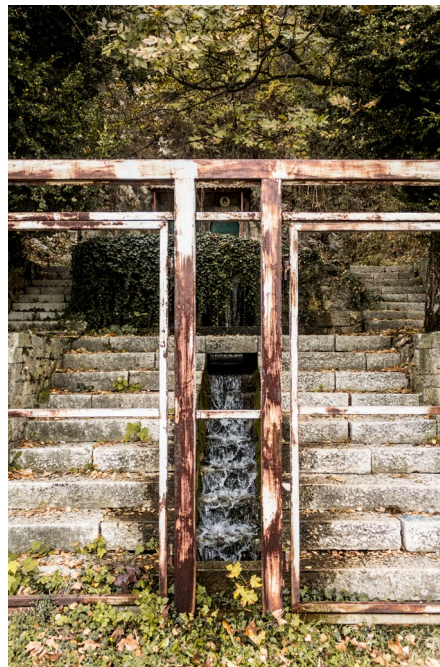
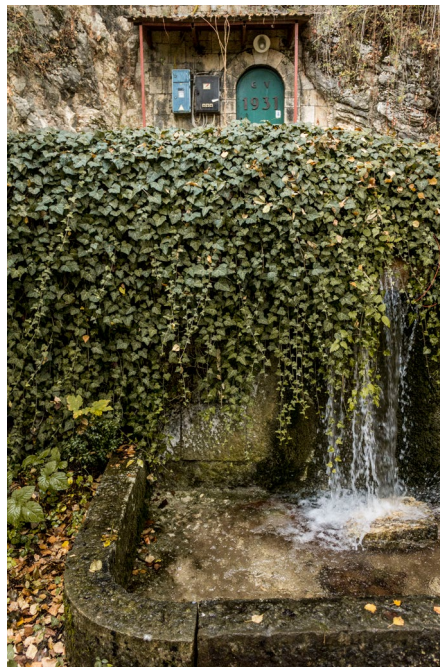
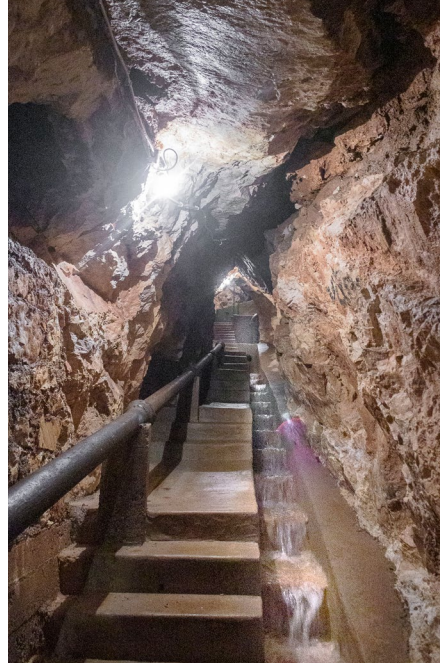
These Informal wellbeing spaces align with the Canton's traditions of exclusive blue space making, beginning with the construction of the Vrelo Mošćanice source in 1889. The picturesque natural landscape contains three reservoirs, two pump stations and a filtration centre. A state mansion was also constructed on-site, which housed the visiting bureaucratic elite of the Austro-Hungarian and Yugoslavian regimes (fig 3.11). While hosting members of the international community, state ambassadors, including the city mayor, would stay in the technical water infrastructure complex with their families (Interviewee 8). Located in the city's periphery the complex is a snapshot of Bosnia's natural wealth. Relaxation was encouraged amongst the state guests, who strolled along paths through carpets of grass, punctuated by banks of woodland trees, flowers and pools of water. The complex also demonstrated Bosnia's industrial development to global actors, as the water was transformed on-site into a natural resource of state-building to aid economic, population and agricultural growth.

Elma, an engineer, working for Canton Sarajevo's public water company (Interviewee 8) expressed anger towards the state, for transforming the city's most picturesque civic commons sites into exclusive spaces only accessible for the enjoyment of powerful state elites. Funded by bill-payers and taxpayers, she believes the green and blue water commons of the state should be

Fig 3.11 State house that has been used since the end of the 19th C. to host state ambassadors and international guests, in the picturesque civic commons of Vrelo Mošćanice. Author's photo - 17.10.18.







accessible to all Sarajevan's, especially as spaces of water are of prominent social importance to Bosnian culture. Lelja shares this sentiment, wishing her Sarajevan neighbourhood, and neighbourhoods throughout the city, had more accessible natural spaces. Following the siege, most of the natural landscape was transformed into cemeteries and sites of development. She believes the sizeable areas of unused green space built into the water commons network should be accessible to the public, combining technical provision with social and public health benefits in neighbourhoods where access to natural landscape is scarce.

There is a blue infrastructure site in Sarajevo that demonstrates how this can be achieved. At Sedrenik reservoir, a steady stream of overspill water flows out of a channel in the cliff face, cascading down a promenade of steps, and into a pool at the site's entrance (fig 3.12). An openable gateway permits resident access and improves the aesthetic and wellbeing environment of the neighbourhood. Elma believes more of Sarajevo's water infrastructure sites could follow this design example. The public feature also demonstrates that the network's water can be made visible in the neighbourhood without creating security concerns over contamination. The water is processed further along the network, or uses overspill resources. This provides the inter-entity masterplan with an opportunity to shape the new blue typologies to enhance resident wellbeing. The 'healing' agenda of Sarajevo's public water spaces is nothing new to the city's water norms. Dating from the valley's first settlement by the Illyrian's, water's healing qualities were developed by the Romans. Vrelo Bosne spring water was piped into their settlement's baths for its healing qualities (Mehmed 2008). During the Austro-Hungarian era, water's historical association with healing was adopted into the empire's place-making identity for the city, which is still capitalised upon today. Central Sarajevan pharmacies sell Mineral water for its healing qualities, and the Bosnian national football team visits the Vrelo Bosne spa, using the sources healing waters in muscle relaxation treatments.

Fig 3.12 The journey of overspill water of Sedrenik neighbourhood, travelling from subterranean cave reservoir to public neighbourhood space. Author's photos - 17.10.18.

Sarajevo's perception of water as a 'healing' element makes the new masterplan typologies more likely to be used by residents for its wellbeing benefits.

Urban planning schemes that incorporate blue and green outdoor environments are fundamental characteristics of a 'healthy city' (Thomas 2015: 187). In line with good practice, environments dominated by natural elements such as trees, grass and water (White et al. 2013b) are increasingly being considered as essential settings for mental health promotion. Post-conflict populations would benefit from these urban environments of resilience, as the socio-economic hardship, as well as cultural and family tensions experienced by those living in peacebuilding societies, has a profound impact on the public's mental health. These daily stressors have led to a prevalence of anxiety and depressive disorders, which due to societal stigma, often go professionally untreated and have led to a rise in unhealthy coping mechanisms of substance abuse and youth delinquency (Placella 2019). The effects of daily stressors on the public are furthered by symptoms of PTSD and trans-generational trauma. Even Sarajevo's urban fabric can exacerbate mental health issues. Velma and other Lelja are tired of the city's war scarred buildings, which bring back memories of their families turbulent wartime experiences. Rather than seeing bullet holes and memorials, they wish they were rid of the daily stressors and the emotional pain they experience living in a post-conflict city that still shows signs of war damage. Although development of health and social policy is required to tackle the root of these issues, Sarajevo's civic body, and its blue and green water infrastructure sites, can play an important role in improving public mental health - if they are designed to be inclusive natural neighbourhood spaces. Neighbourhood spaces that facilitate commuter walks and lunch spaces promote habits of resilience and wellbeing.

The psychological health benefits of exposure to nature can be improved if mindfulness is practised, which helps to clear the mind of worry. Although this is not an isolated cure, it helps individuals deal with the daily stressors within their domestic and working environments (Conradson 2005: 341).

Due to their expansive populations, natural spaces in urban bodies have been identified as providing therapeutic wellbeing experiences to sizeable quantities of the general public (Larson and others 2016). In a post-conflict city like Sarajevo, where the population is saturated with displaced war survivors and their children, making the new blue and green infrastructure spaces of the bi-communal masterplan accessible to the public could be included in the city's public mental health initiative. The Swiss Agency peace-building foundation funds this initiative, to destigmatise mental health and encourage localised solutions (Swiss Agency 2019). By using these spaces to increase awareness of wellbeing practices that could replace unhealthy coping mechanisms, the masterplan's accessible natural infrastructure spaces could become a valuable peace-building asset to improve residents' lives.

### **3.3 MULTI-FUNCTIONAL BLUE INFRASTRUCTURES ENHANCE NEIGHBOURHOOD LIFE**

A move to spatially 'unblackbox' water utility networks is a rapidly growing area of urban design. The unblackboxing movement is driven by municipal desire to improve environmental, economic and social sustainability. Water infrastructure design is a suitable tool to address these issues, as they span large densely populated urban areas. Even in fragile states like Bosnia, sizeable investment is being used to fund water infrastructure projects that span the city neighbourhoods. Kevin Lynch set an urban design challenge in 1984 (312-313), to make civic processes perceptible. This challenge aims to enhance public understanding of the infrastructures that surround them, and upon which they depend.

In the last decade, a number of urban designers and theorists have offered insight into how Lynch's challenge could be met (Domínguez Rubio & Fogué 2015; Jefferson and Letteri 2017; Massaro 2018). The term 'unblackboxing' has a double meaning. Firstly, the water infrastructure typologies must use aesthetics, spatial programming and pedestrian flow to create an environment





Fig 3.13 Community interaction occurring in a Medellín pump station park, designed by Opening in 2015, the project was designed by Colectivo 720 Architects. The water is made visible by reusing two old pumps, creating visible blue infrastructure that provides the neighbourhood with psychological and social benefits.

of public inclusivity. The multi-purpose water infrastructure spaces must also use aesthetics and pedestrian flow to make visible the governance and physical infrastructure processes that sustain their water network. As well as being technically sustainable, these multi-purpose infrastructure spaces must be socially sustainable, by serving the needs of the local neighbourhood space through spatial programming. Secondly, from a civic, social and relational standpoint, unblack-boxing is understood as a political act (Domínguez Rubio & Fogué 2015). This means that the multi-purpose sites should also support programmes of civic-state engagement. Applying this 'unblackboxed' approach to Sarajevo's inter-entity water management masterplan is necessary to enhance the infrastructure's peace-building agenda at the neighbourhood level.

The thesis has already examined the political and psychological needs that the water infrastructure sites could address across the city if they were integrated within community life. The public water reservoir parks of Medellín present an unblackboxing design strategy that fulfils these needs, as well as social neighbourhood needs, in a city of comparable development to Bosnia that is transitioning from conflict (fig 3.13). Similar to the water infrastructure governance in Sarajevo, the Medellín mayor occupies the seat of the chairman of the water infrastructure board of directors, and has the power to appoint the CEO and the other Board members (Orlandi 2016). This structure has allowed the water infrastructure to play an essential role in the transformation of Medellín. The proactive approach of the last mayors has allowed the deployment of large-scale urban regeneration projects directly linked with the infrastructural system of the city.

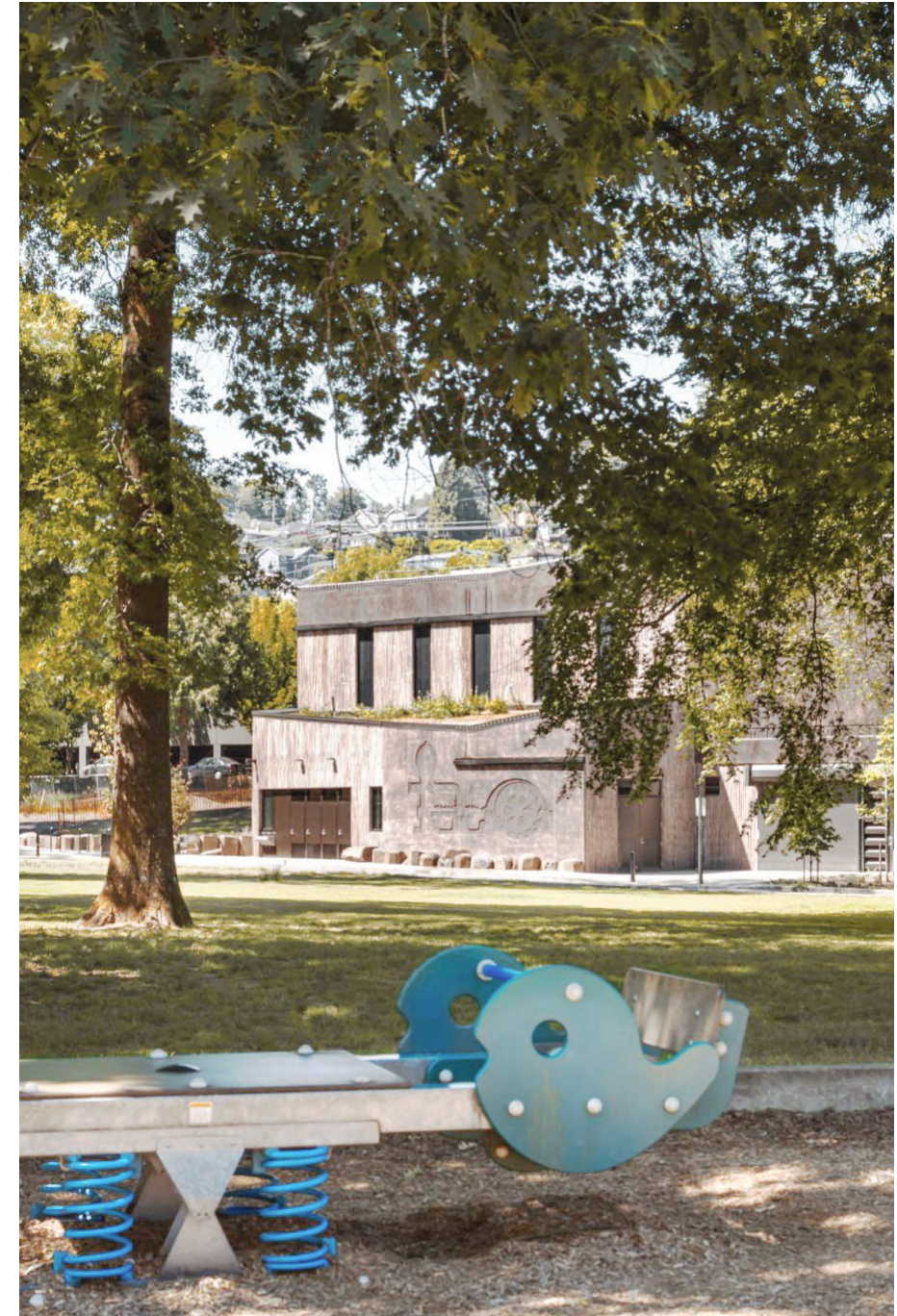
Throughout the past fifty years, Medellín was known as the 'city of death', due to its ongoing fatal civic conflict (Palaez 2011). During this period, public authorities fenced off the state-owned city water tanks to prevent militia or paramilitary gangs poisoning the water. The sites became 'forbidden islands' right in the middle of the city's neighbourhoods (Mollard 2015), similar to the current situation in Sarajevo. However, due to their central community location, they have



been used throughout the last five years to drive drastic urban transformation. Thirty-seven water tanks of 144 were chosen for development. The criteria for selection included available surface area, ease of integration into residential districts, geological and technical restrictions, planned infrastructure works and collaboration opportunities with neighbourhood social projects (Orlandi 2016). The Medellín project was designed at the neighbourhood scale, unlike previous interventions which planned for the city as a whole. This allowed the multi-purpose public water infrastructure spaces to act as a catalyst for change, revitalising its most poor neighbourhoods by re-appropriating leftover space. Each of the 37 water tank designs were adapted to the social needs of the context they sat within. The programme for the sites varies between auditoriums, open air theatres, picnic areas, playgrounds and laundrettes. The project success lies in the social and technical implementation within deprived neighbourhoods. They are the only public space at the disposal of the community, and provide new cultural and recreational activities to encourage citizen interaction.

Social co-benefits can also be achieved within technical projects of a smaller scale, similar in size to the sites of Sarajevo's network expansion. In Kitsap County, Washington, a community consultation was held during the planning stages to replace an aged and undersized stormwater outfall pipe. Neighbourhood residents voiced their desire to combine this technical piece of infrastructure with a communal gathering space, using a context-sensitive natural design that enhances the neighbourhood's character (May and others 2016). The constructed stormwater facility functions as a community park, with car parking, gathering space and a spiral fountain at its heart. Upon residents request, community signage was introduced to provide education on citizen's responsibility to maintain the neighbourhood's water quality (The Partnership for Water Sustainability BC 2016). By utilising the blue space to its full technical and social potential, citizens were fully satisfied with the state works, easing

Fig 3.13 Hanna Mason Pump station in the Portland Willamette Park, USA, uses its cladding to visually communicate the water processing that goes on within the walls of the pump station (MWA Architects 2017).





emotional responses the construction disruptions triggered and creating water-wise citizens invested in the upkeep of their blue neighbourhood space. In a more passive capacity, the public open-air reservoirs of Washington Park, USA also use the typology's natural landscape features to enhance the neighbourhoods natural space with added relaxation and recreational qualities. Residents can sit, stroll or run alongside the water's edge, incorporating the space into wellbeing lifestyle routines. While the Hanna Mason Pump station in the Portland Willamette Park, USA, uses its cladding to visually communicate the water processing that goes on within the walls of the pump station (Fig. 3.13 MWA Architects 2017). As the five pumps were combined with park storage and public restrooms, an opportunity was taken to use the buildings aesthetics to increase local understanding of its function within the water network.

When asked about the likeliness of creating multi-functional infrastructure sites during the GrCF: Sarajevo Water expansion, the EBRD project manager was convinced this was beyond the economic means of utility development in Bosnia, and was only a utopian vision for Northern European countries. The Medellin project proves otherwise, but it must be noted that their public company is required by law to reinvest 30% of their profit back into the city which helped to fund the project. This policy does not exist in Sarajevo. However, if Sarajevo's water management stakeholders followed the money-saving strategy, the Deschutes valley project in Washington adopted (City of Tumwater 2018), state costs could be lowered. A public-public partnership was established to integrate a reservoir and pump station with a new neighbourhood park. The multi-functional infrastructure space was equipped with a playground, public toilets and parking following community consultation. The top of the reservoir acts as a viewpoint and community art piece, with a mosaic shaped like a water droplet that has ten water scenes highlighting the waters social importance. The project was praised for its cost savings and environmental construction efficiency, and additional park features amounted to only 15% of the total project cost (LOTT 2016). The extra international funding Sarajevo's masterplan is entitled to apply for due to its peacebuilding credentials could also be used to transform Sarajevo's

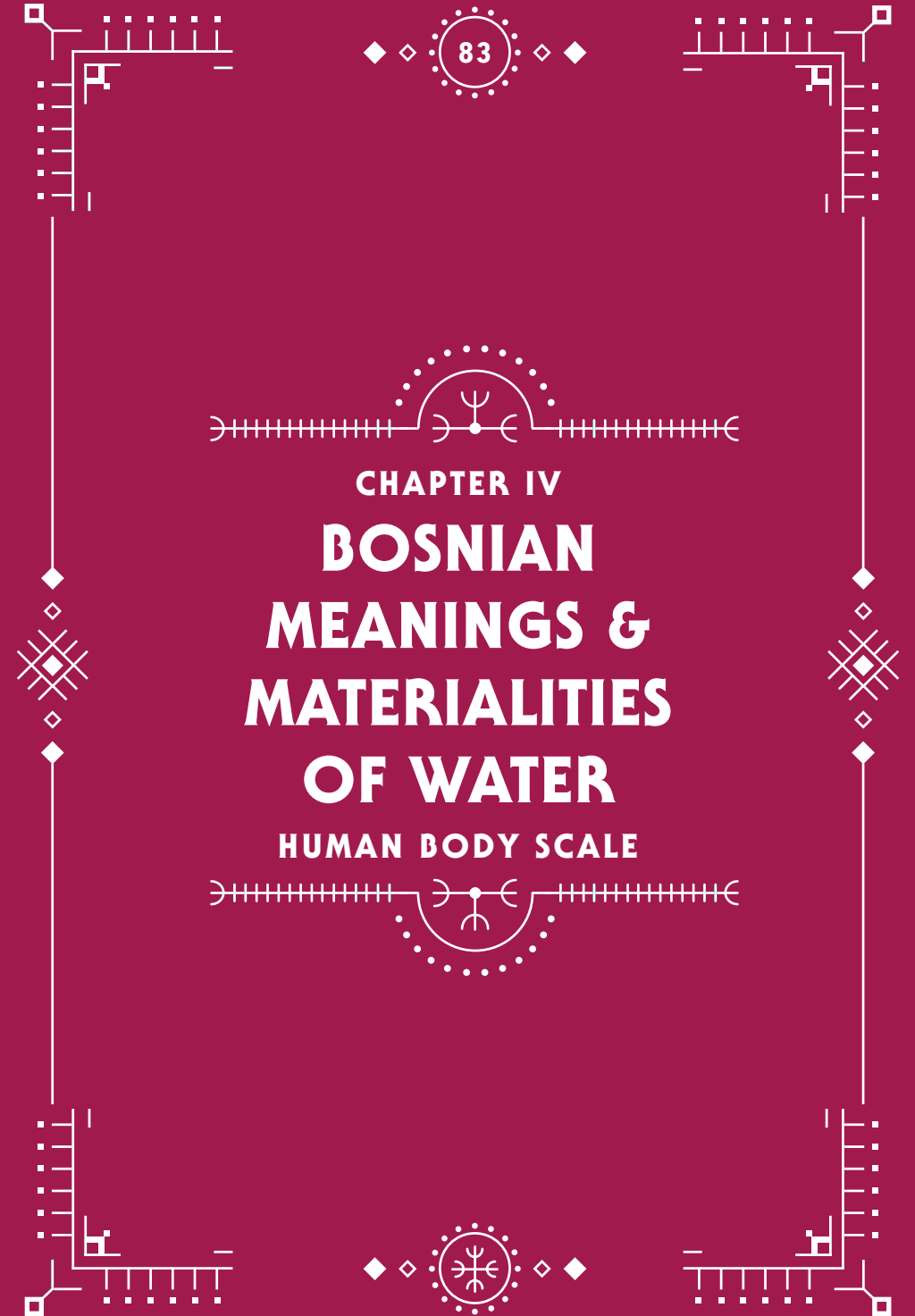
blue infrastructure sites into public civic spaces that enhance the residents quality of living, through their natural, social and political spatial attributes.

### 3.4 MAKING THE INVISIBLE VISIBLE

The spatial and social analysis of Sarajevo's water infrastructure typologies reveals an urban design opportunity to improve state-citizen relations, which have been severely damaged by the water shortages. Sustainable interventions merge landscape, architecture and civic space to enhance the neighbourhood environment of the masterplan's new build typologies. As in the case study of Medellín, Canton Sarajevo bureaucrats must explore strategies to address the political and psychological issues experienced at the neighbourhood scale. If successfully integrated by the neighbourhood community, multi-purpose water infrastructure spaces have an opportunity to improve state-citizen relationships, and raise public awareness for both state and citizen responsibilities that must be performed to maintain the water infrastructure.

These findings raise some final architectural questions to be answered in the final chapter. Which Sarajevo neighbourhoods would socially benefit the most from new build multi-purpose pump stations and reservoirs? What architectural form and aesthetics will be used to increase local knowledge of how the water infrastructure functions? How can water be used as a materiality within these spaces, to create urban pockets of wellbeing? Local social norms of water use in Sarajevo's public blue spaces will be paramount for successful for the new water infrastructure sites to be integrated into community life. This leads onto one final peace-building investigation are public water practices performed across Sarajevo's ethnic divide? The answers to these questions will inform this thesis design project, which aims to create inclusive community spaces that attract all of Sarajevo's peoples to share the same space - united around common Bosnian water practices.

CHAPTER IV  
**BOSNIAN  
MEANINGS &  
MATERIALITIES  
OF WATER**  
HUMAN BODY SCALE







#### 4.1 POST-WAR SPATIAL IDENTITY

The military tactics of the siege of Sarajevo differed to the attacks of ethnic cleansing for territorial gain that occurred throughout Bosnia during the war. Sarajevo became a target of 'urbicide' (Stevenson 2010) whose diverse repositories of ethnic cultural identity were annihilated (Pullan and Baillie 2013: 6). The attack successfully transformed the melting pot of religious tolerance and ethnic diversity into a segregated city, with divided homogenised populations. The IEBL has shaped an ethnic division within the city's urban fabric. This urban division is expressed through public space-making and the cultural practices that are performed within these spaces. This spatial segregation along ethnic lines did not exist before the war. The shift in population demographics stems from two factors. After the war, a large proportion of Bosnian Serbs migrated across the IEBL into East Sarajevo (Bollens 2013: 192-93). Countering this, a large number of Bosniaks who escaped Bosnian Serb dominated regions across the country migrated to the city. They replaced the native Sarajevo population which escaped during the siege and set up home in safety amongst their new Bosniak neighbours.

Rebuilding architecture and culture is an essential act of re-establishing group identity of a persecuted or displaced community following warfare (Bevan 2016). It shapes the collective ethnic identity, derived from members common interest, experiences and solidarity (Taylor and Whittier 1992). Differing ethnic identities and spatial practices have shaped public space making on both sides of the divide. The Spatial Plan of the Republic of Srpska defines Sarajevo as a 'shelter for Serbian people', in which the territories origin, symbols and values must be protected from oblivion. Upon crossing the IEBL, the Bosnian language in Latin script is replaced with the Serbian Cyrillic script (fig 4.1), while Bosnian and Islamic flags are replaced with Serbian

Fig 4.1 Invisible border marked by signs depicting ethnic differences between the two territories, through the use of latin and crylic script. Author's photo - 16.10.18.

flags, and flags of the orthodox church. Crucifixes dot the skyline instead of minarets. While in Canton Sarajevo, the celebration of Islamic identity has shaped public space, which required extensive rebuilding after a number of Islamic buildings were targeted for destruction during the war. As Bosnia transitioned into a capitalist economy, international development also played a role in shaping Sarajevo's public space, which has not been favourably perceived by the public (Interviewee 30; Interviewee 37; Interviewee 12). Many Sarajevo's are unhappy about the development of Islamic eastern aesthetics and customs materialising in their city which differ to their own moderate Bosniak culture. Furthermore, the Republic of Srpska highlights the development as the 'Islamisation' of the Fed BiH. Imran points to the monumental King Fahd Mosque funded by Saudi Arabia. He complains that the scale of the complex and architectural form of two minarets are not in keeping with the style of Bosnian Islamic culture (fig 4.2). Furthermore, he takes issue with the conservative female Islamic attire and hairstyles adorned by men within the community, and the markets outside the mosque that are spreading the Wahhabi culture. While Branka, a Bosnian Serb who has lived in Sarajevo all her life refuses to go into Canton Sarajevo city centre anymore. The post-war Islamic redevelopment and introduction of conservative customs make her feel uncomfortable, and she no longer recognises the city of her youth.

The principle of peace through segregation was driven by the belief that conflict can regularly occur alongside high levels of intergroup contact, as seen in similar situations such as Belfast during the 1970s (Mac Ginty 2001). As Bosnia has not reverted to violence within two decades of peace, unlike almost half of post-conflict societies (Högbladh 2006), the enforced segregation has been acknowledged as a successful measure of short-term peacebuilding within the country. However, the territorial division has facilitated the entities to develop opposing agendas of ethno-national state-building that has shaped their civic body and societies. The current and future

Fig 4.2 King Fahd Mosque funded by Saudi Arabia. He complains that the scale of the complex and architectural form of two minarets are not in keeping with the style of Bosnian Islamic culture. Author's photo - 17.10.18.

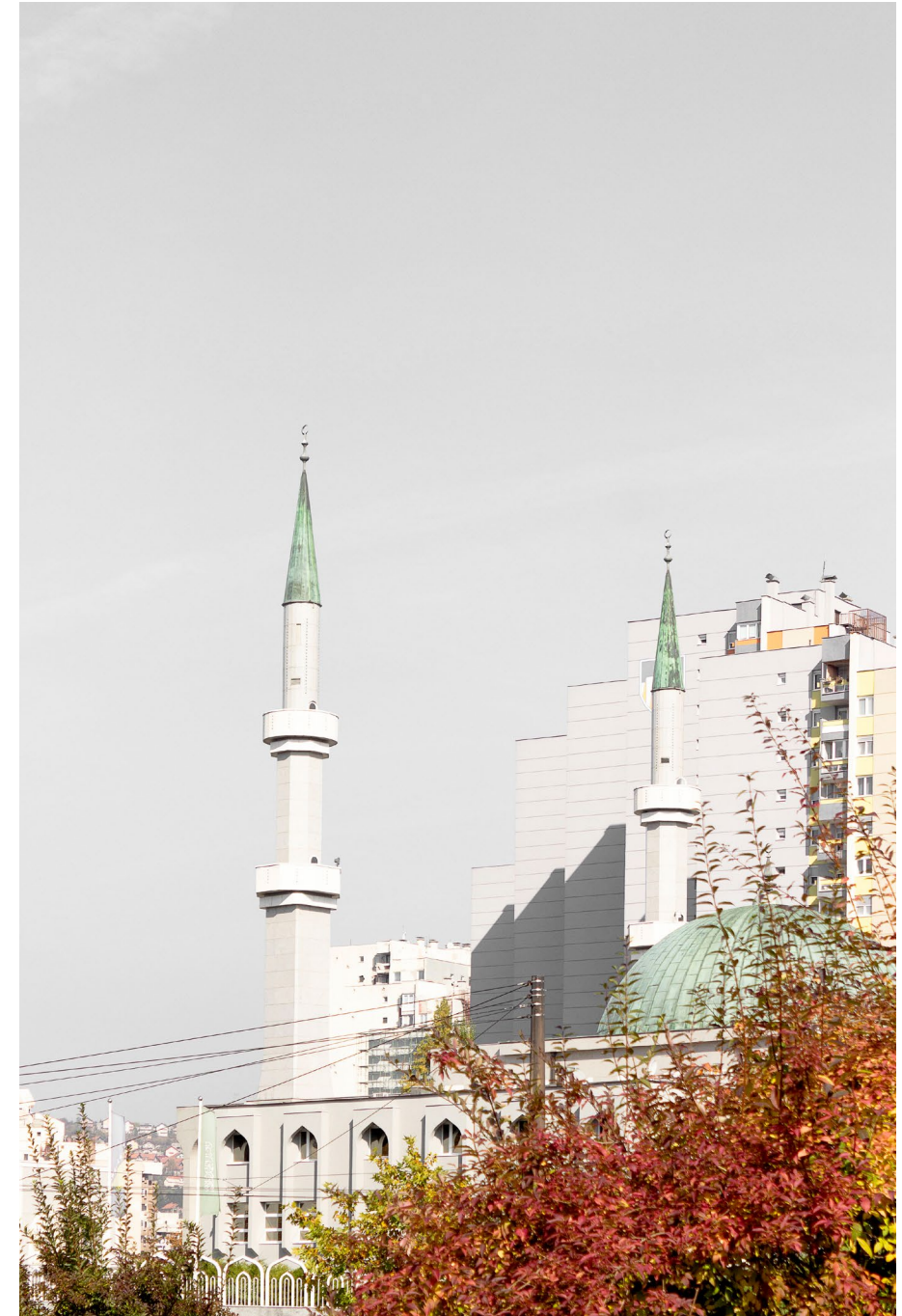






Fig 4.3 Lelja's photo-voice images of Bosnia's water rich landscape, which she defines as the image of the Bosnian nation.

generations of Sarajevo are being moulded by the segregated collective identity of their ethnic communities and spaces. The prolonged effect of territorial segregation in the urban environment has been found in some cases to breed ignorance, introversion, intolerance and prejudice (Forbes 1997).

To counter these social obstructors to the social peace-building process, it has been found that contact improves intergroup relations, once a respective amount of time has passed since the conflict (Allport 1958). As recent studies show, positive contact between divided groups reduces social distance (Pettigrew and R. Tropp 2000), prejudice (Pettigrew and Tropp 2006), sectarianism (Hayes and others 2007) and increases the desire to have ongoing interactions (Gaunt 2011). As ethnic identities continue to shape city development in a way that makes those who do not belong to the group uncomfortable, opportunities for cross-group integration in neutral space, devoid of exclusionary space making is even more critical for long-term peace stabilisation. It is in this light that this chapter turns to examine Bosnia's public blue spaces, to examine if their natural landscapes, materialities, and the cultural and recreational practices performed in these spaces may be suitable for inter-ethnic interaction to take place.

## 4.2 INCLUSIVE GATHERING IN RECREATIONAL BLUE SPACES

Water-rich spaces are popular sites of recreation that attract crowds from both sides of the IEBL. Each photo-voice participant captured an image of Bosnia's blue landscapes as a shared national symbol. Lakes, rivers and fountain springs located in both entities were photographed. As Lelja expressed, 'no matter where you go in the country, in the Fed or RS, natural water features shape the landscape of our shared nation' (fig 4.3) During the Austro-Hungarian industrial revolution, Bosnia's territory was perceived as an economic resource but also as a 'landscape' for the first time, of aesthetics and moral value (Kern 2003). As Paul Readman expands areas of 'wilderness' still existed, landscape was generally seen not as 'natural', but as something created in dialogue with men and women.



As Stephen Daniels (1994: 5) continues, this meaning became accepted as national in character, despite the persistence of associations between landscape and locality. Images of Bosnia's water-rich landscape became an aesthetic of national identity, appearing on stamps and postcards, as travel routes to remote water-rich destinations became accessible.

The Bosnian war tainted the meaning associated with Bosnia's landscape. Pamela Colombo and Estela Schindel (2014) explore the dark side of collective identity that landscapes can embody, focusing mainly on state inflicted violence. Bosnia's landscape was mutated, with topography shifting to erase the existence of a community, or remain eerily untouched but loaded with memories of disappeared loved ones. Victims of ethnic cleansing were disposed of in Ravines and mass graves, while minefields weaponised grasslands and forests. The Višegrad massacres saw between 1000 - 3000 Bosniaks killed on the Drina River Bridge. Their bodies were thrown into the river. Similar attacks occurred along the river valley (Vulliamy and Jelacic 2005). The meaning of such landscapes changed within the collective memory of persecuted communities.

However, the majority of Bosnia's state owned blue landscapes have retained their beloved national identity. Following the dissolution of Yugoslavia, Bosnia became predominantly landlocked. The blue landscapes' place-making attributes were elevated to reform the nation's image and tourism industry. The national border has redirected centripetal forces of movement. More Sarajevans take trips to Bosnia's water sites than the Croatian coastline during the summer (Interviewee 29). Doves of Bosnians visit waterfall sites, reservoirs and swimming pools, treating them like beaches (fig 4.4). Visitors to the Konjic waterfalls and the Pannonian reservoir in Tuzla lay down their towels, and spend a day relaxing with friends while dipping into the water.

Fig 4.4 In landlocked Bosnia, a recreational waterfall beach attracts many visitors, who recline on towels, and swim in the water . Author's photo - 09.08.18.







Fig 4.5 Signs at Konjic waterfall which prohibit religious water rites from being practised on site, in an attempt to keep the site inclusive. Photo taken 09.08.18.

Restrictions have been implemented to make them inclusive spaces for all ethnicities. At Konjic waterfall signs are dispersed across the site to prohibit water's use in religious rituals. The force of falling water has carved the natural limestone environments. This neutral setting attracts Bosniaks and Bosnian Croats from the surrounding area to share the same space.

Andrew (Interviewee 17) lives in Canton Sarajevo but explains that he and his friends only cross the IEBL for recreational purposes. However, interactions between visitors and ethno-nationalities varies, dependent upon the activity. In sociology, social interaction is defined as 'dynamic actions' between two or more actors (Labour 1996). There are four forms of social interaction that can be categorised as 'passive' and 'active'. In relation to space and place theory, a 'public place' is used to host an occasion. In this case, the public place is the recreational blue space, which attracts differing ethnicities to gather in one place (Hornecker 2005). If a 'situation' occurs in this public place, it encourages, active interaction between the people gathered for the occasion, with the 'encounter' being the actual interaction to take place (Harrison and Dourish 1996). When participating in excursions at blue Bosnian sites, like white water rafting, active interaction occurs. Visitors work together, talk and form friendships when partaking in such situations. However, Goffman (1963) argues that being present in a public place for an occasion already creates opportunities for encounters. Even though people do not interact with each other, they can still be regarded as in a stage of 'passive' interaction. When Bosnian strangers are relaxing in a shared blue space, passive interaction is most likely to occur. As visitors are in their swimming costumes, they feel more exposed and aware of others encroachment within their personal space. Unless the visitors are particularly extroverted, verbal communication is restricted to discussing situational problems with the facilities, or to exchange information. However, interactions between visitors and ethno-nationalities varies with the activity.

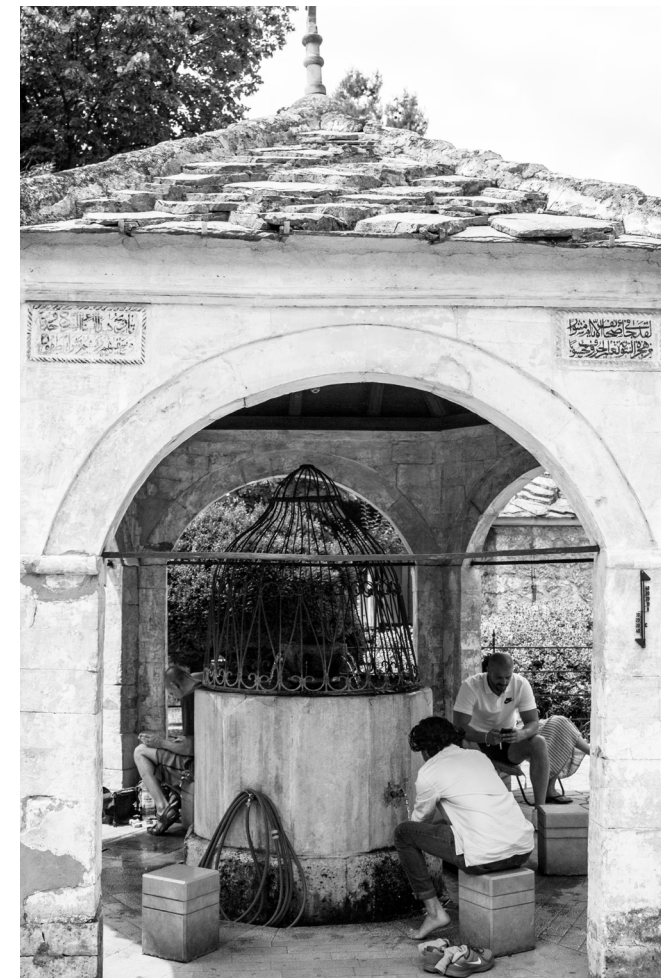
The performance of sacred rites in Sarajevo's natural blue spaces originates with the Illyrian and Romans, as described in chapter 3. The Ottoman and

Austro-Hungarian empires elevated water's sacred use into the spatial domain. Mosque complexes were adorned with ablution fountains (fig 4.6), Synagogues housed Mikveh purification baths, and Catholic and Orthodox churches contained holy water and baptismal fonts for rituals of purification and blessings (fig 4.7, fig 4.8). Aesthetics communicate water's sacred status, through ornate designs, religious symbols, scripts and imagery. Even the body of those partaking in the religious rite can be adorned with religious garments, identifying them as members of the religion.

Religious suppression during the Socialist era led to an explosion of religious practices following Yugoslavia's dissolution. Rituals were implemented as a tool of ethnic nation-building (Kalčić 2005: 155). This strengthened religious group identity and legitimised territorial claims while celebrating their cultural resilience following the war. Taking the Water Blessings was practised by few Christian Orthodox believers during the Austro-Hungarian era, and was forgotten during the socialist era. However, since 2016, East Sarajevo's have proudly partaken in the Epiphany cold water swimming event in the Željeznica River (fig 4.10; Sarajevo Times 2016). The winner receives blessings for the forthcoming year. Meanwhile, it has become popular for the Bosnian Croats to take pilgrimage to Međugorje. Crowds gather within the religious complex to wipe the tears of the Sculpture of the Risen Christ onto a handkerchief (fig 4.11). The tears are believed to cure the ailments of loved ones, following the apparition of the Holy Mother Mary in 1981 (Ryan 2018).

The Bosniak religious calendar also has its own annual hydro-social rite. Male believers publicly perform the five daily Wudu rituals at the Mosque Shadirvan Prayers are then performed on kilims handwoven by women of the community. Thousands of devotees also partake in Europe's largest Islamic pilgrimage, Ajvatovica, outside Prusac village (fig 4.12; Hadži Muhamedović

Fig 4.6 One man practices the Wudu, while two more rest in the shade of the canopy. Aesthetic symbols, scripts and form used to express Islamic this as a sacred public Islamic space. Two materialities of stone and water . Author's photo - 23.09.18.







2018: 48). According to myth, the water shortages that plagued the village ended after an Islamic Cleric performed prayers for forty days at the base of a rock that was obstructing access to the spring. Prayer mats and bodies in religious dress adorn the pilgrimage site during the annual celebration. Bridge diving is another Ottoman tradition performed by young Bosnian men (fig 4.9). However, all ethnicities partake in this activity. The secular rite of passage into manhood is a challenge of skill and courage (Petrovic 2012: 70). The sport is performed on rivers flowing through Sarajevo, Banja Luka and Travnik (Srpska Times 2018; Sarajevo Times 2015). However, it is most famously associated with the Stari Most Bridge in Mostar.

Apart from the inclusive Bosnian custom of bridge diving, these practices of using water to strengthen exclusive ethnic groups must not be adopted by the multi-functional water infrastructure spaces, if they are to be ethnically inclusive. However, it is worth noting that there is a common material theme between these sacred and secular spaces of ethnic water rituals. The three materialities of water, stone and fabric appear in interior sacred spaces and natural spaces that the religious rituals are practised within. Due to the sacred use of water in such spaces, the stone and fabric are ornately adorned, expressing an aesthetic language of group identity that transforms the objects, fabrics and spatial implementations from the realm of the mundane, to the realm of the sacred. This provides the future water infrastructure developments with a design opportunity to adopt these sacred local materialities of water spaces, and experiment with how they can be used to celebrate the social and peacebuilding importance of Sarajevo's inter-ethnic gathering spaces.

Fig 4.7 Catholic believers gather around a statue of the risen Christ, waiting their turn to wipe what they believe to be healing water from the seeping leg. Author's photo - 23.09.18.

Fig 4.8 Crowds gather in a large open space on the Stari Most riverbank in Mostar to watch the bridge diving competition. Bosnian national flag hangs in the background. Main materialities are stone, water and fabric.

Fig 4.9 Christian Orthodox Epiphany cold water swimming, East Sarajevo.

Fig 4.10 Orthodox fountain within Church courtyard uses Christian iconography carved into stone to express the Orthodox identity. Author's photo - 29.09.18.



#### 4.4 WATER, STONE & FABRICS OF MEMORY AND JUSTICE

Water, fabric and limestone have also played a spatial and narrative role in Bosnia's collective memory practices. Similar to the sacred ethnic water practices, memorialisation strengthens inclusive group identity in the aftermath of trauma. Bosnia's three ethnicities do not agree on a shared historical narrative of their recent history. To analyse the role memorialisation plays in Bosnian society goes beyond the scope of this thesis. However, themes of materiality that are shared across the ethnic groups in these spatial and material practices to strengthen group identity will be analysed in this section, to further a local understanding of how Bosnian spaces are used to strengthen collective identity. This analysis will also examine how blue space can also be used for relaxation and contemplation. These wellbeing psychological practices will inform the inclusive design programme in a similar way as the recreational social uses will.

These themes will be further explored in the design project, with the intent of creating a new architectural aesthetic for Bosnia's peace-building society that does not communicate ethnic exclusivity, but inclusivity. This new architectural aesthetic is not proposed to replace the existing aesthetics of ethnic identity that the Dayton era rightly allows to be expressed, but sits alongside them. They represent an integrative peace-building era in Sarajevo's history, where inter-entity collaboration, psychological support, improved state-civic relations and inter-ethnic space making through water infrastructure development is peace-building progress to be aesthetically celebrated within the heart of community neighbourhoods. Material experimentations with water, stone and fabric will be presented at the end of this section, depicting the beginning of a process of design experimentations, to determine how the analysis could shape the materiality and spaces of the water infrastructure sites.

Fig 4.7 Memorial for the Children killed in the siege, and Ottoman graveyard, in Sarajevo's city centre.  
Author's photo - 23.09.18.







### 4.3.1 STONE

The regions medieval tombstones (Stećci; fig 4.13) are the only form of tangible heritage shared by the Bosniaks, Bosnian Croats and Bosnian Serbs (UNESCO 2018). Created between the 12th C. - 16th C. the Stećci were used for burial by the Orthodox Church, the Catholic Church and the Church of Bosnia (which predominantly converted to Islam). The monumental limestone slabs engraved with a language of symbols are interspersed across the landscapes of Bosnia, Serbia, Croatia and Montenegro (Buturovic 2016). These monuments nestled in water-rich landscapes are a national image of the country and appear on 10KM banknotes and stamps.

Although no joint narrative of commemoration existed following the Bosnian war, The materialities of water and stone in spaces of remembrance continued. However, these blue spaces of commemoration adopted exclusive forms and symbols to differentiate between ethno-national narratives and spaces of remembrance. Water is less commonly used in the Bosnian Serb memorials of the Republic of Srpska (fig 4.15). However, in the territories village of Stari Brod, the river Drina hosts sculptures to commemorate the WWII victims of the Ustaše and Nazi regimes. Outstretched hands and tormented human figures punctuate the still waters. One figure thrusts a large cross in the air, allowing passing cars to understand the memorials ethno-national narrative.

Blue spaces are commonplace in Bosniak cemeteries, as water symbolically represents life. The water features create calming natural environments and facilitate Wudu before prayers. Family members and visitors to Sarajevo's Kovači Siege cemetery gather around the water pool of the main complex tomb. Water laps over the limestone like ripples on a lake and mesmerising patterns of reflected sunlight capture attention. Islamic imagery shapes the lattice roof structure and crescent water basin. At Alipašino Polje memorial (fig 4.14), another peaceful blue environment has been created. Sarajevans

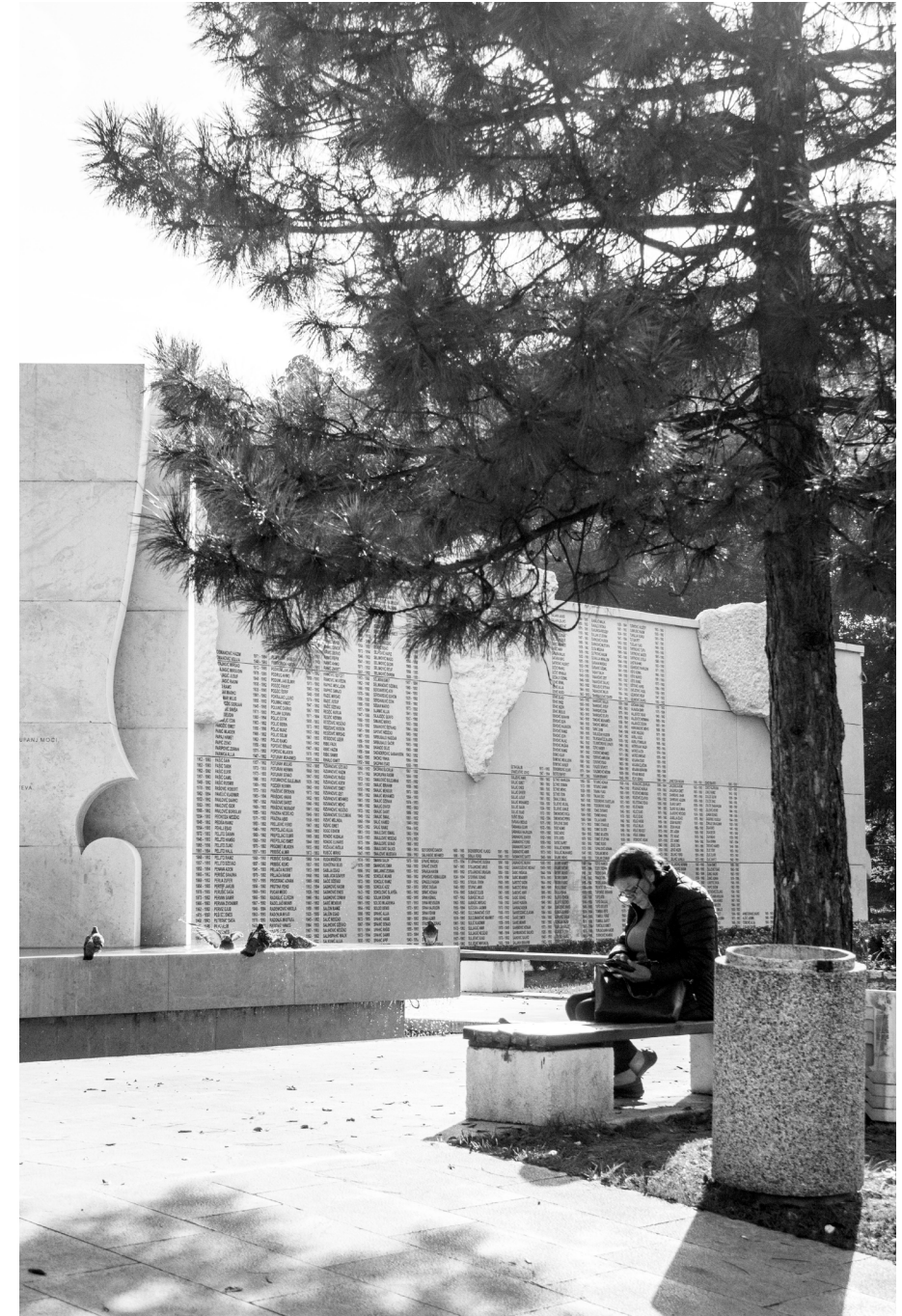
Fig 4.12 Stećci tangible heritage memorial in the centre of Sarajevo. Author's photo - 10.11.18.

rest on benches under tree shade, around a significant fleur-de-lis water feature, which is a symbol of the Bosniaks. A stone memorial wall stands behind the water feature. The polished and raw stone is engraved with the names of the Siege's fallen. Solitary individuals mainly frequent these sites of exclusive aesthetics. These visitors rest and contemplate in the blue pockets of calmness, shielded from the surrounding urban life by vegetation and the sounds of water. Water is also present within the nation's limited spaces of shared commemoration. Sarajevo's most prominent memorial is a water fountain, commemorating the children of all ethnicities killed during the siege. Once again, Sarajevo's sit on stone benches surrounding the memorial under tree shade. Water laps along the brass basin, revealing the children's footprints. While in 2014, a replica of Sarajevo's Sebilj was erected in Missouri, USA. The fountain pays homage to the contribution of the Bosnian refugee population of all ethnicities, which has grown to 70,000 (Cross 2017: 351). The Sebilj is a national symbol of Bosnian identity, represented on national stamps and postcards. The fountain marks the centre of St. Louis's 'Little Bosnia' (Hume 2015: 16), allocating a space to express emotion and celebrate the identity of the displaced Bosnian community.

### 4.3.2 WATER

The discourse around accessing water during the siege is another local form of remembrance. The anthropological findings of Kalina Jordanova (2012) reveal that mothers are more likely to tell their children about their siege experiences. A mother's memory of collecting water for family and household sustenance is more easily shared with pride than a father's wartime actions of violence. Such stories miscast the stereotype of Bosnian women as 'victims'. Instead, they perceive themselves as actors of resistance and survivors. Much of the early literature on Bosnian women's experience of genocide and warfare took a victim-centred perspective. The media has perpetrated this imagery. Women were photographed wailing at gravesides,

Fig 4.11 Woman rests during daily commute under the shade of the tree, next to the Bosniak memorial wall. Author's photo - 30.09.18.



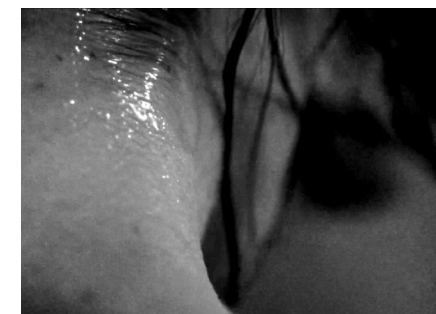


fleeing with children or in traumatised states following gang rape. Such portrayals widely contrast how men's wartime roles have been portrayed - as power brokers, fighters, and sacrifices for the ethno-national cause.

A 2018 short film entitled 'The Siege' (fig 4.6) has publicly bolstered the narrative of women's fight of resistance. The film captures how the weekly chore of fetching water, often overcoming perilous obstacles became an act of defiance. Branka climbed into the hilltops twice a week to collect water from the natural streams, avoiding sniper fire. While Boba's story of her weekly trips across the city to collect water during periods of low rainfall mirror scenes from the film. She and two female friends avoided danger by darting along learned routes of shelter between ruined buildings. Water fetching pilgrimages took between two to six hours. The water Boba collected was used for consumption by her whole family, to upkeep her house and hygiene. However, Boba took most pride in perfecting the skill of using small quantities of water to keep her hair clean. 'It's your resistance. It's your way to resist, to wash hair, to take a shower, to dress, some make up. I could wash my hair with one litre and a half. So I was a pro.' She retained the normality that the aggressors were trying to destroy.

Edin explains how women of all ethnicities gathered to collect water for their neighbourhood. With the fall of Canton governance, neighbourhoods banded together to support and provide for each other. Women gathered around public taps, making them popular targets for aggressor bombings. During the Markale Massacre, 68 Sarajevans died and 144 who were injured while collecting water and bread in 1994 (Haskin 2006: 97-98). The stump of the market's water pump was transformed into a Sarajevo Rose memorial, infilled with blood-red concrete resin, to commemorate the lives lost (fig 4.17). While Eli Tauber explains how the Jewish community had a protective stronghold in the city. They opened their doors to all Sarajevan's

Fig 4.16 Stills from 'The Siege' 2018, which depicts a woman's journey through the besieged city to collect water and use it to clean herself, as a form of resistance.



who came knocking regardless of ethnicity, who needed water, food and medical attention. These women stood united against a common cause.

### 4.3.3 FABRIC

Crafts are another form of narrative that has helped Bosnian women come to terms with the past, to share their experiences and to express their identity. They have also Bosniak hand woven kilims, the Bosnian Serb cross stitch (fig 4.20) and Bosnian Croat tattooing (fig 4.19), have grown in popularity following the war. These crafts were heavily discouraged during the Socialist era. Some Bosnian Croats who bore ethnic tattoos were prosecuted and fired from their jobs (Krutak and Deter-Wolf 2017: 153). However, following the war, women have reengaged with their historic cultural arts. The process and finished pieces are used to express identity, to mourn for their country and to fight for justice. These crafts of tangible heritage have been particularly important to women in displaced communities. Crafting groups provide an opportunity to gather together, exchange knowledge of an old aged tradition and to forge deeper community bonds. These groups have become a form of talking therapy, as women create friendships, share personal struggles, and even traumatic stories about their war experiences (Balkanist 2016).

During the Dayton peace process, the female Bosnian voice was absent from negotiations. All mediators, witnesses, signatories and negotiators were men (Akyol 2019). However, women were as equally affected by the conflict as their male counterparts.<sup>4</sup> However, 20,000 women are still fighting to get the status as a civilian of war, to gain access to justice and compensation (Amnesty International 2017: 10). Devoid of a political platform for female voices, women NGO groups battle for women's rights. Such groups as the Mothers of Srebrenica work to protect and fight for justice for female refugees, rape survivors and the survivors of genocide who lost their male relatives. They use crafting projects to express their calls for justice, engaging with a traditional cultural craft in a contemporary way. The unthreatening materiality has helped to communicate their message when all other avenues have



Fig 4.17 Sarajevo rose in Markale Market marks the location of the community pump that was attacked. Author's photo - 10.10.18.

Fig 4.18 Women collect water during the siege from public taps. Ursula Meissner 1993.

Fig 4.19 Tattooed Bosnian Croat grandmother.

Fig 4.20 Bosnian Serb cross stitch garments.



failed (Lippman 2019: 118). The process of 'Craftivism' (Youngson 2019) is perhaps more important than the final product (Buszek and Robertson 2011: 197), as a supportive community is formed around the shared cause.

The kilim produced during the 'monument in waiting' project uses traditional Bosniak motifs but weaponises the symbols (Deacon and Calvin 2014: 29-30). The kilim produced during the 'monument in waiting' project uses traditional Bosniak motifs but weaponises the symbols (Deacon and Calvin 2014: 29-30). Personal memories and historical facts are encoded into the weave. The kilim is not laid on the ground but hung unfinished on the wall, symbolising the endless process of closure experienced by the women. A ritual of attaching prayer beads to the tassels at the bottom was used to (fig 4.23) express the women's hope for justice (Aksamija 2011). Over 15 other 'Memorial Quilts' have been created since the end of the war. The quilts display places, symbols and names of the crafters family that were killed or destroyed during the war. The projects provide women with a collective voice to advocate for justice. The quilts are either hung in contested sites of massacre or carried. The Mothers of Srebrenica carried memorial a quilt through the streets on their way to war crimes tribunal in The Hague (fig 4.21; Selimovic 2014: 77). While the 'Love of Embroidery' project (fig 4.22) saw thousands of cushions embroidered with the name, date of birth and hometown of a missing loved one (O'Reilly 2017: 55). The cushions were carried through the streets of Tuzla during peaceful protests annually to demand accountability for the Srebrenica massacre.

In Sarajevo's borderland, practices of public space making can be loaded with physical symbols of ethnic identity. Such spaces can make the 'other' feel uncomfortable, less likely to frequent or interact the people of this space (Interviewee 30). The abundant water landscape offers a neutral setting.

4. The OSCE (2019) found that nearly half of women had property severely damaged or destroyed, nearly two-thirds of women had a spouse or family member who took part in the fighting, and almost 48% found it impossible to find work. More than two in five had to flee their homes, and 24% of those were permanently displaced. Women also suffered grave violations of human rights, particularly sexual abuse.

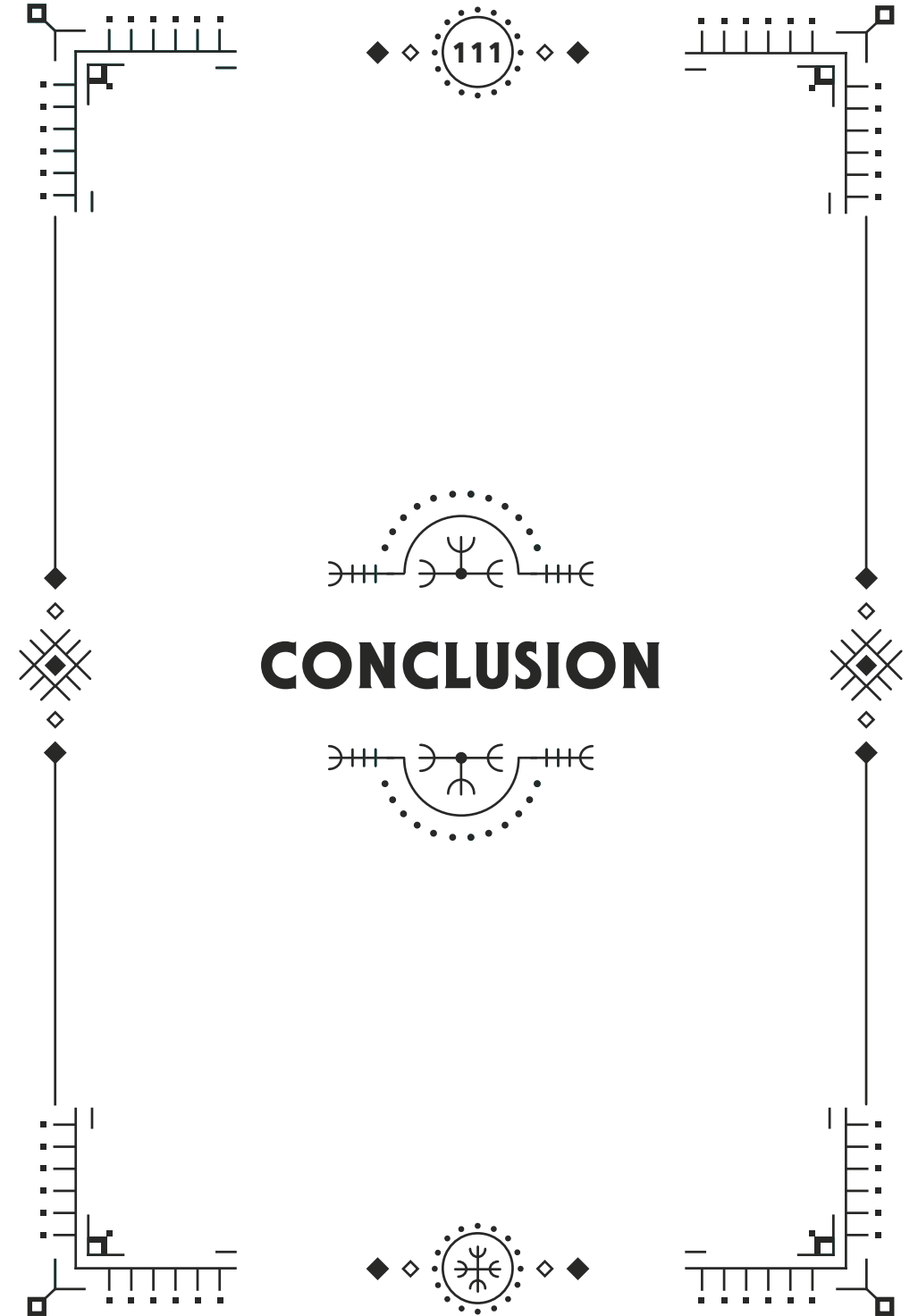


Fig 4.21 The mothers of Srebrenica outside the Court of Appeal in the Hague. Hand-woven carpet and cushion display the names, birth and death dates of their killed relatives.

The landlocked country takes pride in the vast natural water bodies and reservoirs of their mountainous landscapes. Residents from all backgrounds will travel to spend time in such spaces. To sustain the inclusivity, practising religious rites in these spaces is out of bounds. However, it is through the religious rites that the most ornate water materialities and expressions of group identity can be seen, and heard - whether threaded across fabric or carved into stone. No matter the religion, these practices and spaces are woven together using familiar materials and sensory experiences.



Fig 4.23 Women collect water during the siege from public taps.





Sarajevo's water infrastructure development has the opportunity to fulfil the regions hydrosocial needs as well as their hydrological needs. By doing this, the political, psychological and social post-conflict issues that materialise in the urban fabric across the riverbasin, the city, the neighbourhood and the site scale could be addressed. If the development plans continue as they are, an opportunity to increase the resilience of minds, neighbourhoods, communities and the state of this fragile nation's largest settlement will be missed. The current development plans could even put the nation in danger of an escalation of ethno-national tensions, if it continues to be ill-equipped for the effects of climate change.

This use of urban space at a range of scales to contribute to Bosnia's peacebuilding process could set a precedent for the future of the country's water infrastructure development and peace-building efforts. Despite Bosnia's abundant water resources, only 65% of the population is connected to public water utilities, compared to the 90% EU average (UNDP 2019). Failing infrastructures have caused similar shortages in other Bosnian cities, including Banja Luka (RS) and Mostar (FBiH), while rural areas which are home to the majority of Bosnia's displaced, poor and vulnerable citizens make up the 35% awaiting connection to the public network (Interviewee 2).

In an effort to achieve equal access to safe water for all citizens, substantial international investment to fund infrastructure maintenance and development projects is pouring into Bosnia. Capitalising on the infrastructures' span across geographical, political, social and cultural spheres could benefit reconciliatory state-building efforts across the country, under the neutral guise of technical development. This could help to overcome the challenge of apathy and engrained social bias experienced in peacebuilding states. As Banja Luka and Mostar seek to secure funding for projects similar to Canton Sarajevo's water infrastructure development, this hydrosocial approach could potentially be rolled out across the state, expanding its peace-building capacity.



**LIST OF INTERVIEWEES****EXPERT: STRUCTURED INTERVIEW**

1	██████████ European Bank of Regional Development Project Director GrCF: Sarajevo Water Project	15.06.18
2	██████████ Hydro-Engineering Institute Sarajevo (HEIS) Director & Chief Researcher Lord mayor of Sarajevo during the second half of the siege	08.06.18
3	Jennifer White Founder of NGO Project 1948	07.08.18
4	David Bedford Civil Engineer, Atkins	09.10.18
5	Dan Tram Civil Engineer, ARUP	20.11.19
6	Ross McQueen Projects and Infrastructure Coordinator, Fields of Life	28.08.18
7	██████████ Canton Sarajevo water company director	13.10.18
8	██████████ Canton Sarajevo water company employee	13.10.18
9	██████████ Canton Sarajevo water company employee	17.10.18
10	██████████ Canton Sarajevo water company employee	17.10.18

**CITIZEN OF SARAJEVO**

Semi-structured interview (Names have been changed for anonymity)

11	Tatjana	07.05.18
12	Azra	07.05.18
13	Nejla	20.05.18
14	Faris	13.06.18
15	Merjem	15.07.18

16	Davud	14.08.18
17	Andrew	18.09.18
18	Boris	05.10.18

**PHOTO-VOICE INTERVIEWS**

5.10.18 - 22.10.18

Semi-structured interview  
Sarajevo citizens (Names have been changed for anonymity)

19	Armin
20	Safet
21	Sajra
22	Leslie
23	Velma
24	Elma
25	Amra
26	Lelja
27	Ema

**ORAL TESTIMONY**

Structured interview (Names have been retained with permission)

28	Ajna Maksumić Citizen of Sarajevo during the siege	12.11.18
29	Berina Maksumić Citizen of Sarajevo during the siege	12.11.18
30	Branka Ramadnović Citizen of Sarajevo during the siege	08.10.18
31	Boba Sirotnović Citizen of Sarajevo during the siege	16.07.18
32	Edin Konjević Citizen of Sarajevo during the siege	10.08.18
33	Johnny Saunderson International news reporter during the siege	18.07.18
34	Elvis Barukčić Local news reporter during the siege	10.08.18



- 35 Eli Tauber  
Sarajevo Jewish community leader 15.09.18
- 36 Amar Pavlović  
Citizen of Sarajevo during the siege 14.06.18
- 37 Imram Ramadnovic  
Citizen of Sarajevo during the siege 20.05.18

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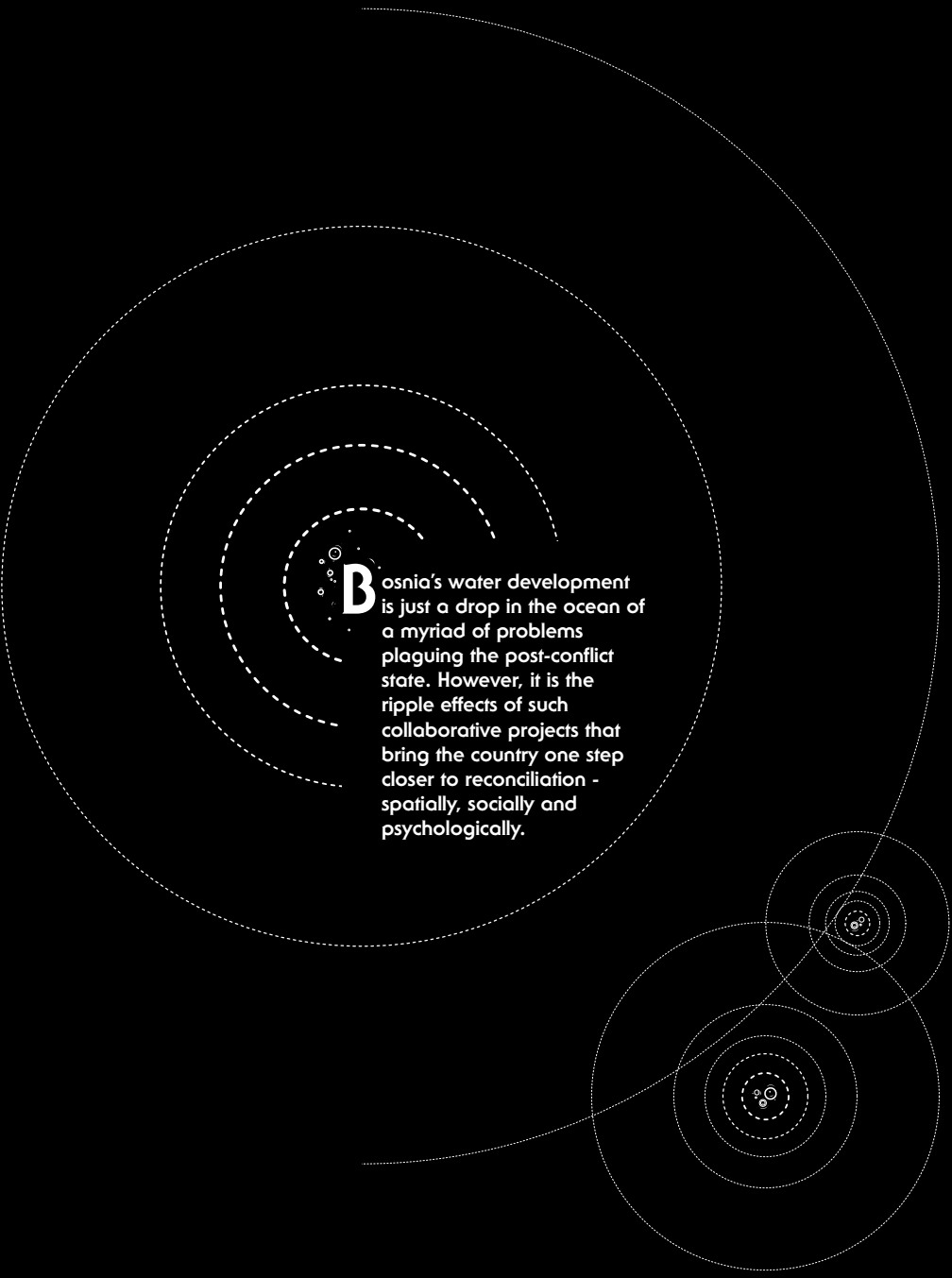
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**B**osnia's water development is just a drop in the ocean of a myriad of problems plaguing the post-conflict state. However, it is the ripple effects of such collaborative projects that bring the country one step closer to reconciliation - spatially, socially and psychologically.

