River restoration in the urban landscape as a turning point in culture and hydropolitics: Narrations and case studies for the challenges of the 21 st century

Rzońca, Apolinary; Zamorowska, Karolina

Veröffentlichungsversion / Published Version
Zeitschriftenartikel / journal article

Empfohlene Zitierung / Suggested Citation:
Rzońca, A., & Zamorowska, K. (2023). River restoration in the urban landscape as a turning point in culture and hydropolitics: Narrations and case studies for the challenges of the 21 st century. *Studia z Polityki Publicznej / Public Policy Studies*, *10*(3), 61-76. https://doi.org/10.33119/KSzPP/2023.3.4

STUDIA
Z POLITYKI
PUBLICZNEJ

PUBLIC POLICY STUDIES

szpp.sgh.waw.pl

eISSN: 2719-7131

Vol. 10, No. 3, 2023, 61–76

DOI: 10.33119/KSzPP/2023.3.4

Apolinary Rzońca[1], *Karolina Zamorowska*[2]

River restoration in the urban landscape as a turning point in culture and hydropolitics: Narrations and case studies for the challenges of the 21st century

Abstract

The purpose of this article is an interdisciplinary and cross-domain analysis of the idea of restoration of watercourses in urban landscapes. We refer to publications from the field of urban studies, ecohydrology and ecological humanities. In the first part of the article, we define the problem range and analyse the narrations of the artistic projects of the recent period dealing with blue infrastructure in cities. Next, we review case studies illustrating good practice in urban spaces involving the so-called urban-river concept. These examples will allow us to identify benefits to be found for cities, especially in the field of the fight on climate change. The article aims to outline possible solutions for the urban landscape, including opportunities to enrich the urban culture and identity.

Keywords: hydropolitics, urban rivers, Anthropocene, urbanization, urban culture, restoration, environmental history.

JEL classification codes: Q25, Q54, Q56, Q58

[1] Polish Academy of Sciences, Institute of Literary Research; Polish-Japanese Academy of Information Technology, e-mail: apolinary.rzonca@ibl.waw.pl, https://orcid.org/0000-0002-6674-8981

[2] University of Łódź, Faculty of Economics and Sociology, e-mail: zamorowska_karolina@wp.pl

Restytucja rzek w miejskim krajobrazie jako zwrot w kulturze i hydropolityce. Narracje i studia przypadków na miarę wyzwań XXI wieku

Abstrakt

Celem artykułu jest interdyscyplinarna i międzydziedzinowa analiza idei przywracania cieków wodnych miejskim krajobrazom. Powołujemy się na publikacje z zakresu: studiów miejskich, ekohydrologii, humanistyki ekologicznej. Pierwszą część artykułu poświęcamy na zdefiniowanie problematyki, a także dokonujemy analizy narracji projektów artystycznych z ostatnich lat, dotyczących zagadnienia niebieskiej infrastruktury w miastach. Następnie przyglądamy się studiom przypadków, które ukazują dobre rozwiązania w obszarach miejskich z wykorzystaniem tzw. „koncepcji miejskiej rzeki". Te przykłady służą nam do zdefiniowania korzyści dla miast, szczególnie tych związanych z walką na polu zmian klimatycznych. Celem naszego artykułu jest zaprezentowanie możliwych rozwiązań dla miejskiego krajobrazu, w tym potencjalnego wzbogacenia kultury i tożsamości miast.

Słowa kluczowe: hydropolityka, miejskie rzeki, antropocen, urbanizacja, kultura miejska, restytucja, historia środowiskowa

Kody klasyfikacji JEL Q25, Q54, Q56, Q58

One of the most important discourses in modern ecological policy concerns the status of rivers in the urban landscape. This article aims to introduce the phaenomena, concepts and ideas associated with the restoration of watercourses in the urban landscape. To that end, it relies on an interdisciplinary methodology, for interdisciplinarity is crucial to the discussion of hydropolitical issues, which has so far focused on the relationship between water and conflict (Bréthaut et al., 2022). The paper endeavours to answer the question – fundamental to the 21st century – of what solutions within an urbanized watercourse landscape could be simultaneously beneficial to local communities and biodiversity. Thereafter, we provide and analyse examples of narrations and solutions capable of providing inspiration for decision-makers and shapers of urban policies.

At present, hydropolitics marks the intersection of numerous academic disciplines, including political ecology, hydrology, environmental protection, engineering studies, as well as humanities and social sciences. This means that hydropolitics can nowadays serve as one of the tools for solving problems connected with drastic and still intensively progressing climate transformations on the planet. One of the major chroniclers of these processes is Pulitzer winner Elizabeth Kolbert (2022), who, throughout the entire narration of her last book, provides examples of impacts

relating to the transformation of the natural environment (inland waterways, for instance), as well as of extremely harmful interventionism of anthropopressure potentially even directly targeting urban rivers transformed or devastated in the wake of human activity.

Politologist Michał Zaręba (2015: 17) notes that one of the first writers to use the term 'hydropolitics' in an academic paper was John Waterbury. In his *Hydropolitcs of the Nile Valley* (1979), the latter explored the strategy of the states administrating the water resources in the North-East Africa region. Arun Elhance makes another example with his *Hydropolitics in the Third World: Conflict and Cooperation in International River Basins* (1999). Elhance frames hydropolitics within the categories of the study of conflict and international relations, with an important role for the cross-domain aspect to play, among political, geographical, biological and other sciences. Until the end of the 20th century, hydropolitics had dealt with international relations and political strategies linked to the management of water resources (Zaręba, 2015: 18). The 21st century brought more complexity. This is illustrated by Peter Mollinga (2008: 12–13) with the demarcation of four fields in which the paradigm of hydropolitics plays out: everyday politics of water, water policy politics in the context of sovereign states, international hydropolitics, and global water politics. In the context of this article, the most pertinent issues are those associated with the local and domestic perspective. The shaping of a hydropolitical vision can be collaborative on the state – local- or self-government – self-organized citizens line. At the same time, it is worth emphasizing that each of the aforementioned actors is capable of their own initiative in the field of water landscape in urban areas, which are the focus of our interest here. Moreover, in accordance with Article 211 of Polish Water Law Act, inland running waters, including surface waters and groundwaters, are owned by the Treasury. Thus, the citizens have a democratic right of co-decision-making on the future of the state government's and local government's water policies.

This train of thought brings together seemingly disconnected disciplines, including critical humanist analysis (environmental history), sociology (urban studies) and hydrology. The purpose of what might deceptively appear too bold a combination is to bring closer to the reader the phaenomena and processes playing out in an extraordinarily dynamic manner in our culture and natural environment and affecting our everyday lives.

One of the key terms in today's ecohydrology is the environmental potential defined by the five co-existing WBSRC parameters (water, biodiversity, ecosystem services, resilience, cultural heritage and education) (Zalewski, 2020: 54). This means that the care and stewardship of the natural environment, notably including watercourses, should not focus on improving the water parameters and biodiversity alone

but should also directly address cultural aspects and those relating to the local heritage and education. Ecohydrologist Maciej Zalewski (2020: 54) points out the crucial significance of the human factor to the shaping of the local space, in keeping with the needs of the 21st century: 'This perception is also the determinant of education and openness to collaboration with the adepts of other domains, the dynamically changing world, and people from different cultural areas. Humanity is the only species capable of shaping its own environment to a great extent; hence, protection of the environment, biodiversity and resources must take local communities into account as a key element having impact on the environment's potential.'

Putting things in that way necessarily sets forth an interdisciplinary direction for the study of the relationship between humans and the natural environment (including rivers). What is of exceptionally significant value is also that the need for such a meeting of disciplines is voiced by a scientist with close ties to natural sciences. As we speak about the inclusion of local communities in the shaping of new – pro-ecological – solutions worthy of the 21st century for watercourses, we allow for the possibility of debates and narrations of key relevance to the quality of life not only in any specific sub-basin but also the whole country, continent and planet.

Taking a closer look upon the socio-hydrologic paradigm, i.e. a cross-domain concept based on analysing the relationship between the water environment and society, Piotr Matczak emphasizes the importance of the social aspect and interdisciplinarity. According to Matczak (2021: 34) socio-hydrology: 'must serve the better understanding of the mutual, bilateral interactions occurring at the intersection of hydrology's and society's water processes, in particular the study of how those interactions could influence future changes in the hydrological system.'

Matczak also appreciates the perspective of political ecology, which has enabled the emergence of the concept of hydro-social studies addressing the relations between humans and the water environment, exploring research topics such as water landscapes and hydrosocial cycles. As he goes on to stress: 'Those studies take note of the importance of bio-physical forces, but large emphasis is placed on the role of politics and culture in shaping them, as well as on relationships of power and social inequalities.' (Matczak, 2021: 37–38).

The hydrological cycle has been inserted in the framework of hydrological sciences and become a method of presentation of water flows in the hydrosphere. The hydro-social cycle, on the other hand, focuses attention on the social nature of such flows, as well as the key role of water; it emphasizes the processes in which water and society permeate each other and together have an intense impact on planet life as a whole (Linton, Budds, 2014). It is worth stressing that the effect of the diverse forms of regulation of river beds, as well as generation of pollution discharged into

watercourses, is that practically all elements of Earth's inland water environment (and especially in cities) currently bear the marks of anthropogenic interference. Accordingly, researchers (Linton, Budds, 2014) point out that the planet's water circulation is as though by necessity inscribed in social and hydrological categories.

If we also factor in the state ownership of the phaenomena relating to the flow of water in time and space, expressed through the jurisdiction of the various government agencies and other emanations of the Treasury, then we can observe another slew of practices of shaping of the environment by public institutions, as well as discourses ordering and controlling the natural resources in a nearly Foucauldian way, with agency and effectiveness.

Narrations on urban rivers – the shaping of liquid Utopias worldwide

One of the past decade's key narrations on hidden watercourses in cities and the role of an urban hydropolitics worthy of the 21st century is *Lost Rivers*, a documentary film directed by Caroline Backle (2012). She tells the tale of metropolitan rivers hidden or buried, completely eradicated in the aftermath of anthropopressure and urbanization. The first example explored by the makers of the film is London, with multiple rivers erstwhile found in the catchment of the Thames. The producers confront us with a map in which we can see the Westbourne, Tyburn and Fleet, which had passed through the vicinity of Buckingham Palace. Nowadays, meanders of asphalt streets have replaced the river beds. The narrator emphasizes the phasing out of small rivers in urban centres on the wave of 19th-century modernity, characterized by rapid industrialization and progressive urbanization, especially from such emblematic metropolises as London itself. Another reason was the contamination of rivers resulting in a degradation of the quality of life along with problems with sanitation and public health. The densely populated streets of 19th-century London were prone to becoming hotbeds of cholera and typhus.

One of the architectural elements of the urban landscape designed to prevent further outbreaks was a multi-kilometre system of underground canals designed by the eminent engineer, Sir Joseph Bazalgette, whose sewer systems eliminated the bacteria from the water supply and curbed cholera in the territories covered by the grid. Thus, one of the key elements of modernity was underground sewers – the complete concealment of watercourses in cities. In the film, we trace the footsteps of a party of explorers passionate about unravelling the creations of 19th-century modernity.

The narration then takes us to more examples from other cities of the world in which rivers have been tamed and concealed. One of such examples is Toronto's Garrison Creek, with a brick sewer similar to the ones in London, through which the creek continues to run till the present day. Simultaneously, the narrator draws attention to the serious predicament of many a city such as Toronto whose Achilles' heel is the precipitation-induced overflowing of the canals exporting untreated sewage directly to rivers or basins. That is a direct cause of environmental pollution within cities themselves and their neighbouring areas. The Toronto case involves resurging pollution zones in Lake Ontario, with the accumulation of contaminated sewers, teeming with bacteria, from urban areas, including streets. One of the solutions on which landscape architects are working is the idea of a sponge city, i.e. creation of green areas to house deposited rainwater.

Another example, the city of Yonkers on the Saw Mill River, illustrates the practices of a form of urban watercourse restoration called 'daylighting', literally, 'bringing a river into daylight.' In other words, those are projects to liberate watercourses previously imprisoned in concrete canals, culverts or pipelines in order wholly or partially to uncover the river bed (Pinkham, 2000). Such actions are motivated by environmental, economic and socio-cultural factors, which accelerate the restoration of watercourses, contribute to the rehabilitation of the aquatic ecosystem and facilitate the better socialization of such newly uncovered areas of the urban ecosystem (Khirfan, Peck, Mohtat, 2020). In the case of the uncovering of Saw Mill River, the key initiative came from the Groundwork Hudson Valley non-profit organization, having established and co-ordinated a coalition made up of local authorities, communities and business leaders to transform the Yonkers landscape with environmental justice and education on sustainable development. Both practices were the local authorities' answer to mounting problems relating to climate change especially affecting cemented cities that are prone to faster heat accumulation. The task would have been impossible without commensurate social, expert (scientific), business and media support. All those factors had a decisive impact on the local transformation.

The purpose of uncovering watercourses is to assist municipal sewer systems with the management of surplus rainwater and to mitigate the consequences of temperature increase (Khirfan, Peck, Mohtat, 2020). The example of the uncovering of the Saw Mill River's bed illustrates the concept of transformation of the urban landscape away from the overuse of concrete in the urban space (Mencwel, 2020), towards a green park of social recreation. It must be noted that the authors of the project achieved the reversal of the anthropogenic landscape and a true restoration of the river bed to daylight and at once to the entire municipal community. The above also marks a clear turning point in the local culture and perception of hydropolitics worthy of

the 21st century, as well as the fight to preserve biodiversity, because Saw Mill River is inhabited by populations of American eel and salmonids.

The restoration works in the public sphere began in 2010, and the successive phases of freeing the river were gradually accomplished in the years 2016 and 2019. The river, filled in the 1920 s, was liberated on the initiative of the Groundwork Hudson Valley non-profit organization, which unites the authorities, local communities and business leaders to transform the urban life by promoting pro-ecological attitudes and education about sustainable development. It appears that such local partnerships for the benefit of the natural environment (including the aquatic environment) are a promising solution in many regions of world. Poland has been witnessing for many years the successful operation of the Association of Cities and Communes of Parsęta River Basin in Karlino (Związek Miast i Gmin Dorzecza Parsęty w Karlinie – ZMGDP, 2022), which is dedicated to the care of the rivers and delivery of educational programmes, as well as restoration of anadromous fish populations, monitoring of the chemical composition of the waters, acquisition of international grants for the renaturation of watercourses, and implementation of projects for the revitalization of urban green areas. Such local partnerships can be important from the perspective of the aforementioned cultural potential of the environment (Zalewski, 2020: 54), as well as being the manifestation of new hydropolitics based on the understanding of complex modern challenges and codependencies between (a vulnerable) humanity and (a damaged) aquatic environment.

Narrations on urban rivers – the shaping of liquid Utopias in Warsaw

Narrations dealing with the restoration of urban rivers also penetrate into Poland. Magdalena Staroszczyk and Konrad Schiller, Curators of Wola Museum (2022), in collaborative effort with scientists and environmental activists, compiled a presentation of Warsaw's former hydrographic network. The exhibition, titled *Niech płyną! Inne rzeki Warszawy* [literally: *Let them flow! The other rivers of Warsaw*] coincided in time with the tale of two hydrobiologists, Andrzej Mikulski and Monika Sysiak, who outlined on the pages of Gazeta Wyborcza daily (Chełmiński, 2022a) the scope of their studies into former watercourses in Warsaw. The products of the studies include a new map marking the beds of the rivers previously lost to deliberate anthropopressure. According to the map, the vicinity of Trasa Armii Krajowej in Żoliborz District was traversed by the Rudawka (transformed into an underground canal due to roadworks) and the Polkówka, the latter passing near Plac Wilsona and

nowadays completely eradicated. The Rudawka gained the spotlight in 2021, when streets were flooded amid underground works, during which the hidden river canal suffered damage. The now-former president of Państwowe Gospodarstwo Wodne Wody Polskie (PGWWP) – 'Polish Waters' – Przemysław Daca referred to the concealed river as a 'rain canal', the purpose of which was to, 'drain the rainfall' (tvn24.pl, 2021). Such a rhetoric could possibly have been not only the product of quotidian political struggles involving the downplaying of the importance of underground urban watercourses but also an expression of sustained annihilation of the given aquatic ecosystem in the linguistic layer, including the narrative layer. At the same time, it manifested a certain way of organizing the natural environment (Bińczyk, 2018: 155) in pursuance of a capital-centric environmental policy placing special emphasis on the taming of natural terrain and its radical adaptation to human needs. That evokes the principal assumptions of modern culture as described and analysed by Zygmunt Bauman. The author of *Nowoczesność i zagłada* saw contemporary times as a horticultural culture, which he defined as designs for an ideal organization of life and social relations, as well as building of an identity grounded in a marked distrust of nature (Bauman, 2009: 200–201). Moreover, Bauman (1995: 61) wrote: 'Modern science was born of the irresistible ambition to overcome Nature and subordinate it to human needs. (…) Indeed, Nature has acquired the meaning of something that has not yet been but is to be subjected to human will and reason – a passive object of purpose-driven action; an objective lacking a purpose in itself and thus waiting to be given a purpose by the benefits it will bring to people. (…) Nature lacks internal integrity and sense: it is, therefore, the fabric of man's creative designs.'

The sociologist wrote these words almost thirty years ago, at the same time as defining modern genocide by human-designed and human-operated machines and technology. It would seem that practices formerly used on living organisms – rivers (in and out of cities) could be addressed in terms of ecocide, which is sometimes put on par with genocide (Małczyński, 2018: 142). In the case of ecocide, the horticulturist is an advocate of anthropocentric visions and projections in which such elements of the (natural) landscape as are either unwanted or unyielding to direct control are equated with weeds and rooted out in a similar manner. The narrations used by the hydrobiologists telling the history of urban watercourses resemble the tone of the papers and maps of Holocaust researchers studying no-longer-existing Jewish city quarters. Already in the narration itself, those activities reinstate the buried existence and herald in a new hydropolitics of restoration Utopias that may be the answer to challenges relating to climate change, including hydrological drought.

In her virtual lecture titled *Dawne rzeki i mokradła Warszawy – utracone dziedzictwo stolicy* [literally: *The erstwhile rivers and wetlands of Warsaw – the capital's lost*

heritage], Sysiak (2022) relies on maps on which she finds or marks the watercourses formerly passing through Warsaw. She not only cites non-human actors but largely focuses on human practices relating to the expansion of Poland's capital city. What is interesting here is that the hydrobiologist directly assumes the perspective and methodology of environmental history, which, in the footsteps of social anthropologist Tim Ingold, should be understood as a continuum of the activities of all organisms, human and non-human, now or in the past, having contributed to the formation of the environment (Ingold, 2005: 83). The environment is a sculpture-monument subject to unending transformation and shaping under the influence of biotic, abiotic and anthropopressure factors. The latter are of key or even overwhelming importance, as they most frequently touch on the subordination of nature to principles involved in human life, which in turn is associated with the expansion of cities in the Anthropocene, as described by the political scientist Rafał Matyja (2021: 138): 'That is a phaenomenon directly linked to the expansion of cities – at a time when they cease to be complete defensively walled wholes, when they break out of the confines delimited by the citadels constructed in the 18th and 19th centuries, nothing can avert their greedy sights set on the neighbouring greens. (…) It is also, however, a history of bridling of nature of which we are less conscious. Associated with the necessity of mitigating the risk of floods and elimination from the urban landscape of such rivers, courses, floodplains or swamps as at some point in time have posed an obstacle to mankind.'

The restoration of urban rivers within Warsaw in keeping with the hydrobiologist's proposal contains elements of reconstruction of a lost environment, which are key to the punchline of her study. It can also be the moment when environmental history exists coincidentally with performative theories, which, too, deal with research into reconstruction practices. In the words of Dorota Sajewska (2017): 'Reconstructing the past through reconstruction practices is not tantamount to recalling or, alternatively, remembering – for the goal is to allow an event from the past to occur again, so that one can one again live out that which is in the past.'

Reconstruction practices are based on a performance spectacle of restoring a lost environment from the annals of history, as well as potential opportunities for the adaptation of restoration projects in the encountered circumstances of the urban landscape. For the performance of urban river restoration to take place, certain strictly delimited conditions must be met, where one of the prioritized elements of the process are (hydro-) political decisions taken on the local-government tier. This is illustrated by the example of the Drna, the sources of which – according to hydrobiologists – had once been located somewhere near Wola District's Generała Bema Street, and thereafter the river passed through today's Okopowa and Stawki Streets, then Plac Inwalidów, eventually flowing into the Vistula in the vicinity of the Citadel (Chełmiński, 2022a).

It was precisely during the performative activities accompanying the *Niech płyną! Inne rzeki Warszawy* exhibition (under the aegis of Wola Museum) that a happening of activists and local socio-political actors took place with a view to launching a performative process leading up to the restoration of Drna River. The happening, in the form of a perambulation, borrowed from the aesthetic of canoeing trips. The participants' catchphrase was 'restoring the Drna' or 'reconstructing the river' in its estuary section. Influenced by the emergence of a local restitution culture grounded in academic, media and visual narrations, Żoliborz district councillors took a positive view of the proposal and voted the daylighting of Drna into motion (Chełmiński, 2022b). Before anything else, this shows that a certain turn in culture, based on narrations, is capable of contributing to the emergence of the assumptions of a new urban water policy. This leaves open the question of the restoration of the other rivers of left-bank Warsaw, as described by scholars, including the river Bełcząca, canalized in the 17th century (it used to flow, among others, what is now Stare Nalewki Street and enter the Vistula at Most Gdański), Dunaj (in the vicinity of today's Szeroki Dunaj Street), as well as – canalized in the 18th century – Strumień Nowomiejski (crossing the Old City) and Żurawka (passing through Żurawia Street and Plac Trzech Krzyży, among others). It will be expedient to add that the regulated Potok Służewiecki of today has taken over the course of the former Sadurka (Chełmiński, 2022a).

Besides questions about benefits relating to sustainable development in cities, such as slowing down the climate change and lowering the temperatures (the role of rivers in the shaping of a pro-ecological urban landscape), it will be worth inquiring into the biodiversity of the discussed systems, including the potential composition of the ichthyofauna of the restored watercourses. This is because balanced parameters in rivers directly translate into the quality of life of all living organisms – all of the local culture.

Other case studies of river restoration in urban landscapes worldwide

Modern planning concepts increasingly emphasize sustainable development, including rational water management in a city for tangible environmental, economic and social benefits. Mentioned among the elements composing the blue infrastructure are the network of natural and semi-natural areas, such as: rivers, watercourses, lakes, ponds, wetlands, drainage ditches, reservoirs, dry reservoirs, large-water-capacity land, as well as permeable surfaces and technical devices facilitating water retention and infiltration in urban areas (Pancewicz, 2021: 65).

Los Angeles River

One of the emblematic examples of river restoration in the urban landscape is the general revitalization plan for Los Angeles River, which flows into the Pacific Ocean. The watercourse, with sources in San Fernando Valley in San Gabriel and Santa Susana Mountains, was transformed into a flood-control canal after the Los Angeles Flood of 1938, resulting in the degradation of its ecosystem. The design, co-created by American architect Frank Gehry and landscape architect Laurie Olin and adopted by Los Angeles municipal authorities, envisages the transformation of the concrete-encased canal into an environmentally friendly public green space also friendly to the inhabitants. As the outcome of the revitalization (Studio-MLA, 2022), the concrete will yield place to greens. As a target, the project assumes the adaptation of the city to climate change, protection of animal species existing in the vicinity of the river bed, as well as improvement of the water level and quality.

A parallel initiative piloted by the Council for Watershed Health in the Los Angeles River area is the biodiversity improvement facilitated by Fish Passage and Habitat Structures Design (LAR FPHS) and Fish Passage Restoration (LAR FPR) projects. Both explore the potential redesign of the river bed and banks in the urban section of the Los Angeles River so as to ensure sufficient throughput and access to habitats, in the upper tributaries, for salmonids such as the especially precious steelhead species (an anadromous form of the rainbow trout native to California), which is one of the natural symbols of the region (CWH, 2022).

Apart from being beneficial to the environment, the revitalization of the river is supposed to enable a number of socio-economic benefits for the inhabitants. The project design stipulates the allocation of unused land to recreational and cultural purposes. Cultural and educational facilities (such as museums, cinemas or theatres) are expected to be constructed near the river. The architects have also proposed numerous platforms, bridges, overcrossings and tunnels intended to increase the river's accessibility for the city dwellers. Diversification of the landscape, on the other hand, is provided by suspended parks and squares, as well as a pedestrian and cycling route. The lead time is estimated at 25 years and the cost at USD 20 billion (Sahagún, 2021).

Isar River in Munich

The Isar has a catchment area of 8,900 km^2. The source of that mountain river is found in the Austrian Alps, and its estuary flowing into the Danube is German territory. The largest city on the Isar's bank is Munich, where intense regulation works

began on the river in the early 19th century for flood control and, a bit later, also electricity production (Bańkowska et al., 2010: 185). However, in years 2000–2011, the municipal authorities of Munich in consultation with the regional authorities of Bavaria decided to launch a renaturation project on 8.3 km of the section passing through the city. The investment was a response to the pressing social needs for the recovery of green and blue spaces in the urban area. The main objectives were to be the improvement of the water level and quality, as well as the river's continuity and increase of its morphodynamic activity, protection of the biodiversity of the local fauna and flora, assurance of the population's access to the waterline, as well as establishment of recreational facilities at the Isar and strengthening of Munich's aesthetic appeal (Bańkowska et al., 2010: 186–187). Elements of the renaturation works included raising the river bed from 50 to 90 metres and filling it with gravels, as well as removal of the concrete reinforcement of banks and rapids, to be replaced by structures made of natural materials. Thanks to increasing the slope inclinations, the land could be used to fulfil the various needs of Munich's citizens (Wulf, Schaufuß, 2013).

In an article published by Environment & Society – a portal launched on the initiative of the Ludwig Maximilian University in Munich and the Deutsches Museum in Munich – we can read that one of the largest beneficiaries of the Isar renaturation programme is the little bittern, a heron species finding more food on the river's new banks than ever before (Benítez Requena, Hanusch, Summer, 2017). Certain species belonging to the ichthyofauna gained important improvements in the accessibility of the route to the spawning grounds. Before the renaturation, there had been approximately 17 fish ladders. However, many fish species could not use them, as the size was too small or the construction was defective. The Isar is a right-bank tributary of the Danube and thus a river housing the characteristic and extraordinarily precious local species that is the huchen (also known as Danube salmon).

Summary. Rivers in cities as conscious hydropolitics for the 21st century

The principal assumptions of the European Green Deal (EGD) communication, a flagship document of the European Commission delineating the most important challenges and postulates of European environmental policy for the 21st century, include the following statements: 'The natural functions of ground and surface water must be restored. This is essential to preserve and restore biodiversity in lakes, rivers, wetlands and estuaries' (EC, 2019: 17) and: 'The urban dimension of cohesion policy will be strengthened, and the proposed European Urban Initiative will provide

assistance to cities to help them make best use of opportunities to develop sustainable urban development strategies' (EC, 2019: 27).

The solutions proposed as part of the EGD can be understood to include the so-called free-flowing rivers, i.e. assumption of elimination of water barrages and dams in order to bring back unobstructed flow to fluvial ecosystems, as well as the daylighting of encased or buried watercourses, so they can regain their life-giving properties. Those are realistically viable hydropolitical assumptions that should be followed also by Polish cities in their obligation to strike a balance between overbuilt space and green-and-blue infrastructure.

In 2023, the Sendzimir Foundation published a report titled *Rzeki Warszawy w oczach mieszkańców* [literally: *The rivers of Warsaw in the eyes of its inhabitants*] in the aftermath of a survey that polled a sample of 540 people in Warsaw (Waldmann-Bąkowska, 2022: 2–57). The respondents identified recreation and leisure, contact with nature and the fight for a better climate among the most important benefits from the presence of rivers in cities. Local floods and inundations were mentioned as the major hazards. Creation of natural habitats and ecosystems, recreation and sports, lowering the temperature in the city, and rainwater deposition, in that order, were identified as key functions of rivers in the urban space. The respondents were also asked to name buried or canalized watercourses in Warsaw. Most often mentioned were the names of three historical running waters – Rudawka, Drna and Żurawka. Retention, renaturation and regulation were identified as important activities to prevent water deficit in the city. Interestingly, when questioned about solutions relating to a surplus of water, the respondents stated regulation, retention and renaturation in this reversed order. This means that with regard to the hazards associated with water surplus and flooding, the dominant perspective is the one of high anthropopressure and taming from the turn of the 19th and 20th centuries.

The last question: 'In your opinion, is there a need for action to be taken in Warsaw with a view to expanding the network of rivers and other watercourses?, ' was answered affirmatively by the majority of the respondents, but, unfortunately, the predominant group of those asked probably ignored the question. This is presumably the result of the fact that the idea of daylighting of rivers in cities does not yet enjoy broad recognition (especially in Warsaw). It is worth noting that the results communicated by the Sendzimir Foundation's report are promising, as they fall in line with the hydropolitical narration on the revitalization of running waters within the territory of Warsaw.

The purpose of this article was to provide arguments in justification of an approach based on the interplay of politics, local community culture and hydrological developments in the sustainable, pro-ecological development of cities. It must be emphasized

that the examples discussed in the article attest that social behaviours, including the identified narrations, have suitable agency on local-government policy tiers to shape the imagination and vision of a water policy worthy of the 21st century, including on the basis of arguments supplied by scientists.

Declaration of contribution levels

The authors declare that 90% of the article is authored by AR, and 10% by KZ.

Declaration of conflict of interests

The authors declare that their studies and work on the article were free of any commercial or financial ties interpretable as a potential conflict of interests.

References

Backle, C. (2012). *Lost Rivers* (Catbird Productions). https://vimeo.com/ondemand/lostrivers (accessed: 2 September 2022).

Bańkowska, A., Sawa K., Popek Z., Wasilewicz M., Żelazo J. (2010). Studia wybranych przykładów renaturyzacji rzek, *Infrastruktura i Ekologia Terenów Wiejskich* 9: 181–196.

Bauman, Z. (2009). *Nowoczesność i zagłada*, Kraków: Wydawnictwo Literackie.

Bauman, Z. (1995). *Wieloznaczność nowoczesna. Nowoczesność wieloznaczna*, Warszawa: Polskie Wydawnictwo Naukowe.

Bińczyk E. (2018). *Epoka człowieka. Retoryka i marazm antropocenu,* Warszawa: Polskie Wydawnictwo Naukowe.

Bréthaut, C., Ezbakhe, F., McCracken, M., Wolf, A., & Dalton, J. (2022). Exploring discursive hydropolitics: a conceptual framework and research agenda. *International Journal of Water Resources Development* 38(3): 464–479.

Chełmiński, J. (2022a). *Dawne rzeki płyną pod Warszawą. Naukowcy szykują się do odkopania jednej z nich,* https://warszawa.wyborcza.pl/warszawa/7,54420,28021780, podziemne-rzeki-warszawy-jest-pomysl-zeby-odkopac-jedna-na.html (accessed: 2.09.2022).

Chełmiński, J. (2022b). *Rzeka Drna na Żoliborzu ma być odkopana. Którędy płynęła, zanim ją przykryto?*, https://warszawa.wyborcza.pl/warszawa/7,54420,28861309, rzeka-drna-na-zoliborzu-ma-byc-odkopana-ale-pojawil-sie-problem.html (accessed: 2.09.2022).

CWH (Council for Watershed Health). (2022). *The Los Angeles River Fish Passage Projects,* https://www.watershedhealth.org/larw-fish-passage (accessed: 2.09.2022).

Benítez Requena, L., Hanusch, E., Summer, J. (2017). Munich and the Isar. *Ecopolis München. Environment & Society Portal.* http://www.environmentandsociety.org/node/8050 (accessed: 2.09.2022).

Ingold, T. (2005). Kultura i postrzeganie środowiska, In: *Badanie kultury: Elementy teorii antropologicznej* (73–86), M. Kempy, E. Nowicka (Eds.). Warszawa: PWN.

Khirfan, L., Peck, M.L., & Mohtat, N. (2020). Digging for the truth: A combined method to analyze the literature on stream daylighting. *Sustainable Cities and Society*, 59: article number 102225.

Kolbert, E. (2022). *Pod białym niebem. Natura przyszłości*. Warszawa: Wydawnictwo Filtry.

EC (European Commission). (2019). *European Green Deal.* https://eur-lex.europa.eu/resource.html?uri=cellar:b828d165-1c22-11ea-8c1f-01aa75ed71a1.0016.02/DOC_1&format=PDF (accessed: 2.09.2022).

Linton, J., & Budds, J. (2014). The hydrosocial cycle: Defining and mobilizing a relational-dialectical approach to water. *Geoforum*, 57: 170–180. DOI: 10.1016/j.geoforum.2013.10.008.

Małczyński, J. (2018). *Krajobrazy zagłady. Perspektywa historii środowiskowej*, Warszawa: IBL PAN.

Matczak, P. (2021). Możliwości i trudności badań interdyscyplinarnych na przykładzie socjo-hydrologii, In: *Ekologia interdyscyplinarności*, (33–44), J. Axer, M. Konarzewski (Eds.). Warszawa: Wydawnictwo Uniwersytetu Warszawskiego.

Matyja, R. (2021). *Miejski grunt. 250 lat polskiej gry z nowoczesnością*. Kraków: Wyd. Karakter.

Mencwel, J. (2020). *Betonoza. Jak się niszczy polskie miasta?*. Warszawa: Krytyka Polityczna.

Mollinga, P. (2008). Water, politics and development: Framing a political sociology of water resources management, *Water Alternatives* 1(1): 7–23.

Muzeum Woli. (2022). *Niech płyną! Inne rzeki Warszawy,* https://muzeumwoli.muzeumwarszawy.pl/wystawa/niech-plyna-inne-rzeki-warszawy/ (accessed: 2.09.2022).

Pancewicz, A. (2021). Woda w mieście – działania z zakresu błękitnej infrastruktury dla łagodzenia zmian klimatu i zapobiegania ich skutkom w miastach rdzenia Górnośląsko-Zagłębiowskiej Metropolii, *Builder* 285: 65–67.

Pinkham R. (2000). *Daylighting: New life for buried streams, https://d231jw5ce53gcq.cloudfront.net/wp-content/uploads/2017/05/RMI_Document_Repository_Public-Reprts_W00-32_Daylighting.pdf* (accessed: 2.09.2022).

Sahagún, L. (2021). *Frank Gehry's bold plan to upgrade the L.A. River seeks to atone for past injustices,* https://www.latimes.com/environment/story/2021–01–11/frank-gehry-plan-los-angeles-river (accessed: 2.09.2022).

Sajewska, D. (2017). *Rekonstrukcja jako profanacja archiwum,* https://www.dialog-pismo.pl/w-numerach/rekonstrukcja-jako-profanacja-archiwum (accessed: 2.09.2022).

Studio-MLA. (2022). *Los Angeles River Revitalization Master Plan,* https://studio-mla.com/design/los-angeles-river-revitalization-master-plan/ (accessed: 2 September 2022).

Sysiak, M., (2022). *Dawne rzeki i mokradła Warszawy – utracone dziedzictwo stolicy,* https://www.youtube.com/watch?v=uay4fqBU5Iw (accessed: 2.09.2022).

tvn24.pl. (2021). *Wiceprezydent zarzucał mu "zgubienie rzeki". Prezes odpowiada: rzeka Rudawka nie istnieje,* https://tvn24.pl/tvnwarszawa/najnowsze/warszawa-awaria-w-kanale-rudawki-wody-polskie-odpowiadaja-na-zarzuty-ratusza-5069486 (accessed: 2.09.2022).

Waldmann-Bąkowska, E. (2022). *Rzeki Warszawy w oczach mieszkańców. Wyniki geoankiety poświęconej percepcji dolin rzecznych*. Warszawa: Fundacja Sendzimira.

Wulf, R., Schaufuß, D. (2013). *Isar-Plan Munich: a New Lease of Life for the Isar River*, https://climate-adapt.eea.europa.eu/metadata/case-studies/isar-plan-2013-water-management-plan-and-restoration-of-the-isar-river-munich-germany/11265923.pdf (accessed: 2.09.2022).

Zalewski, M. (2020). Model interakcji czynników biotycznych i abiotycznych – teoretyczne podstawy ekohydrologii, In: *Ekohydrologia* (55–74), M. Zalewski (Ed.)., Warszawa: PWN.

Zaręba, M. (2015). *Hydropolityka w regionie rzeki Mekong. Między konfliktem a współpracą*. Łódź: Uniwersytet Łódzki.

ZMGDP (Związek Miast i Gmin Dorzecza Parsęty). (2022). *Trwają prace związane z rewitalizacją parku przy ul. Parkowej w Karlinie*, http://parseta.org.pl/index.php?id=65&tx_ttnews [tt_news] =2955&cHash=e751237fdb2a25fc090b8a84a38a7524 (accessed: 2.09.2022).