

Towards water regionalism? Examining the linkages between water, infrastructures, and regionalism in Turkey

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ABSTRACT

Moving beyond the purely material understanding of infrastructures, new perspectives in infrastructural regionalism assert that infrastructures and regions simultaneously shape each other. Drawing on this reciprocal relationship, we introduce the concept of ‘water regionalism’ to examine how regional factors, dynamics, and complexities shape water infrastructures, and how water infrastructures concurrently shape regions. Through qualitative research methodologies, we empirically demonstrate how this concept operates in practice by examining the history of regional planning and hydraulic infrastructure development in Turkey, particularly the process of how the South-eastern Anatolia Project (GAP) and the GAP region have shaped each other since the 1970s.

ARTICLE HISTORY


Received 14 March 2024
Accepted 25 October 2024

KEYWORDS

Water infrastructure; regionalism; critical infrastructure studies; GAP; Turkey; Euphrates and Tigris Basin

Introduction

Water infrastructures, particularly dams, are long considered central elements of development (Altınbilek, 2002; Biswas & Tortajada, 2001; World Commission on Dams, 2000). Despite years of debate in both policy and academic circles around their economic, social, and environmental costs and benefits (Khagram, 2004; McCully, 2001; Pearse-Smith, 2014), infrastructures retain their importance in water politics, ‘concretizing’ the biophysical, hydrological, political, social, economic, and ecological dimensions of the substance at multiple scales, in particular spatiotemporal contexts. As inherently political structures, their design, planning, and implementation processes reflect a power interplay between multiple actors across various scales. Governments often envision these structures as instruments to achieve a range of goals, from reconfiguring socio-natural relations at multiple scales (Mason, 2022, p. 54) to reinforcing nation-building agendas (Akhter, 2015; Menga, 2016). In other words, and as explained in greater detail later, infrastructures are not merely material assemblages of concrete, steel, and plastics, but rather complex hybrids that encompass non-material aspects, implications, and challenges. Particularly in

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This article has been corrected with minor changes. These changes do not impact the academic content of the article.

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critical infrastructure scholarship, infrastructures are imagined beyond their material existence and functions and, instead, considered to be shaping, and being shaped by, society. This imagination also aligns with the concept of the hydrosocial cycle where water, infrastructures, and society mutually (re-)make each other (Linton, 2014; Swyngedouw, 2009).

Building on the subjective and non-material understanding of infrastructures, recently a new perspective has emerged in the growing literature on infrastructural regionalism. This perspective focuses on the relationship between infrastructures and regions, asserting that they also (re-)make each other (Addie et al., 2020; Karvonen, 2024; Glass et al., 2019). In this article, we focus on this often-overlooked feature of infrastructures, and seek to examine how regional factors, dynamics, and complexities shape (the politics of) water infrastructures, and how water infrastructures concurrently shape (the politics of) regions. We introduce the concept of 'water regionalism' to describe this complex relationship and aim to demonstrate how it unfolds and operates in practice by examining the history of regional planning and hydraulic infrastructure development in Turkey, a key country in constructing water infrastructure and leveraging its hydraulic capabilities to achieve various political, economic, and social development objectives (Bilgen, 2023). Focusing exclusively on the development and management of the Turkish portion of the Euphrates and the Tigris Basin (ETB), we examine whether or how the South-eastern Anatolia Project (*Güneydoğu Anadolu Projesi*, GAP), one of the largest regional development projects ever launched, and the South-eastern Anatolia Region (SAR), now widely referred to as 'the GAP region' for being the epicentre of energy and irrigation projects, have shaped each other since the 1970s.

The contribution of this article is threefold. First, we introduce the concept of 'water regionalism' as a useful and novel approach to analyse the linkages between infrastructure building, water resources development, water governance, and regionalism across multiple scales, from local to transboundary, although the latter is addressed to a lesser extent. Thus, we provide the emerging literature on infrastructural regionalism and regional water infrastructure governance with a new and improvable conceptual lens. Second, we empirically demonstrate how SAR has been territorialized through GAP while GAP has emerged as a technopolitical intervention reflecting the regional characteristics of SAR (see Akıncı et al., 2020). Thus, we not only present a case study that can be replicated in a range of national and transboundary water interaction contexts, but also put into practice and expand our understanding of conceptual frameworks related to infrastructural regionalism and regional water infrastructure governance. Third, we make a case to move beyond urban contexts when examining the interplay between infrastructure and regionalism to be able to encompass a broader and more inclusive regional scale and, thereby, establish (stronger) interdisciplinary linkages, particularly between critical infrastructure studies, development studies, international relations, political science, and water politics.

In terms of our methodology, we employ a qualitative approach as it allows us, *inter alia*, to capture the richness, diversity, and complexity of our data, which we collected through three major techniques across a decade. First, one of the authors conducted online and on-site archival research twice in a 10-year interval – between 2013 and 2014 and between 2023 and 2024 – in the archives of the GAP Regional Development Administration (*GAP Bölge Kalkınma İdaresi*, GAP-BKI), the National Library of Turkey, and the Turkish Grand National Assembly (*Türkiye Büyük Millet Meclisi*, TBMM), all located

in Turkey. Second, also between 2013 and 2014 and between 2023 and 2024, the same author conducted online and face-to-face 'elite interviews' with a diverse group of politicians, bureaucrats, specialists, scholars, and journalists who have played significant roles in shaping Turkey's hydraulic history, particularly in the development, management, research, and communication of the ETB. In the first phase of research, the author interviewed 64 participants employed at, or retired from, various institutions including, but not limited to, the Development Foundation of Turkey, the GAP-BKİ, the General Directorate of State Hydraulic Works (*Devlet Su İşleri Genel Müdürlüğü*, DSI), the (defunct) State Planning Organization (*Devlet Planlama Teşkilatı*, DPT)/the Ministry of Development, and TBMM. In the second phase of research that took place within Turkey and abroad, the author interviewed 33 participants not only from governmental institutions such as DSI, the Ministry of Foreign Affairs, and the Turkish Water Institute, but also non-governmental organizations such as the Hydropolitics Association and higher education institutions such as Ankara University Water Management Institute. Third, we used experiential data gathered through our years of interdisciplinary, multiscalar, and cross-sectoral research and policy engagement centred on the GAP region (Bilgen, 2021), Turkey (Sayan, 2016, 2017, 2019), ETB (Kibaroglu & Sayan, 2016), and the Middle East (Kibaroglu, 2016). We followed the principles of qualitative content analysis (Schreier, 2012) and (critical) discourse analysis (Van Dijk, 2001), and used NVivo as our qualitative data analysis software when describing, categorizing, and interpreting our data.

In the rest of the article, we first explain the complex relationship between water, infrastructure, and regionalism, and clarify how we conceive of a region and the process of regionalism. Following this, we provide a brief history of regional planning and hydraulic development in Turkey. In our empirical section, we explain how GAP and the GAP region (i.e., SAR) have created 'region-infrastructures' and 'infrastructure-regions' in a symbiotic and reciprocal manner. Finally, we discuss the implications of 'water regionalism' for national water governance, explain the prospects of broadening this perspective to analyse transboundary contexts, and make our concluding remarks.

Water, infrastructures, and regionalism

Infrastructure is a complex, contested, multidimensional, and lived phenomenon, the study of which requires an interdisciplinary theoretical and analytical approach (Carse, 2017). Infrastructure refers to visible or invisible physical systems in the form of technological networks, wires and pipes that facilitate the flow of goods, give mobility and agency, and allow the exchange of ideas to their users (Chachra, 2023; Larkin, 2013). Yet, infrastructure is not confined to its materiality. It is rather a hybrid entity that coexists with social structures, ecology, and technologies where each reproduces each other, as conceptualized in critical infrastructure scholarship (Dourish & Bell, 2007; Star, 1999; Steele & Legacy, 2017). Infrastructures are collective and, therefore, define the relationship between people and places. Due to their reliance on space and resources, they cannot be separated from broader social, cultural, historical, and political processes (Chachra, 2023).

This 'hybrid' understanding of infrastructure informs the infrastructural regionalism literature that concerns itself with the study of the interplay between infrastructure and regions and whether or how they shape each other (Glass et al., 2019). As highlighted by

others as well (Karvonen, 2024), we are particularly interested in the process of how regions are territorialized in a way to transcend regional boundaries by infrastructures. The process of territorialization through infrastructures often involves multiple actors and entails political decisions taken at multiple scales (Sayan & Nagabhatla, 2024). In such contexts, regions are not considered 'taken for granted' and predetermined spaces. Instead, they are perceived as spaces that are politically territorialized by infrastructures beyond their simple geographical boundaries (Karvonen, 2024). Based on this conceptualization, the region refers to 'the contested product of territorialisation, technological interventions and discursive framings', as regions represent new spatial imaginaries by being materially and discursively produced, imagined, and structured through infrastructures (Addie et al., 2020, p. 179).

The fluid, historically contingent, and socially constructed understanding of regions (Jonas, 2012, p. 264) has also challenged the traditional urban focus of infrastructure and regionalism studies. This approach, for instance, emphasizes the need to abandon the conventional distinction between urban and suburban regions for their boundaries have become blurred over time (Soja, 2015). Similarly, the approach highlights the destabilizing impact of modern metropolitan dynamics on the 'conventional territorial definitions of urban regions which do not adequately account for fluid multiscalar nature of the urban process' (Addie & Keil, 2015, p. 408). Despite such challenges, however, the predominantly urban focus of the majority of works on infrastructure and regionalism remains mostly intact and, therefore, continues to shape the ways in which regions and regionalism are imagined. When looked through an exclusively urban lens, for example, regionalism refers to 'all strategies to establish institutions, policies or governance mechanisms at a geographical scale, which approximates that of existing socioeconomic interdependencies within an urban agglomeration' (Brenner, 2002, p. 5). Consequently, 'city-region' becomes a dominant scale of analysis when examining how urban spaces are territorialized by the interplay between global social and economic order and states (Jonas & Moisisio, 2018), along with metropolitan city-regions, multicity regions, megaregions, and subnational regions (Schafran, 2014; Wachsmuth, 2017; Webber et al., 2017; Wiig & Silver, 2019).

The Special Issue of *Territory, Politics, Governance* deserves a special focus for utilizing the concepts discussed above to conceptualize the interface between water infrastructure and regional governance. In this issue, Usher (2024), Milligan et al. (2024), and Zimmermann (2024) keep the traditional focus of the critical infrastructure and regionalism literature on urban contexts and investigate how water infrastructures and territorialization are intertwined with each other in different contexts, namely Singapore, Atlanta, and Ruhr. Some others, however, challenge the urban–regional focus of the infrastructural regionalism literature and argue for the need for this emerging literature to engage with different scales. Gansauer and Haggerty (2024), for example, call for situating these conceptual discussions within the 'rural' regions, as the traditional 'urban–regional' dichotomy cannot fully grasp specific rural governance-related challenges shaping/shaped by rural water infrastructure development and rural regions. Sayan and Nagabhatla (2024), on the other hand, claim that injecting a more flexible, international relations-focused definitions of 'region', 'regionalism', and 'regionalization' into the critical infrastructure studies literature would enable and facilitate the analysis of territorialization of regions far beyond national boundaries. The authors not only introduce 'transboundary' as an additional level of

analysis, but also empirically demonstrate, through their case study on the broader Central African Region and the Transaqua interbasin water transfer project, how regional characteristics and water infrastructures simultaneously influence and reproduce one another (Sayan & Nagabhatla, 2024).

Related to this, hydrosocial thinking also provides valuable insights on the co-construction of water, society, and infrastructures – the three major components of the hydrosocial cycle within which they co-produce each other at multiple scales (Linton & Budds, 2014; Swyngedouw, 2009; Wesselink et al., 2017). Hydrosocial territories highlight the fluidity of physical boundaries and the engagement of people in the process of boundary-making (Hommes et al., 2019). Water infrastructures, in this context, concern ‘both boundary making and connection making, channelling water flows to link (or disrupt) places, people and practices’ (Hommes et al., 2019, p. 85). However, most studies guided by the hydrosocial thinking limit their scope with the localized implications of water infrastructures and the localized territorialization of spaces (Acevado Guerrero, 2018).

Given that large-scale water infrastructures have been an integral part of developing economies’ nation-building and national development agendas (Bilgen, 2021), their design, implementation, and negotiation are inevitably politicized processes shaped by political, economic, and social dynamics at national, regional, and global levels. Also, the effects and implications of these infrastructures are not always confined to their localities, but rather spill over to other spaces, requiring the examination of the interplay between water infrastructure and regions beyond localized, urban cases (Kaika, 2005; Glass et al., 2024). We propose the concept of ‘water regionalism’ to unpack the territorialization of water and, more broadly, the relationship between water infrastructures and regions at a larger scale. When proposing ‘water regionalism’, we adopt a broader understanding of ‘region’ and ‘regionalism’. For instance, we consider regions to display the characteristics of political and administrative units with unambiguous boundaries and contested spaces at the same time (Keating & Wilson, 2014, p. 841). As in an imagined community, it is mostly the common experiences, habits, identities, memories, and practices of people that create and sustain a region (Fawcett, 2004, p. 432). In our analysis, for example, we refer to the GAP region as a unit of analysis with clear boundaries (administratively referred to as SAR, geographically demarcated as part of the ETB) as well as a contested space held together by distinct biophysical characteristics, socioeconomic structures, and sociocultural identities compared to the rest of Turkey. We consider rural regions to be contested as well as ‘naturalized space[s], clientelist in servicing the environmental and biological needs of neighbouring metropolises (“ecosystem services”, in modern parlance), or as functional economic spaces to be managed for the resources they contribute to national economy’ (Welsh & Heley, 2023, p. 1440). Turkey’s rural regions also have distinct economic, social, cultural, geographical, and administrative features that distinguish them from urban regions with certain boundaries. Drawing on this urban/rural distinction, GAP has made a range of economic and agro-industrial promises built around the rural features of SAR while at the same time aiming at replacing SAR’s rural/traditional characteristics with their urban/modern counterparts. We, on the other hand, perceive ‘regionalism’ as a formal project, programme, or scheme geared towards delivering social and economic development or other related goals in a particular region (Otele, 2020, p. 514). These designs may reflect views, ideologies, and aspirations of policymakers and

other dominant stakeholders. This understanding enables us to imagine GAP as a political and/or politicized infrastructure project (see Bilgen, 2019), reflecting regional imaginaries of the Turkish state and aiming to territorialize regions in their entirety, e.g., south-eastern Turkey. In the next section, we contextualize our conceptual framework by providing a concise history of Turkey's hydraulic infrastructure building efforts and regionalism from the 1920s onwards.

Regional planning and hydraulic development in Turkey

The early years of the modern Turkish Republic witnessed a dual and complementary process of the social and political construction of the nation-state and the material construction of public works. The development of water infrastructures played a crucial role in enabling the control of nature (water resources) and making of the nation-state (Kurtiç, 2019, pp. 93–94). Resultantly, the Turkish state began its initial efforts to investigate, develop, and govern its natural resources both to meet its growing water needs and expand its reach (Bilgen, 2021). In 1925, the Water Directorate was created under the Ministry of Public Works. The General Directorate of Waters was established in 1929 and transformed into the Directorate of Water Works in 1939 (Altınbilek & Hatipoğlu, 2020, pp. 64–65). In 1935, the Electrical Power Resources Survey and Development Administration (*Elektrik İşleri Etüt İdaresi Genel Müdürlüğü*, EİE) was established to develop the country's energy and natural resources (Tekeli, 2009, p. 147). Following the Ministry of Public Works and EİE's efforts to explore the country's hydropower potential, conduct hydrological surveys, and carry out engineering projects (Tiğrek & Kibaroğlu, 2011, p. 27), preliminary studies on river basin planning began.

On another front, the construction of the Hoover Dam in the United States in the 1930s had tremendous implications for water infrastructure building across the world. In this period, the U.S. government institutions such as the U.S. Bureau of Reclamation and the U.S. Army Corps of Engineers became globally known for their expertise in water resources management (Tozoğlu, 2021, p. 384). The creation of the Tennessee Valley Authority (TVA) radically changed the way river basin development was conceived. TVA was the amalgamation of 'unified development (the damming of all the streams of a given river basin to bring the river under total control), the benefits of multipurpose dams (hydropower, flood protection, transportation, irrigation [etc.]), and the idea of regional development' (Molle et al., 2009, p. 333). As in many other developing nations, the TVA idea began to gain ground in Turkey in the late 1930s, shaping how the rivers would be developed and governed in the following decades (Alkan, 2021, p. 71).

Aligning itself with the USA following World War II, Turkey signed the Bretton Woods agreement to integrate with the postwar international economy and, consequently, received Marshall aid. The Marshall Plan considered Turkey a suitable supplier of agricultural products to war-torn Europe. Therefore, the plan entailed the development of the country's agriculture as well as infrastructure sectors. To this end, the USA provided Turkey with the financial and technical support required to build and modernize dams, granaries, and harbour facilities across Turkey. For example, the Sarıyar and Seyhan dams were built through the help of American aid and expertise in 1951 and 1953, respectively (Tozoğlu, 2021, pp. 387–388). Furthermore, the model of the U.S. Bureau of Reclamation inspired the establishment of DSİ in 1953. DSİ became the primary state agency tasked

with the planning, design, construction, and operation of water structures across the country. As a reflection of the influence of the USA on dam-building and watershed management practices (Kurtiç, 2019, p. 99), DSİ divided Turkey into 26 basins (Alkan, 2021, p. 73). Following the state's decision to envision the Euphrates and the Tigris basins as a single transboundary basin for being linked both naturally (at the Shatt-al-Arab) and artificially (through the Tharthar Canal; Bağış, 1997, p. 579), this number has gone down to 25.

The 1960 coup initiated the Keynesian period of the economy with an emphasis on national developmentalism, rapid industrialization, and strong protectionism of the domestic market through import substitution. Marking the beginning of two decades of planned economy, DPT was founded in 1960. DPT introduced five-year development plans (FYDPs) as a means not only to manage public investments, including those in the water sector (Kıbaroğlu et al., 2009, p. 288), but also to address regional disparities in a planned manner (Tekeli, 2008, p. 69). Jointly prepared by policymakers and experts, FYDPs concerned addressing issues as diverse as 'economic growth, sectoral decisions, distribution of state investments and incentives, public administration, social policy, housing, urbanization, rural development and regional development policies' (Sezgin, 2018, p. 654). In other words, the 1960 coup was an important milestone in terms of representing the triumph of planning, industrial growth, and urban universalism over patronage, populism, and rural parochialism (Heper & Keyman, 1998, p. 264) as well as of 'science' in policymaking over the 'unscientific' economic approaches pursued by the previous government throughout the 1950s (Küçük, 1978, p. 272).

The transition from a partial to a holistic approach in planning made large-scale infrastructures a key component of regional development (Alkan, 2021, p. 43). Because '[t]he major systematic aspect of water-related activities in Turkey [was] central planning' (Altınbilek & Hatipoğlu, 2020, p. 66), hydraulic infrastructure development gained momentum. The increased policy cooperation and coordination between DSİ and DPT (Sayan, 2016, p. 8) elevated dam development to a policy tool to fulfil Turkey's national development goals, many of which, such as increased agricultural production, advanced industrialization, and modernized infrastructures, would increase the demand for water and energy (Kıbaroğlu & Maden, 2014, p. 348). To this end, the state (has) approached water infrastructure building in line with a 'hydraulic mission' (see Conker & Hussein, 2019).

The first FYDP (1963–1967) placed particular emphasis on developing the Keban region that covered the provinces of Malatya, Elazığ, Tunceli, and Bingöl (Tekeli, 2013, pp. 46–47). The construction of the Keban Dam, the first large dam built on the Euphrates, began in the mid-1960s. Unlike the first FYDP, the second FYDP (1968–1972) adopted a more market-oriented, private-sector-friendly approach and considered urbanization instead of regional comparative advantage to be the engine of development (Sezgin, 2018, p. 656).

The third FYDP (1973–1977) was prepared after the 1971 coup, in a context where import substitution industrialization policies did not yield the expected outcomes in terms of reducing regional disparities across the country. Also, in this period the capital-intensive nature of investments led to unemployment and triggered migration from rural to urban centres, widening the gap between wealthy and poor regions (Eraydın, 2019). As a novel attempt to address the issue at a national scale, the third FYDP introduced the

'Priority Localities in Development' with the expectation that the provision of incentives would create an investment-friendly environment in the least-developed localities and, thereby, reduce interregional inequalities (Akpınar, 2011, p. 123). As the term 'region' (*bölge*) supposedly had political and separatist connotations, the term locality (*yöre*) was preferred (Millî Güvenlik Kurulu Genel Sekreterliği, 1993, p. 74). The fourth FYDP (1979–1983) reinserted the term 'region' back into the state's development lexicon and introduced 'functional regions' to ensure regional development (Sezgin, 2018, p. 657). Meanwhile, the Keban Dam became operational in 1975. All hydropower and irrigation projects planned to be built on the Euphrates and Tigris were combined under the umbrella of GAP in the late 1970s.

Announced in 1980, the *24 January Decisions* marked Turkey's encounter with neoliberalism, necessitating the state to adopt a private sector-led and outward-oriented development strategy. Following the 1980 coup, the military regime also supported the neoliberal restructuring of the economy. The neoliberal transition has had implications for regional development policy. For instance, the adoption of export-led growth strategies, the mobilization of investments in infrastructure and telecommunication sectors, and the creation of new institutions such as capital market, free trade zones, and reformed banking sector were of high importance for integration purposes (Tekeli, 2009, pp. 129–130). DPT abandoned its planning duties and, instead, concerned itself with disbursing incentives, supporting the private sector, and operating on a project basis (Keleş & Mengi, 2013, p. 194).

Against this backdrop, the fifth FYDP (1985–1989) highlighted the need to open to international markets, diminish the role of the state in investment policies, make the private sector the engine of regional development, strengthen local governance, and utilize endogenous resources for regional development, among others (Sezgin, 2018, p. 657). The energy and water sectors have also undergone rapid reforms. Approved in 1984, Law No. 3096, for instance, provided the private sector with the authorization to produce, transmit, and distribute electricity through various models such as build–operate–transfer, build–own–operate, and transfer of operating rights (Kıbaroğlu et al., 2009, p. 291). In the water sector, this system was 'extended to water supply and sanitation services in municipalities, and to the construction, operation and management of infrastructure, such as dams, hydropower plants and irrigation systems' (Tiğrek & Kıbaroğlu, 2011, p. 29). Consequently, the main role of the state shifted from a principal contractor to into a market regulator in water governance (Sayan & Kıbaroğlu, 2016, p. 1289). A late outcome of this shift was a 'boom' in the construction of small, run-of-the-river type hydroelectricity power plants (HPPs) through the partnership of DSI and the private sector – a process also referred to as 'the privatization of water' (İşlar, 2012, p. 376). While at a national level the HPPs were promoted as a solution to meet Turkey's energy needs by way of utilizing the 'untapped' or 'wasted' regional natural resources, at a regional/local level there was a backlash against the socioecological impacts of these projects.

The sixth FYDP (1990–1994) was the first plan to acknowledge the European Union's (EU) conception of regional policy (Eşiyok, 2009, 110), particularly the principle of subsidiarity (Sezgin, 2018, p. 658). While the seventh FYDP (1996–2000) did not dramatically differ from the previous plan, Turkey's EU candidacy in 1999 necessitated the state to reorient its regional policy in line with the EU standards to reduce its regional disparities

(Göymen, 2008). Consequently, the eighth FYDP (2001–2005) highlighted globalization and the EU accession as the key drivers of economic and social change (Sezgin, 2018, p. 659) and considered sustainability, integrity, balance of social and economic development, betterment in quality of life, and participation as the fundamental principles of regional development (Türk, 2012, p. 113). Based on the EU's Nomenclature of Territorial Units for Statistics (NUTS) classification, 26 regional development agencies were subsequently created in 26 NUTS II regions across Turkey in three phases in 2006, 2008, and 2009 (Çelebi Deniz & Erkut, 2022, p. 5).

Harmonized with the EU's financial calendar, the Ninth Development Plan (2007–2013) became the guiding document on the transformation of regional policies with its exclusive focus on increasing regional competitiveness through local natural and human potentials, specialization, innovation, and knowledge economies (Sezgin, 2018, p. 659). Extending this approach, the Tenth Development Plan (2014–2018; Türkiye Cumhuriyeti Kalkınma Bakanlığı, 2013, pp. 1–3) and the Eleventh Development Plan (2019–2023; Türkiye Cumhuriyeti Cumhurbaşkanlığı, 2019, pp. 1–3) emphasized the need to follow a sustainable, participatory, and human capital-based approach within which notions such as innovation, competitiveness, liveability of cities, place branding, regional clustering, stability, productivity, international cooperation, rule of law, democratization, and good governance informed regional policies to reduce regional disparities.

Nevertheless, intra- and interregional differences within Turkey persist. Compared to other Organization for Economic Co-operation and Development (OECD) members, Turkey faces stark regional disparities in unemployment rates and well-being, 'with the richest 20% of regions reporting a GDP per capita 3.2 times higher than the poorest 20% of regions' (OECD, 2022). Considering that 'isolated, economically marginal, and poorly developed frontier regions' have traditionally been designated as dam sites, it is hardly surprising that Turkey, too, has considered water infrastructure as a key means to, *inter alia*, generate the revenue needed to address regional disparities (Huber & Joshi, 2015, p. 13). The next section will discuss the conceptualization and operationalization of this goal by focusing on the production of region-infrastructures and infrastructure-regions at different scales, and illustrate whether or how GAP and the GAP region have been making and remaking each other.

Region-infrastructures, infrastructure-regions

GAP in brief

The GAP region is bordered by the Mediterranean Region to the west, the Eastern Anatolia Region to the north, Syria to the south, and Iraq to the south-east. It includes the provinces of Adıyaman, Batman, Diyarbakır, Gaziantep, Kilis, Mardin, Siirt, Şanlıurfa, and Şırnak, covering an area of 75,193 km² and a population of 9.2 million that corresponds to 9.7% of Turkey's total surface area and 10.9% of Turkey's total population, respectively (GAP-BKİ, 2023, p. 9, see Figure 1).

While the initial hydrological observations on the Euphrates and the Tigris can be traced back to late Ottoman times (Stahl, 2014), Turkey began its surveys on the Euphrates in 1936, and extended these surveys to the Tigris in 1945 (Altınbilek, 1997, p. 311). On the Euphrates, the Lower Euphrates Project was initiated as a set of 13 projects on



Figure 1. The GAP region in Turkey.

hydropower generation and irrigation in the 1960s. In the 1970s, the scope of the project was expanded to include the projects planned to be implemented on the Tigris. GAP was thus created in the late 1970s.

GAP entailed the construction of 22 dams, 19 HPPs, and irrigation and drainage networks to generate 27 billion kWh of energy per year and to irrigate 1.7 million ha of land in a few decades in south-eastern Turkey (Topçu et al., 2019, p. 192). From the 1980s onwards, GAP became a multisectoral and integrated regional development project following the inclusion of additional sectors such as agriculture, education, healthcare, and tourism into the project framework (Ünver, 1997, p. 194). GAP's focus on sustainable human development in the region was built upon the concept of integrated regional development of the GAP Master Plan of 1989. In order to implement the principles set out in the plan and coordinate the management, monitoring, and evaluation of development-related activities, GAP-BKİ was created under the guidance of the DPT. From 1994 onwards, GAP was repackaged as a 'sustainable human development project' (Topçu et al., 2019, p. 192). The major objectives of the project can be summarized as removing regional disparities, promoting national cohesion, modernizing land ownership, and developing agriculture, energy, and industry sectors (Warner, 2008, p. 279). In that sense, the project not only reflects a commitment to water infrastructure building as a development strategy, but also resembles a silver bullet for multiple local, regional, national, and international ambitions (Akbulut et al., 2018, p. 97).

As of 2023, 91% of the energy projects and 60% of the irrigation projects under GAP have been completed (DSİ, 2023, p. 51). The implementation of the project, however, has not always been smooth. On a local scale, for instance, GAP has become a cause for concern for its environmental, social, and cultural effects, such as soil salinization (e.g., in Harran), the displacement of people (e.g., in Birecik), and the inundation of historical sites (e.g., in Hasankeyf). On a national scale, the project has been a source of contention among political parties and bureaucratic organizations, leading to disagreements on issues related to budget allocation, administrative jurisdiction, ownership, and so on. On an international scale, the project has also been a thorny issue between Turkey, Syria, and Iraq, the ETB's upstream versus the two downstream riparians, respectively.

'Regions make infrastructures'

A powerful discourse of 'inevitability' has been influential in steering the components and purposes of GAP. The (relative) abundance of water resources in SAR, for instance, is considered one of the major reasons why the region has been chosen as a site of energy and irrigation projects. Originating in the eastern highlands of Turkey, the Euphrates and the Tigris are the second and third longest rivers in the Middle East and North Africa (after the Nile) with a length of 3000 km and 1850 km, respectively (FAO, 2009, p. 3). While there is no consensus on the annual average flow of the rivers (Mason et al., 2023), the water potential of the Euphrates and the Tigris in Turkey is estimated to be around 30 billion cubic metres (BCM)/year and 24 BCM/year, respectively, increasing to 37 BCM/year and 58 BCM/year when contributions from the tributaries in Syria, Iraq, and Iran are also factored in (Özdemir et al., 2002, p. 32). A government official explained the government's official policy on the ETB waters as follows:

When considered a single river system, the Euphrates–Tigris has an annual flow of about 85 BCM. It is as large as the Nile. Why would we let go of the opportunity to use this water? Every country builds dams. Every country irrigates its land. We are not an exception in this regard, (Interview, 6 March 2023, Ankara)

As the interview excerpt above also demonstrates, the large volume of water available in the basin has been a strong motivation, as well as a legitimate justification, for implementing energy and irrigation projects in SAR instead of other regions across the country.

The high variance of annual and monthly flow of the Euphrates and the Tigris is also considered an important reason why GAP has had to be launched in SAR. In the mountainous headwater regions in Turkey, most of the precipitation falls as snow, which melts in spring and, with additional seasonal rainfall, makes rivers reach their maximum flows between March and May (FAO, 2009, p. 2). The average annual flow of the Euphrates at the Turkish–Syrian border varied from 14 BCM (1961) to 57 BCM (1969) between 1946 and 1994 (Altınbilek, 2004, p. 19). The average annual flow of the Tigris at the Turkish–Iraqi border varied from 7 BCM (1961) to 34 BCM (1969) in the same period (Altınbilek, 2004, p. 19). The minimum and maximum monthly flows of both rivers differed almost 28-fold for the Euphrates and about 80 times for the Tigris (Altınbilek, 2004, p. 18). Against the backdrop of the erratic flow of the rivers, both government officials and academic experts made a case for dam building in the ETB for their crucial role in storing excess water,

regulating the basin waters, making the flow pattern more uniform and, thus, providing benefits to both upstream and downstream riparians. Another government official, for instance, highlighted the key role dams built under GAP play in storing water as follows:

When I was in active duty, I remember an incident where the snow that was supposed to melt in three months unexpectedly melted in only 10 days. It was an extreme weather event. When DSİ notified our ministry, we immediately sent diplomatic notes to our downstream neighbours and promised not to flood them with 7000–8000 million cubic meters of water. We told them we would slowly send them around 2500 million cubic meters, bank to bank. We said, try to manage it. Then we stored this water behind the Atatürk Dam and other dams, and showed everybody the benefits of storing water, especially when the wind blows from the wrong direction. (Interview, 16 March 2023, İstanbul)

An academic, on the other hand, highlighted the role of the same dams in regulating the ETB waters by stating that ‘energy dams are beneficial. Because the energy dam must constantly release water to turn the turbine, it also regulates the flow of water. It makes water available even during dry seasons. Rivers become more regulated’ (Interview, 22 March 2023, online via Zoom). Similarly, another academic pointed out the ‘regulatory function’ of dams as the *raison d’être* of some GAP dams, saying that ‘the Birecik and Karkamış dams were built as afterbay dams, to regulate the water released from the Atatürk Dam. This is how the downstream riparians receive water uninterruptedly’ (Interview, 17 February 2023, online via Zoom).

Turkey’s climate is considered another reason behind the implementation of GAP in SAR. Turkey has a semi-arid climate with an average annual rainfall of 574 mm and a total annual volume of precipitation of 450 BCM (DSİ, 2023, p. 38). It is a ‘water-stressed’ country with 1322 cubic metres of available water per capita per year (DSİ, 2023, p. 15). Droughts have recently become more frequent and severe (Su Yönetimi Genel Müdürlüğü, 2022, pp. 25–31). While most of the ETB has a subtropical climate with wet winters and dry summers (FAO, 2009, p. 2), the lower parts of the basin have a hot desert or hot semi-arid climate (Bozkurt & Lütfi Şen, 2013, p. 151). Mean annual precipitation in the Euphrates Basin ranges from 1000 mm in the Turkish portion to 150 mm in Syria, and 75 mm in southern Iraq (UN-ESCWA & BGR, 2013, p. 56). In the Tigris Basin, mean annual precipitation ranges between 400 and 600 mm, with values measured as high as 800 mm and as low as 150 mm in the upper and lower parts of the basin, respectively (UN-ESCWA & BGR, 2013, p. 108). Given the arid and semi-arid conditions of both Turkey and the ETB, as well as the future impacts of climate change on the wider region (Şen et al., 2011), dams are seen as an essential means of ensuring water security. This point is reiterated by a professor as follows:

We need water in summer. We have Mediterranean climate; we don’t get precipitation. It is imperative for us to collect, store, and save water to be able to use it in summer. Also for energy generation purposes. I mean, we are not like Norway; we don’t get rain all the time so we cannot always generate energy. Therefore, we must build dams. With the effects of climate change, we might even consider building more dams in the Euphrates–Tigris Basin because snowpacks no longer hold enough water. If you don’t have enough capacity, you must build extra dams. This is inevitable. (Interview, 9 February 2023, online via Zoom)

Economic disparities between SAR and the other regions are also considered a crucial reason behind GAP’s design and execution. As mentioned before, SAR has lagged the national average in many respects, particularly in terms of economic development (see

Benek, 2009; Pamuk, 2008). In 1985, the gross regional product (GRP) of SAR formed only 4% of Turkey's gross domestic product, while per-capita GRP in the region was 47% of the national average (DPT, 1990, p. 1). In the early 1990s, the region's unemployment rate was 22% whereas Turkey's unemployment rate was 11% (GAP-BKİ, 1996, p. 26). In order to address this economic gap, the GAP Master Plan sought to increase GRP by 445% and per-capita income by 209% while creating 3.8 million new jobs by 2005 (GAP-BKİ, 2023, p. 4). Despite some progress over the decades (Bilgen et al., 2021), disparities in income remain largely intact. In 2022, the lowest income group in the region earned 10,283 Turkish Liras (TL) while the same group in Turkey overall earned 14,712 TL. Similarly, the highest income group in the region earned 59,361 TL while the same group in Turkey overall earned 116,773 TL (GAP-BKİ, 2023, p. 18). Regional disparities in unemployment rates remain stark too: 30% of the working force in south-eastern and eastern Turkey was unemployed in 2021 (OECD, 2022). Due to persistent economic problems in the region, the idea of making hydropower 'the main pillar of the region's development' (Turgut, 2000, p. 244) has become an indispensable part of Turkey's development agenda and a policy mantra, as also explained by an academic:

Historically, Turkey has seen water as a fundamental means of development, through the lens of a hydraulic mission. Taming water, using water for economic purposes, using water to serve society, managing water to address health issues . . . Many references have been made to water. Using water to reap economic benefits has been an important criterion of success, and transboundary waters are no exception. (Interview, 14 February 2023, online via Zoom)

Sociocultural and ethnic differences between SAR and the rest of Turkey are also highlighted as a driving force behind the implementation of GAP. The ethnic composition of SAR, 64.1% of which is made up of Kurds (KONDA, 2011) and the rest of Turks, Arabs, and other minor ethnic groups (Mutlu, 1996, p. 65), is also occasionally considered a factor why the region has been chosen as the project site (see Akıncı et al., 2020; Bilgen, 2018a; Harris, 2008; Özok-Gündoğan, 2005). While SAR is 'historically' considered one of the most under-developed regions in Turkey (Mihçı, 2012), in the early years of GAP the government officials lacked the sufficient scientific and applied knowledge of the sociocultural features of the local population (Ertürk, 1993, p. 20). This was also reflected in an anecdote told by a government official about their appointment to SAR: 'society I found there was beyond my imagination. . . . It was so different, so different than all other regions. . . . The language, culture, and ethnicity were different. Lifestyles were very different' (Interview, 30 April 2014, Ankara). Both to overcome the knowledge gap and address the observed differences in various spheres, a series of academic studies on the social fabric of SAR was conducted through government-academia partnership between 1992 and 1994, the compilation of which led to the formulation of the GAP Social Action Plan in 1994. The plan diagnosed the region as a space dominated by traditional social and cultural structures where semi-feudal social and economic relations, nomadism, landlordism, and tribalism persisted (GAP-RDA, 1999, p. 4), and highlighted that these structures would hinder social development if left unaddressed (GAP-RDA, 1999, p. 6). To dismantle these traditional structures and replace them with their modern counterparts, a range of social development projects such as Multipurpose Community Centres and Social Progress for the Youth were initiated throughout the 1990s and 2000s (Kibaroğlu, 2006, p. 179). In that sense, the production of specific knowledge about the sociocultural

structure of the region, the problematization of certain aspects of the region via that knowledge, and the implementation of social programmes based on the defined problematique followed a sequential process within which sociocultural constructs and materialities shaped the project's direction and objectives. While being shaped by a range of regional features and factors, GAP has also created a unique region and actively shaped the biophysical, political, economic, social, and cultural spheres of this space in line with a normative development agenda, as demonstrated below.

'Infrastructures make regions'

GAP has created new surface water bodies in SAR while simultaneous or subsequent water infrastructures in Syria and Iraq have also created large water bodies in the lower parts of the ETB (Mason et al., 2023). The maximum storage capacities of the dams on the Euphrates and the Tigris are calculated to be 144 km³ and 116.5 km³, respectively (UN-ESCWA and BGR, 2013, pp. 62, 113). As the centrepiece of GAP, the Atatürk Dam alone has a reservoir capacity of 48.7 BCM (Tortajada, 2000, p. 454). The newly created water bodies have indeed had spillover effects on other sectors. For example, the Atatürk Dam Reservoir alone has generated employment opportunities, initiated irrigated agriculture, diversified industrial production, and created new economic activities such as fishing, tourism, and recreation (Tortajada, 2000, pp. 455–460). As discussed before, dam reservoirs regulate the flow of the Euphrates and the Tigris except extremely dry and wet periods (Beaumont, 1998, p. 174). However, they also cause water loss due to excessive evaporation, 50% of which can be prevented through coordinated water resources development and management in the ETB (Altınbilek, 2004, p. 28).

GAP has created increasingly urbanized spaces as well. The project has been an important conduit to extend the government's urbanization agenda towards remote rural areas. In 1990, 56% of the local population in SAR and 59% of people in all Turkey lived in urban settings (GAP-BKİ, 1993, p. 5). In 2022, the rate of urbanization in SAR and Turkey was both 93.3% (GAP-BKİ, 2023, p. 11). Taken together with the artificially created water bodies, the created urban spaces demonstrate that GAP has not only facilitated the transition of SAR into the GAP region, but also created 'intra-GAP region' spaces of smaller scale with their own distinct economic, hydraulic, physical, and political characteristics and functions formed and sustained by the human–water–infrastructure interactions inherent in the project.

GAP has facilitated the transformation of the region into an agro-industrial base in Turkey and, with limited success, the 'breadbasket' of the Middle East (Hommes et al., 2016, p. 12). In the early stages of GAP, 36% of the cultivated land was used as dry farming land, 1.7% as irrigated farming land, and the rest for horticulture and other activities (DPT, 1989, p. 4.5). As the share of irrigated farming in agricultural production has increased, the variety of crops produced, as well as their share in nationwide production, has also changed (Bilgen et al., 2021, p. 1587). The surge in cotton production following the irrigation of the Harran Plain in 1995 was particularly remarkable. While 13.2% of cotton produced in Turkey originated from SAR in 1985, this figure increased to 60.89% in 2022, making the region a hub for cotton production (GAP-BKİ, 2023, p. 27). Relatedly, GAP has incentivized the creation of hubs for industrial manufacturing and commerce, such as Gaziantep. The number of organized industrial zones and small industrial sites has

significantly increased (GAP-BKİ, 2023, pp. 46–47). As an agro-industrial base, the region exported \$14.4 billion of goods and services in 2022 – 5.7% of Turkey's total exports in that year (GAP-BKİ, 2023, p. 42).

As argued elsewhere (Bilgen, 2018b, 2019), the successful integration of local markets to national and international markets has been a significant guiding principle in the process explained above. The project framework has long highlighted the role of the private sector and public–private partnerships in transforming the economic and social landscape of the region. In the 1980s, the idea that ‘the full potential of GAP can only be realized through foreign and local investment’ (Bağış, 1989) gained prominence. In the 1990s, too, the architects of the projects highlighted that ‘the role of the state [was] gradually diminishing in the development process in Southeastern Anatolia [...]’ and, therefore, ‘[p]rivate investments [had to] be the real engine of development’ (GAP-BKİ, 1996). To this end, GAP Entrepreneur Support Centres were created to provide foreign and national entrepreneurs, investors, and business owners with the guidance and consultancy about regional investment opportunities. In the 2000s, a set of guidelines under the Competitiveness Agenda for the GAP Region was laid out to facilitate the transformation of the region into ‘a new, value-added economy’ based on the identity of ‘the cradle of sustainable civilization’, thereby rebranding with a positive international image, sustainable agriculture, ‘clean tech’ manufacturing, and innovative service industries (GAP-GİDEM, 2007, p. 12). Relatedly, three regional development agencies – Dicle, Karacadağ, and İpekyolu – were established in Mardin, Diyarbakır, and Gaziantep, respectively, in order to attract private-sector investment for regional development purposes, strengthen public–private partnership for regional development, and include more local, non-state actors in the regional development process. In the 2010s, large multinational corporations became involved with the project to run numerous projects, particularly to ensure corporate social responsibility (GAP-BKİ, 2017, p. 95). In a sense, GAP has served to facilitate the ‘opening up’ of the region to neoliberal capitalist values. In this new setting, local people who were thought to have ‘a fatalist and passive mentality’ would ‘reach a consciousness regarding human will and activity to be able to change nature for their own interests and create a more combatant and entrepreneur mentality’ (GAP-BKİ, 1996, p. 6). In other words, local people were expected and encouraged to undergo a ‘mentality change’ by embracing a rational, risk-taking, and entrepreneurial attitude to become ‘homo economicus’ – self-interested and self-sufficient economic agents. For instance, local farmers who embraced traditional agricultural practices were expected to acquire new skills and learn ‘what to cultivate, when to cultivate, the profitability of the product in stock market, how to transport the product’ so that they could ‘become self-sufficient people’ even if it would take years, according to a member of parliament (Interview, 13 May 2014, Ankara).

GAP has inspired the design and implementation of other regional development projects such as the Eastern Anatolia Project (DAP), the Eastern Black Sea Project (DOKAP), and the Konya Plain Project (KOP). Since 2011, each project has also had its own regional development administration, modelled partly upon the GAP-BKİ. When completed, DAP, DOKAP, and KOP will, respectively, irrigate 1,377,656 ha, 477,970 ha, and 1,647,239 ha of land (DSİ, 2023, pp. 52–55). Despite their clear regional focus, however, the projects have not been able to ‘place-brand’ the administrative units within which they have been operating. In other words, unlike the GAP region, a DAP region,

a DOKAP region, or a KOP region is yet to be created – an indication that the capacity of a project to forge a region is not fixed, but rather determined by a myriad of structural and contextual factors pertaining to a specific region. In that sense, GAP and the GAP region have achieved an equilibrium of infrastructural, regional, and hydraulic dynamics that has allowed the co-construction of the project and the region.

Discussion and conclusion

In line with the calls to broaden the urban–regional and local focus of the infrastructural regionalism (Sayan & Nagabhatla, 2024), our analysis contributes to this literature by applying broader definitions of ‘regions’ and ‘regionalism’ to the analyses of the interface between water infrastructures and regionalism. Our understanding supports the perception of a region as an administrative division, a geographical unit, and a contested space while supporting the perception of regionalism as a project geared at ensuring development, order, stability, security, and similar normative goals in a particular space (see Fawcett, 2004; Keating & Wilson, 2014; Otele, 2020). This is a timely intervention in this literature, as our analysis draws attention to the territorial implications of water infrastructures at a larger scale while underpinning the politicized nature of water infrastructure development. Furthermore, our analysis revisits the debate on how the politics and design of water infrastructures reflect regional characteristics and dynamics (Sayan & Nagabhatla, 2024), and highlights that water infrastructures and regions *simultaneously* reproduce each other in the confines of our understanding of water regionalism.

Our analysis shows that SAR’s regional characteristics have led to the birth of GAP. The creation of the project can be attributed to factors such as the Euphrates and the Tigris, flowing through SAR, and their recognition as ‘strategic’ water resources within Turkish policy circles. Additionally, Turkey’s pursuit of water security through infrastructure development is influenced by the semi-arid conditions in SAR, further emphasizing the significance of the GAP’s inception. Furthermore, the region’s multiple, long-standing economic challenges and its sociocultural and ethnic differences have also led to the evolution of GAP into a multidimensional regional development project, where SAR has made GAP. GAP has also reconfigured SAR with several subprojects within the GAP agenda by putting multidimensional regional transformation at the heart of the project over time. In fact, the region has started to be referred to as ‘the GAP region’ in Turkey and beyond. Similarly, GAP has been instrumental in integrating SAR to national and global markets and achieving urban transformation in the region, thus bringing a new regional identity to the region.

This understanding can be enriched by focusing on the ETB as a transboundary region and examining how the basin and water infrastructures implemented by all riparian states shape each other. For example, the case of GAP demonstrates how regions make infrastructures at an inter-state level. Turkey’s regional vision for the ETB, particularly through GAP, aimed at large-scale, regional water development projects to meet growing needs. Similarly, Syria and Iraq pursued their own large-scale water resource projects, such as Syria’s Euphrates Valley Project and Iraq’s various dams and canals, although these lacked the comprehensive, multisectoral, and regional approach seen in GAP (Altınbilek, 2004; Kibaroglu, 2002).

Turkey's regional strategy focused on integrating the Euphrates and Tigris as a single transboundary water system, leading to its 'Three-Stage Plan' (1984) for equitable resource use (Kibaroğlu, 2002). However, Syria and Iraq rejected this regional approach, demanding a water-sharing agreement from the Euphrates that protected their existing water uses. The differences in the positions of the riparians can be explained by the fact that each side hoped to gain the most benefits from its respective arguments. On the one hand, Syria and Iraq feared that their claims to a larger share of the Euphrates would be weakened if they were to consider the rivers as part of an integrated transboundary river system ('region'). Since the late 1980s, Turkey, on the other hand, has tried to retain its energy and irrigation development schemes both in the Euphrates and Tigris portions of the ETB (Kirschner & Tiroch, 2012).

While Turkey promoted GAP as a regional sustainable development project through international partnerships, Syria and Iraq criticized the project for reducing water availability downstream. They raised concerns about evaporation losses, water diversion for irrigation, and increasing urban and industrial demands due to population growth (Kirschner & Tiroch, 2012; Öziş et al., 2020). This international disagreement escalated with Turkey's construction of more dams in the 2000s, sparking diplomatic crises, particularly over the Ilisu Dam (Kibaroğlu & Sayan, 2021). Despite these international tensions, Turkey's GAP project significantly influenced its water diplomacy, presenting a model of development that aimed to integrate socioeconomic goals across the entire ETB.

Yet, more empirical evidence unpacking the relationship between water infrastructure and regionalism in Iraq and Syria is needed to reinforce these dimensions at basin level, although our perception of water regionalism may be a starting point for future studies and reinforce 'transboundary' scale as a unit of analysis in infrastructural regionalism studies.

Our account of the history of regional planning and hydraulic infrastructure development in Turkey and our analysis of the relationality of SAR and GAP demonstrate that water, infrastructures, and regions cannot be considered self-generated entities that exist in a void. On the contrary, each element interacts with each other in a contextual, relational, mutually constitutive manner and, consequently, creates a complex constellation of actors, institutions, and interests that, via water, enables regions to make infrastructures and infrastructures to make regions. Acknowledging this dynamic, two-way relationship when analysing regions/regionalism through (hydraulic) infrastructures or vice versa would facilitate a much-needed transition from a purely technical hydraulic paradigm to a more politically, socially, and ecologically sensitive paradigm which would provide a more accurate picture of the power and politics of water and infrastructure politics in a particular region.

Acknowledgements

The authors thank Zeynep Sila Akıncı for creating the map used in this work. The authors also thank Umut Kuruüzüm and Michael Mason, the organisers of the 'Ecologies of Fragile Landscapes Workshop' at LSE (9 June 2023), where the first draft of this work was presented, Greg Shapland,

the discussant of the work, and the workshop participants for their valuable comments and feedback, as well as Professor Tortajada and two anonymous reviewers for their support and constructive feedback on earlier versions of this manuscript.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Author contribution statement

All three authors have equally contributed to conceptualization, writing, editing and reviewing this manuscript.

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