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# **Producing a Chinese hydrosocial territory: A river of clean water flows north from Danjiangkou**

## **Abstract**

Hydrosocial territories are produced not just through concrete water infrastructure, but through flows of people, water, money, and ideas at multiple scales. As part of China's South-North Water Transfer Project, water drawn from the distant Danjiangkou Reservoir now supplies the megacities of Beijing and Tianjin with the majority of their drinking water. To provide this new service – supplying drinking water of sufficient quality and quantity – the Reservoir and its upper reaches are in the midst of socio-economic and ecological transformations. In this article, we outline the tools being mobilised to send a river of clean water north, including administrative interventions, displacement, and discursive imaginings. We argue that what is being attempted is a wholesale reorganisation that marginalises local territorialities, reflects China's particular governing rationalities and practices, and highlights new spatialities of water governance. Our analysis of the remaking of Danjiangkou pushes hydropolitical scholarship to more precisely define the geographies of power in hydrosocial territories.

## **Key words**

Hydropolitics; power; governmentality; water pollution; resettlement; China

## **Introduction**

The two huge municipalities of Beijing and Tianjin now source the vast majority of their drinking water from the Danjiangkou Reservoir over 1000km away. They do so thanks to the Middle Route of China's South-North Water Transfer Project (SNWTP), an expensive, technologically and politically challenging interbasin transfer scheme. As a complex system operating in places with severe water pollution problems, the SNWTP relies not just on concrete infrastructure but on an array of governmental technologies in its attempt to transfer drinkable water from tributaries of the Yangtze River to large cities in North China. It is a hydropolitical project *par excellence*, and one that highlights the complex interrelations of water and politics in contemporary China.

This paper aims to examine the tools being mobilised to achieve the primary objective of the SNWTP's Middle Route – supplying Beijing and Tianjin with water of sufficient quality and quantity – and what these can tell us about how the Chinese state governs water. It focuses on the interventions at and around the Danjiangkou Reservoir. To make sense of these interventions we conceptualise them as a governmental program aimed at optimising the supply of clean water. Our approach resonates with critical geographies that draw on Foucault's (1980; 1991) notion of governmentality (see for instance Braun, 2000; Rose-Redwood, 2006; Huxley, 2007; Hellberg, 2014), but also related scholarship on hydrosocial relations and, specifically, hydrosocial territories. We demonstrate how a new hydrosocial territory is being produced encompassing the Danjiangkou Reservoir and its upper reaches, a region that has come to be identified with the phrase “continuously/forever send a river of

clean water north” (*yijiang qingshui yongxu bei song* 一江清水永续北送). The production of this territory relies on a number of technologies, which extend well beyond those typically associated with water governance, and which reflect China’s particular mentalities of government.

The paper proceeds as follows. In the first section we discuss the concept of hydrosocial territories and then turns to an otherwise separate literature on Chinese mentalities of government (or Chinese governmentalities), which, while not typically concerned with water governance, provides insight into the exercise of power in China. A dialogue between these two literatures forms the theoretical basis of our analysis. In the second section we introduce the Danjiangkou area and its new role as part of the SNWTP in sending a river of clean water north. In the third section we outline what we consider to be the key tools being mobilised beyond physical water infrastructure to produce a new hydrosocial territory at Danjiangkou: central government-led planning mechanisms, compensatory fiscal mechanisms, displacement, and discursive imaginings. Our intention is not to assess the success of this hydrosocial project (which continues to evolve), but to detail the *attempt*, and the different networks of actors enrolled in this remaking of territory. Our analysis drives forward an understanding of how hydrosocial territories are made in a non-liberal, non-Western context, with implications for hydropolitical theory.

### **Hydrosocial territories and Chinese governmentalities**

There is a rich history of scholarship in geography and cognate disciplines that parses the relations between water and power/politics, or “hydropolitics” (for a brief review see Rogers & Crow-Miller 2017). Against purely biophysical notions of the hydrological cycle, *hydrosocial* approaches draw attention to how interventions into hydrological conditions are always political in character, with uneven social effects (Swyngedouw 2009). These studies understand water and politics to be co-produced and they see water infrastructure as doing political work (see for instance Bijker, 2007; Loftus, 2009; Bakker, 2012; Carse, 2012; Budds et al., 2014; Linton and Budds, 2014; Swyngedouw, 2015). Most recently, the concept of a hydrosocial *territory* has been used to focus more intently on scale and territorialisation, highlighting how processes at multiple scales work to rearrange hydrosocial relations in particular places for particular goals (Boelens *et al* 2016). This concept has much in common with the notion of the “waterscape” – “a produced socio-natural entity in which social power is embedded in, and shaped by, both water’s material flows and its symbolic meanings” (Budds and Hinojosa, 2012: , 124) – through which scholars have explored the scalar politics of water governance. Scholarship on hydrosocial territories puts added emphasis on how such territories are not simply about governing water: indeed in our case of Danjiangkou, attempts to move people and to reorganise industry and agriculture are as central to the production of territory as water infrastructure.

Boelens *et al* (2016: , 2) describe a hydrosocial territory as the:

contested imaginary and socio-environmental materialization of a spatially bound multi-scalar network in which humans, water flows, ecological relations, hydraulic infrastructure, financial means, legal-

administrative arrangements and cultural institutions and practices are interactively defined, aligned and mobilized through epistemological belief systems, political hierarchies and naturalizing discourses.

Studies that draw on this concept outline how various interests can of course compete to create overlapping and contested hydropolitical projects (Boelens et al., 2016; Hoogesteger et al., 2016). Hoogesteger *et al* (2016) call these “territories-in-territory”, structured by different forms of authority, sources of legitimacy, and related discourses. Similarly, in Turkey, Hommes *et al* (2016) draw attention to counter imaginaries that may challenge the dominant hydropolitical imaginary, while Duarte-Abadía and Boelens (2016) highlight how diverse regimes of value and representation can clash in a Colombian hydrosocial territory. Our analysis of Danjiangkou is therefore attuned to the possibilities of counter discourses and contestation.

An examination of hydrosocial territories is an examination of how new imaginaries are materialised through networks of water, people, finance, infrastructure, institutions and practices. But beyond saying that these networks are often mobilised through political hierarchies, the political nature of hydrosocial territories – how exactly their production is an exercise of power – can be ill-defined. The broader hydropolitics literature engages more fully with critical approaches to power and offers some guidance in this regard. In particular, Foucauldian-inspired studies have focused on the rationalities that shape governmental programs as a way to understand power relations and technologies of government in water management (Bakker, 2012; Hellberg, 2014; Kooy and Bakker, 2008). Much of the focus has been on neoliberal rationalities and techniques as they play out in the UK’s water markets (Bakker, 2005), in Chile (Budds, 2013), South Africa (Hellberg, 2014), Ecuador (Rodríguez-Lado and Boelens, 2016), and elsewhere. Bakker (2014) for instance, details processes of privatisation, commercialisation, economic valuation, marketisation, and the liberalisation of governance as evidence of a shift from state dominance of water management to market environmentalism.

However, such practices and their underlying neoliberal rationality do not adequately explain Chinese governmental programs. While there are experiments in water markets, trading, and reforms to pricing, state dominance of water management has not necessarily been displaced by a neoliberal rationality. If we are to understand Chinese hydrosocial territories as governmental programs, we must be more precise about how such programs work. This is where we turn to a parallel discussion of the ways in which power moves across scales, space, and subjects, and the particular regimes of truth and historical resonance that shape governmental programs in China.

Dutton and Hindess (2016) argue that the repressive, total, Maoist state has been dismantled, but that there are echoes of Maoism in Chinese mentalities of government at play today. These echoes manifest as continual experimentation, campaign-style programs, the use of models (model people, model villages, model cities), mass events, pervasive administrative interference, and Party supervision (Perry, 2011; Cartier, 2016; Dutton and Hindess, 2016). That said, these ways of governing can co-exist with liberal or neoliberal forms of governance, such as a reliance on expertise and service provision from non-state

organisations, and in environmental governance, economic valuation and marketisation (Sigley, 2006; Ong and Zhang, 2008; Bray and Jeffreys, 2016). Therefore, we should be open to the ways in which programs of government in China might be *hybrids*, reflecting “the integration of socialism and neoliberalism in China’s political economy in which the Party-state entrains market rationalities from within a socialist political-aesthetic” (Cartier, 2016: , 95). Scholars have only recently begun to explore how these multiple rationalities play out in Chinese water governance (Rogers et al., 2016; Clarke-Sather, 2017).

In what follows we detail specific techniques such as planning instruments, fiscal mechanisms, the rearrangement of people and space, and discourse, and reflect on the rationalities that underlie these and what they might tell us about the geographies of power in China. But first, we first briefly introduce the study site.

### **The Danjiangkou Reservoir and upstream areas**

The Danjiangkou Reservoir and its upper reaches are enrolled in a project of sending a river of clean water north. This imaginary is relatively new, and as we will describe, is being produced by a series of interventions. Prior to the SNWTP there was already a dam at Danjiangkou, the construction of which displaced 382,000 people between 1958 and 1974 (Yan et al., 2016). The Reservoir, which lies partly in Henan Province and partly in Hubei Province, is fed by the Han River, the Dan River and their tributaries. Downstream of the dam the Han River eventually flows into the Yangtze. The heightening of the dam wall (2005-2009) to significantly expand the Reservoir’s capacity for the SNWTP submerged another 17,000 hectares of farmland, 4300 hectares of forest, and 620 hectares of buildings, and displaced a further 317,200 residents (Yan et al., 2016). In the eastern section of the reservoir a canal was then constructed to draw water from the Reservoir to Beijing and Tianjin by gravity flow.

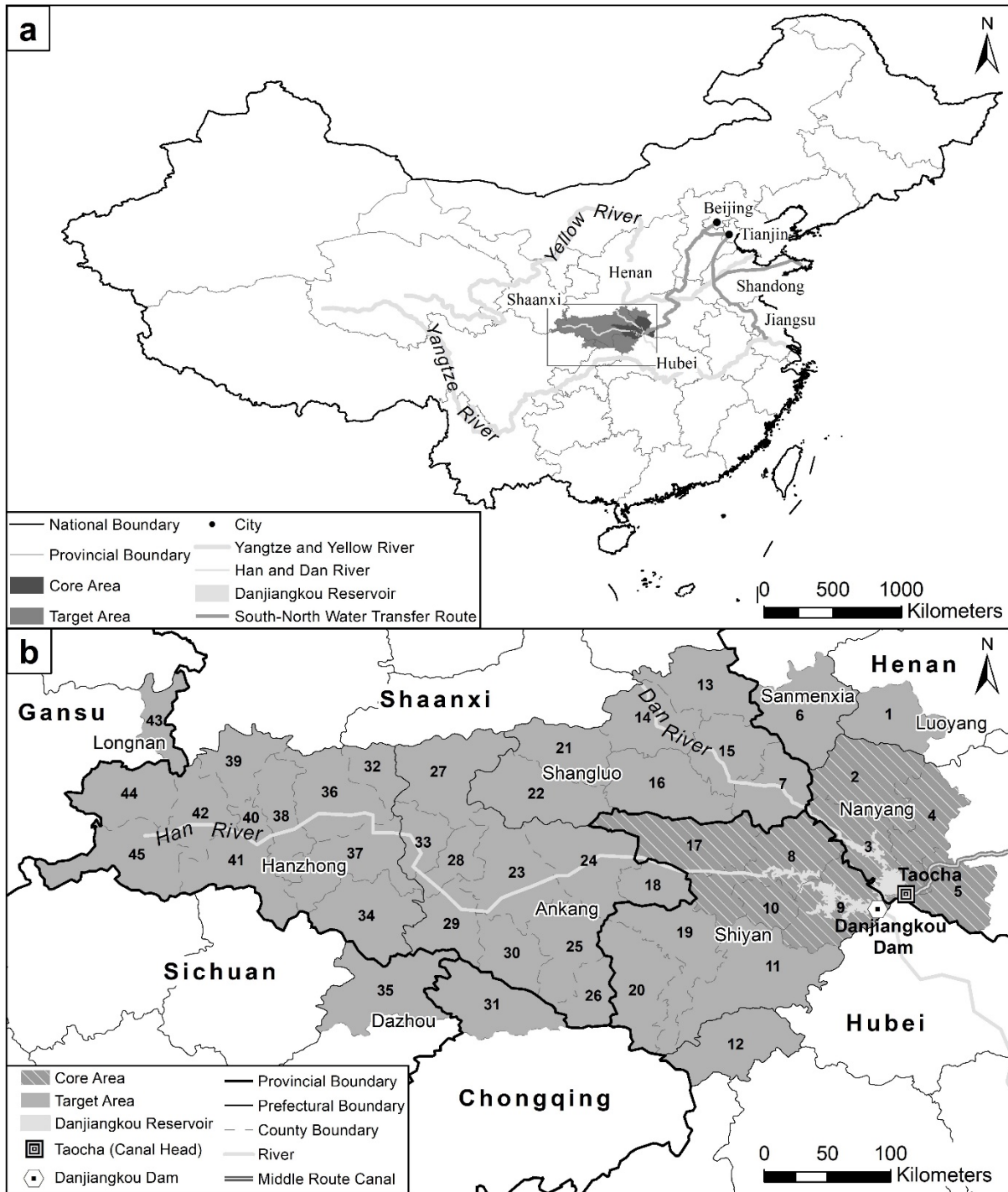
Construction of the SNWTP’s Middle Route has been managed by the SNWTP bureaucracy that, until March 2018, sat under the State Council (now the Ministry of Water Resources), as well as other lines agencies at multiple levels (for a detailed analysis see Wang and Li, 2019). The new processes described below, however, are being driven by the National Development and Reform Commission (NDRC), the Ministry of Water Resources, new inter-provincial partnerships, and state media. As such, the hydrosocial imaginary we describe, while being led by the central government, encompasses state and semi-state actors at multiple scales.

This new hydropolitical imaginary crosses administrative and hydrological boundaries. It is not simply a representation of the area’s hydrology: counties downstream of the dam have not been included, and the area is not envisaged as being part of the larger Yangtze catchment (also see Crow-Miller and Webber, 2017). If we take the NDRC’s 2015 “The 13<sup>th</sup> Five-Year Plan for Water Pollution Prevention and Soil and Water Conservation in Danjiangkou Reservoir Area and Upper Reaches” (丹江口库区及上游水污染防治和水土保持 ‘十三五’ 规划) as a starting point for understanding this hydrosocial territory, then it is

administratively comprised of nationally designated poverty counties<sup>1</sup>, counties, districts, cities, and a forestry area in the provinces of Hubei, Henan, and neighbouring Shaanxi (see Figure 1b). The counties, districts, and cities immediately surrounding the reservoir are designated as “core” areas, while more distant counties, lying along the Han and Dan rivers are “target” areas. In order to make sense of this new imaginary of river systems and administrative entities, we must briefly outline the purpose of the SNWTP Middle Route.

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<sup>1</sup> China has 592 nationally designated poverty counties, primarily in inland regions, where average per capita income is below a certain threshold. They receive preferential funding through China’s fiscal system.



**Figure 1 a) Location of study site, b) The Danjiangkou Reservoir and Upper Reaches Area as delineated by the NDRC's 2015 Plan**

Notes: List of counties and districts (nationally designated poverty counties are marked with an asterisk): Luanchuan\* (1), Xixia (2), Xichuan\* (3), Neixiang (4), Dengzhou (5), Lushi\* (6), Shangnan\* (7), Yun\* (8), Danjiangkou\* (9), Shiyan (10), Fang\* (11), Shennongjia Forestry Area (12), Luonan\* (13), Shangzhou\* (14), Danfeng\* (15), Shanyang\* (16), Yunxi\* (17), Baihe\* (18), Zhushan\* (19), Zhuxi\* (20), Zhashui\* (21), Zhenan\* (22), Ankang (23), Xunyang\* (24), Pingli (25), Zhenping\* (26), Ningshan\* (27), Hanyin\* (28), Ziyang\* (29), Langao\* (30), Chengkou\* (31), Foping\* (32), Shiquan\* (33), Zhenba\* (34), Wanyuan\* (35), Yang\* (36), Xixiang (37), Chenggu (38), Liuba\* (39), Hanzhong (40), Nanzheng (41), Mian\* (42), Liangdang\* (43), Lüeyang\* (44), Ningqiang\* (45).

Previous analyses of the SNWTP have identified the political significance of the Middle Route in supplying the capital Beijing and, to a lesser extent, Tianjin with a more secure supply of water (Moore, 2014; Crow-Miller, 2015; Webber et al., 2017). There are plans to eventually extend the Eastern Route to supply Tianjin, but at present, it only supplies cities in the provinces of Jiangsu, Shandong, and Anhui. The Middle Route was designed to supply 1.2 billion m<sup>3</sup> of water annually to Beijing, 1 billion m<sup>3</sup> to Tianjin, 3.4 billion m<sup>3</sup> to Hebei Province and 3.7 billion m<sup>3</sup> to Henan Province. As of 2016, Beijing's *total* water supply was comprised of 27.4% diverted water, 25.77% recycled water, and 45.1% groundwater and very small amounts of local surface water, but about 70% of its *domestic* water is supplied by diverted water (Beijing Water Authority, various years). Smaller cities in the provinces of Henan and Hebei also draw water from a series of water gates along the canal.

The canal must provide large quantities of water, but it must also supply relatively *clean* water, a challenge in a region where run-off from growing cities, heavy industry, and farms results in heavily polluted surface water. There is standardised water treatment in destination cities like Beijing, but a strong emphasis is being placed on pollution control at the transfer source (i.e. Danjiangkou) to prevent heavy metal contamination and to promote broader environmental remediation in the Reservoir area. What happens at Danjiangkou is therefore critical to the successful operation of the Middle Route, and indeed to the broader legitimacy of this mega-project and China's evolving water governance practices. If water pollution cannot be effectively governed in the catchment, the river of water flowing north to Beijing and Tianjin will be decidedly unclean, or at least no better quality than other local surface waters despite being much more expensive, and the governmental program we describe will have failed.

The pollution challenges at Danjiangkou are significant. Of the tributaries that flow into the Reservoir, water quality varies from the worst (Grade V – unfit for any use), to the best (Grade I) (Chen et al., 2015). One study identified the main sources of ammonium nitrogen, arsenic and other pollutants in high pollution sites as industrial discharge (Chen et al., 2015). Another study suggests that there is much higher risk of pollution from industrial production in cities near the Reservoir (particularly plastics and manufacturing) than from agricultural run-off (Li et al., 2016). The NDRC identifies the worst water quality – Grade V – in the area surrounding Shiyang City, a major car manufacturing base (National Development and Reform Commission, 2017). Nonetheless, both farmers and enterprises are being targeted for pollution control. Nitrogen run-off from farms is of particular concern due to high levels of chemical fertiliser use. The NDRC identifies the highest levels of nitrogen within the boundaries of Shaanxi's Hanzhong and Shangluo prefectures (both located in the upper reaches of the Han River), and Henan's Nanyang Prefecture.

Sources of pollution are therefore dispersed (both upstream and in smaller tributaries, and immediately surrounding the Reservoir), cross provincial and prefectural boundaries, and vary in severity. In what follows we draw on observations at sites surrounding the Reservoir (including water treatment plants, farms, and reforestation trials), a small number of semi-structured interviews conducted in 2018 with local officials from county and township government agencies responsible for pollution control activities, and extensive analysis of

secondary data (Chinese-language government documents and yearbooks, and media reports) to identify the technologies being mobilised to control this pollution in order to send a river of clean water north.

### **Producing a hydrosocial territory at Danjiangkou**

In producing a hydrosocial territory at Danjiangkou, water infrastructure plays a critical role. For the purposes of the SNWTP, the dam was heightened to massively increase the capacity of the Reservoir from 17.45 billion m<sup>3</sup> to 29.05 billion m<sup>3</sup> and a canal was built between Danjiangkou and Beijing/Tianjin. From the main canal there are canals and reservoirs supplying minor cities and counties along the route, there is additional infrastructure in Beijing, and a number of larger complementary diversions. One of these is a 67km canal that replenishes the lower reaches of the Han River by drawing water from the Yangtze River at Jingzhou. But the network of interventions being brought together to ensure a clean supply of water for Beijing and Tianjin is not simply a concrete one that acts on flows of water. It is administrative and discursive, and includes planning instruments, mechanisms to move money, and policies and programs designed to move people, farms, and factories.

#### *Centralised planning for pollution control*

There have been multiple iterations of central government-led plans for the Middle Route's source area, focused on both socio-economic planning and on environmental management. Some plans are aligned with China's five-year planning cycle (12<sup>th</sup> Five-Year Plan 2011-2015, 13<sup>th</sup> Five-Year Plan 2016-2020). Table 1 lists these plans, their territorial reach, and their objectives. While they are published by either the NDRC or the Ministry of Water Resources and endorsed by the State Council, consortia of research institutes and companies actually prepare the plans: the latest plan was produced by the (former) Ministry of Environmental Protection's Environmental Planning Institute, alongside China International Engineering Consulting Company and the Yangtze River Water Conservancy Commission. As such, these plans are predominantly, but not entirely, a tool of the central state.

As Table 1 shows, the Danjiangkou Reservoir and upper reaches have been the target of central-level planning interventions for over a decade: the first planning study and subsequent report was published in 2005. The most recent iteration is the '13<sup>th</sup> Five-Year Plan for Water Pollution Prevention and Soil and Water Conservation in Danjiangkou Reservoir Area and Upper Reaches. The purpose of the Plan is to protect and continue to improve water quality in the Reservoir and upper reaches, to ensure the smooth operation of the SNWTP (to send clean water north) and to promote regional sustainable economic and social development (National Development and Reform Commission, 2017). The 2015 Plan actually extends the area in previous plans to include parts of Wanyuan Prefecture in Sichuan, Chengkou County in Chongqing, and Liangdang County in Gansu, all of which contain tributaries that flow into the upper Han River. Apart from these new additions, the reach of the plans (their hydrosocial imaginary) has been relatively stable, encompassing the Danjiangkou Reservoir and the Han and Dan rivers and their main tributaries, and excluding areas downstream of the Reservoir and along the Middle Route canal.

**Table 1: Central government planning documents for Danjiangkou Reservoir and Upper Reaches**

Document name	Published	Period	Ministry	Objectives	Scope
“The 13 <sup>th</sup> Five-Year Plan for Water Pollution Prevention and Soil Conservation in Danjiangkou Reservoir Area and Upper Reaches” 丹江口库区及上游水污染防治和水土保持“十三五”规划	2015	2016-2020	NDRC	-Defines water quality (ammonium nitrate, COD), conservation, and risk control targets -Reservoir to reach Grade II by 2020 -Forestry coverage to increase 5-10% -Delineates 3 zones -Delineates 43 control units (including 11 priority units)	95,200km <sup>2</sup>  14 prefectural-level cities, 49 counties, county-level cities, districts or forestry areas in Shaanxi, Hubei, Henan, Gansu, Sichuan, Chongqing
“The 12 <sup>th</sup> Five-Year Plan for Water Pollution Prevention & Soil Conservation in Danjiangkou Reservoir and Upper Reaches” 丹江口库区水污染防治和水土保持“十二五”规划	2011	2011-2015	NDRC	-Water quality at Taocha water intake to reach Grade II -Water quality targets (nitrogen) for main tributaries, and Reservoir -Delineates 49 control units	8 prefectural-level cities, 43 counties, county-level cities, districts or forestry areas in Shaanxi, Hubei and Henan
Regional Economic and Social Development Plan in Danjiangkou Reservoir & Upper Reaches 丹江口库区及上游地区经济社会发展规划	2012	2012-2020	NDRC	-Defines water source protection area, ecological agriculture area, and cluster development zone -Sets up counterpart funding arrangements	43 counties, forestry areas, county-level cities, districts in Shaanxi, Hubei, and Henan  9 “core areas” surrounding the reservoir
Water Pollution Prevention and Soil Conservation Plan in Danjiangkou Reservoir and Upper Reaches 丹江口库区及上游水污染防治和水土保持规划	2005		Ministry of Water Resources	-Defines water quality (ammonium nitrate, COD) and soil and water protection targets -Delineates 3 zones -Delineates 18 control units	88,100 km <sup>2</sup>  40 counties, forestry areas, county-level cities, districts in Shaanxi, Hubei, Henan

Sources: Compilation Committee (2005); NDRC (2012); Shaanxi Daily (2012), NDRC (2017)

These documents are an attempt to reshape the Danjiangkou region through zoning, curtailment of certain activities, and allocation of strict water quality targets. To achieve the objectives set out in the 2016-2020 Plan, the region is divided into three zones: a water source security area immediately surrounding the Reservoir and the Dan River; a water quality influence area in the middle reaches of the Han River; and a water source ecological conservation area in the upper reaches of the Han River. The Plan then further divides these areas into “control units” (water quality monitoring sections), with specific water quality targets. For instance, the Dan River Pre-Reservoir Entry Control Unit in Henan Province, where the Dan River flows into the Danjiangkou Reservoir, has a water quality target of Grade II. Each control unit must take measures to prevent industrial, urban, and rural pollution such as building sewage treatment plants, developing rural garbage collection systems, implementing discharge standards, implementing livestock and poultry exclusion zones, prohibiting fertiliser use within one kilometre of river banks, and promoting the use of organic fertilisers (National Development and Reform Commission, 2017). The cost of these activities is estimated to be 19.6 billion RMB, with the highest levels of investment required in Shaanxi Province (10.4 billion RMB). We turn to the question of who is paying below.

For 11 “priority” control units, there are specific targets for minimum annual reductions in ammonium nitrate and chemical oxygen demand. No other pollutants are included in the Plan (though China’s grading system is based on 24 indicators). These targets for water quality form part of local officials’ performance evaluation criteria, while provincial governments sign a “target responsibility contract” for water source protection with the State Council’s SNWTP Office. Performance evaluation is the central government’s primary means of shaping the behaviour of local officials. Importantly, targets are included as veto targets, meaning any official who fails to meet them will not be promoted, regardless of their other work. Thus, the central government’s political levers are being mobilised alongside these planning tools to drive their implementation. These targets reflect a more general trend in Chinese water management towards strict regulation of water use and water quality through nationwide measures such as the Three Red Lines<sup>2</sup> and the River Chiefs system<sup>3</sup>.

The far-reaching impacts of zoning are more clearly demonstrated in the 2012 Regional Socio-Economic Development Plan in Danjiangkou Reservoir and Upper Reaches. The Plan’s purpose is again to ensure the smooth operation of the SNWTP, to speed up economic development in the region, to improve people’s livelihoods and to make an overall plan for rural and urban development (National Development and Reform Commission, 2012). The region is divided into three zones: a water source protection area, ecological agriculture area and cluster development area (the water quality zones in the 2015 Plan presumably overlay these socio-economic zones). Within the water protection area polluting industries are to be

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<sup>2</sup> The Three Red Lines are targets for overall water use, water use efficiency, and minimum standards for water quality (chemical oxygen demand, ammonium nitrate) (Nickum et al., 2017). This is a relatively new approach to water management in China, addressing some of the critiques of an overemphasis on supply-side, engineered solutions. The Han River is one of several pilots under the 2012 Pilot Program for Accelerating the Strict Water Resource Management System in the Han River Basin (Ministry of Water Resources, 2017).

<sup>3</sup> The “River Chiefs” system (河长制 *hezhang zhi*) assigns responsibility for water quality in individual rivers to top government and Party officials in the local area (Chien and Hong, 2018).

closed, people to be resettled, mining strictly controlled, and wetlands and forests protected. In the ecological agriculture area pesticide and fertiliser use are to be reduced, clean energy facilities promoted in villages, and waste collection and sewage treatment systems built in villages. In the cluster development area older industries are to be merged or relocated, cleaner industries promoted, and industrial emissions controlled.

The Plan defines the economic “direction” for each prefecture. For instance, Shiyan City is to build up its automobile manufacturing industry and tourism industry, and Shangluo Prefecture is to produce high-quality green agricultural products. Specific counties are listed for specialised agriculture (organic tea, citrus, mushrooms, walnuts etc) and tourism development. A number of areas are identified for ecological resettlement projects (see below). The 2012 Plan is therefore an attempt to comprehensively reorganise the economic activities of the region to deliver a new service: clean water for Beijing and Tianjin. Similar to Carse’s (2012) analysis of the Panama Canal watershed, certain land use practices are being defined as ecologically irresponsible, and the landscape is being reorganised to prioritise the delivery of drinking water. These plans are therefore large-scale central-government interventions into regional and local socio-economic processes with the intent of securing a clean water supply.

### *Fiscal transfers*

Given the extensive agricultural and industrial restructuring and pollution management envisaged through these plans, another key tool in the making of this hydrosocial territory is flows of government capital. These flows are forging new links and responsibilities: fiscal transfers are now occurring through what is known as the counterpart cooperation program (对口协作 *duikou xiezuo*) between water source and water receiving areas. Tianjin is partnered with Shaanxi Province, and Beijing with provinces of Henan and Hubei. The goals of the program, which began in 2014, are broad: “helping the poor, protecting water quality, strengthening people’s livelihoods, promoting transformation” (State Council SNWT Construction Committee Office, 2017a).

These fiscal transfers recognise the burden placed on local governments in the Danjiangkou region to manage water pollution, many of which are nationally designated poverty counties (see Figure 1b). State media reports that in Shaanxi’s Hanzhong Prefecture, where eight of eleven counties are poor counties, GDP growth is 2% lower than in non-water sources areas, and that its GDP actually decreased by 10 billion RMB during the 12<sup>th</sup> Five-Year Plan period (Shaanxi Daily, 2017). Hubei’s Danjiangkou City is said to have had its annual fiscal revenue reduced by 509-639 million RMB because of SNWTP-imposed constraints on development (Danjiangkou City People's Government, 2018). Rather than the central government simply transferring funds to these areas through China’s existing fiscal transfer system, Beijing and Tianjin, as beneficiaries of the Middle Route, are being enrolled in new fiscal networks to effectively compensate water source areas for the SNWTP’s impacts.

Beijing’s initial plan in 2014 outlines expenditure of 500 million RMB through 152 projects, including direct aid and cooperative projects (SNWTP Construction Yearbook Compilation

Committee, 2015). Tianjin's 2014 plan includes expenditure of 210 million RMB in 70 projects in Shaanxi. Individual districts are partnered with individual counties and cities: for instance, Beijing's Chaoyang District is partnered with Henan's Xichuan County. Projects include promoting environmental protection and green agriculture, but also extend to tourism development, scientific cooperation, industrial restructuring, village beautification, and construction of schools and hospitals. A further element of cooperation is temporary assignments for officials. For instance, twelve Beijing Municipal Government cadres are sent to work in county governments in Henan Province each year, and 20 Henan cadres are sent to Beijing (Sohu, 2016).

Transfers have significantly ramped up for the 13<sup>th</sup> Five-Year Plan period (2016-2020). Beijing will spend 2.5 billion RMB and Tianjin 1.5 billion RMB on projects that include pollution control, wetland construction, poverty alleviation, and agricultural and industrial development. Tianjin's partnership arrangements have a precise goal: where the Han and Dan Rivers enter the Reservoir water quality should be higher than Grade II (State Council SNWT Construction Committee Office, 2017b). Considering the intended annual supply to Beijing and Tianjin, on top of the metered price of SNWTP water, they are respectively compensating source regions 2.08 RMB and 1.5RMB per cubic metre of water delivered.

Achieving the imaginary of Danjiangkou and its upper reaches as a source of clean water rests on significant transfers of money and expertise from wealthy receiving areas to less-developed source areas. These transfers are enabling the Danjiangkou Reservoir and its upper reaches to strengthen its "service" to the SNWTP by safeguarding its "duty" to send a river of clean water north (Hubei Provincial Development and Reform Commission, 2016). It is specifically Beijing and Tianjin as wealthy centrally-governed municipalities that are playing this role: the provinces of Henan and Hebei also benefit from diverted water, but have not entered into similar partnerships. These fiscal arrangements echo arrangements during and after the Three Gorges Dam project that saw coastal provinces invest heavily in inland counties affected by the dam (Wilmsen, 2016). They are an attempt to ameliorate the burden of national mega-projects on poorer areas and effectively redistribute resources to inland regions to drive economic development; but in this case, non-polluting development.

### *Displacement*

Another key tool in producing a hydrosocial territory at Danjiangkou is the displacement of certain kinds of people, farms, and industries. Due to the zoning and strict water quality targets in the plans outlined above, there are certain activities that are no longer deemed acceptable in the Danjiangkou Reservoir and its upstream areas. This has resulted in significant displacement of people through resettlement projects, and also the closure of farms and factories to promote economic restructuring.

It is relatively well known that over 300,000 people from six counties in the provinces of Hubei and Henan were resettled as a result of the raising of the Danjiangkou Dam. But the intersecting goals of pollution management, poverty alleviation, and economic restructuring are evident in much more extensive resettlements in the Han River's upper reaches. In

Shaanxi's Ankang, Hanzhong, and Shangluo prefectures, by 2014, 880,000 people had been resettled (SNWTP Construction Yearbook Compilation Committee, 2015). Resettlement will continue until 2020 under the Southern Shaanxi Relocation and Settlement Project (*shaannan yimin banqian anzhi gongcheng* 陕南移民搬迁安置工程). While these resettlements are primarily for poverty alleviation, as part of China's bid to end absolute poverty by 2020, they are also described as part of the "glorious mission" and "political responsibility" of sending a river of clean water north (Ministry of Environmental Protection, 2016). Whether these resettlements have resulted in improved water quality in the Han River and its tributaries is yet to be established. But given that there is concern about high levels of nitrogen run-off in these upstream areas (see National Development and Reform Commission, 2017), and that these resettlement projects have resulted in reduced access to farmland (Li et al., 2015), the mechanism through which they might achieve this is moving people out of farming and into urban settlements.

There is limited publicly-available data on the extent of agricultural and industrial restructuring in the region, but the intent of the multiple plans and the various projects funded under the counterpart cooperation program is to control flows of pollution and promote a "greener" economic structure. In Henan's Xichuan County this has meant that 350 companies have been shut down or transferred elsewhere, and 19,000 workers laid off. The loss in fiscal revenue has reportedly resulted in "huge financial pressure" on the county government (Xinhua, 2017). Within Henan Province, more than 1000 polluting enterprises are said to have been closed (Xinhua, 2015), including paper, chemical, and pharmaceutical manufacturers, many of which were former pillar industries. We noted several shuttered cement factories along the edge of the Reservoir. In Hubei's Shiyan Prefecture, hundreds of turmeric processing plants have been shut down due to pollution concerns, and applications to establish new enterprises are being rejected on the basis of their pollution intensity (Gov.cn, 2014). Shaanxi Province is closing down its cement, steel and nonferrous metal production in prefectures along the Han River, while trying to develop its green tourism industry, green agricultural products, and expand its solar generation capacity (SNWTP Construction Yearbook Compilation Committee, 2015).

These displacements are occurring largely within the boundaries of the Danjiangkou hydrosocial territory. Shaanxi's resettlement projects are moving people to nearby towns, not to other parts of the province or beyond. Attempts to restructure local production seems aimed more at changing the make-up of industry and agriculture than sending them elsewhere. However, it is possible that more polluting agricultural and industrial practices will be absorbed by counties or cities that lie outside the boundaries of the water source area.

### *Discursive imaginings*

During the construction of the SNWTP a discourse of "eating bitterness" (Crow-Miller and Webber, 2017) was used as a way of muting the obvious uneven burdens of the project. Such a discourse of sacrifice was reminiscent of earlier socialist politics that linked work and patriotism and emphasised the good of the nation (Hoffman, 2010). Those resettled by the Danjiangkou Dam heightening were described as dedicating themselves to their country (报

国 *baoguo*) through their resettlement “spirit” (China Network News, 2016). Now, with the focus firmly on pollution control, there has been a notable shift in discourse to recognising the *responsibility* of protecting water quality while simultaneously emphasising the *benefits* that cooperation between source and receiving areas can bring.

Xichuan County is considered to be the most important water quality “guardian” (护卫者 *huwei zhe*) of the Danjiangkou region as it immediately surrounds the Taocha canal head, the Middle Route’s “tap”. Having eliminated its “backward” industries, the county is said to be experiencing the “sweet taste” of green development. Villages in this county are said to have a heavy responsibility for protecting water quality, hence green transformation is the choice they “had to make”: “faith in green development cannot be swayed, firmly protect a canal of fresh water” (Xinhua, 2017). As well as industrial restructuring, transformations in agriculture are envisaged by leading local farmers away from their current practices into efficient, “ecological” farming (see Figure 2). The manager of a new pomegranate agribusiness we visited in Xichuan claimed that no fertilisers were used, and the farm would soon gain organic certification. Officials from Beijing were helping to broker supply contracts for the fruit as part of Xichuan-Chaoyang cooperation. The county governor describes the SNWTP as catalysing a green development path for water source areas that balances the environment and the economy (Xinhua, 2015). In this vein, Xichuan is now considered to be a national ecological civilisation demonstration zone (State Council SNWT Construction Committee Office, 2017c).



Figure 2: (a) A pomegranate agribusiness in Henan’s Xichuan County. The sign includes the phrase “develop the county’s economy to contribute to continuously sending a reservoir of clear water north” (b) A sign at the Taocha canal head “South-North Water Transfer, benefit the country benefit the people” (First author, 2018)

Xichuan County is partnered with Beijing through the counterpart cooperation program, with significant flows of money and expertise each year. These two places are described as being tied by water: while Beijing receives “sweet” water, “Beijing’s politics, economics, culture, livelihood and other support are all bringing benefit to Xichuan” (China Network News,

2016). Beijing's residents are described as being grateful – “drink the water and think of its source” (饮水思源 *yinshui siyuan*) – and to be united in a spirit of cooperation (China Network News, 2016). This partnership discourse naturalises a link between two previously distant, and economically polarised places.

These new tropes, repeated in central and local media, help to facilitate an imaginary that binds a motley collection of counties and cities to each other, and to Beijing and Tianjin. In that they emphasise green development and industrial restructuring in source areas, they also situate the specific service being provided by the region in a much larger project of forging China's ecological civilisation - a concept that is being mobilised by the Chinese state as exemplary of its environmental and economic stewardship, and its aim of decoupling economic growth from environmental degradation (Pow, 2017). Indeed, the SNWTP as a whole is described as playing an important role in building an ecological civilisation and protecting ecological security (China Daily, 2017). Thus, there is discursive work being done to shift the narrative from sacrifice to opportunity and partnership, and in doing so, to link the Danjiangkou hydrosocial territory to a much larger national project.

## Discussion

A new grouping of counties, prefectures, and provinces in central China is now providing the service of clean drinking water for mega-cities in the north. The Danjiangkou Reservoir and upstream areas can be understood as a new hydrosocial territory, produced through a governmental program that is attempting to reconfigure local economies, land use, industry, and settlements. Unlike other studies of hydrosocial territories, we find little evidence of the incorporation of local territorialities or integration of local practices and discourses (Boelens et al., 2016: , 7). We find, rather, that a wholesale reorganisation is taking place to discipline local territorialities, driven primarily by powerful agencies of the central government, but enabled by a collection of actors at different scales, including local and state media, county governments, and Beijing and Tianjin's municipal governments. In what follows we consider what this tells us about the Chinese state's territorial practices and briefly outline further lines of enquiry.

Carse (2012) describes the reorganisation of Panamanian landscapes and populations to optimise water delivery through the accretion of knowledge, technologies, and institutions around an existing hydrological basin. In contrast, the Danjiangkou Reservoir and upper reaches hydrosocial territory draws a line through a hydrological basin to separate upstream areas from downstream areas, and separate two major tributaries from the Yangtze. Similarly, its boundaries act to carve out a new administrative territory that crosses provincial, prefectural and county borders, trumping any local interests with national-level priorities. Places within the boundaries of this territory are now spatially bound to water-receiving areas in their responsibility to control pollution. But there is a gradient. The inner core appears to be more strongly controlled than outer zones, echoing earlier zoning technologies in western China's grasslands (see Yeh 2005). Places outside the boundaries have no such responsibility and are entirely removed from the narrative of green transformation and partnership, resulting in rescaling *within* the region.

To realise this territorial imaginary the central government is mobilising a number of interlocking tools: centralised planning and the integration of water quality targets into local officials' performance evaluation, fiscal transfers, displacement, and discursive imaginings. These tools reflect China's particular ways of doing things and are made possible by the power of state media, a hierarchical political system, the five-year planning cycle, and state and village collective ownership of land. That is not to say that these tools are unique to the Chinese state. Duarte-Abadía and Boelens (2016) outline how zoning technologies have been used to create a "water factory" in the Colombian highland wetlands, while Hidalgo-Bastidas *et al* (2018) explore how in Ecuador socialist-inflected promises of development were strategically used to placate local populations impacted by the Daule-Peripa mega-hydraulic scheme. What we wish to emphasise, rather, is that while in China there is an obvious shift from simply bolstering water supply to strictly controlling pollution, there is little evidence of market environmentalism as described by Bakker (2014). Privatisation, commercialisation, marketisation, and liberalisation of governance may be occurring to a limited degree in Chinese water management more broadly (see Sheng & Webber 2019; Jiang *et al* 2020), but these are not the primary tools being used to send a river of clean water north from Danjiangkou. Further, we argue that this new hydrosocial territory is not being produced through a *reprogramming*: through critical reflection on existing governing practices that problematise socialist planning and seek more efficient forms of governing (Hoffman, 2010; Collier, 2011). If these interventions can be said to have shared problematisations or styles of thinking (Rose *et al.*, 2006), they seem more about socialism with Chinese characteristics than anything else.

Under this overarching rationality, though, we should not assume that power works in the same way across space, and it is here that hydrosocial territories as a concept seems under-theorised. Analyses of hydrosocial territories need to account not just for how power can shape where water flows (Marks 2019), but for the multitude of effects on local communities of the many different tools mobilised through state hydrological projects.

Many of the territorial practices at Danjiangkou are disciplinary. Zoning and state-driven displacement do not rely on opening up and releasing space, but on circumscription and enclosure (Elden, 2007). However, while they close down possibilities for certain kinds of people, farms, and factories, this closure is being softened by an alluring discourse of opportunity amidst a broader ecological civilisation project. Fiscal transfers and the associated discourse of partnership work by drawing in water-receiving areas, stretching ties of responsibility across space (Allen, 2016). The allocation of water quality targets within local officials' performance management acts to reinforce the presence of the Party-state's coercive personnel system. The production of a hydrosocial territory at Danjiangkou therefore attempts to reconfigure territory through both proximity and reach, and rests not simply on controls over water, but interventions into other activities that employ or affect water. Scholarship on hydrosocial territories needs to more precisely define these geographies of power and their effects.

At Danjiangkou, we see two key areas for future exploration. The first is the governing practices of local officials in the midst of tightening water quality controls. How do they

reconcile strict water quality targets and zoning requirements with their continued need to grow their economies amidst entrenched local interests? Beyond Danjiangkou, how do officials make sense of a nascent water market in a system otherwise defined by pervasive administrative intervention? Collier (2009) and Li (2016) argue that multiple rationalities are brought into a relationship – are assembled – but how this works in practice in China is yet to be seen, and could enrich our understanding of Chinese governmentalities. The second is different forms of contestation on the ground. This article has mapped the attempt at producing a new hydrosocial territory at Danjiangkou, but more research is needed into how this plays out on farms, in villages, in urban communities, in local businesses, and in the offices of technocrats and local officials. Rather than juxtapose the interventions of strong or monolithic with weak and fragmented states (Marks 2019: 75), we should assume all hydropolitical projects to be incomplete, contested, and constantly negotiated through everyday practices (Hommes & Boelens 2017).

## **Conclusion**

A new hydrosocial territory encompassing the Danjiangkou Reservoir and its upper reaches is being produced, with the aim of sending a river of clean water north. Our analysis shows that this imaginary already has material consequences, produced by flows of water and new water infrastructure, but equally by fiscal, administrative, and discursive tools that are rearranging people, farms, and factories, and shaping the behaviour of local officials. While the Reservoir and its upper reaches are being enrolled in a central government-led project to provide the service of clean water, neighbouring counties remain on the periphery, as do downstream areas of the Dan River, which are nonetheless affected by upstream withdrawals.

The making of this hydrosocial territory and the rationalities it reflects can be understood as part of China's broader territorialising project of optimising its resources and environment. This project is continually in the making: construction of new water supply projects and those promoting greater connectivity of existing water infrastructure has recently accelerated (Jiang *et al* 2020). Our analysis of how water, pollutants, people, and money are being moved around at Danjiangkou for an environmental service therefore highlights one of potentially many new spatialities of water governance. For hydropolitical theory, this analysis drives forward our understanding of how hydrosocial territories are made in non-liberal, non-Western contexts with different overarching rationalities. For political geography and critical approaches to power more generally, our analysis outlines some of the workings of Chinese governmentalities and the territorial practices of the Chinese state. Cartier (2013) argues that we should pay far more attention to territorial change *inside* China, for what it can tell us about the uneven geographies of state power. We reiterate this call, adding that the governance of water is a key site for furthering our understanding of these geographies.

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