

Portland State University

**PDXScholar**

---

Geography Faculty Publications and  
Presentations

Geography

---

2015

# Discourses of Deflection: The Politics of Framing China's South North Water Transfer Project

Britt Crow-Miller

*Portland State University, bcrow@pdx.edu*

Follow this and additional works at: [https://pdxscholar.library.pdx.edu/geog\\_fac](https://pdxscholar.library.pdx.edu/geog_fac)



Part of the [Geography Commons](#), and the [Water Resource Management Commons](#)

**Let us know how access to this document benefits you.**

---

## Citation Details

Crow-Miller, B. (2015). Discourses of deflection: the politics of framing China's south-north water transfer project. *Water Alternatives*, 8(2).

This Article is brought to you for free and open access. It has been accepted for inclusion in Geography Faculty Publications and Presentations by an authorized administrator of PDXScholar. Please contact us if we can make this document more accessible: [pdxscholar@pdx.edu](mailto:pdxscholar@pdx.edu).

Crow-Miller, B. 2015. Discourses of deflection: The politics of framing China's south-north water transfer project. *Water Alternatives* 8(2): 173-192



---

## Discourses of Deflection: The Politics of Framing China's South-North Water Transfer Project

**Britt Crow-Miller**

Department of Geography, Portland State University, Portland, Oregon; [bcrow@pdx.edu](mailto:bcrow@pdx.edu)

---

**ABSTRACT:** Despite significant financial, ecological and social trade-offs, China has moved forward with constructing and operationalising the world's largest interbasin water transfer project to date, the South-North Water Transfer Project (SNWTP). While it is fundamentally linked to broader political-economic goals within the context of China's post-Mao development agenda, the SNWTP is frequently discussed in apolitical terms. Based on extensive discourse analysis and interviews with government officials across North China, I argue that the Chinese government is using "discourses of deflection" to present the project as politically neutral in order to serve its ultimate goal of maintaining the high economic growth rates that underpin its continued legitimacy. These discourses, which replace concerns with human-exacerbated water stress with naturalised narratives about water scarcity and the ecological benefits of water transfer, serve to deflect attention away from anthropogenic sources of water stress in the North China Plain and serve as apolitical justifications for pursuing a short-term supply-side approach rather than the more politically challenging and longer-term course of dealing with the underlying drivers of water stress in the region.

**KEYWORDS:** Discourse, interbasin water transfer, water politics, China

---

### INTRODUCTION

Discourses – or the ways problems are talked about, written about, and framed – are central to how we as humans "make and break our world, our institutions, and our relationships through how we deal with social goods" (Gee, 1999: 9-10). The discourses or storylines used to frame the discussion of a given issue can also be an especially powerful political tool, not only illuminating who gets helped and who gets harmed (Gee, 1999), but actually working to shape material consequences on the ground. Discourse, in other words, is not just a reflection of power, but a tool by which power may be wielded and reinforced.<sup>1</sup>

When it comes to the management of water resources, discursive tools – such as the social construction of scarcity and the historicisation of particular water narratives – have been used across the world to justify water management schemes (for examples, see Bakker, 1999; Aguilera-Klink et al., 2000; Kaika, 2003; Agnew, 2011). This is especially true for large water infrastructure projects – such as China's recently completed South-North Water Transfer Project (SNWTP)<sup>2</sup> – which are often presented as a solution to the kinds of water shortage situations that tend to give rise to naturalised water scarcity

---

<sup>1</sup> Conversely, power can also be undermined through discourse. See Pritchard, 2012 for a discussion of how a discourse of French non-expertise related to water engineering projects served to alter the power landscape around irrigation projects and technical knowledge in colonial North Africa.

<sup>2</sup> Construction on the Middle Route and Eastern Route of the SNWTP was completed in late 2014 and these branches are expected to be fully operational by late 2015. The Western Route of the project, on which construction has not begun, has been indefinitely delayed.

narratives (see Mehta, 2001 and 2007; Sneddon, 2003). By examining the politics of government-propagated discourses surrounding the SNWTP, the world's largest inter-basin transfer project to date (Liu and Wu, 2012), this article delves into the specific ways in which water is being wielded as a political tool in 21st century China.

Methodologically, this research draws upon a range of mixed qualitative approaches. A discourse and content analysis of key government documents related to the SNWTP between 2002 and 2013 was performed. More than 120 English and Chinese articles published on the project, water resources, and development by local, regional, and national state-run newspapers, between 2003 and 2013 were also collected for content analysis. Additionally, in 2011 I conducted semi-structured interviews with 25 senior government officials selected through snowball sampling from specific government offices and entities identified in advance as being centrally engaged in work on the Middle Route of the SNWTP and/or on water and development in Beijing, Hebei, Henan, and Hubei provinces. In addition to subjects from various water- and urban planning-related departments along the southern and middle reaches of the SNWTP's Middle Route, I also conducted interviews with officials involved in regional water and urban planning in the capital, including several posted at the Beijing Municipal Institute of City Planning and Design and the China Academy of Urban Planning and Design. These interviews were particularly important because, as Oksenberg (2001: 23) notes, "The [government's] vision of modernity is embodied in the urban and regional plans (城市规) produced by the various architectural design institutes and provided to local governments around the country".

While in the field I also engaged in participant observation at a handful of meetings at the SNWTP Middle Route Headquarters in Zhengzhou, Henan. These meetings, while not open to the public, included formal presentations by government officials on the progress, challenges, and projected outcomes of the Middle Route. By observing these meetings I was able to gain insight into the various ways in which government actors are framing the project and the broader discourses into which it fits. Finally, I was able to gain privileged access to several of the Middle Route's key restricted sites, including the Danjiangkou Reservoir, the Yellow River tunnels northwest of Zhengzhou, the Taocha sluice, and several of the new communities to which more than 330,000 migrants have been relocated to accommodate project construction across the North China Plain.

While this methodological approach would not be appropriate for ascertaining 'truths' about, for example, the ecological impacts or governance challenges of the SNWTP, it is well-suited to uncovering the discourses at play in the case of the SNWTP. This is because discourse is often performative (Bakker, 1999). By looking at the stories being told, the ideas, concepts, categories and the official language used by government officials and offices in China to discuss the SNWTP, we may gain insight into the broader political-economic interests by which the massive water control scheme is being shaped and driven. Moreover, by making explicit the government discourses surrounding the SNWTP, we have a chance to expose its politics before they are 'settled' into the built environment in future water management projects, including the yet-to-be-built Western Route of the project.

Through these methods I have identified two primary discourses of deflection – defined as strategic storylines put forth by decision-makers that present a potentially controversial issue or project in such a way that alternative pathways are effectively pushed outside of the bounds of consideration – at play in the SNWTP. The first involves the naturalisation of water scarcity in North China, while the second narrative presents the SNWTP as an environmentally beneficial project. Such discourses, I argue, work to draw attention away from the anthropogenic sources of water stress on the thirsty North China Plain (see Figure 1), finding solutions to which is both politically and logistically challenging and out of line with the government's short-term economic growth goals. The paper proceeds by introducing the region in which the SNWTP is intended to alleviate water stress, followed by an in-depth discussion of each discourse of deflection at play in the SNWTP, and a conclusion, which includes several recommendations for alternative pathways for addressing water stress in North China.

## ASSESSING WATER RESOURCES ON THE NORTH CHINA PLAIN

The North China Plain (NCP), an alluvial plain approximately 400,000 km<sup>2</sup> in area, is characterised by very low per capita water availability. This historically important and naturally semiarid region saw the birth of Chinese civilisation, made possible through the technological control of water. Today, as home to a population of more than 400 million, it is one of the most densely populated areas in the world and serves as a major centre of political and economic power in 21st century China. Additionally, the region is considered a breadbasket of China, relying heavily on irrigation<sup>3</sup> to produce more than 60% of the country's wheat, 45% of its maize, and significant amounts of millet, sorghum, and cotton (Yang et al., 2015: 428). Between rising industrial and urban use rates and significant agricultural demand that cannot be met with surface water alone, the NCP's groundwater resources are experiencing major stress and a range of associated ecological impacts, including salt water intrusion along coastal areas and the drying up of lakes and wetlands.<sup>4</sup> In addition to a dramatic increase in groundwater pumping in recent decades,<sup>5</sup> large cities on the NCP have also taken control of many of the region's rivers, damming or diverting their flows not only at the expense of ecosystem function, but also of rural communities and smaller regional and county level cities (Crow-Miller, 2014).<sup>6</sup>

Despite efforts to draw upon a diversity of water sources across the region, the average annual per capita water availability on the NCP is now less than 500 m<sup>3</sup> – just half of the United Nations' 1000 m<sup>3</sup> standard for 'water shortage' (Berkoff, 2003; Probe International Beijing Group, 2010). In Beijing, the region's most populated city with approximately 20 million inhabitants, per capita availability has dropped below 240 m<sup>3</sup>, making it one of the most water-stressed mega-cities in the world at about one thirtieth the global average (Probe International Beijing Group, 2010).<sup>7</sup> This number also places the city's supply below UNESCO's 300 m<sup>3</sup> per capita standard for the absolute minimum water supply necessary to support a "modern and productive social life" (cited in Wei et al., 2010).

To alleviate the NCP's increasingly severe water situation, in 2002 China's central government launched the SNWTP, the largest water transfer project in human history. Through a series of canals and tunnels and operating primarily on the basis of gravity rather than pumps, the project will transfer roughly 45 km<sup>3</sup> per year from the Yangtze River and its branches in south-central China to the North China Plain once fully operational. The project plan includes three routes: the Western, which has been

---

<sup>3</sup> Because of the NCP's climate — characterised by high summer temperatures, chilly winters, and highly variable annual rainfall averages, making it prone to severe droughts and flooding—a vast majority of agricultural production relies on irrigation. In the early days of the People's Republic of China, groundwater irrigation on the NCP was exceedingly rare, but by the onset of widespread economic reform in the late 1970s it had come to account for 10-15% of total irrigation supply. By the 1990s the share had risen to roughly 40% and more recent estimates put the ratio between 70 and 90% in some parts of the region (Calow et al., 2009: 229; Li et al., 2014).

<sup>4</sup> Recent studies suggest that more than 90% of the lakes once found in Hebei Province, which surrounds Beijing, have been lost to falling water tables (Brown 2006: 52) and an estimated 80% of the NCP's wetlands have been destroyed (Gleick, 2009: 86). Subsidence is also an issue, resulting in higher flood risk and poor drainage in urban areas and cities like Beijing, Tianjin and Cangzhou, which have been documented to be sinking by inches and sometimes feet as the groundwater beneath them continues to be tapped at unsustainable rates (Shalizi, 2008: 162; Springer, 2011).

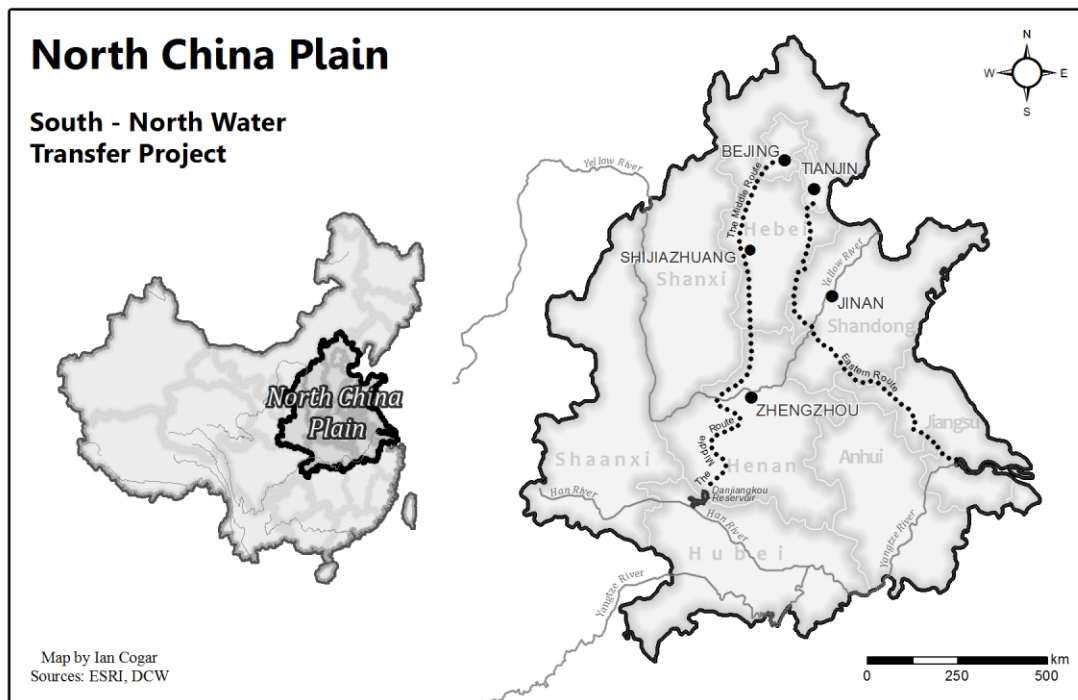
<sup>5</sup> More groundwater wells have been sunk on the NCP over the last quarter century than in anywhere else in the world (Calow et al., 2009: 229). Official estimates suggest that the number of wells sunk across the country as a whole has increased from about 150,000 to more than 4.7 million between 1965 and 2003 (Wang et al., 2007).

<sup>6</sup> For example, in the early 2000s the flow of the Juma River—a tributary of the Hai—was so extensively dammed and diverted in Beijing in order to serve the city's largest industrial water consumer, the Yanshan Petrochemical Plant that downstream users in Hebei have since been forced to turn to groundwater resources (Gleick, 2009: 90), exacerbating the region's unsustainable reliance on pumped water.

<sup>7</sup> Estimates by the Beijing Water Authority place this even lower, at around 100 m<sup>3</sup> per person (Gu, 2011). This is likely part of a larger (constructed) discourse of drought and water scarcity in and around Beijing that helps to justify water diversions from the city's surrounding provinces. See below for further discussion.

indefinitely delayed, and the Eastern and Middle Routes, which were completed in 2014 (see Figure 1). The Middle Route is the most significant of the three in terms of the initial volume of water to be transferred, cost, and social-ecological impacts. As of this year, the Middle Route will begin transporting an annual 12 to 13 km<sup>3</sup> of water (between three and four times Beijing's current annual water consumption) from the Danjiangkou Reservoir on the Han River (a major tributary of the Yangtze River) more than 1200 km north of Beijing.

Figure 1. The SNWTP Middle and Eastern Routes on the North China Plain.



Map courtesy of Ian Cogar, PSU Geography, 2015.

The financial, social and environmental costs of the project are significant. Recently estimated to have cost USD 81 billion for the first two routes (Yeager-Kozacek, 2015), the project has been supported primarily by the central government through debt in the form of bonds and loans, and supported to a lesser extent by provincial and municipal governments along its routes (Webber, 2012). Among the social impacts is the relocation of more than 330,000 people who have been displaced near the Middle Route's Danjiangkou Reservoir alone (International Rivers, 2013). Ecologically, the impacts of the project are expected to be significant and include secondary salinisation in the recipient basins and the crossing of biogeographic barriers between river basins (Meador, 1992: 18), which could lead to the introduction of invasive species, including disease vectors and parasites such as those that cause schistosomiasis (Zhang, 2009). Scientists also expect to see changes in the flow patterns of the Yangtze River and its main tributary, the Hanjiang. The total volume of water diverted from the Yangtze Basin via the routes of the SNWTP will be about 4-5% of the river's annual discharge, but could constitute more than 20% of the river volume during the dry season from December to March (Zhang, 2009: 1243). This dramatic decrease in the volume of the Yangtze River due to the northward diversion is expected to accelerate the intrusion of seawater into the estuaries of the Yangtze Delta and reduce coastal sediment flows, which will either slow or reverse delta formation (Zhang, 2009: 1243). Likewise, on the Hanjiang water flow downstream of the Danjiangkou Reservoir will also be reduced, compromising ecosystem function and exacerbating pre-existing eutrophication issues in the area (Shao

and Wang, 2003). The project's water donor region is already struggling with moderate to severe water stress (Dai et al., 2008; Zhao et al., 2015), as well as with biodiversity loss in the wake of other large water-control projects like the Three Gorges Dam (Wu et al., 2004). Other impacts include shifts in long-established patterns of ecosystem service distribution, including changes in the availability and quality of drinking water, and changes in spatial patterns of economic growth and urbanisation, livelihoods, agricultural productivity and inequality (Chen and Xie, 2010; Wei et al., 2010).

## WATER AND CCP LEGITIMACY

Despite these significant trade-offs, the SNWTP is necessary if the government is to maintain the status quo of rapid urbanisation and closely linked economic growth rates on the North China Plain. The transfer project, while offering a temporary lifeline to the region, fails to address the broader underlying anthropogenic causes of water stress on the NCP, which include rapid urban population growth (China City Statistical Yearbook 1995, 2001, 2008) and severe industrial pollution, which has rendered more than 50% of surface water in the region contaminated beyond usefulness including for industry (Shalizi 2008; MEP, 2013).<sup>8</sup> To address either of these exacerbating factors through policy measures (such as stricter pollution regulation enforcement) would require a sacrifice in economic growth,<sup>9</sup> which is a critical factor in the Chinese Communist Party's continued legitimacy.

As Mukerji argues, "sound resource management and infrastructural development remain backbones of political legitimacy" (Mukerji, 2003: 675). In particular, large engineering projects – including water control schemes like interbasin transfers, dams, and other river-control projects – often serve as physical displays of political legitimacy, establishing the power of one ruling group over another or fortifying an already powerful regime. Consider, for example, the importance of U.S. control of the Panama Canal zone in the 20th century (Carse, 2012) and the linkages between reservoir and damming infrastructure and the project of French 'hydroimperialism' in North Africa in the 19th and 20th centuries (Pritchard, 2012). We see from these examples that the physical world gains political significance through the construction of the built environment as, "a place to demonstrate intelligence, a collective cognitive capacity to dominate that has been a foundational and legitimating principle of power" (Mukerji, 2003: 656).

The Chinese Communist Party's ability to provide adequate water resources to the North China Plain is also linked via economic growth to its prospects for continued legitimacy (see Crow-Miller, 2013). Following a shift away from the traditional ideals and the collective memory of the Communist Revolution as the basis of Party legitimacy in the last two decades (Gilley, 2008), the CCP's legitimacy has come to be based largely, though not exclusively, upon its ability to deliver high rates of continuous economic growth and a sustained rise in the standard of living for a majority of those it governs (Downs and Saunders, 1999: 119; Yu, 2013: 77). Oksenberg (2001: 31) suggests that economic growth is one of three major pragmatic pillars on which the Chinese Communist Party and its leaders justify their claim

---

<sup>8</sup> High agricultural water use rates also play a significant role in shaping overall water demand, although agriculture has been declining as a source of water use, while urban and industrial uses dominate overall demand growth (WRG, 2009; Calow et al. 2009; Liu and Wu, 2012).

<sup>9</sup> Much of the post-1978 population growth in North China's cities has been driven by rural-urban migration. To take Beijing as an example, since reforms the city's population has grown from 8.7 million to over 20 million. During the same period the share of the city's population comprised of migrants grew from just 2.5 percent to more than 36 percent and per capita water availability declined by nearly 75 percent (Beijing Statistical Yearbook, 2011). A similar trend of dwindling per capita water supply alongside (though not necessarily causatively linked to) rapidly growing migrant populations can be found in several other cities across the North China Plain, including Shijiazhuang, Tianjin and Zhengzhou (1995, 2001, 2008 China City Statistical Yearbooks). While stricter control of the number of rural-urban migrants flocking to North China's cities as a means of checking urban population growth would certainly relieve some of the stress on urban water supply, it would also deny these economic hubs the cheap, exploitable labour that has been so essential to sustaining high growth rates (Huang, 2007; Chan, 2009).

to power: "they have protected the sovereignty and territorial integrity of the country, they have maintained China's unity and domestic stability, and they have achieved rapid economic growth and a higher standard of living for the overwhelming majority of their people". As Ma notes, "[t]here is little question that China's top leaders have always understood that sound economic performance leads to enhanced legitimacy" (Ma, 2009: v). The most recent data available from a Pew Research Center survey indicate that 86% of Chinese are satisfied with the direction in which their country is heading and 82% are satisfied with the current state of the Chinese economy (see Ma, 2009). These proportions, Ma argues, offer a strong economy-based endorsement of government leadership and confirm the importance of economic growth to CCP legitimacy.

As Woetzel et al. (2009: 15) confirm, three quarters of the economic performance on which rising national incomes and global economic power rest is generated in cities. However, as Bao and Fang (2009: 274) note, when water resource use approaches or exceeds the threshold of natural supply, water becomes a significant endogenous factor in shaping urbanisation and economic growth. They continue, "If water resources are scarce and water resources constraint force is large, urbanization and socio-economic development will slow down". The impressive economic record of the North China Plain, derived in large part from its urban centres, has in recent years come up against regional water shortage as a growth-constraining factor. Without additional water resources, urbanisation and the economic growth it generates will certainly decline in this critical region (Yong, 2009). While there have not been any major public opinion polls taken to date on how urban Chinese feel about the SNWTP or on their awareness of the ecological or longer-term and spatially uneven economic impacts of the project, it is indeed possible that many may be in favour of it given that it is anticipated to support growth in important urban economic centres in North China.

As attested to by a Chief Planner at the Beijing Institute of City Planning – a key branch of the Beijing City Government that deals with decisions and planning related to development and water management – the links between economic growth and water in the cities of the NCP are both critical and direct.

The question is not just how to deal with water (...), but how to support economic activity. You can't stop economic growth. If you stop it (...) social problems will arise. So if we don't have enough water then we must find a method to get more. (...) Maybe [the SNWTP] is not the best method, but we *must* use it. (...) If we don't solve the water problem, the city will die. It won't have water, it won't have people and it won't generate growth (Li, 2011).

By delivering additional water to the North China Plain the SNWTP enables continued growth in a key urban, economic, and industrial region. As such, it is fundamentally wrapped up in the Chinese government's ability to maintain power and legitimacy.

## DISCOURSES OF DEFLECTION

Discourse as a site of analysis offers a window into the broader interests, including political-economic, behind resource management policies and projects and helps to illuminate how those interests are translated into material consequences. As Bakker (1999: 211) demonstrates in her work on water and the development of the Mekong River Basin, "[d]iscourse analysis of development (...) requires an exploration of the social and cognitive bases of problem definition, and a genealogy of the institutions and practices through which actors are mobilised around specific storylines". Building on this, the way a storyline or discourse is constructed will, in turn, shape how the issue or problem around which it is built is framed, interpreted, discussed and analysed and, ultimately, how that problem is addressed.

In the case of the SNWTP, the project itself is part of a 'sanctioned discourse' of industrial modernity dating to the late 19th century in which nature is seen as something over which humans can exert control (Allan, 2003).<sup>10</sup> Beyond this broader 'hydraulic mission' paradigm (Allan, 2003) there are two primary storylines being propagated in government documents, by government officials across North China and in government-run media outlets, which serve as alternative stories about the drivers of water stress and justifications for the SNWTP. Similar to 'nirvana concepts' – which, as Molle (2008: 133) notes, tend to "obscure the political nature of natural resources management [and] are easily hijacked by groups seeking to legitimise their own agendas", – discourses of deflection are depoliticising, acting to deflect attention away from the major anthropogenic sources of water stress on the North China Plain, the long-term impacts of the project, and the spatially uneven distribution of project benefits and costs. In other words, while the severe water stress being experienced on the NCP does indeed demand immediate attention, alternatives that go beyond the 'life-line' approach of the SNWTP are not being seriously considered.<sup>11</sup>

### Naturalisation discourse

One prevailing discourse used in the official literature and in my discussions with more than two-dozen government officials of the SNWTP construes the North China Plain's situation of severe water stress as a predominantly natural phenomenon, rather than the result of increasing anthropogenic stress on a naturally unimpressive regional water endowment. Throughout the world, the concept of scarcity has proven to be a powerful framing tool in debates around supply-side water management schemes such as large inter-basin water transfer projects (Metha, 2001; Sneddon, 2003; Swyngedouw, 2004; Zimmerer, 2010). The widespread adoption of the scarcity framework is also related to the fact that scarcity tends to be quantifiable, easily modelled, as well as naturalising and scientifically credible (Zimmerer, 2010: 184), as opposed to a subjective or socio-politically constructed label. Swyngedouw (2004: 47) highlights the underlying political dynamic this framework so often serves in the context of urban and regional water supply:

the discursive representation of water as being an integral part of nature permits casting 'nature' into pole position to explain scarcity. ... [N]ature is the principal 'cause' of water scarcity rather than the particular political economic configurations through which water becomes urbanized in highly selective and socially uneven ways, resulting in a serious 'scarcity' for the poor and powerless and abundant water for the socio-economic and political elites.

In other words, the scarcity framework can be utilised as a seemingly apolitical and implicit justification for water management projects that serve the interests of those already in positions of power within hydraulic bureaucracies.<sup>12</sup> This is also evident in the case of Israel, where Harris and Alatout (2010: 153) note that assumptions about water scarcity and abundance speak not only to the physical conditions of the environment. Rather, "[t]heir significance lies in the role they played in underwriting a host of political and technical apparatuses that led to the centralization of water policymaking and

<sup>10</sup> This view is not, of course, unique to China and may be found throughout the world at various historical moments – including the early 20th century American West, Brazil, Spain, and modern South Africa (see Molle et al., 2009: 330-331 for discussion).

<sup>11</sup> It should also be noted that the short-term "life-line" approach to dealing with North China's water stress allows the underlying drivers of the issue to persist unchecked, which, without radical changes, will stimulate increased total water use over time and potentially exacerbate the region's water issues in the medium- and long-term.

<sup>12</sup> Such hydraulic bureaucracies include not only the interests of nation-states, but also politicians, construction companies, elites, and development banks (see Molle et al. 2009). In China, due to the central role of the state in construction, in water development (e.g. the state-owned giant, Sinohydro) and in the banks funding the SNWTP, these interests and actors are nearly inseparable.



consolidation of centralised Israeli state apparatuses". Turning to the SNWTP, the naturalisation of water stress on the North China Plain as a mechanism for justifying the project is largely premised upon a well-known saying on the geography of China's water resources traced back to Mao Zedong in the early 1950s: "water is abundant in the south and scarce in the north, so why not borrow a little from the south if possible" (南方水少, 北方水多, 如有可能借点水来也是可以的). In fact, Mao's use of the phrase in a 1953 conversation with the head of the Yellow River Basin Commission is popularly seen as the genesis of the SNWTP (Chen et al., 2002; Liu and Zheng, 2002; Ma et al., 2006). This phrase presents the water scarcity of the north as a natural phenomenon, not as the result of human behaviour (and indeed, human behaviours had not, at that point, driven the situation to its current severity). At that time, water in the north was, relatively speaking, naturally scarce in comparison to the south.

But now, the limits of what North China's naturally semiarid climate can support are being tested and the natural scarcity argument has been carried into the present day despite being an anachronism. Six decades later, the first half of the phrase, 'water is abundant in the south and scarce in the north' was repeated as dogma by nearly all of my government-employed interview subjects when asked to characterise the state of water resources in North China. Another official echoed this in his own words, "Of course, [Beijing's water supply] situation is not very optimistic. Beijing is a very water-stressed city and its resource situation is *naturally poor*" (Chen, 2011; emphasis added).

In addition to this phrase comparing north to south, there are several key words used to describe regional water resources as part of the naturalisation discourse. Most commonly, the North China Plain is presented as an 'arid' or 'dry' (干旱的) and drought-prone region by government officials and by popular Chinese media outlets. For example, referring to the water transfer project, one official told me, "through this engineered control [of water] it is possible to solve the urban development problem in the *arid north*". (Sun, 2011; emphasis added). While urban population was cited by several officials as a factor exacerbating natural(ised) water stress in North China, in none of my interviews were other possible anthropogenic sources of stress mentioned, including severe industrial water pollution.

Similarly, a majority of the state-run media news articles on the SNWTP surveyed as part of my discourse analysis used this narrative to frame the project as a necessary intervention to help curtail natural water scarcity. For example, an article from *China Today* describes the SNWTP as, "a large-scale trans-basin water diversion project designed to take water from China's *water-rich southern area* to the *dry north*" (China Today, 2011; emphasis added). A *China Daily* article describes the SNWTP as, "designed to divert water from the *water-rich south* of the country (...) up to the *dry north*" (China Daily, 2008). Another article from *Xinhua* identifies the project as intended to, "transport water from the Yangtze River to the country's *drought-prone northern regions*, including Beijing" (Xinhua 2012; emphasis added). Similar language pervades nearly all of the popular Chinese news articles dealing with the SNWTP.

The use of technical language such as aridity and the emphasis on climatic episodes such as droughts are also pervasive in this discourse (Tang et al., 2011; Zhu, 2012; Zhu and Chao, 2012). As a climatic term, aridity is typically used to describe areas receiving between 100-300 mm of annual rainfall, such as Phoenix, Arizona; Death Valley, California; Cairo and Dubai. With a long-term average annual precipitation range between 500 and 650 mm (Zhang et al., 1999: 37), the North China Plain, characterised by a continental monsoonal climate, falls within the bounds of the semiarid (rather than hyper-arid or arid) classification.

Narratives that present the NCP as an arid region prone to drought serve to frame water shortage on the North China Plain as a natural phenomenon, rather than a situation in which extreme anthropogenic pressures have been placed on a naturally semiarid region over the last three decades of rapid industrial and urban growth. Such constructions may also have played an important role in the initial approval of the SNWTP, which came in 2002, one year after the end of a four-year period of drought in the NCP and serious seasonal flooding along the Yangtze (Shao and Wang, 2003: 9). The

timing of the State Council's approval of the project, in the immediate aftermath of a national discussion of regional drought, is likely to have played a role in the project's relative popular acceptance,<sup>13</sup> in comparison to a project like the Three Gorges Dam, which attracted significant opposition from citizen groups and environmental organisations both nationally and internationally.

In addition to the reliance on key phrases and words as part of the naturalisation discourse, several interviewed subjects mentioned that rainfall in the north has declined over the last 20 years. For example, "Now with lower [rainfall] levels we are experiencing water problems. I have heard from some water scholars that rainfall patterns are cyclical so maybe after twenty years it will go back up" (Wang, 2011). The North's rainfall patterns are indeed characterised by periodicity (Tan, et al., 2011), and average summer precipitation has been in a period of decline since 1965 (Hao et al., 2010), but the severity of the region's water stress far exceeds the impacts of these trends in many places.<sup>14</sup>

Looking at other large-scale water management projects, such as the Sardar Sarovar Dam Project in Gujarat, India, we see that narratives about naturally declining rainfall and links to climate change are often used as a tool to justify unpalatable projects (see Metha, 2001). This discursive strategy not only naturalises water stress, but, in an interesting scalar turn, it shifts responsibility away from local and regional behaviour and casts international actors such as the United States, the world leader in per capita carbon-dioxide emissions, as the main culprits. It will be interesting to see if climate change becomes a more prominent scapegoat for the water problems of North China in the coming years and decades, or indeed if it begins to have a more measurable impact on the region's water profile.

The other side of the scarcity narrative is the supposed 'abundance' of water in the south – the donor region of the water to be transferred northward via the Middle Route. As one Beijing official in charge of the city's water resources and urban infrastructure told me: "in contrast to the north, water resources in the south are (...) abundant" (Sun, 2011). Another official remarked "the south has an abundant water supply, but in the north every province lacks water" (Li, 2011). Similarly, an article in *China Today* reads, "[t]he reality of the situation in the water transfer region is that the south's Yangtze River system has sufficient water resources to supply the transfer" (China Today, 2011). This narrative is also supported by popular sayings about how plentiful water is in Henan and about the ubiquity of lakes in Hubei, the so-called 'province of a thousand lakes' (千湖省).

Despite these claims of profusion, water resources in the donor basin of the Middle Route have come under significant stress in recent decades. While in the field in southern Henan in 2010 and 2011, it was clear from the number of riverbeds crisscrossing the land that surface water had indeed been abundant in the area at one point in time. But now most of those riverbeds are either dry or host to dwindling flows during wet and dry seasons alike. Many have become construction sites or year-round grazing land. Perhaps more startlingly, between 55 and 90% of the region's lakes have either dried up or been lost to urban development (Du et al., 2011; Liu, 2012). During one extended field trip in the spring and early summer of 2011 – also a period of major construction for the Middle Route – the

---

<sup>13</sup> It should be noted that there is no available data on the Chinese public's stance toward the SNWTP. Relative popular acceptance here simply means that there has been no widespread or vocal opposition to the project to date. There are likely several reasons why this is the case, discussed in detail below.

<sup>14</sup> Hao et al. (2010) demonstrate a decline in summer precipitation in North China of 14.9 mm on average for each decade between 1951 and 2008. While studies agree that North China has been both warmer and drier over the last few decades (Bao et al., 2012a; Yu et al., 2014), they differ on the degree to which this climatological trend has impacted water availability. For example, around Beijing specifically, some models predict a marginal decline in annual regional runoff by 2020 and an increase of between 14 and 90% in the 2050s (see Bao et al., 2012b). Moreover, studies also suggest that human activities are more significant than climate in contributing to recent and projected changes in the hydrological cycle in several areas of North China. For example, surface water flow decline in the Hai River Basin's Taolinkou catchment area is estimated to be only 41.5% attributable to human activities, while in the Zhangjiafen and Guantai catchments the proportions are roughly 60 and 74%, respectively (see Bao et al., 2012a).

donor basin suffered a severe drought in which the levels of the Danjiangkou Reservoir fell to historic lows and populations in the Han and Middle Yangtze Basins struggled to have their basic water needs met (Wong, 2011; International Rivers, 2013). In fact, the Yangtze River Basin has experienced frequent and severe droughts over the last half century, with 2006 marking the river's lowest runoff levels in 50 years and no flood during the flood season (Yu et al., 2014: 545).

The U.S. State Department has identified insufficient water at the project's main transfer repository, the Danjiangkou Reservoir (which stores water from the Han River), as the primary challenge to the Middle Route (WikiLeaks Cable, 2011).<sup>15</sup> As Liu Changming of the Chinese Academy of Sciences (CAS) warned even before construction on the project began, "in some cases at least, the water is not absolutely surplus in the exporting region (...) [F]or the middle route project, diverting water from the middle and lower reaches of the Han River will reduce the amount left for irrigation and navigation" (Liu, 1998: 907). Another CAS scholar in Wuhan, Du Yun, is sceptical whether the Han River has any water at all to spare for the transfer project (Watts, 2011). In fact, the long-term project plan was recently modified to include a pump connection from the Three Gorges Reservoir on the Yangtze River in order to increase the supply to the Danjiangkou Reservoir (the Middle Route's donor source), which, according to the discourse, has plenty of water to spare (Middle Route Project, 2013). However, due specifically to intensive human activities across the basin, the Yangtze, the source of the Han River, is also experiencing a degree of water stress, though the severity of stress is still under debate.<sup>16</sup>

### Environmental benefits discourse

The second pervasive discourse being employed in the case of the Middle Route is premised upon the alleged environmental benefits of the SNWTP. The basic narrative is that the SNWTP, particularly the Middle Route, is an ecologically friendly water management scheme that will help improve the environment of the NCP. In my interviews, the environmental benefits narrative was employed particularly among government officials in and around Beijing as a justification for the sacrifices made in the south in support of the Middle Route. For example, one interviewed subject told me, "The South-North Water Transfer Project will improve the ecological situation on the entire North China Plain and be a huge benefit" (Sun, 2011). Another illustrative quote comes from an interview with a high-ranking government official in Beijing:

Increasing the speed of urbanisation and economic growth is one aspect of the project, but I think that the more important benefit will be improving the ecological environment. At the moment, much of our water supply comes from groundwater, which degrades the environment. Increasing the water supply will allow us to reduce our reliance on groundwater, so we can say that the project will have environmental benefits (Chen, 2011).

Surprisingly, it was not only in the north that I encountered the refrain that the project will reduce the region's unsustainable reliance on groundwater withdrawals, but also in a handful of interviews with local government officials in the Middle Route's donor basin in Henan Province. While officials in these areas will not gain access to any of the route's water and the legitimacy of the Party at the national

---

<sup>15</sup> This source, while non-traditional, is an unclassified but sensitive government document sent from the United States Embassy in Beijing to the U.S. Secretary of State, Department of Agriculture, Department of the Interior, Environmental Protection Agency, the American consulates in Chengdu, Guangzhou, Shanghai, Shenyang and Hong Kong, and several other offices involved in work on the environment, science and technology. It was leaked and made publicly viewable by the controversial online non-profit, WikiLeaks.

<sup>16</sup> At one extreme, Dai et al. (2008) suggest that the Yangtze is among the top ten most water-stressed rivers in the world. Taking a more moderate stance, the World Resources Institute's Aqueduct Water Project suggests that the Yangtze Basin as a whole is experiencing low to medium water stress, but much of the Han Basin (including the Danjiangkou Region) is categorised as experiencing medium to high water risk (see WRI).

level is not their primary concern, they stand to benefit from the project in other important ways. In Henan's Xichuan County (淅川县), for example, Middle Route construction has brought government investment to an area that has otherwise been left behind by the development efforts of the provincial and national governments. While affecting Xichuan County perhaps more than any other in terms of water availability and social displacement, the project has brought jobs and investment, and local government officials there are eager to justify the project in any possible terms, including the ecological benefits discourse (Ma, 2011; 2011; Liu, 2011; Lu, 2011). The example of Xichuan also demonstrates that the SNWTP is valuable to government officials not only for its ability to support and enhance legitimacy at the national level, but in bringing economic investment and development (even if it leaves much to be desired qualitatively) to county-level jurisdictions.

This discourse is also prominent in the state-run media, which tend to present the transfer project as a necessary step to take for addressing the region's (naturalised) water challenges, rather than in overtly negative or positive terms. One representative article from the China News Network claims that the SNWTP is intended to "mitigate the increasingly severe water shortage on the NCP and improve the ecological environment" (China News Network, 2012). Another claims that the project will, "effectively relieve groundwater over-extraction, (...) begin containing the worsening situation of aquatic ecosystems in the north, and recover and improve the ecological environment, step-by-step" (People's Daily, 2012). According to an article in *China Today* (2011),

the Eastern and Central route construction [of the SNWTP...] will bring ecological benefits. According to Shen [Fengshen of the SNWTP Commission of the State Council] depletion of the water table is obvious due to the overexploitation of groundwater in drought-prone areas, and he offers an example, "Water is hardly ever seen while digging subway tunnels in Beijing, but the situation is quite different when digging tunnels in Guangzhou which is very rich in groundwater. (...) However, after the southern water is available to northern areas, groundwater overexploitation will be curbed".

The last excerpt is particularly problematic in its conflation of Guangzhou, a city that receives an average of more than 1700 mm of rain per year, the same as coastal Oregon, with the SNWTP's water donor zone.

Additionally, this excerpt and the broader discourse it exemplifies suggest that the Middle Route will significantly relieve pressure on groundwater resources across the North China Plain when, in fact, its impact will be heavily concentrated along the immediate periphery of the project, and the region as a whole will continue to experience dramatic groundwater decline (Ye et al., 2014). A recent study on the impact of the SNWTP's Middle Route on the groundwater table of the Hai River Basin – a key basin on the North China Plain that encompasses Beijing – suggests that depth to groundwater increased by up to 20 metres in cities such as Beijing and Tianjin between 1999 and 2005, prior to any transfer of water from the project. Groundwater levels have also been on the decline in the Hai River Basin *as a whole* (Ye et al., 2014). After water transfer begins along the Middle Route, Ye and his colleagues expect to see an increase in groundwater levels due to recharge from the canal in areas within close proximity of the project route, but, importantly, they suggest that groundwater levels will continue to decline across roughly 70% of the basin (Ye et al., 2014). Not only do their results show that the transferred water "cannot satisfy all requirements" in terms of the region's groundwater demand, but their work suggests that even localised improvements in the water table close to the project may be attributable to spatial shifts in groundwater distribution across the basin that were underway even prior to the project's launch. Further, the water transferred by the project is officially intended, "only [to] provide water for municipal and industrial use in Beijing, Tianjin Municipalities, and Hebei, Henan, Hubei Provinces" while, "consideration [will be given] to agriculture and other uses of water in some (...) areas" (Middle Route Project, 2013). The minority portion of transferred water that will contribute towards meeting agricultural demand will be used to increase the irrigated area of the NCP by 0.6 million ha (Middle Route Project, 2013). Given that agricultural irrigation is the primary source of groundwater demand in

North China (COWI, 2013) and that transferred water will be used to actually increase the scope of irrigation in the area, it is difficult to see how groundwater extraction rates would decline significantly as a result of the SNWTP. Additionally, the environmental impacts of the project itself – from secondary salinisation to the reversal of delta formation and biodiversity loss (Meador, 1992: 18; Zhang, 2009) – would certainly come as a trade-off to any localised reduction in groundwater use. Which path is less ecologically harmful is not immediately clear.

The environmental benefits narrative is also supported by frequent vague government references to the SNWTP's role in supporting 'sustainable development' (可持续发展). In one closed-door government meeting on the Middle Route that I observed in Zhengzhou, the SNWTP was contextualised among interbasin transfer projects of the past, including early transfer projects in ancient Egypt and Ethiopia and more contemporary projects in Spain, California, and Pakistan. The many interbasin water transfer projects undertaken in post-1949 China were then enumerated and the presenter, an official in the Middle Route Henan office, asserted, "These projects have had a significant effect on local production, life, and the rational use of natural resources. At the same time, they have maintained the lifeblood of sustainable development (可持续发展的命脉)". Government documents, such as those issued by the State Council announcing the approval of the SNWTP and outlining its aims, suggest that the project will contribute to the goal of sustainable development, but fail to provide any details or specific examples of how (for examples see State Council, 2003; SNWTP Construction Committee Law 5, 2004).

Related to the narrative about the environmental benefits of the Middle Route and its contributions to sustainable development are two dicta that present an alternative story to the reality of water management on the North China Plain. First, my interview subjects, particularly those from planning offices, frequently suggested that the government is following a principle they call, 'Let water supply dictate demand' (一供定需). This slogan implies that North China is striving to live modestly within the means of its tight water budget by reining in its water demand based on the limitations of the available supply. While this approach would ensure a more temperate effect on the environment, the SNWTP is aimed precisely at *increasing* the region's supply to meet growing demand. What is actually being put into practice with such a massive interbasin water transfer project is not the principle of 'Let water supply dictate demand', but exactly the opposite, 'Let water demand dictate supply'.

Another phrase in the same vein is 'Save water first, transfer water after; Control pollution first, share water after; Protect the environment first, use water after' (先节水后调水, 先治污后通水, 先环保后用水). This aphorism, appearing in government documents related to the SNWTP and water management in the North (for example, see State Council, 12/23/2002), again gives the impression that the SNWTP is part of an environmentally conscientious, policy-driven, balanced supply and demand-driven effort to manage the water stress of North China. Ultimately, the environmental benefits narrative, focused on the Middle Route as an alternative water source to over-taxed groundwater supplies on the NCP, and vague notions of sustainable development, is a discourse of distraction that serves as an apolitical justification for the SNWTP and helps to mask its negative environmental and social impacts, attempting to green-wash the project and recast it in a more positive light.

## COUNTER DISCOURSES

What is somewhat surprising for a project as large in scale and impact as the SNWTP is the seeming lack of widespread pushback from civil society and strong counter-narratives that differ from those being put forth by the government. China's recent history is rich with instances of environmental protest, ranging from spontaneous gatherings of a few dozen people to organised protests drawing several tens of thousands and international media attention (see, for examples, Du, 2006; Phillips, 2013; Watts, 2009). Unlike the projects targeted by many of these protests, largely motivated by NIMBY ('not in my backyard') concerns, the SNWTP does not pose an immediate or obvious threat to citizens' everyday

health. Instead, the concerns are primarily longer-term, socio-economic, and ecological. Additionally, spanning more than 1200 km, the project lacks a clear nucleus and its effects are not concentrated in a single geographic area, which presents issue awareness and organisational challenges. Together, these two factors have likely contributed to the relative lack of civic organisation around the SNWTP to date.

In questioning the relative absence of popular Chinese engagement with the issues of the SNWTP, the role of non-governmental organisations (NGOs), of which there are now an estimated three million (Ling et al., 2007) – is also worth a brief examination. There is a growing consensus among scholars that this rapidly developing body of organisations is assuming an increasingly central and positive role in shaping outcomes around China's environmental politics (Yang, 2003; Heggelund, 2004; Carter and Mol, 2007; Hu, 2009). Based on my work with the head volunteers at *Green Earth Volunteers* (绿家园志愿者) – one of the oldest and most prominent environmental NGOs in China known specifically for working on issues related to major rivers – between 2010 and 2012, it is clear that the organisation is quite knowledgeable about the details of the SNWTP and appears to be very concerned about the impacts it will have on both ecosystem health and human communities across China. However, GEV has not attempted to draw attention to these concerns as it did so successfully in the anti-damming campaigns on the Nu River (Mertha, 2008; Xie, 2011).

Similarly, the Institute of Public and Environmental Affairs (IPEA, 公众环境研究中心), an environmental non-profit organisation based in Beijing and run by one of China's most outspoken environmental activists makes no direct mention of the SNWTP on its website or in its extensive published reports. The Green Friend Association (绿色之友协会), an environmental NGO that has been operating out of Shijiazhuang in Hebei Province since 1996, and Huaihe River Guardian (淮河卫士), another prominent environmental NGO focused on the North China Plain's Huai River, also lack open campaigns and publicly available documents related to the water transfer project. Green Hanjiang (绿色汉江), the only environmental NGO dedicated to the Han River Basin and based in the city of Xiangyang on the banks of the Middle Route's source, the Danjiangkou Reservoir, does express brief concern over the project on its website (see ghj.org.cn), but still fails to directly contest the SNWTP or promote any substantive narratives to counter those put forth by the government.<sup>17</sup>

In contrast to another commonly held view that China's growing civil society will eventually serve as a check on the power of the authoritarian regime (Zhang, 2003; Tai, 2007; Yu, 2007), Ma and Schmitt (2008: 102) point out that Chinese NGOs are in reality, "not structured as a counter-balance to power, because if they were, they would be banned". But in his study of grassroots organizations (草根组织), Spires argues that these bottom-up groups formed by concerned citizens around specific issues are able to engage in a tactical relationship with the government which he calls 'contingent symbiosis'.

NGOs are looking to meet social needs, while government officials, especially at the local level, seek to make sure all 'problems' in their jurisdictions are dealt with in ways that do not attract unfavourable attention from their higher-ups. When cooperation on mutual goals is achieved, NGOs can continue their work (...). Yet clearly such a relationship is both fragile and contingent. If NGOs keep their operations small and make no calls for political representation or democratic reform, officials can turn a blind eye and claim credit for any good works the NGO does. But if an NGO's work draws too much attention to the failings of local officials or if it oversteps a fuzzy and frequently shifting political line, the organization can be disciplined or even closed down (Spires 2011: 12).

---

<sup>17</sup> Each of the organizations mentioned in this paragraph has been identified by China Water Risk as a key civic player attempting to shape the social impacts of water management in China (see CWR 2010).

What this means is that NGOs in China are often most effective as advocates for specific issues at lower levels of government jurisdiction because their work can support the interests of local officials without threatening their authority or crossing political boundaries. On the other hand, when Chinese NGOs attempt to advocate around non-local issues, one half of the symbiotic relationship that allows them to operate is missing from the equation. In other words, higher-level government officials cannot benefit in the same way from engaging such organisations and, in some situations, NGO participation can actually threaten their goals. While the activists and NGOs working against the damming of the Nu River were successful in drawing national and international attention to their cause, they were ultimately not attacking the central government or its national political-economic agenda because the project was launched by the Yunnan Provincial Government and never officially endorsed by the then-Premier Wen Jiabao.

The case of the Three Gorges Dam, also highly publicised both nationally and internationally demonstrates that when the central Chinese government either launches or makes a clear endorsement of a controversial project, it is very risky for NGOs to attempt to exert pressure, even regarding local-level impacts. In the early 1990s alone nearly 180 people – including the well-known activist, Dai Qing – were imprisoned for speaking out on the Three Gorges Dam project (Mertha, 2008: 2). With the repression associated with organising against the Three Gorges Dam project serving as a not-so-distant reminder of state power, groups like Green Earth Volunteers and Green Hanjiang are likely acutely aware that contesting a project such as the SNWTP would require contesting the fundamental goals of the central government, a venture far riskier than pressuring local or even provincial-level officials to deal with a smaller-scale project.

## CONCLUSION

By delivering massive amounts of water to the water-stressed North China Plain, the SNWTP will help foster continued economic growth and urbanisation in one of China's key political, economic, and population centres. However, this supply-side approach to water management, heavy with trade-offs, serves as a temporary lifeline to the region, maintaining the economic status quo while allowing stresses to intensify over time as anthropogenic sources of water stress persist unchecked. Because stepping back to address the primary sources of water stress on the NCP, which include severe industrial water pollution and rapid urban population growth, would require a sacrifice in growth rates, we are instead seeing a range of discourses put forth by government entities to depoliticise and justify the project. These 'discourses of deflection' also work to mask the project's social and ecological impacts, outlined in detail above.

The first major discourse of distraction at play involves the naturalisation of water stress on the NCP. This narrative, put forth by government officials working on water and development, in government documents and by state-run news sources, emphasises water scarcity in the north, abundance in the south, and focuses on key words such as drought and aridity. By framing water stress as a purely natural problem, the solution space is shifted to focus on increasing supply to the region. The second discourse of distraction rests on the argument that the Middle Route will deliver environmental benefits to the recipient basin by significantly relieving pressure on overburdened groundwater resources. This deflects attention away from the negative environmental effects of the transfer project, while presenting it as a socially and ecologically responsible water management scheme that will help to ameliorate regional water issues.

As Gupta and van der Zaag (2008) argue in their seminal piece of interbasin water transfers, such "grand scale engineering works (...) are only justified after all (smaller scale) alternatives have been exhausted" and only when specific criteria, including a real surplus in the donor basin, are met. In addition to lacking real water surplus in the Han and Yangtze river basins, alternatives to the SNWTP are far from having been exhausted. While several cities in the North have recently begun launching

important efforts to reduce the anthropogenic amplifiers of regional water stress, including notable projects underway in Beijing in particular,<sup>18</sup> there are several options, which, in combination, offer promising alternatives to problematic and short-sighted supply-side management strategies like the SNWTP. While enforcement of existing water pollution laws would help to significantly reduce pressure on North China's water supply, it is economically and therefore politically infeasible in the short-term because it would require shutting down polluting factories, limiting or prohibiting development in protected water source areas, and imposing fines on industries and individuals who dump untreated industrial and household wastewater into waterways (Probe International Beijing Group, 2010). Another important though controversial policy measure could be to more strictly control plans for growth in North China's largest cities and instead develop economic opportunities that either draw rural-urban migrants to less resource-stressed areas or enable them to find well-paying work closer to home. There are also a number of other less-politically and economically complex measures that could be taken to help relieve the severe stress on the North China Plain and other water-stressed regions in China, including the SNWTP's donor basin. Possibilities include further investment in green infrastructural projects that facilitate water reclamation and groundwater recharge, improved and more pervasive water recycling programmes, investment in technologies that will help improve China's low industrial water use efficiency, market-based water pricing (with equity considerations taken into account), and a tradable water rights programme. In combination, these strategies are likely to offer a far more sustainable pathway forward in water management as China struggles to balance political and economic goals with social and environmental costs.

## REFERENCES

- Agnew, J. 2011. Waterpower: Politics and the geography of water provision. *Annals of the Association of American Geographers* 101(3): 463-476.
- Aguilera-Klink, F.; Pérez-Moriana, E.; Sánchez-García, J. 2000. The social construction of scarcity. The case of water in Tenerife (Canary Islands). *Ecological Economics* 34(2): 233-245.
- Allan, J.A. 2003. *IWRM/IWRAM: A new sanctioned discourse?* Discussion Paper No. 50. Water Issues Study Group. London: University of London.
- Bakker, K. 1999. The politics of hydropower: Developing the Mekong. *Political Geography* 18(2): 209-232.
- Bao, C. and Fang, C. 2009. Integrated assessment model of water resources constraint intensity on urbanization in arid area. *Journal of Geographical Sciences* 19(3): 273-286.
- Bao, Z.; Fu, G.; Wang, G.; Jin, J.; He, R.; Yan, X. and Liu, C. 2012b. Hydrological projection for the Miyun Reservoir Basin with the impact of climate change and human activity. *Quaternary International* 282: 96-103.
- Bao, Z.; Zhang, Z.; Wang, G.; Fu, G.; He, R.; Yan, X.; Jin, J.; Liu, Y. and Zhang, A. 2012a. Attribution for decreasing streamflow of the Haihe River Basin, northern China: Climate variability or human activities? *Journal of Hydrology* 460-461: 117-129.
- Beijing City Government. 2013. Beijing's plan for accelerating the construction of sewage treatment and reclaimed water use facilities, 2013-2015. (In Chinese, 北京市 2013 年. 北京市加快污水处理和再生水利用设施建设三年行动方案 2013-2015年)
- Beijing Statistical Yearbook. 2011. Beijing Municipal Bureau of Statistics. Beijing, China. (In Chinese, 2011年北京统计年鉴. 北京市统计局. 北京, 中国).
- Berkoff, J. 2003. China: The South-North Water Transfer Project – Is it justified? *Water Policy* 5(1): 1-28.

<sup>18</sup>For example, in 2013 the City of Beijing announced an ambitious plan to increase wastewater recycling and reclaimed water use through the construction of 47 new water recycling plants, the upgrading of up to 20 existing sewage treatment facilities, and the construction of new pipelines for rainwater recycling throughout the Beijing metropolitan area (see Beijing City Government, 2013).



- Brown, L.R. 2006. *Plan B 2.0 Rescuing a planet under stress and a civilization in trouble*. New York: W.W. Norton & Co.
- Calow, R.C.; Howarth, S.E. and Wang, J. 2009. Irrigation development and water rights reform in China. *International Journal of Water Resources Development* 25(2): 227-248.
- Carse, A. 2012. Nature as infrastructure: Making and managing the Panama Canal watershed. *Social Studies of Science* 42: 539-563.
- Carter, N.T. and Mol, A.P.J. (Eds). 2007. *Environmental governance in China*. New York, NY: Routledge.
- Chan, K.W. 2009. The Chinese Hukou System at 50. *Eurasian Geography and Economics* 50(2): 197-221.
- Chen, F. and Xie, Z. 2010. Effects of interbasin water transfer on regional climate: A case study of the Middle Route of the South to North Water Transfer Project in China. *Journal of Geophysical Research* 115(D11): 1-17.
- Chen S. 2011. Personal communication. 8 December 2011.
- Chen, X.Q.; Zhang, D.Z. and Zhang, E.F. 2002. The south to north water diversions in China: Review and comments. *Journal of Environmental Planning and Management* 45(6): 927-932.
- China City Statistical Yearbook. 1995. National Bureau of Statistics of China. Beijing, China, 1995. (In Chinese, 1995年中国城市统计年鉴。中华人民共和国国际统计局。北京, 中国, 1995年)。
- China City Statistical Yearbook. 2001. National Bureau of Statistics of China. Beijing, China, 2001. (In Chinese, 2001年中国城市统计年鉴。中华人民共和国国际统计局。北京, 中国, 2001年)。
- China City Statistical Yearbook. 2008. National Bureau of Statistics of China. Beijing, China, 2008. (In Chinese, 2008年中国城市统计年鉴。中华人民共和国国际统计局。北京, 中国, 2008年)。
- China Daily. 2008. Water from Hebei eases Beijing water shortage. 29 September 2008.
- China News Network. 2012. Summary: South-North Water Transfer reaches tenth anniversary, Eastern Route to open next year. 27 December 2012. (In Chinese, 中国新闻网. 2012年. 综述: 南水北调开工十周年东线一期工程明年通水. 2012年12月27日)。
- China Today. 2011. Why water diversion project is still making ripples. 13 June 2011.
- COWI 2013. Groundwater in China: Part 1- Occurrence and use. Kongens Lyngby, Denmark: COWI.
- Crow-Miller, B. 2013. Water, Power, and Development in Twenty-First Century China: The Case of the South-North Water Transfer Project. Dissertation. University of California, Los Angeles.
- Crow-Miller, B. 2014. Diverted opportunity: Inequality and what the South-North Water Transfer Project really means for China's future. *GWF Discussion Paper 1409*, Global Water Forum, Canberra, Australia.
- CWR (China Water Risk). 2010. The social impact of water. <http://chinawaterrisk.org/wp-content/uploads/2011/06/The-Social-Impact-of-Water.pdf>
- Dai, Z.; Du, J.; Li, J.; Li, W. and Chen, J. 2008. Runoff characteristics of the Changjiang River during 2006: Effect of extreme drought and the impounding of the Three Gorges Dam. *Geophysical Research Letters* 35(7).
- Downs, E.S. and Saunders, P.C. 1999. Legitimacy and the limits of nationalism: China and the Diaoyu Islands. *International Security* 23(3): 114-146.
- Du, J. 2006. PX and PTA projects kick off in Xiamen. *China Chemical Reporter* 17(34): 13-13.
- Du, Y.; Xue, H.P.; Wu, S.J.; Ling, F.; Xiao, F. and Wei, X.H. 2011. Lake area changes in the middle Yangtze region of China over the 20th century. *Journal of Environmental Management* 92(4): 1248-1255.
- Gee, J.P. 1999. *An introduction to discourse analysis: Theory and method*. New York, NY: Routledge.
- Gilley, B. 2008. Legitimacy and institutional change: The case of China. *Comparative Political Studies* 41(3): 259-284.
- Gleick, P.H. 2009. China and Water. In *The world's water 2008-2009: The biennial report on freshwater resources*, pp. 79-100. Pacific Institute for Studies in Development, Environment and Security. Washington, DC: Island Press.
- Gu, W. Beijing's water shortage is already 1/10<sup>th</sup> of the international threshold for severe stress. *People's Daily*, May 18, 2011. <http://env.people.com.cn/GB/14671856.html>. (In Chinese, 贾玥. 北京缺水已破国际警戒线的1/10 形势异常严峻. 人民日报, 2011年05月18日) (accessed 16 October 2012)

- Gupta, J. and P. Zaag, van der. 2008. Interbasin water transfers and integrated water resources management: Where engineering, science and politics interlock. *Physics and Chemistry of the Earth* 33(1-2): 28-40.
- Hao, L.; Min, J.; Ding, Y. and Wang, J. 2010. Relationship between reduction of summer precipitation in North China and atmospheric circulation anomalies. *Journal of Water Resources and Protection* 2(6): 569-576.
- Harris, L.M. and Alatout, S. 2010. Negotiating hydro-scales, forging states: Comparison of the upper Tigris/Euphrates and Jordan River basins. *Political Geography* 29(3): 148-156.
- Heggelund, G. 2004. *Environment and resettlement politics in China: The Three Gorges Project*. Aldershot, UK: Ashgate.
- Hu, H. 2009. Peasant worker NGOs: Practical significance and development strategies. *Development Strategies* 37-41. (In Chinese 胡洪彬. 2009. 农民工 NGO: 现实意义与发展策略. 发展战略: 37-41).
- Huang Y. 2007. Urban development in contemporary China. In Veeck, G.; Pannel, C.W.; Smith, C.J. and Huang, Y. (Eds), *China's Geography*, pp. 268-302. Lanham, Maryland: Rowman & Littlefield.
- International Rivers. 2013. [www.internationalrivers.org](http://www.internationalrivers.org)
- Jia D. 2011. Personal communication. 13 December 2011.
- Kaika, M. 2003. Constructing scarcity and sensationalising water politics: 170 days that shook Athens. *Antipode* 35(5): 919-954.
- Li, D. 2011. Personal communication. 21 November 2011.
- Li, X.; Li, G. and Zhang, Y. 2014. Identifying major factors affecting groundwater change in the North China Plain with grey relational analysis. *Water* 6(6): 1581-1600.
- Ling, B.; Lam, W.; Wickeri, E. and Tan, T. 2007. China's civil society: Controls, limits and role in a 'harmonious society'. *China Perspectives* 3: 118-125.
- Liu, C. 1998. Environmental issues and the South-North Water Transfer Scheme. *The China Quarterly* 156: 899-910.
- Liu, C. and Zheng, H. 2002. South-to-north water transfer schemes for China. *International Journal of Water Resources Development* 18(3): 453-471.
- Liu, Y. 2011. Personal communication. 12 December 2011.
- Liu, H. 2012. The disappearing act of lakes in China's Hubei. *The Wall Street Journal, Market Watch*, 3 July 2012.
- Liu, J. and Wu, Y. 2012. Water sustainability for China and beyond. *Science* 337: 649-650.
- Lu, M. 2011. Personal communication. 14 December 2011.
- Ma, S. 2011. Personal communication. 13 December 2011.
- Ma, J.; Hoekstra, A.Y.; Wang, H.; Chapagain, A.K. and Wang, D. 2006. Virtual versus real water transfers within China. *Philosophical Transactions of the Royal Society* 361: 835-842.
- Ma, L. and Schmitt, F.G. 2008. Development and environmental conflicts in China. *China Perspectives* 2: 94-102.
- Ma, L.J.C. 2009. China authoritarian capitalism: Growth, elitism, and legitimacy. *International Development Planning Review* 31(1): i-xii.
- Meador, M.R. 1992. Inter-basin water transfer: Ecological concerns. *Fisheries* 17(2): 17-22.
- Mehta, L. 2001. The manufacture of popular perceptions of scarcity: Dams and water-related narratives in Gujarat, India. *World Development* 29(12): 2025-2041.
- Mehta, L. 2007. Whose scarcity? Whose property? The case of water in western India. *Land Use Policy* 24(4): 654-663.
- Mertha, A.C. 2008. *China's water warriors: Citizen action and policy change*. Ithaca, NY: Cornell University Press.
- MEP (Ministry of Environmental Protection). 2013. *State of the environment in China*. Beijing.
- Middle Route Project, South-North Water Diversion Project Commission of the State Council. [www.nsb.gov.cn/zx/english/mrp.htm](http://www.nsb.gov.cn/zx/english/mrp.htm) (accessed 16 February 2013)
- Molle, F. 2008. Nirvana concepts, narratives and policy models: Insights from the water sector. *Water Alternatives* 1(1): 131-156.

- Molle, F.; Mollinga, P.P. and Wester, P. 2009. Hydraulic bureaucracies and the hydraulic mission: Flows of water, flows of power. *Water Alternatives* 2(3): 328-349.
- Mukerji, C. 2003. Intelligent uses of engineering and the legitimacy of state power. *Technology and Culture* 44(4): 655-676.
- Oksenberg, M. 2001. China's political system: Challenges of the twenty-first century. *The China Journal* 45: 21-35.
- People's Daily. 2012. South-North Water Transfer Project has 10<sup>th</sup> anniversary, in race against time for on-schedule transfer. 27 December 2012.  
(In Chinese, 人民日报. 2012年. 南水北调工程开工建设十周年按时通水, 我们和时间赛跑. 2012年12月27日).
- Phillips, T. 2013. Chinese protesters take to the streets in Kunming over chemical plant plans. *The Telegraph*, 26 July 2013.
- Pritchard, S.B. 2012. From hydroimperialism to hydrocapitalism: 'French' hydraulics in France, North Africa, and beyond. *Social Studies of Science* 42: 591-615.
- Probe International Beijing Group. Beijing's water crisis: 1949-2008 Olympics – 2010 Update.  
<http://journal.probeinternational.org/beijing-water/sources/olympic-report/> (accessed 10 March 2015)
- Shalizi, Z. 2008. Water and urbanization. In Yusuf, S. and Saich, T. (Eds), *China urbanizes: Consequences, strategies, and policies*, pp. 159-184. Washington, DC: The World Bank.
- Shao, X. and Wang, H. 2003. Interbasin transfer projects and their implications: A China case study. *International Journal of River Basin Management* 1(1): 5-14.
- Sneddon, C. 2003. Reconfiguring scale and power: The Khong-Chi-Mun project in northeast Thailand. *Environment and Planning A* 35(12): 2229-2250.
- SNWTP Construction Committee Law 5. 2004. Notification regarding views on the construction management of the South-North Water Transfer Project, September 30, 2004.  
(In Chinese, 国调委发[2004]5号. 关于印发《南水北调工程建设管理的若干意的通知, 2004年9月30日).
- Spires, A.J. 2011. Contingent symbiosis and civil society in an authoritarian state: Understanding the survival of China's grassroots NGOs. *American Journal of Sociology* 117(1): 1-45.
- Springer, K. 2011. Soaring to sinking: How building up is bringing Shanghai down. *Time: Science and Space*, 1-45.
- State Council National Law 17. 2003. The State Council's notification concerning the establishment of the South-North Water Transfer Project Construction Committee under the State Council, July 31, 2003.  
(In Chinese, 国务院国(2003)17号. 国务院关于成立国务院南水北调工程建设委员会的通知, 2003年7月31日).
- State Council, National Message #117, 2002. State Council message regarding the approval of the South-North Water Transfer Project Master Plan, 12/23/2002. (In Chinese, 国务院, 国函(2002) 117号. 国务院关于南水北调工程总体规划的批复, 2002年12月23日).
- Sun, M. 2011. Personal communication. 8 December 2011.
- Swyngedouw, E. 2004. *Social power and the urbanization of water*. Oxford: Oxford University Press.
- Tai, Z. 2007. *The Internet in China*. New York: Routledge.
- Tan, L.; Cai, Y.; An, Z.; Yi, L.; Zhang, H. and Qin, S. 2011. Climate patterns in north central China during the last 1800 yr and their possible driving force. *Climate of the Past* 7: 685-692.
- Tang, S.; Zhao, Y. and Feng, J. 2011. Why transfer the south's water to the north? *China Today*, 15 June 2011. (In Chinese, 唐书彪, 赵亚媛, 娇枫. 2011年. 为什么要把南方的水调到北方来? 今日中国, 2011年6月15日).
- Wang, H. 2011. Personal communication. 21 November 2011.
- Wang, J.; Huang, J.; Blanke, A.; Huang, Q. and Rozelle, S. 2007. The development, challenges and management of groundwater in rural China. In Giordano, M. and Villholth, K.G. (Eds), *The agricultural groundwater revolution: Opportunities and threats to development*, pp. 37-62. Colombo, Sri Lanka: International Water Management Institute.
- Watts, J. 2009. Chinese protesters confront police over incinerator plans in Guangzhou. *The Guardian*, 23 November 2009.
- Watts, J. 2011. China water resettlement: 'Honest folk have lost out'. *The Guardian*, 9 September 2011.
- Webber, M. 2012. *Making capitalism in rural China*. Cheltenham, UK: Edward Elgar Publishing.

- Wei, S.; Yang, H.; Abbaspour, K.; Mousavi, J. and Gnauck, A. 2010. Game theory based models to analyze water conflicts in the Middle Route of the South-to-North Water Transfer Project in China. *Water Research* 44(8): 2499-2516.
- WikiLeaks Cable, August 30, 2011 (released). Cable 08BEIJING3030, Realizing Mao's vision of water for the North in time for the Olympics. From American Embassy, Beijing to Secretary of State, Washington, DC; 6 July 2008.
- Woetzel, J.; Mendonca, L.; Devan, J.; Negri, S.; Hu, Y.; Jordan, L.; Li, X.; Maasry, A.; Tsen, G. and Yu, F. 2009. Preparing for China's Urban Billion. McKinsey Global Institute.
- Wong, E. 2011. Central China hit by drought, as reservoirs become 'dead water'. *New York Times*, 16 May 2011.
- WRG (Water Resources Group). 2009. *Charting our water future: Economic frameworks to inform decision-making*. McKinsey and Company.
- Wu J.; Huang, J.; Han, X.; Gao, X.; He, F.; Jiang, M.; Jiang, Z.; Primack, R.B. and Shen, Z. 2004. The Three Gorges Dam: An ecological perspective. *Frontiers in Ecology and the Environment* 2(5): 241-248.
- Xie, L. 2011. China's environmental activism in the age of globalization. *Asian Politics and Policy* 3(2): 207-224.
- Xinhua. 2012. Chinese cheer out Year of Rabbit. 22 January 2012.
- Yang, G. 2003. The co-evolution of the internet and civil society in China. *Asian Survey* 43(3): 405-22.
- Yang, X.; Chen, Y.; Pacenka, S.; Gao, W.; Ma, L.; Wang, G.; Yan, P.; Sui, P.; Steenhuis, T.S. 2015. Effect of diversified crop rotations on groundwater levels and crop water productivity in the North China Plain. *Journal of Hydrology* 522: 428-438.
- Ye, A.; Duan, Q.; Chu, W.; Xu, J. and Mao, Y. 2014. The impact of the South – North Water Transfer Project (CTP)'s central route on groundwater table in the Hai River basin, North China. *Hydrological Processes* 28(23): 5755-5768.
- Yeager-Kozacek, C. 2015. China completes second line of south-north water transfer project. Circle of Blue. 8 January 2015. [www.circleofblue.org/waternews/2015/world/photo-slideshow-china-completes-second-line-south-north-water-transfer](http://www.circleofblue.org/waternews/2015/world/photo-slideshow-china-completes-second-line-south-north-water-transfer) (accessed 3 March 2015)
- Yong, J. 2009. China's water scarcity. *Journal of Environmental Management* 90(11): 3185-3196.
- Yu, J. 2007. Conflict in the countryside: Emerging political awareness among China's peasants. *China Perspectives* 3: 28-34.
- Yu, M.; Q. Li; Hayes, M.J.; Svoboda, M.D. and Heim, R.R. 2014. Are droughts becoming more frequent or severe in China based on the Standardized Precipitation Evapotranspiration Index: 1951-2010? *International Journal of Climatology* 34(3): 545-558.
- Yu, P.H. 2013. Ten challenges for China's new leader. *American Foreign Policy Interests* 35(2): 75-81.
- Zhang, H.; Wang, X.; You, M. and Liu, C. 1999. Water-yield relations and water-use efficiency of winter wheat in the North China Plain. *Irrigation Science* 19(1): 37-45.
- Zhang, Q. 2009. The South-to-North Water Transfer Project of China: Environmental implications and monitoring strategy. *Journal of the American Water Resources Association* 45(5): 1238-1247.
- Zhao, X.; Liu, J.; Tilloston, M.R.; Guan, D. and Hubacek, K. 2015. Physical and virtual water transfers for regional water stress alleviation in China. *Proceedings of the National Academy of Sciences* 112.4: 1031-1035.
- Zhang, Y. 2003. *China's emerging civil society*. Brookings Institution. Washington, DC: Center for Northeast Asian Policy Studies.
- Zhu, J. 2012. Drinking water remains a concern. *China Daily*, October 30, 2012. [www.chinadaily.com.cn/china/2012-10/30/content\\_15855802.htm](http://www.chinadaily.com.cn/china/2012-10/30/content_15855802.htm) (accessed 20 November 2012)
- Zhu, J. and Chao, L. 2012. China's major water project makes headway. *China Daily*, 6 April 2012.
- Zimmerer, K. 2010. Spatial-geographic models of water scarcity and supply in irrigation engineering and management: Bolivia, 1952-2009. In Goldman, M.J.; Nadasdy, P. and Turner, M.D. (Eds), *Knowing nature: Conversations at the intersection of political ecology and science studies*, pp. 167-185. Chicago, IL: University of Chicago Press.

---

THIS ARTICLE IS DISTRIBUTED UNDER THE TERMS OF THE CREATIVE COMMONS *ATTRIBUTION-NONCOMMERCIAL-SHAREALIKE* LICENSE WHICH PERMITS ANY NON COMMERCIAL USE, DISTRIBUTION, AND REPRODUCTION IN ANY MEDIUM, PROVIDED THE ORIGINAL AUTHOR(S) AND SOURCE ARE CREDITED. SEE [HTTP://CREATIVECOMMONS.ORG/LICENSES/BY-NC-SA/3.0/LEGALCODE](http://creativecommons.org/licenses/by-nc-sa/3.0/legalcode)

