



# Trans-boundary Water Cooperation in China

A Case Study of Hebei-Beijing district



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## Abstract

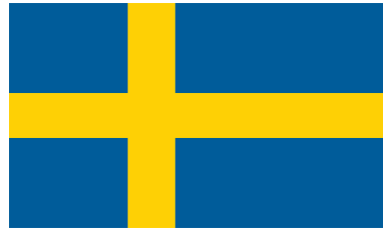
In recent years, much attention has been paid in the scientific literature and the policy community to the potential for conflict to arise as a result of environmental degradation. In China, studies warning of environmentally induced conflict in this country have predominantly ended with highly predicted outcomes rather than careful analysis of specific mechanisms by which cooperation could forestall violence. With specific regard to the claim of violent conflict arising from scarcity of water, the water-relationship between upstream Hebei province and downstream Beijing Municipality in the Hai river basin constitutes an exception to the norm in the sense that there is cooperation when we should expect conflict. This paper deals with this empirical gap at the intrastate level by exploring *how* and *why* water scarcities lead to cooperation between Hebei province and Beijing in the Hai river basin when we should expect conflict. In question form, my primary research problem can be expressed: ***How can we explain that self-interested intergovernments like Hebei province and Beijing Municipality are collaborating on scarce water resources?***

Methodologically, I chose a single-case method as a tool to demonstrate causality. Using a process tracing approach, I then went through my case in order to identify the intervening causal mechanism between the independent variable (water scarcity) and the outcome of the dependent variable (cooperation). To conduct my analysis, I cross-fertilized the environmental-cooperation theory with two of Nobel Prize winner Elinor Ostroms eight management principles and thereby created an analytical framework to apply on my case.

The result of the study is of significance for studies that seek to specify the conditions under which groups of users will cooperate or fight over resources upon which they depend. It demonstrates that water-related cooperation has been developed by an external authority rather than by voluntarily self-organization of the intergovernments in Hebei and Beijing. Contrary to Ostrom, this thesis highlight that an external authority – namely the State Council – has facilitated collective action through designed policies of incitement.



Sida



只有井水枯干以后，我们才能知道水的价值。

– Benjamin Franklin

## Preface

In my work with this thesis, I have had crucial help from several people and institutions. My debt of gratitude to them is of course great. They are:

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Finally, I wish to thank **Sanne Cavendish Nordström** and **family Svensson** who helped me in innumerable ways. Many other who are not listed here, I wish to thank for their support and help with this project.

***"Wherever there is a river, there is no water;  
Wherever there is water, it is heavily polluted"***  
– author **Mei Jie**

*This thesis is dedicated to*

Chinas people

*in the hope that this future – their future –  
will be more democratic and more sustainable than  
ours has been*

# Trans-boundary Water Cooperation in China

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<b>1</b>	<b>Presentation of Problem</b>	<b>5</b>
<b>2</b>	<b>Area of Research</b>	<b>6</b>
2.1	Social and Scientific Relevance	6
2.2	Statement of Purpose	7
2.3	Outline of Thesis	8
<b>3</b>	<b>Theoretical Framework</b>	<b>9</b>
3.1	Water Scarcity and Conflict	9
3.2	Water, Cooperation and Sharing of Benefits	10
<b>4</b>	<b>Research Design</b>	<b>16</b>
4.1	Definitions	16
4.2	Research Questions	16
4.3	Selection of Case	18
4.4	Method	19
4.5	Generalisation	20
<b>5</b>	<b>Bureaucratic Structures on Water Resources Management</b>	<b>21</b>
5.1	Legal and Institutional Background	21
5.2	Weakness in Local Environmental Protection Departments	23
5.3	River Basin Water Resources Management	24
<b>6</b>	<b>The Hebei-Beijing Case</b>	<b>26</b>
6.1	General Overview	26
6.2	The Decline of Guanting and Rise of Miyun Reservoir	27
6.3	Water Conflicts	28
6.4	From Conflicts to Sharing of Benefits	29
6.5	Eco-Compensation in Hebei-Beijing	31
<b>7</b>	<b>Analysis</b>	<b>34</b>
<b>8</b>	<b>Conclusion and Remarks for Future Studies</b>	<b>42</b>
<b>9</b>	<b>References</b>	<b>43</b>
9.1	Literature	43
9.2	Interviews	45

# 1 Presentation of Problem

The apocalyptic warnings of water wars have appeared frequently in scientific journals over the years. As the severity of water resources have intensified all over the world, so have the conflicts<sup>1</sup>. According to these theories there is a link between water and violence where strained environmental resources contribute to conflict. One notable researcher in the field has been Thomas Homer-Dixon who addresses the connection between environmental scarcity and violent conflict. According to him the likelihood of violent conflict is greatest when supply, demand and distributional sources of the scarcity of renewable resources interact<sup>2</sup>. Some of the research conducted for the construction of Homer-Dixon's theories has been made on China. Homer-Dixon mentions China as a particularly pivotal state because of high population growth, serious water scarcity and deforestation. He claims that these factors threaten to cause major internal violence or disintegrate the whole state in the future<sup>3</sup>. While a growing number of studies examine the relationship between environmental degradation and violent conflict, the equally important issue of how environmental strain can provide incentives for cooperation has rarely been subjected to systematic analysis<sup>4</sup>. Most research that has been undertaken on the issue of environmental cooperation suggests that international river basin management could enhance peace between countries. To make a contribution to the debate this thesis will focus on transboundary water resources at the intrastate level in Northern China.

As a result of population growth and industrial expansion in the north, China has experienced escalating water demands, further intensifying water shortage in these areas. This leads to competition over scarce water resources, especially in the transboundary regions of a river basin, which are generally under different political jurisdictions. The scarcity is greatest in the Hai River basin, which originates from the upstream Hebei province to downstream Beijing. Although these major stakeholders by this reasoning exhibit the conditions usually found in the definition of environmental scarcity indicating that competition over the resource is expected to produce violence, violent conflict has not occurred. *The purpose of this study is to explore how and why water scarcities lead to cooperation between Hebei province and Beijing in the Hai River basin when we should expect conflict.*

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<sup>1</sup> Conca, Ken., (2006), "The New face of Water Conflict" in Navigating Peace: No.3 p.1, Woodrow Wilson Center.

<sup>2</sup> Urdal, Henrik., (2008), "Population, Resources and Political violence: A Subnational Study of India, 1956-2002", Journal of Conflict Resolution, Volume 52 Number 4, p.594.

<sup>3</sup> Homer-Dixon, T.F., (1999), "Environment, Scarcity and Violence", Princeton University Press: Princeton p.19-21.

<sup>4</sup> Carius, Alexander., (2006), "Environmental Peacebuilding: Conditions for Success", Woodrow Wilson Center p.59. The article is adapted from a longer report prepared for the German Ministry for Economic Cooperation and Development, available online at [http://www.ecc-platform.org/images/adelphi\\_report\\_environmental\\_peacemaking.pdf](http://www.ecc-platform.org/images/adelphi_report_environmental_peacemaking.pdf)

## 2 The Area of Research

This thesis will start with a brief application of the scientific debate this study contributes to in terms of social and scientific relevance. Some of the recent research gaps will be explained and a context is opened for my study. I will then move on to present the purpose of the study.

### 2.1 Social and Scientific relevance

When formulating a research problem in social science, you often require that it must meet two requirements. It must be both socially relevant and of interest to the scientific community. Put another way: The problem must be grounded in both social and scientific relevance. My problem, which will become clear in no uncertain terms, is about fresh-water resources and its importance to life and livelihoods. We have passed the halfway point towards the 2015 target date for achieving the Millennium Development Goals, and despite progress, massive challenges remain. Millennium Development Goal 7 calls for halving the proportion of people without sustainable access to safe drinking water. While the world is on track to achieve the water target globally, large regions of the world and many countries lag behind, and some risk backsliding<sup>5</sup>. This is particularly the case in China where 300 million people are without access to safe water supply. According to Ma Jun, a leading Chinese water expert, several cities near Beijing and Tianjin, in the northeastern region of the country, could run out of water in five to seven years<sup>6</sup>. The increasing pressure on the limited freshwater resources makes greater and deeper knowledge of how to manage transboundary waters essential. Availability of water affects our everyday lives and how we manage this critical resource is something that we every day have a reason to consider. My study therefore fulfills the requirement of social relevance. How is it with the scientific relevance? My study meets the scientific requirement for two reasons.

*First*, the water scarcity is greatest in the Hai River basin, with 120 million inhabitants, including Beijing and Hebei province, which shows the highest population pressure on scarce water resources in China<sup>7</sup>. While the environmental degradation and the population dynamics indicate environmental scarcity and mirror the conditions said to lead to violent conflict – according to Homer-Dixon – violence has not occurred. Surprisingly, researchers know relatively little about why the dogs bark in some cases but not in others in the face of similar levels or forms of environmental scarcity<sup>8</sup>. Why does environmental scarcity produce conflict in some cases but not in others? My ambition is to challenge the veracity of the link

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<sup>5</sup> The United Nations World Water Development Report., (2009), ”*Water in a Changing World*”, p.vii. Available online at [http://www.unesco.org/water/wwap/wwdr/wwdr3/pdf/WWDR3\\_Water\\_in\\_a\\_Changing\\_World.pdf](http://www.unesco.org/water/wwap/wwdr/wwdr3/pdf/WWDR3_Water_in_a_Changing_World.pdf)

<sup>6</sup> Gang, Chen., (2009), ” *Politics of Chinas Environmental Protection: Problems and Progress*”, World Scientific Publishing CO: Singapore, p.7.

<sup>7</sup> The World Bank., (2009), ”*Addressing China’s Water Scarcity: A Synthesis of Recommendations for Selected Water Resource Management Issues*”, p.1. Available online at <http://books.google.se>

<sup>8</sup> Dabelko, Geoffrey., (2000), ” *Environment, Population and Conflict: Suggesting a Few steps forward*”, Environmental Change & Security Project Report. Issue 6, p.100.

between environmental scarcity and conflict by conducting an empirical study of a site whose scarcity conditions approximate those of cases used by proponents to underwrite their claims. This research attempts to address this empirical gap, drawing on fieldwork conducted by me in the Hai river basin between April and May 2010.

*Secondly*, my case study provides a window into the forces generating various forms of cooperation in the face of shared scarcity. This cooperation, the potential basis for environment confidence-building, represents an under-explored field. In the article "*Environment, Population, and Conflict: Suggesting a few steps forward*" Geoffrey D. Dabelko points to a needed direction for research that focuses on cases where environmental scarcity is present but a spectrum of outcomes from cooperation to conflict occurs<sup>9</sup>. This thesis makes a contribution to the debate by helping to resolve the conflict versus cooperation questions that have been asked repeatedly in this field.

## 2.2 Statement of Purpose

My primary research problem is to explore *how* and *why* water scarcities lead to cooperation between Hebei province and Beijing in the Hai river basin when we should expect conflict. For those readers who find it natural that the problem is formulated in question form, my primary research problem can be expressed: *How can we explain that self-interested intergovernments like Hebei province and Beijing Municipality are collaborating on scarce water resources?* More specifically, my problem is focused on understanding the causal mechanisms that connect water scarcity to cooperation. In explanatory respect the institutional dynamics will particularly be scrutinized. When this task is complete, it is also- I believe- possible to explain *how* and *why* the causal links work.

With theories on water cooperation at my hand, I will in other words explore how and why we find aspects of cooperation in a situation where conditions for environmentally prone conflict seem to exist. Although theories suggest that environmental strain can provide incentives for increased cooperation this topic lacks empirical evidence and is an area for future research. As stated by Conca: "*the substate level of analysis for environmental peacemaking clearly represents an area for future empirical and applied research in its own right*".<sup>10</sup> To make a contribution to the debate this empirical study will examine the outcome of water resource scarcity at the intrastate level between the capital Beijing and Hebei province located in the Hai river basin.

Before I continue, let me first define what I'm *not* going to do. I will not frame the environmental problem in security terms and discuss the advantages and disadvantages of linking environmental problems to security concerns. The environmental security debate will *not* be included in my thesis.

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<sup>9</sup> Dabelko, Geoffrey., (2000), "*Environment, Population and Conflict: Suggesting a Few steps forward*", Environmental Change & Security Project Report. Issue 6, p.101.

<sup>10</sup> Conca, Ken & Dabelko Geoffrey., (2002), "*Environmental Peacemaking*", The John Hopkins University Press: Baltimore and London, p.231.



## **2.3 Outline of the Thesis**

I will conclude this introductory chapter with a brief overview of the thesis structure. In the next chapter (3) I will deal with this study's theoretical framework. I will then present the case study and the choice of research strategy in chapter (4). Chapter (5) and (6) are empirical and several empirical "explanatory pieces" will figure. Some more systematic attempt for explanation will not be made here, but will be carried forward to chapter (7) – where the research question will be answered through an analysis linking the theory with the case study and a discussion of the situation. The final chapter (8) ends with conclusions and remarks on future studies.

### 3 Theoretical Framework

This chapter should be seen as a background to this thesis empirical part. I will address two strands of discourse, one highlighting water-conflict and the other focusing primarily on how trans-boundary water resources may reduce conflict and contribute to benefit-sharing. Finally, I will move on to discuss the cooperation-promoting factors that my empirical analysis is based on in order to provide the reader with some indicators of analysing water-cooperation.

#### 3.1 Water Scarcity and Conflict

Inequitable access to water can trigger conflict, especially if the water is embedded in larger conflicts of a high politics nature, or where limited economic diversification limits the range of policy options open to governments<sup>11</sup>. Although wars over water have not occurred, existing research suggest that environmental scarcity is most likely to be linked to violent conflict at the subnational level<sup>12</sup>.

It is well established that unregulated access to common pool resources results in unsustainable use, to the final disadvantage of all. The inevitable consequence is the overexploitation of the resource, damaging the ecosystems and the services they provide<sup>13</sup>. This theory corresponds well with Wallensteens definition of a conflict: "*a social situation in which a minimum of two actors strive to aquire at the same moment in time an availalbe set of scarce resources*"<sup>14</sup>. A river basin is a common pool resource, meaning that use of it by one rival will necessarily diminish the benefits available to others. In other words, water use in one part of the basin creates external effects in other parts. If these externalities are not "internalised", the overall benefits are reduced and the outcome is sub-optimal<sup>15</sup>. This is a particular problem with transboundary waters because upstream partiers may overuse the resource and downstream parties may be powerless to stop this, or to extract compensation. The question, then, is how rivals to transboundary rivers arrive at seeing the benefits from optimal water management, such that their interest coincide with cooperation?

In order to explain why and under which conditions rivals co-operate, it is useful to look at the theories which have been conducted about conflicts and their relation to scarcity of resources. First of all, let us start with a few notes on the concept of scarcity. Scarcity by

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<sup>11</sup> Öjendal, Joakim., (2006), "*Transboundary Water Cooperation as a tool for Conflict Prevention and for Broader Benefit-Sharing*", Global Development Studies No.4, p.40.

<sup>12</sup> Conca, Ken & Dabelko Geoffrey., (2002), "*Environmental Peacemaking*", The John Hopkins University Press: Baltimore and London, p.231.

<sup>13</sup> Öjendal, Joakim et al., (2006), "*Transboundary Water cooperation as a tool for Conflict Prevention and for Broader Benefit-sharing*", Global Development Studies No.4, p.40.

<sup>14</sup> Wallenstein, Peter., (2005), "*Local conflict and water: addressing conflicts in water projects*", Swedish Water House, Stockholm p.9.

<sup>15</sup> Qaddumi, Halla., (2008), "*Practical approaches to transboundary water benefit sharing*", Working Paper 292, Overseas Development Institute, p.1.

definition implies diminishing resources and/or a pressure on the supply of available resources from an increasing demand. Attempts to overcome scarcities are sought through two distinct mechanisms: supply-side regulation and demand-side regulation. Competition, however, also entails a potential for conflict. Combined with the two mechanisms for adapting to change we get the convenient four-field diagram below<sup>16</sup>.

Water conflicts by causes (right) and types (down):	Attempts to increase supply	Attempts to manage demand
	Conflicts between countries	(1)
Conflicts within countries	(3)	(4)

Source: Ohlsson (1999, 212)

Following this analytical framework of Leif Ohlsson, the argument of this paper is that; 3) driving forces for conflicts within countries at present are attempts to increase supply, resulting in competition between different sectors of society and different groups of population; but that 4) attempts to increase supply by necessity will be superseded by demand regulation; and consequently from a policy point of view the most important potential cause for conflicts over water will be mechanisms for conflict within countries caused by the new demand management practices necessitated by water scarcity<sup>17</sup>. From this analytical framework, one can make a distinction between two types of conflicts. Ohlsson makes a distinction between *first order* conflicts, which are those resulting from natural resource scarcity itself; and *second order* conflicts, which result from the adaptation strategies by which societies try to overcome natural resource scarcity.

### 3.2 Water, Cooperation and Sharing of Benefits

The previous section of this chapter identifies different categories of water conflicts and their intensity. Over the last decade, however, views have begun to emphasizing cooperation over scarce natural resources. Ken Conca highlights that common environmental threats is likely to lead to a positive interaction which builds trust between adverse societies. He suggests two general pathways by which environmental cooperation might occur: *changing the strategic climate* and the *strengthening post-Westphalian governance*. Since the second pathway applies more to the regional and international level than to the subnational, I will direct my attention to the cooperation-promoting factors in

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<sup>16</sup> Ohlsson, Leif., (1999), " *Water Scarcity and Conflict*", International Security Challenges in Changing World, Studies in Contemporary History and Security Policy Volume 3, p.211.

<sup>17</sup> Ibid., p.212.

the first "changing the strategic climate" pathway. Along this pathway, the premise of environmental cooperation would alter these dynamics by the following means:

- **Uncertainty reduction**
- **Promotion of more diffuse forms of reciprocity**
- **Lengthening the Shadow of the Future**

*First*, with regard to uncertainty, which includes technical complexity and rival forms of knowledge that make environmental cooperation difficult may also provide opportunities to create new cooperative knowledge. Taking advantage of these collaborative opportunities would give governments a better understanding of the extent of their economic and ecological ties. For example, environmental cooperation typically requires sharing of national data to construct a larger transboundary picture of a problem. These asymmetries in information create opportunities for mutual gain. Moreover, environmental collaboration can provide a low-stakes arena in which governments can establish patterns of transparency regarding their interests<sup>18</sup>.

*Second*, Conca argues that environmental cooperation demands diffuse forms of reciprocity. "Specific environmental problems typically involve upstream/downstream relationships or other asymmetries in the distribution of responsibilities and consequences. Even in the Classic Case of a "commons" or common property resource, it is rarely the case that all actors bear identical responsibility for environmental damage or that the resulting losses will be distributed in a purely symmetrical fashion. These asymmetries tend to create situations in which different actors bring very different types of goods to the bargaining table: the basis for cooperation tends to be more complex than simply asking each other to contribute in the same way and to accept the same benefits."<sup>19</sup> By this reasoning, overlapping ecosystemic interdependencies provide a chance to create opportunities for shared gains and establish a tradition of cooperation.

*Third*, a longer shadow of the future is when actors pay more attention to the future, when they value it more relative to present, and when they expect to engage in sustained interaction with one another. Even though short time horizons are common as power and profit often are significant aspects for those in power, environmental collaboration can lengthen the shadow of the future if the actors establish dynamic forms of cooperation that promises future benefits. Since environmental problems are future bound and surrounded with uncertainty, environmental cooperation provide public goods that will pay a stream of future benefits on a joint investment made today<sup>20</sup>. These circumstances push actors to extend the time horizon that frames the bargaining process.

As explained earlier, uncertainty is central to environmental policy. For most environmental problems, we have very limited knowledge of the underlying physical or ecological

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<sup>18</sup> Conca, Ken., (2001) "Environmental Cooperation and International Peace" in Diehl, P. F. and Gleditsch, N. P., "Environmental Conflict", Westview Press: Boulder and Oxford, pp.230-232

<sup>19</sup> Ibid., p.234

<sup>20</sup> Ibid., p.236

processes, the economic impacts of environmental change, and the possible technological changes that might occur and ameliorate the economic impacts and/or reduce policy costs<sup>21</sup>. These structural factors determines political actors discretions and shapes their policy options which can be both obstacles and opportunities towards cooperation. Put it another way – uncertainty can make the actors to choose to continue on the path that involves unilateral action, or it can act as an incentive for cooperation. The role of uncertainty in policy design is especially important for environmental problems that involve long time horizons. Long time horizon exacerbates the uncertainty over policy costs and benefits. For policy makers it will be difficult to justify almost any policy that imposes costs on society today but yields benefits only 10 to 20 years from now, so the size of the time horizon can be the make or break factor in policy evaluation<sup>22</sup>. We can therefore argue than an important dimension of collective-action problems<sup>23</sup> relating to water utilization is that the prospects for cooperation increases if parties sharing resources interacts over a long period of time, an interaction that is expected to continue into the future. If the *shadow of the future* is high enough (the actor assign a sufficiently high value to the expected payoffs from future collective-arrangements), then each actor is expected to choose the strategy of conditional cooperation<sup>24</sup>.

To solve the collective-action problem the concept of *benefit sharing* has been proposed as one approach to bypass the competing claims for transboundary water resources. The idea with benefit sharing is that if the focus is switched from physical volumes of water to the various values derived from water use – including *economic, political* and *environmental* – riparians will correctly view the problem as one of positive-sum outcomes associated with optimising benefits rather than the zero-sum outcomes associated with dividing water<sup>25</sup>. In the case studies of the report "*Transboundary Water cooperation as a tool for Conflict Prevention and for Broader Benefit-sharing*", the authors follow the framework of Sadoff and Grey (2002) when analyzing benefit-sharing in transboundary river basins. They identify three broad sets of benefits which are key motivating factors for decision makers:

- In the **security** arena, transboundary water management – river basin authorities with clear legal and organizational structures - can provide a platform for that civilization by reducing uncertainty and increasing the

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<sup>21</sup> Pindyck, Robert S., (2007) "*Uncertainty in Environmental Economics*", Review of Environmental Economics and Policy, volume 1, issue 1, pp.62.

<sup>22</sup> Ibid., p.60

<sup>23</sup> Defined as two rivals drawing water from a shared lake or river, and the resource is polluted and that each actor can clean it up unilaterally. Each actor prefers that the other do it, but the second-best preference is that they cooperate in cleaning it so that the the resource becomes usable again. For a further discussion on collective-action problems see: Benvenisti, Eyal., (1996) "*Collective Action in the Utilization of Shared Freshwater: The Challenges of International Water Resources Law*", The American Journal of International law, Vol. 90, No. 3, pp.390.

<sup>24</sup> Ibid., p.391.

<sup>25</sup> Qaddumi, Halla., (2008). "*Practical approaches to transboundary water benefit sharing*", Working Paper 292, Overseas Development Institute, p.1.

assurance of supply needed for future prosperity. For example, benefits may include reduced effects of hydrologic variability, flood and drought mitigation<sup>26</sup>.

- **Economic development:** The framing of the logic in the language of economic development means that common currency can be found *via* trade-offs that lead to benefit-sharing. In the economic sphere, a well-managed watershed will provide enhanced benefits in terms of trade, food production and livelihoods<sup>27</sup>. For example, the immediate benefits of cooperation might be reduced costs associated with flood control; the medium-run benefits, increased agricultural yields.
- In the **environmental** sphere, water is foundation for all sustainable economic activities, with strong contributing factors to social stability and human well-being. Benefits that cooperation could bring is improved environmental management and increased system-wide yields of water. All of these have economy-wide impacts, directly affecting productive output. For example, where rainfall is highly variable and riparians lack credible commitments, investment patterns will reflect risk-adverse behaviour as water users attempt to cope with uncertain supplies. Farmers will be hesitant to invest in land improvements and capital-intensive production technologies if there are no cooperative agreements with equitable utilization of the common water resource within a basin<sup>28</sup>.

In conclusion, Öjendal et al. conclude that a well-managed watershed can provide enhanced benefits in terms of *Security, Economic development* and the *Environment* – but maintains that benefit-sharing would be impossible without institutions<sup>29</sup>. In line with this, Aaron T. Wolf argues that levels of conflict or cooperation are largely determined by the institutional capacity within a basin. As stated by Wolf: "*The likelihood and intensity of conflict rises as the rate of change within a basin exceeds the institutional capacity to absorb that change*"<sup>30</sup>

I have now quite extensively described the main features of the theories on water cooperation. The question then is how the theories could be of use in *my* empirical study on transboundary water cooperation between Hebei province and Beijing. My starting point is

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<sup>26</sup> Öjendal, Joakim et al., (2006), "*Transboundary Water cooperation as a tool for Conflict Prevention and for Broader Benefit-sharing*", Global Development Studies No.4, p.174.

<sup>27</sup> Ibid., p.38.

<sup>28</sup> Qaddumi, Halla., (2008). "*Practical approaches to transboundary water benefit sharing*", Working Paper 292, Overseas Development Institute, p.4.

<sup>29</sup> Öjendal, Joakim et al., (2006), "*Transboundary Water cooperation as a tool for Conflict Prevention and for Broader Benefit-sharing*", Global Development Studies No.4, p.175.

<sup>30</sup> Wolf, T. Aaron., (2001). "*Transboundary Waters: Sharing Benefits, Lessons Learned*", Secretariat of the International Conference on Freshwater – Bonn 2001, p.10.

to direct my attention to the the *three* cooperation-promoting factors in Ken Concas "*changing the strategic climate*" pathway, which will be a part of my analysis protocol. *First*, rivals in a river basin will cooperate if they have mutual interests and stand to gain from coordinating their actions. Common interest, such as alleviating water scarcity, can provide actors with greater transparency, lower transaction costs through *uncertainty reduction* which is more cost-effective compared to gains associated with a non-cooperative behavior where actors attempt to cope with uncertain supplies. *Secondly*, cooperation is facilitated when a actor experiencing water scarcity provides side payments to the other party as an incentive. *Interdependence* is a motivation for cooperation since it facilitate a type of relationship in which neither rival may act without some type of coordination with the other party. The important lesson is that cooperation may emerge despite the self-interest of the rivals, provided that the interdependence of the parties induces them to exchange data, coordinate their policies, and abide their agreements. *Third*, water scarcity *extends the time horizons* rivals consider in their dealings. Intergovernments, like in my case, will act in a long-term way if high costs in the short-term promises future profits which outweigh these costs. Environmental problems such as water scarcity change actors "mental maps" by forcing decision makers to think about future generations.

In my view, all three factors are in line with Nobel Price winner Elinor Ostroms eight management principles. In her book "*Governing the commons, the evolution of Institutions for Collective action*", she raises the question under which conditions groups of users can be expected to cooperate and to internalize transboundary externalities and how institutions must be shaped in order to bring cooperation about. She illustrates eight principles on the managing of common-pool resources:

- 1. Clearly defined boundaries**
- 2. Congruence between appropriation and provision rules and local conditions**
- 3. Collective-choice arrangements**
- 4. Monitoring**
- 5. Graduated sanctions**
- 6. Conflict-resolution mechanisms**
- 7. Minimal recognition of rights to organize**
- 8. Nested enterprises<sup>31</sup>**

In my own list down below, I will place emphasis on two of her principles. Like I have said earlier, *interdependence* provides the main motivation to cooperate, but fears of cheating must be overcome for cooperative arrangements to ensue and subsequently hold. Similarly, Ostrom has argued that cooperation depends on the creation of institutional arrangements among groups of users– that *reduces uncertainty* and increase transparency<sup>32</sup>. In terms of Ostrom's principles, principle (4) *monitoring* and (6) *conflict-resolution mechanisms* are important institutional arrangements for my study. A fundamental feature of transboundary cooperation is the establishment of joint monitoring, which requires parties to define common information needs on the basis of their water management policies. Principle (4)

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<sup>31</sup> Ostrom, Elinor., (1990), "*Governing the Commons: The Evolution of Institutions for Collective Action*", Cambridge University Press: Cambridge, New York, Melbourne, p.90.

<sup>32</sup> *Ibid.*, p.33-36.

means in practice that I assume that those who have the supervising responsibilities in the Hai river basin concerning the water resource must act according to laws and rules. There are always users who sees an opportunity to escape from the obligations that are part of the system. If the users included in Hai river basin shall follow the rules, there must be *conflict-resolution mechanisms* (6) in a simple way to solve conflicts arising from water issues. With regard to conflict prevention, transboundary water cooperation is facilitated when there are institutions that can reduce the structural causes of conflicts concerning distribution and use by promoting for peaceful conflict settlement. Principle (4) and (6) on Ostroms list will therefore be an important guidance for my work.

The five factors I have now put forward will be on my analytical framework on page 16. For my own part, I am prepared for the fact that the empirical data can lead to a mechanism that I have not included on my analytical framework. The empirical test is therefore superior to my theoretical starting points.



## 4 Research Design

This chapter provide the reader with some information about the research design of the paper. I will start off with defining the variables and outline the research question that are to be answered in the study. This chapter then deals with selection of case, choice of research method and implications that the choice of research has on the possibility to generalise from the study.

### 4.1 Definitions

In order to explore how and why water scarcities lead to cooperation between Hebei province and Beijing in the Hai river basin – some general definitions have to be made.

- **River Basin:** Refers to the province that the river or its main tributaries passes through.

#### **Independent variable:**

- **Water Scarcity:** In this study, a community is considered to have scarce supplies of water if the annual availability of water is 1,000 cubic meters or less per person. In volumetric terms, 1000 m<sup>3</sup> per capita/year is taken as threshold for water scarcity, and 500 m<sup>3</sup> per capita/year is used as the threshold for "absolute water scarcity". This follow the proposals of Öjendal et al<sup>33</sup>.

#### **Dependent variables:**

- **Cooperation:** May be an arrangement between two governments for accomplishing a common goal or solving a mutual problem.

### 4.2 Research Questions

In section 2.2 above, I fully described my overall research problems. My primary research problem is to explore how and why water scarcity lead to cooperation between the intergovernments located in the same river basin. This research problem relates in particular to the causal question, in other words:

***- How can we explain that self-interested intergovernments like Hebei province and Beijing Municipality are collaborating on scarce water resources?***

In order to solve my primary research problem I have presented a list of factors for cooperation that appears to be exhaustive. It should be inserted in this context that the following list is not exhaustively describing *all* cooperation-promoting factors that exists in the field. My analytical framework will serve as a guide for my work but it does not mean that I am "locked" to it. Rather I will have an open approach to find other mechanisms in the field that are not included on my list. The empirical material is crucial and can backfire.

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<sup>33</sup> Öjendal, Joakim et al., (2006), "Transboundary Water cooperation as a tool for Conflict Prevention and for Broader Benefit-sharing", Global Development Studies No.4, p.24.

**Tabell 1. Analytical framework**

	<b>Further explanation</b>	<b>Yes</b>	<b>No</b>
<b>1. Reciprocal interdependence</b>	Are both intergovernments in a situation where they can attain mutually payoffs from cooperation?		
<b>2. Uncertainty reduction</b>	Is there more trust and less uncertainty now than earlier between Hebei province and Beijing?		
<b>3. Lengthening time horizons</b>	Are Hebei province and Beijing perceiving themselves to be part of a relationship that promises future benefits? Is the water scarcity forcing the intergovernments to think about future generations?		
<b>4. Monitoring</b>	Does the monitoring system has the adequate capacity for managing water resources in the Hai river basin?		
<b>5. Conflict-resolution mechanisms</b>	Are there any mechanisms for discussing and resolving conflictual water issues between Hebei province and Beijing?		

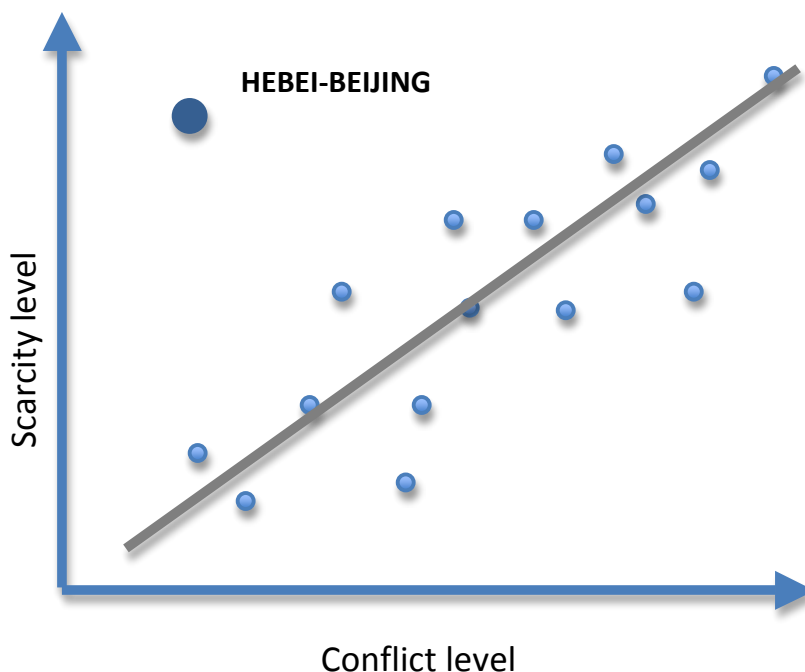
### 4.3 Selection of Case

The survey will revolve around one case. If a survey of such a character should have any general scientific interest the case must point out of itself. A common - and reasonable - requirement is that it becomes clear “what the study is a case of”. If this requirement is met the study is placed into an existing scientific context. What shall we then say that this study is a case of? To think in these terms is useful when planning your study, but you have to be explicit and systematic in determining this status.

As for my primary research problem, the water-relationship between upstream Hebei province and downstream Beijing in the Hai river basin is my focus in this study. The literature on natural resource management in shared river basins comprises many important studies that seek to specify the conditions under which groups of users will cooperate or fight over resources upon which they depend. Shared river basins (such as Hai river basin) present conditions similar to those that make river water so susceptible to conflict. With specific regard to the claim of violent conflict arising from scarcity of water resources, Hebei-Beijing constitutes an exception to the norm and can therefore be categorized as a deviant case compared to the environmental-conflict thesis. This study explores *how* and *why* this case does not follow the theorized trajectory in the sense that there is cooperation when we should expect conflict. Regarding my primary research problem I therefore meet the requirements for a deviant case since I cast light on the exceptional and the untypical in this research area.

There are good arguments for selecting deviant cases. If we analyze such *a* case and identify the underlying causes, there are reasons to believe that the theoretical propositions we reach have general aspects that can also say something interesting about *other* cases in the same category. My reasoning can be illustrated by my own figure down below.

**Figure 1.** A stylized Scarcity – Conflict relationship



## 4.4 Method

The criticisms of Thomas Homer Dixon and the Toronto Group's findings have been particularly on methodological grounds. Gleditsch claims, for instance, that the Toronto Group fails to select cases appropriately by choosing cases in which both the independent (*environmental scarcity*) and dependent variable (*conflict*) were known *a priori* to exist. Gleditsch additionally contends that this methodological approach violates a fundamental principle of research design that applies to both qualitative and quantitative analyses<sup>34</sup>.

Consequently, With this knowledge at hand I have chosen to work with a case study of qualitative nature since this method is considered to be the most appropriate when analyzing a contemporary event or process such as water scarcity leading to cooperation<sup>35</sup>. Indeed, in order to understand whether there are causal links between water scarcity and cooperation - and if there are, *how* and *why* these links work - it will be necessary to use the single-case method as a tool to demonstrate causality. Using a process tracing approach, I will then go through my case and sum up with an analyze. Methodologically, process tracing serves as a tool that attempts to identify the intervening causal mechanism between an independent variable (water scarcity) and the outcome of the dependent variable (cooperation)<sup>36</sup>. For my own part, I believe an inductive observation of apparent causal mechanisms are most appropriate because my case is a deviant case. This approach, process induction, is suited to the study of cases that have outcomes that are not predicted or explained adequately by existing theories<sup>37</sup>. With this case-study method (involving process-tracing) I want to be able to say *how* and *why* water scarcity lead to cooperation by tracing the causal mechanisms.

I will conclude this section with a brief outline of my fieldwork design. My case are analyzed through a 8 weeks field trip to Beijing and Hebei, where I will talk to people from a broad spectra of stakeholders, officials and researchers as practically possible. Moreover, to easily gain an overview of the cooperation in the area, I have chosen to specifically look at the situation in Beijing Municipality and Zhangjiakou city in Hebei.

Semi-structured interviews will be conducted with a fairly open framework which allows for two-way communication. Using semi-structured interviews, I can easily ask supplementary questions, deepen the discussion and develop the answers given. The information obtained from semi-structured interviews will not just provide me with answers, but the *reasons* for the answers which helps me to trace the causal mechanisms. Even though the analyze of the case is based on different kinds of data from different people, the same general

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<sup>34</sup> Homer-Dixon T.F., (2000), " *The Environment and Violent Conflict: A response to Gleditsch's Critique and some suggestions for Future Research*", Environment Change and Security Project Report. Issue 6, p.85.

<sup>35</sup> Yin, R.K., (1994) " *Case Study Research: Design and Methods*", Sage: London, p.23

<sup>36</sup> George, Alexander L & Bennet, Andrew., (2005), " *Case Studies and Theory Development in the Social Sciences*", Belfer Center for Science and International Affairs, MIT press p.206.

<sup>37</sup> George, Alexander L & Bennet, Andrew., (1997), " *Process Tracing in Case Study Research*", paper presented at the MacArthur Foundation Workshop on Case Study Methods, Belfer Center for Science and International Affairs, MIT press. Available online at <http://users.polisci.wisc.edu/kritzer/teaching/ps816/ProcessTracing.htm>

questions are asked in each interview.

## 4.5 Generalisation

I will now investigate the issue of generalisation, since this is the issue over which case study methodology has been most questioned. How are generalisations made from a single case? The possibility to say something about *how* and *why* water scarcity lead to cooperation in Chinese river basins in general is sharply reduced by the amount of cases. Although a qualitative case study never can be representative in a statistical sense, and thereby be criticized for not allowing for generalizations to be made, it does not mean that my generalized ambitions are being undermined. A *theory-reeled analytic* generalization can be made through induction<sup>38</sup>. In my case this is done through inductive theory-generation, or conceptualization, which is based on data from within a case. By identifying facts in my case I can develop a theory, consisting of a set of related concepts, in which generalisations are made.

Before moving on to the empirical section something needs to be said about the criteria for drawing conclusions. Based on my analytical framework there are two types of criteria I need to think about. First, I need to assess the degree of occurrence of each indicator in the analytical framework. Secondly, I need to decide how many indicators I need to find to say that the theory is supported or not. Since my study is of qualitative nature the indicators rests on reasonable thinking rather than absolute and quantitative criteria. I will therefore carefully consider each factor in the analytical framework and base my conclusions on those factors which stands out and differs from the amount in the sense that they receive more support from the interviews.

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<sup>38</sup> Johansson, Rolf., (2003), "Case Study Methodology", Methodologies in Housing Research organised by the Royal Institute of Technology, Stockholm p.8. Available online at <http://www.infra.kth.se/BBA/IAPS%20PDF/paper%20Rolf%20Johansson%20ver%202.pdf>

## 5 Bureaucratic Structures on Water Resources Management

This chapter deals entirely with the institutional and legal factors that hamper the Chinese government from being successful in water management and pollution control. I will specifically address the water challenges at the local level and the River Basin Commissions critical role on water management. On page 23, there is a figure of China's Water Management Apparatus, which will give the reader a general understanding of the country's political structure concerning water issues.

*"By understanding the governmental structure of China, we can start to understand why China is facing a water crisis."*

– Interview 4

### 5.1 Legal and Institutional Background

First, China is a country where the rights are centralized in the central government, that is the main characteristic of the Chinese government. Under the Constitution, ownership of water resources is exercised mainly through the Ministry of Water Resources as an organ of the State Council on behalf of the people<sup>39</sup>. The legal framework and institutional arrangements for water management has developed mainly within the past 20 years. Currently, China is undergoing a transition from "rule by law" to "rule of law". Historically, Chinese law has been based on "punishment" by which a ruler governs the governed ("rule by man")<sup>40</sup>. On the other hand, the "rule of law" is a western concept in which laws regulate the behavior of officials and "assumes the existence of rights", and is fundamentally inconsistent with the traditional way of Chinese thinking. Although the "rule of law" has been adopted as part of the Chinese legal framework in the last twenty years, laws are still widely seen in China as giving "power" to a ministry. As a result, ministries may draft laws in their area of competence and this process results in laws by ministries for ministries, which provides specific powers for the ministry concerned. Hence, there is a Water Pollution Protection and Control (WPPC) Law for the Ministry of Environmental Protection (MEP) and the Water Law for the Ministry of Water Resources (MWR). Much of the problem that faces these two ministries arises from the concept that "power" is vested in the ministry by virtue of "their" law, rather than in the western context where power is vested in the law which may be exercised by specific ministries acting in concert with other laws and other ministries<sup>41</sup>.

This concept of "power" is also reflected in their governmental structure which at first glimpse gives an impression of a system that is hierarchically clearly defined, with core

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<sup>39</sup> Interview 4; 15/04/2010

<sup>40</sup> Wang, Xuejun & Ongley, Edwin., (2004), *"Transboundary Water Pollution Management in China: The Legal and Institutional Framework"*, Water International, Volume 29, p. 271

<sup>41</sup> Ibid., p.272

leadership at the top and individuals linked to vertical ministries that control units from the centre to the local level. However, this hierarchical chain of organisation in the water management system is actually characterized by vertical and horizontal fragmentation<sup>42</sup>. *Horizontally*, at every level of government several institutions are involved in water management. At the central level, the NPC (National People's Congress) and the State Council play an overarching role through enactment of laws/regulations and supervising their implementation and coordination. Within this system, there are from the central level conflicts in responsibilities mainly between MWR and MEP since they don't know which problem should be treated by which department<sup>43</sup>. For example, even though water quality and quantity management are integrated issues they are separated from each other and put under MEP and MWR. The MWR is responsible for water allocation planning and water rights administration, whereas MEP is responsible for water quality- such as pollution prevention and control. The State Council is well aware of the severity of this institutional fragmentation and has promoted institutional transformation in order to solve integrated issues<sup>44</sup>.

However, this two track system is replicated at the local (province, prefecture, county) level. Water resource bureaus at the provincial level and water affairs bureaus (WAB) at the municipal level, which are overseen by MWR at the central level, are responsible for the administration of water rights, the planning and operation of water utilities, and the protection of water bodies on the basis of water function zones. Environmental protection bureaus (EPBs) overseen by MEP are responsible for issuing pollution permits, controlling pollution, and protection of water bodies on the basis of environmental water zones<sup>45</sup>.

*Vertically*, the water management system is also fragmented. This existing regime of water resource management is mainly based on administrative boundaries of different levels of government rather than at the river basin level. A ministry or a commission has the same administrative rank (*buji*) as a provincial-level government, which means that a ministry cannot tell a provincial government what to do. These functional units exist at the vertical chain through successively lower territorial levels of government. Individual functional units within this system receive administration guidance from their parent units above them; they are also subject to the leadership of the local governments to which they belong; but communication between functional units at the same territorial level has been very limited<sup>46</sup>.

One of the aspects that arises when studying legal and institutional issues in China is the importance of social stability, and how it influence policymaking. While this is a positive political component, it can lead to excessive secrecy, lack of transparency and arbitrary use

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<sup>42</sup> Heggelund, Gorild., (2004), *Environment and Resettlement Politics in China: The Three Gorges Project*, Ashgate Publishing Limited: England, p.50

<sup>43</sup> Interview 2; 08/04/2010

<sup>44</sup> Ibid.,

<sup>45</sup> The World Bank., (2009), *Addressing China's Water Scarcity: A Synthesis of Recommendations for Selected Water Resource Management Issues*, p.19. Available online at <http://books.google.se>

<sup>46</sup> Gang, Chen., (2009), *Politics of Chinas Environmental Protection: Problems and Progress*, World Scientific Publishing CO: Singapore, p.19

of authority<sup>47</sup>. A key to transforming China's water crisis may be using water more efficiently by public participation, but the potential for unnecessary social unrest created by environmental activists means that green movements rarely coincide with existing political boundaries. The prognosis might change, however, since China is permitting the formation of social movements on the condition that they become legal entities by registering with the government<sup>48</sup>. Let us now turn to explain China's local environmental protection apparatus.

## 5.2 Weakness in Local Environmental Protection Departments

Besides the central level, environmental protection bureaus at various local levels are also in a disadvantageous position when performing their duties. In all cases, it is the local government, not the higher levels of the environmental protection apparatus, that provides local environmental agencies with their annual budgetary funds. Thus, the ability of EPBs or WABs to enforce laws is compromised by their dependency on local government for their authority and budget. It is not surprising, therefore, that there are many complaints about the inadequacy of pollution or water saving enforcements when it is not in the economic interests of the local government<sup>49</sup>. The GDP-measurement takes a very high proportion in the evaluation of intergovernments. High-speed GDP-growth not only is an important index to measure local official's performances linked with their future job promotions, but also increases local fiscal revenues and benefits local officialdom materially as a whole<sup>50</sup>. According to Interview 4 there is a clash between GDP-growth and ecological activities in China. Since the intergovernments have been regarding the economic growth as their top-priority, they need many productive activities to increase people's short-term living standard in order to legitimize its own governance. These productive activities are very highly related to water-consumption, which imposes huge environmental pressures upon ecological systems.

This dilemma can be highlighted between Beijing City and its upstream water-supplier Zhangjiakou City in Hebei province. In order to save water to the Chinese capital several measures have been taken which has restricted the economical development of Zhangjiakou<sup>51</sup>. As stated by Interview 4:

*"If Beijing helps Zhangjiakou to develop there will be much more economic development, but the water will be even more polluted which will threaten Beijing's water-safety. On the other hand, if Beijing does not help them they will always be under-developed which could trigger disgruntled rural people to move to urban areas and increase the per capita water*

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<sup>47</sup> Wang, Xuejun & Ongley, Edwin., (2004), "Transboundary Water Pollution Management in China: The Legal and Institutional Framework", Water International, Volume 29, p. 272

<sup>48</sup> Lieberthal, Kenneth., (2004), "Governing China: From Revolution Through Reform", W\*W\*Norton & Company: New York, London – Second Edition, p.288

<sup>49</sup> Wang, Xuejun & Ongley, Edwin., (2004), "Transboundary Water Pollution Management in China: The Legal and Institutional Framework", Water International, Volume 29, p. 273

<sup>50</sup> Gang, Chen., (2009), "Politics of China's Environmental Protection: Problems and Progress", World Scientific Publishing CO: Singapore, p.23

<sup>51</sup> Interview 4; 15/04/2010



*consumption. However, there is a way we can realize this – and that is if we can find the value of the ecological environment and internalize this into our welfare calculations. This would encourage and give incentives for the governments, villages and farmers to fight for a better environment”*

A further problem is the fact that polluting enterprises can avoid compliance of strict environmental standards by keeping good relations (*guanxi*) through bribery in forms of cash<sup>52</sup>. Corruption is in this regard understandable because at this level the industry is typically an extremely powerful political actor, due to its employment and financial contributions.

### **5.3 River Basin Water Resources Management**

As subordinate institutions of MWR, China has long had seven river-valley commissions to work on the integrated development of entire river basins. Such commissions exist for the Hai river basin and this institution are authorized by MWR to manage water resources in the river basin. Theoretically speaking, the HRBC is an integrated institution, but when it comes to practice this commission has limited power because it doesn't have the authority to issue orders to the provinces that fall within their jurisdiction<sup>53</sup>. Since each province has the same rank as MWR, moreover, the commission lack any direct route for exercising executive authority in the river basin. Furthermore, the river basin commissions, which have no formal links to the EPBs have no responsibility for pollution planning or management and are unable to implement comprehensive integrated water resource planning and management<sup>54</sup>. At the same time, for each RBC, the commissioner is appointed by the ministry: there is no commission board or board of directors, and the provincial governments have no role in their governance<sup>55</sup>. This means that the management strategies is mainly top-down centric with no inclusion of stakeholders and weak local engagement. As stated by Interview 2:

*“At the moment the Hai River Basin Commission is a weak institution, it is just a representation of the MWR and it represent the opinion from the central government. It doesn't consist of experts or stakeholders from various districts. There are no experts or officials from the governments in Beijing or Hebei province representing the commission.*

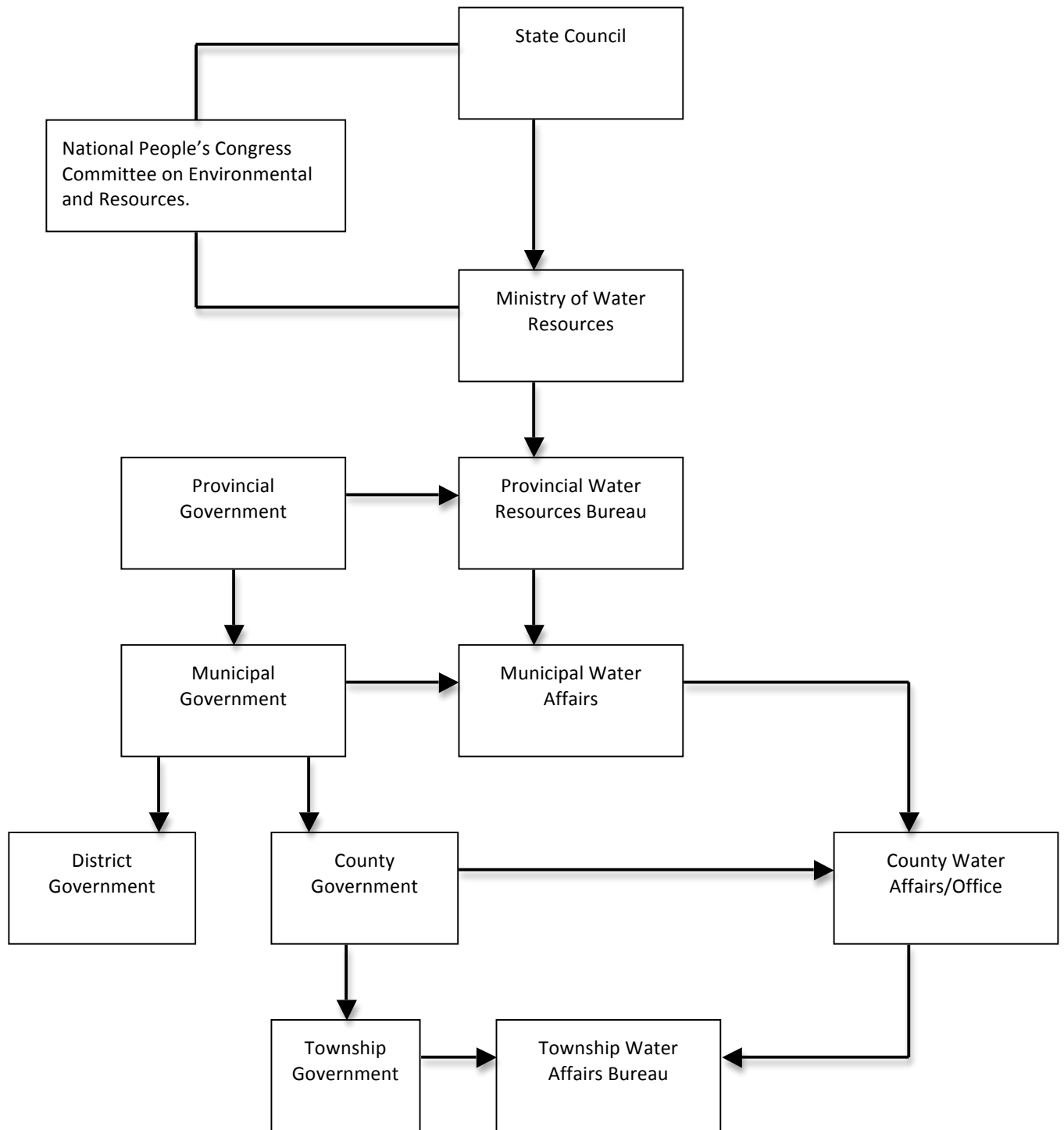
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<sup>52</sup> Gang, Chen., (2009), *“Politics of Chinas Environmental Protection: Problems and Progress”*, World Scientific Publishing CO: Singapore, p.18

<sup>53</sup> Interview 2; 08/04/2010

<sup>54</sup> Wang, Xuejun & Ongley, Edwin., (2004), *“Transboundary Water Pollution Management in China: The Legal and Institutional Framework”*, Water International, Volume 29, p. 273

<sup>55</sup> Shen, Dajun., (2009), *“River basin water resources management in China: a legal and institutional assessment”*, Water International, volume 34, No.4, p.492



 Leadership Relationship  
 Advisory Relationship

**Figure 2.0 China's Water Management Apparatus**

Source: Adopted from Chen Gang 2009:20

## 6 The Hebei-Beijing Case

It is now time to consider the cooperation situation between Hebei province and Beijing over the scarce water resources along the Hai River. The data presented down below derives from a 8-week field trip to Beijing and the cities of Zhangjiakou, Shijiazhuang in Hebei province. I will start with a historical description of how the water crisis developed in the Hebei-Beijing district in order to give the necessary background information to the reader. I will then move on to present water conflicts in the district and especially highlight the cooperation between Hebei-Beijing.

### 6.1 General Overview

Beijing Municipality is located in the dry northeast edge of the Northern China in central Hebei province. Since 1958, the Chinese capital and its rural land were expanded to cover a total area of 16,400 km<sup>2</sup>.<sup>56</sup> While Beijing plays an important role in Chinas national political and economic development, its expansion since 1958 has come at a serious ecological cost for Hai river basin. About 90 percent of the surface water flowing through Beijing comes from rivers and streams outside the municipality in neighbouring regions – Hebei province, Shanxi province, and Inner Mongolia<sup>57</sup>. All are part of the much larger Hai river basin which ranks as the most water shortage river system in China. Within Beijing municipality, the average annual renewable freshwater supply available per person is less than 300 m<sup>3</sup>.<sup>58</sup> Beijings surface water supply comes mainly from two sources: Yongding river and Chaobai river. Both rivers are located in the upstream of Hebei province and are managed by the city-authorities Zhangjiakou and Chengde. This strategic-geographical position makes Beijing and its upstream districts closely interconnected<sup>59</sup>. In the light of drought and the decline of freshwater supply due to withdrawals in upstream areas, it is not surprising that competition over water use and distribution between Hebei-Beijing have become more serious. However, in recent years, this intergovernmental situation has more and more been transformed into cooperation.

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<sup>56</sup> Interview 7; 23/04/2010

<sup>57</sup> Qing, Dan., (2008), "Beijings Water Crisis: 1949-2008 Olympics", Probe International, p.3, available online at [www.probeinternational.org](http://www.probeinternational.org).

<sup>58</sup> Interview 2; 08/04/2010

<sup>59</sup> Interview 7; 23/04/2010

## 6.2 The Decline of Guanting and Rise of Miyun Reservoir

*“China’s policy makers have no choice: we must switch from supply-side management to demand-side management”*

– Interview 8

Today, two-thirds of Beijing’s total water-supply comes from groundwater. The rest is surface water coming from 85 reservoirs and rivers. The municipality’s two largest reservoirs, Guanting and Miyun, are under jurisdiction of Zhangjiakou and Chengde city in Hebei province. About 97 % of the Guanting reservoir and its huge catchment area of 43,402 km<sup>2</sup> are located in the neighbouring provinces<sup>60</sup>. According to the initial design Guanting reservoir had a planned storage capacity of 4,16 billion m<sup>3</sup>, but in recent years the storage has been reduced to less than 1,3 billion m<sup>3</sup>.<sup>61</sup> When the reservoir was constructed in 1954, planners obviously did not take into consideration the economic development and rising water demand for agricultural irrigation and industries in Beijing’s neighboring provinces Hebei and Tianjin. In the 1970s, the construction of 248 small reservoirs as well as intensive groundwater mining caused a considerable reduction of Guanting’s inflow. Severe pollution by untreated sewage from the cities of Zhangjiakou and Datong decreased the water inflow to Beijing<sup>62</sup>. In 1997, the Guanting reservoir had become too polluted to use as a source of drinking water, which led Beijing to close it down from providing water to Beijing’s urban supply. The Water Resource Bureau of Beijing Municipality initiated several projects to improve the water quality of the polluted reservoir, such as building wastewater-treatment plants and closing down polluting factories in Zhangjiakou and Chengde. According to Beijing officials these measures have taken great effect and the inflow to Beijing can now be used for urban supply again.

With deteriorating water quality of Guanting reservoir and the depletion of groundwater tables in urban areas, Miyun reservoir became increasingly important for Beijing in the 1980s<sup>63</sup>. With a total watershed area of 15, 788 km<sup>2</sup>, 2/3 of the areas in Zhangjiakou and Chengde, and a capacity of 4,38 billion m<sup>3</sup> - it was mainly responsible for providing water to rural areas in Beijing, Hebei and Tianjin<sup>64</sup>. In 1981, there was a prolonged severe drought and the decision was made that the two big reservoirs were no longer going to supply the downstream regions but only Beijing. At that time a conflict emerged between Beijing and Tianjin. In situations like this, even though the political structure doesn’t allow any province to impose its will on any other province, Beijing, as the capital of the country, have administrative help from the central government<sup>65</sup>. Consequently, this conflict induced the State Council to assure Beijing rights to the reservoirs, and as an exchange a water-diversion

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<sup>60</sup> Ibid.,

<sup>61</sup> Interview 4; 15/04/2010

<sup>62</sup> Peisert, Christoph & Sternfeld, Eva., (2005), “Quenching Beijing’s Thirst: The Need for Integrated Management for the Endangered Miyun Reservoir”, China Environment Series – Issue 7, p.35, available online at [www.wilsoncenter.org](http://www.wilsoncenter.org)

<sup>63</sup> Ibid.,

<sup>64</sup> Interview 3; 09/04/2010

<sup>65</sup> Interview 8; 05/05/2010

project from the Luan River was built to Tianjin. From that time and on, water from Miyun was only reserved for domestic use for Beijing and would neither be used to supply industry or agriculture<sup>66</sup>. In the last decade, the capacity of Miyun reservoir has declined sharply. According to Interview 4 can the reservoir at the moment just hold as much water as 960 million m<sup>3</sup>, which is less than ¼ of the original capacity<sup>67</sup>.

I have stated here a brief review of how Hebei province and Beijings water crisis arose, which entirely has been handled in a technical way; find or make more water supplies. The strong water-supply management strategy from China's policy makers can also be exemplified in the 40 billion dollar-project: the South to North Water Diversion Project (SNWD). The SNWD will transfer water northward from the Yangtze River system. Construction of the "middle route" began in 2003 and is supposed to divert up to 14 billion m<sup>3</sup> to the North in 2010, but it has been delayed due to environmental and cost concerns and will be completed in summer of 2014. So the project will bring some short relief since 72 counties of Hebei province, 80 % of the area, and 90 % of the area of Beijing will be able to have sufficient water if the project is succeeded. In the long term, however, northern China must make drastic efficiency gains if it doesnt want to risk to dry up<sup>68</sup>.

### 6.3 Water Conflicts

Managing water resources over jurisdictional boundaries have become a demanding task of the Hebei provincial and Beijing government. The two main water conflicts stemming from the rivalling authorities have been:

1) **Conflicts over distribution and quality:** Since 70-80 % of the surface water supply to Beijing comes from Miyun and Guanting reservoir, which to a great part belongs to Hebei province, the water quantity and quality of these reservoirs depend on the water use in this province<sup>69</sup>. To evaluate the responsibilities and benefits enjoyed by the beneficiaries is an issue disputed between Hebei and Beijing. Authorities in Hebei maintain that those benefiting from both quantity and quality of water should pay – and therefore Beijing should pay them a compensation for delivering water to Beijing. On the other hand, Beijing's position is that those polluting the water should pay<sup>70</sup>. Consequently, officials in Beijing have argued about the heavily polluting factories in upstream Zhangjiakou and Chengde. The behaviour of both intergovernments can be termed as a "free-rider problem". That is, although both parties have an interest in the water quantity and quality in the Hai river basin, it is in the specific interest of each intergovernment for both intergovernments

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<sup>66</sup> Ibid.,

<sup>67</sup> Interview 4; 15/04/2010

<sup>68</sup> Interview 6; 20/04/2010

<sup>69</sup> Interview 3; 09/04/2010

<sup>70</sup> Peisert, Christoph & Sternfeld, Eva., (2005), "Quenching Beijing's Thirst: The Need for Integrated Management for the Endangered Miyun Reservoir", China Environment Series – Issue 7, p.35, available online at [www.wilsoncenter.org](http://www.wilsoncenter.org)

to sacrifice in order to achieve that collective interest. In this context, each intergovernment will stick to their “principle” and basically “free-ride” on the water quality cleanup of the other. Why should Hebei clean up its polluting actions when there is no way to receive compensation from Beijing that benefit downstream? Why should Beijing give compensation to Hebei when water resources are heavily polluted from upstream Hebei?

**2) Beijing restricting Hebeis upstream districts development:** Heavily industrialized areas in upstream Chengde and Zhangjiakou of Hebei have contributed significantly to Beijings headaches in the past. That this has been the case is not surprising – with 3656 and 3286 (RMB) as an annual net income per capita for rural people in Zhangjiakou and Chengde, these areas demonstrates a huge contrast to wealthy Beijing whose annual net income per capita was 10747 (RMB) for rural people in 2008<sup>71</sup>. This pollution-burden on Beijing led to the establishment of water protection zones under the 1985 and 1995 regulations, which strongly restricted the economical boom in upstream districts of Hebei. As Beijings development has gradually increased since then, so has Beijings desire to get water from Hebei increased. While the upstream areas of Hebei need rapid development to reduce the economic gaps, and as result, water use and sewage discharges has increased. In this condition, there is a clash between GDP-growth and ecological activities which is at the center of urban-rural conflicts in China and highlights an issue that the Central government so far has not a complete solution to<sup>72</sup>.

## 6.4 From Conflicts to Sharing of Benefits

In the beginning of 21 century, the Central government began to feel the urgent need to address the ecological issues caused by the regions rapid economical growth. That the water crisis in the early 2000:s is an issue on the rise is obvious. In lesser than 60 years Beijing has been transformed from relative water abundance to water crisis. The political reaction to its water crisis was set by this internal crisis together with an external factor, namely the Olympics bid victory in 2001. In the face of the present water crisis and conflicts, the success of the Olympics beating functioned as a catalyst which gave the State Council the power to implement the “*Plan for Sustainable Water Utilization in Early 21st Century (2001-2005)*”<sup>73</sup>. This plan paved the way for better coordination and fewer conflicts in the region by promoting projects of water conservation and pollution control in the upstream water source areas like Hebei and Beijing. One of the main purposes of the plan was to make sure the sustainable usage of the water resources among these districts, as well as economic development in both districts<sup>74</sup>. The State Council’s plan required that payments in water resource projects within Beijing and Hebei mainly be financed by the intergovernment’s budgets, with adequate support from the central government. The central government subsidized 875 million dollars, while the Beijing municipality invested

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<sup>71</sup> Interview 3; 09/04/2010

<sup>72</sup> Interview 4; 15/04/2010

<sup>73</sup> Interview 1; 05/04/2010

<sup>74</sup> Interview 7; 23/04/2010

1.875 billion dollars in the projects of environmental construction and pollution control in the upstream of Miyun and Guanting reservoirs. For Miyun and Guanting reservoirs in the planning, Hebei province invested 498 million dollars through 164 sub-projects including agricultural and industrial water saving, water and soil conservation, pollution control, capacity building, etc. To enhance the real-time monitoring of water quantity and water quality in the cross-province boundaries and strengthen capability building of planning implementation, the Hai River Basin Commission was authorized to set up a system for water quantity and quality monitoring. The implementation of the projects were, however, weak and no long-term effective payment mechanism was established that could keep the cooperation enduring<sup>75</sup>.

In the beginning of 2005 “suggestions for Water Rights Transfer policies” was made by MWR who defined water right transfer as the transfer of access rights to water resources<sup>76</sup>. The distribution of water-user rights and the initiative of new fairer economic mechanisms, such as water price bargaining – promoted watershed environment improvement in the Hebei-Beijing region<sup>77</sup>. Although the policies from 2001 indicate that financing sustainability is a concern, the plan from 2001 together with the Water Law 2002, Water Rights Transfer and initiatives such as water-price bargaining have all been significant policy-steps in establishing a framework of cooperation between Hebei-Beijing. As stated by Interview 2:

*“These policies have slowly transformed the traditional administrative mechanisms to more fair and market dependent mechanisms. As here we can see bargaining, the phenomenon of bargaining and Hebei has definitely gained benefits.”*

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<sup>75</sup> Haixia Zheng & Lubiao Zhang., (2006), ”Chinese Practices of Environmental Compensation and Payments for Ecological and Environmental Services and its policies in River Basins”, Worldbank, p.30, available online at <http://siteresources.worldbank.org>

<sup>76</sup> Liu Guihuan & Zhang Huiyuan., (2008), ”Chinese Policies and Practices regarding Payments for Ecological Services in Watersheds”, Chinese Journal of Population, Resources and Environment, Vol. 6 No.1, p.38.

<sup>77</sup> Interview 2; 08/04/2010

## 6.5 Eco-Compensation in Hebei-Beijing

*“Ultimately, if the cooperation should subsequently hold in the future there must be “win-win” outcome for both parties”*

– Interview 7

Following the creation of institutionalized approaches in 2001-2005, a shift in the focus of these policies took place when politicians were increasing their focus on eco-compensation mechanisms in the country’s development plans. In April 2006, Premier Wen Jiabao stressed in his speech at China’s 6<sup>th</sup> National Conference on Environmental Protection that *“the policy and mechanism for eco-compensation will be established and improved in accordance with the principle of who exploits conserves, who damages pays, who benefits compensates and who pollutes pays”*. The State Council’s Decision on Strengthening Environmental Protection for Scientific Development issued in December 2005 - also mirrors the commitment to come up with innovative mechanisms to address environmental and ecological imbalances of all stakeholders involved. It required that *“eco-compensation mechanisms should be established as quickly as possible, and the central and local government budgets should include eco-compensation elements, and pilot work in eco-compensation must be under-taken at national and local level”*. In China’s eleventh five-year plan for economic and social development (2006-2010) also required eco-compensation should be considered in the transfer and payment of central and local finance<sup>78</sup>.

This policy-change paved the way for a Water Resource and Environment Coordination Committee with Zhangjiakou, Chengde and Beijing in 2005 - which formulated Management Practices of the Treatment Funds for the Water Resource and Environment in Beijing and its neighboring area. The compensation was mainly provided by the Central government in the form of transferred payment while complemented by some funds from Beijing Municipality. It covered two areas. One was mainly in the form of transferred payment to control water environment pollution in Guanting and Miyun Reservoir, while the other payment was to develop water-saving industries in Zhangjiakou and Chengde. From 2005 to 2009, Beijing spent 100 million RMB to compensate for the costs and losses in the protection in the headwaters of Guanting and Miyun reservoirs<sup>79</sup>. Furthermore, with the relevant policies designed by the central government - a policy platform was now set up to make eco-compensation possible between Hebei-Beijing. Such a mechanism had been proposed for a long time by both Zhangjiakou and Chengde who wished to establish a “mechanism of payment for water utilization based on water value” by means of “linking water to benefits”. A significant breakthrough at the provincial level was made in October 2006 when the Beijing government paid money to compensate Hebei for water obtained from the province.

In 2006 and 2008, the governments of Beijing and Hebei signed the *Memorandum on Consolidation of Cooperation in Economic and Social Development*, listing the cooperation programs in nine aspects, including construction of transportation infrastructure, protection of water resources and ecological environment<sup>80</sup>. Following this cooperation, Beijing signed

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<sup>78</sup> Guihuan Liu & Jun Wan., (2008), *“Eco-Compensation Policies and Mechanisms in China”*, BlackWell Publishing Ltd, Volym 17 p.235.

<sup>79</sup> Interview 1; 07/05/2010

<sup>80</sup> Ibid.,



an agreement with Zhangjiakou and Chengde in which compensation was being provided to those farmers who gave up water-use-intensive farming. With this, Beijing would gain around 50 million more square metres of water and local farmers in Hebei would be compensated 50 million RMB annually within the first two-year period of the agreement<sup>81</sup>.

Since 2006, the transition from rice-growing to dry land farming has been launched in Chaobai river drainage area and Chicheng county of Zhangjiakou city who have transformed 17.4 thousand mu (1 mu=666.7 m<sup>2</sup>). From 2007 to 2008, a total area of 103 thousand mu has been transformed in Chicheng county of Zhangjiakou, Fengning and Luangping county in Chengde city. Any kind of fertilizer and pesticides were forbidden in order to control the pollution, and as a payment for this burden Beijing compensated the local farmers with 400 RMB/mu in 2006, 450 in 2007 to 550 in 2008<sup>82</sup>. In addition to the Crop-pattern Change Program, the government of Zhangjiakou proposed a "*Transboundary Water Environmental Protection and Information Sharing System Construction Program*" in 2006. The program started in October 2007 and investment added up to 23 million RMB where Beijing would afford 12 million. Emphasis was put on capacity building to share water environment information between Zhangjiakou and Beijing and to cope with emergencies in the transboundary area by constructing a monitoring system. These policies, which attempts to increase the knowledge-generating capacities, have all in all created cooperative knowledge between Zhangjiakou and Beijing<sup>83</sup>.

Although the water quantity and quality of Zhangjiakou has been improved significantly since the Crop-pattern project was implemented<sup>84</sup>, the payment for environmental services upstream is not sufficiently transparent and doesn't include mechanisms that directly reward upstream farmers. According to some farmers in Houcheng town of Chicheng county the project is compulsory and only a small amount of the compensation was transferred to the farmers for their water protection activities. Moreover, the criteria is too rigid which discourage farmers who are growing less-water-intensified crops all the time. For example, farmers who grew corn before the project started will be excluded from full compensation since they will not have to change their crop-pattern from rice to corn.<sup>85</sup> Another problem is that a large amount of the compensation is mainly in form of projects. According to sources from Beijing officials, Hebei and Shanxi provinces organized a large scale water diversion to Beijing in last October 2009. The transfer of 44 million cubic meters of water was fulfilled under the coordination of MWR while the Beijing municipal government provided the compensation in the form of funds and projects, rather than water resource compensation<sup>86</sup>. This highlights that a formal payment from Beijing to Hebei based on present water issues exists but has not yet been developed into a criteria of payment that are acceptable to relevant stakeholders or been sufficiently institutionalized.

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<sup>81</sup> Guihuan Liu & Jun Wan., (2008), "*Eco-Compensation Policies and Mechanisms in China*", BlackWell Publishing Ltd, Volym 17 p.239.

<sup>82</sup> Interview 11; 12/05/2010

<sup>83</sup> Interview 9; 10/05/2010

<sup>84</sup> Ibid.,

<sup>85</sup> Interview 10; 11/05/2010

<sup>86</sup> Interview 1; 05/04/2010

On the other side of the coin, this is the first mechanism of eco-compensation established between provinces in China in which monetary compensation was provided by the lower reaches to the upper reaches for the measures taken to save water<sup>87</sup>.

From the above, some lessons can be carried out from the current eco-compensation mechanisms between Beijing and Hebei province. Despite successful steps at the provincial level, it is evident that both ecological compensation in the form of transferred payment from the Central government in 2005-2009 and the compensation mechanism designed by Beijing and Hebei in 2006/2008 – faces challenges. These are as follows:

- 1) **The implementation of eco-compensations mechanisms need to be further strengthened.** First of all, a lack of legislative support in this regard presents difficulties for Hebei-Beijing to implement eco-compensation. Some laws and regulations have general rather than clear and concrete stipulations for ecological compensation. For example, Water Pollution Prevention Law defines that *“The Government shall set up ecological compensation mechanism in the form of transferred payment for the sourcing area of drinking water and the upstream area along the rivers, lakes and reservoirs.”* So far, there are no detailed regulations for the implementation of this stipulation that intergovernments can refer to.
- 2) **Financing sustainability is a concern since no long-term mechanism is guaranteed.** The ecological construction project invested by the Central government does not have the long-term perspective or the coordination mechanisms between various departments. The ecological compensation for the upstream areas of Guanting and Miyun reservoirs are mainly undertaken by forestry, water resources and environmental protection agencies, without a coordinated mechanism that can integrate the stakeholders involved.
- 3) **Lack of clarity of who benefits and who should pay for the ecosystem services.** Since there is no long-term compensation mechanisms for the ecological cooperation between Beijing and Hebei province, which clearly defines the scope of benefits and responsibilities, it is hard to track down the responsible party once the compensation program for water quantity and quality fails. This pattern of diversified compensation from Central government and Beijing Municipality to Hebei - has not yet reflected the principle of “who benefits, who compensates”<sup>88</sup>.

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<sup>87</sup> Guihuan Liu & Jun Wan., (2008), ” *Eco-Compensation Policies and Mechanisms in China*”, BlackWell Publishing Ltd, Volym 17 p.239.

<sup>88</sup> Interview 1; 05/04/2010

## 7. Analysis

This chapter deals with my research question which will be answered through an analysis linking the theory with the case study. I will analyse the case with my analytical framework and by doing so also answer the research question: ***How can we explain that self-interested intergovernments like Hebei province and Beijing Municipality are collaborating on scarce water resources?***

### 1. Reciprocal Interdependence

As discussed in chapter 3.2, *reciprocal interdependence* is one of the basis for the analytical framework in this thesis. The interesting question then becomes: *Are both intergovernments in a situation where they can attain mutually payoffs from cooperation?*

Both the *Memorandum on Consolidation of Cooperation in Economic and Social Development* in 2006 and 2008 between Hebei-Beijing are procedures for cooperating to realize the optimal use of scarce water resources in the same region. To some extent, these agreements confirms interdependence. The upper reaches of Hebei are of strategic importance to Beijing due to its position for ecosystem health downstream. Beijings economic power is also important to Hebei to strengthen its economy. That is, because the payoffs for overexploitation has become highly negative in the upstream/downstream relationship, the dominant strategy of Hebei-Beijing has become cooperation. This observation implies that the interdependence of the intergovernments have induced them to exchange data and coordinate their policies by signing agreements in 2006 and 2008. Furthermore, convergence towards a cooperative agenda has resulted in benefits-sharing to both parties. The first type of benefit derived from the cooperation is better water-management, providing benefits to upstream Hebei and downstream Beijing in terms of water quality and quantity<sup>89</sup>. Even if both sides arrive at seeing the benefits from water management, the outcomes are not equitable. On the one hand, Beijing Municipality has provided particular compensations to the upstream Hebei districts who make ecological services to Beijing. On the other hand, Hebei has mainly received compensation in the form of projects and not through an arrangement where the costs and benefits are articulated in a legal way that is evenly distributed to the stakeholders involved. For example, the Crop-pattern Change Program was mandatory and meant no adequate payments to farmers who switched their crop-pattern from rice to corn. This skewed distribution of costs and benefits means asymmetrical interdependence which gives power leverage to the most dependent party, the downstream Beijing Municipality.

Against this background, I would therefore hold that reciprocal interdependence can be identified but in a purely asymmetrical fashion.

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<sup>89</sup> Confirmed by Interview 2; Interview 7; Interview 9.

## 2. Uncertainty Reduction

*“This cooperation surely starts from mutual trust, without trust there would be no cooperation”*

– Interview 7

*Is there more trust and less uncertainty now than earlier between Hebei province and Beijing?* As readers know from my theoretical chapter, uncertainty is often a barrier to cooperation because intergovernments have incomplete information about each others intentions and have to cope with uncertain water supplies. Moreover, uncertainty over current and future benefits/costs has obviously been a barrier to prompt Hebei-Beijing to choose a strategy of conditional cooperation. The mistrust in this political struggle over water resources began, however, to slowly be transformed in the 2000s. The reason for this is simple. Beijing and Hebeis changing preferences occurred within – simply put – a more encouraging institutional framework. A few developments in that first decade stand out as particularly important, such as the passing of the Water Law in 2002 and the Water Rights Transfer policies in 2005, which was the turning point to distribute water-user rights. These policies in combination with water-price bargaining initiatives changed “the strategic climate” for Hebei-Beijing and provided opportunities for them to create new cooperative knowledge. Perhaps the most important step towards cooperation during that decade was the ecological compensation policies which opened up the possibility to balance the interests of various stakeholders. Taking advantage of these opportunities reduced the uncertainty in ways that enhanced the prospects for an agreement between the intergovernments. In this context, Hebei and Beijing reduced the transaction costs involved in bargaining over water by signing *Memorandum on Consolidation of Cooperation in Economic and Social Development* in 2006 that included common decision-making and distribution of information concerning water quality and quantity. As interview 9 admit, the *“Transboundary Water Environmental Protection and Information Sharing System Construction Program”* has resulted in shared knowledge between Zhangjiakou and Beijing. The fact that transparency has increased and transaction costs has decreased can further be confirmed by following quote from a Hebei official:

*“The projects from 2006 together with South to North Water Diversion Project has certainly meant that we officials are working more closely and trust each other more than before”<sup>90</sup>*

An interesting thing here is that that cooperation has spilled over to nine areas that are of concern for both parties, such as traffic infrastructure and agriculture. This integration of each governments economic and ecological ties shape their interest such that it coincide with cooperation. With regard to the question I have asked above, I think my reasoning harmonizes well with the view that “uncertainty reduction” has contributed to the cooperation between Hebei-Beijing. The presence of this aspect can, however, be traced to the institutional framework and will be discussed in more detail later in this analysis.

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<sup>90</sup> Interview 5; 18/03/2010

### 3. Lengthening the Time Horizons

*“The cooperation should go on in a long-term course since we all know that Guanting and Miyun reservoirs are in a strategic geopolitical position to Beijing which makes alternatives to cooperation impossible”*

– Interview 7

An important dimension of collective-action problems relating to water-cooperation is time horizon. For almost any policy maker it is difficult to succeed in lengthening time horizons since it is hard to justify policies that impose costs on society today but yields benefits in the future. As mentioned earlier in my thesis, self-interested actors can, however, overcome this obstacle and choose the strategy of cooperation when they see themselves locked into regular future interaction and value it more relative to the present. The question is then whether Hebei province and Beijing's change of path in the water sector can be explained on the basis that the actors have acted in extended time horizons. *Are Hebei province and Beijing perceiving themselves to be part of a relationship that promises future benefits?*

If we ignore the rhetorical part and instead look at the policy which is linked to the cooperation-agreements in 2006 and 2008, then there is little support that long term costs and benefits have had any crucial effect on the intergovernmental changed path. I want to refer to *three* reasons why the growing awareness of the need for collaboration on water and other issues between Hebei-Beijing does not reflect extended time horizons. *First*, this is illustrated by the fact that the transboundary eco-compensation mechanism designed by Beijing and Hebei province does not have the long-term perspective since it was signed in 2006 and 2008, with negotiations for every year. *Second*, the eco-compensation arrangement has not reflected a true principle of “payment for ecological services” and is rather mainly in the form of assistance projects. Such assistance from Beijing does not have a regular format and mechanisms that can keep it enduring over a longer period. It should be inserted here that the voices of all the relevant stakeholders (farmers for example) have not been heard or taken into account sufficiently in the calculation of compensation between Hebei-Beijing. The fact that Beijing Municipality has provided compensation mainly in the name of projects indicates reluctance to give a wider payment that is acceptable to all stakeholders. I would say that this means that particularly Beijing Municipality is more concerned of short-term profit and power, instead of focusing on a longer-term agenda. *Third*, a problem in China is that officials who work for the government will shift their posts frequently and switch to other departments<sup>91</sup>. Given that it is hard to ensure continuity in the decision-making, the long term is essentially beyond the political horizon. If this structural factor gives weak incentives to lengthening time horizons in politics, then we can expect that long-term future benefits have had a limited effect on the strategy of cooperation between Hebei-Beijing as well. The answer to my question is, therefore, “no”.

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<sup>91</sup> Interview 1; 05/04/2010

## 4. Monitoring

*Does the monitoring system has the adequate capacity for managing water resources in the Hai river basin?* At present, the overall institutional arrangements for water management in China is fragmented. The authority to address aspects of water resources management is concentrated in the MWR. Under the leadership of this agency there is a Hai River Basin Commission at the basin level who are responsible for organizing and monitoring the implementation of relevant laws and regulations, notable the Water law. Due to the political and administrative system, Beijing and Hebei province both have the same rank as the MWR which makes HRBC constrained in their ability to exercising orders to these provinces in Hai river basin. Under such a system, the provincial governments are in the upper hand for providing provincial water resources departments with budgets and staffing while HRBC are marginalized in their independent action. As a consequence, HRBC faces important constraints to implement integrated plans for river basin development, especially because various stakeholders, officials and experts from the provinces have no role in their governance. The fact that the implementation of eco-compensation mechanisms have not been sufficiently institutionalized shows the need for an institution that have the capacity to cross provincial boundaries. For example, the ecological compensation for the upstream areas of Guanting and Miyun reservoirs are mainly undertaken by forestry, water resources and environmental protection agencies, without a coordinated authority that can integrate the stakeholders involved.

A further problem is the fact that the management of water quantity and quality are separated from each other and not designed in an integrated way. It is relevant to mention here that MWR is responsible for water quantity, while MEP is responsible for water quality – whose overlaps in monitoring act as obstacles to more efficient monitoring and better water management. Since the system does not allow HRBC to exercise authority across administrative boundaries in Hebei-Beijing districts, it is clear that the cooperation between Hebei-Beijing have not emerged due to HRBC. What about the question? I would argue that the above reasoning is well consistent with the answer "no".

## 5. Conflict-resolution Mechanisms

Monitoring is not the only source of problem in dealing with water issues, crossing administrative jurisdictional boundaries in China. Like in the previous part the same reasoning can be applied to the question: *Are there any mechanisms for discussing and resolving conflictual water issues between Hebei province and Beijing?*

Basically, there is no institution which can solve conflicts between different water user groups in China. In light of these water competitions, such complaints or disputes are rarely resolved due to inadequacy of dispute settlement mechanisms, political interference at local levels and bureaucratic inefficiency<sup>92</sup>. As mentioned earlier, one of the principal reasons for these transjurisdictional conflicts is that, under current system, each province is responsible for its own water quality and quantity management. For example, Beijing Municipality has

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<sup>92</sup> Wang, Xuejun & Ongley, Edwin., (2004), "Transboundary Water Pollution Management in China: The Legal and Institutional Framework", Water International, Volume 29, p. 275.

the authority to sanction against those who break the law within its borders, but they cannot go to Hebei to enforce the water protection law. This should be done by HRBC according to their responsibility to resolve inter-provincial water conflicts in Hai river basin. But in practice, disputes over water use and distribution are rarely resolved since HRBC is a weak institution and there are no detailed procedures in the law for solving conflicts of water quantity. Furthermore, since the HRBC is appointed by the MWR – it has no legal status to intervene in a pollution situation. Settling pollution disputes are instead handled by MEP but they face difficulties to act in practice since they find themselves in conflict with their "bosses", namely the local governments which might have strong incentives to not intervene against polluting companies. They are also hampered by the fact that there is no right or procedure for one jurisdiction to sue another for pollution damages. Of the conflict-resolution mechanisms I have mentioned here, there are no indications that they would have shaped the interaction among the intergovernments and thus enabled stable cooperation. However, this observation does not imply that policy makers not have pushed forward environmental protection on transboundary issues, it rather shows the challenge to translate words into action.

The above discussions shows that *reciprocal interdependence* and *uncertainty reduction* have contributed to cooperation between Hebei-Beijing, while there are no indications which supports the idea that cooperation over scarce water resources has emerged due to *extended time horizons, monitoring or conflict-resolution mechanisms*. As highlighted in my analysis, cooperation has been in the interest of the intergovernments involved, and partly hinges on the set up of mutual gains and reduced uncertainty and mistrust.

Following principle (1) and (2) on my analytical framework, have these principles provided incentives to cooperate by itself or do they structurally depend on institutional conditions? On the one hand, Hebei province and Beijing Municipality are physically interdependent because water bodies respect no boundaries and therein lies opportunities for cooperation. On the other hand, potential gains of cooperation are hampered by Beijings political and economical advantage which makes them reluctant to give side payments to Hebei. Since several interviews have confirmed Beijings reluctance to develop procedures for cooperation<sup>93</sup>, I would argue that the changed path that occurred in 2006 can be traced to structures that shaped the behavioral roles of the actors. Rational actors do not make decisions in a vacuum, they do have to adapt to structural conditions. Policy decisions – such as passing of the Water Law in 2002 and the Water Rights Transfer policies in 2005 – can be seen as institutional incentives, which in turn changed Hebei-Beijings behavioral roles and lowered transaction costs. In this case, principle (1) and (2) are connected with changing framework conditions which relies on a external authority that could impose a solution by reducing uncertainty and making participation more benefit- driven. The external authority I am thinking of, which will be principle (6) on my analytical framework, is: State Council.

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<sup>93</sup> Interview 1; 05/04/2010, Interview 4; 15/04/2010, Interview 5; 18/03/2010

## 6. External Authority

*“The cooperation would not have happened without the coordination of the State Council”*

– Interview 4

The changed path of cooperation that arose in 2006 between Hebei-Beijing would not have been able to prosper if it had not been for the coordination the intergovernments received from the State Council<sup>94</sup>. If the State Council had not designed policies and canalized different incentives for water-cooperation, such as water-use rights system and eco-compensation policies, it would not have been possible for the self-interested intergovernments to shift their preferences and choose cooperation. According to sources in the Hebei government this kind of upstream-downstream compensation-agreement that occurred in 2006, would not have occurred voluntarily without encouragement from higher levels of government<sup>95</sup>. It is significant to highlight the importance of the context in relation to the cooperation. As I have tried to show earlier there is reason to argue that this policy-platform designed by the State Council was developed as a result of a moment in the beginning of the 21 century. It occurs when the State Council was caught in a dilemma and decided to implement the *“Plan for Sustainable Water Utilization in Early 21st Century (2001-2005)”*. This decision was a result of two events that converged. The first event has its origin in the State Council:s urgent concern on its water crisis in the beginning of the 21 century when it is clear that the competition between different users is becoming more severe. The second event has to do with the Olympics bid victory in the summer of 2001. With these two factors acted as catalysts, the implementation of the 2001-project became inevitable. Furthermore, you cannot exclude the possibility that Chinas WTO membership in late 2001 has had an impact on Chinas decision-making in the environmental arena when Chinas concern of its international image increased. As highlighted in chapter 6.4 this project from 2001-2005 promoted better coordination in the region and paved the way for several other important policy-steps towards cooperation. The political decisions I am thinking of is the passing of the Water Law in 2002 and the Water Rights Transfer Policies in 2005, which together with water-price bargaining initiatives gave Hebei province benefits from the resource protection to downstream Beijing. With these policies, we could see a transformation from administrative to more equal market-dependent mechanisms.

Following these policy designs in 2001-2005, the State Council initiated eco-compensation by using public finance and coordinating the intergovernments involved. This policy-platform reduced the uncertainty and increased transparency regarding their interests and intentions. A channel to the negotiating table was now created for the intergovernments, which paved the way for the agreement *Memorandum on Consolidation of Cooperation in Economic and Social Development* in 2006, listing cooperation in protection of water resources and ecological environment. Although this agreement was finally developed by Hebei-Beijing, Beijing Municipality would remain in a position reluctant to act and give compensation to Hebei if it had not been for political impulses from the top. Therefore, the State Council played a key role in providing policy guidance and financial support for establishing the first mechanism of eco-compensation between provinces in China. The question is how to explain *why* the State Council has acted in this way?

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<sup>94</sup> Interview 1; 05/04/2010, Interview 2; 08/04/2010, Interview 4; 15/04/2010

<sup>95</sup> Interview 5; 18/04/2010



The answer is that this powerful political actor has succeeded in *lengthening time horizons*. The characteristics of all policies, from the decision to implement the *Plan for Sustainable Water Utilization in Early 21st Century (2001-2005)* to the decision on eco-compensation in *Strengthening Environmental Protection for Scientific Development 2005*, is that they are all long-term commitments to address the ecological degradation in the affected Hebei-Beijing region. Since the character of water problems is future bound, thereby threatening the Chinese state-capacity in the long-term<sup>96</sup>, has forced the State Council to include future generations in decision-making. My theory – that there *is extended time horizons of an external authority*, namely the State Council – which can explain the changed path of cooperation – can be further confirmed by a study which has examined the decision-making process of the South To North Water Diversion Project. Before I move on and describe the final decision to start the SNWT, it is worth noting that this project has also promoted cooperation between Hebei-Beijing on water issues.

From the emergence of the idea in the early 1950s to the launch of the project in 2002, the objective of the SNWT has been to divert a capacity of 45 billion m<sup>3</sup> through three routes in the middle of this century. Given large uncertainties in future water demand, a question would be how the SNWT project has been able to receive the final approval from the State Council and to be implemented rather hastily before the deadline. According to the ETH-Board of Switzerland the inclusion of the environmental objective has provided a strong argument for the final decision to start the project. Their analysis highlights, although alleviating water stress in the economic sectors remained the short-term priority, improving the environment by allocating required water for ecosystem recovery became a long-term goal<sup>97</sup>. Like I have demonstrated in my own study, their study shows that the increased urgency to halt the environmental degradation paved the way for the final decision on implementation. I would argue that this indicates a change in the mental maps of the State Council – which means that environmental issues have been a powerful incentive to extend the time horizons of the State Councils decision-making.

Based on the reasoning above, we can now answer the question: ***How can we explain that self-interested intergovernments like Hebei province and Beijing Municipality are collaborating on scarce water resources?*** The answer to my question, and thus the causal mechanism, can be found in the *extended time horizons of the State Council*.

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<sup>96</sup> Interview 6; 20/04/2010. Also confirmed by Elisabeth Economy (1997) whose findings suggest that water scarcity should be considered a long-term threat to the Chinese state-capacity. Available online at <http://www.library.utoronto.ca/pcs/state/china/chinasum.htm>

<sup>97</sup> Hong Yang & Alexander J.B. Zehnder., (2005), "The South-North Water Transfer Project in China: An analysis of Water Demand Uncertainty and Environmental Objectives in Decision Making", Swiss Federal Institute for Environmental Science and Technology, Water International, Volume 30, Number 3, p.339-349

**Table 2. Fulfillment of analytical principles**

	<b>Yes</b>	<b>No</b>
<b>1. Reciprocal interdependence</b>	<b>X</b>	
<b>2. Uncertainty reduction</b>	<b>X</b>	
<b>3. Lengthening time horizons</b>	<b>X</b>	
<b>4. Monitoring</b>		<b>X</b>
<b>5. Conflict-resolution mechanisms</b>		<b>X</b>
<b>6. External authority</b>	<b>X</b>	

## 8. Conclusion and Remarks for Future Studies

The apocalyptic warnings of water wars have appeared frequently in scientific journals over the years. As the severity of water resources have intensified all over the world, so have the conflicts. In China, studies warning of environmentally induced conflict in this country has predominantly ended with highly predicted outcomes rather than careful analysis of specific mechanisms by which cooperation could forestall violence. In this study, I have addressed this empirical gap at the intrastate level by exploring *how* and *why* the Hebei-Beijing case does not follow the theorized trajectory in the sense that there is cooperation when we should expect conflict. Most research that has been undertaken on the issue of environmental cooperation suggest that situations characterised by environmental degradation have certain properties such as – *reciprocal interdependence*, *uncertainty reduction* and *longer time horizons* – which facilitate cooperation. In order to conduct my analysis, I have cross-fertilized this theory with two of Nobel Prize winner Elinor Ostroms eight management principles and thereby created an analytical framework. Then I applied this analytical tool on my case in order to answer the primary research question: ***How can we explain that self-interested intergovernments like Hebei province and Beijing Municipality are collaborating on scarce water resources?***

From a theoretical stand point, existing theories have been tested but, as my empirical study also led to an additional mechanism – *external authority* – I have developed further existing theories. The result of the study corresponds to some degree well with the environmental-cooperation theory. It has been demonstrated that *reciprocal interdependence* and *uncertainty reduction* could be identified, but that these factors do not significantly explain why the intergovernments in Hebei-Beijing choosed the strategy of cooperation in 2006. The thesis rather highlight that an external authority – namely the State Council – has been a key factor to enhance the interaction among the intergovernments and thus enabled cooperation. These actions can in turn be traced to changed mental maps of the State Council – as it shows that environmental issues have been a powerful incentive to *extend the time horizons* of the State Councils decision-making in the beginning of 21 century.

This thesis is of significance for the conflict versus cooperation questions that have been asked repeatedly in the environmental field as it contributes with an example from the intrastate level, namely – the Beijing-Hebei case which reflects the first agreement of eco-compensation between upstream-downstream provinces in China. Furthermore, it is of significance for the environmental-cooperation theory since my study shows that even though a situation characterised by water scarcity has certain cooperation-promoting factors, it is difficult for self-interested actors to develop cooperation without an external authority. In contrast to Ostrom's work, who argues that actors are able to maintain a common resource through self-governance without outside intervention, my study shows that external institutional arrangements have been a precondition for managing water resources and avoid an escalation of conflict between Hebei-Beijing. To gain a better understanding of water cooperation in China a remark on future studies can be given:

- It would be interesting to design a comparative research with analyses on several cases of eco-compensation in China. A focus could be put on which institutional factors promote and hinder eco-compensation agreements.

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## 9.2 Interviews

**Farmers in Huacheng Town of Chicheng County,** Zhangjiakou City, who are part of the Crop-pattern change program between Hebei-Beijing,

**Director Ma Jun,** Institute of Public & Environmental Affairs,

**Ms. Mei Jie,** SNWD expert and author to *"The Mighty River Goes North"*,

**Director Yuhai Dai,** Beijing Municipal Water Resource Bureau,

**Professor Shaofeng Jia,** Institute of Geographical Sciences and Natural Resources Research, Chinese Academy of Sciences,

**Professor Xin Zhi & Senior Engineer Chen Junqi,** Beijing Forestry and Parks Department of International Cooperation,

**Professor Zhang Zhongmin,** Director of Green Friend Association,

**Mr. Duan Huangnan,** Vice Director of Environmental Protection Bureau in Zhangjiakou City,

**Mr. Zhang Junfeng,** Water-expert from Green Earth Volunteers, Environmental NGO,

**Mr. Zhu Xiaoguang,** official from Hebei Environment Protection Federation,

**Vice Director of Water Resource Bureau of Chicheng County,** Zhangjiakou City,