

# Sponsorship Versus Mandate: Different Role of Functional Departments and Government Chief in the Vertical Diffusion of Authoritarian China

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# **Sponsorship Versus Mandate: Different Role of Functional Departments and Government Chief in the Vertical Diffusion of Authoritarian China**

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**Abstract:** This research decomposes one level Chinese government as the government chief and functional department and attempts to explore the different role they play in the vertical diffusion mechanism of authoritarian China. In order to control the horizontal diffusion mechanism among local governments, we choose a non-profitable policy of local government as the sample. Based on analysis of innovation and diffusion process of collect and refund policy from 2004 to 2016, an agricultural water-saving policy conducted in Hebei province, we find the functional department can play the role as sponsor to encourage policy innovation of local government, however contribute little to the policy diffusion. While the government chief play the vital role in policy diffusion through mandate mechanism under authoritarian personnel system. The influence of local government chief can even exceed that of national ministry in local policy diffusion. This research highlights the effect of neglected Chinese government structure in the vertical diffusion mechanism and tries to enrich the policy diffusion theory under the authoritarian regime.

**Keywords:** vertical intervention, government structure, policy innovation, policy diffusion

## **Introduction**

Numerous researches has featured the policy innovation and diffusion of local government in decentralized political structures as the ‘laboratories of democracy’ (Volden, 2006; Karch, 2007a). However, the phenomenon of policy innovation and diffusion initiated by the local governments are not only observed in domestic countries, but also exhibited in authoritarian or transitional regimes (Gel'man & Lankina, 2008; Malesky, 2008; Martinez-Bravo, 2014). The diffusion of innovation in China draws intensive research attention. Chinese central government using the pilot system to encourage local governments implement policy innovation and promoting the successful experience of local government afterward are regarded as Chinese experience that led to the economic miracle and regime adaptability (Heilmann, 2008; Wang, 2009; Xu, 2011). Recent year more and more policy scientist has conducted systematic studies, focusing on the dynamic mechanisms of policy diffusion of regional innovation in authoritarian China (Ma, 2013; Ma, 2014; Zhu, 2014; Zhu & Zhang, 2016).

There are four classic diffusion mechanisms, learning, competition, imitation and coercion (Shipan & Volden, 2008). The previous three are the horizontal diffusion

mechanism, while the latter one is the vertical diffusion mechanism. The horizontal diffusion mechanism has been proved by the worldwide researches empirically and revealed certain similarities (Walker, 1969; Gray, 1973; Berry & Berry, 1990; Ma, 2013; Zhu & Zhang, 2016). While The vertical diffusion mechanism seems to related more to the political and power structure of each country. For example, the federal government of United States can only promote the policy innovation of local states through legislation, fiscal transfer and political signals under the constraint of its constitution (Welch & Thompson, 1980; Allen et al., 2004; Berry & Berry, 2014).

The Chinese political system is characterized as regionally decentralized authoritarian system (Xu, 2011), which include fiscal semi-decentralization, administrative semi-authoritarianism, and centralized personnel manage system (Montinola, Qian & Weingast, 1995; Li & Zhou, 2005; Kung & Chen, 2011). The vertical intervention also revealed different pattern. Because of the performance evaluation-based personnel system, the superior government can facilitate the rapid diffusion of new policy instruments and also contribute to the divergence of policy instruments adoption in local governments (Zhu, 2014). Chinese government have five administrative layers. Each layer is composed of two different components, government chief and numerous functional departments, which control different resources and have diverse behavior logics. However, previous researches always consider the superior government as a whole, the coercion seems to be the only vertical intervention mechanism exerted by the superior government.

What is the different role of government chief and functional departments played

in the vertical diffusion mechanism in authoritarian China? Other than coercion, are there other vertical mechanism due to the sophisticated government structure? This paper aims to explore the research question based on the 12 years' diffusion of innovation process of an unprofitable agricultural pricing policy collect and refund policy, which aims to create water-saving incentive for farmers. This policy was invented in 2005 after a bunch of experiment sponsored by project of Hebei Provincial Water Resources Department(HPWRD) and had gained national reputation among policy makers and scholars ever since. However, this star policy influenced by the vertical intervention from government chief and functional departments of superior governments in different years, encountered 12 years' struggling diffusion process and even was on the edge of extinction in 2014, which provide valuable evidence for this study.

The rest of the paper is organized as follows: the section 2 review the relevant theories and proposed research hypotheses accordingly. The section 3 introduce the research design, methodology, data gathering and policy background. The section 4 testify the hypothesis based on the 12 years' diffusion of innovation process of the star policy. The section 5 concludes the paper, discuss the theoretical contribution, policy implication and put forward avenues for future research.

## **Vertical intervention, Government structure and Innovation Diffusion in Authoritarian China**

Policy innovation referred to local governments adopted a policy which is new to

themselves, no matter how old the policy maybe or how many other governments have adopted(Walker,1969). Innovation diffusion is the process by which an innovation spreads across the members of certain social system (e.g. jurisdictions or organizations) over time (Rogers, 2003; Shipan & Volden, 2012). The innovation diffusion across governments have internal and external mechanisms. The internal mechanism includes socioeconomic factors and political situation of local governments, such as the economic growth, population, fiscal revenue, election and even the policy entrepreneurs of local policy networks (Walker, 1969, Berry and Berry, 1992; Mintrom, 1997). While the external mechanisms always refer to the classic diffusion mechanism, learning from earlier adopters, economic competition among proximate cities, imitation of larger cities, and coercion by superior governments (Shipan & Volden, 2008; Graham et al.,2013). The former three are the horizontal diffusion mechanisms, while the latter one is the vertical diffusion mechanism.

The horizontal diffusion has shown some similarities among worldwide empirical researches (Walker,1969; Gray, 1973; Shipan & Volden, 2008; Ma, 2013; Zhu & Zhang, 2016). Most United States based policy diffusion research focuses on horizontal diffusion between similar levels of state governments (Eyestone,1977; Soss, 2001 ;Boehmke & Witmer, 2004; Berry & Baybeck 2005; Shipan & Volden, 2006). The horizontal diffusion is frequently discussed whenever the innovation of local government gathers in a geographic cluster (Berry & Berry, 1990; Peterson & Rom, 1990; Rashman & Radnor, 2005). And the horizontal diffusion is not only observed in the subnational level, but also observed in the national level between counties

(Simmons & Elkins,2004; Simmons, Dobbin & Garrett,2006; Elkins, Guzman & Simmons,2006; Gilardi,2010).

On the contrary, vertical diffusion usually involve coercive activity from the superior government under the mandate mechanism (Walker, Avellaneda & Berry, 2011; Berry & Berry, 2014). Compared to the horizontal diffusion, only small amount of researchers pay attention to the vertical diffusion mechanism under the United States federal system. Those researches reveal the federal government promote the policy innovation of local states through methods, such as legislation, controlling fiscal transfer and sending political signals (Welch & Thompson, 1980; Allen et al.,2004; Berry & Berry, 2014).

The horizontal diffusion seems to lay the foundation on the incentive of decision makers which share great similarity from subnational level to national level. While the vertical diffusion is embedded in the political structure of certain entity which exhibit more diversity. The vertical diffusion of United states is shaped by the constitutional structure of government. Other than foreign policy, national defense and interstate commerce, the relationship between the federal government activity and state government activity was left to practice and the interpretation of Supreme Court (Allen et al.,2004). Even the embedding policy proscriptions in state constitutions can impact the rate and likelihood of policy diffusion (Fay & Wenger,2016).

The regionally decentralized authoritarian system in China (Xu, 2011), which characterized as market preserving federalism, experimentation under hierarch and performance evaluation-based personnel system as well (Montinola, Qian & Weingast,

1995; Tsui, 2005; Li & Zhou, 2005; Kung & Chen,2011), also shape its vertical diffusion mechanism fundamentally. The centralized personnel system determined by the central government and its impact has been researched comprehensively. Researches find those Chinese local officials who promoted by the superior government conduct different behavior from their counterpart in western democratic countries (Zhu & Zhang, 2016), they have to implemented the policy initiative by the central government in order to getting promoted (Shih, 2008; Kung & Chen,2011), that's why the mandate mechanism of vertical diffusion is obvious in China. In order to getting promoted under the performance evaluation-based personnel system, the local officials also initiative different kinds of policy innovation to feature themselves (Zhu, 2014). The previous researches always consider the central government as a whole, and the mandate mechanism seems to be the only vertical diffusion mechanism derived from the authority of the central government.

The difference between the government chief and the functional departments, which characterized as the Tiao-Kuai relationship in China study (Mertha, 2005), hasn't been discussed intensively in previous vertical diffusion research. Chinese government have five administrative layers, each layer is composed of the government chief and the functional departments (see figure 1). The government chiefs refer to vice prime minister, prime minister, members of standing committee of political bureau and party secretary in the central government. The functional departments in the central government are the various ministries managed by ministers. Each layer has similar government structure.



The decision makers of the policy innovation and diffusion in local government are the government chief. Policy implementation are carried out by the government chiefs from the county level to the village level. The vertical diffusion mainly talked about the influence the superior government chief and functional departments exert on the local government chief, which we believe exhibit different patterns under the influence from two different component of superior government.

Take the central government as example, the central government in previous research mainly refer to the government chief (Ma, 2013; Zhu, 2014; Zhu & Zhang, 2016). While those functional departments are the various ministries, which have great impact on the policy making and their influence on the vertical diffusion has been neglected. The ministers of central government have little impact on the promotion of the government chief of local governments, while they can sponsor the policy innovation of local government through various projects containing large number of huge fiscal transfer, which has become the principal measure the superior functional department taking control of subordinate government chief (Zhou et al.,2013). Many researches reveal that the fiscal transfers are more and more conducted by the functional governments in the name of diverse project, instead of the general transfer conducted by the government chiefs. Under the tax-sharing system and the constraint of ordinary fiscal resource (Tsui, 2005), the local government chiefs always compete with each other to take project coming from the superior functional departments, aiming to increase the additional fiscal revenue and taking the instruction from them at the same time.

The projects that connect superior functional department with subordinate government chief share some similarity with the method how federal government in the United States influence the state governments (Welch & Thompson,1980). This project mechanism has two features. First, the projects are scarce, only a small amount of local government chiefs can take possession after the competition. Second, every project from the superior functional department has its time limit. When the deadline comes, the connection between the superior functional department and the subordinate government chief ends in coming years.

***H1: The superior functional department can sponsor the policy innovation of local government chief, through providing the projects containing specific fiscal transfer.***

***H2: For those policies that the local government chiefs could not benefit from the policy implementation, the sponsorship from the superior functional department could not contribute to policy diffusion in large scale.***

***H3: The superior functional departments can only influence the policy adoption of subordinate government temporarily during the period of the projects. When the projects are ended, the diffusion of innovation process would vanish in a short time.***

As illustrated by previous research, the powers to issue important document in the name of the CPC central committee and State council, determine the promotion of subordinate officials and distribute general fiscal transfer are concentrated in the hands of government chiefs. The superior government chiefs have the full capacity to transform their willing into the action of subordinate officials. The mandate mechanism

is the device that the superior government chiefs used to launch those policies they initiative. It seems when the superior government chief release distinct signal about certain policy, the subordinate government chief would try their best to implement the policy despite the difficulty they may encounter (Shih, 2008; Kung & Chen,2011; Zhu & Zhang, 2016).

***H4: If one policy innovation gets the explicit support from the superior government chief, the subordinate government chief would take necessary measures to accelerate the process of diffusion of innovation, even those policies that the local government could not benefit from the policy implementation.***

Chinese government has five administrative layers, the influence of government chiefs from the township level to the national level increase gradually. In the normal condition, the personnel of one level government was controlled by the upper level government chief. Since the five administrative layers follow the same rule, the government chief in the national level could have the influence on the personnel of town level government in theory. In practice if the CPC party secretary and prime minister have explicit appraisal on a country level official, this official would receive promotion in a short time (Shih, 2008). And local officials always try to initiative the policy innovation that could impress the government chiefs in national level. The centralized of personnel system empower the government chiefs in national level have the ability to influence the diffusion of innovation across multiple administrative levels.

While the superior functional departments can only influence the subordinate government through the projects system. The administrative ranking of ministers is

much higher than a government chief in the county level. However, if a minister wants to influence the diffusion of innovation of a local government, the project mechanism seems to be the limited means he can depend on. The superior functional government could give the subordinate government chief some honor within the system and pilot status with the fiscal transfer. However, this influence seems relative weak when it compares with the influence from the superior government chief which derived mainly from the centralized personnel system. In the terms of diffusion of innovation in local government, the influence of government chiefs and functional departments in different level seems comparable.

***H5-1: If the level of government chiefs is higher, the influence they exert on the local government is bigger. The national government chief have strong influence on the diffusion of innovation process in local government.***

***H5-2: The functional departments in the national level can only influence the diffusion of innovation in country level through projects and fiscal transfer.***

***H5-3: The influence of functional departments in national level could not match the influence of the government chief in the country-level diffusion of innovation process, in terms of unprofitable policy.***

## **Research design, methodology and data collection**

### ***Research design***

As illustrate above, the diffusion mechanisms that can be decomposed as horizontal and vertical diffusion. These two mechanism can be separated explicitly

from theory, however always happen spontaneously in practice (Shipan & Volden, 2008; Walker, Avellaneda & Berry, 2011; Berry & Berry, 2014). The previous researches about Chinese policy diffusion mainly depend on the econometric method, focusing on those policies which had spread across the country (Ma, 2013; Ma, 2014; Zhu & Zhang, 2016). These researches have proved the competition, learning, emulation and vertical mandate mechanism empirically. However, the superior government in the vertical diffusion mechanism was regarded as a whole in previous researches. Since those researches have to test the horizontal and vertical diffusion at the same time, different role of functional departments and government chief played in the vertical diffusion may not draw enough attention. In order to test the vertical diffusion mechanism systematically, this paper chooses the twelve years' innovation and diffusion process of an unprofitable policy as the research sample.

The basis of horizontal diffusion mechanism is that the local government can benefit from the policy implementation. Most of the policies in classic diffusion researches focusing on the horizontal mechanism are profitable, such as the economy policies which can bring investment and economic growth, the welfare or civil rights policies which can contribute to maintaining social stability, the tax policy or state lottery policy which can increase the fiscal revenue of local government (Gray, 1973; Berry & Berry, 1990; Berry & Berry, 1992; Lowry, 1992; Shipan & Volden, 2008). Since the profitable policies are necessary for horizontal diffusion, the unprofitable policies are the suitable cases for vertical diffusion. The unprofitable policies referred to those policies, which have positive externality, cannot bring any tangible benefit to

the local government, even increase the fiscal burden of local government and always encounter struggling diffusion process. The local governments would not adopt this policy spontaneously unless there are the vertical intervention from the superior government.

Those policies aim to recover the environment and address the pollution issue in China are typical unprofitable policies. The unprofitable policy in this research is an agricultural pricing policy “collect and refund policy”, which was invented and diffused in Taocheng district, Hengshui city, Heibei province since 2004, aiming to create water-saving incentive for farmers in the droughtiest and groundwater-overexploited region in northern China to alleviate the groundwater overexploited status of that region. Implementing the collect and refund policy can make the farmers spend money and labor on saving water and the water saving rate of each pilot village can reach 20% (Chen, Wang & Zhu, 2014; Wang, Zhang & Huang, 2016). However, the local government benefit little from the policy implementation. The benefit of farmers’ water-saving behavior and the recovering the groundwater level cannot reveal in the short time. The implementation of collect and refund policy even needs sustainable fiscal support from local government (Chen, Wang & Zhu, 2014).

The local governments do not have the incentive to adopt this policy. Actually the collect and refund policy was invented in 2004 sponsored by project of Hebei Provincial Water Resources Department(HPWRD). This policy has gain national reputation among policy makers and scholars after it was invented, due to the sophisticate design and surprising effect. However, this star policy encounter 12 years’ struggling diffusion

process and even on the edge of extinction in 2014, as the local government have insufficient incentive to adopt it.

### ***Methodology***

In the early years, the qualitative research was regarded as a second-best solution, when the pooled data disable the use of up-to-date statistical models (Berry & Berry, 2014). Recent year, the researches on policy diffusion has increasingly moved beyond the problem of *whether* policies diffuse to the question as to *why* this is the case and through what causal mechanisms diffusion occurs (Karch, 2007b; Shipan & Volden, 2008). The qualitative research has revealed its advantage. The combination of cross-case analysis and within-case process tracing seems to be the best practice to tackle the twin challenge of diffusion, which are “Are policy changes really the outcome of a process of diffusion” and “What is the mechanism underpinning this process?” (Starke, 2013).

In this paper, we are interested in why and how the vertical diffusion mechanism happens under the Chinese government structure instead of whether the vertical diffusion happened. And we use the combination of two qualitative methods, within-case process tracing and cross-case analysis to analyze the research question. The within-case process tracing mainly focus on the diffusion of innovation of collect and refund policy in Taocheng district. While the cross-case analysis pay attention to the diffusion process of collect and refund policy in the counties that nearby Taocheng district after 2015.

### ***Data collection***

We have excellent contacts with the pilot, which are the key factors influencing empirical studies in China. The network ensures our access to extensive information about the pilot in the form of paper and electronic documents, and in-person and telephone interviews.

In July 2010, July 2016 and December 2016, we have visited the Taocheng pilot three times. In July 2010, the authors visited the TWAB (Taocheng Water Affairs Bureau) for the first time and conducted deep interview with the policy inventor and all the officials in TWAB who participated in the policy innovation from 2004 to 2005, visited the villages where adopted the collect and refund policy, interviewed the villages leaders and make 60 household questionnaire.

In July 2016, the authors visited Hengshui City and Taocheng District for the second time. This time the author interviewed the mayor, vice executive mayor and vice party chairman of Hengshui City, the director and vice director of HWAB (Hengshui Water Affairs Bureau), the director and vice director of TWAB and all the important officials who is related to the diffusion of innovation of collect and refund policy. The author also came to the specific five villages which still keep carrying out the policy even after 2014's notification and other nearby five villages which adopted the policy once and stopped the policy recently, interviewed the two village officials and five local farmers each village who were participated or are still participating in the policy.

In December 2016, the authors have visited the counties nearby Taocheng Districts, which have adopted the collect and refund policy after 2015. We interview the director of Jizhou County and Zaoqiang County, the director, vice director and local officials of



Jizhou WAB and Zaoqiang WAB, village leaders and farmers of two local villages in each county which have adopted the collect and refund policy recently.

Other than the three times field trips, the author also had collected all the related local document, newspaper and academic paper from 2004 to 2016, made several telephone calls and wrote a couple of e-mails to supplement the necessary details that hadn't been noticed during the field trip. The abundant material provided a solid foundation to explore our research question.

## **The diffusion of innovation of collect and refund policy**

### ***Policy background***

At the beginning of twenty-first Century, China has begun to suffer severe water crisis. The water shortage has become the constraints of the economic and social development of many places in northern China (Wang et al., 2009). Agriculture is the most water-intensive sector, in 2015 agriculture alone accounted for 63.1% of total water use. However, irrigation water use efficiency is still low, and this is largely blamed for the severity of the region's water stress (Cai, 2008).

Two mechanisms, pricing mechanisms and tradable water rights systems, are regarded as the promising measures to increase the efficiency of agricultural water use in China. Some researchers have found that increasing water prices can yield water conservation benefits and negatively impacts farmers' incomes at the same time (Wang et al., 2007; Huang et al., 2010). The unwillingness of Chinese government to increase farmers' burdens since 2003 has further impeded the adoption of pricing mechanisms

for agricultural water conservation (Wang & Chen, 2014).

The tradable water rights systems at farmers' level has been established in Zhangye City, Gansu Province since 2001 (Sun, 2009). Tradable water rights mean that the local manager determine farmer's water consumption quota at the beginning of one irrigation year, according to the regional rainfall, planting habits and water conservation index. If farmers' water usage exceeds the quota, they have to buy from other farmers. If farmers' water usage is less than the quota, they can sell to other farmers (Wang, 2017). However, the evidence has revealed that tradable water rights systems, which originated from the California in United States and Murray-Darling Basin in Australia, was not implemented well under the Chinese context (Zhang et al., 2009). The main reason lies in two aspects. First, the land area of Chinese farmers per capita is lower than those of Australian and American farmers. The transaction cost of agricultural water rights trading in China is far greater than the trading profits under the constraint of resources endowment (Wang, 2012). Second, the hydrologic condition is uncertain and the variation of rainfall of each year is too large. Those quotas designed by the local managers at the beginning of one year always deviate the actual quotas used by farmers after a year which affect the implementation of the policy (Chen, Wang & Zhu, 2014).

The collect and refund policy was invented in 2005 after a bunch of experiments, based on the experience of irrigation pricing reform and tradable water right system. The principal of Taocheng collect and refund policy is illustrated in figure 2. The policy was conducted in village level, the local WAB raised the water price per unit before an irrigation cycle. The original irrigation fee (A in figure 2) was handed in to power

company or village committee as usual, while the raising part (B in figure 2) was refunded to the farmers according to their land area with per unit land area get the same amount of money after an irrigation cycle. The essence of collect and refund reform is that the average irrigation consumption of each farmer per area act as the benchmark to reward or punish farmers according to their real water consumption. Those farmers whose water consumption below the average level will gain the subsidy, which is exact amount of punishment from those farmers whose water consumption exceed the average level. It is a kind of reallocation of interest between farmers wasting water and saving water in each village. Since the reallocated benchmark is the average irrigation amount, each farmer had to compete with others to save water in order to win the subsidy. This competition mechanism provides a drive force for the farmers to save water. The collect and refund reform do not increase the farmers' burden if we evaluate from a village level (Chen, Wang & Zhu, 2014). The TWAB even provided additional government subsidy (C in figure 2) based on the volume of water consumption in order to relief farmers' burden and promote policy implementation. In the final version of collect and refund policy of Taocheng District, the raising part(B) and the government subsidy(C) together refund to farmers according to their land area after an irrigation cycle. The collect and refund policy was first carried out in Guojiazhuang Village and Yantikou Village in August 2005. TWAB officials raised the agricultural water price (calculated by the electricity price) from 0.35 RMB/m<sup>3</sup> to 0.5 RMB/m<sup>3</sup>, and the WAB offered a subsidy of 0.05 RMB/m<sup>3</sup>.

### ***The policy innovation and diffusion process***

The innovation of collect and refund policy was the product of provincial water-saving society pilot sponsored by HPWRD. In April 2004, TWAB was selected as the provincial water-saving society pilot. TWAB initiative tradable water rights pilot in Chonggao Village in October 2004, aiming to replicate the Zhangye experience. However, the tradable water right system conducted in Chonggao Village was failure, due to the mobility of water resource and the fragmented land area. From the October 2004 to August 2005, TWAB has experienced the ‘flexible quota management’ and ‘flexible total management’ in two other different villages and drawn valuable experience about which is the suitable irrigation pricing mechanism in northern China. TWAB came up with the idea of ‘collect and refund’ and implement this policy in Guojiazhuang Village and Yantikou Village in August 2005 (Chen, Wang & Zhu, 2014). January 2006, these two pilot villages finished the autumn irrigation cycle. After the new policy was adopted, the farmers had taken water-saving measures themselves and the water usage of pilot villages decreased nearly 20%, which declare the success of innovation of collect and refund policy.

The diffusion of innovation of collect and refund policy started in 2005. The number of villages which adopted the collect and refund policy in Taocheng district, the supporting projects and the fiscal fund from 2005 to 2016 are illustrated in table 1. There is adoption–implementation gap in policy diffusion researches, which means organizations may adopt an innovation symbolically rather than using it in reality (Fichman & Kemerer, 1999; Ma, 2014). The collect and refund policy was implemented in village level. The adoption of the policy could not depend on those village officials

who declare they have adopted this policy. Since the functioning of collect and refund policy needs sustainable fiscal support, we can figure out the number of those villages which had implemented the policy in reality through the distribution of TWAB subsidy each year.

The TWAB has gained three pilot status from 2005 to 2017, the first pilot was provincial water-saving society pilot which lasted from 2005 to 2007. The second pilot was national water-saving society pilot which lasted from 2009 to 2011. The third pilot was national groundwater overdraft governance pilot, which lasted from 2015 to 2017. The pilot status brings the pilot privilege, which provides the fiscal resources and space for the bold policy innovation. HPWRD was the main sponsor of the policy innovation and diffusion from the 2004 to 2011. From 2005 to 2007, the HPWRD granted 2.9 million yuan in three consecutive years under provincial water-saving society pilot. TWAB are identified as the national water-saving society pilot in 2008. However, during the pilot period from 2009 to 2011, TWAB do not get the fiscal support from Ministry of Water Resource (MWR). The sponsor is still the HPWRD, who granted another 1.1 million yuan from 2009 to 2010 to support the pilot. There is no fiscal support for collect and refund policy from 2011 to 2014. TWAB has become one part of national groundwater overdraft governance pilot in 2014, and the pilot period last from 2014 to 2017. The central and provincial government have granted 17.99 million yuan from 2015 to 2017 and the Taocheng district government also has provided 1.95 million yuan from 2016 to 2017, specifically for collect and refund policy.

The diffusion of innovation process is strictly associated with the transform of

pilot status. Inspired by the successful experience, TWAB promoted the collect and refund policy in Dengzhuang Township with the provincial water-saving society fund. The number of pilot village reached 10 in 2007 and increased to 14 in 2008, which is the largest policy implementation scope before 2014. From 2009 to 2010, with the additional fiscal grant from HPWRD during the national pilot period, the number of pilot village maintained at about 12 for three years. There is no fiscal support from 2011 to 2014, and the pilot scope decreased each year. In 2014, the number of pilot villages came to only 5 and these five villages are all small village.

The Hebei province was confirmed as the national pilot for groundwater overdraft governance January 2014. The total amount of investment on groundwater governance in Hebei province, conducted mainly in Hengshui, Cangzhou, Xingtai and Handan cities, reached 30 billion yuan from 2015 to 2017. The collect and refund policy became one of the policy instruments in “2014 pilot scheme for comprehensive treatment of groundwater overdraft in Hebei” issued on May 2014. The collect and refund was promoted in the whole Hengshui city and some counties in Cangzhou and Xingtai city from 2015 to 2016. This is the first time that the collect and refund policy had been adopted outside Taocheng District. During this time, TWAB got 17.99 million yuan from central and provincial government and 1.95 million from Taocheng district government. The number of pilot village has increased from 5 in 2015 to 36 in 2016. Up to December 2016, all the pilots that had implemented the collect and refund policy have restored the policy again. Every township of Taocheng District began to conduct general investigation to figure out the exact number of land area, pumping-well location

and water pump style, aiming to achieve full coverage of collect and refund policy wherever using pumping-well to draw the groundwater during the national pilot period (Wang & Chen, forthcoming).

## **Empirical findings**

### ***The test of hypothesis 1***

The policy innovation of collect and refund policy in Taocheng District was the result of provincial water-saving society pilot, which is initiated by the MWR and sponsored by the HPWRD. TWAB designed the reform scheme, gave specific instruction to village officials and was deeply involved with the policy innovation and implementation process in pilot villages.

In December 2003, the MWR planned to select 100 provincial water-saving society pilot. The director and vice director of TWAB had no idea about what the water-saving society was, however they wanted to compete for the pilot status. After dedicated preparation, TWAB became one of the four provincial pilots in Hebei province in April 2004. MRW initiated the pilot project and provided the legitimacy for the local policy experiment.

*MRW convene the head of 100 provincial pilots to Zhangye City, Gansu Province, which is the first water-saving society pilot in July 2004. The director of Water Resource Department cultivated the local officials. The director didn't provide any guideline or documents. He said the experience of Zhangye City was just a reference. The pilot of each province could has its own plan and conduct bold experiment to achieve the policy goal of water saving (Chang Baojun, Vice director, TWAB, July 2010).*

HPWRD was the main sponsor from 2005 and 2010, which provided 4 million yuan for the provincial and national water-saving society pilot. The budget of provincial pilot project is not for the innovation of collect and refund policy alone, actually it also includes some engineering projects (such as the transformation of metering facilities, the installation of rural drinking water measurement facilities, the installation of intelligent water metering, test and modification of pumping-wells), and the administration cost of implementing collect and refund policy (Such as printing of leaflets, brochures, posters and writing brush, making card, CD-ROM and multimedia record, traveling fee for study other pilot's experience). Table 2 is the inventory of fiscal budget of provincial pilot project in 2005, 2007 and 2010, which reveals that the funding from HPWRD was the total source of the policy innovation of collect and refund policy. TWAB had no idea about how to establish a water-saving society during the first provincial pilot period. They had tried in different directions and the collect and refund policy was the unexpected outcome. After the success of collect and refund policy in 2006, TWAB has devoted more fiscal resources to the subsidy of collect and refund policy.

The policy innovation was designed and implemented by TWAB and cooperated by the village officials. From October 2004 to August 2005, TWAB had trial 'tradable water right system', 'flexible quota management', 'flexible total management' and 'collect and refund policy' in various pilot villages. During these time, the TWAB do not depend on the township government, they provide the guideline and sponsorship for the pilot village directly and have come to the pilot villages numerous times. For



example, the functioning of ‘tradable water right system’ in Chonggao village require lots of manpower to register the water usage of farmers after each irrigation. The recording work could not depend on the village officials alone, TWAB had sent ten more officials to assist the village officials a couple of time. TWAB officials are deeply involved with in the policy innovation and implementation process (Chen, Wang& Zhu, 2014). Actually the officials in pilot villages do not have the responsibility to cooperate with the TWAB. In order to motivate the village officials, TWAB provide the engineering projects, which comes from the provincial pilot project for each pilot village, in exchange for the support of policy innovation.

Figure 3 is the illustration of the interaction between superior functional departments and the pilot villages. The policy innovation of pilot village is sponsored by the functional departments of superior government and under the guideline of MWR, HPWRD and TWAB, without the direct intervention from the government chief in each layer. H1 has been proved that the superior functional government can sponsor the policy innovation through providing the projects containing specific fiscal transfer.

### ***The test of hypothesis 2***

As illustrated above the policy innovation of collect and refund policy do not have the direct support from the government chief in each layer. Actually from the 2005 to 2014, the diffusion of collect and refund policy is promoted by the superior functional departments.

The diffusion process has been struggled from the beginning. Inspired by the successful policy experiments of the first two pilot villages, Taocheng WAB planned to

promote the collect and refund policy in Dengzhuang township in 2007. However, TWAB has encountered the opposition from the Dengzhuang Township government. Dengzhuang township government encourage the local farmers to plant vegetables to get rich, despite the fact that cultivation of vegetable requires large amount of water and mainly depends on the over-exploitation of groundwater. The vegetables industry has become one of the pillar industries in Dengzhuang town. The township government fear that if the TWAB promote the collect and refund policy in large scales, the farmers will not grow vegetables any more in order to save water. So the township government didn't support TWAB.

Without support from the township government, the collect and refund policy cannot be adopted in large scales. There are only 9 persons which include officials and temporary employees in TWAB, who are responsible for the collect and refund policy. This limited manpower is in charge of the collect and refund policy of the whole district. Although the implementing of collect and refund policy is relatively simple, the investigation of irrigation water consumption of each pilot village before and after an irrigation cycle to calculate the amount of government subsidy and the refunding process conducted by village officials should be under the supervision of superior officials. The officials in TWAB could not supervise the whole district if the policy is promoted in large scale. The functioning of collect and refund policy needs the support from the township government. However, the daily staff of township government is also limited and they have their own agenda every day, without the consent of the township government chief, those staff would not spare their time for TWAB.

The TWAB is the functional departments of superior government for township government chief. However, TWAB exert little influence on the promotion of township government chief. They only can require the cooperation by providing the various projects. In the case of collect and refund policy, TWAB provide the engineering projects for the pilot village directly and the township government can benefit little from the policy implementation. There is no reason for township governments to support TWAB, even under the background of conflict policy goals of developing vegetable industries.

The incentive of village officials should be paid attention. Even through the raising money will return to the farms and there is government subsidy, the implementation of collect and refund policy is still a sensitive issue. The essence of the collect and refund policy is the reallocation of interest within the village, which require the dedicate work of the village officials. If the village officials could not get the reward, they do not have incentives to implement this complex policy. TWAB had to provide the engineering projects for pilot villages in exchange of the support of village officials.

The collect and refund policy is an unprofitable policy and also conducted in villages. Adopting the unprofitable policy in rural area require the support from the township government and village officials, which TWAB alone do not seems to have enough authority to gain. TWAB only promoted 10 pilots out of 33 villages of Dengzhuang town in 2007 and the largest number of pilot villages in Taocheng District could only be 14 under the sponsorship of TWAB. H2 has been proved that for those policies local government chiefs could not benefit from the policy implementation, the

sponsorship from the superior functional department could not contribute to policy diffusion in large scale.

### ***The test of hypothesis 3***

The HPWRD are the sponsor of policy innovation and diffusion from 2005 and 2010, which provided 4 million yuan under provincial and national water-saving society pilot project. However, TWAB do not get any fiscal support for collect and refund policy from 2011 to 2014. The functioning of collect and refund policy after 2011 depended on the remaining fiscal fund of the pilot project that hasn't been spent in previous years. The remaining fiscal fund is only 200 thousand yuan, after granting the subsidy for pilot villages in 2013. The number of pilot village has decreased since 2011. The number of pilot village is 12 in 2011 and decreased to 9 in 2012, 7 in 2013.

Given the draining fiscal fund, TWAB decided to conduct the collect and refund policy in 5 small villages in 2014 and planned to stop all the pilot projects after July 2015. In 2014, the Taocheng TAB issued a notification to the villages, 'The water-saving society construction pilot project has ended for years. The implementation of collect and refund policy lacks necessary funding sources. All the pilot villages except (Dongzhuang, Dongxingtong, Suli, Caozhuang and Dengzhuang) stopped from this year. All kinds of pilot projects will all be ended from July 2015'.

Despite the national reputation and glory the collect and refund policy had gained, this legendary policy was on the edge of extinction in 2014. The decline of pilot villages is associated with the end of pilot projects in 2011. Without sponsorship of HPWRD, the collect and refund policy had only hardly survived for three years. H3 has been

proved that the superior functional departments can only influence the policy adoption of subordinate government temporarily during the period of the projects. When the projects are ended, the diffusion of innovation process would vanish in a short time.

#### ***The test of hypothesis 4***

The Hebei province was confirmed as the national pilot for groundwater overdraft governance January 2014. The collect and refund policy became one of the policy instruments in “2014 pilot scheme for comprehensive treatment of groundwater overdraft in Hebei” issued on May 2014. The Hebei provincial government had issued many specific documents to implement the groundwater overdraft governance ever since. In October 2015, HPWRD with the provincial department of finance and provincial price bureau jointly issued the ‘agricultural water price reform and the premium method’, which give the specific guideline to promote collect and refund policy. The diffusion of collect and refund policy in Hebei province started ever since.

The diffusion pattern of collect and refund policy after 2015 was different from that one before 2015. The driving force of the policy diffusion has become the superior governments’ mandate mechanism, which is enumerated by previous researches (Ma, 2013; Ma, 2014; Zhu, 2014; Zhu & Zhang, 2016). The classic model is illustrated in Figure 4. The superior government chief mobilize the subordinate government and provide fiscal support. While the superior functional departments also give the subordinate governments technical guidance at the same time.

The groundwater overdraft governance has drawn the attention of government chief from national level to the township level. And the collect and refund policy was

regarded as the policy instruments to alleviate groundwater over-exploitation by local government. We take the diffusion process of collect and refund policy in Taocheng District, Jizhou County and Zaoqiang County in Hengshui City after 2015 to testify H4.

*Diffusion in Taocheng District.* December 2015, in response to the groundwater over-exploitation governance and HPWRD guideline, Taocheng District government has established a leading group for promoting collect and refund policy. The leading group is headed by the deputy governor and the membership includes the director of all the relevant bureaus and five pilot Townships. In February, September and November 2016, Taocheng District government held three consecutive meetings on the promotion of collect and refund policy and trained the village officials. Taocheng District government also established the supervision mechanism. Every Friday the township government should hand in the document, recording the progress of promoting collect and refund policy to the district government. Criticism would be given to those townships which make poor progress. The diffusion of collect and refund policy would be referee for the whole year' performance evaluation

The obstacle of promoting collect and refund policy in previous years lies in two aspects, insufficiency of fiscal money and the lack of incentive of township and village officials. After 2015, these two problem has been addressed well. As one of the 8 pilot counties, which implement the irrigation pricing reform for groundwater governance, Taocheng District get 17.99 million yuan from central and provincial government from 2015 to 2017. Unlike the previous fiscal fund, these 17.99 million yuan are granted specific for collect and refund policy, which enable the Taocheng District government

have the capacity to promote the policy county-wide. The supervision mechanism can ensure the dedication of township and village officials for a time. Taocheng District government even granted 1.95 million to create incentive of township and village officials. In 2014, the collect and refund policy was on the edge of extinction. In 2015, the number of collect and refund pilot village is still 5. In 2016, the number of pilot villages increased to 36 and many other villages are prepared for the adoption. The Taocheng district government plans to promote the collect and refund policy wherever has the pumping well in 2017.

*Diffusion in Jizhou County and Zaoqiang County.* Jizhou County and Zaoqiang County are all in Hengshui City and had never adopted collect and refund policy before. The diffusion process of collect and refund policy is rapid in these two counties.

The party secretary and governor of Jizhou County attaches great importance to promoting the policy. They held several special conferences, which include the director of all the relevant bureaus and townships, for promoting the policy. The governor even set up a Wechat group to supervise the progress of each township. Jizhou County government rewarded 30 thousand yuan for each township and the village officials could get the subsidy of 3.5 yuan per mu for their service after one irrigation cycle. The number of pilot village of Jizhou County which made the basic preparation reach 37 up to December 2016. Zaoqiang county government had taken similar measures. They had established a leading group headed by the governor and included all the relevant officials. The county government plans to take 1 million each year from the county fiscal budget to reward the township and village officials. Up to December 2016, 56

villages had completed the basic investigation.

The diffusion process of Taocheng District, Jizhou County and Zaoqiang County exhibit similar patterns. H4 has been proved that if one policy innovation gets the explicit support from the superior government chief, the subordinate government chief would take necessary measures to accelerate the process of diffusion of innovation, even those unprofitable policies could be promoted in short time.

#### ***The test of hypothesis 5***

The policy innovation and diffusion process of collect and refund policy had influenced by the multilayer government chief and functional departments, which provide evidence to test hypothesis 5.

***The test of hypothesis H5-1.*** The main reason of rapid diffusion process after 2015 are the collect and refund policy was enlisted as the provincial groundwater governance policy instrument. However, when the officials from MOF (Ministries of Finance) paid a visit to Hebei province in order to compile comprehensive scheme on January 2014, they didn't want to include the collect and refund policy. Officials from MOF expressed an opinion which are shared among many functional department officials, "the financial system wants to support a project which has a time limit such as 3 to 5 years, not to engage in perennial." The functioning of collect and refund policy need sustainable fiscal money which do not fit the appetite of the officials in fiscal departments. The collect and refund policy wasn't considered as one of the policy instruments among the original packages.

However, the unexpected appraisal of vice Prime Minister changed the destiny of



collect and refund policy. April 2014, vice Prime Minister Wang Yang paid a visit to Hengshui city to inspect groundwater governance, he also made a speech during the inspection. During the speech he spoke highly of Taocheng collect and refund policy, explained essence of the policy and regarded this policy as a good instrument to save water, which exceeded local officials' expectations since the present local officials from provincial level to city level didn't mention collect and refund policy to him during his inspection. The speech of Vice PM has influenced the compilation of the final package. During the compilation process of "2014 pilot scheme for comprehensive treatment of groundwater overdraft in Hebei". HPWRD negotiated with the provincial department of finance, the collect and refund policy had to be enlisted as the provincial scheme and should spend lots of fiscal money supporting it because of the Vice PM's speech.

The appraisal from the supreme government chief has great influence, which make the abandoned policy become the star policy of the provincial governance plan and get the large amount fiscal money. H5-1 has been proved, If the level of government chiefs is higher, the influence they exert on the local government is bigger. The national government chief have strong influence on the diffusion of innovation process in local government.

***The test of hypothesis H5-2.*** Collect and refund policy has been famous within national water conservancy system since it was invented. As shown in Table 3, there are many officials from MWR and HPWRD who had paid a visit or praised the collect and refund policy in different occasions.

In February 2009, Former Minister of MWR Wang Shucheng praise the collect and refund policy on national work conference on water resources, “it is a miracle created by the local government. It is like a beautiful spray in China water policy innovation spring tides”. September 2010, Vice Minister of MWR Hu Siyi praise the collect and refund policy twice on the experience exchange conference about national water-saving society pilots, “The collect and refund reform seems simple, however its essence is the using of price mechanism, bring interest adjustment and enhance the water using efficiency, which is meaningful.” The experience of collect and refund policy was also printed as conference material to provide guideline for WAB in other places. April 2013, Vice Minister of MWR Li Guoying come to Hengshui City and visit the pilot, he said “it is an effective water-saving mechanism to improve irrigation water use efficiency and is worthy of promotion”.

The praise of officials from MWR and HPWRD had brought the pilot policy honor, fiscal support and great reputation among national water conservancy system. In 2008, Taocheng WAB was the only county-level national water-saving society pilot in Hebei province. In 2012, the Taocheng WAB was chosen as the national excellent working group within the water conservancy system. The inventor of the collect and refund policy, the vice director of Taocheng WAB Chang Baojun was also selected as the national advanced worker at the same time The provincial water-saving society pilot include general fiscal fund for each pilot, however the national water-saving society pilot do not include the counterpart fiscal fund. HPWRD granted another 1.1 million yuan from 2009 to 2010, mainly due to the appraisal of former minister.

However, this national reputation among functional departments do not bring the diffusion of innovation and the pilot policy was on the edge of extinction in 2014. H5-2 has been proved, the even functional departments in the national level can only influence the diffusion of innovation in country level through projects and fiscal transfer.

***The test of hypothesis H5-3.*** As illustrated above, despite the support and appraisal from the superior functional government, the diffusion process had made little process. Actually when the officials from MWR and HPWRD paid a visit to Taocheng district, the vice mayor of Hengshui City and vice governor of Taocheng district had companied the visit due to the courtesy of Chinese bureaucracy. However, the Hengshui city and Taocheng district show little interests in promoting collect and refund policy before 2014. Even MWR exerts little influence on Taocheng district government in terms of policy diffusion.

The county-level government in China are the basic layer of government which has the authority to allocate its fiscal budget, has direct control on the township government and is responsible for local policy implementation. The diffusion of unprofitable policy in large scales needs the firm support from county-level government. Only When the leading groups among different counties are established, the collect and refund policy in different places has been promoted in practice in 2015. H5-3 has been proved, the influence of national functional department could not match the influence of the country government chief in terms of diffusion of local unprofitable policy.

## **Conclusion and discussion**

This research decomposes one level Chinese government as the government chief and functional department and explore the different role they played in the vertical diffusion mechanism of authoritarian China. Unlike the quantitative method, this paper adopts the within-case process tracing and cross-case analysis to analyze the research question. Based on the innovation and diffusion process of collect and refund policy, an agricultural water-saving policy conducted in Taocheng district, Hengshui City, Hebei province, this paper separates the vertical diffusion mechanism specifically.

We find the functional department can play the role as sponsor to encourage policy innovation of local government, however contribute little to the policy diffusion. Even the national functional government can only influence the local government through project and fiscal transfer. The county-level government held the prime responsibility for local policy diffusion. While the superior government chief play the vital role in policy diffusion through mandate mechanism under authoritarian personnel system. The influence of local government chief can even exceed that of national ministry in the diffusion process of unprofitable policy.

This research tries to highlight the different role of superior government and functional department in the vertical diffusion mechanism and enrich the policy diffusion theory under the authoritarian regime. The mandate mechanism explained by previous researches mostly refer to the superior government. While the special role played by the superior functional department seems to be the sponsor for policy innovation. Since the vertical diffusion mechanism always needs to consider the context

of the native political structure, this paper tries to make the diffusion of innovation theory more generalized by providing the vivid detail of Chinese context.

The attention of county government chief seems to have the greatest influence on the local policy diffusion. Interesting question which should be further explored is that how to influence the county-level government Chief. One answer is through the mandate mechanism from the superior government chief. The further question lies behind the answer is that what is the attention allocation pattern of the supreme government chief, if all superior government follow this rule. Since the attention of supreme government chief is limited and there are so many issues competing for their attention, the attention allocation mechanism require further exploitation if we want to have deeper understanding about vertical diffusion mechanism in authoritarian China

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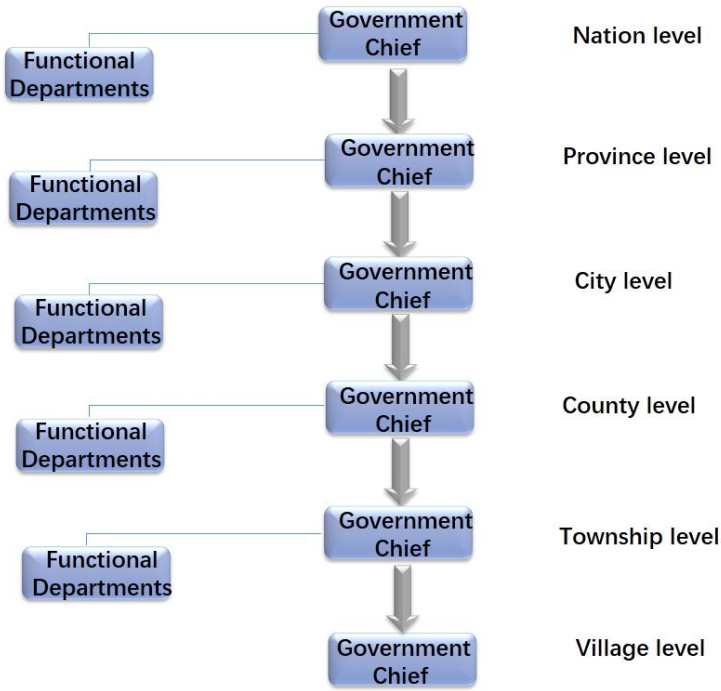


Figure 1. The structure of Chinese government

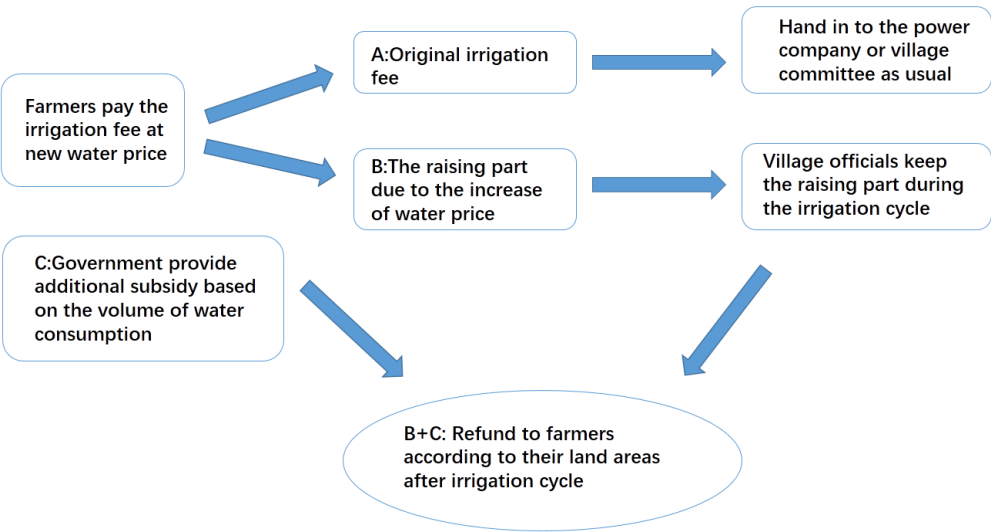


Figure 2. The principal of Taocheng collect and refund policy

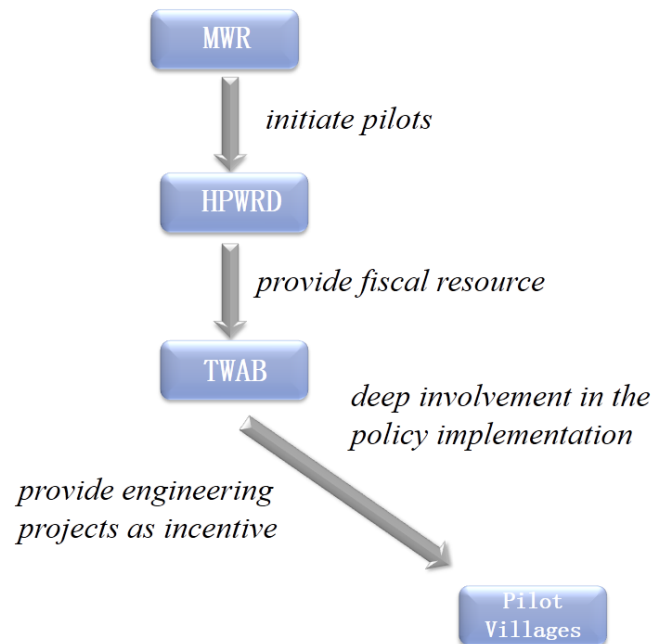


Figure 3. Superior functional departments and policy innovation

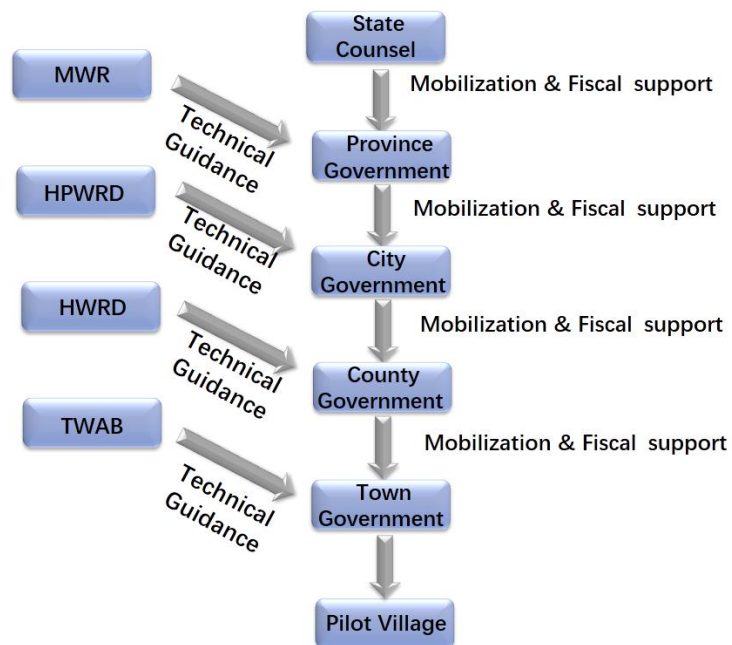


Figure 4. Superior government chief and policy diffusion

Table 1. Pilot village and fiscal fund of collect and refund policy (2005-2016)

Year	Pilot village	Pilot Project	Fiscal fund (yuan)
2005	3	provincial water-saving society pilot	0.5 million from HPWRD
2006	10	provincial water-saving society pilot	0.6 million from HPWRD
2007	10	provincial water-saving society pilot	1.8 million from HPWRD
2008	14	none	none
2009	13	national water-saving society pilot	0.6 million from HPWRD
2010	11	national water-saving society pilot	0.5 million from HPWRD
2011	12	national water-saving society pilot	none
2012	9	none	none
2013	7	none	none
2014	5	none	none
2015	5	national groundwater overdraft governance pilot	3.02 million from central and provincial government
2016	36	national groundwater overdraft governance pilot	4.96 million from central and provincial government ; 1 million from Taocheng district government
2017		national groundwater overdraft governance pilot	10.01 million from central and provincial government; 0.95 million from Taocheng district government

Table 2. Inventory of fiscal budget of provincial pilot project (2005, 2007 & 2010)

Year	Inventory of fiscal budget	Amount(10 thousand yuan)
2005 (0.5 milion yuan)	Leaflets, brochures, posters and writing brush	3.1
	Making card, CD-ROM, multimedia record	8
	Traveling fee for study other pilots' experience	3
	The establishment of WUA	5
	Administrative regulations, association management system	2
	The investigation for basic situation	1
	The operation of pilot village , water-saving society Seminar	2
	The transformation of metering facilities	11
	Rural water transformation	12
	Industry water balance test	2.9
2007 (1.8 million yuan)	Rural drinking water measurement facilities	26
	Agricultural metering facilities	13
	Intelligent water metering	6
	The transformation of pipeline and equipment life	25
	Test and modification of pumping-wells	15
	Agricultural pipeline and equipment transformation	30
	The establishment of WUA	10

	Subsidy for pilot village which conducted collect and refund policy	55
2010		
(0.5 million yuan)	Pipe network transformation	7
	Seepage pipeline construction	14
	Well test, pump maintenance	7
	The establishment of WUA	5
	Subsidy for pilot village which conducted collect and refund policy	17

Table 3. Officials from MWR and HPWRD

Date	Officials from MWR and HPWRD
Mar 2006	Deputy director, division of science and technology, MWR
Mar 2006	Deputy director of HPWRD, director of the water resources division, HPWRD
Apr 2007	Deputy director of HPWRD, deputy director of the provincial finance department
May 2007	Director of water resources division, MWR
Jan 2009	Director of division of water resources management, MWR
Feb 2009	Former Minister of MWR
Feb 2009	Deputy director of Finance Department of MWR, deputy director of HPWRD, director of Finance Department of HPWRD
Mar 2009	Director of HPWRD, director of water resources, HPWRD
Oct 2009	Water resources development center, HPWRD
Sep 2010	Vice Minister of MWR
Apr 2011	Haihe River Water Conservancy Commission, MWR
Apr 2011	Deputy director of water resources center, MWR
Apr 2013	Vice Minister of MWR