

# PERFECTING THE USE-AND-PAY SYSTEM FOR WATER RESOURCES IN CHINA

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## ABSTRACT

*The necessity of perfecting the Use-and-pay (UP) system or Users Pay Principle (UPP) system for water resources in China is first analyzed. The experiences of practicing UP/UPP in the past 40 years are summarized, and the main problems existing in the actual system are also pointed out. In terms of the characteristics of accountable material objects and value of water resources comparing with other natural resources, some measures and methods of perfecting actual UP/UPP system are proposed in the paper.*

*Keyword: Water Resources; Use-and-pay (UP) system; China; perfection; accounting characteristics.*

## 1 PERFECTING THE USE-AND-PAY SYSTEM OF WATER RESOURCES CONFORMS TO THE DEMANDS ON THE CURRENT NATIONAL SOCIAL SITUATION, WATER SITUATION AND ESTABLISHED SOCIALISTIC MARKETING ECONOMICAL SYSTEM

- 1) Due to the reasons of populousness and the special natural geographic condition, perfecting the UP/UPP system is propitious to overcoming unfavourable natural characteristics of water resources.
- 2) Drought and water shortage in some parts of China is extremely serious, perfecting water resources UP/UPP is in favor of mitigating serious water shortage both in urban and in rural areas.
- 3) The future economical development needs large amount of water resources, so the perfecting of water resources UP/UPP system will be advantageous to implement the shape-up of economy with smaller resources.
- 4) Due to the serious deterioration of water environment in China, the perfecting water resources UP/UPP system is beneficial to the effective protection of water resources, and will facilitate sustainable utilization of water resources.
- 5) The perfecting of water resources UP/UPP system suits the needs of the transition from traditional planning economic system to socialistic marketing economic system for the management system and undergoing circulating mechanism of water resources.

6) The safeguard of sustainable water resources utilization is commonly concerned by lots of countries nowadays. The establishing and perfecting water resources UP/UPP system is an important management and protection measure for a country.

## **2 PERFECTING WATER RESOURCES UP/UPP SYSTEM IS NEEDED TO SUMMARIZE EARNESTLY THE EXPERIENCES AND PROBLEMS OF THE EXISTING UP/UPP SYSTEM, AND TO DEFINE CLEARLY THE IMPROVEMENT DIRECTION FOR FUTURE**

### **2.1 EXISTING UP/UPP SYSTEM**

(1)UP/UPP system is already carried out for a long time in our country, mainly focus on calculating and levying upon water prices and water resources prices

Before the enactment of The Water Law of the People's Republic of China (Water Law for short) in 1988, calculating and collection of water prices for the water supply from hydro-works was first according to "The Trying out Method of Utilization and Management of Water Prices Levying upon Hydro-works" which was established by the Ministry of Water Resources and approved by State Council in 1965. Later it was on the basis of "The Ratifying, Planning Levying and Management Methods of Water Prices Levying upon Hydro-works" issued by State Council in 1985. The users who use water supplied by urban waterworks pay water price complied with related local regulations. The measures of collecting water resources prices were only put forward in the areas where suffer from serious water resources shortage at such as ShanXi, LiaoNing and TianJin provinces. ShanXi Province is the first one to levy water resources prices. The Water Law issued in 1988 made clear prescription on the collection of water prices and levying upon water resources prices.

(2)While implementing the No. 34 statute of The Water Law of 1988, water is commonly divided into three classes from the point of water conservancy economy: The first class is natural water, that is water in natural state; the second class is self-supporting water, which is took directly from ground, rivers and lakes to serve as self-provide water sources by party and government organizations, schools, armies, enterprises and institution themselves; The third class is commercial water, which is sold by water-supply units. According to "The Ratifying, Planning Levying and Management Measures of Water Prices Levying upon Hydro-works" issued by State Council in July, 1985, if the users use water supplied by hydro-works, they should pay water prices in term of the method issued by State Council, and the detailed rules legislated by provinces, municipalities directly under the central government in conformity to the methods issued by State Council. If the users utilize water supplied by waterworks of cities, they should pay water prices in term of regulations enacted by related management organizations. In order to control the exploitation of groundwater in the urban area strictly, by using financial way to enforce supervising and management, the measures of levying upon water resources prices to the units drawing water from ground directly are implemented. That is to say, to the users which self-provides water from ground in urban area, it will be charged as water resources prices. At the same time, considering the difference of water resources conditions between the south and the north area in China, it is decided by each province weather charging water resources prices from other users who draw water directly from ground, rivers and lakes and served as self-provided water sources.

From 1988 till now, on the side of collecting water prices, each province (region, city) has issued collection method and standard successively. Some provinces even modified

them. On the side of levying water resources prices, there are 25 provinces (regions, cities) enacted levying methods and standards. The collection method of State Council is in the process of formulating.

It should be confirmed that a lot of practical experiences had been obtained in the collection of water prices and water resources prices. It formed a basis for further improving UP/UPP system in China.

## **2.2 EXISTING PROBLEMS**

The current use-and-pay systems of water resources in our country has some positive effects for better management, utilization and protection of water resources. But from the point of prompting reasonable water resources development and sustainable utilization to ensure the sustainable development of social economy, it is not so healthy and perfect, further improvement is needed. Especially in the following two aspects:

First, the charging standard is commonly on the low side. According to investigation, the cost of water supply from hydro-works is 3.3 cents per cubic meters at average national level. But the water price is less than 2.3 cents per cubic meters. In particular for agricultural water price, it is less than half of the cost of supplying water in most provinces. Industrial water prices only occupies 0.1% ~ 0.3% of cost of products at national average. Municipal water prices is only 0.23% of consumption. Water resources prices is also commonly lower and could not react its value. In 1995, the present water resources prices carrying capacity analysis were carried out in terms of different industry in 15 provinces (or municipalities). The results show that apart from very few industries and some specific cases, water resources prices occupied very limited part of cost in most of the cases.

Secondly, the actual water resources use-and-pay levying objects are not complete. Due to the reason that water resources have the characteristics of multi-use and fluidity, and different kinds of users from upstream to downstream in the same basin will affect each other. So only levying water resources prices from the users who fetch water directly from rivers, lakes and ground is not complete. It should include the water basin and hydropower utilization et al. At the same time, only depending on collecting water prices and levying upon water resources prices can not solve the problems related to protecting water resources and maintaining the stability of ecosystem etc, which are caused by the deterioration of water quality, destroying of water basin functions, damaging of hydro-works, decreasing groundwater level, ground subsidence etc. Other extra systems should be established. For example, the Water Conservancy Industry Policy issued by the State Council puts forward to set up financial compensation mechanism for protecting water resources, restoration of ecosystem, and to start up levying upon waste water treatment fee to urban water supply. It is a supplement of this aspect.

## **3 HOW TO PERFECT WATER RESOURCES UP/UPP SYSTEM**

### **3.1 ACCOUNTABLE CHARACTERISTICS OF MATERIAL OBJECTS AND VALUE OF WATER RESOURCES (COMPARING WITH OTHER NATURAL RESOURCES)**

Compared with mine, forest, grassland, land, biology and sea resources, water resources have the following main accountable features:

- (1) Water resources is a kind of circulative resources

The cycle of water resources means that water coming from the evaporation of seawater, falls to ground with rainfall, and generates runoff and groundwater, then flows to sea through rivers. This process goes round and round annually. This feature determines that the total amount of water resources, such as within the country or within a basin, is fluctuating around years average and not existing the problem of empty.

(2) Water resources is a kind of fluidity resources with stochastic change

The stochastic property of water resources means water volume changing yearly and monthly. There are high, average and low flow year. Continuous high flow and consecutive low flow years are also happened at times. Low flow period and high flow period are the case every year. And this kind of change is random, it complies with statistics rules. The fluidity of water resources means that under the gravity, water flows from higher to lower place, from up to down streams, and will finally go to the sea (inner rivers will go toward terminal lakes). Analyzed from the point of water resources serviceability, water resources is not possible fully used as mine, forest and cultivated land. Only some parts of water resources that used by mankind through hydro-works has its value.

(3) Water resources is not only substantial resources, but also environmental resources. It is not substitutive.

(4) Water resources is exchangeable, or not exchangeable. The trade-off market displays obvious regional feature.

Water supplied to mankind through hydro-works has commercial property. It can satisfy the requirements of people. From this point, water is exchangeable. But the range of exchange is very limited, water of China could not sell to the U.S.A (here mentions a large amount of water for people's subsistence, not including few mineral water exported). The transport range through channel and pipes is limited and has obvious regional property. From this point of view, water is not exchangeable.

(5) Water resources is a kind of multi-functional resources

The existing multi-functional properties and different multi-functional properties in different regions of water truly determines the water resources value in different regions. The magnitude of water resources value should be determined according to its functions.

(6) Water resources is a kind of repetitive resources

(7) Water supplied to people through hydro-works is monopolized, the marketing competition does not exist.

If water is treated as a kind of commodities, this kind of goods only could be developed locally and also consumed locally. It is not possible sell water from other places. So it is monopolized, because there is no competition, and no prices generated from market competition. Water prices could only determined according to three components including water resources value, water supply cost and benefit. If the local government treats water supply as welfare and reduces water prices, it will result in the difficulty of water supply companies. It will affect the development of water supply enterprise and at the same time foster waste of water.

### 3.2 MEASURES FOR PERFECTING WATER RESOURCES UP/UPP SYSTEM

(1) Definitude the intension of water resources UP/UPP and particular contents

The so-called water resources UP/UPP system is actually a set of management measures that national government adopts to force the organizations or individuals to pay a sum of money by

compelling means when they develop and/or utilize water resources in order to guarantee the water resources sustainable utilization. The intension and real contents of water resources use-and-pay system is mainly include the following two aspects:

First, water resources UPP system should include utilization refund and usage compensation.

When users use water resources (no matter which feature of water resources), due to the ownership of water resources belonging to national government, the users should pay a sum of usage expenditure. If it's to use directly natural water resources (surface water and groundwater), then the expense is purely water resources prices. If it's to use water from hydro-works or urban waterworks, the expense should include both water resources price and water prices. Above usage charge is called usage refund. After the users use water resources, it generally causes two kinds of effects. One is consuming part of water (i.e. thermal power plant), it will reduce the total amount of water. Another effect is that drainage water quality is different from natural water, and causes the change of natural water quality and water body functions. These two kinds of effects is disadvantage to the protection of water resources and the maintenance of ecosystem. In order to protect water resources and keep ecosystem affected less from these effects, investments is needed. So implementing the usage compensation to drainage and consuming water for users is needed, that is to say, charging usage compensative fee.

Second, UP/UPP of water resources should establish suitable charging methods and standard according to the multi-functional characteristic of water resources.

As mentioned earlier, the multi-use of water resources causes that there is a different characteristics between water resources and other resources in the accounting of substantial amount and value amount. The existence of this feature requires national government constitutes usage water resources charging methods and standards respectively, not only according to purposes but also considering the typical features of each purpose of water resources, and at the same time, plentitude consideration of water usage for different users.

For example, while constitute usage refund charging methods and standard, at least we should distinguish several classes such as directly fetching water from rivers, lakes, groundwater, water basins usage and water energy utilization. Then if detailed division is needed, for example directly fetching water, it includes in the usage for irrigation, industry, domestic, thermal power and mineral water etc.

Another example: while establishing usage compensative methods and standard, the key issue is the situation of drainage after the users use water resources. Such as the use of water in hydraulic power station, it just passes through turbine, and it doesn't consume water quantify and spoil quality after use. So the charge of usage compensative prices is obviously not reasonable (the operation of hydraulic power station causes the disadvantage to downstream is another story). For thermal power water usage, it usually causes the loss of water amount, but will not bring large change of water quality (the water temperature in the surrounding of drainage point will change, but generally cause little effect to water bodies quality). So when considering the UP/UPP system of thermal power plant, this characteristics should be taken into account, etc.

(2) The key issue is to perfect legislation framework

In order to manage, utilize and protect water resources well, the water resources UP/UPP system established should regulate and control the whole process of users utilizing water resources. The Water Law enacted in 1988 is not enough because it only stipulates to levy water price and water resources price. Charging water resources prices is limited to the users who directly fetch water from rivers, lakes and groundwater and purposes is not complete. So while amending The

Water Law, it should complete water resources UP/UPP system framework. Not only just including the original contents of the Water Law, it should also add new contents.