Exploitation of Water Resource in Jiaozuo, Henan

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Abstract

Jiaozuo has rich groundwater resources and water's quality is good. Due to unreasonable use and the serious pollution, cause the limited water resources to consume at an astonishing speed. This paper analysis to the water environment of this city from the aspects, such as the exploitation condition and the contradiction between supply and demand of the natural water etc, finally proposes the solution measures of worsening water resources in this area, hope for providing some helps to enhance the consciousness of environmental protection and construction of harmonious society.

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The water is a limited and precious natural resources, is the active factor in the ecosystem system, and mankind the existence is closely related. Because of the influence of mankind's activity, express the pollution and the depravation of the water environment of different degree in the global scope. This isn't only seriously restrict the development of the social economy, even endanger to the mankind's existence and the health. The water resources environment condition in Jiaozuo city ream a person a misgiving, pollute very seriously; due to the related research work carried out late, and experience isn't enough. This text has all important meaning to raise people's environmental protection consciousness, establish the diapason of person and nature get along with, Seek the healthy development of the economy and carry out the water resources can keep on exploitation.

1. The exploitation condition of the natural water resources

1.1 The exploitation of the earth's surface water

The surface water of the city mainly is distribute in river and reservoir, the multi- year average surface discharge is 26.63 hundred million cubic meters; the runoff discharge of flow into the city is 20.79 hundred million cubic meters from the another province among them (contain the Qin river 15.6 hundred million cubic meters, the Dan river 3.5 hundred million cubic meters), self-production runoff discharge inside the
area 5.84 hundred million cubic meters. The earth's surface water mainly is Qin River and the Dan River upper course, under the natural state, water quality is better. Particularly the mountain area river, can attain The Third Class water quality, Belong to the calcium type a water, it is suitable for to drink and to produce with agriculture. Used for agriculture to produce annually of use the amount of water is 4.8 hundred million cubic meters, account for 27% of two river runoff discharges.

The plain river because of affluxing the industrial waste water draining from factory, mine and town enterprise and living dirty water, the water quality is subjected to a very great pollution. In the surface water of plain region inside the river valley, 14 rivers such as Qin River, Mang River etc. all encounter to the severity pollution, besides Xin River and Lingquan stele, the rest river segment has already lost the usage function. Take the Mang River as an example, its south supervise and control section of Zhu ditch in Win county, the comprehensive pollution index of 1998 is 207.8, have already lost an agriculture irrigation function. Is subjected to the influence that the underground water level descends in the river valley, the natural runoff of many small rivers has already no longer existence.

1.2 The exploitation of the groundwater

This city groundwater exploitation, according its way and characteristic can is divided into the mine water-drainage, the large source ground concentration to exploit continuously; the mine self-provided well dispersive exploitation continuously, the agriculture irrigate asunder and interrupted type to exploit four kinds of forms. Among them, the mine water-drainage is the main form that the groundwater discharges, mining for the large headwaters ground secondly, is the factory mineral self-provided well and agriculture to irrigate machine well again. From 1991-1995 years, the mineral well drain equally is the 7.008 cubic meters per second, share 61.6% that the groundwater always excretes quantity; The factory mineral self-provided headwaters ground mines groundwater equally is the 2.1 cubic meters per second, have 18.6% that the whole city groundwater excretes a total amount; The agriculture use exploit quantity average for the 1.5 cubic meters per second, have 13.2% that the whole city groundwater excretes a total amount; The running water company mines the groundwater 0.734 cubic meters per second, having 6.6% that the whole city groundwater excretes a total amount.

In addition to above-mentioned district scope, other district groundwater distributes a circumstance for: The Meng state groundwater resources is 1.19 hundred million cubic meters, Wen county's 1.42 hundred million cubic meters, the Qinyang region 1.063 hundred million cubic meters, the Wuzhi county is 1.93 hundred million cubic meters. Whole cities the groundwater mined the total amount as 12.18 hundred million cubic meters in 1983, among them, agricultural used water was 10.3 hundred million cubic meters, accounting for 84.6% of mine total amount, the industry used water as 0.66 hundred million cubic meters, account for 5.4% of mine total amount, the town life used water as 1.22 hundred million cubic meters, account for 10% of mine total amount.

2. The existent problem in the development and exploitation process of the natural water resources

Accompany with the fast development of the economy, limited water resources also is being consumed with astonishing speed. Currently, the development utilization of water resources of Jiaozuo city is up to 44%. According to the data provide by Jiaozuo agriculture science technique graduate school, Jiaozuo city a year to need the amount of water as 12.1 hundred million cubic meters currently, supply water the quantity as 10.47 hundred million cubic meters, be short of water the quantity as 1.63 hundred million cubic meters. At the medium dry year, the whole cities need the amount of water as 14.71 hundred million cubic meters, supply water the quantity as 11.89 hundred million cubic meters, be short of water to 2.82 hundred million cubic meters. It is thus clear that, even in not- dry year Jiaozuo city is also the city of the
water shortage, so should promote an economy to use water and circulate to use a water strongly to solve the supply and demand antinomy of the increasingly outstanding water resources. But the river break to flow and the pollution of the earth's surface water and groundwater, urge this antinomy to turn worse.

2.1 The headstream breaks to flow

Due to excessive exploitation and utilization, inshore river of Jiaozuo city take place break to flow multifarious, and gradually serious. In Jiaozuo city, there has been currently many river run offs breaking to flow now. Appeared to break to flow at the earliest stage is the Mang river, since 1990, appear to break to flow annually, the longest time is in 1997, break to flow to reach to for 145 days. And now not only the river valley area small river has already broken to flow, the big river, such as the Qin river, also start to appear to break to flow, the average discharge in the withered water only have 0.10 cubic meters per second. The break of severity flows condition make the river pollution to worsen more, in order to breaking to flow, reduce pollutant to descend to leak quantity, some rivers became a pollution serious black river, smelly river.

According to monitor the data contrast in recent years, during the river breaks to flow a period, the density of Cu, Zn, Pb, fluoride, NO₃-, BOD₅, volatile phenol and cyanide...etc. present to increase high trend. In the meantime, because the river breaks to flow, reducing the complement quantity from the earth's surface water to permeate groundwater, but having already polluted seriously of the earth's surface water permeate again in the further pollution groundwater. Break to flow to turn to the littoral soil reason, sand, the agriculture produce layout, farm crop yield, the water ecosystem system to all produce very great influence.

2.2 The earth's surface water resources pollution

In 1998, carried on a monitor to the water quantity of the Yellow River and the Sea River these two waters system in Jiaozuo city's scope, discovered the earth's surface water has already encounter to the heavy degree a pollution as a result. The main headstream pollution degree from heavy to lightly one by one: the Mang River, Dasha River, Xin River (belong to Dasha River), the Qin River, each main rivers all present the organic pollution characteristic.

1) The Yellow River water system

Mang River: According to the examination result of the monitor spot on the south of Zhu ditch in Win county, express that the synthetically pollution index of the river water has already attain 207.8, belonging to a serious pollution. Among them, salt permanganate index number go beyond standard 36.5 times, chemical oxygen demand exceed criterion 41.9 times, the five-day bio-chemical oxygen demand overtake the standard 90.0 times, volatile phenol 11.3 times, the non-ion ammonia is 23.1 times. Currently, the Mang River has already lost an agriculture irrigation function, saying nothing of to drink.

Qin River: According to the South Bridge monitor of Wuzhi city order an examination, the synthetically pollution index number of the river water is 9.0, belonging to a medium degree pollution. Among them, salt permanganate index number goes beyond standard 1.7 times, chemical oxygen demand exceed criterion 1.1 times, the five-day bio-chemical oxygen demand overtake the standard 3.2 times, and volatile phenol is not beyond the standard.

2) The Haihe River water system

Dasha River: According to the research of the monitor station of Wuyanglou in Xiuwu county, the synthetically pollution index number of the river water is 16.0, belonging to a medium degree pollution. Among them, salt permanganate index number go beyond standard 1.7 times, chemical oxygen demand
exceed criterion 3.0 times, the five-day bio-chemical oxygen demand overtake the standard 7.1 times, volatile phenol and the non-ion ammonia are not beyond the standard.

New river (Dasha River upper stream): According to the examination result of the monitor spot of Linquanbei in Jiaozuo area, express that the synthetically pollution index number of the river water is 2.7, belonging to a slight pollution. The chemical oxygen demand and the five-day bio-chemical oxygen demand are all not beyond the standard. The monitor spot is unique place that attain the national The Forth Class standard in the city's surface water monitor. Comprehensive pollution index number provide by the supervision station of Zhuguozhuang in Xiuwu county is 31.9, belong to severe degree a pollution. Salt permanganate index number goes beyond standard 4.56 times, chemical oxygen demand exceed criterion 7.48 times, the five-day bio-chemical oxygen demand overtake the standard 14.85 times, non-ion ammonia is 0.76 times, and volatile phenol is not beyond the standard.

3. Genetic analysis of the natural water resources supply and demand antinomy

Through comprehensive analysis of natural water resources of Jiaozuo city, we can see the city's water resources exist a following problem:

3.1 The development strength is not enough to transit water

a) At Sanmenxia Hydrological Station of Yellow River, the annual average discharge reach to 413 hundred million cubic meters, the nation assigns 55 hundred million cubic meters to Henan annually, but lead a water currently more than 30 hundred million cubic meters, still have 20 hundred million cubic meters of the water wasn't make use of. Although Jiao city has already built the lead Yellow River engineering such as the dike irrigation spots of Dai village and Dayulan etc. and Baimaquan irrigation area etc., whole city the annual lead water quantity only gets 1.0 hundred million cubic meters or so. Compare with other region and cities along Yellow River, the margin is very big. Qin River and the Dan River the annual discharge reach to 18 hundred million cubic meters, among them the Qin River about 1,5 hundred million cubic meters, the Dan River about 3 hundred million cubic meters, but lead amount of water about 4.8 hundred million cubic meters currently or so, share only two river 27% of the annual discharge.

3.2 In Jiaozuo city the earth surface water to have already suffered a serious pollution

Mang River, Dasha River, Xin River and Qin River etc. each main headstream pollute already very seriously, The Quanlingbei monitor spot is the only place that attain the National Forth Class standard in the whole city; The comprehensive pollution index number of the Mang River be up to 207.81, have already lost an agriculture irrigation function, say nothing of to drink.

The data show that only the industrial business enterprise waste water of Jiaozuo city to exhaust 129,530,000 tons in 2000, contained mercury 0.075 tons among them, the chromium was 0.042 tons, six price chromium were 2.34 tons, the lead was 0.51 tons, the arsenic was 0.282 tons, volatile phenol was 24.2 tons, the cyanide was 7.6 tons, the chemical oxygen demand was 53946 tons, petroleum was 102.8 tons, total suspending particle was 53796 tons, the sulphide was 96.1 tons. The earth's surface water been pollute is use to agriculture or descends seepage, all constituting to the soil and the groundwater to pollute and threaten directly.
3.3 The groundwater mines too much, making the underground water level descend year by year, making the river replenishment not enough.

Accompany with the development of the economy and the exaltation of the standard of living in recent years, the people's need to the water resources is also in the significant growth. The mine of excessiveness result in Jiaozuo city 3449 square kilometers of the groundwater is descend with the speed of 0.5 meters annually. Because the groundwater mines too much, there have a few bigger “the groundwater funnel area” inside Jiaozuo region, in addition to the funnel area at Gangzhuang of the suburb etc., the bigger groundwater funnel areas are the Qingfengling region and Xunfengling funnel area.

While the Qingfengling funnel area forms in 1972, the area is already 300 square kilometers, the center water level is 13.4 meters, but the area is already 2, 650 square kilometers up to now and the center water level is 28.44 meters. Currently, the groundwater water level descend to have already spread to the northeast region of Meng State city, the south of Qinyang city, the whole Win county areas and northwest part of Wuzhi county. It is thus clear that the underground water level descends astonishing speed.

2) When the Xinfengling funnel area formed in 1972, the area is 10 square kilometers, now already is 160 square kilometers, the center water level is 21 meters, involving scope to include the northeast of Wuzhi and the southwest of Xiuwu. At present, within the 40 meters depth well there were already more than 5000 eyes withered, 1400 eyes discard.

3.4 The groundwater recharge to the river basin has the vital significance on maintaining the activity of the rivers and ecological system

Because of many years the concentrated super quantity mine groundwater, making the underground water level descend year by year, causing the river depending on the groundwater replenishment to break to flow, on the contrary, at raining season the river water supplies groundwater, thus shortening the time of the plentiful water period, accelerated headstream to break to flow, result in the small discharge river occurrence to break to flow phenomenon.

To sum up, the water resources total amount are more abundant in Jiaozuo city, but personal amount of resources is low, the waste of water resources and the pollution phenomenon very serious, already to people of the daily life constitute threat, the people of parts of regions exist condition depravation.

4. Measures to solve the problems

The first, manage strictly the problem of waste water of the super mark by the pollution enterprise, suppress the pollution source head, change the water resources ecosystem environment, want to "the bigotry disease" business enterprise to handle seriously, put the exaltation environment quality in the business enterprise to produce of first.

The second, must changes the present condition of the more extensive business and the less intensive type in industrial structure, total science and technology level very low. Increase science and technology content, use the forerunner's technique guidance production, and raise a business enterprise to use water efficiency.

The third, try hard to resume the using ground of green to turn, increase to overlay rate of plant, strengthen the water and soil conservation work, recover and exaltation the clean itself ability of the natural environment.

The fourth, initiate use water frugally and scientifically, promote to use water circularly, eradicate completely the problem of the water resources. waste in the flooding irrigation and daily life.
In conclusion, don't resolve this problem that worsen environment and the shortage resources check and supervision the social economy develop, impossible realized the can sustain development strategy, can't even set up an ecosystem environment system with civilization, diapason, have order and healthy, the mankind also will encounter to the bad luck abandon by great universe necessarily.

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