

## Research Article

### Research on the Chemical Pollution of Food Producing Enterprise in Anhui Section of the Huaihe River

<sup>1</sup>Zhenbo Xu, <sup>2</sup>Fanghui Liang, <sup>1</sup>Ruili Wang, <sup>1</sup>Lianqing Li, <sup>3</sup>Zunwei Li and <sup>4</sup>Ling He

<sup>1</sup>Faculty of Literature and Education of Bengbu College,

<sup>2</sup>Faculty of Foreign Language of Bengbu College,

<sup>3</sup>Faculty of Biological and Food Engineering of Bengbu College,

<sup>4</sup>Faculty of Chemistry and Environment Engineering of Bengbu College, Bengbu, 233000, China

**Abstract:** In this study, based on field surveys, we analyze pollution situation and reasons of food producing enterprises in Anhui section of the Huaihe River. Furthermore, exploring key measures to deal with this problem from food producing enterprises, government and the other aspects is also discussed in this study to make a consultative reference for the environmental governance of Huaihe River and the relevant areas.

**Keywords:** Anhui section, Basin of Huaihe River, chemical pollution, food producing enterprise

## INTRODUCTION

China's economy is growing rapidly in the recent years. However, the high growth of GDP is at the expense of the environment. At the end of the last century, 90% of urban water is in seriously pollution, 50% of urban water does not meet drinking water standards and 40% of water is undrinkable nationwide; 60% of the total water volume of the southern city due to the pollution (Danhui and Hongli, 2010). Focusing of many environmental problems in China today, the most serious environmental pollution is caused by food producing enterprise, which is staggering the Basin of Huaihe River. As one of China's seven major rivers, the Huaihe River is running through Henan, Anhui, Jiangsu and Shandong Province, flowing through 34 prefectures (cities) totally to 182 counties (cities). The river's arable land area and population density ranks first in the seven major rivers. And in the 82 global water quality monitoring sections, 54.8% of the sections is reaching Grade I~IV requirements of water, 8.9% is in Grade V and 36.3% of the section is more worse than Grade V (He and Sun, 2003). In recent years, the Huaihe River pollution has seriously influenced economic development and social stability (Guo *et al.*, 2012; Liu *et al.*, 2007; Zhu and Lee, 2002; Zienkiewicz *et al.*, 1975). Especially in the Anhui section, because drinking water of millions of coastal residents does not meet the standards, "cancer villages" exists, such as, Qiugang, Changhuaiwei, Longzihu District, Bengbu and Wanggang, Changqing, Yuhui District, Bengbu and the like. Through field investigation, combining point (village) and line (chemical industry) and fully grasping the distribution, operation and pollution of the food

producing enterprise in Anhui section of the Huaihe River, we could promote government, business and the public to participate in the career of managing environmental pollution in the Huaihe River.

In this study, based on field surveys, we analyze pollution situation and reasons of food producing enterprises in Anhui section of the Huaihe River. Furthermore, exploring key measures to deal with this problem from food producing enterprises, government and the other aspects is also discussed in this study to make a consultative reference for the environmental governance of Huaihe River and the relevant areas.

## INVESTIGATION PROCESS

**Time and area of the investigation:** The survey can be roughly divided into three phases: pre-capitol (July 2013), mid-term survey (August 2013), tidying up (September 2013 to December). In order to reflect the representative and typical of this survey, the selected areas are involving "nine local places in Anhui province altogether 29 cities and counties" according to "Water Pollution Prevention Plan in the Basin of Huaihe River (2011 to 2015)".

**Ways and means of the investigation:** The investigation mainly takes sampling survey, following with the key-point investigation and case tracking. Selected samples primarily stress on state-owned, provincial-control enterprises and business units with pollution record, taking villages and industrial parks that have been intensively distributed of business enterprises into consideration. According to the specific circumstances of the survey, the method mainly

Table 1: Situation on samples of food producing enterprise in Anhui section of the Huaihe River

Company	Specific address	Self-introduction of company	Products and size	Supervision/ Illegal situation
Anhui Debang Chemical Co., Ltd.	Tian Jia'an District, Huainan	A foreign joint-stock enterprise and a major enterprise being specially protected in Huainan	Soda, ammonia, chloride and other edible soda	
Anhui Tianrun Chemical Co., Ltd.	Jianghuai Road, Bengbu	national high-tech enterprise of producing fine chemical products	Annual product capacity of 30,000 tons of Polyacrylamide	National key monitoring enterprise in 2010. Illegal recording In 2004,2006, 2009 and 2010
Anhui Haoyuan Chemical Co. Ltd.	Fukang Road, Fuyang	A large chemical company, top 10 in Anhui chemical industry and top 20 in national fertilizer industry	Total annual production capacity 800,000 tons of ammonia, 600,000 tons of urea, 400,000 tons of ammonium bicarbonate, 300,000 tons of methanol and so on	National key monitoring enterprise in 2010, seriously polluted enterprise of Fuyang (2005)

Table 2: Situation on samples of villages in Anhui section of the Huaihe River

Village	Location	Polluting enterprises	Polluting situation	Main threat	Status of safeguarding the rights	Media reports
Qiugang village	Longzihu District, Bengbu	Jiucailuo Chemical company (moved)	There are water, air and soil pollution, causing many villagers get cancer	Legacy environment (water and soil pollution)	Villagers have good awareness to defend rights	Many times
Gongqiao Village	Mengcheng County, Bozhou	Qiyuan Paper Mill (closed five years)	The paper thickness in the water to Guo River is about 1m	Safety issues of drinking water and pollution in rivers	Villages have good attitudes but they know little of rights and legal knowledge	No
Zhaoda Village, Xu village	Yingquan District, Fuyang	Haoyuan Chemical Company	Discharge of sewage leads to barren and the villagers cannot use river water for irrigation, also they are been exposed to chemical emissions	The safety of drinking water and air pollution	The villagers do not dare to complain	No

consists of copy writing-to find, collect and present information on relevant topics; inquiry-learn about environmental pollution from local residents; observation-field reconnaissance on foot, collecting and testing sample to access to relevant intelligence information by observing the GPS locator data (Table 1 and 2).

### THE INVESTIGATION RESULTS

**Survey on chemical enterprises:** More than eighty food producing enterprise were selected in this study and they are generally focusing on fertilizers, pharmaceuticals, paper, cement and other fields. These companies are located in the Huaihe River tributaries and near the village, taking advantage of cheaper land and abundant water resources, which give them low production costs. Considering ways of investigation, we have selected following companies as objects to keep track of (Table 1).

**Village survey:** More than a dozen of villages were interviewed in the investigation and it is understood that there are differences in villages pollution, pollution causes, the villagers' attitude and difficulty level to solve. Some selected representative villages are as follows (Table 2).

### INVESTIGATION ANALYSIS: THE PERFORMANCE AND REASONS OF ENVIRONMENTAL POLLUTION IN ANHUI SECTION OF THE HUAIHE RIVER

**The water pollution in chemical industry:** The Basin of Huaihe River is surrounded by many food producing enterprise, which bring about a variety of environmental pollution, especially water pollution. According to the results of laboratory analysis of the water body, we can suggest that Polychlorinated Biphenyls (PCBs) in the Huaihe River are mainly from papermaking waste water pollution. For example, sewage pollution of Haoyuan Chemical Factory in Fuyang has led to Fumeng River completely lost vitality as a dead river. Waste water discharge in food producing enterprise is the main cause of water pollution in the Huaihe River. Meanwhile, waste water discharge of residents living along the Huaihe River, long-term contamination of the Huaihe River decrease its own water purification capacity, which are all the important factors.

**Air pollution in food producing enterprise:** Another important reason that has polluted Anhui section of the Huaihe River is cement plant. During the production of cement, it will generate large quantities of dust. It is well-known that dust collector is generally using bag collector or Electric Dust Collector (EDC), but the

effect of dust collection bag is not so good as EDC. However, cement production costs are going to rise when we turn on the ESP. In order to decrease the costs, the plants often turn the ESP off, which makes dust disperse in the sky. Furthermore, the cement plant will not only produce cement dust but also large amounts of sulfur dioxide. If the sulfur dioxide is untreated but discharged directly into the sky, it is possible to create acid rain, which will be another serious air pollution problem.

**Other pollution in food producing enterprise:**

**Noise pollution in food producing enterprise:** Chemical company is now in a wholly-machine operation so that noise pollution is very serious. These food producing enterprise in the Anhui section are mostly distributing in rural areas and far away from the city. The factories are very close to the village and there is no installation muffler or soundproof wall. There is no doubt that noise pollution is very serious.

**Land contamination:** The reconnaissance has found that waste water discharged by food producing enterprise is generally discharging directly into the river near the village in Anhui section of the Basin of Huaihe River and the waste water has become the main source of pollution of water and soil. Contaminated soil change itself physically and chemically, which lead to soil compaction, reduced fertility and soil poisoned etc. The contaminated soil can also be leached by rainwater and the polluted materials is possibly flowing to groundwater or surface water passed from the soil, so that cause water pollution and degradation of water quality. The creatures growing in the polluted soil may do harm to people through the food chain after absorbing, accumulating and enriching of soil contaminants. At the same time, the chemical enterprises casually throw away the solid waste, which clog the river and its pungent smell is unbearable.

**THE SOLUTIONS TO DEAL WITH THE POLLUTION IN ANHUI SECTION OF THE HUAIHE RIVER**

In summary, food producing enterprise that discharge the emissions of toxic and hazardous in Anhui section of the Huaihe River Basin must take immediate and appropriate action and relevant government departments to supervise the pollution emission should also make a difference.

**Of chemical enterprises:**

**Consciously abide relative laws and regulations and earnestly fulfill their social responsibilities:** Relative enterprises should develop and implement specific targets and timetable to control pollution emission so that to gradually reduce from the source and finally

phase-out the use of hazardous substances. Taking paper enterprises for example, Linping Paper Company in Xue Village, Shengquan, Xiaoxian, Suzhou and Hongguang Paper Group in the national key monitoring township enterprises list. After rectification, Linping Paper Company appears the issue of excessive pollutants in the first quarter of 2010 and except that, the remaining two years have no illegal recording on the two enterprises. In the actual survey, the situation that the reduce of wastewater and improvement of water quality that residents talked about is in accordance. Whether it is forced by external pressure or a voluntary act, we call on the relative industry business should learn from the enterprises as described above and effectively fulfill their social responsibilities and duties.

**Proactively publish information and strengthen environmental construction:**

"Environmental Protection Law of the PRC" (2014 revision), which Article XIII clearly stipulates, constructing project that is environment-polluted must conform to the regulations of the State governing environmental protection. The vast majority of food producing enterprise belong to such projects, therefore, we should first start from the pre-construction. The report of construction projects on environmental impact must make pollution and environmental impact assessment and stipulate the controlling measures. We should start from the view of environmental protection for site selection. Secondly, in the production process, they should accord with their own chemical industry's characteristics and implementing the "protecting the environment, prevention-oriented" approach and strengthen the environmental management of the production process, which is also including the comprehensive utilization of "three wastes" and the treatment and disposal for more efficient production at lower cost of some necessary pollutants (He and Sun, 2003).

**Of governments:**

**Improve the function of institution and carry out administrative accountability:** The government should establish and improve the regulatory agencies of environmental protection of the Basin of Huaihe, pushing the executive leadership responsibility to environmental quality and defining the specific behavior of defending the environmental regulations among government departments and staff. Giving the appropriate punishment to the department that decrease the quality of environment with lacking of implementing regulations makes "official post" of the leadership be linked with the issue that whether they are responsible for regional environment. What's more, it is necessary to give the real power delegated to the environmental protection department with clear

responsibilities, so that the environmental regulations can be implemented powerfully.

**Control dust and exhaust gas pollution and governance environment garbage effectively:** The compliance food producing enterprise should be organized or coordinated by government to set garbage points in its vicinity and they should also deliver the garbage in time, while the government can invest in the development of the garbage industry. In the other hand, food producing enterprise could burn some garbage that can not be broken down naturally but it must be strictly limited dust and exhaust gas emission in incineration plants. Thereafter, the chimney must be high position and mounted exhaust filtration devices to reduce toxic substances into the atmosphere to a minimum.

**Focus on publicity and education to promote awareness of environmental protection of citizen:** Relevant government departments should further strengthen publicity and education of environmental protection, widely publicizing and popularizing the knowledge of environmental science and law, enhancing environmental awareness and legal concepts of the public to improve their awareness of environmental protection of the Huaihe River: First of all, all regions and departments must treat legal knowledge of environmental protection as an important part of the training of cadres and workers to improve all leaders' and people's consciousness of environmental compliance. Governments at all levels should take environmental performance as the main indicators of assessment of the officials, putting the importance of environmental protection of the Huaihe River on the agenda. Secendly, they should also guide public opinion to spur social organizations come into role, which expose all kinds of behaviors to damage Huaihe environment and encourage public to participate in the activities to prevent Huaihe's environment, such as the

activity, "to protect the Mother River-Huaihe River", has been actively carried out among primary and middle schools of the basin of Huaihe River. And the media should report and commend advanced models of environmental protection in Anhui section of the Huaihe River, with the addition of public exposing and criticizing offense of pollution and environmental damage.

#### ACKNOWLEDGMENT

Green in Jianghuai Area Environmental Advisory Center of Anhui province; Green Environment Protector Association of Bengbu College.

#### REFERENCES

- Danhui, Y. and L. Hongli, 2010. Analysis of economic losses of the environmental pollution in the mid nineties of China. *China Ind. Econ.*, 27: 115.
- Guo, M.W., X.R. Ge, S.L. Wang and H. Zheng, 2012. Enterprises list of excessive discharge of pollutants. *Disaster Adv.*, 5: 186.
- He, L. and X. Sun, 2003. Reasons and prevention for chemical accidents. *Chem. Safety Environ.*, Vol. 7.
- Liu, Y.Z., X.R. Ge, C.G. Li and S.L. Wang, 2007. Control strategy dynamic optimization of the hybrid electric bus based on driving cycle self-learning. *Chinese J. Rock Mech. Eng.*, 26: 2130.
- Zhu, D.Y. and C.F. Lee, 2002. Moving-gimbal effects compensation of double gimbal magnetically suspended control moment gyroscope based on compound control. *Int. J. Numer. Anal. Met.*, 26: 1573.
- Zienkiewicz, O.C., C. Humpheson and R.W. Lewis, 1975. Drive optimization of tricept parallel mechanism with redundant actuation. *Geotechnique*, 25: 671.