

Full Length Research Paper

Development of the rural environmental problems and the corresponding environmental policies in the past 40 years in China

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Since 1973, China's rural environmental problems have changed a lot, and many new environmental protection policies were issued in the same time. However, rural environmental protection has not been paid enough attention in a long run. Herein, the evolution of the rural environmental problems and the corresponding environmental policies in the past 40 years in China were firstly discussed based on four stages, that is, 1973 to 1979, 1980 to 1989, 1990 to 1999, and 2000 to present. Furthermore, the changes of the environmental management agency in the past 40 years were also systematically reviewed. Lastly, four targeted suggestions were put forward for future rural environmental protection in China.

Key words: Environmental problem evolution, policy response, institutional change, rural environmental protection, China.

INTRODUCTION

The United Nations Conference on the Human Environment held in Stockholm in 1972 is a landmark event in modern environmental protection. The Chinese government sent a delegation to attend this conference. Subsequently, the first National Environmental Protection Conference was held in August, 1973 in China. Since then, the prelude of environmental protection in China opened up. In the past 40 years, environmental protection has been gradually carried out, and a lot of achievements

were acquired, especially in the industrial and urban areas (Wang, 2010; He et al., 2012).

However, little attention has been paid to those issues in the rural areas. In fact, the environmental problems in the rural areas have been becoming more severe, and a lot of new environmental problems emerged in large numbers (Sun et al, 2012). For example, according to the National Soil Pollution Census Bulletin (2014) issued by the Ministry of Environmental Protection (MEP) and the Ministry of Land and Resources (MLR), the national soil environmental conditions overall are not optimistic and the over limit rate is 16.1%. Furthermore, the pollution levels with slight, mild, moderate and severe are 11.2, 11.2, 1.5 and 1.1%, respectively.

Environmental problems in China possess distinct

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feature of the age. For example, pollution of township enterprise was remarkable in the 1980's. Furthermore, environmental policy also has typical characteristics in different stages. Obviously, the analyzing of rural environmental problems and the corresponding policies based on different stages could help us to further discover the law of development of the rural environmental problems in China and provide with meaningful experience and lessons for further improving the present rural environmental policies and environmental management systems. Many researchers focused their research works on Chinese environmental policies analysis based on different stages. For example, Li et al. (2008) divided the evolution of Chinese environmental policies into four stages based on the six environmental conferences of China. Song et al. (2008) divided the evolution of Chinese environmental policies into three stages according to China's economic system reform, that is, environmental policies in planned economy system, environmental policies in the transition from planned economy system to market economy system, and environmental policies in market economy system. Song and Fei (2013) divided the evolution of China's agro-environmental policies into three stages according to the policy objectives and policy tools, including policy establishment stage (1982 to 1991), policy strengthening stage (1992 to 2004), and policy transformation stage (2005 to present). By referring to the previous reports in this study, the rural environmental problems and the corresponding environmental policies in China were discussed based on four stages since 1973, that is, 1973 to 1979, 1980 to 1989, 1990 to 1999 and 2000 to present. Moreover, the changes of rural environmental management agencies were also analyzed, and some policy suggestions were put forward for future rural environmental protection.

METHODOLOGY

Stage division

The stage division is based on the main environmental problems as well as the important environmental policies in different periods so as to make the discussion of the environmental policies more specific. 1973 to 1979 is the initial stage that people are aware of environmental protection; the first Environmental Protection Law of the People's Republic of China (for Trial Implementation) was enacted in 1979. In addition, 1980 to 1989 is an exploration stage for environmental protection. In this stage, a formal Environmental Protection Law was issued in 1989. 1990 to 1999 is a ramp-up period for sustainable development; China's agenda 21: China and the world's population, environment and development white paper was approved by the State Council in 1994 and sustainable development was identified as the national strategy in China. Furthermore, from 2000 to present is a period that environmental protection was rapidly advanced and implemented. In this stage, new Environmental Protection Law (2014) and the Regulation on the Prevention and Control of Pollution from Large-scale Breeding of Livestock and Poultry (2014) were issued and rural environmental protection was institutionalized and legalized in China.

Historical review as the main methodology

Since environmental monitoring and the corresponding statistics in the rural areas have been rarely carried out in the past few decades in China, thus, the full article was analyzed mainly based on a historical review of literature, policy documents and reports. What is more, the study still wants to evaluate whether the policy arrangements have matched with the environmental problems well in a certain period. Furthermore, just as suggested by Crabbe et al. (2008), the evaluation of the environmental policy is based on the principles of timeliness, validity and responsiveness.

ENVIRONMENTAL EVOLUTION AND POLICY RESPONSE

Rural environmental problems firstly came up vs relatively dispersed policies (Stage 1: from 1973 to 1979)

In this stage, there were no obvious environmental problems in the rural areas. The main task of this stage in the rural areas was economic development. The policies referring to rural environmental protection were to improve the rural environmental hygiene. Especially, water pollution and drinking water safety have been paid much more attention (Zhu, 1977). The major policies in this stage were summarized in Table 1.

Two of the most important policies in this stage were Decision of the Central Committee of the Communist Party of China (CCCPC) on Some Issues Concerning Accelerating Agricultural Development (Draft) and Regulations on the Work of Rural People's Commune (Trial Draft) passed by the 3rd Plenary Session of the 11th CCCPC in 1978, which laid the foundation of agricultural resources and agro-ecological environmental protection. These policies demonstrated that the Chinese government has begun to pay attention to agricultural and rural environmental protection. Furthermore, Environmental Protection Law of the People's Republic of China (for Trial Implementation) issued in 1979 was the fundamental law for environmental protection. However, only article 21 "positive development of pesticides with high efficiency, low toxicity and low residues, promotion of comprehensive prevention and biological prevention, rational utilization of sewage irrigation, prevention of soil and crop pollution" referred agricultural environmental protection. In 1970s, industrial and urban sewage was exploited for irrigation of farmland and a national sewage irrigation meeting held in Shijiazhuang in 1972 put forward the principle of "active yet prudent development". As sewage irrigation was legalized in Environmental Protection Law of the People's Republic of China (for Trial Implementation), it was rapidly extended in 1980s, bringing up a hidden risk of farmland contamination.

From the earlier discussion, it can be seen that most of the policies in this stage are present in various administrative regulations and policy documents of the Communist Party of China (CPC), lacking of peremptory provisions.

Table 1. Rural environmental problems and policies during 1973 to 1979.

| Rural environment problems | Relevant policies about rural environmental protection |
|----------------------------|---|
| Water pollution problems | Provisions for protecting and improving environment (Trial Draft) (1973) |
| | Responsibilities and main focuses of environmental protection of the environmental protection department and other relevant department under the state council (1974) |
| | Decision of the CCCPC on some issues concerning accelerating Agricultural Development (Draft) (1978) regulations on the work of rural people's commune (Trial Draft) |
| | Regulations on aquatic resources breeding protection (1979) |
| | Fishery Water Quality Standard (1979) |
| | Opinions on strengthening the work of rural environmental protection (1979) |
| | Farm irrigation water quality standard (1979) |
| | Environmental protection law of the People's Republic of China (for Trial Implementation) (1979) |

Furthermore, these documents always focus on protection of natural resources, including forest, land, grassland, river, wild animal, and so on. However, little attention has been paid on the prevention and control of rural environmental pollution, especially for those caused by chemical inputs in the agricultural production (Cai, 2009).

Environmental problems of township enterprise looming up and preliminary policies (Stage 2: from 1980 to 1989)

With rapid economic growth in China, urbanization process was accelerated in this stage. "Three Wastes", including waste gas, waste water and waste solid, produced by urban industry and Municipal Solid Waste (MSW) were largely transferred into the rural areas. Moreover, enterprises with heavy pollution and high energy consumption, such as chemical industry and papermaking industry, were constructed in the rural areas. Pollution produced by the township enterprises possessed the characteristics of vast areas, more victims, difficult in management, and lack of effective supervision which lead to more heavy pollution in the rural areas than that in the urban areas (Feng, 1988; Zhang, 1986; Zhang et al, 1988). Obviously, pollution produced by the township enterprises became the focus of rural environmental protection in this stage.

Furthermore, since traditional farming has been developing into modern farming in this stage, new environmental problems gradually emerged. For example, the unregulated and excessive use of pesticides, such as hexachlorocyclohexane (HCH) and dichlorodiphenyltrichloroethane (DDT), could not only kill the pests but also the beneficial insects. A document in the early 1980s revealed that over 50% of the crop and livestock products were detected with HCH when 7700 samples were investigated from 16 provinces in China.

More heavily, nearly 100% animal samples were detected with HCH (Guo and Jiang, 1981). Moreover, traditional irrigation methods could cause over-exploitation of water resources. Excessive reclamation

overgrazing and deforestation led to serious soil erosion and desertification.

In this stage, environmental policy system was initially constructed in China. A series of laws and regulations were passed, as summarized in Table 2. The most important law issued in this stage was Environment Protection Law of the People's Republic of China in 1989. It explicitly stipulated "strengthening rural environmental protection, prevention and control of ecological destruction, rationally use of pesticides and fertilizers". These terms and conditions are the legal basis of rural environmental protection.

The concept of "*Ecological Agriculture*" was proposed in this stage. Ecological agriculture is a high-efficiency modern agriculture system established based on the principle of ecology and economics. Since modern scientific and technological achievements and modern management method are employed in the ecological agriculture, higher economic benefits, ecological benefits and social benefits could be obtained (Xu, 2014). Decision on Strengthening the Work of Environmental Protection and Opinion on Implementing Ecological Agriculture and Strengthening *Agro-ecological Environment Protection*, respectively issued in 1984 and 1985 by the State Council have emphasized the development of ecological agriculture. Furthermore, most of the literatures about rural environmental protection in this period were also focused on construction of ecological agriculture (Zhou, 1986; Tang, 1988; Zhang et al., 1989). Since then, various forms of ecological agricultures were rapidly developed.

Multi-level environmental problems welling up and increasing policy attention (Stage 3: from 1990 to 1999)

In this stage, besides the inherent environmental problems, such as urban industrial "Three Wastes" pollution transfer, township enterprises pollution, and serious ecosystem damage, a variety of environmental problems induced by agriculture welled up and many of

Table 2. Rural environmental problems and policies during 1980 to 1989.

| Rural environment problems | Rural environmental protection policies |
|---|--|
| Ecological environment problems | Minutes of national rural work meeting (1982) |
| | Some issues concerning current rural economy policies (1983) |
| | Notice of the CCCPC concerning rural work in 1984 (1984). |
| | Ten provisions of the CCCPC and the state council on further animating rural economy (1985). |
| | Opinion on implementing ecological agriculture and strengthening agro-ecological environment protection (1985) |
| Pollution of Township Enterprises | Deployment of the CCCPC and the state council on rural work in 1986 |
| | Decision on strengthening the work of environmental protection " (1984) |
| Urban pollution diversion | Decision of strengthening environmental management of villages, towns, streets and enterprises (1984) |
| Water Pollution | The 7th five-year plan of national economic and social development of the People's Republic of China (1986). |
| Soil erosion | Water pollution prevention and control law of the People's Republic of China (1984) |
| Rural Ecological Environment, Urban and Rural Integration | Water and soil conservation law of the People's Republic of China (1982) |
| | Environmental protection law of the People's Republic of China (1989) |
| | The second session of national environmental protection (1983) |
| | The third session of national environmental protection (1989) |

these problems even became more and more serious (Tao, 1996). For example, chemical fertilizer, pesticide and mulching film were largely used in modern agriculture. Based on the data from the Soil and Fertilizer Institute, Chinese Academy of Agricultural Sciences, over 50% samples were higher than the standard value when the concentration of nitrate was tested in 14 counties of north part of China (Liu, 1999). Obviously, nitrate pollution in the groundwater caused by the excessive use of nitrogen fertilizer in the farmland was quite serious. Furthermore, livestock poultry dejecta seriously polluted the rural environment. It was estimated that the total amount of livestock poultry dejecta reached 2448 metric ton in 1990, of which only 60% was efficiently utilized. All the rest was directly discharged (Liu, 1994).

In this stage, environmental protection policies were mainly included in the State Council decisions, department rules or relevant laws and regulations (Table 3), with emphasizing on the coordination of environmental protection and economic development. In 1995, for the first time, rural environmental conditions were included in the *China Environment Bulletin* and in 1999 the bulletin clearly pointed out that the rural environment quality decreased rapidly. One of the most important policies in this stage was Some Opinions of the State Environmental Protection Administration (SEPA) on Strengthening Rural Ecological Environment Protection issued by the former SEPA in 1999. It is the first policy that directly targets for

the rural environmental protection in China. Moreover, many special laws and regulations were constituted in the field of water, land, biological resources, and so on (Gao, 1996). For the improvement of rural living environment, Regulations on Village and Town Planning and Construction Management was issued by the State Council in 1993, which required constructing a comprehensive planning of market towns and villages, such as "maintenance of village appearance and environmental sanitation", "protecting and improving ecological environment", and "preventing and controlling pollution and other public hazards, increasing afforestation".

Non-point source pollution increasing aggravation and agriculture undergoing green transformation (Stage 4: from 2000 to present)

The characteristics of environmental problems in this stage were as follows. Firstly, point source pollution and non-point source pollution coexisted, and even the proportion of non-point source pollution exceeded industrial pollution in many regions (Su and Ma, 2006). Secondly, pollution from rural life and agricultural production overlapped together. Pollution induced by agriculture production, such as fertilizers, pesticides, and agricultural film has been increasingly aggravated (Jin et

Table 3. Rural environmental problems and policies during 1990 to 1999.

| Rural environment problems | Rural environmental protection policies |
|---|---|
| Agricultural film and intensive livestock farm pollution problems | Decision of the state council on further strengthening environmental protection (1990) Law of the People's Republic of China on prevention and control of environmental pollution caused by solid waste (1995) Several opinions of the SEPA on strengthening rural ecological environment protection (1999) |
| Pesticide pollution problems | Regulations of the People's Republic of China on pesticide management (1997). Notice of further strengthening supervision and administration of agrochemical production units wastewater discharge (1997) |
| Pollution of township enterprises | Township enterprise law of the People's Republic of China (1996) Regulation on strengthening environmental protection of township enterprises (1997). |
| Water pollution problems | Decision of modifying water pollution prevention and control law of the People's Republic of China (1996 revision) Decision of the state council on some issues concerning environmental protection (1996) Government work report (1999) |
| Soil and water loss problems | Law of the People's Republic of China on water and soil conservation (1991) Regulation of prime cropland preservation (1998) |
| Ecological environment pollution problems | Regulations on village and town planning and construction management (1993) Agricultural law of the People's Republic of China (1993) Criminal law of the People's Republic of China (1997) |

al., 2015). Because of the lack of effective management instruments in rural areas, pollution from rural life was also an important pollution source in this stage (Lu, 2008). It was estimated that over 80% of eutrophication in Dianchi Lake, Tai Lake and Chao Lake were caused by total nitrogen and total phosphorus from human and animal feces and sewage (Zhu, 2005). Finally, township enterprise pollution and urban pollution transfer all together largely aggravated the pollution in rural areas (Chen, 2008).

In this stage, environmental protection was lift to an unprecedented height, while agricultural environmental protection was elevated to the height of agricultural ecological civilization construction. Almost all the comprehensive policies in this stage mentioned the protection of rural environment with the characteristics of more professionalism and specificity, as summarized in Table 4.

In 2014, the revised *Environmental Protection Law of the People's Republic of China* paid much more attention to solve agricultural and rural pollution. More detailed expatiation, such as monitoring of pollution sources, prevention and control of pollution from pesticides and fertilizers, prevention and control of pollution from livestock and poultry breeding, and prevention and control of rural life pollution, were stipulated. Furthermore, the role of govern-

ments at all levels in rural environmental protection was defined. Furthermore, as the first administrative regulation at national level in the field of rural environment protection, the Regulation on the Prevention and Control of Pollution from Large-scale Breeding of Livestock and Poultry issued in 2014 made a detailed provisions about prevention, control, comprehensive utilization and harmless disposal of pollution from livestock and poultry, which was an important milestone in the history of rural environmental protection in China. The Outline of the National 12th Five-Year Plan for Economy and Social Development (2011) required that agricultural chemical oxygen demand (COD) and ammonia nitrogen emission should be respectively reduced about 8 and 10% in 2015 compared with that in 2010, which was the first restriction for pollutant emissions in the National Planning.

The policies in the previous stages mainly focused on solving of specific environmental problems. However, in this stage, the related national policies were more inclined to promote coordinated development of society, economy, and environment in rural areas so as to build a sustainable agricultural system (Dong, 2008; Li, 2008; Gao, 2014). The objective of agricultural modernization in this stage was shifted to "high-yield, high-quality, high efficiency, ecology and safety" from "high yield".

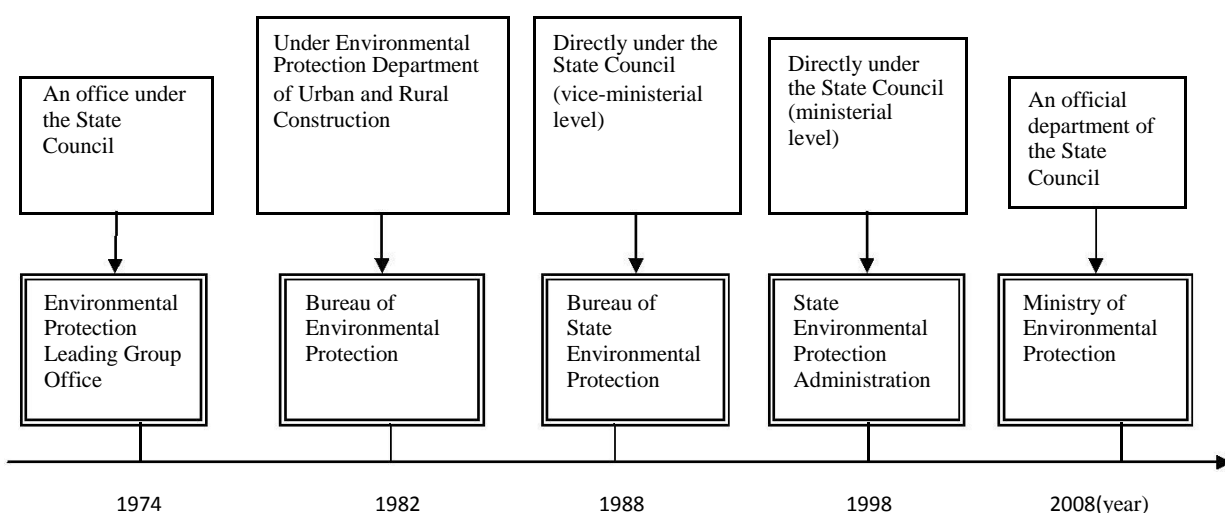
Table 4. Rural environmental problems and related policies from 2000 to present.

| Rural environmental problems | Rural environmental protection policies |
|---|--|
| Livestock and poultry breeding pollution | Administration measures for livestock and poultry breeding pollution prevention and control (2001) Implementation of “control award” to speed up solutions to salient rural environment problems (2009) The national 10th five-year plan for environmental protection (2001) Regulation on the prevention and control of pollution from large-scale breeding of livestock and poultry (2014) |
| Agricultural film, pesticides | Law of the people’s republic of china on prevention and control of environmental pollution caused by solid waste (2004 revision) Outline of the national 11th five-year plan for economy and social development (2006) |
| Comprehensive improvement of rural and agricultural environment | The 10th five-year plan of national environmental protection (2001) Outline of the national 11th five-year plan for economy and social development (2006) Outline of the national 12th five-year plan for economy and social development (2011) Agricultural law of the People’s Republic of China (2002 revision) The national 9th five-year plan for environmental protection and long-term goals for the year 2010 (2002) Implementation of “control award” to speed up solutions to salient rural environment problems (2009) Opinions on speeding up the development of modern agriculture and further enhance the vitality of rural development (2013). About accelerating agricultural science and technology innovation to continue to enhance ability to ensure supply of agricultural products (2012) About increasing the momentum of balancing urban and rural development to further consolidate the basis of agricultural and rural development (2010) |
| Ecological protection | Law of the People’s Republic of China on prevention and control of desertification (2001) Opinions of the state council on further doing a good pilot work in returning farmland to forest and grass (2000) Law of the People’s Republic of China on water and soil conservation (2010 revision) |
| Water pollution | Rules for the implementation of the water pollution prevention and control law of the People’s Republic of China (2002) |
| Funds for rural environmental protection | Opinion on strengthening rural environmental protection (2007) Rural well-off environmental protection action plan of China (2006) Guidance on eco-compensation pilot work (2007) Implementation of “control award” to speed up solutions to salient rural environment problems (2009) |
| Straw burning pollution | Emergency notice on further strengthening comprehensive utilization of straw and forbidding straw burning (2007) |
| Agricultural cyclic economy and sustainable development | Circular economy promotion law of the people’s republic of china (2008) Opinions on promoting the construction of new socialist countryside (2006) Opinions on actively developing modern agriculture and promoting the construction of new socialist countryside (2007) Opinions on comprehensively deepening rural reform to accelerate agricultural modernization (2014) |

Obviously, ecological and environmental protection has been the inherent requirement of agricultural development

Table 5. Typical environmental problems and the main focus of the policies in the four stages.

| Variable | 1973-1979 | 1980-1989 | 1990-1999 | 2000 to present |
|--------------------------------|------------------------------|---|---|--|
| Typical environmental problems | Water pollution | Township enterprises and urban pollution transfer | Superimposed problems Rural ecological environment deterioration | Negative effects of agricultural non-point source pollution discharge present clearly |
| Policies focus | Advocating sewage irrigation | Developing ecological agriculture | Reorganizing villages | rural environment comprehensive improvement, agricultural development green transformation |
| Evaluations | Bad policy response | Little policy response, not focus on the main problem | Little policy response, not focus on the main problem | Relatively good response, but scattered policies are not enough |

**Figure 1.** Change of China's environmental management agencies.

in China (Jin and Shen, 2013).

Summary of typical problems and important policies in each stage

Table 5 is a summary of typical environmental problems and main policies focus in each stage. It can be seen that some policies do not response very well to the environmental problems. For example, in the 1970s, the policy of advocating sewage irrigation resulted in a vast tract of farmland pollution. In the 1980s, industrial and urban pollution was largely transferred to the rural areas. However, no effective measures were taken to control the pollution transfer. Furthermore, the development of ecological agriculture in this stage did not restrain the deterioration of environment in rural areas. In the 1990s, rural ecological environment deterioration began to aggravate. However, the main policy response just rested

on village's renovation. Since 2000, non-point source pollution from agricultural production was increasingly prominent. However, the policies about rural environmental protection were still scattered and lack effectiveness. The investment to the rural environmental protection from the government was still limited.

EVOLUTION OF RURAL ENVIRONMENTAL MANAGEMENT AGENCY

The change of the national environmental protection agency

In the past 40 years, the status of national environmental protection agency has kept improving and evolving into a permanent agency from a special one, as shown in Figure 1, which fully reflected that environmental protection has been given increasing attentions by the Central People's

Government (Arthur, 2006). As the first environmental protection agency in China, the Environmental Protection Leading Group Office (EPLGO) under the State Council was formally established in 1974. In 1982, EPLGO was merged with the National Construction Committee (NCC), the State Administration of Urban Construction (SAUC), the State Administration of Construction Engineering (SACE), and the State Administration of Surveying and Mapping (SASM) into the Ministry of Urban and Rural Construction and Environmental Protection (MURCEP), of which the Bureau of Environmental Protection (BEP) was established. Moreover, the BEP was also an administrative body of the State Environmental Protection Committee (EPC) founded in 1984. In 1988, the BEP was promoted as the State Bureau of Environmental Protection (SBEP) (vice-ministerial level) directly under the State Council, and it was further promoted as State Environmental Protection Administration (SEPA) in 1998 at the ministerial level, although still affiliated to the State Council. In 2008, it was further promoted as the Ministry of Environmental Protection (MEP), which is an official department of the State Council to participate in decision-making on national significant affairs.

Change of rural environmental management agency

The change of rural environmental management agencies could be divided into two stages. In the first stage, the rural environmental management agencies and its functions were gradually strengthened until 1980s. In 1976, rural environmental protection scheme was firstly brought into the administrative management system. An environmental protection division set in the Bureau of Science and Education of Ministry of Agriculture and Forestry was responsible for rural environmental protection. In 1985, agricultural environmental protection was charged by the Energy and Environmental Protection Office (EEPO) of the Ministry of Agriculture, Animal Husbandry and Fisheries (MAAHF) (Duan, 1985; Li and Wang, 2005). In 1987, the EEPO was renamed as the Bureau of Energy and Environmental Protection (BEEP). In 1989, the office was further renamed as the Department of Energy and Environmental Protection (DEEP).

However, rural environmental agency and its functions were weakened in subsequent restructuring of State Council. In 1996, the main task of ecological environmental protection was endowed to the SBEP. In 1998, the SBEP was upgraded to the SEPA and the function of rural environmental protection was administrated by the SEPA. Correspondingly, the Ministry of Agriculture (former Ministry of Agriculture, Animal husbandry and Fishery, renamed in 1988) only reserved the function of agricultural environmental protection that is endowed by the national laws, administrative rules and regulations. As the foundation of the MEP in 2008,

Department of Natural Ecological Protection under the MEP and the Department of Education, Science and Technology under the Ministry of Agriculture were responsible for rural environmental management at national level. However, compared with the high complexity of rural environmental problems, the capability of these agencies is still weak, especially in the county areas.

Conclusions

The rural environmental problems have been undergoing a change from single problem to multiple-level problems, from simple problems to complex problems. By reviewing the problem evolution, policy response and institutional evolution in the past 40 years, the following general conclusions could be drawn.

Firstly, rural environmental problems are lack of corresponding attention. The rural environmental protection policy system is still insufficient. The current environmental laws and regulations targeting pollution prevention and control in urban and industrial areas are difficult to apply to the rural areas. The documents issued by the central government related to rural issues during the recent 11 years all pay close attention to "the issues of agriculture, farmer and rural areas". However, scattered policies are not enough to deal with the complicated rural environmental problems. Moreover, the current policies related to rural environmental protection are mostly present in the form of normative documents, or only mentioned in the special programs and plans. Thus, there is no substantial effect for rural environmental protection.

Secondly, the policy response has fallen too far behind the actual environmental problems and even some of the policies are negative to the environmental protection in the rural areas. The probable reason is the imperfection of the present rural environmental management system, such as the missing of the system for environmental monitoring, information collection and feedback in rural areas.

Thirdly, rural environmental management agencies tend to shrink. Although the status of the environmental protection departments have been promoted in the past 40 years, the function of these departments weakened in recent years which can be reflects by the internal functions and institutional settings in the environmental protection departments. It is very difficult to deal with complex environmental problems in rural areas.

RECOMMENDATION

Based on the problems mentioned above, four policy suggestions are put forward in this work. Firstly, the rural environmental protection policy system should be established and completed soon. For example, the

Regulation of Rural Environmental Protection should be rapidly established so as to specify the responsibility of all levels of governments, standardize the management and use of environmental protection fund, and stipulate the method and procedure of rural environmental information collecting and publicity. Furthermore, policies and plans for rural environmental protection should be also formulated based on different kinds of rural pollutions.

Secondly, the government should further highlight the importance of environmental protection in rural areas. The study suggests that rural environmental protection should be promoted as the focal point in the future No.1 Document, which could further demonstrate the importance of rural environmental protection in the national level.

Thirdly, the management agency for rural environmental protection should be reconstructed and further strengthened. Interdepartmental and high-level management system should be more efficient for rural environmental protection in long-term. Thus, the study advised to establish the division of countryside in MEP and the division of environmental protection in Ministry of Agriculture. At the local level, the study advises to set an environmental grassroots-based organization, such as the environmental management cooperative organization. It should possess the responsibility to organize the villagers to participate in the rural environmental governance.

Lastly, the environmental protection fund should be largely increased. The CCCPC has put forward the strategy of “*industry nurturing agriculture*” and “*building a new socialist countryside*”. It clearly demonstrates that the solving of the rural environmental problem should not solely depend on agriculture, especially considering that the city industrial pollution was transferred into the rural areas. Thus, the central government should largely increase the financial support for improvement of rural environmental monitoring network, construction of pollution control facility, training of farmers, and so on.

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Conflict of Interests

The authors have not declared any conflict of interests.

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APPENDIX

Bureau of Energy and Environmental Protection (BEEP)
 Bureau of Environmental Protection (BEP)
 Central Committee of the Communist Party of China
 (CCCPC)
 Chemical oxygen demand (COD)
 Communist Party of China (CPC)
 Department of Energy & Environmental Protection
 (DEEP)
 dichlorodiphenyltrichloroethane (DDT)
 Energy and Environmental Protection Office (EEPO)
 Environmental Protection Leading Group Office
 (EPLGO) hexachlorocyclohexane (HCH)
 Ministry of Agriculture, Animal Husbandry and Fisheries
 (MAAHF)
 Ministry of Environmental Protection (MEP)
 Ministry of Land and Resources (MLR)
 Ministry of Urban and Rural Construction and
 Environmental Protection (MURCEP)
 Municipal Solid Waste (MSW)
 National Construction Committee (NCC)
 State Administration of Construction Engineering (SACE)
 State Administration of Surveying and Mapping (SASM)
 State Administration of Urban Construction (SAUC) State
 Bureau of Environmental Protection (SBEP)
 State Environmental Protection Administration (SEPA)
 State Environmental Protection Committee (EPC)
 Three Wastes” (waste gas, waste water and waste
 residues)