

Situation of Rural Ecological Environment and Management system Innovation in Northeast Major Grain Producing Areas

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Abstract: This article investigated 36 administrative villages in Heilongjiang Province, Jilin Province and Liaoning Province. The questionnaires ask about the issuance of local rural sanitation, solid waste, chemical fertilizers, pesticides, the use of plastic film and environmental protection activities. Statistics based on the questionnaires are as follows: Organic Waste is the major part of rural solid waste in Northeast Major Grain Producing Areas. The average amount of chemical fertilizer of the three northeastern provinces is 61.62、93.12、80.49t/km² respectively, which exceeds the safety limit set by developed countries to protect the environment. This article sets out the rural ecological environment problems, institutional innovate on management of the rural ecological environment according to the actual situation of Northeast Major Grain Producing Areas. Management system innovation includes legal system innovation, organizational innovation and Organization management innovation. [World Rural Observations 2009;1(1):24-28]. ISSN: 1944-6543 (print); ISSN: 1944-6551 (online).

Key words: rural ecological environment; management system innovation; Northeast Major Grain Producing Areas

1. Introduction

With 18% of the country's total arable land, Northeast Major Grain Producing Areas is one of the important commodity grain production bases, which made a significant contribution to the country's economic development. However, with the rural

economic development, rural eco-environmental issues especially the problems of environmental pollution in rural areas are increasingly prominent, which make fragile rural ecological environment face tremendous pressure.



Figure1. Pollution in rural areas of three provinces in Northeast China

The survey about rural eco-environmental problems in Northeast Major Grain Producing Areas was carried out in July, 2009. The effective number of questionnaire is 498 in a total of 700, of which 193 in Heilongjiang Province, 174 in Jilin Province, 131 in

Liaoning Province. The survey was conducted on residents of towns and administrative villages. Contents include rural health, waste, environmental protection activities and so on, with the way of releasing questionnaires and asking.

2. Situation of rural ecological environment in Northeast Major Grain Producing Areas

2.1 Solid waste and sewage pollution

There are no perfect environmental infrastructure constructions, waste disposal sites and agencies, so garbage which hasn't been dealt with is open-air dumped everywhere. The questionnaire divides all the solid wastes into 4 main types. The first category is organic waste, including leftovers, plant stalks, animal carcasses, etc.; the second one is recyclable garbage, including paper, plastics, metals and textiles, etc.; the third one is inorganic refuse, including discarded bricks,

cement, tiles, etc.; the fourth one is hazardous waste.

Most of the sewage is not treated, according to the statistics based on the questionnaire. The proportion of sewage directly discharged or deposited into rivers is 68.5%. The one which is thrown at random around villages is 26.9%. The one deposited into farmland is 3.5%. And the rest one is 1.1%. Gray water takes account for 50%, black water accounts for 20%, and other sewage accounts for 30% out of all the Discharged wastewater. The sewage washed into rivers by rain finally causes pollution to the source of drinking water.

Table 1 Classification and proportion of solid waste in Northeast Major Grain Producing Areas

Kinds	Organic Waste	Recyclable rubbish	Inorganic refuse	Hazardous Waste
Proportion	50%~60%	25%~30%	5%~10%	<5%

2.2 Pollution from agricultural production

Pollution generated in the agricultural production process is serious in villages in Northeast Major Grain Producing Areas. Excessive application of chemical fertilizer and pesticide, and improper using of plastic film lead to soil compaction and deterioration of water quality of groundwater resources. Use of chemical fertilizers per unit effective area of arable land can be calculated according to the questionnaires. Three-year

average of Heilongjiang Province, Jilin Province and Liaoning Province, respectively is 61.62、93.12、80.49t/km², which far exceeds the maximum safety, 22.5t/km², set by developed countries to prevent soil and water contaminated by chemical fertilizers. As a result, soil organic matter content reduces and fertility declines. At the same time, a considerable number of chemical fertilizers directly flow into water resources without been fully utilized.

Table 2 Chemical fertilizer Application situation in Northeast Major Grain Producing Areas

year kinds	2004			2005			2007		
	Heilongj iang	Jilin	Liaoning	Heilongji ang	Jilin	Liaoning	Heilongj iang	Jilin	Liaoning
Effective irrigation area (1000 km ²)	22.82	15.95	15.20	23.94	16.13	15.27	29.50	164.06	14.91
Nitrogen (m t)	57.12	88.44	64.42	57.5	61.30	64.0	65.92	62.71	65.42
Phosphate (mt)	33.66	7.08	11.44	33.8	6.20	11.4	39.31	6.51	11.45
Potash (m t)	15.78	9.73	9.05	17.70	10.00	9.60	22.72	11.06	10.88
Compound Fertilizer (m t)	37.25	53.84	32.94	42.00	60.70	34.9	47.25	74.12	39.72
Total (m t)	143.81	159.09	117.85	150.90	138.10	119.90	175.20	154.39	127.47

Source: 2005, 2006, 2008 "China Statistical Yearbook"

Pesticide pollution is also very serious in rural areas. Farmers increase the use of pesticides in order to

improve crop productions and control pests. There are upward trends of application of dose and kinds of pesticides year by year according to the questionnaires. A number of toxic substances of pesticide causes ecological environment polluted, even threat to people's health, which infiltrate in water, soil and agricultural products.

Greenhouse and the plastic film used widely in rural areas can promote crop growth, but with low recovery rate, plastic film is another kind of pollution. According to the questionnaires, the recovery rate is less than 80%. This means that a large number of non-degradable plastic film remains in the soil. Absolutely, plastic film has destructive influence on soil and hinders crops growth.

2.3 Pollution from livestock and poultry breeding industry

Phenomenon of livestock and poultry manure misplacing huddle exists everywhere in villages in Northeast Major Grain Producing Areas. Livestock manure releases smelly gas which contain ammonia, sulphide, methane and other harmful ingredients to pollute environment and threat to people's health. Massive livestock and poultry manure which is directly discharged into the ditch without treatment make local water resources deteriorate, even spread certain diseases. Soil quality has been affected by high concentration sewage irrigated. Livestock and poultry manure without fermentation processing applies directly to the soil. As a result, many harmful bacteria and parasites cause pollution to the soil and crops.

2.4 Pollution caused by urban and rural enterprises

The fact that industrial urban pollution transferred to rural areas exacerbates deterioration of ecological environment in villages. Wastewater discharged by some polluting industries such as electroplating, paper, plastics, etc, contains heavy metals. The wastewater is deposited into farmland irrigation river in the main protected areas without thoroughly dealt with. Emissions of cement plants and brick factories pollute atmosphere and destruct the rural environment that decline the quality of agricultural products and seriously affected the normal life of residents.

3. Cause analysis about deterioration of rural ecological environment

3.1 Unsound legal system of ecological environment protection in rural areas

There are many China's existing laws relating to

the protection of agriculture ecological environment. But those laws without consideration of environmental pollution special status in rural areas can not adapt to the needs of rural development. Phenomenon of not full enforcement complying with the law is being. Related management systems exist in name only. Most law enforcement events of environmental protection departments are ex post facto punishment. The prevention of environmental pollution has not been attention to. Phenomenon of duplicate construction and decentralized funds often leads a organic management program to local operation of each department, even if the implementation of environmental protection projects in rural areas. Environmental protection effect is poor.

3.2 Insufficient funds of the ecological environment management in rural areas

Most funds of China's pollution prevention and control are invested in the industrial and urban areas for a long time. Urban environmental pollution has been transferred into rural areas, but the rural areas have little access to funds of pollution control and environmental management capacity-building from national financial channels.

The construction of residents living environment infrastructure does not enter the public service system which evaluates local officials' political achievements. So local government usually does not allocate special funds to control ecological environment in rural areas, even problems are in adverse conditions.

3.3 Farmers' weak environmental protection awareness

The actions of waste separation use organic fertilizers and non-use highly toxic pesticides are seldom in Northeast Major Grain Producing Areas, according to the questionnaires. Because of lower level of rural residents' education, weak environmental moral sense and lack of legal education and publicity, farmers pursue short-term effects of economic development in the agricultural production process and neglect the rural eco-environment polluted by the large-scale use of pesticide and chemical fertilizer. 70% of farmers, who know litter about scientific application and balanced fertilization, always increase the dose of pesticide and blindly application chemical fertilizer. As a result, chemical fertilizer with low utilization rate, pollute the ecological environment, even affect the normal life of residents.

4. Mode research and system innovation on rural

ecological environment management

4.1 Mode research in rural ecological environment

Traditional and modern waste disposal techniques are combined. Pollutants are classified by

composition, processing methods and the construction of treatment facilities.

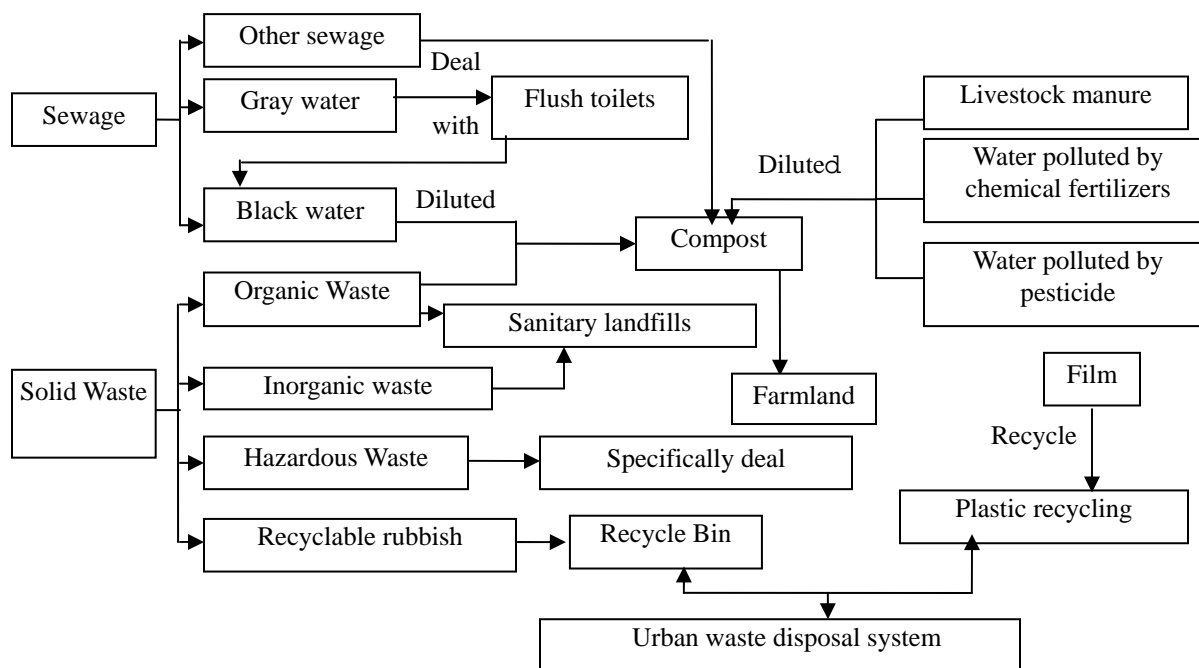


Figure 2. Pollutant processing mode in rural ecological environment

4.2 Management system innovation in rural ecological environment

4.2.1 Legal system innovation

It is necessary to establish a rural eco-environmental protection law based on the current status and characteristics of pollution of rural ecological environment. Make the rural ecological environment protection and construction into the country's legal management system. In the course of law enforcement, it is necessary to correctly handle the relationship between the rural economy development and environmental protection. Achieve rural economic development should not be established on the expense of the environment, each law enforcement agencies must strictly comply with the law requirements in the course of law enforcement. Environmental protection departments must be "There are law, and lawbreakers must be dealt", "prevention first, combining prevention, monitoring the entire

process."

4.2.2 Organizational innovation

Organizational innovation means that an independent new government organization should be established in Northeast Major Grain Producing Areas, which is different from urban and industrial ecological environment protection organizations. The new government is in charge of rural ecological problems.

Regions with rural ecological environment problems should be designated as a specific region, according to the characteristics of administrative divisions in Northeast Major Grain Producing Areas. These regions have to be geographical approaches, similar socio-economic development situation and similar pollution.

In the part of government institutions, the optimized allocation of administrative resources is set on the principle of "streamlined, unified and efficient", to avoid the phenomenon of redundant construction

and decentralized funds. The staff have to comply with the social morality and professional ethics, honesty and diligent.

In another part of personnel allocation, traditional personnel administration has to transform to the direction of modern human resources management. Improve the government personnel's cultural level and specialized quality who work at the new organization.

4.2.3 Organization management innovation

Organization management innovation is reflected in two aspects. On one hand, legal means are the main management methods; on the other hand, macro-management and direct management are the main part. So management approach including administrative, legal methods and methods of ideological work must be innovative. At present, the new rural construction is in a crucial stage. It is difficult to adapt and accept the loss of interest probably brought by the implementation of the rural ecological environment management for farmers who firmly hold old ideas and concepts. This requires matching use of the above methods. Governmental organizations should have good ideological and political education to change their ideological and moral values, to enhance their environmental awareness.

At the same time, the large-scale use of modern, high-tech facilities, technology, achieve modern, high-tech and network management and effectively reduce the operating costs and improve efficiency.

5. Conclusion

The new management system which is close cooperation at all levels of the main power, coordinated operation, management efficiency, is established in Northeast Major Grain Producing Areas, through creating a new governmental organization and the above institutional innovation. The staff must clarify their positions; effectively contact the local situation when they work on ecological environment. That can achieve the process of comprehensive institutional innovation smoothly, and improve the ecological environment in villages in Northeast Major Grain Producing Areas.

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