

A CHINA ENVIRONMENTAL HEALTH PROJECT RESEARCH BRIEF

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“Garbage Villages” Growing Waste Problems in Rural China

By Fan Feng

The changing nature of rural waste in China over the past two decades is creating growing ecological and human health problems in the Chinese countryside. Roughly speaking, there are three kinds of waste streams seriously impacting China's countryside areas—growing consumer wastes, agricultural runoff, and illegal dumping of industrial and municipal wastes. Rural areas are especially in trouble, as they lack the adequate infrastructure and technical staff to manage the waste, resulting in “garbage villages” throughout China's countryside.

Pesticides and Pigs

Since agriculture provides a living for over half of China's population, agricultural waste still remains an enormous problem. Higher demands from newly rich urban residents force farmers to adopt chemically intensive measures to increase their production of crops and livestock. According to Ministry of Environmental Protection statistics, every year, approximately 12 million tons of China's crops are contaminated with heavy metal residues. (See CEHP Research Brief on Pesticides for more information specifically on pesticides). China's “livestock revolution” in the 1980s that sparked investment in concentrated animal feeding operations has dramatically increased animal production for domestic consumption and exports, but at a major cost to water and soil quality. For example, while over a billion tons of effluent is discharged from pig farms alone, only around 5 percent of it is being treated, with the rest freely dumped into nearby rivers or lakes. (For more information on health and environmental impacts of animal production, see “Surf and Turf” in CES 9)

Industrial and Municipal Tentacles of Waste

Small and medium industries located in rural areas are also major contributors to the fouling of China's agricultural land and water by dumping enormous amounts of untreated waste. On March 9th, a story reported in *The Washington Post* illustrated a ubiquitous waste catastrophe in rural China—in Henan Province a company producing solar energy panels was dumping a toxic bi-product, silicon tetrachloride, into fields in the village of Gaolong. This poisonous chemical bi-product, which is expensive to recycle, leaves the ground infertile and dangerous upon contact for humans.¹

Local governments in poor rural areas are heavily dependent on any industrial production, so they often turn a blind eye to companies dumping wastes. Exacerbating the problem even further is when urban waste “tentacles” extend into villages and swamp those rural areas with garbage. In rural areas of Jiangsu and Zhejiang provinces, industrial pollution dominates waste flows into villages—both from nearby enterprises that are unable to stabilize their discharge quantities and standards and from garbage from other parts of the country. In Yixing City, Jiangsu Province, a farmer surnamed Pan told reporters, “Before the water was clear, and now the pollution from dozens of chemical plants nearby has made the water smell bad- it's not that we farmers like pollution, government officials only care about money, no one cares about smelly water and garbage, it's everywhere.”²

Emergence of a Throwaway Countryside?

In terms of consumer waste production in rural areas, statistics are incomplete, but per capita waste generated in the Chinese countryside is estimated to increase by 0.4 tons/year with no sign of slowing down.³ Preliminary studies estimate that China's rural areas produce up to 300 million tons of garbage a year.⁴ Some

sources even indicate that the current per capita waste generation by Chinese rural citizens is close to that of the urban areas.⁵ Prior to the reform era in the 1980s, rural citizens were not permitted to travel freely, so rural areas were fairly isolated from economic development and were more self contained, their waste was mostly organic, and could be recycled or decomposed. Now, as rural economies have boomed and are even partially industrialized, the composition of waste in the countryside has changed—with consumers dumping large quantities of discarded plastic bags and packaging haphazardly.

While it is easy to dismiss the haphazard dumping of wastes in rural China to ill-informed consumers and corrupt industries and local officials, a major hindrance to addressing these waste issues is that investment in rural environmental protection and waste management infrastructure is small and plagued by problems. This means that even the simplest forms of consumer waste disposal and management, such as landfills, in rural China are lacking.

Mounting “Modern” Waste Challenges in Rural China

Central to the rural waste problem is that the “modernization” of waste in China’s countryside has not led to the consequent modernization of the waste management infrastructure. In most rural areas the limited waste disposal and management facilities are still very primitive. In terms of consumer waste, rural citizens do not always know how to dispose of the new types of garbage, and tend to just dump their garbage into a hole, a river, or another “natural landfill.” Even worse, some try to burn or bury potentially toxic wastes themselves, directly contaminating local soil, air, and groundwater resources.

With seriously inadequate or no public sanitation facilities and highly weak environmental protection enforcement, rural waste is becoming a serious environmental and human health problem. A villager surnamed Zhu in Sanyou Village, Wujiang City, Zhejiang Province described the environmental situation of his village to a reporter: “behind the river is Boss Lu’s pig farm, with the excrement of hundreds of pigs, all of the polluted water is directly discharged into the river - it’s a little better in the winter, but we don’t even dare open the windows during the summer. Flies are everywhere, and in the rainy months when the river rises, the excrement and garbage floats out of the river and gets everywhere. Farmers have petitioned, and the government gave the pig farm a biogas digester that they just don’t use, because no one cares anyway.” The village’s situation is grim, as dozens of young people have died from cancer.⁶

In a report published by the Chinese People's Political Consultative Conference in 2005, it was stated that in less developed regions of Zhejiang Province, 89 percent of the villagers were simply freely dumping their waste. The rest of the province relied mainly on rural garbage dumps or burning landfills to dispose of their waste. Almost none of the sanitation facilities, town or county dumps and landfills were fully consistent with municipal landfill pollution control standards. The rural government officials charged with waste management struggle to even address consumer waste problems because they lack staff and proper equipment.⁷

Many problems still plague places where there are sanitation facilities. For example, after the Three Gorges Dam was constructed, a group of new migrant workers planned to build town garbage and sewage treatment plants, but because they could not cover operating costs, the plants operated intermittently. The local government originally financed the costs, but the people either did not think they were responsible for the costs or did not have the means to cover the costs. This is a prime example of “heavy construction, light management”⁸, where the construction of the treatment facility became a burden too heavy for the rural residents to bear. Some attempts at building infrastructure have also been harmful, such as when latrines are accidentally (or consciously) built over rivers or when toilets flush directly into rivers.

The difficulties that arise from trying to build any sort of infrastructure or implement new technology in rural regions are the same. Those areas lack capital, and have little means of attaining credit to finance projects. The low income of residents in rural areas makes it almost impossible for them to obtain credit themselves from commercial sources or even rural banks. Besides needing capital for more technical projects, like renewable biogas energy development, there also are not enough qualified support staff to sustain the project

and keep it operating continuously. Furthermore, the rural public is generally unaware of the negative environmental and health impacts of their bad waste habits. Local governments have little incentive to distribute information if they have any, and communication with remote villages is difficult.

Central Government Approaches to Rural Waste Solutions

The central government in its 11th Five-Year-Plan talks of “building a new socialist countryside,” and promoting urbanization of rural areas. Though it touches upon issues of water safety, electrification, education, and healthcare, there is no mention of waste or waste management infrastructure directly. Unfortunately, if the rural areas are to urbanize even further without any sustainable or sufficient waste management development, the problem will only get worse. It seems that the Ministry of Environmental Protection’s (formerly SEPA’s) environmental policies and regulations on solid waste management target more visible problems of waste in urban areas. The SEPA document *Technical Policies for the Municipal Refuse Disposal and the Prevention and Control of Pollution* mentions disposal technologies for landfills, incineration and composting, but once again, focuses on urban wastes. At the rate that rural waste is developing though, such policies could be adapted to handle rural waste issues. Currently, different types of waste are handled by different ministries. Mixed waste and construction waste is managed by the Ministry of Construction, hazardous waste and electronic/plastic waste by MEP, and recyclable waste by the Ministry of Commerce.⁹ Once again, it is difficult to extract where rural waste lies in the governing structure.

However, more up-to-date rural-specific sanitation regulations should be formulated to institutionalize the guarantee of long-term improvement of the environment in rural areas. With regards to rural sanitation regulations, in 1993 the government promulgated the *Regulations on Village and Collective Town Planning, Construction and Management*, which mentioned the possible introduction of rural sanitation regulations, programs to raise public awareness of sanitation, and promotion of rural garbage governance; however, so far there are only a handful of mainly international pilot projects on rural waste.

One notable bottom-up initiative began in 2005 when Kaihua County in Zhejiang Province started to promote the use of a garbage classification and recycling approach to tackling the waste problems. They built garbage sorting facilities, organic garbage composting grounds, and inorganic and construction waste landfills. After the organic waste has rotted, it can be used as fertilizer or compost, which saves farmers those costs while reducing the pressure on landfills and nourishing deteriorated soil. Plastics and bottles could also be recycled for money. After the first batch of 32 model villages’ waste disposal projects were finished, the county expanded the project to 110 villages. By the end of three years, they hoped that all the garbage in the 400 plus villages in the county could become renewable.¹⁰

In 2007, China’s Vice Minister of Health did state that the government should try to improve rural sanitation, but the emphasis has been more on human waste disposal. Provincial governments need to establish an effective waste disposal network, and genuinely collaborate with the township governments. It is up to the provincial and county governments to take the lead to implement changes in lower, local governments.

Promising International Initiatives on Rural Waste Infrastructure

China received a \$33.1 million loan from the Asian Development Bank in 2002 to focus on widespread promotion and adoption of biomass-based renewable energy systems in rural areas of Henan, Hubei, Jiangxi and Shanxi provinces. The Efficient Utilization of Agricultural Wastes Project uses the agricultural wastes from crops and animals to fuel biogas digesters and biomass gasification plants. Specifically, the project planned to use over a million tons of agricultural wastes per year that would otherwise be inappropriately disposed of, and provide over 600,000 tons of sludge and effluent as organic farm fertilizer.¹¹

In 2006, the ADB also gave technical assistance to China’s Rural Water Supply and Sanitation (RWSS) Sector, specifically in the poorer western provinces. In the past 20 years, China has achieved significant results in the RWSS Sector. Those past efforts focused mainly on the construction of physical facilities and now the government is trying to strengthen sector policy, strategy and operational frameworks, institutional capability

building, as well as integrated efforts in health education. The ADB reviewed the current status of the RWSS, helped formulate policies and strategies for long-term RWSS development and suggested possible investment projects that it could contribute to. The ADB selected 6 case studies based on their representation of different development characteristics among the western, central and eastern regions of the PRC. Currently, the central government faces three major challenges to developing the RWSS: the huge extent of the burden [over 300 million rural residents do not have access to safe drinking water], the severe shortage of funds, and insufficient construction/post-construction management. Rural sanitation is directly connected with a safe drinking water supply, as many of the surface sources that residents draw their drinking water from are contaminated by human activities and waste, such as latrines, farm animal wastes, and wastes from rural enterprises. Previous efforts to develop the RWSS focused on the construction of physical facilities in rural water supply and sanitation. Now, the government is giving more attention to strengthening policies, operational frameworks, institutional capabilities and health education.¹²

Similarly, the World Bank in conjunction with the UK Department for International Development, UNICEF and the Chinese government, invested a total of \$75 million in the Western Provinces Rural Water Supply, Sanitation and Hygiene Promotion Project, approved in 2007 and to be completed by 2012. The goal is to aid rural communities in Shaanxi and Sichuan provinces in obtaining safe drinking water, promoting environmental sanitation construction and health education, educating the rural population, and ameliorating the general environmental conditions. Specifically, the sanitation health portion of the project will build composite septic pit lavatories, wash and soak away systems, and solid waste landfills.¹³ It is still too early to see the effects of the project, for by the end of the 2007 fiscal year, the project was just beginning to be executed.¹⁴

Recommendations for the Future

One potentially useful strategy for dealing with the rural waste issue is to focus on landfill-to-energy generation, which could help address two pressing rural challenges—abundance of garbage and shortage of energy. One notable international initiative that is working in China on tapping into methane from landfill is Methane to Markets, a partnership of developed and developing countries which collaborate together in hopes to advance the recovery and use of methane as an energy source. China is part of the partnership, which means that it declared to minimize methane emissions from key sources, landfills being one of them. While the current projects in China are for urban landfills, perhaps in the future, projects can be expanded to rural landfills and dumps as well.

Rural waste infrastructure and treatment in China needs to be modernized, keeping up with recycling and disposal technologies, with the ultimate goal of improving rural life and the environment. There needs to be research concerning different types of garbage, to see if certain ones are usable for composting, energy conversion, or recycling. Villages near each other should try to build facilities and offer services that they can share. It is unnecessary for one village to build their own complete waste disposal system, and it is much more effective to focus on establishing complementary facilities with a nearby village.¹⁵ Services and day-to-day operational duties can also be run together, with different villages' committees responsible for their own tasks. Finally, there needs to be market incentives for properly treating and disposing of solid waste and enforcement of punishments for improper disposal. For example, low-interest loans could be given out specifically to those wishing to develop waste management projects in rural areas. Regardless of how it is done, economic incentives to invest in waste management would lead to financial assistance for the development of appropriate facilities and services.

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