

Review on the literature of toilet revolution

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Abstract: With the new rural strategy put forward, rural construction has gradually received social attention, but rural construction in all aspects also face many problems, such as the construction of technology is not applicable, funds are not in place and the cost of processing and so on. This paper attempts to start from the application of toilet technology, the introduction of case discussion, summed up the construction of toilets should be implemented in reality according to local conditions. This paper analyzes in detail the current research situation of the types of toilet application technology at home and abroad, and at the same time provides some theoretical ideas for the current rural toilet revolution by using case analysis. This study not only touches on the more secretive topic in the theoretical research, broadens the theoretical boundary for this topic, but also provides some theoretical guidance for the practice of toilet reform.

1. Introduction

"The problem of agricultural rural peasants is a fundamental problem related to the economy and livelihood, and it must always be solved." Agriculture, rural "as the top priority of the work of the whole party, the issue of rural revitalization strategy is implemented." At present, China's rural toilet revolution in response to the party's call is in full swing, with strong efforts towards a broader field, further goals." China's toilet culture has a long history, China's ancient emphasis on toilets began in the Qin and Han dynasties, in the Tang and the Song Dynasty, the Qin Dynasty toilet squat, sitting two, began to distinguish between men and women and between the middle of the cubicle. To the Han Dynasty, it attached great importance to privacy and convenience, began to increase the setting of vents, and later in the Qing Dynasty jiaqing years began to appear a fee for public toilets. With the development of social economy, toilet problem as an important measure to enhance social management has gradually entered the public vision, the previous "dirty, messy, poor " gradually received attention. In the early days of the founding of New China, the country set off a " toilet, tube faeces, Shishi " toilet cultural movement; 20 century years, in preparation for the Asian Games as an opportunity, China opened the " toilet revolution " in the age of the century, the problem of toilets gradually shifted from the spontaneous movement of social organizations to the integration into the national policy level, In modern times set off a vigorous " toilet revolution."

With the new rural strategy put forward, the countryside gradually embarked on the transformation from the instrumental concept to the value concept, in which the rural toilet revolution is the main embodiment of this transformation. However, since the rural economy is still in the development stage, it also faces many problems in various aspects, such as the non-applicability of construction technology, the lack of funds and the cost of dealing with it. Therefore, this section focuses on the current types of rural toilet application technology in China and the application areas of each technology, as well as the current domestic toilet revolution better local case reference.

2. Rural toilet application technology type analysis

2.1 Status of research abroad

Ecological toilet refers to a kind of toilet which has no pollution to the environment and can make full use of various resources, emphasizing the concept and function of self-purification and resource recycling of pollutants. The study of ecological toilets abroad started in the late 1980s. It is considered that the current foreign toilet treatment technology mainly has the packing toilet [1], the water-free degradation type ecological toilet and the compost type ecological toilet and so on several kinds.

2.1.1 Water-free degraded ecological toilets

A technology in Paris, France, breaks down a technique that eliminates the smell of animal and livestock faeces, a technique that can reduce 80% the left and right ammonia gas has been put into use on the market. However, this type depends on the decomposition of microbial imports, this technology on the strain of the single requirements, high cost, for industrialization is still a major constraint. Such technologies are currently applicable only to urban areas in both developed and developing countries.

2.1.2 Water-free packaged ecological toilets

The UK has developed a health system called "slopes", which has been put on the market in the UK and Ireland, which are largely free of water, do not need to use deodorant, do not require sewage pipes, and faeces automatically chemically in wooden boxes where faeces are placed, breaking down into fertilizers, Packed in automatic wooden cases. Composed of toilet, sliding groove, plastic collection box, electric fan and exhaust pipe, under the toilet is sliding groove, faeces down the sliding groove directly into the plastic collection box containing sawdust, faeces slowly decomposed into mixed fertilizer under the action of electric fan exhaust. At the same time, through the electric fan and exhaust pipe pumping ventilation, plastic collection box air to maintain circulation, not only to eliminate the stench, but also to make faeces produced by anaerobic bacteria cannot survive, and eventually survive the aerobic bacteria to break down faeces into non-toxic tasteless water and carbon dioxide. However, this technology consumes a lot of energy and two times the pollution is serious, so the use of the above is still a blank state.

2.1.3 Composting Ecological technology

Finland developed anhydrous compost toilet, without water, electricity, very environmentally friendly and do not produce odor. The mounting location is also not limited and can be on the ground and in the living area or in the bathroom. The liquid entering the toilet can be separated from solid waste, the resulting solid waste is compost directly in the rotating compost drum, and a good insulation and ventilation design ensures that the composting effect and the composting process are odorless and that the piled fertilizer can be easily removed from the container. Foreign developed countries pay attention to ecological environmental protection and recycling of resources in toilet construction, which is the place to study in China.

2.2 Status of domestic research

The research on ecological toilet in our country started late, but in recent years, with the Government's attention to the sustainable development of rural areas, scholars have opened a lot of research work. According to the current academic research, there are two types of toilet reconstruction which are more suitable for the current rural areas: non-ecological dry toilets and water-flushing toilets respectively. In particular, it is a new type of fecal urine distribution ecological dry toilet, three-cell septic tank simple water flushing toilet and water flushing toilet with drainage system.

2.2.1 Fecal urine sub-set ecological dry toilet

It is considered that the working principle of the new ecological dry toilet is the type of classified collection, separate treatment and special utilization of fecal urine from the source [2], which is suitable for arid and semi-arid water shortage areas, the lack of fertilizer resources in the north and cold areas, Huang Zhiyou considers this retrofit technology to be more advanced, has higher cost requirements and is not applicable in underdeveloped rural areas in the north.

2.2.2 Three-lattice dung simple water flushing toilet

Three-lattice dung simple water flushing toilet is the main type of rural toilet reform in China, Pan Junqiang recommended to use the combination of "three-lattice dung, rugged and durable" rectification and utilization[3], the liquid filtered by septic tank can be used as fertilizer, can also be used to water greening plants, etc. And faeces after drying can also be used as fertilizer for agricultural production, forming a sustainable circular economic chain. This type of technology has low price requirements, is easy to build and adaptable, but is suitable for water-rich areas and areas where groundwater exploitation is sustainable.

2.2.3 Water flushing toilets with drainage systems

Water flushing toilets with drainage systems can make household laundry water, kitchen sewage, toilet sewage and other unified treatment to meet the standards of emissions, but this technology is generally only used in areas with sufficient water resources and to be able to supply water for a perennial year, suitable for areas with a complete drainage system and high degree of urbanization. Some scholars believed that whether it is this technology, or the new type of fecal urine divided ecological dry toilet and three-cell septic tank simple water flushing toilet [4], as long as the more difficult the fecal recovery, the higher the cost of transformation and management, which is not affordable for rural economic conditions. The toilet revolution in our country is concentrated in the countryside, the country north and South climate difference is big, the precipitation is seriously unbalanced, so how to use the technology to reduce each technology in the North.

3. The way to reduce costs and case comparison

From the technical cost considerations, domestic scholars according to the complexity of China's climate and topography to the rural toilet technical transformation has carried out a series of explorations. Among them, the more representative is Gao Sukun, who from the study of "How to improve the adaptability of technology while reducing the cost of technology", put forward that toilet reform to local conditions to choose the transformation technology "not only to solve the problem of individual farmers, but also to construct rural toilet use, management, maintenance and fecal resource conversion system, sustainable implementation program." According to this, he developed a series of low operating costs, easy management and maintenance, clean and hygienic, can adapt to a hygienic, can adapt to a variety of conditions in various areas of rural ecological toilet products. On the other hand, the current application of "bubble water-saving ecological technology" has also realized the requirement that the rural toilet revolution "should be economically acceptable and sustainable in a way"[5, 6].

From the point of view of social financing, it is mainly government subsidy + rural self-funded form and "commercial toilet". While the ecological technology revolution has been carried out in other regions, Guilin has stepped into the track of exploring the universal mode of rural toilet revolution, Guilin adopted government subsidies and farmers' self-funded ways to stimulate rural toilet reconstruction, and the policy model has gradually gone from pilot to national popularization. As early as 2006, Qin Bin Ming put forward the "government-led, commercial toilet" mode of operation, opened the industrial and commercial construction of toilet services, and later Zhang Aiping also mentioned the concept of "commercial toilet", but did not discuss in depth. Fan also as early as 2012 through the Pilot survey of rural toilets in Jixi [7], summed up the "science and technology and people's livelihood, policies and people's livelihood, industry and people's

livelihood, development and people's livelihood" four major relations, the rural toilet reform and science and technology, industrial chain linked to form a complete toilet development system.

Table 1. Toilet application case analysis.

Province	Jixi Alkali Factory Village	Penglai, Shandong
countryside	A new village.	Rural Tourism Oriented Rural Areas.
Applied technology	(1) Solar hot water supply. (2) Wells, pools and toilets are interoperable to achieve 24 hours of direct supply.	(1) Establishment of technical Steering Group. (2) Alteration of three-grid septic harmless sanitary latrines.
Fundraising channels	(1) Financial subsidy. (2) Brand effect Yilan County and Jian Xin Company to adopt mortgage guarantee, low price interest rate and tracking service win-win mode.	The establishment of the municipal village level three fund raising system, municipal finance annual arrangement of special funds, rural toilet funds to provide the corresponding funds matching, according to each toilet 600 yuan standard for incentive subsidies.
Effect	(1) Difficult to toilet in winter and difficult to bathe. (2) Fecal treatment and environmental problems are addressed.	(1) Environmental improvement, harmless treatment. (2) Improving the quality of ecological agriculture. (3) Improving the quality of farmers and improving old habits.
Beneficiary response	Many costs have been omitted; both water supply and heating have been improved.	Toilet reform really from "face" to Do "Rizzi"; develop civilized, healthy and hygienic life behavior habits.

At present, in the rapid economic development of rural areas, the more advanced toilet revolution application technology has been gradually used and popularized, but because of the higher cost of technological transformation, the general rural simply cannot afford to change. This requires the current rural communities to actively seek more financing channels, quoting high-tech talent, the application of rural toilet technology gradually ecological and sustainable.

4. Conclusion

The construction of rural toilet revolution is an important measure of new socialist countryside, and also an inevitable requirement for the development of the Times. Toilet reform not only in the technical source to develop sustainable ecological products, but also to have the concept of dynamic adjustment, in different regions of rural areas, different conditions for the application and development of sustainable, specific technology, because China's rural economy is still in the development stage, so in the search for appropriate technology to consider the cost, Technology adaptation and multi-fund financing, and so on, actively develop ecological technology, adhere to the recyclable and sustainable goal of resource utilization, and put China's rural toilet application technology to create an ecological road. In addition, the toilet revolution cannot be separated from cost investment, in the case of limited government power, how to use limited resources to build a circular flow of capital chain, so that the rural toilet revolution to live, towards the direction of ecological development, is our constant exploration of the goal.

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