iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 11 **Issue:** XII **Month of publication:** December 2023

DOI: https://doi.org/10.22214/ijraset.2023.57458

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International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 11 Issue XII Dec 2023- Available at www.ijraset.com

Management Status and Disposal Suggestions of Construction Waste in Yiyang City

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Abstract*: With the continuous development of the city and the implementation of the shed renovation project, the collection, transportation and disposal of construction and demolition debris had become the focus of attention in the field of solid waste treatment. The research was carried out based on the management and recycling of construction and demolition debris in Yiyang. The basic situation, collection, transportation and recycling operation and management situation, relevant management policies and problems in management and disposal in Yiyang City were analyzed. And the relevant suggestions were put forward, hoping to provide referenced for the disposal of construction and demolition debris.
***Keywords*: construction and demolition debris, resource utilization, waste disposal, disposal suggestions, management status**

I. INTRODUCTION

With fruitful results of "Chinese 13th Five-Year Plan" and the comprehensive drawing of the "14th Five-Year Plan", Chinese urbanization has made significant progress, and the level and quality of Chinese urbanization have been greatly improved. By the end of 2020, the urbanization rate of permanent residents nationwide had reached 63.89%, and the urbanization rate of registered population had increased to 45.4%[1]. However, due to the reconstruction of the old Urban area, the development of the new town area and the construction of municipal infrastructure, a large amount of construction waste has seriously affected the quality of urban ecological environment and the living standard of residents [2]. According to the survey data of the Prospective Industry Research Institute, the amount of construction waste generated in China continued to increase from 2006 to 2019, with a large increase in 2018 and 2019, the increasement are up to 19.5% and 21.1% respectively compared with the previous year. The total amount of construction waste generated in 2019 has exceeded 2.3x109t[3]. At present, a large amount of construction waste is simply treated or buried, and its recycling rate is low, only about 5%. The backwardness disposal method has a serious impact on economy, environmental development and people's lives [4-5].

At present, according to the Statistical Yearbook of Yiyang City, the solid waste generation amount in 2021 is about 163.85x104 tons. The solid waste storage amount is about 17.57x104 tons, and the solid waste disposal amount is about 4.15x104 tons. Based on the systematic investigation of the current situation of construction waste in Yiyang City, it is found that there is no special statistics on the amount of construction waste generated in Yiyang City at present. It is necessary to develop a comprehensive supervision information system for construction waste, improve the whole process management system of collection, transportation and terminal disposal, so as to make more efficient reuse of construction waste and build a waste-free city.

II. BASIC SITUATION OF CONSTUCTION WASTE IN YIYANG CITY

According to CJJ/T 134-2019 Technical Standard for Construction Waste Treatment, construction waste is defined as the waste soil, waste and other wastes generated during the construction, reconstruction, expansion and demolition of various buildings, structures, pipe networks, etc. It can be divided into five categories: engineering residue, engineering slurry, engineering waste, demolition waste and decoration waste [6]. Construction waste in Yiyang City mainly comes from construction sites, house demolition, village reconstruction, illegal demolition, decoration, public building construction and other projects.

In 2009, Yiyang City promulgated the Measures for the Management of Construction Waste Disposal in Yiyang City [7], and then in 2016, Yiyang City promulgated the Regulations on the Management of Construction Waste Disposal in urban area of Yiyang City [8]. The documents stipulate that any unit or individual person in the urban area must be authorized before disposal of construction waste. Construction waste must be transported by companies with corresponding transportation qualification, transported in accordance with time and route specified in certificate time and route, and consumed at the designated place.

At present, Yiyang Xuyuan Recycling Company, Hunan Construction Engineering Environmental Protection Company and Yiyang Fangcheng Construction Company have entered the trial operation stage, and Hunan Qiaoxin Environmental Protection Company and Hunan Yifa Recycling Company are under preparation.

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Among them, Xuyuan Recycling Project has been completed and put into operation in August this year, which can treat with more than 1 million tons of construction waste annually; 2 new construction crushing production lines and 2 construction solid waste recycling production lines have been built, with an annual output of 180,000 tons of water-stable materials, 200,000 cubic meters of hollow blocks, 80,000 cubic meters of permeable bricks for roads, 280,000 cubic meters of thermal insulation blocks and 400,000 tons of building aggregates [9].

By 2022, Yiyang City has introduced 8 construction waste recycling enterprises (Table 1). Although there are many relevant enterprises, the following problems still exist in the recycling utilization of construction waste in Yiyang City:

1) The relevant statistical departments of Yiyang City have not classified and counted the solid wastes in this city, and the data have not been reasonably quantified, which may eventually lead to the failure of solid waste resource utilization enterprises to reasonably estimate the amount of solid waste required to be treated, waste production capacity and form a trend of adverse competition. At the same time, the relevant policies are not matched and fail to effectively support the initial development of relevant enterprises.

2) There is a phenomenon that the construction waste project is backfilled or directly transported to the landfill site for open-air landfill or randomly stacked at the demolition site without standardized treatment in the Regulations on the Management of Construction Waste Disposal in Urban area of Yiyang City. Such illegal disposal not only affects the appearance of the city, but also leads to a secondary pollution. Dust in construction waste will cause air pollution, heavy metals and organic substances contained in construction waste will enter surface water and groundwater through surface runoff and infiltration along with rainfall, causing serious pollution to soil and water [10].

3) Due to difficulties in site selection and construction, the construction of construction waste transfer and allocation site is progressing slowly. At the same time, the existing facilities layout is difficult to balance the transportation distance of each region, resulting in the phenomenon of illegal disposal due to the high disposal cost.

4) Laws and regulations need to be improved. Although the Measures for the Administration of Construction Waste Disposal in Yiyang City and the Regulations on the Administration of Construction Waste Disposal in Urban area of Yiyang City punish the units and individuals who violate the management of construction waste, the punishment standards and implementation regulations for specific violations cannot be checked, and there is no corresponding regulation on the standards for environmental pollution control during transportation. These deficiencies bring great difficulty to the specific management work.

TABLE I Yiyang City Construction Waste Resource Utilization Enterprise

Name	Address
Yiyang Xuyuan Renewable Resources Co., Ltd.	Xinyuan Village, Changchun Town, Ziyang District, Yiyang City, Hunan Province
Yiyang Fangcheng New Building Materials Co., Ltd.	Renxingshan Village, Fuqiushan Township, Taojiang County, Yiyang City, Hunan Province
Hunan Qiaoxin Environmental Protection Technology Co., Ltd.	Changchun Town Xianfengqiao Village, Ziyang District, Yiyang City, Hunan Province
Yiyang City Shuntong Building Materials Co., Ltd.	Huang Ni Hu Xian Feng Ling Cun, Heshan District, Yiyang City, Hunan Province
Yiyang Rongwang Construction Waste Disposal Co., Ltd.	Xielin Gang Zhen Bei Feng Huan Cun, High-tech Zone, Yiyang City, Hunan Province
Hunan Yifa Renewable Resources Co., Ltd.	Hongxing Village, Huilongshan Street, Heshan District, Yiyang City, Hunan Province
Yuanjiang City Jiaxu Renewable Resources Co., Ltd.	Shipbuilding Industrial Park, Yuanjiang City, Hunan Province
Yiyang City Yining Renewable Resources Co., Ltd	Wufangwan Formation, Caomenwan Village, Henglongqiao Town, Heshan District, Yiyang City, Hunan Province

III.SUGGESTION ON MANAGEMENT AND DISPOSAL OF CONSTRUCTION WASTE

1) Implement the principle of territorial management. Governments at all levels should shoulder political responsibilities, divide their work and cooperate, make joint efforts, implement the responsibility system for leading cadres in ecological resources and ecological civilization construction, strictly implement ecological environment protection, and implement "the same responsibility of the party and government" and "one post and two responsibilities".
2) Strengthen source control. Construction sites and residential decoration points are extensive, so it is particularly important to strengthen source control. Before the commencement of construction projects and decoration projects, they shall register and file in the streets under their jurisdiction, and establish a contact person system with the community. Before the decoration of residential areas, the property shall issue decoration precautions to residents and sign decoration agreements.
3) Construction waste sorting and collection facilities shall be equipped. The project site shall be equipped with classified collection facilities for construction waste, and classified collection of construction waste shall be done well; residential quarters with site conditions shall also be equipped with centralized collection facilities for decoration waste, and special personnel shall be assigned to guide the decoration owners and decoration construction teams to classify decoration waste and put it into designated collection facilities, and the classification of decoration waste shall be accepted after decoration, and domestic waste shall not be mixed with decoration waste.
4) Improve the collection and transportation system of construction waste. Strict implementation of disposal approval. Construction sites and individuals who discharge construction waste are strictly required to go through administrative disposal approval procedures at the comprehensive administrative law enforcement bureau or examination and approval bureau of each district, and pay construction waste disposal fees according to regulations. Strengthen transportation management. Construction waste transportation management should be franchised, transported by professional transportation enterprises, construction waste transportation vehicles should be in accordance with the local traffic management, comprehensive law enforcement departments designated time, route. Construction of supporting facilities. The government should give financial support to the construction of standardized construction waste transfer and allocation sites in various districts, manage them according to different categories, and reasonably distribute and dispose of different categories of construction waste. Engineering waste is mainly used for site leveling or foundation backfilling. Waste generated in decoration waste and demolition projects is sorted and then enters the disposal site and resource utilization facilities for disposal and utilization. Construction waste concrete blocks, bricks, gravel, etc. enter the construction waste resource utilization plant to produce recycled aggregates. Building materials such as recycled bricks.
5) Strengthen the construction waste system construction. Although Yiyang City has issued Interim Measures for Urban Construction Waste Management in Yiyang City, with the economic and social development, some clauses in the management measures do not meet the needs of construction waste management. Therefore, it is necessary to speed up the revision and improvement of Interim Measures for Urban Construction Waste Management in Yiyang City, promote local legislation when conditions are ripe, and strengthen the legislative guarantee of construction waste management. The government and relevant departments also need to formulate a series of relevant laws and regulations and management measures to guide and supervise construction units and individuals.
6) Establish a long-term management mechanism. We should do a good job in publicity and education and constantly raise the awareness of the whole people to protect ecological resources and environment. Municipal administration, transportation, public security, garden sanitation and other departments in each district shall strengthen linkage, strictly enforce the law, and put an end to the phenomenon of illegal disposal of construction waste.
7) Establish comprehensive service supervision platform for construction waste in Yiyang City. The construction waste management will be integrated into the platform of "One Network Communication Office" and "One Network Unified Management", strengthen scientific and technological empowerment, and implement linkage and efficient management. The supervision platform shall include construction site information, backfill point information, transportation company information, government affairs disclosure information, violation information and other contents. Platform monitoring shall be carried out from source control to terminal disposal. Violations will also be publicized on the platform, so as to further enrich supervision channels, give full play to social supervision power, and force the standardized operation of muck transportation industry.
8) Improve the recycling level of construction waste. Optimize resource production line. The recycling of construction waste will be incorporated into the modernization development of the construction industry. According to the market demand, the product categories of recycling of construction waste will be enriched. Construction waste can be produced into recycled road base materials, recycled asphalt mixtures, recycled aggregates, recycled cement concrete, recycled mechanical sand, recycled mortar,

recycled blocks and new cementitious materials. While meeting the diversified market demand, enhancing the market competitiveness of recycled products and improving the added value, it can also improve the resource utilization rate of construction waste and improve the comprehensive utilization level of construction waste. Strengthen technological innovation support. Encourage building materials production enterprises to carry out research on construction waste recycling technology and equipment research and development, increase financial support, and strengthen scientific and technological support. Strengthen cooperation among universities, scientific research institutes, construction waste disposal enterprises, design units and construction units, accelerate the promulgation and implementation of technical standards for various recycled products while jointly promoting technological progress and product research and development. Promote the use of recycled products. Implement the compulsory use system of construction waste recycling products, clarify the requirements for the scope, proportion and quality of construction waste recycling products, encourage the government to invest in sponge city construction, black and smelly water treatment, urban ecological restoration and other projects to adopt construction waste recycling products; if other projects can use construction waste recycling products, they should be given priority to use, so as to improve the proportion of construction waste recycling products used in each project construction.

IV. CONCLUSION

Through systematic research on construction waste management and resource utilization in Yiyang City, the results show that there are shortcomings in construction waste infrastructure in Yiyang City, imperfect laws and regulations, weak source control and difficult transportation and law enforcement. The next step should be to optimize construction waste resource disposal facilities in Yiyang City, strengthen source control and law enforcement supervision, and establish laws and regulations system for resource utilization of construction waste in Yiyang City.

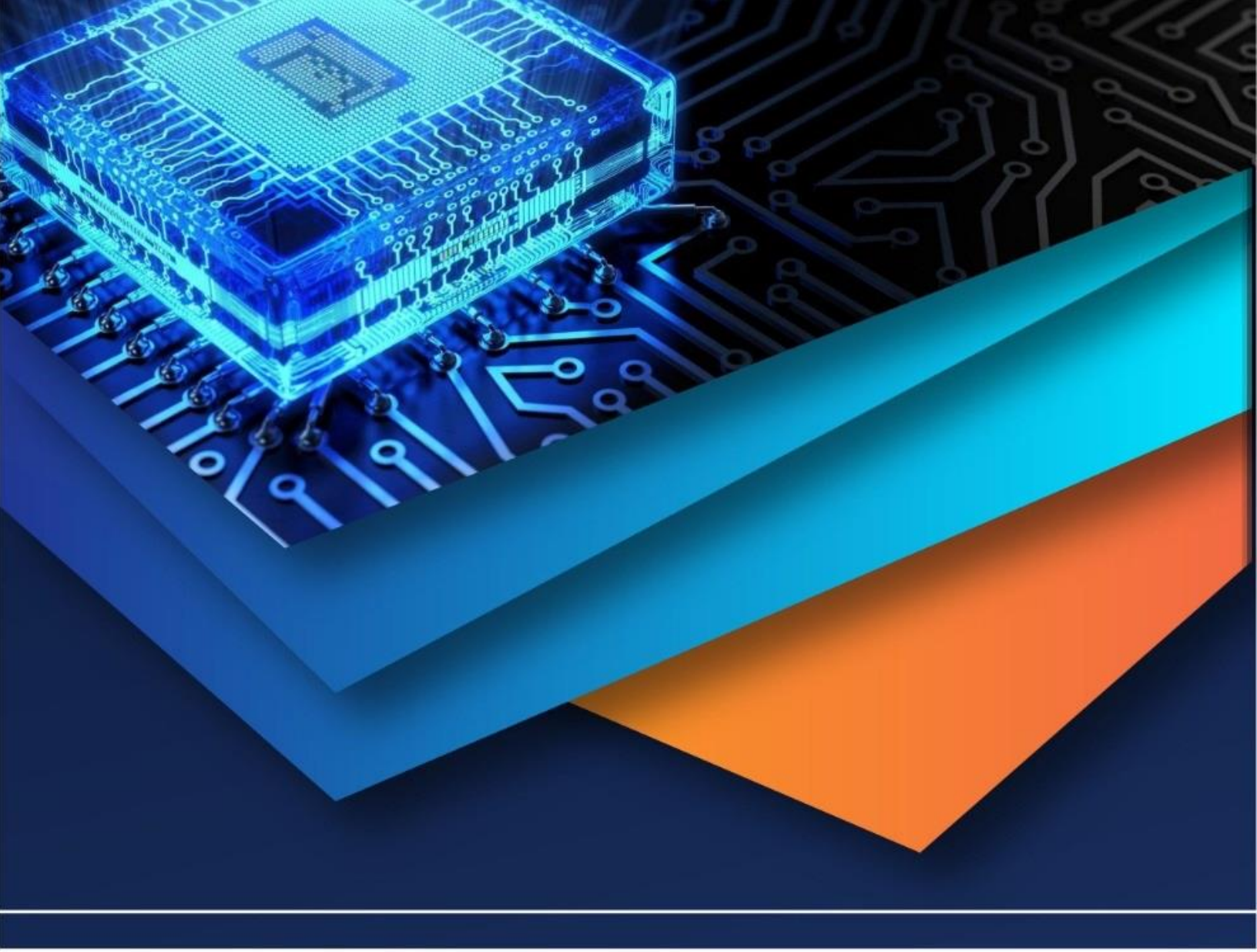
V. ACKNOWLEDGMENT

This work was supported by the China National University Student Innovation & Entrepreneurship Development Program [grant numbers 202211527020].

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