

Research and the Countermeasures on the Main Waterlogging Points in Jingdezhen City

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Abstract. Through the field investigation of Haode lots, Huang Niedou lots, the lots around Chashan Road Jinye Hotel, East Road Jinsha Sunshine Railway Lots, Longjing Road, Xingyuan Road and Jiahe Road intersection, Hejiaqiao lots, the seventeenth primary school-Fuchun garden-Tongbin Road lots, the combination of urban and rural areas after the Changjiang Square, totally 8 streets in Jingdezhen city, this article carried out careful analysis and research on the waterlogging points, and then according to the specific circumstances to put forward the practical solutions to solve the waterlogging problem in some points, in order to get the complete and systematic research on the causes and solutions of the waterlogging problem in Jingdezhen city.

Research Background

"Every storm it will be flooded", "In the city to see the sea" have become the true portrayal of Chinese cities. Floods and waterlogging disasters have greatly dampened the normal operation of cities in China, and have showed the intensified trend, which has brought about serious impact on residents' life and city image. Therefore, the city waterlogging disaster has become a hot spot in media and public attention, while prevention and reduction of floods have become the focus of the study of governments and scholars.

Jingdezhen is one of the heavy rain centers in Jiangxi Province. Since Jingdezhen is in the subtropical temperate monsoon area, the average humidity is 78% for many years, and the rainfall is long and wide. Changjiang River through the Jingdezhen city bring serious floods and waterlogging to the city, since 1998, basically every year the events will happen that the water level exceed the warning line of floods, over the warning line about 2 meters, every three years there will be a rather big flood. Jingdezhen city is in the hilly area, the region's terrain is ups and downs, natural drainage capacity is very weak, and as the population continues to increase, urban residential area continues to expand, hardened pavement area also increased, leading to short-term heavy rainfall, while the surface can not absorb precipitation, to form water collection in the low-lying place, coupled with weak water infrastructure, which lead to serious waterlogging. This paper mainly investigates and analyzes the situation of terrain difference, rainfall, functional zoning and disaster impact in Huangnitou coal area, Hejiaqiao, Haode building materials market, East second Road Jinxia sunshine railway and other places.

The use of sponge city theory to further enhance the ability of a district to withstand natural disasters such as rainstorms, to ease and further solve a problem of waterlogging in a district, so the city's urban waterlogging status to make a detailed investigation and study, find out the basic situation of the waterlogging points, investigate and analyze the reasons for the formation, using sponge city theory on the existing issues to adjust the planning, make the greatest efforts to prevent floods and accidents.

Research Scope

The scope of the survey is the main district of Jingdezhen City, Zhushan District (Jingdezhen City) with area of 40 square kilometers, Changjiang District with area of 380 square kilometers.

Research Content

Research significance: Provide hydrological analysis results for the sponge city construction.

Investigation and analysis on the current situation of waterlogging in Jingdezhen city. Through the investigation of the current situation of waterlogging in the eight waterlogging points in the city, the main factors of waterlogging problems and the causes of waterlogging are analyzed, and the practical significance and pertinence of this research are highlighted.

An analysis of the causes of waterlogging problems

In view of the factors of internal waterlogging, including the impact of the global warming environment, but also by the geographical conditions, but the impact of intensive human life and rapid expansion of urban construction are the main factors, summed up them mainly contain:

Natural factors, geographical factors, human factors the three major causes. The main impacts of Natural factors on waterlogging problems is extreme rainy weather; The main impacts of geographical factors on waterlogging problems are: 1, low-lying terrain 2, flood irrigation; The impact of human factors on the problem of waterlogging are: 1, the lack of new urban planning and design concept; 2, the lack of legislative policy support 3; the lack of water professional attention; 4, low standard design; 5, too fast urbanization process, hard ground area are increasing greatly; 6, drainage facilities construction and system maintenance lag behind.

The following are classification of the different types causing in waterlogging of Jingdezhen city:

Low-lying type. The occurrence of waterlogging is caused the rain can not timely discharged, low-lying areas due to the influx of rain in all aspects, likely to cause waterlogging. The overall terrain is lower than the surrounding area, but the drainage function is not bad, and the area is large, the general precipitation has little effect on it, but when the precipitation reaches a certain intensity, due to rainfall continue to flow from the surrounding higher areas, beyond drainage capacity, then waterlogging occurs.

Changjiang district Huangnidou Lot is located in the east gate of Jingdezhen new factory street, cross connected with Fuliang County and Changjiang District, the north is the mountain, while the south is the Yangtze River tributary of the South River. Because it the joint place of urban and rural areas, transportation pressure is high, it often happen traffic accidents, with great potential of security. The internal traffic in the design section is dominated by village streets, embankment roads and bridges. The village road staggered disorder, the new plant East Road and the village often have the truck, with heavy dusty. The north of Huangnitou area is mountain, while the south is the Changjiang tributary located in low-lying areas, due to low-lying areas. The area has suffered poor flood resistance, once the continuous heavy rain hit, the low terrain areas will be surrounded by high water around the region, when the local drainage ditch will be paralyzed, then the floods will be difficult to deal with. The status quo of water conservancy facilities is weak, except for the two flood ditch in the village head and tail, no any other flood control facilities.

Chashan Road Golden Leaf Hotel is located in the surrounding area of Jingdezhen Porcelain Avenue Chashan junction, the Golden Leaf Hotel East porcelain Avenue are areas that has been artificially raised, while the central Chashan Road has the lower terrain, the western part belong to the high mountain. Compared with the Chashan high and low section, Porcelain Avenue and the central Chashan Road are the lower section, so the two place forms a certain height of the ramp road, the road surface water go along the slope, in the heavy rainfall process, leading to obvious waterlogging in Chashan Road. And Porcelain Avenue has been improved, Chashan Road is located in the lowest in the three places, so the most serious waterlogging appears in this place annually.

Chaoyang Road, Golden Sunshine Garden Lot, Golden Sunshine is located in Jingjiang City, Changjiang District, Chaoyang Road, the north is near the Changjiang Square. From north to south, the terrain are gradually lower, the waterlogging happens in the low-lying areas. The opposite is the Jingdezhen the first middle school, near the majority of shops, with densely population, mostly are covered by house, in the west side, there are the small number of roadside vendors, the road is small and uneven, garbage discarded everywhere seriously lead to environmental pollution. During the heavy rainstorms every year, the rain flows down the slope, the roads are narrow, and the garbage blocks the sewage drainage mouth, which leads to the fact that the houses in the low land are

completely immersed in the rain, and the living and economy are greatly affected. Residents have more private house, and sewer distribution is complex.

Longjing Road, is located in the cross section of Xingyuan Road and Jiahe Road, the west side of Jingdezhen Changjiang District Haode building materials market, the place near the mountains, the terrain gap is much larger, with a few of houses, less drainage, sewer waste sludge blocking, resulting in pipeline sludge to reduce the effective filtration of water, resulting in poor water flow, reducing the drainage capacity. Serious damage to the road, there are large and small pits, pavement has been hardened, water erosion is not good when raining, leading to water can not be discharged in short-term rainstorm, resulting in water collection in the section of the road.

Bridge type. In the bridge hole of the traffic arteries, it is the frequent waterlogging areas. Because these bridges are often the intersection of two roads, or under the railway, the terrain was significantly lower, and some for the safety of the railway, they are much lower than the surroundings. In the event of heavy rainfall, the driver is difficult to through the bridge outside the road depth of water to determine the bridge hole splash situation, usually with lucky mind to go through, prone to happen dangerous accident.

Jingdezhen Changjiang Square after the combination of urban and rural areas located in Changjiang Square, next to the junction of Tongyang Road and Chaoyang Road as a starting point, from the southeast to northwest extension to the intersection of Jingdong Avenue at the junction and the road around the city. And this area to the middle of Taoyang North Road, the lowest point, the surrounding terrain gradually increased, a short period of time heavy rainfall can easily lead to urban waterlogging.

Sewer invalid type. In the process of urban construction, due to the different contractors, construction time before and after the gap is too large, often lead to the original sewer in the construction process was artificially blocked, can not drain or drainage capacity is very poor. In the event of precipitation, the water flow to the lower, accumulation in the slightly lower place, when there is a strong precipitation, where it will form a clear waterlogging.

Jingdezhen Haode Trade Plaza is located in the opposite of Jingdezhen porcelain avenue Changjiang district government, the south side of Jingdezhen City, is the location place of Jingdezhen city government, Changjiang District People's Government, Jingdezhen ceramic institute, people and goods are going frequently. Surrounded by mostly large commercial housing and lower shops, the block is the Jingdezhen building materials market, household activities throughout the city. It is typical that real estate development is mixed with the original tenants. Floods in the area of the public's impact on all aspects of life, especially in the second phase of Hao De building materials trade market will be a large area of waterlogging, the first floor shops is flooded, causing big influence on the owner of the business and the normal life of residents.

Slope type. That is, there is a clear slope on the ground, the place is below the slope, while the water on the road go along the slope down, in the heavy rainfall process, leading to significant waterlogging, these areas are generally serious areas of floods.

Seventeenth Primary school and Fuchun Garden are both in Xinchang West Road, Zhuzhou District, Jingdezhen City, the south is Changjiang. Tongbin Road, Xinchang Road West Road, the north Chaoyang Road, the south is Fuchun Garden, the connecting section of Xinchang Road and Chaoyang Road. The lots from north to south are gradually lower. The section of the southern section of the river- hangjiang, and the tributary is near the Fuchun Garden district. Near tributaries, the illegal housing construction are mess, with population concentration, garbage cause serious pollution of the river, sewage discharge without treatment, and the river has signs of dry, the impact on waterlogging drainage is small. Drainage system is imperfect, river congestion, river rose, bringing inconvenience to the traffic travel.

Research Summary and Countermeasures Research

After the investigation of Jingdezhen city waterlogging points, from the terrain, urban structure system, residents living conditions, etc., roughly summarizes the causes leading to Jingdezhen urban water floods in the following

- (1) the terrain ups and downs, many low-lying and hilly lots
- (2) The accumulation of garbage leads to sewer blockage
- (3) large-scale development of urban areas, underground drainage pipeline fragmented
- (4) less drainage outlet, drainage system transformation is not perfect, a single way of rainwater discharge
- (5) residents living functional partition is unreasonable
- (6) urban landscape is less, plant coverage rate in waterlogging area is low

Using "sponge city" theory from the following aspects to put forward the countermeasures for solving the problem of urban waterlogging : First, the sunken green space, change the city both sides of the main road green belt and urban parking lot into the sunken green space, and change the road surface into the slope type, to facilitate the water flowing into the setting the gap, and establish urban rainwater harvesting system, using natural, artificial wetlands, parks and other facilities to release the rainwater; as much as possible to restore the original river, the pool, reservoirs, ditches, to form the cycle of urban water system, weaken the city heat island effect, improve the rainwater permeability.

Second, establish rainwater garden in the low-lying areas of the city, rain garden is a sponge city water cycle management measures, the use of plants and materials as the main body, the use of landscape design approach to make it integrated with the surrounding urban landscape. So that the rainwater facilities in addition to a real rainwater storage function, but also full of artistic ornamental value, making it as a unit to solve the problem of urban flood and build sponge city. Jingdezhen river network is intense with many water paths, and showing a typical feature like southern city that in the rainy season, the river water level soared, thus speeding up the construction of ecological legislation is imminent. Through reasonable planning, the use of the existing river bank landscape design to make the fine-tune, widely distributed vegetation, which can not only reach the flood storage, but also increase the river water self-purification capacity for water pollution control.

Third, in the latter part of the design and planning, we will focus on planning from the big city to analyze the actual situation of the road, combined with the local customs and other factors, to explore how to design, to achieve landscape ecology, social and cultural harmony and unification, focus on how to use Sponge city theory to take reasonable transformation on the main city of waterlogging points. Establishing the comprehensive safety pattern and water safety pattern, the ecological safety pattern, travel and living safety pattern, which is based on the mountain body as the base and the south river system as the core, taking them as the basis of regional ecological protection and green corridor construction.

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