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# Drainage System: An Analysis of Problems and Attempt to Provide Rectification Measures in Raipur

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**Abstract:** *This paper attempts to study an efficient, economic, easy-to-maintain drainage system. Climate change and urbanization are converging to challenge city drainage infrastructure, and their adverse impacts on the environment remain undeniable. Sustainable drainage systems have gained public interest in the recent years, as a result of its positive effects on water quality and quantity issues and additional recreational amenities as perceived in the shaping of the urban landscape. This paper studies recent progress in sustainable drainage development based on the observations and basic study on the topic of drainage system.*

*After presenting the key elements and criteria of sustainable drainage design, there are various devices and methods for increasing the efficiency of the drainage system in the current scenario. The changes required are pretty simple and would require interest from both sides i.e. the government and the people.*

**Keyword:** *Sdrainage, sustainable, urbanization, water table, surface drainage, up steam drainage, longitudinal slope, slotted inlets*

## Abbreviations

- 1) JNNURM -Jawaharlal Nehru National Urban Renewal Mission
- 2) SBA- Swachh Bharat Abhiyan
- 3) i.e. -that is

## I. INTRODUCTION

The problems affecting the day to day life of a common man in modern India comprises of monetary problems, quality education, health and medical problem and the list is unending. With the constant efforts and schemes launched by the government, there still remains a lot to be desired by the common working class people of India. One such issue is the provision of a proper drainage system for the drainage of storm and rainwater.

Drainage systems across India have had a lot of issues regarding its serviceability, design, design period and efficiency. A proper drainage system is one of basic requirements in the current case scenario of the growing India and especially in the smart cities being set up across the various regions of India. It is the need of the hour to install the very best of the drainage systems as the problems associated with poor drainage includes:

- 1) Loss of foundation stability and structural foundation damage.
- 2) Causes hindrance in traffic movement.
- 3) Premature aging of concrete and discoloration of exterior walls.
- 4) Inconvenience in movement of pedestrians.

### A. What is Drainage System?

A drainage system is an artificial method which is used to remove surface and subsurface water from a given area. It is a system which uses construction techniques to remove the water from streets, sidewalks, parking lots, footpath etc for smoother movement of traffic, people in the city.

### B. Possible Causes of Poor Drainage System

When it comes to a poor drainage system of a place, no one entity or authority can be blamed. The citizens are equally responsible for the poor condition of the drainage system yet the main problem lies from the side of government. The government has launched

many schemes for the welfare of the people like Jawaharlal Nehru National Urban Renewal Mission (JNNURM), Swachh Bharat Abhiyan (SBA), just to name a few.

There are over a hundred smart cities being planned in India at the moment. The plan is one of the biggest step in taking forward the nation to be at par with one of the fastest growing countries in the world. These concepts are shaping up to be the perfect examples of utilization of the resources available to the best of it's capabilities in terms of design, technology, concept and digitization. One of the key aspects while planning a city is the drainage system.

## II. THINGS TO KEEP IN MIND

A roadside drainage system is typically designed based on the following points they are as follows:

- 1) upstream drainage area,
- 2) historic drainage patterns ,
- 3) water table levels to ensure sufficient drainage
- 4) ease of maintenance
- 5) protection of water quality , and public safety.
- 6) The surface water from the carriage way and shoulders hold effectively be drained off without allowing it to percolate to sub grade
- 7) The surface water from the adjoining land should be prevented from entering the roadway .
- 8) The surface drainage should have sufficient capacity and longitudinal slope to carry away all the surface water collected .
- 9) Flow of surface water across the road and shoulders and along slopes should not cause formation of erosion .

### A. Area Of Survey

Here are the some of image of Raipur which needs an efficient drainage system along road side and the possible modifications possible.

#### CASE 1



Fig.1 Gudhiyari Road Raipur

The drainage system is choked by dumping waste into it. Generally drainage system in India has this major problem because people do not know the proper methods of dumping waste and it adversely effects the drainage system.



Fig.2 Drainage Channels

These kind of drainage channels help in restricting the movement of garbage and waste material in the drainage increasing the efficiency of drainage system.

#### CASE 2



Fig.3 NIT ROAD RAIPUR



Fig. 4 SLOTTED INLETS

NIT ROAD can be constructed as Slotted inlets thus it can easily convey the roadside water through slotted inlets in an efficient manner.

### III. CONCLUSION

The drainage system is one of the most essential parts of effective urban system which needs to be considered while planning a town or city. There are a lot of easy solutions to increase the efficiency of the current drainage system. In the above cases provision of basic channels could increase the efficiency blocking the entry of household wastes into the channels which leads to the choking of drainage and overflow of water in times of storm and heavy rains.

Instead of just changing the drainage system fully, little tweaks would prove beneficiary and economical to both the government and the people.

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