

SURVEY OF TOWN FOR IDENTIFYING WATER LOGGING PROBLEM CAUSES AND SOLUTIONS

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ABSTRACT

This research based on the rainfall causes flooding that it is caused by high intensity storm, rainfall and runoff in the city area that is overcome due to lack of proper drainage system and inefficient management. It discovers the water logging problem, its cause and its effects on the surroundings and nature of the city from the authorities of different organizations and people living in different wards of Pune City Corporation. This water logging becomes a burden for the inhabitants of Pune city and creating adverse social, physical, economic and environmental impacts. It creates disturbance to traffic movement and normal life, damage of structures and infrastructure, destruction of vegetation and water habitats and loss of income potentials are the encountered effects of water logging on city life. The rain water becomes polluted as it mixes with solid waste, clinical waste, silt, contaminants, domestic wastes and other human activities that increase the water born disease. Groundwater table rise below cultured, industrial and urban areas, and archaeological sites is a worldwide environmental phenomenon. Groundwater level rise can cause damages to the foundations of the archaeological monuments due to water logging and salt accumulation. Plenty of factors contribute to the groundwater rise. Important factors are those related to hydrological and hydro geological conditions as well as the inadequate sewerage, excessive irrigation and poor drainage systems. At the end of the study, there are some recommendations from the DYP SOE students of PUNE UNIVERSITY by selecting a suitable size of drain pipe to avoid the water logging on the porwal road (Lohegaon) & to provide some recommendation as an input for the concerned authorities for better management of storm water.

Keyword : - Infrastructure, Waterlogging, Urban area, Drainage Study, Pune city, storm water etc.,

1. INTRODUCTION -

In last few years, rainfall induced water-logging has become a common hazard in the Urbanized areas. *When the water table rises to such heights that the soil pores in the root zone become saturated, thus displacing the air, the land is said to be water logged.* It affects water in soil to become displaced, natural procedures in the earth are affected and there is buildup of harmful substances in the soil, which can causes problems with growth of plants in

the immediate area. It also occurs without proper management of water and obstacle of ordinary drainage particles. Sometimes, excessive rainfall within a very short span it causes water-logged situation in both the rural and urban areas. Water-logging problem is one of the main reasons for land erosion, In our country. The artificial and natural drainage helps to remove sillage and storm water from surface and prevents many problems such as water logging, environmental pollution etc. So it has natural significance in our daily life. Drainage in human settlements has assumed considerable significance due to the tremendous population growth and the rapid but haphazard urbanization evident in most countries. Failure to provide adequate drainage is directly linked to the diseases like malaria, spread of diarrhea, damage to housing and property, interrupt communications, and environmental degeneration.

Therefore this study highlights major portion regarding water logging problem and thus tried to clarify the terminologies and others important matter which will give a clear idea regarding the subject matter of the study. Our goal to do a case study of the current urban water logging in Porwal Road (Lohegaon) of Pune District, trying to highlight the main causes behind it, the effects of water logging in the area and the remedial measures to counter act the effects water logging.

2. OBJECTIVES -

The primary focus of the study is on the factors influencing the water logging and salinity problem in Pune district. The physical development trend, the rainfall intensity and the storm water drainage system of Pune district is ascertained. But, the definite

1. To find out the causes of water logging and salinity in the region.
2. To investigate the temporal inventory of water logged and salt affected areas using geospatial data.
3. Develop the understanding for the effects on human life, economy and the environmental quality of the city due to water logging would be studied.
4. To provide some recommendation as an input for the concerned authorities for better management of storm water.

3. LITERATURE REVIEW -

In this literature review, we have collated information from the scientific and grey literature on the effects of prolonged surface water logging on soil quality, ecosystem services and farm practices with the aim of evaluating the impacts for different farming systems, crops and soil types found in England and Wales. In this report, prolonged water logging is defined as occurring when the whole of the 'A' horizon layer is saturated or filled with water for more than 24 hours. Water logging and salinity of soil are the two main factors affecting the agricultural productivity and sometime becomes too important factor for economic development for crop production. In India, it is estimated that about 6.0 m ha land is affected from various nature and order of water logging and about 8.5 m ha land is affected from different degrees of soil salinity. The separation of the site and valuation of the severity of water logging and soil salinity are pre-requisite for any reclamation programmed. However, the traditional methods of soil sampler and land surveying demand vast human resource, and are time consuming, difficult and costly. Besides, the active nature of these problems makes it more difficult to use traditional methods for comparison purpose in huge areas. systems by the random construction of embankment through interrupting the balance of inflow and outflow of water. The "water logged" means the condition of soil that is saturated with water and thus cannot keep oxygen between its particles. Sometimes, excessive rainfall within a very short span it causes water-logged situation in both the rural and urban areas. Water-logging problem is one of the main reasons for land erosion, In our country. So it has natural significance in our daily life. Drainage in human settlements has assumed considerable significance due to the tremendous population growth and the rapid but haphazard urbanization evident in most countries. Failure to provide adequate drainage is directly linked to the diseases like malaria, spread of diarrhea, damage to housing and property, interrupt communications, and environmental degeneration.

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4. PROBLEM IDENTIFICATION –

Some of the problems identified are as follows:-

- 1.To identify the water Logging prone area by the PMC. Porwal Road is the most water logged area in Lohegaon.
- 2.Drainage system get clogged due to heavy rainfall and garbage that thrown by local peoples nearby area,
- 3.There is improper disposal of garbage waste.
- 4.The existing drainage system is full in off season but during monsoon it get over flow. 5.There is defective air circulation & existing drainage system is open.

5. METHODOLOGY –

The work comprises collection of data like topography map ,watershed areas, all the levels of road that are essential for our work, Collection of all the information about Lohegaon road, analyzing and checking of data. Which includes, surface area of Lohegaon, terrain (steep or flat), location of Lohegaon on city map, No. of Restaurants, schools, colleges, shops etc. situated in that area. Collection of data from local authority i.e. From Municipal Corporation of Pune city which includes Pune City Plan, Drainage Plan Of Lohegaon (Porwal Road) Area, Peoples serving in the nearby area, Drainage Plan in that area & Average Rainfall of city etc. And the proper Study of existing drainage system and to define new diameter for the drainage pipe.

5.1 Types Of Drainage System -

Subsurface Drainage System- Subsurface drainage systems are executed under the top layer of soil. Occasionally referred to as a French drain, they work at the root level to take away extra water. Excavation of trenches to install the pipes of subsurface drains. subsurface drainage solution options based on the needs and the location of where the drain would be placed.



Fig – 1: Impact Paradise society Porwal Road

In understanding the types of drainage systems, you'll see that often multiple types work together to remove water and guide it to an appropriate place. The faster water is removed from a structure or area in which pooling can occur, the better. Drainage systems are an essential part of water conservation and preservation that people rarely think about. So we are working on the most water logged area of Lohegaon.(i.e.- porwal road) for proper disposal of storm water that affects the daily routine of local peoples specifically in monsoon season. By using subsurface drainage system we are trying to solve these problems permanently.

5.2 Rainfall Data - The rainfall is quite inconsistent in the district. Heavy rain falls are always expected from the month of June to September. However, some exemption still exists in the pattern of rainfall. In some previous years we found that there is undulating rainfall graph i.e. Rain is occurring in any month ,i.e. pre-monsoon heavy rainfall.

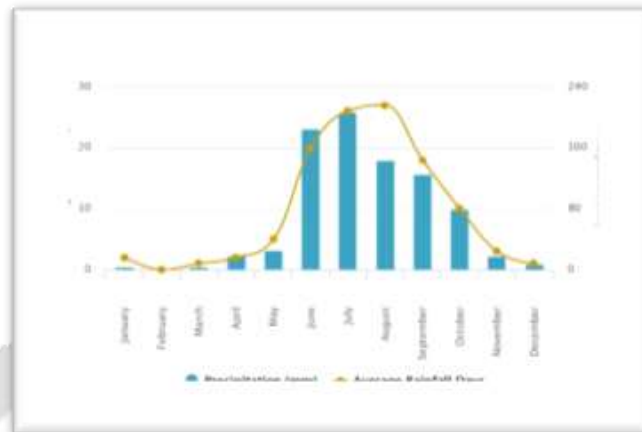


Chart 1 :- Rainfall Data

6. CAUSES -

- 1) Due to Heavy rainfall in the city specially in monsoon season.
- 2) Due to Improper drainage system of the city.
- 3) Due to Lack of improper solid waste management system of the city.
- 4) Due to inappropriate sloping to the road the water logging made in low laying area.

7. SOLUTIONS –

- 1) Proper Drainage system should be provided in the city.
- 2) By Doing proper solid waste management disposal of the city.
- 3) A Drone sensor system can be used to identifying different water logged areas of the city.
- 4) Sewerage manhole should cover tightly.
- 5) By laying pre cast concrete pipe, we can easily remove the storm water that creates problem to the local people.

8. Conclusion -

The following conclusions can be get based on the results and discussion presented previously

- 1) We Studies all the previous papers, booklets, Municipal dataset & maps of drainage and nallhas, We found that there is no storm water drainages system provided in Lohegaon localities.
- 2) We are suggesting to design proper and economical storm water system for the Lohegaon.
- 3) Absence of planned and systematic drainage network system.
- 4) Undersized drains are to be removed and laid appropriate size drains.

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