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PUBLICATIONS

Runoff Estimation by Rational Method and SWMM in Vasai

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Abstract—India is a developing country and due to haphazard growth, cities have witnessed huge problems due to flooding in the recent years. Thus, the focus on flood management and flood risk assessment has increased. In this phase the new cities are being developed in accordance to flood risk management but the older cities facing the problem of water logging and floods very often due to heavy rainfall. It was found that 'Vasai' faces such problems very severely during monsoon. City gets water logged most of the time as intensity of rain is heavy. This is a major issue for Municipal Corporation and also the residents of Vasai. The haphazard growth of the population has imparted huge load on the existing sewers which failed to work efficiently during rainy season. Hence water logging is more frequent. Therefore, to avoid such difficulties water need to be obstructed where it won't impart any damage to the public life and water can be utilized while detaining, for different purposes and the water which is let into sea can be reduced. Runoff estimation can be done by Rational Method and empirical formulae like Lacy's Method, Khosla's Method etc. and also with the help of modern softwares like HEC-HMS, Storm Water Management Model (SWMM). Widely used method for runoff estimation and drainage modelling is SWMM; using SWMM we get total runoff, peak runoff, runoff coefficient.

Keywords: Runoff, SWMM, Rational method.

I. INTRODUCTION

Storm water management is a neglected segment of the protective cover with all the other things taken into consideration for the development of the cities. Thus, need arises for the protection against any type of natural calamities which results in major losses to life as well as economically.

Since the last two decades urban water management has gained importance. This water need to be properly routed to a desired location where it can be treated to reuse for different purposes which is done by most of the cities around the world. Routing is done by culverts, drains, etc. which have impervious surfaces to carry storm water to their destination. Hence the design of drains must be done using correct tools, which might not cause a huge loss to life and economy. Therefore necessity for disaster management

arises for Vasai with average annual rainfall above 2000 mm.

II. LITERATURE REVIEW

Bhadiyadra K., 2015, data collection and field survey was conducted. Past floods were studied and immediate solutions were put forth. The main cause of water logging was due to the river Tapi. To prevent water logging some temporary solutions like hydraulic pumps, ground water recharge well, etc. were suggested.

Khondekar T., 2004, data was collected and analyzed. Causes and effects of water logging were studied and solutions were proposed. Water logging is mainly due to unplanned developed towns and cities. Obstructed and Diverted storm water drainage systems also contributed in water logging.

Priyanka Sahoo, 2018, the committee of five members inclusive of the director of National Environmental Engineering Research Institute [NEERI]. The committee will not only recommend solutions but would prepare a master plan for Vasai-Virar belt. They would also carry out the marking of nullahs, creeks, boundaries of Vasai, Nallasopara and Virar.

Gargi Verma, 2018, the reasons of water logging are being studied and pinpointed. Comparing the past and present Rainfall Patterns and marking the catchment area also studying the development in the infrastructure in the region. At public hearing at least 300 residents stressed on the need of regular maintenance by de-silting of drains and expansion of the drainage systems in Vasai-Virar and claimed against the illegal constructions.

Swapnil Rawal and Ram Parmar, 2018, Sulakshana Mahajan, senior urban planner and team pointed out that "rampant development" is the major cause for water logging and