



# How Does the Rainwater Harvesting Protect the Urban Areas Against Flooding?

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## Keywords

Rainwater harvesting • Flooding urban areas • Unconventionnal water

## 1 Introduction

C.liaw (2006) reported that the urbanization has also been shown to gradually alter urban watershed hydrology by increasing both the quantity and the peak of storm water runoff.

Development impacts are typically prevented and mitigated using technics such as rainwater harvesting. The rainwater harvesting systems are managed in small cost-effective features located at each lot rather than being conveyed and managed in large, costly facilities.

This study investigates how the use of the rainwater harvesting systems can increase the water supply, reduce the amount of on-site rainwater volume and peak at developed sites in urban areas.

Rainwater collected by the contact interfaces of buildings or nature surfaces (green areas, roofs, soil) contributes to runoff, where the fast drain of this water leads to problems in the sewerage systems.

The trunk sewer of the studied area has the following sizing: Ø 1000, 1200. the flow in these pipes was reduced by elimination of the harvested rainwater already calculated from the rainfall.

This quantity of water is stored in tanks sized using the method of tables proposed by Guebail et al. 2011 according to different roofs with percentages occupying them in each affected sub-basin. Three (03) senarios were proposed: the total sub-catchement is considered, the sub-catchement without roofs of the buildings, and the sub-basin without buildings and green areas.

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Fig. 1 Location of the study area (Boucheougouf, Wilaya of Guelma, Algeria)

The results are reported on the graphs Figs. 1 and 2 where it is shown clearly how much the consideration of the water harvesting in the sewerage system conception can affect the decisions.

## 2 Materials and Methods

To conduct the investigation “COVADIS” software was used for calculations of the various hydraulic parameters, such as flows in the trunk sewer and Flow velocity. So, we can deduce an advantage by using the rainwater harvesting in the urbain Sub-bassins.