

The use of GIS for supporting the experimental representation of the selected supply network in Paphos Municipality: 'the hydroGIS Lab'

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Introduction

The Project aims to satisfy the dire need for authorities to solve the extremely serious problem of water supply as a result of continued water shortage.

The innovative aspect of the Project is that, state-of-the-art technologies will be combined for the mapping of water networks through the Global Positioning System (GPS), Radar Scanners and Satellite Remote Sensing (SRS). The data will be entered into a Geographic Information System (GIS) in order to develop a digital imprint and the mapping of the network. GIS, can reveal important new information that leads to better understanding and decisions. Furthermore GIS can be used to emphasize the spatial relationships among the objects being mapped. The core of a complete GIS system consists of three basic components that are in constant balance and interdependence. These are machines (hardware), algorithms (software) and available data (resources) (Figure 1).



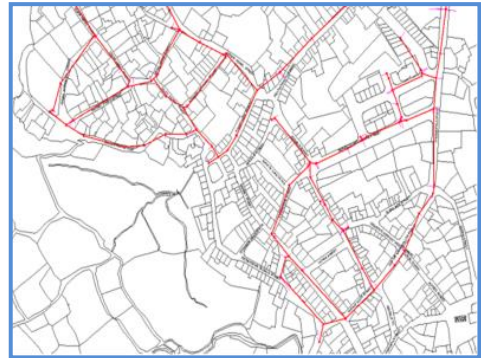
Figure 1: GIS Components

Methodology and Results

A methodology has been created for detecting and adapting critical parameters of the mathematical models (e.g. surface roughness coefficient of pipes etc), based on actual experimental measurements of the flow field in corresponding hydraulic models

The preliminary underground survey conducted for the HYDROGIS project shows positive results in using ground penetrated radar to identify the underground pipe network in the Municipality of Paphos. GPR scanning is a useful tool for modeling the water supply network, design and operation, with the goal of minimizing water loss. The aim of the project is to utilize scanning and 3D spatial representation to develop a GIS platform for managing all information required, including maps, satellite imaging, 3D scans, network system components and others. A methodology has been developed to regarding the critical parameters required for hydraulic models.

Maps from Paphos Municipality depicting existing buildings, streets, etc were used in creating the digital map. The capturing of satellite data at any moment in time using remote sensing techniques can provide the current construction development and, therefore, the immediate water supply needs in the municipality (Figure 2).



(Figure 2)The water network following the GPR

The GIS system is flexible, allowing the addition of any layer considered necessary for the better management of the Project information. The final structure and content of the digital imprint will depend on the results of the initial study of the networks in Paphos Municipality in order to proceed with an accurate modeling of the representative network. (Figure 3) .

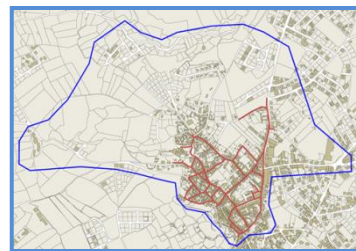
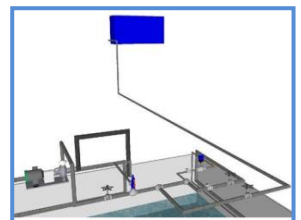


Figure 3 Area of interest, including the GPR water pipe network survey



Made network for experimental studies



Three-dimensional experimental network simulation

