

# Implementing an Open Source Spatial Data Infrastructure for the CLIMRisk project

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## Abstract

The CLIMRisk research project "Climate change adaptation measures in the management of natural and environmental risks" focuses on the Portugal Centre Region (NUTS II) and has the following objectives: assess natural and environmental hazards; analyse climate change scenarios; analyse the risks of climate change impacts and promote the discussion about climate change and propose adaptation measures.

This project was founded by a multidisciplinary team organized by Working Thematic Groups (WTG): Climate Change, Floods, Forests, Environment, Coastal Erosion and Geographic Information System (GIS). The project comprises a territory management component with the joint integration of the areas mentioned, where the GIS WTG performs an essential task, in order to provide a complete and up-to-date spatial data repository for all WTG.

The objective of this study is to develop and implement a Spatial Data Infrastructure (SDI), which will be the preferential way for the project results dissemination, contributing as a tool for changing the regional policies on adaptation measures to the climate changes and to promote awareness in the population.

The development and implementation of the SDI includes four tasks: (1) Development of the infrastructure to be implemented; (2) Implementation of the WebGIS solution and the Geographic Database (GDB); (3) Adaptation of the Open Data Portal (ODP) according to the project specificities and (4) Data availability for the general public.

The infrastructure will be implemented in logic of resource sharing among the various WTG. The proposed architecture is completely based on Open Source technologies and assuming the implementation in a Cloud environment, and it must be scalable according to the future needs of the project.

The SDI architecture (Figure 1) is composed by a Virtual Machine Server (VMS) with the mechanisms that allow an easy communication with each other, regardless of the GIS software of each group.

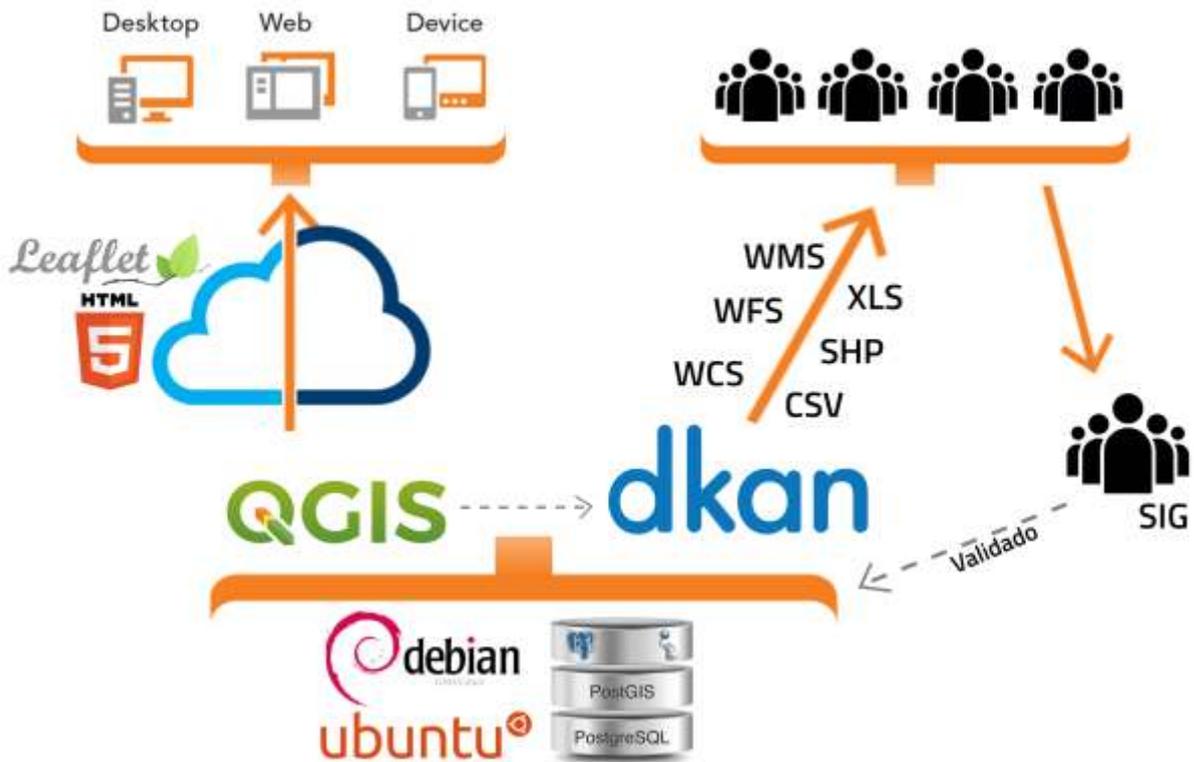


Figura 1- SDI Architecture

This SDI is the core system of the CLIMRisk project and through the GDB will store all raw data and the thematic maps produced by the various WG. This data will be available for download through the *dkan* application, allowing the download by each project researcher, enabling him to analyse and / or manipulate the data, or use an OGC service (WFS, WMS and WCS). Thus, each user can use the data on his own desktop constantly updated, without checking constantly the changes since the last download. Then, all information will be made available to the public through the WebGIS designed with responsive technology, allowing it to be accessible on any device.

The aggregation of the WebGIS with Open Data enables a complete and up-to-date spatial data repository. The data and services provided are targeted to two types of end users: Basic User and Advanced User. The Basic User will tend to search for derived and served data (e.g. for support to decision makers in central and local Public Administration). On the other hand, the Advanced User will be more interested in raw data in order to derive their own information.

**Keywords:** Geographic Information System, Climate Change, Open Data, Interoperability