KINGDOM OF BAHRAIN
Information & eGovernment Authority

Bahrain Soil Mapping Project (2019)

Project Introduction

Since its inception, the Information & eGovernment Authority's GIS directorate has been abiding by its mandate to provide geospatial data that is current , accurate and accessible, and to act as hub for all government geospatial data. To meet these goals, the directorate undertakes national level GIS projects that are crucial for the development of the country , and which is the corner stone for the Bahrain Spatial Data Infrastructure (BSDI) portal .

Soil maps and their associated geospatial data are very important datasets that have a crucial role for various disciplines. Soil is considered the foundation for many projects. In agriculture, soil is the backbone; it is the main source of plants nutrients. It plays a major role in sustaining healthy crops. The type of physical and chemical characteristics of soil is vital for identifying areas suitable for agriculture. Equally, soil is important in construction applications and in identifying the appropriate soil quality central for building(s) foundation.

The Bahrain Soil Mapping project is undertaken in 2019 by IGA to map the soil spatially, physically and chemically in the Kingdom of Bahrain and to fill the gap in the availability of soil geospatial information.

Project Goals

The Bahrain Soil Mapping project aims at gathering, processing, generating and disseminating geospatial soil mapping data for the Kingdom of Bahrain .

Currently, the available soil data for the country is scarce and sparse and does not cover the whole country as well as not being GIS ready .

The main aims of this project are:

- Produce soil maps and study the qualitative distribution of soil in terms of physical and chemical properties utilizing multi-spectral satellite imagery, remote sensing techniques and field survey.
- Conducting research and studies on the agricultural characteristics of the soil.
- Identify favorable areas for agriculture.
- Identify suitable areas for construction.
- Provide soil maps to government agencies through the Bahrain Spatial Data Infrastructure (BSDI) platform.

Project Scope

The project is focused on the Kingdom of Bahrain and covers the entire land area, excluding urban areas and agricultural areas.

The total number of field survey stations is 150 randomly selected station, based on the unsupervised classification maps.

The stations are divided into two main groups, the first group comprising of 100 stations and the second group of 50 stations .

Methodology

The main methodology involves the utilization of remote sensing techniques and field survey data to analysis and derive soil properties maps covering the kingdom of Bahrain. The following is a detailed overview of the methodology:

1

Unsupervised Classification

A multispectral satellite imagery (Landsat 8) was acquired over the Kingdom of Bahrain. The imagery was first rectified and corrected for atmospheric and geometric anomalies. An unsupervised classification map was next generated based on the spectral reflectance of the spectral bands.

2

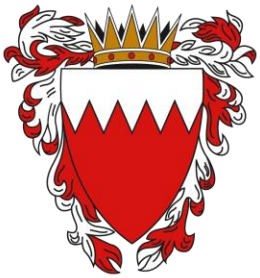
Field Survey

Field survey maps were generated based on the unsupervised classification map. 100 survey stations were generated covering the kingdom of Bahrain. Soil samples were collected for the 100 stations. Both physical and chemical test of the soil samples with a focus on agricultural properties were done.

3

Supervised Classification

Supervised classification maps of the soil were generated for the various soil properties based on the results of the lab test for the soil samples obtained from the field survey.



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