



## Land Covers Change Assessment After Small Dam's Construction Based on the Satellite Data

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### Abstract

The small dams were constructed in the study area for storing the rainwater. The present study was conducted to assess the impact of small dams on the LCC (Land Cover Change) in Nagarparkar, Pakistan based on the satellite data. The ENVI (Environment for Visualizing Images) software was used for classification of the four year's images and three classes viz. water, vegetation, and soil were taken for detection of LCC. The MLH (Maximum Likelihood) supervised method was used to classify the multispectral satellite images. The classified results of the classes were found different each year before and after dam construction. Average results of the two years before dam's construction revealed that water availability, vegetation cover and soil cover was 3.02%, 18.52%, and 32.30% respectively. However, after the dam construction, the water availability, vegetation cover and soil cover was 8.49%, 34.33%, and 17.15% respectively. Overall results revealed that water availability and vegetation cover were increased by 5.47 % and 15.18% respectively while soil cover decreased 15.15% after the construction of dams. Hence, based on the results, it is confirmed that the constructions of small dams have a direct and indirect positive impact on the land cover changes and it can play an important role in the resettlement of the communities of the arid areas.

*Keywords:* Land Cover Changes; Assessment; Before and After Dam Construction; Satellite Data; ENVI Software; Nagarparkar Area.

### 1. Introduction

Pakistan is an agricultural country and once was a water-surplus country; now a water shortage country [1]. It has two main water resources and five climatic zones; the water resources are classified into two main classes: primary and secondary. Primary resources consist of precipitation, glaciers, and snowmelt; secondary resources consist of surface and subsurface water. Climatic zones include arid, coastal, semiarid, and humid. Nagarparkar area comes under the arid zone, in the arid zone irregular and insufficient rainfall occurs having the annual rainfall is less than 250 mm.

In light of the above fact, the Government of Sindh launched the small dam projects in 2007. The main objectives of the small dams' project were to provide water in the arid areas to meet the demand of irrigation, domestic, livestock, potable water and serves for soil and water conservation measure to the remote areas in Sindh. The main water remote areas of Sindh are Kohistan region, Nagarparkar and Ubhan Shah Hills region in which the project was launched, and some small dams have been completed, and some are underway.

After the completion of a few dams in the Nagarparkara area, felt dire need to assess the impact of small dams on land cover change (LCC), hence selected the area for research study purpose. Before selecting the area, the researcher

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