

## The Estimation of Land Use Changes under Irrigation Water of Traditional Streams of Khansar City

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### Abstract

The different land uses in the irrigation water area of the eleven streams of Khansar city during 1969, 1995, 2014, and 2019 have been identified and their area has been determined by analysis of the aerial photos as well as the satellite images of QuickBird, and Landsat in the Google Earth Engine (GEE) environment. Then, the net and gross areas of land under irrigation water, area of non-agricultural land uses, location and area of agricultural land uses under irrigation of the streams are separated according to the type of agricultural activity (orchard or farmland) for each stream. Aerial photos of the study area dated 1969 are the basis for the assessment of agricultural conditions before the law of Fair Water Allocation. The results showed that non-agricultural and particularly urban and residential land uses have increased since 1969. In other words, land use of part of the agricultural lands has been changed to residential and urban land uses. Despite the decreasing trend of agricultural land uses in the last 50 years, these changes have not been the same between the farm and orchard land uses and the area under orchard plantation showed an increasing trend. These changes have dramatically influenced on water demand of the streams. Land use has not significantly changed from 2014 to 2019 and no noticeable change was observed in the area of the agricultural and green agricultural lands as well as the percentage of the orchard and farming lands during these years. The results of this study confirmed the significant changes in agricultural land use and consequently water consumption in the district of the eleven streams of Khansar in recent decades. This study also highlighted the high efficiency of the combined use of aerial photos, spectral satellite images with medium spatial resolution, and visible spectral satellite data with high spectral resolution, as well as using cloud system capabilities of the Google Earth Engine to study changes in agricultural land uses during last decades.

**Keywords:** Land Use, Cultivated area, Remote sensing, Google earth engine (GEE), Khansar city

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