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AIR POLLUTANTS EFFECTS FROM BRICK FACTORIES ON CLIMATE CHANGE USING GEOMATICS TECHNIQUES

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Abstract

Urban air pollution is a major environmental problem in all countries of the world. A great number of factors can influence the air quality in urban area including geographical setting, climatological and meteorological factors, city planning and design, and human activities in urban areas.

The aim of this study is to measure some important pollutant concentrations such as (VOCs, SO₂, H₂S, NO₂, TSP and PMs) in AL-Nahrwan industrial zone in Baghdad suburban, and take the effect of fuel burning that use in the brick factories on the climate change by using mathematical equations and geomatics techniques, as the image satellite spot 7 with resolution 1.5 m. And also with geometric correction for this image satellite, and then go to build a Geodatabase for the position of the brick factories and their data in pollution as in sample point, with spatial analysis for these data, and the final output will be as Thematic mapping showing all data in these maps. The study included identifying six location samples distributed in the study area for the period from (February -May 2015), coordinate of each individual sample location was determined by (GPS). The average concentration of the total suspended particles (TSP) recorded in this study is (315.16) μg/m³ and (694.66) μg/m³ in February and May 2015 respectively. These values are significantly higher than the permissible limit of the national and international allowable limits. The results of NO₂ in February 2015 are (0.099, 0.102, 0.103, 0.097, 0.086, 0.165) ppm and in May are (0.373, 0.588, 0.782, 0.751, 0.77, 0.827) ppm. The most values of NO₂, where the differences in the value of NO₂ is occurred with the seasonal change, exceeding the national limit. The concentration of SO₂ is (0.198, 0.057, 0.021, 0.024, 0.145, 0.02) ppm in February, and (0.328, 0.423, 0.499, 0.515, 0.581, 0.76) ppm in May which is higher than the national limit.

The concentration of particulate matters (PMs) is increased at high temperature and low relative humidity, and the concentration of gasses also increased in summer season.

The correlation analysis was performed between air pollutants and some metrological parameters. The result shows that there is a weak linear correlation between metrological factors and most air pollutants.

Finally, calculating the emission gasses of climate change (CO_2 , N_2O , and CH_4) is performed by applying the formula of climate change where the emission depends on the quantity of fuel oil (heavy oil) used in each factory such as 292000 liter the emission of $\text{CO}_2 = 854$ tones, $\text{N}_2\text{O} = 2.318$ tones, and $\text{CH}_4 = 0.347$ tones.

Keywords: Urban Air Pollution, Air pollution gasses, climate change, Geographic Information System (GIS).