

# **Environmental considerations in planning of urban areas - a case study of Dammam-Khobar-Dhahran area**

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## **Abstract**

The Kingdom of Saudi Arabia is experiencing an unprecedented rate of urban growth. Further, the current national policy stresses on diversifying the economy and to moving the Kingdom toward a stable self sustained economic base, with particular commitment to industrial development. The Eastern Province is the primary source of the Kingdom's oil wealth, where most of the development is taking place. It is therefore advisable to take into account the effect of probable air pollution due to emission of various pollutants from industrial sources particularly the oil related industries in physical planning development plans for urban growth.

The objectives of this study are to estimate the dispersion of sulfur dioxide emitted from some major sources in the Eastern Province and to evaluate its impact on physical development plans. Further, it aims to introduce recommendations for consideration while preparing physical development plans keeping in view air pollution problems. The area selected for study includes Dammam, Khobar, Dhahran, Qatif Oasis, Tarut Island, Safwa, Nejma and Rahima. The Gaussian dispersion estimation models for both short term and long term average concentrations of a pollutant were used to estimate the dispersion of sulfur dioxide.

Estimations showed that the area of study is expected to be exposed to concentrations greater than those specified by the interim air quality guideline standards for sulfur dioxide adopted in Saudi Arabia.

Consequently, evaluation of physical development plans for the area of study shows that they do not conform to the air quality standards. It was concluded that this problem could be mitigated by applying source emission standards, controlling the source characteristics and taking into consideration the air quality in preparing physical development plans. It is further recommended that it may be necessary to revise the air quality guidelines in view of the economic importance of the industrial activity in the area of study to realize the full potential for development.

The lack of reliable data required for dispersion estimations was noted and it was recommended that a data base should be developed to collect relevant information.