

## The Environmental Impact of Sustainability Dispersion of Chlorine Releases in Coastal Zone of Alexandria: Spatial-Ecological Modeling

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**Abstract :** The spatial-ecological modeling is relating sustainable dispersions with social development. Sustainability with spatial-ecological model gives attention to urban environments in the design review management to comply with Earth's System. Naturally exchange patterns of ecosystems have consistent and periodic cycles to preserve energy flows and materials in Earth's System. The probabilistic risk assessment (PRA) technique is utilized to assess the safety of industrial complex. The other analytical approach is the Failure-Safe Mode and Effect Analysis (FMEA) for critical components. The plant safety parameters are identified for engineering topology as employed in assessment safety of industrial ecology. In particular, the most severe accidental release of hazardous gaseous is postulated, analyzed and assessment in industrial region. The IAEA-safety assessment procedure is used to account the duration and rate of discharge of liquid chlorine. The ecological model of plume dispersion width and concentration of chlorine gas in the downwind direction is determined using Gaussian Plume Model in urban and rural areas and presented with SURFER®. The prediction of accident consequences is traced in risk contour concentration lines. The local greenhouse effect is predicted with relevant conclusions. The spatial-ecological model is also predicted the distribution schemes from the perspective of pollutants that considered multiple factors of multi-criteria analysis. The data extends input-output analysis to evaluate the spillover effect, and conducted Monte Carlo simulations and sensitivity analysis. Their unique structure is balanced within "equilibrium patterns", such as the biosphere and collective a composite index of many distributed feedback flows. These dynamic structures are related to have their physical and chemical properties and enable a gradual and prolonged incremental pattern. While this spatial model structure argues from ecology, resource savings, static load design, financial and other pragmatic reasons, the outcomes are not decisive in artistic/architectural perspective. The hypothesis is an attempt to unify analytic and analogical spatial structure for development urban environments using optimization software and applied as an example of integrated industrial structure where the process is based on engineering topology as optimization approach of systems ecology.

**Keywords :** spatial-ecological modeling, spatial structure orientation impact, composite structure, industrial ecology

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