

## **APPLICATION OF GEOINDICATORS TO MEASURE ENVIRONMENTAL PERFORMANCE**

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Environmental indicators have been developed for a number of purposes, including monitoring, reporting and performance evaluation. Many have been designed to make known changes in environmental quality; others aim at revealing the impact of human activities. While many indicators have been conceived to convey professional data, others are used to communicate environmental information to the general public. They range from local to global. Appraisal and reporting of environmental performance is a relatively new field of application of environmental indicators. Reporting requirements range from individual projects to the performance of huge organizations. Indicators must be carefully chosen if they are to convey meaningful information to a variety of stakeholders. In the realm of engineering projects which can have a significant impact on the environment - such as mining, industrial plants, waste disposal facilities and civil works like roads, dams and ports - the most important application of geoindicators is to monitor local impacts. Essential characteristics of a geoindicator for such purposes are: (i) to represent a process affected by the project; (ii) to be measurable; (iii) to measure very short-term changes (one year); (iv) to represent a relationship project activity/environmental effect; (v) data should be collected at a reasonable cost. Examples of geoindicators suitable to a number of engineering projects are (i) amount of soil lost by sheet erosion; (ii) volume of gullies; (iii) area affected by induced siltation; (iv) area disturbed by topsoil removal; (v) groundwater level; (vi) contaminant concentration in soil; (vii) contaminant concentration in groundwater; (viii) hydraulic conductivity of soils.