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ABSTRACTS

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Geo-Environmental threats to human health, eco-systems and built structures in Great Britain

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1. Geo-Environmental threats to human health, eco-systems and built structures may be natural or man-made. The British insurance industry pays out hundreds of millions of pounds a year on claims due to natural environmental threats.
2. Recent research used digital soil survey information to determine the distribution of ground conditions that may adversely affect human health or structural integrity of low rise housing in order to provide better guidance to planners and developers and claims should, as a result, reduce in the long term.
3. Contaminated land can act as a source for substances that cause harm to human health, buildings or the environment. Contaminated land in the UK is assessed in a staged manner that attempts to ensure that effort is focused on minimising potential risks to end users, structures and the environment and not, as has been the case with the US Super Fund, on spending large sums on characterising sites and leaving insufficient resources to tackle unacceptable levels of risk. The risk assessment involves identifying and characterising sources, potential targets and plausible pathways from sources to targets.
4. The assessment of the risk posed by the site to human, building or environmental targets is carried out following a phased site investigation whose aim is to assist decision making. Site investigations involve:
 - collecting appropriate data base;
 - defining nature and extent of contamination sources;
 - identifying and characterising plausible pathways;
 - locating and characterising targets.
5. The characterisation of a site in order to assess the degree of environmental threat involves all three spatial dimensions. A fourth spatial dimension of geological stratigraphy may be added to this. In areas of structurally disturbed strata, geological horizons can be far from horizontal or planar. Geomechanical and petrophysical properties may be spatially correlated within a geological unit but not within any given horizontal depth slice. In addition, situations change with time. Pollutants move vertically under gravity and laterally under the action of hydraulic, pressure and diffusion gradients. Natural chemical and biological processes may cause the breakdown of organic pollutants. Changes in the physical situation may cause changes in state or increased rates of movement.
6. To determine the most appropriate course of action for any specific site, the circumstances at the site must be coupled to the nature of the use to which the site will be put. Those circumstances include topography, geology, hydrogeology, flora and fauna, climate, neighbouring land use and land use history. Appropriate courses of action to mitigate the threat posed by contaminated land may include remediation, removal of contamination, change of intended land use or 'do nothing' if risks are acceptably low. To mitigate the effects of natural threats, special foundations or construction materials may be used. Spatial methods of data handling, processing and analysis can accelerate and improve assessments of risks posed by natural and anthropogenic threats to health, buildings and environment.

B-4. Urban geology: construction, land-use planning, groundwater, environment and hazards

LAND USES - LAND PLANNING AT MILOS ISLAND (AEGEAN SEA, GREECE)

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The island of Milos is situated at Aegean Sea (Greece) and from the geotectonic point of view belongs to Aegean volcanic arc that develops in parallel to the subduction zone of the European and African lithospheric plates. It is characterised by complicated lithostratigraphic articulation and neotectonic deformation, the main features of which are:

- The presence of successive lava flows, various volcanic rocks and sedimentary formations of late Miocene - Holocene all resting on a metamorphic basement.
- The presence of neotectonic, volcanic and seismic activity that is continued during the Holocene.

Additionally, Milos island is characterised by a large number of preservable natural and historical monuments, areas of natural beauty, intensive mineral exploitation, agricultural exploitation, touristic development and rural ecosystems. These features, directly connected to the geoenvironment, are very often incompatible with human activities until nowadays have often resulted in exploitation and management with significant impact consequences.

In order to preserve the natural and historic inheritance and to secure the future development, an attempt of land planning as well as land use determination was made which was based on the estimation of all the data and their elaboration with a GIS system. The final proposal for materialisation comprises the determination and limitation of geographical zones, which are:

- Urban zones, which are mainly characterised by topographical stability, reduced seismic risk, reduced risk for manifestation of hazardous geodynamic phenomena and a low probability of volcanogenic consequences.
- Rural zones, which are mainly characterised by topographic stability, the presence of soil horizons, the absence of toxic geological horizons and the likely proximity to geothermal manifestations.
- Tourist zones that are characterised by the particularity of the sites, the presence of natural and historical monuments as well as shoreline formation.
- Mining - Industrial zones that are characterised by the presence of geological sites with mining or quarrying interest or the presence of high geothermal gradient.
- Natural - Sylvan zones that are characterised by the presence of particular fauna and flora species.

Except the determination of land use, point protection is suggested, as well as interventions with small areas independently of the zones in which they are located. Such areas are those which are intersected by active faults and are exposed to volcanic activity, as well as areas where unique geological phenomena occur and natural and historic monuments are present. The distinction of land use zones at Milos island and its subsequent official seal of approval, will lead to the rational land development that will result from the preservation of the main features which constitute the geoenvironment and the cultural heritage.

INDIAN URBAN WATER SUPPLY PLANNING - FOCUS AND PERSPECTIVE

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The history of urban water supply has been a constant cycle of shortages and subsequent development of resource. Because of the expense involved efforts to expand water system seldom manage to keep ahead of increasing demand for more than short periods. This type of marginal operation results in crises when unexpected events such as drought or ground water contamination occur. Because of the strain on existing systems and the problems posed by expanding demand, the outlook for potable water to urban areas may be regarded as *poorly optimistic*. The present water supply *problems* could hurt the growth and vitality of cities and towns that are the main catalysts of prosperity in the country. Water stress situations are developing at an alarming rate in the mega cities of India and the consequences of inaction are profound. These are manifested in terms of reduced water quantity, quality, low reliability of supply and high costs.

India has evolved from a deficit to surplus food producing country due to commendable development of its water resources despite the fact that nearly one third of the country is subjected to droughts and floods every year. However on the other hand it has been lagging behind in keeping pace with the development of drinking and industrial water supplies to the urban populace in specific. The rapid expansion of urban settlements clubbed with industrial liberalization has led to a phenomenal increase in the demand for water while the already developed fresh water is being continuously churned out of the system due to contamination. The epidemic of water scarcity is spreading to all the urban centers in India. Inequitable use of water in our cities is an uncared phenomena including the capital city of Delhi. The so called privileged sections enjoy the conspicuous and uninterrupted water supply comforts beyond the stipulated limits, whereas the plight of the average suffering citizen in the same city is tyrannized not only by the scarcity but also by the system of supply which is deliberately biased against his needs for a minimum supply of water.

Though many of the Indian cities and towns are endowed with sufficient quantity of potable water to meet the requisite demands but still panic prevails in summer months. Lack of reverence for the water is perhaps an unhappy characteristic of our age. Our cities and towns have become sites of dumping of all kinds without regard to the surrounding environment. The psychological behavior of today's individualistic society is to grab maximum in a shortest possible time. This has led to the total collapse of the concept of concern for the resources including the environment. The garbage dumps, the sewer spills, the water contamination plumes are all on war path to destroy out city inhabitation which is largely neglected by the caring. The pros and cons of our urban environmental and ethical aspects have been elucidated and possible solutions to combat resource pollution are suggested in this paper.