Processing of Spatial Information and Land Data for Compatible Development and Disaster Prevention

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SUMMARY

The international scientific community is aware that our planet will face the impacts of climate change and earthquakes, some already underway and others that may happen in the near future. These events will continue to occur most likely even if emissions that influence will be reduced significantly in the coming decades, through the implementation of mitigation policies on a global scale. In fact, according to the evidence presented in the most recent reports of risk assessment in the world in the coming decades, the European region, especially the Mediterranean region, and other continents will be faced with particularly negative impacts linked to climate change, which, combining the effects due to anthropogenic pressures on natural resources, make the areas of the planet a vulnerable and insidious habitat. The possible negative impacts in the coming decades are related primarily to an increase in average and maximum temperatures (especially in summer), an increase of frequency of extreme weather events (heat waves, droughts and episodes of intense rainfall and snowfall) and a reduction of the average annual precipitation and river flows, with resulting possible decline in agricultural productivity and loss of natural ecosystems. The scientific approach to the problems inherent in the process of shaping the natural land (slope instability and fluvial and torrential activity) should be based on some specific aspects that distinguish this kind of analysis from those inherent in the development and normal government of the territory, science of construction and civil and structural engineering. It is in fact studies that have as their object a "material" that the designer does not choose and for which the mechanical, geometrical and hydrogeological characteristics are difficult to define. An explicit expectation on the part of the society's request for absolute protection is added to the inherent difficulty related to the matter. This situation is determined by multiple aspects, including: the difficulty in accepting the occurrence of natural events. People, even those who live in high-risk areas, often consider extremely unlikely to be directly involved in a disaster. In common feeling and to ancient custom, it is believed that having lived a long time in a certain site is in itself a sufficient condition to make analysis of the phenomena and to propose remedies. In addition, the memory of past disasters is often incredibly short. The restrictions on the use of soil based on the hazards are generally unpopular among individuals and entrepreneurs who see them as an undue interference with their freedom of choice. The same subjects, however, after an occurred disaster, often tend to accuse the Government Authority for not having made adequate interventions. Adaptation measures already taken in the broader context of existing policies for the protection of the environment, for the prevention of natural disasters, for the sustainable management of natural resources and for the protection of health, are not sufficient to take preventive action, even with emergency decision, or to adequately address the consequences of the impacts of climate changes. A clear and coherent strategic approach is needed for the implementation of a plan of action to ensure that prevention and adaptation

measures are taken in a timely manner and are effective and consistent across sectors and levels of government involved. It is therefore considered useful for governments that have the task of deciding to be equipped with a geographic information system containing the necessary and useful information to prevent the consequences of disasters on health, on survival of the population and on the preservation of its assets. The Information System of "Limit Conditions of Emergency" affects the level of detection limit with respect to which the manifestation of the adverse event or exceptional practice should be considered likely and resulting in preventive decisions for the preservation and defense of: • the concentrated urban settlements; • the peripheral and isolated settlements; • the strategic and hazardous production plants waste; • the crops of high public interest. Are defined as "LIMIT CONDITIONS OF EMERGENCY" (CLE) those extreme conditions in which for the preservation of the habitat, in relation to the actual intensity with which the earthquake or flood occurs or can be predicted and of the probable consequences (physical and functional damage such as to lead to the interruption of almost all urban functions present, to involve risk for the public, for territory, for the urban settlement, etc..,) requires the adoption of decisions aimed at ensuring the strategic functions to overcome the emergency, the accessibility for safeguards and rescue activities and the connection of the site with the local context. This means that the predictions are derived from maps and information systems, often already available, that should be integrated by further data to be established as standards and to be made available to those responsible for the acceleration of decision procedures. Supplementary information to be included in GIS, for example, relate to the following information to be adapted according to the specific places: a) list of possible risks or problems recurring; a) The georeferencing of the areas exposed to specific risks; b) Information on potential harms and on the possibly population involved; c) The emergency plan; d) The identification of infrastructure, buildings and areas that provide the strategic b) functions for the emergency; e) The identification of the structures of accessibility and of connection to the local context c) and any critical items; f) The identification of structural aggregates and of individual structural units that can d) interfere with the infrastructure accessibility and connection to the local context.