Editorial introduction to the Geokarst hazards 2009 special issue

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Karst terranes are among the most unique geological features on Earth. They provide geological and archeological evidences of the evolution of life, host natural resources and form exotic landscapes upon which a large human population depends. These settings are also considered among the most vulnerable places in the world to natural and/or man-induced hazards. Preservation and sustainable utilization of natural resources and protection of local communities from risks within karst areas require a reliable understanding of karst from diverse perspectives. This is achieved through a multi-disciplinary approach, combining expertise from different fields of the geosciences and coordination with international experts in these fields.

In Vietnam, karst outcrops are located for the most part in the northern part of the country and are representative of up to 30 % of the northern landmass. Natural resources upon which a large portion of the nation's population relies are found in karst terranes and these sites are among the most important grounds for the existence of local communities. Most of the available groundwater resources of northern Vietnam are related to Paleozoic and Mesozoic karst hydro structures. Karstic regions in Vietnam are also vulnerable to geological catastrophes and natural hazards. In addition, the wellbeing of local communities in these areas is increasingly threatened by shortage of water and/or water pollution issues. Despite numerous research programs developed to study many aspects of karst geology, a thorough understanding of the nature of karst regions, their importance in local life and sustainability, and their vulnerability is lacking.

To better understand the geology, natural resources, and natural and anthropogenic hazards that form the basis for wise use and sustainable management of karst areas, an international symposium on “Geology, Natural Resources and Hazards in Karst Regions (GEOKARST 2009)” was held in Hanoi, Vietnam, on November 12–15, 2009. The symposium was endorsed by UNESCO and jointly organized by the Hanoi University of Mining and Geology and other Vietnamese research agencies, the International Research Center on Karst (China), the University of Natural Resources and Applied Life Sciences (Austria), and the University of La Sapienza (Italy). Eight countries were represented by 26 participants from universities and research institutes around the world. They were joined by more than 60 Vietnamese participants and 200 students from universities, research institutes and geoscience societies in Vietnam and overseas. Many officials and experts from central and local government offices of Vietnam also attended. The symposium also welcomed the participation of Dr. Giuseppe Arduino of UNESCO Regional Science Bureau for Asia and Pacific Office Jakarta and Dr. James LaMoreaux, Editor-in-Chief of Environmental Earth Sciences Journal.

Twenty-three oral and 14 poster presentations were presented in four technical sessions of the GEOKARST 2009. Many critical issues of karst regions were addressed including regional geology, natural resources; vulnerability, quantitative and modern approaches to the understanding of karst systems, and creative strategies and approaches to sustainable preservation and development in karst regions. The symposium was supplemented by a two-day field excursion to explore the unique geological diversity of the UNESCO Natural and Geological Heritage and Conservation Area, Ha Long Bay–Cat Ba Island karst area.

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The successful GEOKARST 2009 Symposium was made possible by the efforts of Professor Paolo Bono and Dr. James LaMoreaux and many others. Dr. Bono and Dr. LaMoreaux not only contributed to the success of the symposium but also realized the importance of introducing the results to the international scientific community through an international accredited scientific journal. The articles in this special issue of Environmental Earth Sciences are therefore the fruitful outcome of, and based on presentations at, the symposium. They have been expanded to include suggestions from discussion and modified to further develop the topic. The papers presented in this

issue offer a general overview of the karst areas of the world with emphasis on Vietnam. This should stimulate further investigation of different aspects of karst systems to better understand their intricacies and their value as well as their vulnerability. It will help form the basis for sustainable conservation and wise utilization of karstic regions.

The guest editors would like to thank the contributing authors who have manifested their interest in this volume. Many thanks also to the referees for their critical appraisal of earlier versions of the research papers, which allowed significant improvements to the quality of the articles.