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NATURAL DISASTER REDUCTION AND ENVIRONMENTAL MANAGEMENT: A GEOMORPHOLOGIST'S VIEW

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Natural hazards, threatening many parts of the world, are often ignored in the context of regional planning and environmental management, although this is necessary for avoiding, or at least substantially reducing the recurrence interval and magnitude of the related «natural» disasters. This is particularly the case for «creeping» disasters, related to environmental degradation caused by slow and in many cases almost imperceptible processes, including desertification, salinization, certain forms of soil erosion, pollution, etc. The more spectacular instantaneous disasters, resulting from high-intensity and low-frequency natural events of endogenous or exogenous origin, are nowadays reported about by the media world-wide. They are, however, soon out of focus again and adequate measures to prevent similar disasters in the future do not always remain a high priority of the responsible authorities.

Disaster reduction through environmental management is a complex issue that requires interdisciplinary applied research related to the natural environment as well as to the socio-economic situation of the endangered societies. In fact, sustainability is at stake. For the implementation of adequate protection measures, ranging from «hard» engineering structures to «soft» management improvements, optimal cooperation between the various sectors of the communities concerned is essential. This multi-sectoral approach should lead up to a master-plan for long term regional management and a disaster scenario specifying tasks and responsibilities of organizations and individuals in case of an emergency situation. Apart from natural disasters, technical-industrial disasters and also the, often neglected, ecological disasters should be considered. Humanitarian disasters are, unfortunately, largely outside the field of science. The UN-IDNDR (International Decade for Natural Disaster Reduction) program of the 1990s concentrated on natural disasters only. Its follow-up, the UN-ISDR (International Strategy for Disaster Reduction), has a broader scope because technological / industrial disasters are also included.

Examples are given of volcanic disasters in Indonesia, including gas emanations on the Dieng plateau and pyroclastic flows on the densely populated SW slopes of the Merapi volcano in Central Java. Further, the effects of the ill-famed eruption of the Nevado de Ruiz volcano, Colombia in 1985 are discussed in relation to shortcomings in disaster mitigation systems. Drought and desertification studies executed in northern Chad and in Botswana are discussed thereafter as an introduction to the problems of assessing and achieving global sustainability problems.

KEY WORDS: Natural hazards, Disaster reduction, Geomorphology, Sustainability.

INTRODUCTION

Natural disasters are of common occurrence in many parts of the world. Particularly the instantaneous disasters resulting from extreme natural events (Nott, 2006) such as floods, landslides, volcanic eruptions, earthquakes and tsunami, are frequently reported about in the media. Creeping disasters, the other main category of natural disasters have become a focus of attention only in recent years and will be dealt with separately. Some types of instantaneous disasters (volcanic eruptions, earthquakes, tsunami, etc.) are of endogenous origin and society then plays the part of victim only. The causes of disasters of exogenous origin (river floods, cyclones, landslides, etc.) are natural in the first place, but human impact on the environment by way of inadequate agricultural practices, engineering works, etc., often is a triggering or aggravating factor. The «natural» disaster in such cases is not fully natural and society is not only a victim but a causative factor as well (McCall & alii, 1992). Hazard zoning and early warnings are the two basic elements of disaster mitigation programmes in endangered areas. Extreme natural events are a fascinating subject of study for earth scientists. They are considered to be disastrous only if they adversely affect society. Creeping processes of land degradation usually concern large areas but frequently remain unnoticed for a long time. Their visual effects often become spectacular only in a late stage when it may be difficult to take the proper remedial measures.

MITIGATING INSTANTANEOUS DISASTERS

Hazard zoning, rooted mostly in geomorphological research, is an important means of reducing the losses of human life and property in case of extreme events because it leads to specifying endangered areas in case of events of specific magnitudes. However, it is only effective if it has been legalized by the responsible authorities and if the en-

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