



Risk assessment of extreme precipitation in the coastal areas of Chennai as an element of catastrophe prevention

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In the south Indian megacity Chennai, disastrous tropical monsoon linked with excessive precipitation frequently leads to wide-flat floods in the coastal plains. The situation is characterized by complex interrelations of anthropogenic and ecological factors that were analysed through an interdisciplinary risk and vulnerability assessment by an international team of scientists. Thereby, the combination of participatory mapping, a web-based mapping system and the analysis of remote sensing data proved to be an effective technique for risk evaluation. The study was commissioned by the GTZ - Advisory Project "Disaster Risk Management in Development Cooperation" and funded by the BMZ.

The analysis of the meteorological data clearly shows that the reason for the increase of floods is not based on a long or medium-term trend reflecting increasing precipitation amounts at the eastern coast of India. However, the combination of the precipitation data with the extends of the main water body emphasizes that the flood risk in the south of Chennai is increasingly due to man-made changes. Without a sustainable planning strategy especially facing the natural run-off due to single strong rainfall events, Chennai will suffer from devastating floods in the future.

The socio-economic analysis of risk perceptions and management strategies underline the interrelated reasons for floods, which are embedded in a broader context of economic globalisation, labour migration and rapid urbanisation. The demand for developing areas leads to the ecological destruction of the marshland close to Chennai. Planning authorities do not react accordingly. Illegal as well as legal garbage dumping is an increasing hazard. Existing infrastructure is not properly maintained. Canals are dysfunctional; storm water drainages are not cleaned regularly; water bodies are not maintained. Uncontrolled construction of IT-companies and private citizens, both legal as well as illegal, are in complete ignorance and violation of the norms and rules of the government. The combination of these factors results in a collapse of natural drainage systems.

The results of this study were merged into an information portal that is publicly accessible and can be expanded by the project partners in Chennai. This geoportal consists of two parts. The first part is the mentioned mapbender-WebGIS-application. A password protected webpage which provides selected tools to the user, depending on authorisation and demand of the user. In our project it we provided a GUI to digitize flooded areas of floodings of the last years. A high resolution satellite image made it possible to digitize known flooded neighbourhoods by means of the georeferenced satellite image. The digitised data was saved via internet at the geodatabase in Freiburg. The second part is an information portal combining different flash-based webanimation techniques to give one an understanding of the processes and results of the project. This part also includes video and audio sequences of key informant and group interviews as well as an interactive mapping tool to access the multiple information of the metal maps in combination with the various geographical data.

As a next step, this instrument was presented in a policy workshop in Chennai to planners, administrative managers and resident welfare organisations as a medium to help further planning and decision-making.