Chapter 13
River Basin Management with a Special Focus on Management of Flood Events

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ABSTRACT

“River basin management with a special focus on management of flood events” deals with the forecast, management and mitigation of flood disasters that have a severe impact on riparian communities and national economies. In recent years it has been increasingly recognized that managing flood risks rather than full flood protection is the way forward for coping with these extreme events. The chapter describes management approaches resulting from the “RIMAX – Risk Management of Extreme Flood Events” research program carried out in Germany for which results were adapted for their adaptation in developing countries. Areas that are covered in the chapter include: (1) Analysis, forecasting and warning; (2) Information management and communication; and (3) Protection and control strategies. The work does not provide packaged solutions but describes results and problems and highlights aspects of importance that would need to be considered for successful implementation in a variety of conditions. It therefore provides a guideline for researchers and practitioners to utilize the generated information under a variety of conditions.

INTRODUCTION

Flood events are the world’s most dangerous natural disasters. They cause immense damage and account for a large number of casualties world wide. Extreme flood events are a natural hazard that, with climate change, become more and more significant regarding the involved risks and associated level of damage. In recent years it has been increasingly recognized that managing flood risks rather than full flood protection is the
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way forward to coping with these extreme events, as forecasts still include some level of uncertainty, technical and financial limit apply to protection assets and the social acceptance of measures has to be considered. So while much progress has been made with regards to flood forecasting, calculation of flood mitigation and flood protection assets as well as operation strategies, it has been recognized that extreme events can not be harnessed but that they need to be dealt with and managed.

Developing as much as developed countries are affected by flood events. This chapter describes management approaches resulting from the “RIMAX – Risk Management of Extreme Flood Events” research program.

The national research programme “RIMAX: Risk Management of Extreme Flood Events”, funded by the German Federal Ministry of Education and Research (BMBF) was initiated as a consequence of several flood events through the last couple of years and their effects on people and environment. Between 2005 and 2010 more than 30 projects are being supported with 24 million Euros. The results of the programme are now being offered to the interested public and practitioner, the German IHP/HWRP Secretariat is a partner of the RIMAX coordination office at the German Research Centre for Geosciences (GFZ) in Potsdam in this regard. The presented methodologies and findings are based on work of the project teams that are referred to in RIMAX (2007) and by Petersen (2009). Further information can be found on the webpage www.rimax-hochwasser.de.

The aim of RIMAX is developing strategies and instruments for flood prediction as well as for the improvement of flood protection and management solutions during extreme events both on local as well as basin wide scales integrating a variety of disciplines. A significant feature of the research results is the close interaction and applicability between research and practice. Through the variety of projects, RIMAX describes a holistic picture, covering the following main areas, also displayed in Figure 1.

Analysis, forecasting and warning:

- Operational flood management
- Forecasting and early warning
- Analysis of historical floods
- Trans-disciplinary analysis of extreme flood events and their consequences
- Risk-based approaches to flood mitigation

Figure 1. Main Areas of the RIMAX research programme (Merz & Bittner, 2008)
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