

PROJECT

CHEF - CULTURAL HERITAGE PROTECTION AGAINST FLOODING

URL: <http://www.chef.bam.de>

DURATION

2007 - 2009

PROJECT TYPE

Capability Project
Cultural Heritage Protection against Floods (contract number: 044251)
6th Framework Programme of the EU.

SCOPE

The European Community has suffered from disastrous floods in recent years, which caused enormous damage and left hundreds of people dead in several European countries. The flooding occurred across regional borders and involved neighbouring states along the rivers Elbe (2002), Odra (1997), Rhine (1993 and 1995) and many more. The economic losses were extremely high and affected not only local regions but also the whole European Community. Europe has to face further flood catastrophes due to the change of climate and due to further building activities in flood-prone regions.

As one prerequisite to minimize costs for rehabilitation, there is an urgent need for protecting the common European moveable and immovable cultural heritage against flood and other environmental hazards and the threatening conditions resulting from this. These services should include monitoring and supervising of drying and repairs as well as a comprehensive damage assessment.

RESULTS

CHEF provides knowledge about flood protection of cultural heritage objects and directly supports the European Floods Directive by giving recommendations on how to assess the vulnerability of monuments. A comprehensive analysis of protective measures BEFORE, DURING and AFTER a flood has been carried out within the project, including technical and administrative measures. An overview of these measures is given, followed by recommendations on how to establish the most effective protective strategies.

The book “CHEF Cultural Heritage Protection against Flood” summarises the available knowledge and shows in a comprehensive series of case studies, which kind of protective measures have been taken during recent flood events and if they were successful or not. It shows very clearly how different the flood situations were and how careful protective measures have to be chosen. Furthermore it will become clear that flood protection is not at all restricted to the use of technical means during a flood. The most effective flood protection happens before the event and the key to successful flood management is awareness and preparedness.

The book shows how to identify and analyse flood risks. In order to avoid or mitigate flood damage to cultural heritage objects, many factors have to be considered, including the historic significance and context of the object, its building structure, its location in a risk area, and its vulnerability to floods. The risk can only be assessed if the flood characteristics of the different types of floods are known. It helps to analyse and classify damage to historic materials, structures, buildings and sites. It is necessary to describe typical damages in an attempt to evaluate the severity of the observed damage and to select the most suitable and effective restoration methods. One chapter of the book includes an analysis of the damage processes in different materials, structures and sites (static and dynamic loading, mechanisms of moisture and salt transport, effects of contamination, erosion, etc.).

A large number of case studies for cultural heritage objects including buildings, cities and landscapes is included in the book. Various representative cultural heritage objects have been investigated in various ways. The aim of the investigations was to find out, what happened during the flood, which damage or loss occurred, which countermeasures have been successful, and what can be learned from the experience that has been gained. A lack of documentation, unspecified structural condition and assembly, unknown material characteristics and unknown flood parameters often lower the effectiveness of the case study. The analyses of the different cases have shown what kind of information should be available in order to set up appropriate emergency management.

Many recommendations on flood protection have been derived from the analysis of the case studies.

Together with the scientific results achieved in the project the authors have compiled a large amount of information and provide an overview about preventive measures before, during and after flood.

CO-ORDINATOR

Bundesanstalt für Materialforschung und -prüfung (BAM)
Contact: Dr. Thomas Kind, Dept. 8 Non-destructive Testing
Email: thomas.kind@bam.de

PARTNERS

- Bundesanstalt für Materialforschung und -prüfung (BAM)
Berlin, Germany
- Institute of Theoretical and Applied Mechanics (ITAM)
Prague, Czech Republic
- Institut für Diagnostik und Konservierung an Denkmälern in Sachsen und Sachsen-Anhalt e.V. (IDK)
Dresden, Germany
- CRUIE - Centro di Ricerca in Urbanistica e Ingegneria Ecologica
University of Genova, Italy
- Slovenian National Building & Civil Engineering Institute
Ljubljana, Slovenia
- Institute of Infrastructure
Unit of Geotechnical and Tunnel Engineering
University of Innsbruck, Austria

- Institut für Bauklimatik
Technische Universität Dresden, Germany
- Institut für Geotechnik
Technische Universität Dresden, Germany
- UNESCO Chair ECOLAND
Training Center on Sustainable Development
University of Bucharest, Romania
- Department of Structural Engineering (DIS)
Politecnico di Milano, Italy
- Industrial Microbiological Services Ltd.
United Kingdom

PUBLICATION

CHEF - Cultural Heritage Protection Against Flooding

Miloš Drdáčký, Luigia Binda, Insa Christiane Hennen, Christian Köpp, Luca G. Lanza and Rosemarie Helmerich
Published by the Institute of Theoretical and Applied Mechanics AS CR, v. v. i. Prague 2011,
ISBN: 978-80-86246-37-6
Language: Englisch

This book was published with support from the Capability Project
Cultural Heritage Protection against Floods (contract number: 044251) within the 6th Framework
Programme of the EU.