Geophysical Research Abstracts
Vol. 12, EGU2010-14634, 2010
EGU General Assembly 2010

Performance and capacity of river dykes of protection against the floods", through elaboration of performance indicators and decision aid tool in view of the patrimonial assessment of river dykes

marc vuillet (1), laurent peyras (1), damien serre (2), and youssef diab (3)

(1) Cemagref, Unité Ouvrages Hydrauliques, Aix en Provence, France, (2) Université Paris-Est, Ecole des Ingénieurs de la Ville de Paris, EIVP, Construction - Environment, Paris, France (damien.serre@eivp-paris.fr, 0033156026125), (3) Université Paris-Est, LEESU, Marne la Vallée, Farnce

France and more generally the World have to face frequent episodes of devastating floods. The human and material damages are multiplied during the failure of a protection structure. In France the length of dykes is estimated to 7500 kilometers, protecting around 15 000 to
18 000 km^2 and an estimated population between 1.6 to 2 millions.
Regrettably, these structures are most of the time old, unidentified, badly maintained, showing signs of weaknesses on numerous occasions.
The management of these dikes raises then considerable problems to the decision-makers who are in charge of guaranteeing a maximal safety to the populations at a rational and acceptable management cost.

The ambition of the project "Performance and capacity in the service of river dykes of protection against the floods" is to propose to Administrator scientific methods and technical tools for the management of river dykes. These tools will be capable of estimating the capacity in the service of dykes, and to define and organize into a hierarchy the actions of inspection, maintenance and repair.

Scientific objectives:
• To suggest a methodology of evaluation of the performance of river dykes
• To identify and to understand the causes of variability (spatial and temporal)
• To analyze the relation between the quality of the data and the quality of the profile of performance
• To propose a methodology of auscultation and confortation of the information

The research work consists in adapting functional analysis based on safety engineering method, in order to precise the role of each rivers dyke's component in regard to the mechanisms of degradation they suffer.
It will allow us to identify failure indicators and decision criteria for evaluating the performance of dykes.

The criteria will be the basis to develop a multicriteria decision aid tool allowing to determine the hierarchical organization and the selection of the sections of a park of dykes of protection against the floods, according to their performances and to their capacities to the service.

Then we will continue the research work to determine the best scales for analyzing spatial and temporal variability of the phenomenon, as well as to test and to improve the quality of the performance indicators.

Finally, we shall synthetize and shall integrate the results into a GIS tool for the dykes asset management.