



Section Sciences et Ingénierie de l'environnement Design Project 2010 (semestre de printemps)

Proposition n° 3

Étude de risque des changements climatiques sur la production hydroélectrique d'une retenue alpine

Encadrant externe

Christopher Bunting ou Marie-Valentine Florin
christopher.bunting@irgc.org marie.florin@irgc.org
International Risk Governance Council
Chemin de Balexert 9
1219 Genève-Châtelaine
www.irgc.org

022 795 17 30

Encadrant EPFL

Prof. Andrea Rinaldo
Andrea.rinaldo@epfl.ch
ECHO - IIE
GR C1 575 (Bâtiment GR)
Station 2
1015 Lausanne
<http://echo.epfl.ch/>

021 693 80 34 – 37 25

Introduction

- IRGC, Marie Valentine Florin et Prof. A. Rinaldo ce sont rencontrés afin de définir l'objectif du Design Project, son cadre d'étude.
- IRGC propose ensuite de « briefer » l'étudiant sur l'approche IRGC de gouvernance des risques, pour que celui-ci puisse l'appliquer à un domaine d'application précis (par exemple, la gestion de l'eau dans un bassin de rivière). En particulier, les outils qu'IRGC mettra à disposition de l'étudiant sont :
 - Introduction au IRGC Risk Governance Framework
 - Rapport sur : Risk Governance Deficits.
- En fonction du sujet, IRGC s'efforcera d'établir une coopération avec un membre du conseil scientifique ou un de ses collaborateurs (<http://www.irgc.org/Scientific-Technical-Members.html>)
- A la fin du projet, IRGC souhaiterait recevoir une note d'une vingtaine de pages, rédigée pour répondre aux questions suivantes : 1) liste des risques et opportunités ; 2) état de la gouvernance de ceux-ci ; 3) problèmes actuels, 4) pistes d'amélioration.

Descriptif du projet

The International Risk Governance Council (IRGC) focuses on risk governance of systemic risks. In 2010, it is interested in cooperating with EPFL students in two specific fields related to climate change: energy and the environment. In both case, it is mainly the assessment and management of the risk, understood in a comprehensive manner ("risk governance") that matters to IRGC, rather than the risk itself. When focus is on the risk, then possible benefits should be part of the research as well.

For more information on IRGC and its work: www.irgc.org

Environment and ecosystems

Climate change impacts on the environment, both positively and negatively. The entire balance of the Earth system may change in the future and governing the risks and opportunities arising from this is a major challenge for policymakers. Among the list of topics of concern and which require improved risk governance are:

• Loss of ecosystem services/environmental degradation

Biodiversity is declining and the functioning of ecosystems is under threat in many regions. Experts are seeking ways to slow this process, but ecosystem managers have a hard task convincing industry, policymakers and regulators as well as individuals to change the way they and economic activity impacts negatively on ecosystem services and the environment. Risk governance is often challenged to provide instruments and guidelines to deal with degradation of public goods. Instruments such as *payment for ecosystem services* or *adaptive governance* are mentioned as possible examples for good governance, but need improved guidelines for their implementation.

An interesting topic is how managers of protected areas prepare to adapt to climate change.

Protected areas, such as national parks (including both land-based and marine), are constituted to protect biodiversity, with a view to enhancing nature conservation. Parks must also assess their abilities to *preserve* or *conserve* their environment. As the climate changes, national parks are becoming laboratories for monitoring biodiversity changes and for finding solutions to problems caused to ecosystems by climate change. Globally, the governance of national parks and protected areas is therefore a topic of interest for scientists, governments, industry and the public. Having identified ecosystem services and their values to society, the challenge now is to establish appropriate governance structures for such public goods. It may be most practical to begin with ecosystem services provided by protected areas, which already have a legal basis through their establishment in legislation. Using protected areas to build governance concepts that can be applied to ecosystem services could provide the basis for expanding such governance approaches more broadly, providing significant social and economic benefits.

• River basin management

River basins are an important element in the hydrological cycle; their ecological balance and their economy may be affected by climate change. It is a place where water flows in and out and where various diverse industrial, transport and amenity users interact. Tensions between stakeholders may result in inadequate water management. It is also a place where many important inter-related issues are often inadequately assessed and managed. Expressed in the form of trade-offs, here are some of them ⁽¹⁾:

- Economic vs. environmental needs and constraints
- Long-term vs. short-term preoccupation
- Land used for agriculture vs. industry vs. habitat vs. nature conservation
- National vs. transboundary management

Furthermore, river basin managers often consider applying concepts and methodologies of « adaptive governance », an interesting approach to managing complex risks where the level of uncertainty is high (as in the case of some new technologies). Work on a subject such as river basin management could provide learning that could benefit other areas of IRGC's work.

¹ For example, on the Dutch-Belgian case for deepening and widening the river Scheldt estuary in the NL to give larger cargo ships easier access to Antwerp in Belgium : http://www.nrc.nl/international/article2313462.ece/Dutch_authority_rules_against_deepening_of_Scheldt