

Theme 2 : Governance and Funding

Catherine Casteigts – Juha Laasonen

Presenters

Tetsuya Sumi, Kyoto University, Japan

Mokhtar Bzioui, president of IME, Morocco

Ronny Rosilette, Collectivité de Martinique

Pascal Dumoulin, SMAVD and Catherine Le Normant, EDF

David Lemarquis, EDF

...



Several topics are covered by this theme :

- The institutional aspects,
- The stakeholder commitments and inter-relationships, and the participatory approaches
- The special cases of cross-border assets

The climate change is of course a very important topic, which is discussed in several papers : how can we manage the reservoirs during flood events, which become more severe, how can we adapt the reservoirs to increasing and changing water uses.

13 papers have been submitted, and 5 will be presented today.

These papers were proposed by 7 countries : China, France, Iran, Japan, Morocco, Switzerland, USA.



Several papers are related to the **management and control of reservoir during flood season**. You will have an example today, with the presentation of Mister Tetsuya Sumi, Professor in Research Institute at the Kyoto University, Japan.

1- Tetsuya Sumi (Japan)

- Flood control operations during the flood caused by heavy rainfall and Typhoon No 7 in 2018 are described in the presentation.
- 213 dams were affected in the flood and emergency spillway operations were carried out at eight (8) dams.
- Improvement proposals of the Panel are also presented.

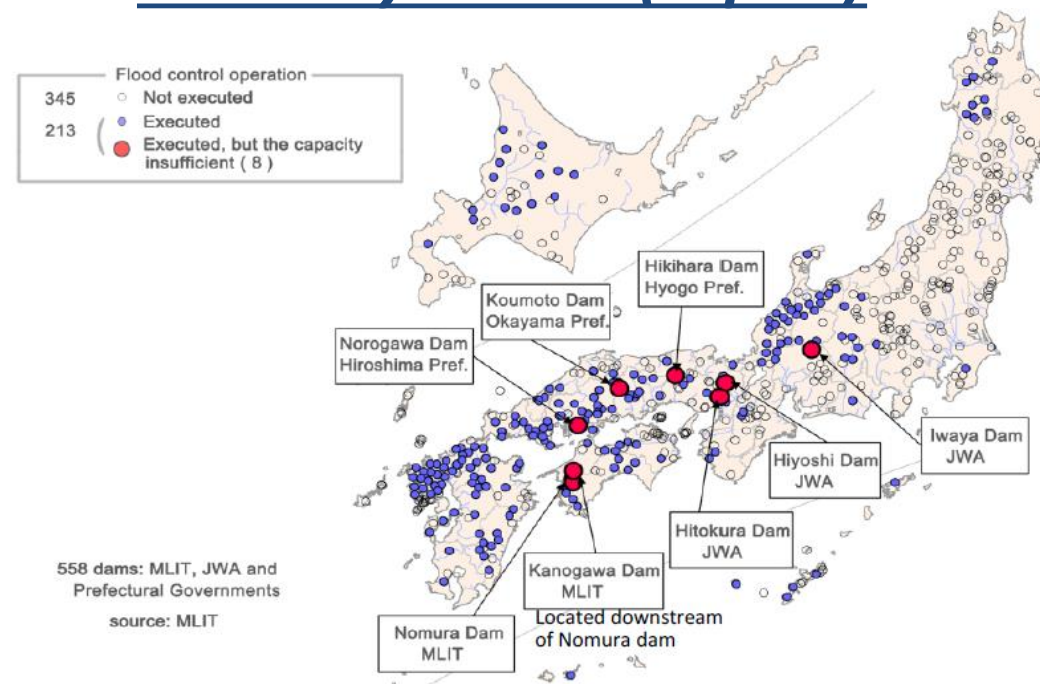


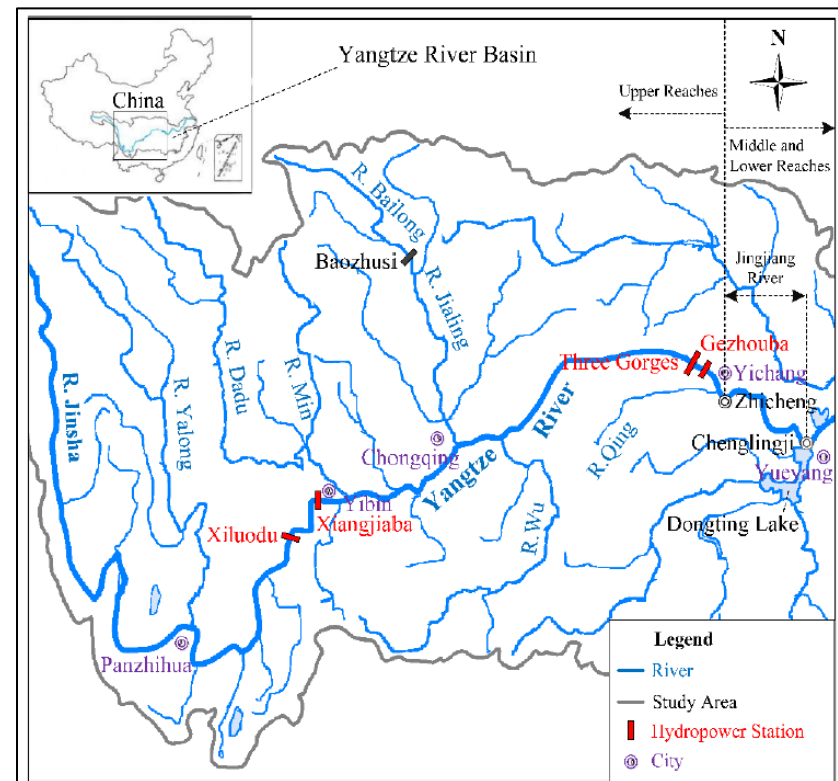
Fig. 2. Situation of flood control of dams in Japan in the July 2018 flood event.



Another example of flood management is the solution proposed in a Chinese paper, which presents a solution for **operating and optimizing a cascade reservoir system during flood season**, including a dynamic control of the reservoir levels and discharges.

This solution has been successfully applied between 2016 and 2019, on the multi-function multi-reservoir system of Jinsha and Yangze Rivers, operated and managed by the China Three Gorges Corporation (CTG), and many benefits (on power generation, water supply, navigation conditions) have been observed.

Song Zhang (China)



Roohollah Amini (Iran)

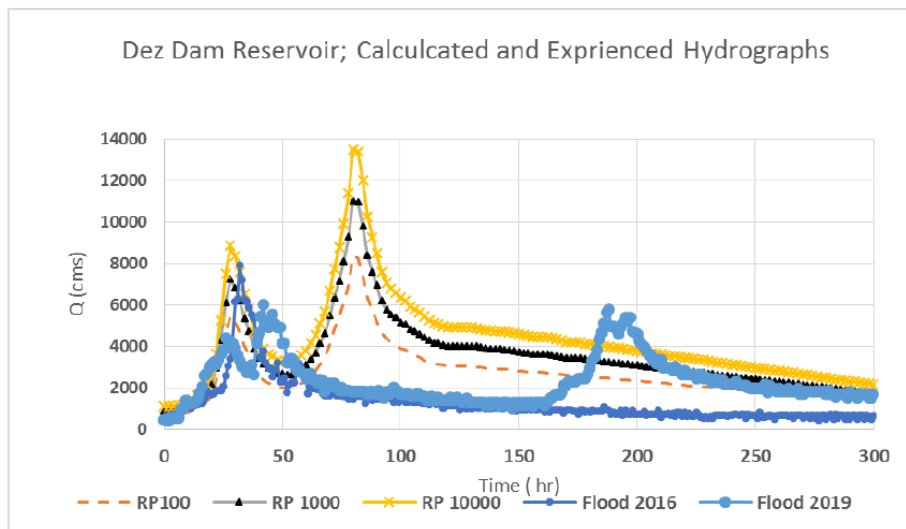


Fig. 4. Dez Dam Hydrographs (Calculated and Experienced).

The paper of Melliger et al presents a method to improve the risk management and the reservoir operation during the extreme floods on **Lake Sakakawea** in North Dakota, USA.

Iranian paper describes the effect of the Dez dam rehabilitation on **flood damage reduction** : a flexible multi-stage routing method, including operator judgment, is proposed to optimize the flood routing policy.

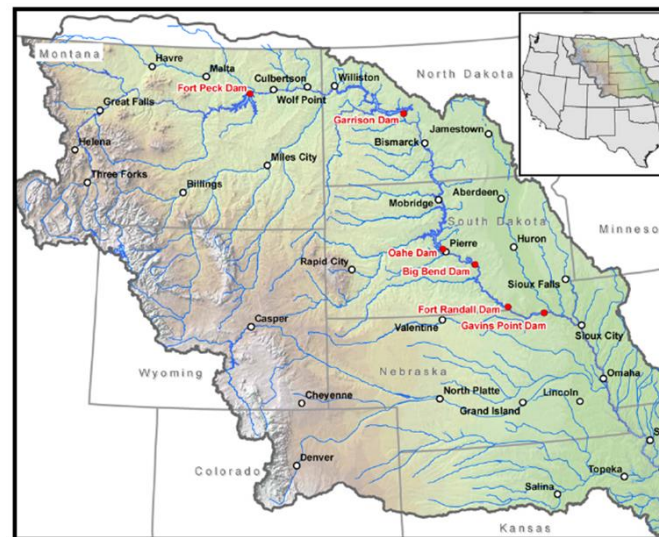


Fig. 1. Mainstem Missouri River dams (red) and Missouri River watershed (shaded relief).

J. Melliger (USA)

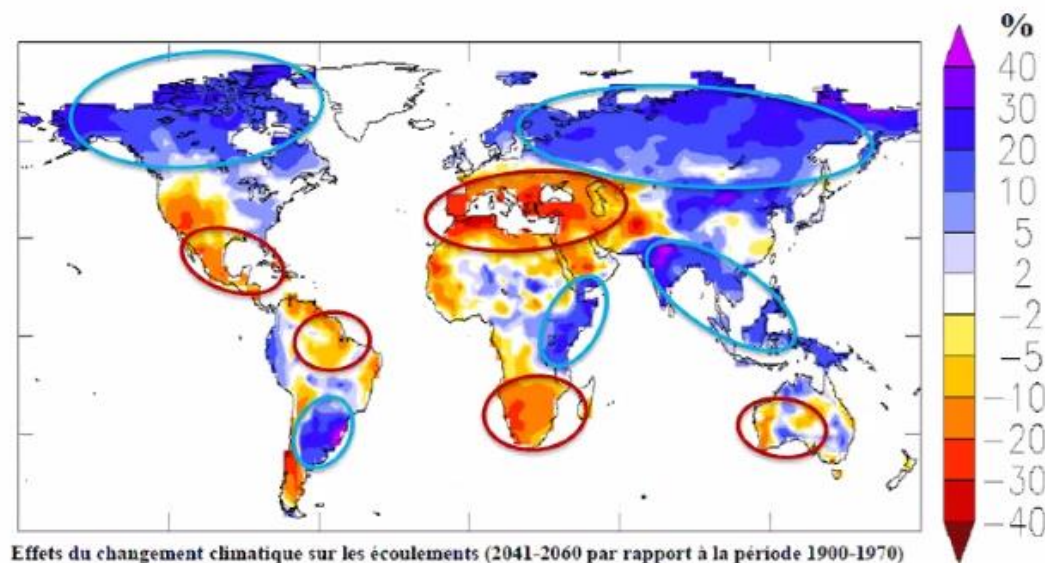


Three papers, which will be presented today, are related to prediction and adaptation to climate change.

Mr. Mokhtar Bzioui, President of the IME (Mediterranean Water Institute) will present us the **multi-use of dams in mediterranean area**, in connection with climate change.

- The climate change will increase drought and water shortage in Mediterranean.
- The role of the dams and reservoirs for the adaption of the climate change is discussed in the presentation.
- One of the recommendations is to take into account social and environmental aspects in the economic evaluations of the investments.

2- Mokhtar Bzioui, Morocco



Source: Global warming and water availability, P.C.D., Milly, United States geological survey (USGS).



3- Ronny Rosilette (France)

The second paper, presented by Ronny Rosilette, from the Collectivité Territoriale de la Martinique, concerns the studies performed in **Martinique**, to predict the effects of the climate change on the river flows and natural hazards (such storms or droughts), and the analysis of **resilience and adaptability of the Manzo dam**.

It shows the importance of a global reflection and of the collaboration between dam users and dam owners, in order to optimize the use of water in the future.



4- Pascal Dumoulin and Catherine Le Normant (France)



Barrage de Serre-Ponçon ©EDF/B. Bodin

Finally, Pascal Dumoulin, from SMAVD, and Catherine Le Normant, from EDF, will present the studies carried out on the **Durance's watershed**, in order to find solutions for sustainable adaptation to global changes, as climate or territory evolution.

In particular, we will discover the project R2D2-2050 and the decision-making tool, C3PO, an innovative project which brings together stakeholders and scientists, leading to an exemplary partnership.



Christophe Brachet (France)

LE BASSIN DU NIGER
THE NIGER RIVER BASIN

Occupation des sols / Global Land Cover

- Sol nu / Bare soil
- Savane ouverte / Open grassland
- Savane dense / Closed shrubland
- Forêt / Forest

Aménagements majeurs du bassin / Major basin developments

- Barrage existant / Existing structure
- Barrage en projet / Planned structure

The map displays the Niger River Basin across several West African countries: Mali, Niger, Burkina Faso, Nigeria, Chad, Mauritania, Algeria, Sierra Leone, Liberia, Côte d'Ivoire, Ghana, Togo, Benin, Cameroon, and Senegal. Key cities and locations marked include TAOUSSA, KANDADJI, NAMÉY, Goronye, Bakaleri, Kainji, ZUNGERU, Shirozo, Jada, Makurdi, Dadin Kowa, Kiri, Gao, and Agadez. The river's course is shown in blue, with numerous dams indicated by yellow dots (existing) and red dots (planned). A scale bar at the bottom indicates distances from 0 to 680 Kilometers. An inset map shows the basin's location within Africa.

The Niger Basin Authority (NBA), created in 1980, is in charge of the coherence of the basin management and developement, in particular the coordinated management of the existing large dams, located in Mali, Niger, Nigeria and Cameroun, and of the current projects in Guinea and Mali.



Several papers illustrate participatory approaches, and stakeholders participation and involvement for environmental, ecological and biological acceptance of the dam projects.

The last presentation today, by David Lemarquis from EDF Hydro, will illustrate an efficient and sustainable collaboration between various partners, around the Roselend dam.

The dam is built in a remarkably rich area, with many different uses, such as hydropower, tourism and pastoralism.

We will see how the Roselend Project federates the different partners and leads to sustainable projects.



5- David Lemarquis (France)



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Conclusion

As we have seen in the different presentations, many studies are carried out to predict the climate changes and their impacts.

These changes will necessitate many adaptations and dams can significantly contribute to improve the management of more severe floods or to optimize the use of water in the future.

The discharge operations in the watercourse during the extreme flood is a very complex situation. Maintain of the dam safety is primary interest, but the flood discharge may cause inundations and hazard for the residents downstream. In addition are the dams downstream able to withstand the flood discharge ? Overall consequences shall be minimized.

Some measures are proposed to increase flood mitigation and upgrade dams. The dam operations with uncertain rainfall prediction have also to be discussed.



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Conclusion

As the needs are various and sometimes opposite, these adaptations imply a necessary partnership between the different stakeholders (owners, operators, users, local collectivities, governments...) and a participatory approach. Moreover, many aspects have to be integrated in the reflection : technical, economic, environmental, social..

Though it is a long and difficult process, including dialogue, negotiation, cooperation, a sustainable partnership is the key for a successful sharing of water, especially in the future.

