

Theme 3: Innovative solutions in reservoir uses

Chair: **Aries FIRMAN** (Indonesia) and **Laurence DUCHESNE** (France)

Morning session: 10.45-12.10

Afternoon session : 14.00 – 15.45

CONCLUSIONS



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- The challenges of forever:
 - **Dam safety:** need for technical international cooperation (CIGB and others): example of Brazil: improving the Regulatory Agenda in the Mining Sector after the rupture of the Brumadinho tailings dam
 - **Hydraulic safety :** example of coordinated sediment management between France and Switzerland
 - **Food and water safety :** example of Ethiopia



- Various innovative solutions have been addressed by our speakers of today and they covered most of the challenges we encounter
- Safety shall remain as our highest priority as dam professionals to secure the project stakeholders, our investments in dams as well as for our planet in sustainable manner.



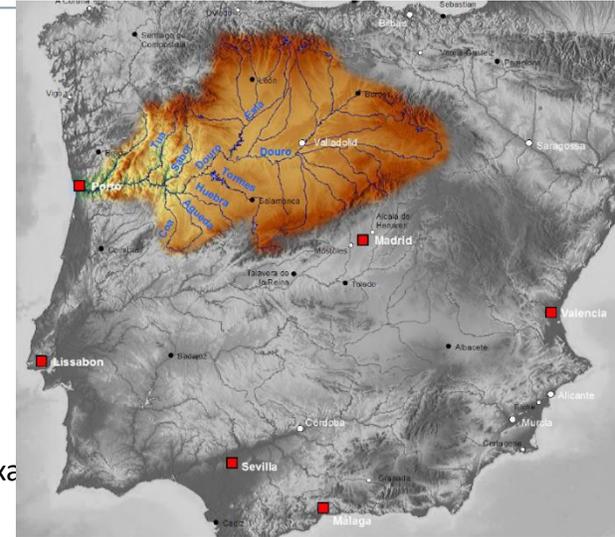
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- The challenges of tomorrow: Climat Change & increase of needs

« Water is vital for the continuity of life on earth (Ozge Turk) »; « the need for water, renewable electricity and protection against floods and droughts is considerable » (Luc Deroo) .

How the innovative solutions could be beneficial for all of us as dam professionals ?

- **transnational** agreements and conflicts on the resource:
example of Portugal / Spain, the Volta Basin (Clement Balique), and a global proposition (Ozge Turk)
- **International** and national cooperation with **new actors**: lawyers, politicians, public participation (bottom up) : exa (Senegal), MRC (Mekong), French approach(Alice Devot), Tool for dialogue (Benoit Dessaint)
- **New management of dams and uses** :
 - New options given by ICOLD committee “Emerging Utilization of Reservoirs” (Luc Deroo)
 - sediment management (Takahiro Koshiba)
 - new approach to assess the climate change of hydro projects (Pierre Yves Bourgin)
 - hydrologic model to modelise the impact of the climat change (Niger basin Nathalie Tomczak), (Loukkos basin Ikram Benbani)
 - Adaptative maintenance and surveillance (Pavel Zvanut)
- **New technologies**: fish monitoring by DNA, floating PV (Aries Friman, Samuel Renaud) and improvement of tools



- The solutions for our challenges in the future should be based on collaborative effort
- Dam professionals in ICOLD must rapidly be ready to set the innovative solutions come into reality to respond to the increase of needs for our reservoirs



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- **Freshwater on the planet**

Groundwater and surface water (rivers and lakes) represent **less than 1%** of the Earth's surface. They are however essential because they are **easily available for human needs**.

- **A constantly increasing demand for water**

The world's population is constantly increasing, mostly located in cities. Water resources are becoming **a precious common good** because they are becoming scarcer and subject to multiple pressures.

- **The impacts of climate change on water resources**

Rising temperatures will lead to many consequences, such as melting ice, more extreme weather events and greater water stress.

- **Threatened deltas**

Deltas **represent only 1%** of the Earth's surface, but they are home to 7% of the world's population.

- **Disappearance of wetlands, loss of biodiversity**

Between land and water, **wetlands are essential ecosystems** for climate, wildlife, economy... But they are disappearing at a high rate.

- **Water to feed the planet**

Agriculture consumes **70% of the world's freshwater** withdrawals. How can we feed an ever-growing population while preserving water resources?

In France, a approach to “territorial water management projects” incorporates a global view that takes into account all the uses of water and associates all the actors of the territory.

With three main orientations:

- The creation of new reservoirs and the optimization of existing ones
- Assistance for farmers to control irrigation and manage soils capable of retaining water;
- Improving the yield of irrigation networks.

Dialogue with the community is the keystone of the approach

