

# *Theme 3: Innovative solutions in reservoir uses*

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

Morning session: 10.45 - 12.10

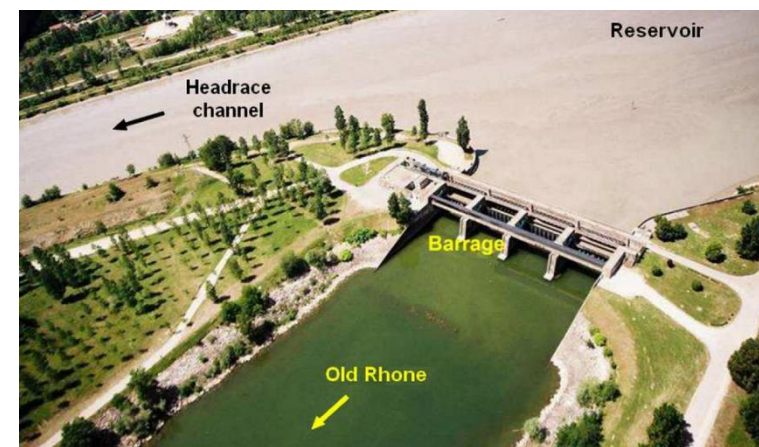
Afternoon session: 14.00 - 15.45



## Theme 3: Innovative solutions in reservoir uses

- 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

To overcome the challenges, **innovative solutions** shall emerge & the 11 speakers'll be ready in a minute to present what they studied in their particular case





## Theme 3: Innovative solutions in reservoir uses

- 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) .

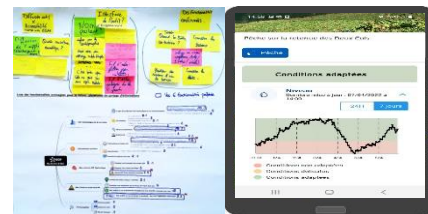
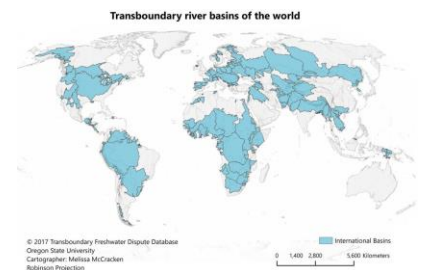
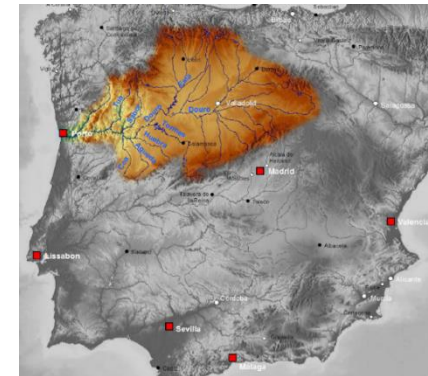
### How the innovative solutions could be beneficial for all of us as dam professionals ?

- **transnational** agreements and conflicts on the resource:

Examples of Portugal / Spain, the Volta Basin (Clement Balique), a global proposition ( Ozge Turk)

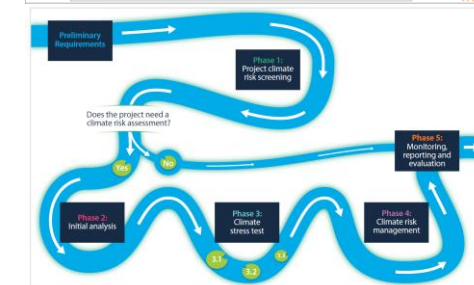
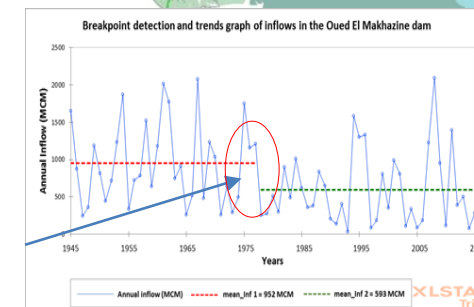
- **International** and national cooperation with **new actors**: lawyers, politicians, public participation (bottom up) :

Examples of OMVS (Senegal), MRC (Mekong), French approach(Alice Devot), Tool for dialogue (Benoit Dessaint)



## Theme 3: Innovative solutions in reservoir uses

- The challenges of tomorrow: Climat Change & increase of needs  
**How the innovative solutions could be beneficial for all of us as dam professionals ?**
  - **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)

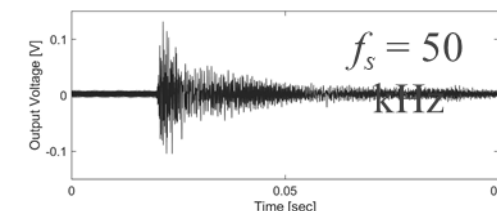
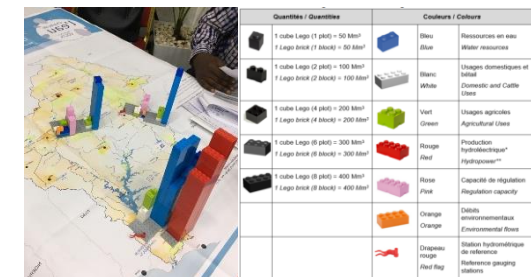


## Theme 3: Innovative solutions in reservoir uses

- The challenges of tomorrow: Climat Change & increase of needs  
**How the innovative solutions could be beneficial for all of us as dam professionals ?**

### – New technologies:

- Floating PV (Aries Friman, Samuel RENAUD )
- Co construction tools
- New approach of sensors uses (fish monitoring by DNA, microphone for sediment transport...)

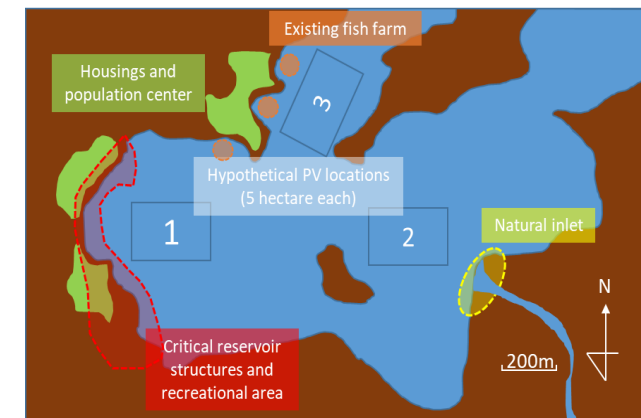


Let's start with a focus with an overview of an hybrid solution SOLAR and Hydropower and some innovation of the Rhone river management

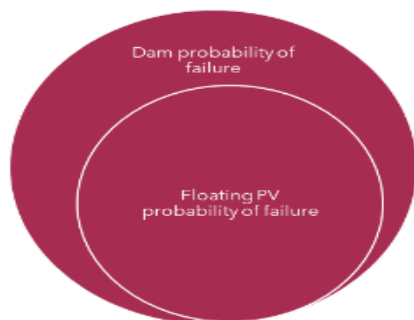


## Theme 3: Innovative solutions in reservoir uses

- Floating PV on Dam Reservoir:
  - Regulatory framework** to set the limit of maximum X%?
  - Criteria for FPV** to secure dam safety?
  - Strategy:** can we opt for these 3 strategies?

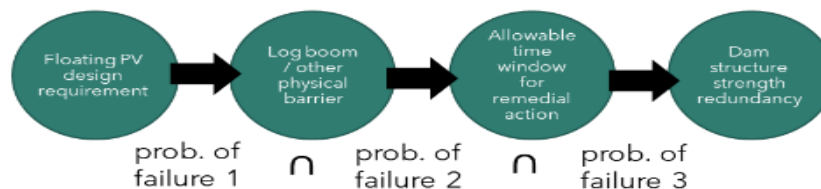


1 Make floating PV prob. of failure <<< dam structure prob. of failure



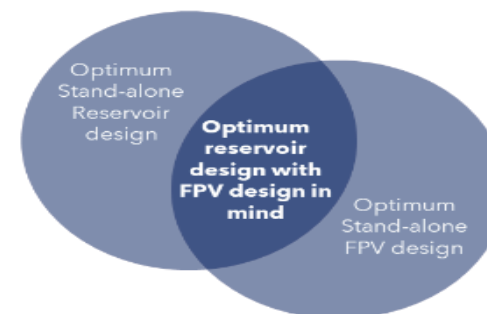
Stricter floating PV requirements, may increase capex & opex of FPV

2 Disconnect direct connection between floating PV's prob. of failure to the dam's prob. of failure



May be achieved through implementation of several physical / non physical barrier between floating PV & dam

3 Design the safety requirements of the dam with the presence of the floating PV in place



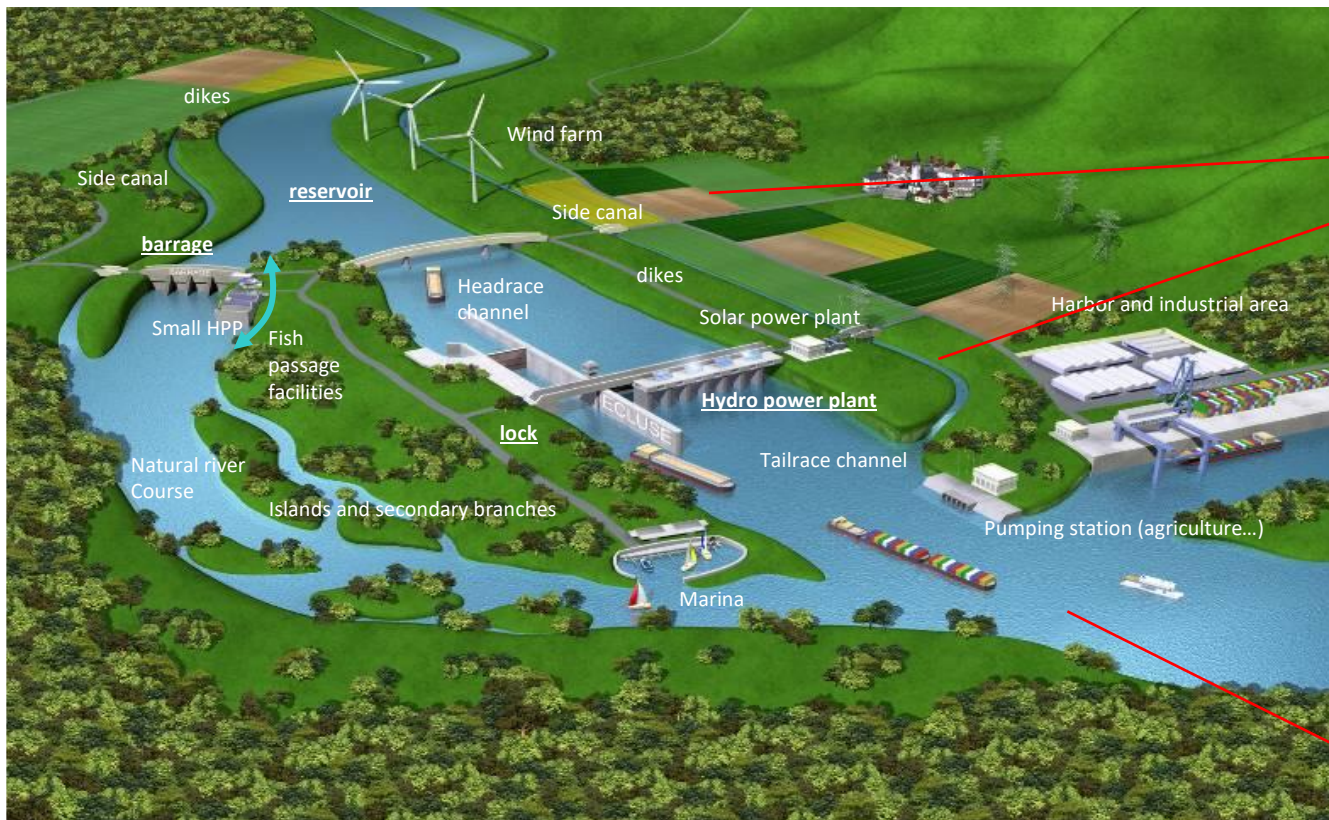
Suitable for newly built / greenfield reservoirs. May increase capex & opex of reservoir structures





## Theme 3: Innovative solutions in reservoir uses

- various uses: example of Rhône river (France):



+ new renewable energies:  
 floating PV, current and fish  
 friendly turbines

cooling of nuclear  
 power plants

floating waste  
 hydrogen dump

coordinated sediment management  
 and water flow management  
 between France and Switzerland

