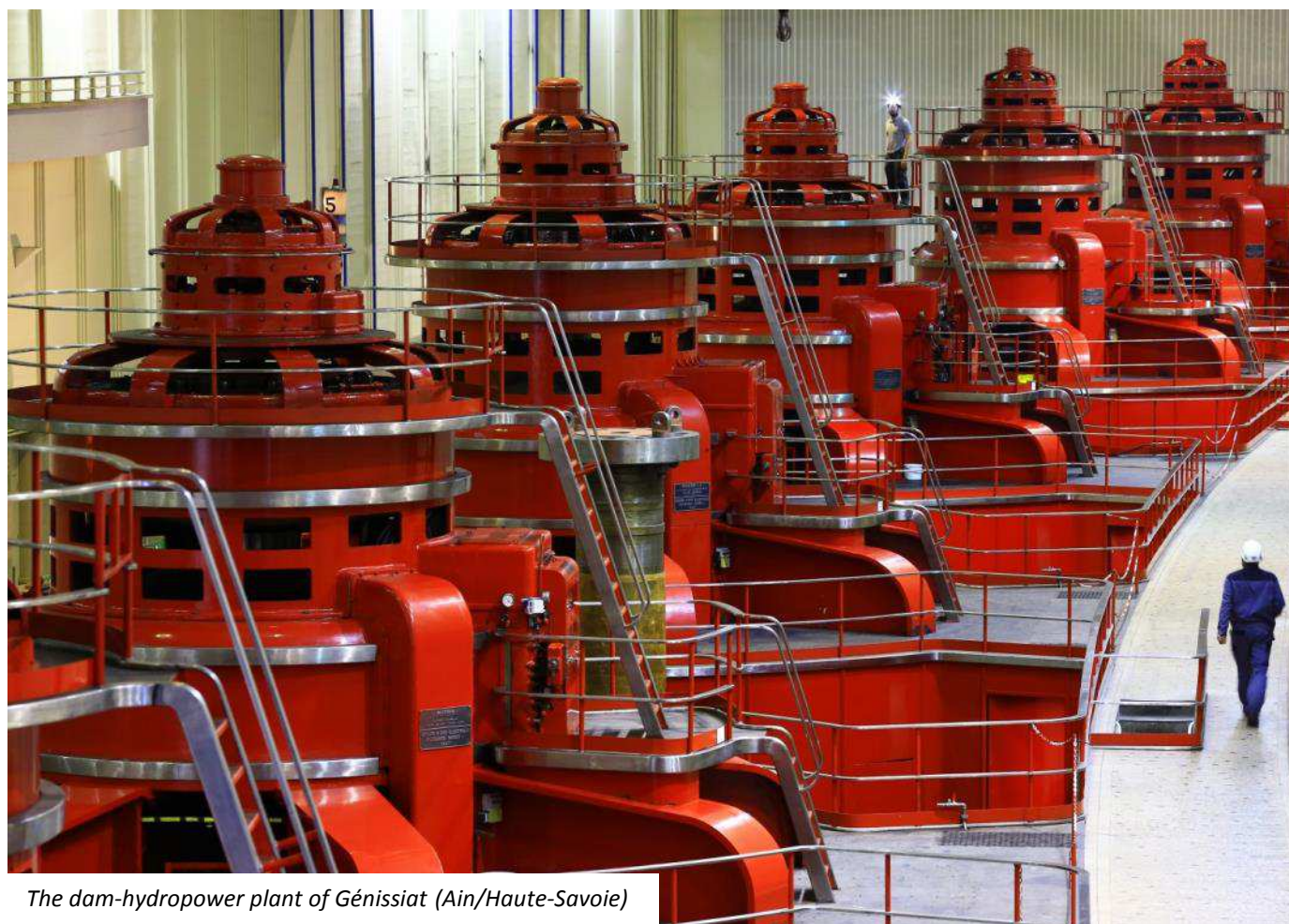




INITIATIVES POUR L'AVENIR
DES GRANDS FLEUVES
INITIATIVES FOR THE FUTURE
OF GREAT RIVERS

Conclusions



The dam-hydropower plant of Génissiat (Ain/Haute-Savoie)

5th session
9 to 13 October 2017 - Lyon / Annecy (France)

Introduction

The 5th session of IFGR was held in Lyon and Annecy from 9 to 13 October 2017 and received the COP23 label. It focused on a cross-disciplinary theme, raised several times during previous meetings: **water pollution**.

The theme of water pollution stands at the intersection of current challenges facing the planet: population growth which leads to increased demand for drinking water; urbanisation and economic growth which leads to higher production of wastewater; climate change which warms the temperature of the seas and reduces the capacity of water to store oxygen and thus purify itself through biodegradation.

The quality of water has an impact on biodiversity through the eutrophication of aquatic systems, food security, access to drinking water and the quality of bathing water. 2 million tons of untreated industrial and agricultural wastewater are discharged every day into water reserves. It is a challenge for public health, since it is known that part of the population is supplied by water taken directly from rivers – for example the Senegal River supplies all the drinking water of Nouakchott, the capital of Mauritania and 60% of the water consumed in Dakar, the capital of Senegal – and that rivers are an integral part of the natural water system and which in turn pollute lakes, aquifers and oceans.

Combatting pollution protects the natural systems that are necessary for all life on earth and for food. It must be carried out for freshwater and sea water, which includes coastal waters. 80% of the pollution reaching the oceans comes from land via rivers and runoff. Also, 3.5 billion people depend on the oceans for their food. By polluting the oceans, we pollute a sphere of life, especially in the Pacific and Indian Oceans, scattered with islands.

By devoting its works to this issue only a few weeks before the COP23 organised in Bonn, IFGR showed its determination to **blow the whistle once again**. Chaired by the Fiji Islands, the Conference of the Parties gave a voice to these populations of the Pacific at the front line of climate change, and underlined the future of the oceans. This future will depend on our capacity to limit the increase of temperature, as well as pollution and its impacts. Perhaps we should say pollutions given the diversity of their origins, types and reversibility.

"Since Earth is our house, and since all the waters, fresh and salt, communicate, understand that by acting in this way, we are throwing our waste into the middle of our living room. Being aware of it isn't enough, we have to act". This the conclusion expressed by IFGR in a plea published at the end of this session.

In addition to understanding and analysing the phenomenon, made possible by the many speeches given during the five days of the session, IFGR wants to contribute to formulating solutions: **What tools are needed to better manage river pollution and limit its risks? What are the best ways to aid the development of solutions?** This will be the second phase of its action on the subject, which will be implemented by making use of the works carried out during these five days.



1. QUALIFY: Water pollution: what is it exactly?

Pollution can be defined as the introduction into the environment of chemical or other substances which, according to their concentration, can harm human health, natural resources and ecosystems.

Rivers can be polluted by the direct discharge of wastewater (industrial effluents, urban wastewater) into aquatic environments. They can also be polluted by runoff from farms and by solid wastes.

This generic definition in fact masks a complex phenomenon having different origins and different manifestations. Understanding it requires a multidisciplinary approach, at the intersection of culture, history, science and different sources of data.

1. *A multiform phenomenon*

Let us examine the etymology of the word pollution. It comes from the Latin word *polluere* which means “dirt” or “soiling”. Historically, pollution is the contamination of a place or a person by impure substances which make the place or the person unhealthy. The religious connotation of the word is thus striking. In Vietnam, it is composed of signs that can be translated by “*catching dirt*”. The notion of pollution is perceived differently as a function of language and culture and it cannot be viewed only through a functionalist perception based on the action of human beings on their environment, as stated by Pascal Bourdeaux.

Pollution can be defined by several variables:

- **Its nature:** is it natural or caused by humans? It can also be generated by the synergy of two phenomena, as in the case of gold prospection, which we shall present further on.
- **Its scale:** is it a simple, tolerable nuisance, or are its effects irreversible for natural spaces and for human health?
- **Its intensity:** is it residual or irreversible, causing a break in the cycle with accumulative effects and the sterilisation of land?
- **Its visibility or invisibility:** it is easier to make people aware and change their behaviour when the pollution is visible; however, today, it is increasingly insidious, as in the case of micropollutants.

2. Pollution in history

We also forget ancient knowledge, according to Corinne Castel. Pollution can be old and therefore forgotten while it could pose risks for the quality of water resources used by riverside inhabitants and for the ecosystems below! Throughout history and in every region of the world, pollution has worsened with sedentarisation and the concentration of populations, the development of towns and cities, mining activities and craft trades.

Rivers have always been subjected to the impacts of anthropic activity whereas in Mesopotamia, in the 3rd and 2nd millennia BC, the god of fresh water and underground water played a purifying role and fended away the demons responsible for diseases. In Andalusia, in the estuary of the Rio Tanto, metal pollution occurring around 2500 BC has been detected by geo-archaeological surveys. More generally, the impact on the environment of old mining and metallurgical activities – with the drainage of sulphur by rainwater and runoff – can still be traced. In Italy, it has been proved that erosion can lead to the release of lead pollution in the Tiber, related to the water supply system of the Roman cities, driven by a lot of pipes. These pollutions are stored in the alluvial plains and deltas for more than 2000 years.



Understanding of the long-term effects is necessary to avoid reaching **irreversibility thresholds**. Thus historical knowledge is necessary.

3. Knowing and believing

When learning about both pollution and climate change, two facets must be taken into account: knowledge and believing. Knowledge is gained from science but also from common sense, observation, and experience and can facilitate political decision-making. But it is not enough. *"We don't believe what we know. We know but don't believe, which is to say that we don't perceive the consequences of this knowledge"*. According to Erik Orsenna, this is a key point of human psychology and a process at work in the environmental phenomena affecting the planet.

The COP23 provided an example, with the repeated appeal of more than 15,000 scientists from 184 countries to avoid the collision between human beings and the natural world, 25 years after their first alert.

How can we progress from knowing to believing and from awareness to commitment?

Pedagogy is needed to show explicitly and simply harmful pollutions and irreversible degradation thresholds for the environment. What are the indicators of good environmental health? What resources exist to favour restoration actions with the participation of the population? **Participatory methods** with a representative panel¹ showed that proximity and familiarity play an essential role in the perception of polluted sites. Likewise, a link between the criteria used to describe the “beauty” of wetlands and their actual state of good health was highlighted. However, this method has limits; for example, sediments are often regarded negatively despite the fact that their contribution is essential for the functioning of the environment.

Art has the advantage of shifting the gaze of the viewer so that they perceive pollution and its impacts more clearly. *Ghostnets* is a project in which the Australian Aborigines of the islands of the Torres Strait have recycled industrial fishing nets lost at sea, turning them into works representing marine species that have become extinct or which are threatened with extinction. Thus exhibitions held all over the world make people aware of the disappearance of biodiversity and a whole civilisation founded on an ancestral relationship with nature.

Thus the problem needs a reflexive approach. Besides its visible effects, **what does pollution signify?** If the relationship between societies and pollution has always reflected their identities, what do our pollutions say about our present day societies? The 7th continent of plastics, which is both the materialisation and symbol of the rationale of externalisation specific to the western lifestyle, proves that we must rethink our relation with waste. The ocean, which appears empty, is in reality a hyphen between territories, as recalled by the population of the Tonga islands. For these people, the notion of island has no meaning, as the ocean is an integral part of their territory, as lived and perceived.

¹ Le Lay Y., Piégay H, Mieux habiter la rivière d’Ain : de la qualité perçue aux actions de restauration, Journée Eau & Connaissances, Agence de l’Eau RMC, 5/12/2017.

2. UNDERSTAND pollution: finding the basis

Pollution is a notion that is both plural and subjective, often linked to cultural perceptions whose sources lie in the history of specific cults, traditions and taboos. However, it is nonetheless a worldwide scourge that now knows no borders. Radical and global action is necessary, but how can such action be adapted to different territories?

Precise diagnostics must be carried out beforehand. The session highlighted different analysis methods and tools that are enhanced by combining different disciplines.

1. Big data: data specific to participatory systems

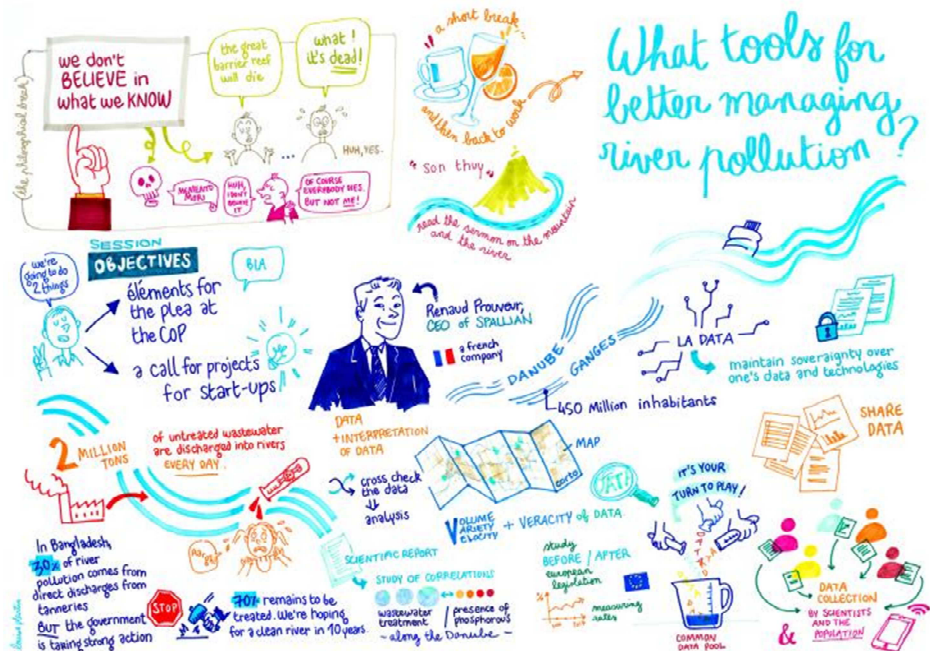
Renaud Prouveur, CEO of the company Spallian, presented his specialised cartography and data management tools that permit better understanding of the sources of pollution and provide solutions to make its management more efficient, illustrated by the examples of the Danube and the Ganges.

Data, especially scientific, available from open source sites, are imported to a map to study the correlation between pollution phenomena and human activities (wastewater, industry, etc.), as well as the impact of regulations on the presence of pollutants in rivers.

The interest of this type of tool resides in two main prerequisites: the precision and objectiveness of the data, and sharing and participating in data collection.

- **Precise data to better anticipate risks**

The efficiency of this tool depends on the quantity of data available. However, the frequency of measurement sensors along rivers remains very variable. **Public authorities should install more of them, which requires funds, and they should also maintain “sovereignty” over the data obtained.**



Evolutive models must be sought, by example, by way of interactive maps that allow visualising changes. Instantaneous data transmission has thus been developed to ensure greater reactivity. For example, in the case of an epidemic, the creation of a specific application by Spallian gives health services, doctors and nurses working in isolated areas the possibility of transmitting data in real time.

Calculation tools then generate alerts as a function of symptoms, as well as in the case of neighbouring zones of air and rail transport, and densely populated areas, in order to detect the risks of propagation as quickly as possible.

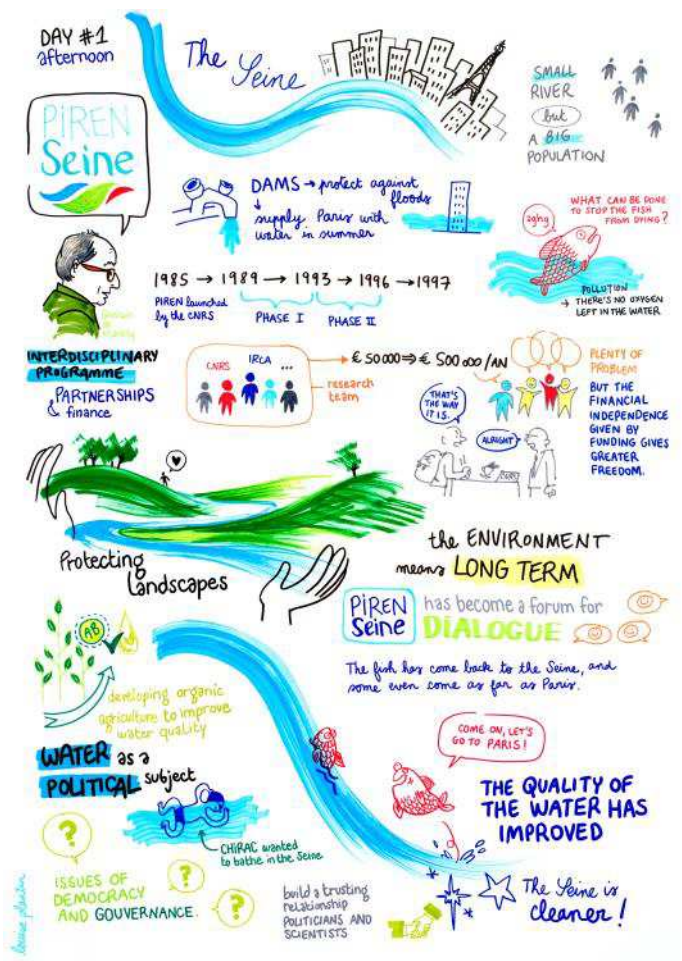
- **Politicising data to incite the public authorities to react**

Information and communication technologies make it possible to politicise issues concerning pollution so that citizens can learn of them and exert political pressure on decision-makers. Groups have been set up that take position on a large number of issues, sometimes in opposition to established figures of authority. As recalled by Julien Clément, in Japan, the local population living close to Fukushima reacted to the lie organised by the management of the nuclear power plants, by producing their own data. They used their own counters to measure radioactivity levels on the sites, set up groups and became a political force, contributing to the transparency and truthfulness of the information disseminated.

2. Scientific research in the service of action

The presentations given by Ghislain de Marsily and Laurence Clottes, head of the Water Resources, Environment and Rivers Department of the Rhone, Mediterranean and Corsica Water Agency, used the cases of the rivers Seine and Rhone to show the need to combine political will with adapted scientific response.

In the framework of an interdisciplinary environmental research programme (PIREN) established by the CNRS thirty years ago, several “large river” projects have been started on the Rhone, the Rhine, the Garonne and the Seine. In particular, PIREN-Seine proposed responses following political awareness of the excessively high cost of water treatment for the city of Paris.



For Ghislain de Marsily, the success and durability of the PIREN-Seine project are due to several elements:

- **the link of trust established between the scientific team and the political sphere**, as well as to the presence of political determination associated with a decisive force of persuasion. Indeed, the present partners of the programme's funders, i.e. the different managements and operators of water for the Seine, were reluctant at the beginning to commit themselves to a combined research programme, despite the impetus given by the delegate from the Seine-Normandie basin.

- **the independence of the programme** regarding the **interventionist** tendencies of scientific bodies (CNRS), especially in the selection of research laboratories. The committee also decided to ensure the continuity of the teams whereas the methodology espoused by the CNRS planned for a call for offers every five years.

In the Rhone Valley, a large organisation has been at work over the last twenty years to improve the quality of the water and the environment. 25% of the objective to achieve a "good state" for the river has been reached. When presenting the organisation, Laurence Clotte emphasised two points: the concentration of toxic substances and the river's morphology.

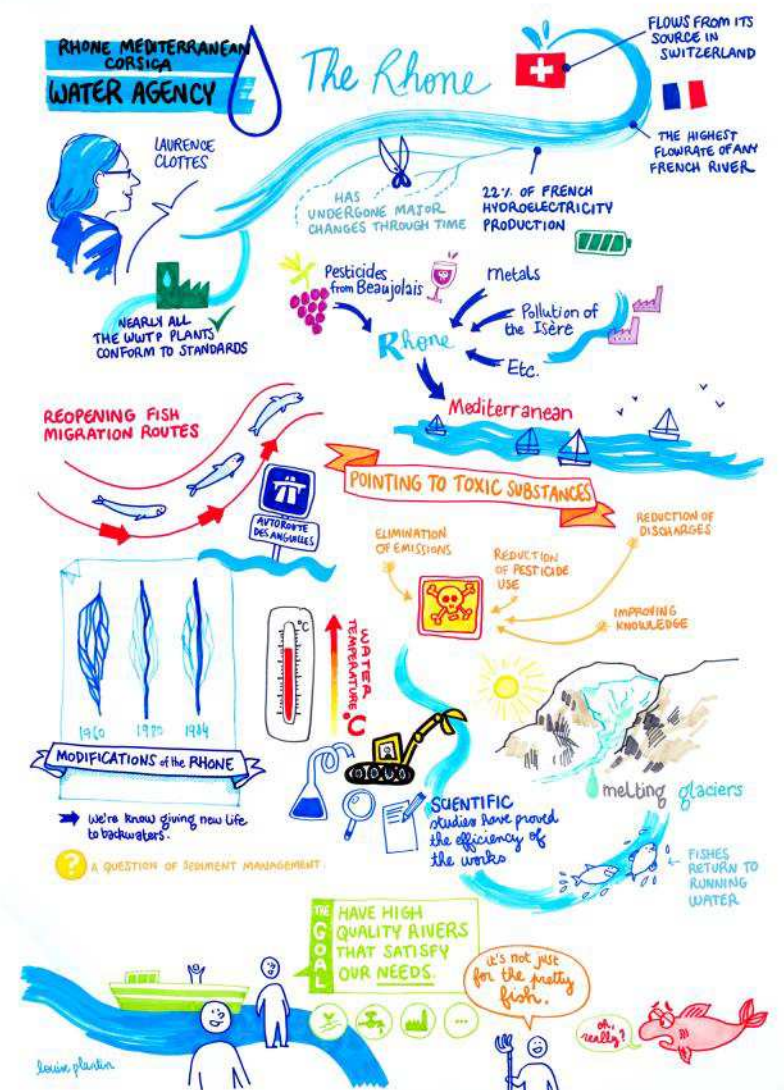
Regarding toxic substances, efforts have been made to reduce organic pollution. For example, the rate of purification of organic materials has risen from 67% to 96% from the 1990s to today. Progress must still be made regarding the reduction of micropollutants. The analysis of flows has also shown that the number of pollutant substances detected increases significantly as the river approaches Lyon.

**The framework directive on water established for the European member States obliges them to reach a good state in 2015 or, failing that, by 2021 or 2027 at the latest.*

Regarding river morphology, the work focuses on the restoration of oxbows and increasing compensation water. What is more, works to enlarge the bed are carried out in reaches that no longer receive boats in order to make the surrounding environment more mobile, and fish migration routes have been made more continuous at dams.

To achieve these goals, the Rhone, Mediterranean and Corsica Water Agency relies strongly on **scientific research** done by monitoring the state of progress of programmes and their relevance. The environmental actions bring together **public** and **private partners**, notably in the interregional framework of the Rhone Plan.

This type of approach backed by the scientific community must, just like data collection, be **open** and **transparent** on the Rhone and elsewhere. In the middle of the 2000s, confronted by pollution problems on the Murray-Darling river system, especially the salinization of land, different reforms were implemented around strong links between scientific research and political decision-makers. The attempts to implement measures came up against the farmers and other users who had not been consulted sufficiently beforehand.



3. ACT: how?

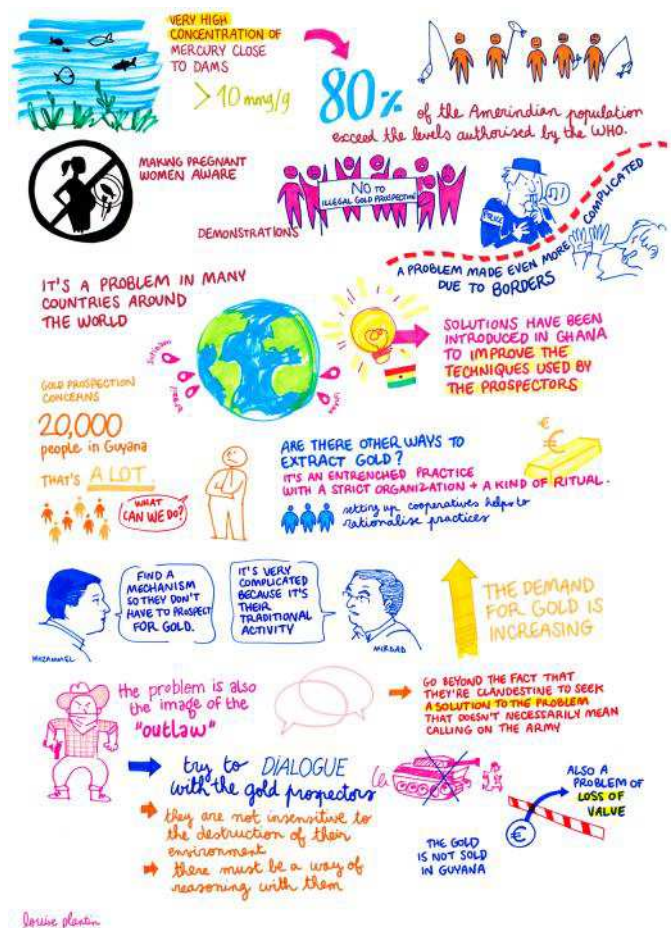
How can one act today faced with the magnitude of the problem and in a context of uncertainty? What are the methods that have been tested on certain rivers and which may inspire others to try them? What are the shortcomings that have to be overcome?

1. By taking into account regional specificities

The case of **gold prospection, a worldwide scourge for the environment and public health**, has raised the question of the type of response needed to counter pollutant practices that are often illegal and located in isolated regions. The way chosen is specific to each situation, between prevention and dialogue.

The presentation by Mirdad Kazanji highlighted the disastrous impacts on health and the environment caused by illegal gold prospection in Guyana. The prospectors leach the soil and release the mercury naturally present in it into the surrounding environment, to which must be added the mercury used by them to amalgamate the gold. The mercury released in this way is ingested by fish which are the main source of food for a large section of the population. Intoxications by mercury also severely affect the Amerindian population (Wayanas) for whom fishing is a traditional activity. These peoples present rates of mercury twice as high as the maximum threshold accepted by health organisations. Mercury has very harmful and irreversible effects on the central nervous system, lungs, eyes, kidneys, digestive system and immune system.

So far, the resources used to combat the gold prospectors have proved to be of little use. The problem of mercury is not restricted to Guyana; it concerns the rest of South America, Asia and Africa. It directly threatens the health of 10 to 15 million gold prospectors. According to the World Bank, 200 tons of mercury are discharged into the environment every year in Latin America.



Four levers can be used to deal with the problem:

- **The search for alternatives** (other though more costly methods exist to extract gold from sediments). Nonetheless, socioeconomic conditions and lack of awareness of the risks linked to mercury are often barriers to the adoption of these new techniques.
- **Regulations and repression** would permit both reducing health risks and strengthening workers' rights.
- **Control** of fish consumption (through **communication and information** operations),
- **Dialogue** with the "outlaw" gold prospectors.

The situations vary greatly from one country to another. Experiments with several solutions have been conducted in Mali. All the gold prospection sites in this country are known and the government has set up prospection corridors to maintain control over these sites. In addition, multifunctional cooperatives have been generalised. They have reduced the use of casual labour and increased productivity.

In the Ivory Coast, where gold prospection affects 95% of the rivers, a national plan has been launched that combines punishment and education, but its deployment remains insufficient due to insufficient resources. The involvement of tribal leaders is one of keystones of the system, since they symbolise traditional authority.

In Ghana, the government has brought this problem partially under control by setting up a programme which equips the prospectors with alternative methods.

In Bangladesh, the authorities have forbidden fishing during the rainy season and a compensation system has been established to indemnify the fishermen during this period.

The discussion on the case of Guyana emphasised the **issue of law. How is it possible to deal with a problem over which the authorities have no control?** Another form of collaboration could be sought by changing the way the public authorities perceive the clandestine gold prospectors. The latter are not necessarily impervious to the impacts of their activity, but the image of "outlaw" pinned on them tends to thwart any consideration by situating these people outside legitimacy, thus outside any reality or reasoning.

Gold prospection on a small craft scale is thus a major challenge in the approach to reducing mercury discharges. IFGR could contribute to this approach and propose solutions, taking inspiration from initiatives already attempted and from the diversity of situations. The response tried in Mali, where societies are organised despite being nomadic, with rites and a hierarchical structure with relations of authority and power, cannot be the same as that in Guyana, where standards are yet to be established and enforced.

2. By privileging cooperation at different levels

The presentation of Laurent Tonini, Territorial Manager of CNR on the Upper Rhone, shed light on the **contributions of French-Swiss cooperation in sediment management**.

A large number of “sediment flushing” operations have been carried out at the Swiss dam of Verbois since the 1940s. The aim of these operations is to remove the sediments accumulated in the lake to prevent risks of flooding low-lying districts of Geneva. Up to the 1980s, the environment was not a subject of great concern and these operations could have had disastrous consequences on the aquatic fauna and flora.

Today, the sediments of the Rhone are subject to joint management by France, Switzerland and the industrial operators. Common rules are applied for channelling the sediments flushed at Verbois into the different reservoirs managed by CNR from the Swiss border to Lyon. These operations are performed every 2 or 3 years, without damaging the environment and by ensuring the safety of the hydropower plants. The sediments are redeposited downstream in the river to ensure ecological continuity, while successive floods eventually push them to their final destination in the sea.

Another example of cooperation in combating pollution was presented by Mozammel Haque. This concerns the activity of tanneries, which are responsible for pollution by chrome.

In Bangladesh, three ministries (water, transport and local government) are involved in a programme to delocalise 200 tanneries built in the 1960s in the capital and the source of 70% of the water pollution. In compensation they benefit from new buildings constructed by the government and a wastewater treatment system through which the water passes before being discharged into the sea. The result is that this type of pollution has already been reduced by 30%.



The problem of the **many uses of water** (hydroelectricity production, agriculture, drinking water, etc.) systematically demands compromises. This **culture of collaboration and balance** has to be pursued and deepened in a context in which water resources are becoming rarer and a growing number of vested parties demand a voice in river management and development.

RIVER EROSION & POLLUTION IN BANGLADESH



3. By identifying easily accessible solutions

Bangladesh provided another example of combating pollution based on natural processes: a research institute (BRRI) brought together local scientists in direct contact with their counterparts in Thailand and Malaysia, to develop methods using organic fertilisers and nature to both grow crops and kill harmful insects (by making use of plastic bottles containing a liquid to attract mosquitoes instead of using pesticides). Moreover, besides being efficient they are inexpensive.

A growing number of solutions point to processes that use natural means (degradation by bacteria or using plants for storage and absorption) so as to identify **clean pollution clean-up processes**. Phytosanitary wastes from agriculture can thus be reduced or retreated by using strains of bacteria. Linked with innovations obtained with nanotechnologies and chemical processes, these methods are promising for a large number of polluted sites.

4. By working to mitigate shortcomings: the case of law relating to rivers

The presentation by Ricardo Alvarez showed that there is a legal vacuum that limits capacities to intervene and combat river pollution caused by ships. The international community focuses on marine pollution from transport although 70% of this pollution comes from fuels discharged into rivers.

Historically, one of the roles of the International Maritime Organization has been to protect the seas and oceans in the case of oil spills. Controlling the pollution caused by ships on rivers is hampered by the lack of regulations: it appears that the law is not adapted to the changes occurring in multimodal transport and in the increased flows of river traffic. The resulting confusion is particularly problematic for river estuaries and mouths which are interfaces between rivers and oceans.

Rivers are subject to several types of law:

- **National legislations,**
- **Multiparty conventions** on cross-border rivers,
- **Customary law,** of which certain provisions must apply at international level, notably in the case of a dispute where it is possible to refer to the International Court of Justice,

- **The United Nations convention** on the use of international waterways for purposes other than navigation, which covers relations between States that share the same river. Does this convention apply if a country receives supplies of oil that it imports by container on a cross-border river, causing pollution on the way that affects other countries? The convention does not actually apply to shipping, though chronic pollution generated by the passage of a ship is liable to be qualified as major damage caused by one country to other countries, and thus can be subject to certain provisions of the convention.

Other regions of the world raise similar questions: regarding the River Senegal, an international shipping code was signed in 2015 by the four Heads of State of the OMVS, in the framework of the SITRAM project aimed at making the river navigable throughout the year. The code is in the process of ratification but it is not yet known if other conventions take precedence over this legislation.



Thus the situation of cross-border navigation remains rather confused. Using the case of South America, Ricardo Alvarez insisted on the **need to protect rivers and oceans in a more integrated fashion**. An international law on rivers appears more realistic, with each State or group of States having its own management conventions. In addition, private economic and public interests superpose each other on rivers. However, the United Nations could issue recommendations or guidelines contributing to the emergence of international law.

Conclusions and perspectives

This session demonstrated both the shared dimension of the problem of pollution and its complexity. It also stressed the need to reconsider certain directions currently taken by development: the most pollutant among them, and the emergence of alternative options. It above all reinforced IFGR's position on the need to consider water pollution as a challenge as important as climate change for our planet. This was the position taken in the plea bearing the title "*The health of rivers, the health of the world*" published in the French daily financial newspaper LES ECHOS, on the eve of the *One Planet Summit*.

IFGR also intends to assist research on solutions to improve the management of river pollution. This will require identifying the pre-projects whose technical development and experimentation it may support thanks to the expertise of its members and the network of rivers they represent. It could also take the form of a call for specific projects that will be carried out with the aid of the business incubators of Engie and the Caisse des Dépôts.

Announcement of the next session

The next session will take place in Senegal in April 2018. Senegal will also host the World Water Forum in 2021. The session will be devoted to the development of the River Senegal for both irrigation and navigation.

The plea for “the health of rivers, the health of the world”

Published in the French daily financial newspaper LES ECHOS on 8 December 2017.

IDEES & DEBATS

opinions

LE POINT
DE VUE

d'Erik Orsenna

Santé des fleuves, santé du globe

Plus notre savoir progresse, plus s'impose l'évidence : notre planète est une. Solidaires de fait sont ses habitants, puisque conscients ou non, volontaires ou révoltés, nous sommes en train de nous forger un destin commun pour le meilleur comme pour le pire. Solidaires sont les éléments, puisque chaque dérèglement de l'un affecte la machinerie de l'autre. Le One Planet Summit, qui se tient la semaine prochaine à Paris, engage l'ensemble des acteurs publics et privés du local à l'international. Faisons en sorte que cette rencontre ne se limite pas au financement de l'adaptation au changement climatique ou à la compensation des pertes subies.

Dans ce « grand jeu de la vie », où interagissent l'atmosphère, l'eau et l'humain, ne segmentons pas les politiques ! La planète est une : la vision se doit d'être globale, concertée et l'approche intégrée pour trouver les meilleures solutions. Prenez la ressource en eau : la protection de l'océan est désormais à l'agenda des COP. Qu'en est-il des fleuves ? Limiter le réchauffement climatique est une priorité. Qu'en est-il pour la pollution ? L'évolution du climat, comme l'urbanisation croissante des rivages, génèrent des tensions grandissantes : la pollution, depuis bien plus longtemps encore, a des conséquences désastreuses sur les systèmes naturels et ce faisant sur la santé. Et elle affecte autant fleuves qu'océans.

Savez-vous que 80 % de la pollution des océans provient de la terre via les fleuves ou par ruissellement ? Que chaque seconde, 50 kilos de plastique sont rejetés par les fleuves dans la mer ? Que

2 millions de tonnes d'eaux usées, d'origine industrielle et agricole, se déversent chaque jour dans les réserves d'eau ? Et que dire des deltas qui subissent les impacts du changement climatique (montée du niveau de la mer, inondation, salinisation) mais aussi de leur érosion, qui remodelent complètement la forme des fleuves et des pollutions. Le Bangladesh importe cette année pour la première fois du riz ! Voilà pourquoi l'un des garants de la santé du monde est la santé de nos fleuves.

**2 millions de tonnes
d'eaux usées, d'origine
industrielle et agricole,
se déversent chaque jour
dans les réserves d'eau.**

**La prise de conscience
ne suffit pas, il faut agir.**

Puisque la Terre est notre maison, et puisque toutes les eaux, douces et salées, communiquent, comprenez bien qu'en agissant ainsi, nous jetons nos ordures au beau milieu de notre salon. La prise de conscience ne suffit pas, il faut agir.

Agir comme pour le climat. Agir car en ce domaine aussi, on avance vers l'irréversible. Agir de manière équilibrée, en apprenant de tous, sans imposer la vision occidentale aux autres.

Agir en traitant mieux. Des technologies se sont développées pour débarrasser la mer de toutes les marées sombres

qui régulièrement la souillent. Des entreprises, petites et grandes, proposent aussi de nouvelles solutions pour les rivières. Pourquoi ne pas les réunir pour comparer les résultats, confronter les idées et les mettre en œuvre ?

Agir en réglementant mieux. Un droit maritime existe, ancien et structuré : le droit des fleuves est plus fragile et plus parcellaire. Entre les deux, aucune coordination ou trop peu, alors que leur domaine est lié. L'ingénierie juridique est aussi nécessaire que les avancées techniques.

Agir en racontant. Certaines villes, pour gagner de l'espace, ont resserré ou caché leurs fleuves sous du béton, en accentuant les phénomènes de crue ou d'érosion. Elles n'y ont pas seulement perdu leur identité. Elles ont ainsi créé des enfants gâtés, parce qu'ignorants : ils croient que les robinets sont des sources et qu'aucune rareté n'est à craindre. Raconter l'eau est un préalable : l'eau sous toutes ses formes, dans tous ses cycles, celle qui ruisselle ou s'infiltre, s'évapore, l'eau qui gèle ou qui tombe.

Comme la vie, l'eau est une. Et l'océan est le lieu où se rencontrent tous les fleuves. Lors de la COP23, 15 000 scientifiques ont tiré la sonnette d'alarme sur la dégradation de la planète, vingt-cinq ans après leur première alerte. N'attendons pas vingt-cinq ans pour nous occuper de la santé des fleuves et océans, et dépassons le stade du diagnostic. Passons à l'action !

Erik Orsenna, académicien, président d'Initiatives pour l'avenir des grands fleuves (IAGF) et ses membres

Exchanges with local actors: *Rivers, a factor of attraction for the territories*

At Lyon: Roland Bernard, municipal councillor and councillor of the City responsible for rivers

Two years after IFGR's first session at the Musée des Confluences, its members were welcomed once again in Lyon to renew impetus.

The City of Lyon has always been built around its rivers: the historic heart of the city, now listed as a UNESCO World Heritage Site, was built next to the banks of the Saone, after which the city expanded to the right bank of the Rhone, and then further eastwards.

"The city's attraction was due to its two rivers". The redevelopment of the banks in 2005-2006 and then more recently, the upgrading of the Confluence district, have given the city's inhabitants the opportunity to make the river banks their own and restore life to them. These developments *"have also allowed us to give meaning to territorial development and make them more attractive, better understood, by providing our fellow citizens with a shared environment of high quality"*.

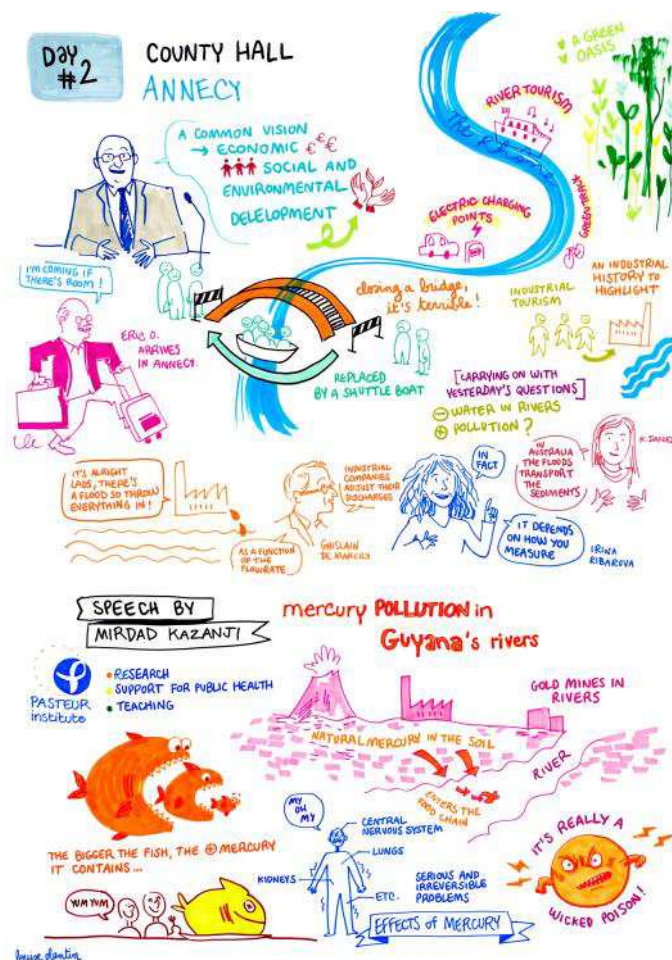


The river banks also welcome forever more river cruisers. River tourism is booming along the entire Rhone Valley and Lyon is *"one of Europe's major cities"*. It provides foreign tourists with the opportunity to discover a rich heritage. Waterways have always been used for transport, whether for pleasure or trade. The City of Lyon, Greater Lyon and the river managers – VNF and CNR – work together to make the rivers an alternative to roads to transport goods and reduce the number of trucks in the city, by developing a new system of urban logistics radiating from the Port de Lyon. Along the same environmental lines, experiments are in progress with a mobile river waste collection barge.

At Annecy: Christian Monteil, President of the Departmental Council of Haute-Savoie

"The Department of Haute-Savoie likes rivers just as well as we like the nature that surrounds us". The Rhone provides much to the territories it crosses, first of all in economic terms. It is used to produce green electricity and participates in developing tourism with the construction of infrastructures such as the locks for pleasure craft at Chautagne and Belley, which allow continuous navigation from Lake Bourget, and with the ViaRhôna, "the touristic infrastructure for the development of soft transport modes along the Rhone". Then, in terms of image and identity, the river structures our geography and landscapes, and it forges an obvious social link from Switzerland to the Mediterranean.

Thus, the Rhone lies at the intersection of industry and the environment and we must learn how to preserve this balance: *"No political decision can be made without awareness of the need to protect these landscapes and territories. We stand on a ridge. We must avoid falling into the temptation to protect the environment under a bell jar, which would bring everything to a standstill, and into that of frenzied development which would achieve the same result but in reverse."*



APPENDICES

Appendix 1: IFGR's news

• The reception of five new members

- **Gilles Mulhauser**: Managing Director of water of the State of Geneva (Switzerland).
- **Irina Ribarova**: Professor at the University of Architecture, Civil Engineering and Geodesy of Sofia (Bulgaria), expert in integrated water resource management and in the circular economy relating to water.
- **Hamed Diane Semega**: new High Commissioner of the Organisation for the Development of the Senegal River (OMVS).
- **Yangbo Sun**: Director of International Cooperation of the Yellow River Conservation Commission, Ministry of Water Resources, China.
- **Marie-Laure Vercambre**: Director of the Water for Life and Peace programme of the NGO Green Cross International.

• Legal changes in the articles of association

On 1 July 2017, IFGR, an initiative of CNR, became an association in the public interest according to the law of 1901. This change in legal status provides it with new recognition by European and international bodies dedicated to water, and enables it to receive funds from other public and private partners to pursue its developments. CNR remains the main contributing party.

• Stronger presence in international coalitions on water

IFGR has supported the ClimateisWater campaign since 2015. In 2017, it joined the World Water Council which gathers 300 organisations from more than 50 countries to make water resource management a priority.

It participated in the international summit of the world's great rivers in Rome on 23 to 25 October (organised at the initiative of the international network of Basin Organisations and the World Alliance for Water and Climate Change), and in the COP23, by holding a conference in the French Pavilion on 9 November.

Appendix 2: Composition of the rivers Committee

Ricardo Javier Álvarez

Vice-President of the Argentinian subsidiary of the Ibero-American Institute of Maritime Law (IIDM) and legal coordinator of South American Waterways.

Pascal Bourdeaux

Historian, Associate Professor at the Ecole Pratique des Hautes Etudes (Religions of Southeast Asia).

Corinne Castel

Archaeologist, Director of Research at CNRS, Director of the French-Syrian Archaeological Mission of Al- Rawda, working at the laboratory “Archéorient. Environnements et sociétés de l’Orient ancien” of the Maison de l’Orient et de la Méditerranée (MOM).

Julien Clément

Doctor of anthropology; deputy director of the Research and Teaching Department of the Quai Branly Jacques Chirac Museum.

Daniel Dagenais

Vice-President of Operations of the Montreal Port Administration.

Katherine Daniell

Doctor of water sciences and researcher at the Australian National University, member of the National Committee on Water Engineering (Engineers Australia), specialised in water governance and participatory processes.

Bernd Gundermann

Architect, founder and director of Urbia-Group – Think Beyond.

Mohammad Mozammel Haque

President of the Bangladesh Inland Water Transport Authority (BIWTA).

Mirdad Kazanji

Director of the Pasteur Institute of Guyana.

Sergio Makrakis

Associate Professor and researcher at the University of the State of Western Paraná - Unioeste (Brazil); specialised in evaluating the impacts of migration passes on fish populations.

Ghislain de Marsily

Emeritus Professor at the Sorbonne University (Paris VI-Pierre-et-Marie-Curie) and at the Ecole des Mines de Paris, member of the Academy of Sciences.

Gilles Mulhauser

Managing Director of water for the State of Geneva, Switzerland.

Tamsir Ndiaye

Managing Director of the Manantali Energy Management Company (SOGEM-OMVS).

Erik Orsenna

Economist, author, member of the French Academy and specialised in sustainable development, the environment, agriculture and emerging economies.

Irina Ribarova

Professor at UACEG (University of Architecture, Civil Engineering and Geodesy, Sofia, Bulgaria); expert in the integrated management of water resources and the circular economy in the sector of water.

Papa Abdoulaye Seck

Minister of Agriculture and Rural Facilities of Senegal.

Hamed Diane Semega

High Commissioner of the Organisation for the Development of the Senegal River (OMVS).

Alfredo Sese

Technical Secretary of Transport and Infrastructure at the Rosario Commodity Market (BCR).

James Spalding Hellmers

Paraguayan Managing Director of Itaipu Binacional.

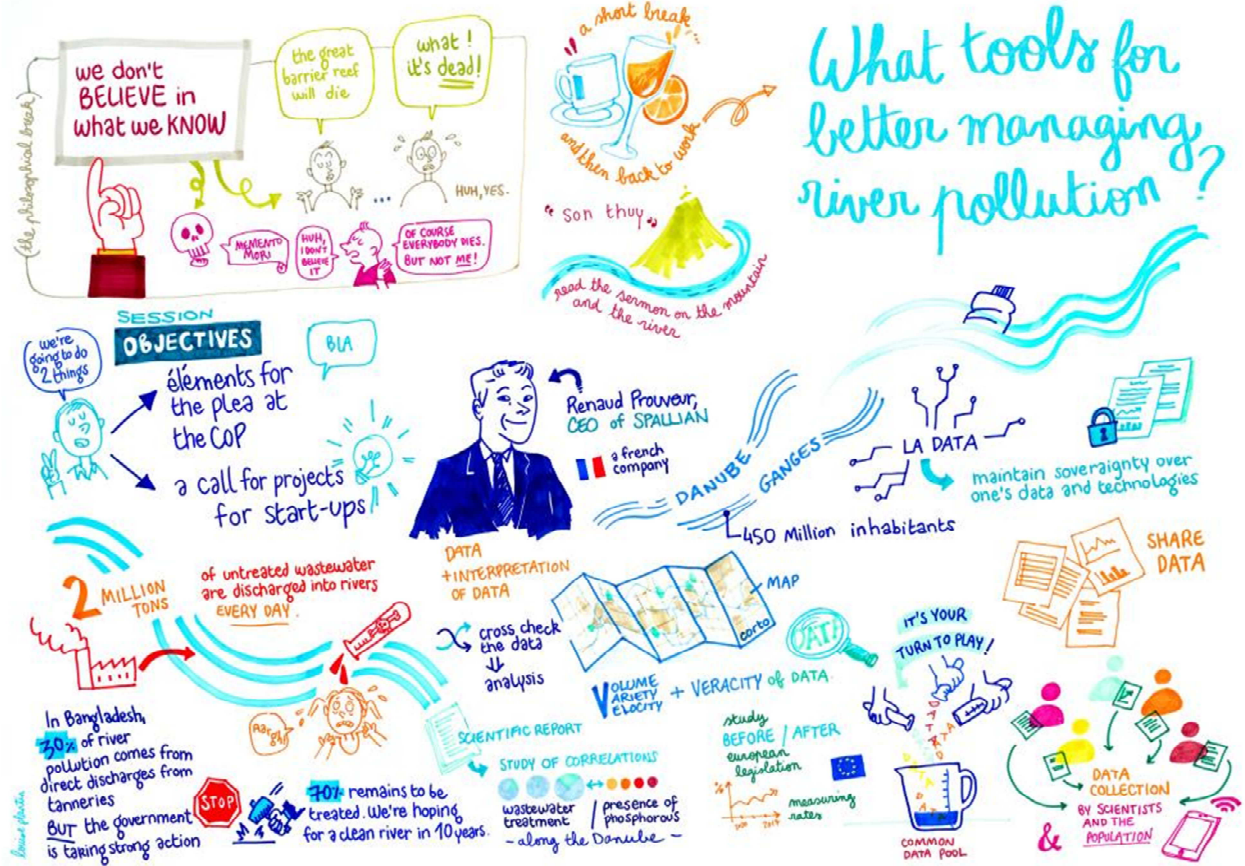
Yangbo Sun

Director of International Cooperation of the Yellow River Conservation Commission, Ministry of Water Resources, China.

Marie-Laure Vercambre

Director of Water for Life and Peace programme, Green Cross International.

Appendix 3: Illustrations of the session, by Louise Plantin



DAY #1
afternoon

PIREN
Seine

The Seine



SMALL RIVER
but
A BIG
POPULATION



DAMS → protect against floods
↓
supply Paris with water in summer



WHAT CAN BE DONE
TO STOP THE FISH
FROM DYING?



POLLUTION
→ THERE'S NO OXYGEN
LEFT IN THE WATER

1985 → 1989 → 1993 → 1996 → 1997

PIREN launched
by the CNRS

PHASE I

PHASE II

INTERDISCIPLINARY
PROGRAMME
PARTNERSHIPS
& finance



research team

€ 50 000 → € 500 000 / AN

PLenty OF
PROBLEM

BUT THE
FINANCIAL
INDEPENDENCE
GIVEN BY
FUNDING GIVES
GREATER
FREEDOM.



the ENVIRONMENT
means LONG TERM

PIREN
Seine

has become a forum for
DIALOGUE

The fish has come back to the Seine, and
some even come as far as Paris.

COME ON, LET'S
GO TO PARIS!

THE QUALITY OF
THE WATER HAS
IMPROVED

The Seine is
cleaner!



Protecting
Landscapes



developing organic
agriculture to improve
water quality

WATER as a
POLITICAL subject

ISSUES OF
DEMOCRACY
AND GOUVERNANCE.

CHIRAC wanted
to bathe in the Seine

build a trusting
relationship
POLITICIANS AND
SCIENTISTS

RHONE-MEDITERRANEAN
CORSICA
WATER AGENCY

The Rhone



FLows FROM ITS
SOURCE IN
SWITZERLAND



THE HIGHEST
FLOWRATE OF ANY
FRENCH RIVER



LAURENCE
CLOTTE

NEARLY ALL
THE WWTP PLANTS
CONFORM TO STANDARDS



Pesticides
from Beaujolais

Metals

22% OF FRENCH
HYDROELECTRICITY
PRODUCTION



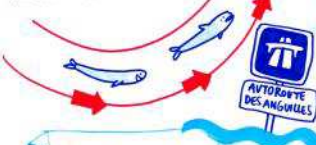
Pollution of
the Isère

Etc.

Rhone

Mediterranean

REOPENING FISH
MIGRATION ROUTES



AUTOROUTE
DES ANGLAIS

POINTING TO TOXIC SUBSTANCES

ELIMINATION
OF EMISSIONS

REDUCTION OF
PESTICIDE
USE

REDUCTION OF
DISCHARGES

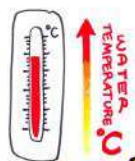
IMPROVING
KNOWLEDGE



MODIFICATIONS of the RHONE

We're now giving new life
to backwaters.

A QUESTION OF SEDIMENT MANAGEMENT



WATER
TEMPERATURE

SCIENTIFIC
studies have proved
the efficiency of
the works



melting glaciers

FISHES RETURN TO
RUNNING WATER

THE
GOAL
HAVE HIGH
QUALITY RIVERS
THAT SATISFY
OUR NEEDS

it's not just
for the pretty
fish.

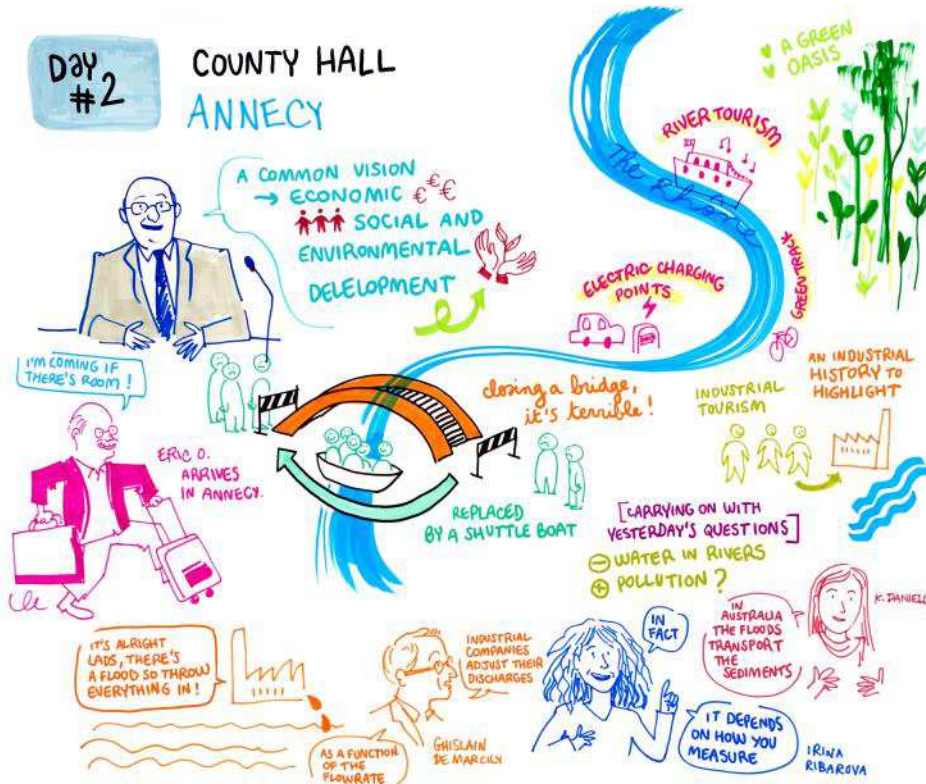
oh, really?



Seine planter

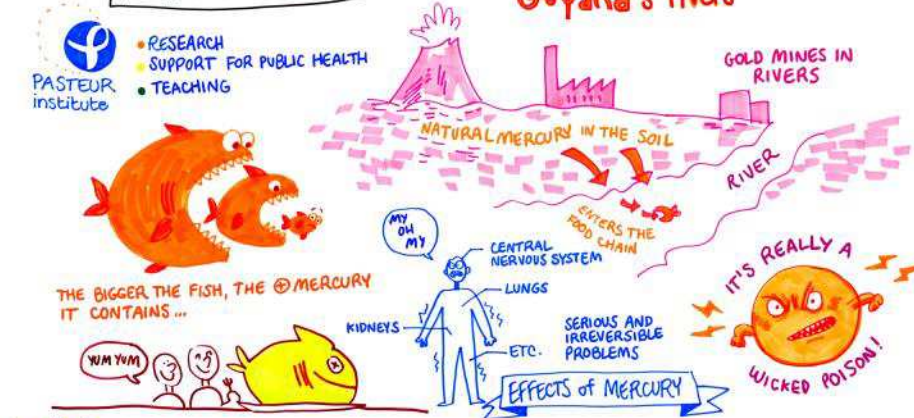
Day #2

COUNTY HALL ANNECY



SPEECH BY MIRDAD KAZANJI

mercury POLLUTION in Guyana's rivers



louise plantin



VERY HIGH CONCENTRATION OF MERCURY CLOSE TO DAMS

> 10 mg/g

80%

of the Amerindian population exceed the levels authorised by the WHO.



MAKING PREGNANT WOMEN AWARE

DEMONSTRATIONS

NO TO ILLEGAL GOLD PROSPECTING

COMPLICATED

A PROBLEM MADE EVEN MORE DUE TO BORDERS

IT'S A PROBLEM IN MANY COUNTRIES AROUND THE WORLD



GOLD PROSPECTION CONCERNS

20,000 people in Guyana

THAT'S A LOT

WHAT CAN WE DO?



ARE THERE OTHER WAYS TO EXTRACT GOLD?

IT'S AN ENTRENCHED PRACTICE WITH A STRICT ORGANIZATION + A KIND OF RITUAL.

setting up cooperatives helps to rationalise practices



FIND A MECHANISM SO THEY DON'T HAVE TO PROSPECT FOR GOLD.

IT'S VERY COMPLICATED BECAUSE IT'S THEIR TRADITIONAL ACTIVITY



THE DEMAND FOR GOLD IS INCREASING



the problem is also the image of the "outlaw"

try to DIALOGUE with the gold prospectors

they are not insensitive to the destruction of their environment

there must be a way of reasoning with them

GO BEYOND THE FACT THAT THEY'RE CLANDESTINE TO SEEK A SOLUTION TO THE PROBLEM THAT DOESN'T NECESSARILY MEAN CALLING ON THE ARMY



ALSO A PROBLEM OF LOSS OF VALUE

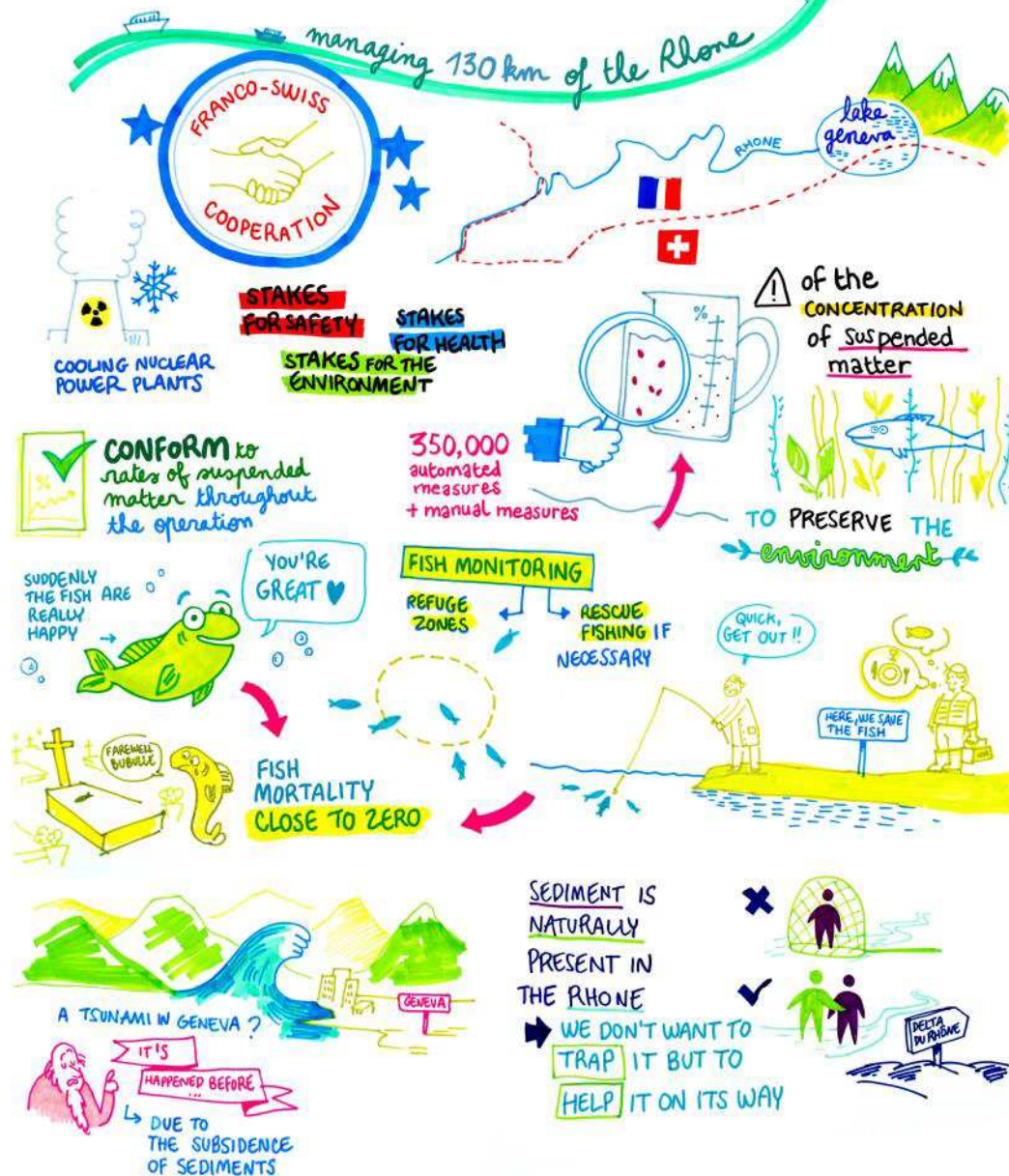
THE GOLD IS NOT SOLD IN GUYANA

louise plantin

SEDIMENT MANAGEMENT

2016-2026 ON THE UPPER RHONE

CVR





RIVER EROSION & POLLUTION IN BANGLADESH



day #3

WE'LL RESUME

NEARLY SHARP

HI-HO

LET'S START AGAIN MY FRIENDS

WE'RE ALMOST ON TIME



about this morning's presentation

WE HAVE TO THINK IN THE LONG TERM FOR US AND FUTURE GENERATIONS.



WE'RE IN THE PROCESS OF CHANGING THE WORLD

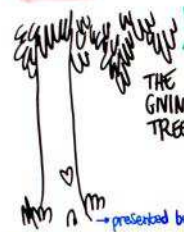
WE CAN'T JUST WAIT FOR BANGLADESH TO DISAPPEAR !?



IT CALLS INTO THE PRINCIPLE OF

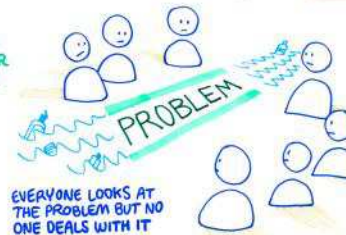
NATION STATES

THE URGENT NEED IS TO REDUCE GREENHOUSE GAS EMISSIONS.



→ presented by Irina →

IT'S LIKE THE BIBLE: EVERYONE HAS THEIR OWN VERSION OF IT.



EVERYONE LOOKS AT THE PROBLEM BUT NO ONE DEALS WITH IT

RIVER POLLUTION



SEDENTARISATION



DEMOGRAPHIC GROWTH



URBAN DEVELOPMENT



DENSIFICATION OF POPULATIONS

ETC.

NO "BIG" POLLUTION PROBLEM BEFORE THE INDUSTRIAL ERA



SOIL SALINISATION



POLLUTION BY METAL

MINE DRAINAGE = A VERY OLD PROBLEM

the landscape of habited areas is no longer "NATURAL"



THERE WAS A BIG PROBLEM OF INSALUBRITY IN THE MIDDLE AGES

(THERE WERE DRAINS IN ANCIENT ROME, BUT NOT ELSEWHERE IN EUROPE).

→ THIS FAVOURED THE DEVELOPMENT OF THE PLAGUE



the Tiber is now remobilising POLLUTION 2,000 years old!

LESSONS TO BE DRAWN FROM THE PAST

UNDERSTAND pollution

AVOID

LIMIT its occurrence

UNDERSTAND IRREVERSIBILITY THRESHOLDS

historical planning



A HISTORIC APPROACH

CURING THE OCEANS AT SOURCE
CARING

THE HEATH of RIVERS

THE HEALTH of the WORLD

the POSITIVE +
& the NEGATIVE -

THE ENVIRONMENT
CAN'T BE SEPARATED
FROM HUMANITY

THE IDEA
OF TIME
PRESENT + FUTURE



STREAMS,
RIVERS, OCEANS,
ETC.

= THE CELLS OF THE
SAME ORGANISM



THE WORLD OF
THOUGHT

THE PEOPLE
OF THE
PACIFIC SEE
THEMSELVES
AS THE

VOICE OF THE WORLD



the sloth
is happy



THE OCEAN IS BENEATH THE EARTH
IN SUMERIAN COSMOGENY.



IT DOESN'T
POLLUTE

1/3 OF THE
WORLD'S DWELLING
ARE MADE OF
EARTH!



agriculture
& rivers

the COMMON SENSE



THE QUESTION
OF SALT

WHAT IF WE PREVENTED THE RIVER
FROM FLOWING TO THE SEA?



IT FACILITATES
THE LIFE OF
THE WRITERS

DON'T BE TOO
INTELLIGENT

HEY,
I'M NOT
DUMB

the notion of
PLEASURE

GOOD WATER
provides PLEASURE

HEALTHY WATER → SPORT
→ HEALTHY PEOPLE!



the "martyr"
test

« Everyone turns their own dreams into reality
as much as they can »

La Fontaine

louise plantin



WHAT WILL BECOME IFGA THINK TANK + DO TANK

GENERAL THEMATIC SESSIONS



⊕ SPECIFIC SESSIONS SATISFYING A DEMAND



SURVIVAL & development

Communication is important

we stay at 2 sessions a year NO MORE!

we've moved on to CONCRETE ACTS

make a demo of what we propose?



we're not just going to wait for someone to ring the doorbell.

Greater Paris

cleaning the sea



publications → web site

pedagogy

"COUPLED" OPERATION

an action session

a reflection session



ADVANTAGES & SPECIFICITIES



WE HAVE AN EXTREMELY SMALL WORKFORCE

ASSISTING PHD STUDENTS.

WHAT IS THE DELIVERABLE? WHO IS IT FOR?

pooling good practices the chance to meet sharing experiences

BUT WHAT DOES THE GROUP REPRESENT TO THE OUTSIDE?

MAKE A SPLASH

IRRITATE LIKE A FLY

BE + VISIBLE

louise plantin



A PRECIOUS GROUP

A GENERATOR OF DISRUPTIVE IDEAS HOW SHOULD WE USE our time?

PROPOSE EXACTLY WHAT WE DO = SESSIONS

WHY DO WE DO WHAT WE DO?

DEFINE WHAT OUR IDEAS ARE ON RIVERS AND climate change.

CREATE the Nobel Prize for Rivers

a call for projects could be launched every year to solve a given problem

THERE ARE A LOT OF SCIENTIFIC PRIZES BUT WE COULD HAVE THEMES LIKE "RIVERS & PEOPLE".

TRAFFIC LIGHTS TO INDICATE INITIATIVES ON THE WEB SITE

idea of self-initiative

louise plantin



should we position ourselves as consultants?

IFGR consulting



HI, IT'S US.

NO, WE'RE NOT CONSULTANTS.

A FRIENDLY, EXPERT AND SIMPLE GROUP



DRAW UP INNOVATIVE SPECIFICATIONS



A QUESTION OF LANGUAGES AND DISSEMINATION



REWARD AN ACTION OR PROJECT?



WELL, DONE PRETTY LITTLE RIVER, YOU'VE BECOME A GREAT RIVER!

GIVE FUNDS TO BE INTERMEDIATE

WHO HAS AN IDEA OF HOW TO SOLVE THE PROBLEM OF MERCURY?

ME!

ME!

ME!

WELL-DONE!

ONE MUSTN'T BE LAZY

AND IT'S PAINSTAKING

(julien never agrees)



WELL, THAT'S IT, THE SESSION'S OVER!

let's put on our tuxedos and have a drink.





INITIATIVES POUR L'AVENIR
DES GRANDS FLEUVES
INITIATIVES FOR THE FUTURE
OF GREAT RIVERS

2, rue André Bonin – 69004 Lyon – France
Tel: + 33 (0)4 72 00 69 48 – contact@iagf-ifgr.org

www.initiativesfleuves.org

Follow us

