Outline

River fragmentation and flow regulation

Difficulties in dealing with water crisis in Brazil

Pressure for water transfers

Some Experiences of Water Transfers – Assessing water transfer and their effects

What then would be the path toward an interbasin water transfers?

Summary – What is “Intelligent” water transfer?
Global HydroLab developed two indicators: the River Regulation Index (RRI) and the River Connectivity Index (RCI). This figure shows a preliminary assessment of the combined effect of river regulation and fragmentation from current and future dams (future dams based on list of hydropower projects under construction).
DIFFICULTIES IN DEALING WITH WATER CRISES IN BRAZIL

Too much emphasis on infrastructure

Infrastructure should be viewed as part of the solution, but it may become a problem if we do not take into account the climate change scenarios*.

The emphasis on big infrastructure overshadows the importance of water management. Focus is on the increase of water supply, but what about demand management?

Water Sector: Take water where, for what and for whom? Development model should be in the spotlight.

Water Management at local scale

At this scale, farmers use water as long as it is available. When water is no longer available, they look for new sources.

Need for rethinking the water governance at this level: more engagement at the municipality level is needed!

Institutional Challenge

Need for more coordination among Institutions, in particular, when they belong to different levels of administration (Municipalities, States and Union).

Most institutions operate the same way when they were created and they have to face new challenges (environment, society, ...).
DIFFICULTIES IN DEALING WITH WATER CRISSES IN BRAZIL

Transparency regarding problem and decisions

The negative of the crisis! (BRA: Southeast & Northeast)
The resistance to using the right terms to describe the situation:

<table>
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<tr>
<th>Water Rationing</th>
<th>→</th>
<th>Conscious use of water</th>
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<tr>
<td>Dead volume</td>
<td>→</td>
<td>Strategic reserve</td>
</tr>
<tr>
<td>Rotating water supply</td>
<td>→</td>
<td>Scheduled system maintenance</td>
</tr>
</tbody>
</table>

Use of the Climate Information

Long-Term:
The Climate Information is not, in general, incorporated into the decision process. There is a long way to go in order to make this happen!

The results are not always well received:
the results can point out that current decisions may be wrong, but one has to consider that such analyses were not available when the decisions had to be made.
Pressure for water transfers

The case for water transfers

New demands must be met primarily through either the increase of efficiency in use or reallocation of existing supplies.

If we restrict water use and promote water savings, is it still necessary to import water from other basins?

In many cases, water use in the recipient basin is not evaluated prior to the construction of a water transfer project. This may contribute to the continuity of unsustainable water use practices and, over time, increases the “thirst” for more water.

Water transfer schemes attempt to make up for water shortages by constructing elaborate systems of canals, pipes, and dredging over long distances to convey water from one river basin (the donor basin) to another (the recipient basin).

Under certain circumstances, large-scale water transfers fulfill an important role in providing water to those in need, but their benefits may be doubtful.
Pressure for water transfers

Water transfers promoting agricultural production in water poor areas

With many IBTs being driven by agricultural water demands, it is important to assess the economic viability of agricultural practices in the proposed recipient basin.
Some Experiences of Water Transfers – Assessing water transfer and their effects

<table>
<thead>
<tr>
<th>IBWT Project</th>
<th>Donor Region</th>
<th>Recipient Region</th>
<th>Purpose</th>
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<tr>
<td>Colorado Big Thompson Project</td>
<td>Colorado River Basin</td>
<td>South Plate River Basin</td>
<td>Irrigation, Industry, Hydropower Generation</td>
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<td>ChaViMoChic (Peru)</td>
<td>Santa River Basin</td>
<td>Inter-valleys of Chao, Virú, Moche and Chicama</td>
<td>Agriculture, Agroindustry, Water Supply, Industry, Hydropower Generation</td>
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<td>São Francisco River Diversion Project (Brazil)</td>
<td>São Francisco River</td>
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<td>Trasvase Daule-Santa Elena (Equador)</td>
<td>Daule River Basin</td>
<td>Santa Elena Peninsula</td>
<td>Irrigation, domestic and industrial uses</td>
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<tr>
<td>Tagus - Segura Transfer</td>
<td>Tagus</td>
<td>Segura</td>
<td>Irrigation, Urban Water Supply</td>
</tr>
<tr>
<td>El-Salam Channel in Sinai (Egypt)</td>
<td>Nile Delta and Nile River Basin</td>
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<td>Lesotho Highlands Water Transfer to South Africa (Southern Africa)</td>
<td>Orange/Senqu Basin</td>
<td>Vaal River System</td>
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<tr>
<td>The South-to-North Water Transfer projects (China)</td>
<td>Yangtze River (Chang Jiang) basin</td>
<td>North and Northwest China</td>
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<td>Snowy Mountains Hydroelectric Scheme (Australia)</td>
<td>Snowy River and Murrumbidgee River Basins</td>
<td>Murray River Basin</td>
<td>Agriculture, Hydropower Generation</td>
</tr>
</tbody>
</table>
What then would be the path toward an inter-basin water transfers?

- Reducing water demands;
- Reducing losses in the water supply network (urban and rural networks);
- Increasing water use efficiency for domestic/urban (water saving practices) and agricultural water uses (increasing the share of the water actually taken up by plants, and producing more crop per unit of water);
- Implementing educational programs;
- Recycling waste water;
What then would be the path toward an interbasin water transfers?

• Supplementing water supplies locally (e.g., rainwater harvesting; water conservation; restoring traditional water management structures; desalinization);

• Reviewing policy and regulations;

• Using the water management instruments to promote efficiency (e.g., improving monitoring of water uses and increasing water prices);

• Implementing conjunctive use of surface and groundwater resources where possible;

And then…
What then would be the path toward an interbasin water transfers?

INTER-BASIN WATER TRANSFER.

“The order above seems to be a natural one to follow, however it does not take into account the political capital in place for the water transfer decision, which may not be there in the future. In this case, either you take the decision in favor of the IBWT at the current moment, or simply hope for a forthcoming political opportunity.”

Martins et al., 2021.
Summary - What is “Intelligent” water transfer?

In summary, an intelligent IBWT should be implemented in the context of more general sustainable development strategies and Integrated Water Resources Management.

Negotiation between donor and recipient stakeholders should be done and agreements reached previously to the construction of the projects.

However, one should also consider the political momentum for the water transfer decision, which may not be favorable in the near future.