

In water disputes, researchers need to be at the table

Increasingly, nations are squabbling over water resources. Science can help to achieve the best outcome for all concerned.

Forty-six years. That's how long it took the United Nations to organize a high-level conference on water. The 3-day event, held last week in New York, was brief compared with its 12-day predecessor, which took place in Mar del Plata, Argentina, in 1977. That meeting helped to catalyse the drafting of the UN's 1992 water convention, an international agreement through which countries agree to cooperate on the use and protection of shared waterways. Delegates to this month's conference did not make any binding commitments, but countries are converging on several ideas. One is to establish a panel of scientists to regularly advise on water issues. Another is for the UN to appoint a 'water envoy', a high-level diplomat representing secretary-general António Guterres. The conference also increased the visibility of the 1992 convention.

Each of these is an important step. The appointment of a UN envoy would send a powerful signal that this is a hot topic, high on the agenda of world leaders, and that a boost to the science is overdue. For decades, there's been much rhetoric around applying science to water resources at the intergovernmental level, but action has been piecemeal. The 1977 conference report (known as the Mar del Plata Action Plan) and the 1992 convention recognize the need for research and development. This need was most recently incorporated into the UN's Sustainable Development Goals (SDGs) in 2015; SDG6 aims to achieve equitable access to safe water and sanitation by 2030. These agreements also mention the need for countries to share data – for example, on river flows, weather and climate, and water quality. But with some two billion people still lacking safe water in their homes, SDG6 is a long way from being achieved.

The necessity of studying and sharing such data is underscored by a Comment in *Nature* written by climate scientist Johan Rockström, economist Mariana Mazzucato and their colleagues (see page 794). Among other things, they describe how land-management practices in one country can impact atmospheric water flows in other countries. But to properly take advantage of such knowledge, countries need to both collect and share data.

One option proposed by the UN's science agency UNESCO is modelled on the Intergovernmental Panel for Climate Change, and would produce periodic global literature reviews to be signed off by governments. Such an idea needs rigorous analysis and testing. Separately, there is

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also a real need for input from independent scientists on water disputes between nations.

At the start of the year, Mohammed Basheer, a water-resources economist at the Humboldt University of Berlin, and his colleagues published a modelling study addressing a protracted dispute over Africa's largest hydroelectric dam on the Nile River. The work showed how Egypt, Ethiopia and Sudan, the three countries involved, could benefit if each was willing to compromise (M. Basheer *et al. Nature Clim. Change* **13**, 48–57; 2023). However, it's not clear whether these recommendations will find their way into negotiations. Relations between Egypt and Ethiopia are fraught, and there is no clear path for the provision of independent scientific advice on the dam.

A study by Patience Mukuyu at the International Water Management Institute in Pretoria, South Africa, and her colleagues, published in early March, reaffirms that relatively few countries that share watercourses are cooperating, such as by sharing data (P. Mukuyu *et al. Water Int.* <https://doi.org/j36p;2023>). Co-author Alistair Rieu-Clarke at Northumbria University, UK, who studies transboundary water issues, emphasizes that there are demonstrable benefits to data sharing. In September 2021, four African countries – Gambia, Guinea Bissau, Mauritania and Senegal – agreed to cooperate (including by sharing data) on a giant underground aquifer, which covers more than 300,000 square kilometres and supplies water to 80% of their combined populations.

The list of transboundary water disputes is lengthening. The Indus Waters Treaty, a 63-year-old agreement between India and Pakistan on sharing the Indus River's waters, is in trouble. The melting of glaciers as a result of climate change is affecting river flows; at the same time, both countries have plans in the works to build dams. In January, India announced that it wants to renegotiate the treaty to take account of a changed environmental and geopolitical situation, rather than work within what it sees as an outdated framework. However, Pakistan wants to continue to resolve disagreements using the treaty's dispute-settlement procedures. Elsewhere, Iran, Iraq, Syria and Turkey have long been at odds over the shared Euphrates–Tigris river basin, where water availability will also be affected by climate change.

The idea of a UN water envoy and science panel offer an opportunity to make a difference to such disputes. More countries that share water resources also need to sign and ratify the 1992 UN water convention. Last week, Iraq, Nigeria and Panama were among ten countries to either do so or announce that they intend to do so much.

The UN and its member states have made a positive start. Increased visibility of the 1992 convention will pay dividends, as will boosting research to help policymakers to better understand and resolve water crises, although the devil will be in the detail. Science, as Basheer told *Nature* earlier in the year, can show countries how to “help each other, look after each other and look out for each other”, when water disputes are being discussed. Ultimately, countries need to accept that scientists must have a seat at the table during these discussions.