

Managing water across boundaries

Why water ethics matter

Water is essential for life, and the rivers are the veins of our planet, yet vital questions continue to arise over ethical and fair river basin management. The situation is now exacerbated by stark climate change scenarios. A recent study by Professor Alexandra Aragão at the University of Coimbra examines the central ethical challenges posed by the joint management of shared river basins in the Iberian Peninsula. Through her research, Aragão has produced an important catalogue of legal principles in relation to water ethics to help navigate these challenges and to guide future management agreements of shared natural resources.

Rivers are essential for human life. They sustain us by providing water as well as offering several vital ecosystem services: for irrigation in agriculture, for transportation, to produce electricity, and as a food source. Rivers can flow across and along multiple countries with no mind for human borders, and as a result, they often pass through densely populated areas, transecting various political territories and social cultures. Inevitably, human activity in and around these rivers can have a negative impact on water quantity and quality and surrounding ecosystems. As you move further downstream, these negative impacts tend to accumulate, creating river segments of varying water quality. This creates a panoply of management issues and conflicts which are both operational and ethical in nature, especially when rivers cross or define country boundaries.

Five large river basins are shared between Portugal and Spain: Minho/Miño, Lima/Limia, Douro/Duero, Tejo/Tajo, and Guadiana. The sources are all located in Spain, whereas the mouths of these rivers are either fully or partially located in Portugal. Because Portugal is generally less industrialised than Spain, the pollution disperses along the way to the river mouth. As a result, these shared river basins need to be jointly managed which creates numerous challenges. In a recent paper, Alexandra Aragão, a Professor in the Faculty of Law at the University of Coimbra, investigated the main ethical challenges faced in the joint management of these shared river basins. In addition, she analysed a set of principles of international environmental law that can

be used to address these challenges and provide answers for the management of shared river basins in the future.

HUMAN ACTIVITIES, WATER, AND CLIMATE CHANGE

The five river basins shared by Portugal and Spain are impacted by human activities on both banks and along the entire course of the rivers. Bridges, dams, sand and water extraction, and fishing activities all have a direct impact on the rivers, causing changes in the quality and quantity of the water as well as the surrounding habitats. Activities such as deforestation, road construction, the use of fertiliser in agriculture, and industrial pollution can all have detrimental effects on rivers and the delicate ecosystems they serve.

Climate change is confounding these issues yet further. In the Mediterranean area, these impacts include drought, water scarcity, desertification, flooding, and heatwaves. Climate change is also having an impact on the salt levels found in the soil and on the ability of non-native flora and fauna to flourish, leading to a proliferation of invasive species. The effects of climate change are forecasted to worsen in areas that are already suffering as a result of the impacts of human activities. Together, these changes are leading to longer water stress periods, a reduction in the ecological functions that these rivers can provide to the surrounding ecosystems, and a decline in the services that benefit human communities.

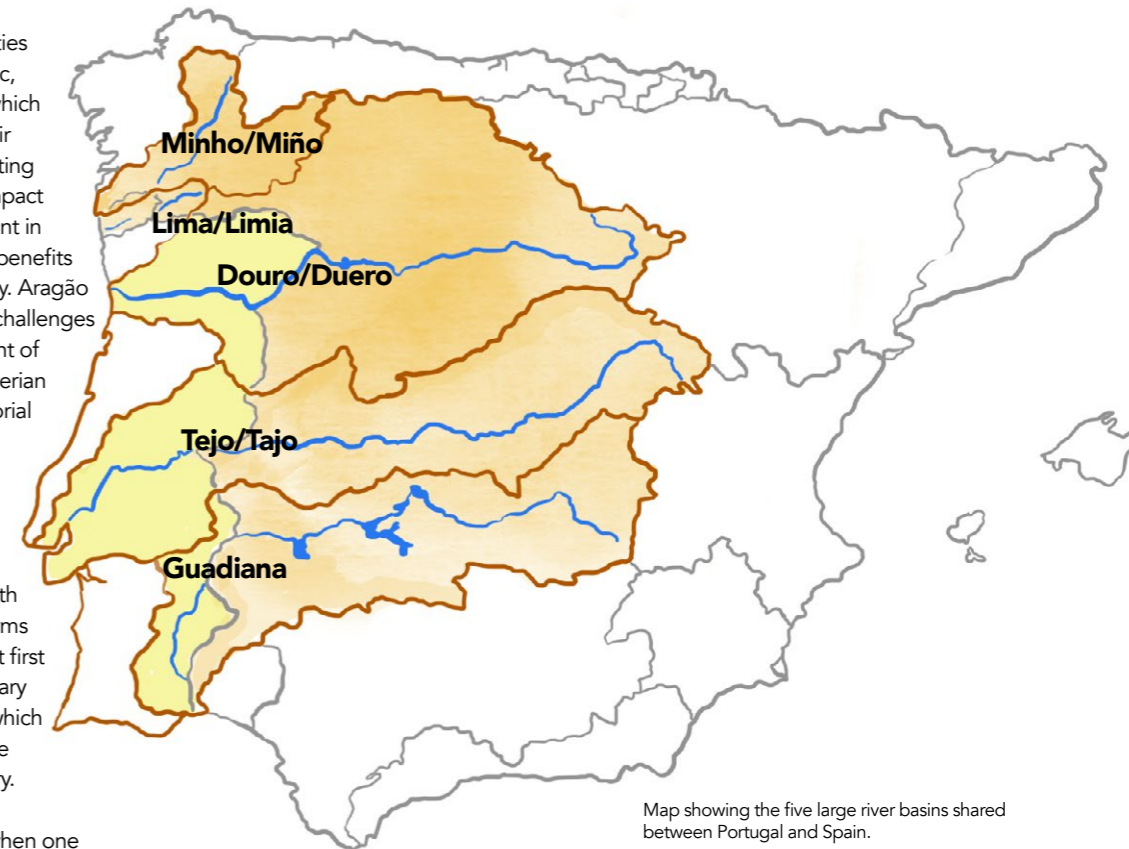
ETHICAL CHALLENGES IN WATER MANAGEMENT

The joint management of shared water sources, such as river basins, can be

highly difficult as communities can have different economic, social, and cultural needs which condition how they use their resources. However, regulating the human activities that impact shared resources is important in preventing harm or loss of benefits to the neighbouring country. Aragão identified the main ethical challenges regarding joint management of shared river basins in the Iberian Peninsula. These are: territorial equity, geomorphologic equity, demographic equity, interspecies equity, development equity, intergenerational equity, and cultural equity. It is worth looking at each of these forms of equity in more detail, but first we can categorise the primary types of territorial conflict which arise depending on how the river flows through a country.

Territorial issues can arise when one country is upstream of another and the activities that it carries out in or around the water directly affect the country downstream, which is observed with the rivers Tejo/Tajo and Douro/Duero. In other cases, such as with the Guadiana river, the river forms the boundary line between two countries, and the thalweg – or the line of lowest elevation within a watercourse – can be altered by human activities such as sand extraction, which can then lead to territorial conflicts.

Geomorphologic, development, and demographic issues can arise when one country has enhanced access to the river compared to another. In the case of geomorphologic issues, this is often due to specific landscape features. For example, one country could have access to the river across flood plains while the other could be blocked by land formations such as rocky cliffs. Economic development in the areas surrounding the river can also lead to inequalities in river resources. This could include water-intensive industries that can contribute to overexploitation of the river at one site, impacting river users further downstream. Similar problems can also be caused by demographic issues where higher population density at certain points along the river can lead to



Map showing the five large river basins shared between Portugal and Spain.

overexploitation of river resources which negatively impacts downstream users.

Cultural, interspecies, and inter-generational issues are also important ethical challenges to be considered in water management. Cultural differences can lead to different community practices that sometimes cause social conflicts which may result in broader sociopolitical disputes. This is largely concerned with how a particular culture relates to bodies of water more generally: is the river appreciated as a source of life, or is it simply treated as a resource for

management must consider the various forms of life which depend upon the river for their subsistence. Finally, there is also the intergenerational aspect to consider. The activities that now have cumulative impacts on the rivers will cause larger damage to the river ecosystems in the future, generating graver impacts for generations to come.

LEGAL PRINCIPLES AND WATER ETHICS

In the European Union, the water framework directive is an important source of legal guidance when it comes

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exploitation and sewage? There are also ethical issues surrounding other species that depend on river ecosystems. Human activities can have vital impacts on other animals and plant life that populate the rivers: an ethical approach to river

to river management. The directive applies both to national and international rivers and river basins, and applies both to transboundary water courses shared among Member States and to those rivers shared with non-EU States. Worldwide,



Territorial issues
(longitudinal)



Demographic issues



Territorial issues
(cross-sectional)



Cultural issues



Geomorphology issues



Interspecies issues



Development issues



Intergenerational issues

The major ethical challenges and equity goals regarding joint management of shared river basins.

international treaties and declarations also contain principles and guidelines on joint management of shared natural resources. In her research, Aragão recognised the importance of a holistic appraisal of the legal principles enshrined in European legislation and in international conventions, with a view to offering

savannahs, wetlands, lakes, coastal waters, etc). International treaties, conventions, and declarations were scoured for information on principles directly or indirectly related to river basin management. Once identified, the legal principles needed to be linked to the equity goals and the related

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clearer guidance on judicious and ethical transnational river management.

Legal principles are one of the most important sources of law. They exist in international treaties, conventions, and declarations and can be used to govern relations between states as well as to respond to ethical concerns raised as a result of harmful human activities. Aragão used this information to develop a catalogue of legal principles on shared river basins specific to the Iberian Peninsula (Spain and Portugal) which can be escalated to the joint management of any shared natural resources (forests,

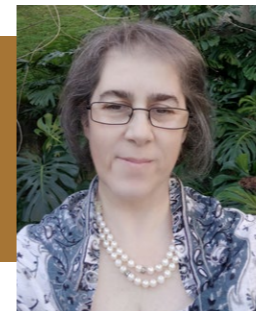
ethical challenges. As a result, ten relevant legal principles were identified and grouped into four main themes: (1) Principles on interstate relations, (2) Principles on access to the rivers, (3) Principles on ecological equilibrium, and (4) Principles on risk management.

This catalogue of principles is a powerful tool that can be used to respond to ethical challenges and enable countries to reach equity and sustainability goals. These principles could be incorporated into any agreements or plans that countries have relating to international rivers or shared natural resources,

which could lead to enhanced equity in relationships between people as well as between people and nature. As a result, the principles have two main roles. The first is to help shape future international agreements for shared river basin management, with a view to entrenching ethics and equity in all future decisions. The second is to limit the ability of states to make rules on acceptable river uses at their own discretion. This would mean considering other interests in any river-impacting decisions: not just human communities, but also the other species dependent on the river, as well as future generations who expect to rely on the river in the coming years and decades.

TAKE HOME MESSAGE

Managing our rivers has become increasingly difficult as climate change exacerbates the negative impacts that human activities are already having. Working together to resolve these issues, however, is not always easy, especially when water bodies such as rivers cross international boundaries. Legal principles can be used to respond to ethical challenges, enhancing equity in neighbour's relationships both in the present and in the future, and thus helping countries to reach sustainability goals. By studying the legal and ethical nuances of our relationship with shared river basins, Aragão provides a cardinal framework which can contribute to the peaceful coexistence of neighbouring states, as well as harmonious human connection with river-based ecosystems and fairer intergenerational relations.



Behind the Research

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Research Objectives

Professor Alexandra Aragão researches the central ethical and legal challenges posed by shared river basins in the Iberian Peninsula.

Detail

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Bio

Alexandra Aragão is Professor at the Faculty of Law of the University of Coimbra, Portugal. She teaches environmental law, ecoliteracy and risk governance. She is vice-director of Portuguese environmental law

review, and she coordinates the interdisciplinary network 'JUST-Side' on *Territorial Justice through spatial data infrastructures* in ten Iberian and Latin American countries and coordinates projects with NGOs on river sustainability.

References

Aragão, A, (2021) Ethical issues and legal principles regarding joint management of shared river basins in the context of climate change and water scarcity in the Iberian Peninsula. *Med. Geosc. Rev.* 3, 319-337 doi.org/10.1007/s42990-021-00060-x



Personal Response

Which ethical issue would be the most challenging to overcome in the context of the Iberian Peninsula?

Development issues, considering that the Spanish side (upstream) is more industrialised, consumes more water and pollutes more than the Portuguese side (downstream). Besides, the water flow regime is very irregular due to the dams for irrigation and hydropower. The practical implementation of the legal concept of 'ecological flow' (a minimal continuous river water flow to support the ecosystems) contained in the bilateral convention on shared rivers, isn't helping much. There is almost no water running down the river beds for several days followed by a sudden weekly flooding. Climate change and longer dry seasons are aggravating this panorama.

