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Legal Perspectives and Considerations in Climate Action

Legal Perspectives and Considerations in Climate Action

The intersection of climate action and legal frameworks is crucial in tackling climate change. Legal perspectives offer structured, enforceable commitments and accountability mechanisms, guiding policy responses across local, national, and international levels. This ensures climate action is effective, fair, and aligned with broader socio-economic and environmental goals.

The Role of Legal Frameworks in Climate Action

Legal frameworks form the foundation of climate action by establishing enforceable commitments and accountability mechanisms. They facilitate the adoption of best practices, encourage the spread of norms, and allow policies and laws to evolve based on new insights and needs. At the national level, legal frameworks make state commitments more visible and credible, ensuring transparency and domestic scrutiny.

International treaties and conventions, such as the United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Agreement, play a significant role in shaping global climate action. These agreements provide a framework for ongoing negotiations and evolving climate obligations.

Key principles of international environmental law, including prevention, precaution, the polluter-pays principle, and common but differentiated responsibilities (CBDR), guide legal responses to climate change. These principles ensure that states take proactive measures to prevent environmental damage and allocate responsibilities fairly.

National Legislation and Policies

National climate action is embedded within broader legislative contexts, including sector-specific laws and policies. The rapid adoption of national climate laws post-Paris Agreement shows the mutual reinforcement between international commitments and national implementation.

Shared Insights

Four guest authors provide insights on current legal frameworks that shape climate action and consider them against the water- energy-food nexus, public-private-partnerships, transboundary cooperation agreements, integrated water resources management and feed-in tariffs and renewable energy certificates.

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Framework legislation at the national level can bridge sectoral divides, promote data sharing, and foster collaboration across various stakeholders.

National legal responses leverage existing laws related to environmental protection, human rights, health, and other areas to advance climate goals. This approach mobilizes a wide array of legal tools to support climate action while providing avenues for citizens and NGOs to hold states accountable. For example, integrating the Water-Energy-Food (WEF) nexus into national policies ensures that responses are holistic and address interconnected challenges.

Challenges and Opportunities

Gaps persist between international and national approaches to climate action. Effective legal frameworks require strong cooperation and enforcement mechanisms at both levels. The principles of international environmental law emphasize the importance of preventing environmental damage and protecting human health and ecosystems.

Addressing the WEF nexus within climate action presents unique challenges. Legal frameworks must recognize and manage the interdependencies and trade-offs between these essential resources. This requires integrated legal and policy responses that harmonize efforts across sectors and scales, ensuring sustainable and equitable resource management.

International courts and tribunals play a key role in climate-related cases, enforcing state obligations and protecting human rights. Advisory opinions from bodies like the International Court of Justice and the Inter-American Court of Human Rights provide valuable guidance and benchmarks for state actions, reinforcing the legal foundations of climate commitments.

Integrating legal perspectives into climate action is essential for creating enforceable commitments, fostering accountability, and guiding coordinated responses at all levels. By leveraging international agreements, national legislation, and comprehensive policy frameworks, the legal system can significantly contribute to mitigating climate change and promoting sustainable development.

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Author Bios

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Dr. Clare O'Hare is an international finance lawyer and Visiting Associate Professor and Fellow at the University of Notre Dame London Law Programme. She has over 15 years of experience working with clients across governments, international organisations and the private sector with particular expertise in emerging markets. Her research interest lies in understanding how markets emerge and develop and the ways in which legal systems create institutional frameworks to reduce risk and increase trust.

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Legal Frameworks for Climate Action

By: Clare O'Hare

As a multi-faceted challenge, and one that impacts differently at the local, national, international, and global level, legal and policy responses are necessarily different. Yet, legal frameworks are important, as they can provide enforceable commitments and responses at a variety of levels. Furthermore, the adoption of responses at the local, national, and international level do not operate in isolation – each can have an impact on further steps. This can result from the diffusion of norms, and adoption of, if not "best practice", then, at the very least, "current practice" across countries and within countries. There is also a process of learning that comes from the adoption of national legislation and policies, which can serve to improve later iterations of treaties, legislation, and policies. Finally, but by no means of less importance, legal frameworks can provide a distinct accountability mechanism by giving individuals and groups with recourse to accountability holding bodies, including domestic and international courts, which may have the power to order corrective action.

Despite the more recent focus on specific "climate" related legal responses, including in National Climate Action Plans, the growing understanding of the interconnected nature of climate change to significant challenges the world is facing highlights how the legal frameworks for climate action can be found in a multitude of texts and instruments. Further, this understanding has also led to deeper insights into how international level frameworks can be implemented or used at a national legal level.

International Agreements and Treaties

The Water-Energy-Food nexus – and climate action more broadly- requires management of resources that are interlinked and a recognition of the diverse areas that can contribute to a response [1]. At the international level, there are broadly two types of legal instruments - hard and soft law instruments. Hard law instruments are generally considered to be those that create rights and duties on states, whereas soft law instruments are not legally binding. While soft law instruments do not have force of law, they are important in creating and setting accepted international norms, as they often represent statements of intent or current opinion, which may later be integrated into a hard law instrument or adopted by nation-states in domestic legislation [2].

It is also important to note that not all parts of a "hard law instrument" will create binding obligations, thus it is important to clearly read all parts of a legal text to identify whether a particular section is a binding commitment or a more aspirational statement of intent.

The United Nations Framework Convention on Climate Change (UNFCCC) is an example of the mixed hard and soft law approach. The framework approach provides for an on-going process of negotiation between states and for the continual adoption, amendment and objective setting of climate related obligations and goals. This is done through the Conference of Parties (COP) process, which most famously resulted in the Paris Agreement. This process can also allow for the involvement of other stakeholders, such as NGOs to input and inform the framework.

Beyond the UNFCCC, there is an extensive array of international instruments and bodies created that touch upon aspects of climate action. These include those international instruments that established organizations such as the World Meteorological Organization, the earliest of the legally binding climate instruments the 1979 Convention on Long-Range Transboundary Air Pollution, the United Nations Convention on the Law of The Sea and also the establishment of the Intergovernmental Panel on Climate Change (IPPC), which is part of the UN system [3]. Other instruments, which provide road maps for action, include the 1992 United Nations Convention on Biological Diversity which recognizes transboundary harm and also requires states to develop national plans related to biological diversity [3].

There are also regional components to the international framework, with regional instruments providing a mechanism for developing responses to specific regional challenges. International law climate frameworks also draw on traditional human rights instruments, as climate change has a direct impact on recognized human rights and on the achievement of the Sustainable Development Goals. In many cases, the individual rights provided in international human rights treaties may be used to ground claims and demands for action in domestic and international courts.

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National Legislation and Policies

National and international climate frameworks and policies can be mutually interdependent, as the rapid introduction of national climate change laws since the adoption of the Paris Agreement suggests [4]. The integration of responses at a national level makes state commitments more visible and transparent to a domestic constituency. By integrating commitments domestically, the commitment becomes more credible, as those making the commitment can [in theory] be held accountable at the domestic level [4].

However, just as at the international level, climate action responses can also be fragmented at the national level, as responsibility for political action is often addressed in sectoral specific ways. As a result, approaches to national legislation and policies need to shift towards a nexus approach, that recognizes the interconnected and interdependent nature of the challenge, implements data sharing, as well as operationalizing possible synergies across areas and stakeholders [5]. Various approaches can be used to overcome the dangers of a siloed implementation of climate policy responses. Specific framework legislation provides one institutional mechanism for bridging sectoral isolation, as it can set out a climate governance structure to underpin longer-term climate goals.

As law is frequently a reactive policy response, legal frameworks for climate action, in particular in the water-energy-food nexus, may also be built on existing laws, rights, and policies. While waiting for an overarching climate response to be formulated, national strategies or polices can harness a variety of existing laws to pursue climate action, including environmental, human rights, health, agriculture, financial, disaster response and energy laws to implement climate goals that recognize the nexus between water, energy and food. This approach can also bridge operational gaps by identifying existing legislation and policies that support action in a variety of policy areas. On the other side, these existing rights or commitments by states can provide avenues for citizens and NGOs to ground actions against the state, and in certain circumstances, private actors in climate-related claims. These rights can include, for example, the right to bodily integrity, property rights, consumer protection and financial regulation, and existing policy commitments may be as diverse as those on public transport, sanitation, financial regulation, or disaster response.

The tradition of using existing laws to respond to new and novel scenarios and challenges is a frequent occurrence [6]. Courts in a number of countries have also issued directives to national governments to abide by climate frameworks and policies [7]. In other circumstances, regulators are requiring greater disclosure on climate-related matters from both states and private actors, which can further assist in decision making. One weakness of this approach is that it may produce a piecemeal response, rather than a holistic nexus response.

Gaps continue to exist however between the international and national level approaches. As a global issue, a coordinated international response is required, yet accountability for, and enforceability of commitments, in this arena is most effective, and primarily available, at a domestic level. For legal frameworks to be effective, cooperation and/or enforcement at the domestic level and international level is required.

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Legal Considerations in Addressing the Water-Energy-Food Nexus

By: Diego Jara

The Water-Energy-Food Nexus (WEF Nexus) constitutes a holistic approach to address the interdependencies and trade-offs between the most essential resources to ensure life and sustainable development. As global population increases, the need for water, energy and food becomes a priority in particular for developing countries that require these resources for economic growth [1].

In this scenario, the WEF Nexus represents a framework to guide countries in formulating adequate management plans, strategies, policies, laws and agreements that enable coordination across sectors and scales to ensure water, energy and food security in the face of climate change [2].

The WEF Nexus can also facilitate the implementation and achievement of the Sustainable Development Goals (SDGs) in particular SDG 6, SDG 7 and SDG2 by materializing these global commitments in national and local level instruments and actions [3].

The regulation of water, energy and food can be challenging in particular for countries lacking strategic coordination mechanisms across sectors and scales where single-sector development can adversely affect people and nature. Under a WEF Nexus approach, countries can recognize the mutual interdependencies between water, energy and food and secure a balance in their development and management in a coherent and harmonious manner. This already complex scenario becomes much more convoluted in the context of transboundary waters, where rivers, lakes and aquifers span across country political borders and where unilateral and single-sector development approaches serve as breeding ground for potential tensions and conflicts.

This section provides an overview of the legal considerations to be assessed and put in practice for countries negotiating agreements focusing on the water, energy and food sectors in transboundary waters to ensure cooperative management approaches and prevent conflict.

Water Rights and Access

Water is essential for life, food production and energy generation. At least 2.2 billion people lack access to safely managed drinking water and approximately 3.5 billion people do not count with safely managed sanitation systems [4].

The right to safe and clean drinking water and sanitation as a human right that is essential for the full enjoyment of life and all human rights was recognized by the United Nations General Assembly in July 2010, reflected in SDG 6 particularly in Targets 6.1 and 6.2 [5]. Ensuring the human right to water and sanitation is a global priority that requires major national efforts to include it as a core element on management plans, policies and laws.

The human right to water is also crucial in the context of transboundary waters as more than half of the world's population lives within the territory of transboundary rivers and lake basins. Humanity crucially depends on the effective management and governance of shared freshwater resources for drinking water, food security, health, livelihoods and quality of life [6].

In this sense, it is imperative that States sharing waters negotiate and develop effective cooperation mechanisms to ensure water for people, nature and sustainable development.

The global instruments to regulate transboundary waters are the Convention on the Law of the Non-navigational Uses of International Watercourses (UN Watercourses Convention) and the Convention on the Protection and Use of Transboundary Watercourses and International Lakes (UNECE Water Convention). These instruments contemplate obligations on the right to water that are reflected in the principle of equitable and reasonable utilization and the principle of no significant harm.

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The UN Watercourses Convention (Article 5) guides States on how to share freshwater resources providing factors relevant to attain such equitable and reasonable utilization (Article 6) including "(b) The social and economic needs of the watercourses States concerned, (c) The population dependent on the watercourse in each watercourse State" emphasising the importance of vital human needs (Article 10.2) In the event of a conflict between uses of an international watercourse, it shall be resolved (...) with special regard being given to the requirements of vital human needs" [7]. Likewise, the UN Watercourses Convention and the UNECE Water Convention establishes the obligation of States to perform due diligence within their territories to prevent any significant transboundary impact which includes any impact that prevent the realization of vital human needs [8]. This is further elaborated through the principle of non-discrimination, that provides that individuals who have suffered or are under a serious threat of suffering significant transboundary harm as a result of activities relation to an international watercourse State (...) shall grant be granted access to judicial or other procedures, or a right to claim compensation or other relief in respect of significant harm caused by such activities carried on in its territory (UN Watercourses Convention, Article 32). Similar provisions are reflected in transboundary river agreements such as the 2002 Senegal River Waters Charter, the 2008 Niger Basin Water Charter, the 2012 Water Charter for the Lake Chad Basin and the 2012 Dniester Agreement that recognize the right to safe drinking water and provide legal and institutional protection to implement transboundary commitments at the national and local levels [9].

Energy Regulation and Sustainability

Emerging markets and developing economies in South Asia and East Asia are leading the increasing global demand for energy. Water plays a key role in energy production from extraction and conversion processes of coal, oil and gas, to electricity generation in hydropower and as cooling water for thermal and nuclear power stations. At the same time, energy is required for pumping, treating, purification, transporting and distributing water [10].

Although, a major development in energy production can be seen at regional level, the globe is still facing major challenges specifically as nearly 775 million people still lack access to electricity worldwide particularly in Sub-Saharan Africa [11]. The United Nations conscious of this challenge adopted SDG 7 (to ensure access to affordable, reliable, sustainable and modern energy for all) which is an opportunity for countries to identify energy options for sustainable development. Hydropower is one of these options as it accounts for 16% of the global share of electricity production and continues to be the largest low-emission source of electricity with countries such as China, Brazil, India and Türkiye leading large development projects [12]. Approximately 70% of hydropower dams with a capacity superior to 1MW are currently being planned or constructed in transboundary river basins, therefore it is crucial for countries sharing waters to develop appropriate agreements and cooperation mechanisms to regulate this activity [13].

Transboundary water agreements containing energy regulations must aim at achieving just and sustainable energy considering social equity, environmental sustainability and economic development. The transition from fossil fuels to renewable energies must consider aspects of justice, equity primarily to prevent any harm to vulnerable populations including local communities and indigenous peoples [1]. Moreover, it is crucial to include aspects of public participation in decision making processes in particular when looking at the development of large water infrastructure projects for energy production that must consider the involvement of different non-State actors including civil society, NGOs, private sector, Academia and local communities to ensure legitimacy and transparency. Such instruments when a potential development might affect indigenous peoples' lands require to include provisions on free prior consultation to prevent any significant impact on these vulnerable communities, their land and resources. Transboundary water agreements looking into energy regulations include the 2012 Dniester Treaty, the 1999 Doosti Dam Agreement and the 1973 Itaipu Treaty [14].

Food Security and Agricultural Policies

The right to adequate food and to be free from hunger is recognized in the 1966 Universal Declaration of Human Rights and the International Covenant on Economic, Social and Cultural Rights (ICESCR). This instrument includes the duty to improve methods of production, conservation and distribution of food by making full use of technical and scientific knowledge (…) and by developing or reforming agrarian systems in such a way as to achieve the most efficient development and utilization of natural resources [15]. The most efficient development and utilization of natural resources contemplated in the ICESCR includes primarily the use and management of freshwater resources as agriculture is a major user this resource accounting for 72% of the withdrawal globally [16].

Despite the right to adequate food and to be free from hunger, nearly 258 million people are facing acute food insecurity worldwide [17]. This scenario is unfortunately expected to worsen as the global issue of hunger and food security has been exacerbated by the COVID Pandemic, ongoing conflicts, climate change and deepening inequalities [18].

These factors represent a major challenge to achieving SDG 2 on end hunger, achieve food security and improved nutrition and promote sustainable agriculture.

Unsustainable agriculture practices can have negative impacts at the local, national, transboundary and global levels due to water overexploitation particularly of groundwater, as well as pollution caused by the use of fertilizers affecting the soil and spreading even to coastal and marine environment.

Transboundary water agreements looking into agricultural practices should ensure good water quality, the protection of soils and the monitoring of fragile ecosystems such as groundwater. River basin organizations include mechanisms to recommend best agriculture practices for instance the International Commission for the Protection of the Danube River ICPDR through its Recommendation on Best Available Techniques at Agro-Industrial Units [19]. Some complementary instruments are the Agreement on the Application of Sanitary and Phytosanitary Measures (1995), the International Treaty on Plant Genetic Resources for Food and Agriculture (FAO, 2009), the International Plant Protection Convention (1997), and the Rotterdam Convention (1998) [20].

Integration of the WEF Nexus in transboundary water agreements

Unsustainable practices on the use and management of water, energy and food systems have left devastating effects particularly in transboundary river basins. In Central Asia, the over exploitation of water for irrigation in cotton production and hydropower development affected the Amu Darya and Syr Daria rivers leading to the shrinking of the Aral Sea. In South Asia, the Indus River faces drying up as a consequence of the growing use of its waters for food and energy to sustain a large growing population. A similar scenario can be seen in South East Asia in the Mekong Region where the continuous development of hydropower has the potential to risk fisheries and the existing aquatic biodiversity as well as agricultural activities including rice production being both fish and rice the basis of the regional diet.

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Climate change exacerbates the challenges in transboundary waters as floods and droughts are already affecting important rivers in Europe such as the Danube and the Rhine vital for navigation and trade. The same occurs in South America, where dry seasons have an impact on shared rivers such as the Amazon and the Parana affecting navigation, trade and hydropower which are some of the main sources of development in this region.

The WEF Nexus can substantially promote the effective management and governance of transboundary waters. States aiming at integrating the WEF Nexus approach in transboundary waters require to initiate a dialogue process looking at existing sectorial interdependencies and potential mutual benefits that can be negotiated during the formulation of agreements. In this sense, to ensure the adequate implementation of this approach, States need to shift from a conception of negating transboundary water agreements focusing on one single sector to consider multiple sectors and resources to be materialized in benefit sharing agreements. This process should also aim at incorporating strategic approaches to ensure sustainable development considering the human rights to water and food, as well as the protection of vulnerable ecosystems that might be significantly impacted during the development of the water, energy and food sectors. Similarly, a correct integration of these sectors should be accompanied by a coherent involvement of different stakeholders including experts on water, energy and food, NGOs, as well as the academia and particularly local communities and indigenous peoples who might be affected by the development of these sectors. In this sense the negotiation of agreements can ensure active and informed participation, transparency and legitimacy [21].

Legal frameworks governing the water, energy and food nexus need to ensure coherence to avoid conflicts and contradiction on its implementation. Moreover, it is essential that such framework primarily reflects and aligns with human rights and sustainable development [20]. The WEF Nexus approach can guide the development of legal instruments effectively to ensure the adequate use and management of water, energy and food at the global, regional, transboundary, national and local levels.

These instruments can provide a framework to ensure harmonious cross-sectoral management and governance.

To be effective they need to be accompanied by other mechanisms including economic instruments such as tax incentives and credits for good water management, renewable energies and sustainable agriculture. These mechanisms can be negotiated and jointly implemented at the regional and transboundary levels through specific basin agreements, management plans and guidelines. The role of river basin organizations is crucial in this endeavor to establish specialized groups and objectives on water, energy and food that can provide guidance to States to implement legislation reforms. In the same way, RBOs can provide guidance on how to establish national coordinating structures such as strategic coordination ministries to ensure coherence in the management of these sectors.

Source: Shutterstock

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Legal Consideration in Practice: Lessons from Case Studies

By: Tejas Rao

This section delves into the practical application of legal frameworks through case studies. It highlights Brazil's PPPs in irrigation, the Nile Basin Initiative for transboundary water management, and Germany's Renewable Energy Sources Act in agriculture. These examples demonstrate some key lessons and pitfalls on how legal mechanisms can facilitate public-private collaboration, transboundary cooperation, and renewable energy adoption, essential for sustainability within the water-energy-food nexus.

Public-Private Partnerships (PPPs)

Public-Private Partnerships (PPPs) are collaborative agreements between government entities and private sector companies aimed at achieving a common goal. In the context of sustainable practices within the water-energy-food nexus, PPPs can play a pivotal role. The case of Brazil's irrigation sector offers a compelling example of how legal frameworks can effectively facilitate such partnerships, combining public oversight with private sector efficiency and innovation.

Case Study: Brazil's Irrigation Sector

Brazil, a country with significant agricultural output, faces challenges in water management, particularly in its semi-arid regions. The legal framework for PPPs in Brazil, established under the Public-Private Partnership Law (Law No. 11,079/2004), provides a robust foundation for integrating private sector expertise and capital into public water management projects [1]. This legislation encourages investment in water-saving technologies and improved irrigation methods, which are crucial for sustainable agriculture.

The PPP model in Brazil has enabled the development of advanced irrigation infrastructure, such as drip and sprinkler systems, which significantly reduce water wastage. The partnerships also facilitate the implementation of renewable energy solutions to power these irrigation systems, thereby addressing the energy component of the nexus. For instance, solar-powered pumps have become increasingly common, reducing dependency on fossil fuels and minimizing the carbon footprint of agricultural activities.

Furthermore, these PPPs often involve capacity-building initiatives where the private sector provides training and technical support to farmers, enhancing their ability to adopt and maintain new technologies. This collaboration ensures that the benefits of improved irrigation and renewable energy are sustained over time, contributing to long-term food security and environmental sustainability.

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Challenges

Despite the successes, the implementation of PPPs in Brazil's irrigation sector has faced several challenges. These include regulatory hurdles, coordination issues between public and private entities, and financial risks associated with long-term investments. Moreover, ensuring that the benefits of these partnerships reach small-scale farmers and do not exacerbate existing inequalities remains a critical concern. Addressing these challenges requires continuous refinement of legal frameworks to enhance transparency, accountability, and equitable distribution of resources.

Additionally, the alignment of public and private goals can be complex. While the public sector focuses on sustainability and social equity, the private sector may prioritize profitability. Balancing these objectives necessitates robust regulatory mechanisms and ongoing dialogue between stakeholders to ensure that PPPs deliver on their promises of sustainable development and social inclusivity.

Transboundary Cooperation Agreements

Transboundary water management is essential in regions where water bodies traverse multiple political boundaries. Effective legal frameworks and cooperation agreements are necessary to ensure the sustainable and equitable use of shared water resources [2, 3]. The Nile Basin Initiative (NBI) serves as a prominent example of successful transboundary cooperation.

Case Study: The Nile Basin Initiative

The Nile River, shared by eleven countries, is a vital resource for millions of people in Northeast Africa. The Nile Basin Initiative, established in 1999, is a partnership among the riparian states aimed at promoting sustainable development and management of the Nile's water resources [2]. The legal framework of the NBI is based on the principles of equitable utilization and the obligation not to cause significant harm, aligning with international water law norms.

The NBI has facilitated numerous projects that enhance water management, agricultural productivity, and energy generation in the region. For example, the Eastern Nile Subsidiary Action Program (ENSAP) focuses on cooperative water resource management and joint infrastructure projects, such as the construction of dams and irrigation systems.

These initiatives contribute to the food security and energy needs of the member states, illustrating the interconnectedness of the water-energy-food nexus.

A significant achievement of the NBI is its ability to foster dialogue and cooperation among the Nile Basin countries, which historically have had conflicting interests over water allocation. Through regular consultations and collaborative projects, the NBI has built a platform for trust and mutual benefit, setting a precedent for other transboundary water bodies around the world.

Challenges

Despite its successes, the NBI faces several legal and political challenges. Differences in national interests and priorities among the riparian states can hinder the negotiation and implementation of cooperative agreements. Additionally, the lack of a comprehensive and legally binding framework has limited the enforceability of NBI decisions. The ongoing dispute between Egypt, Sudan, and Ethiopia over the Grand Ethiopian Renaissance Dam (GERD) highlights the complexities of transboundary water governance and the need for stronger legal mechanisms to resolve conflicts and ensure sustainable management.

The NBI's effectiveness is also hampered by disparities in technical and financial capacities among member states. While some countries can invest heavily in water infrastructure and management, others struggle with limited resources. Bridging this gap requires international support and innovative financing mechanisms to ensure that all riparian states can participate equally in the NBI's initiatives.

Feed-in Tariffs and Renewable Energy Certificates

Promoting renewable energy within the agriculture sector is critical for reducing the energy sector's water footprint and enhancing sustainability. Legal instruments such as feed-in tariffs and renewable energy certificates can incentivize the adoption of renewable energy technologies. Germany's Renewable Energy Sources Act (EEG) provides a successful example of how these legal measures can drive the transition to renewable energy.

Case Study: Germany's Renewable Energy Sources Act (EEG)

The Renewable Energy Sources Act (EEG), introduced in 2000, is a cornerstone of Germany's energy transition policy. The EEG established feed-in tariffs, which guarantee fixed prices for renewable energy producers, and renewable energy certificates, which certify the origin of renewable energy [4]. These instruments have significantly increased the share of renewable energy in Germany's energy mix, contributing to water conservation and reducing greenhouse gas emissions.

In the context of the water-energy-food nexus, the EEG has supported the deployment of biogas plants and solar energy systems in the agricultural sector. Biogas plants utilize agricultural waste to produce energy, thereby reducing the reliance on water-intensive fossil fuels. Solar energy systems, including photovoltaic panels on farms, provide a sustainable energy source with minimal water requirements. These innovations not only enhance energy security but also support sustainable agricultural practices.

Moreover, the EEG has stimulated technological advancements and cost reductions in renewable energy, making it more accessible and viable for agricultural applications. This has fostered a culture of innovation and sustainability within the agricultural sector, with farmers increasingly adopting renewable energy solutions to power their operations.

Challenges

While the EEG has been successful, it also faces challenges. The financial burden of feed-in tariffs on consumers and the grid integration of intermittent renewable energy sources are significant issues. Additionally, the transition to renewable energy requires substantial investments in infrastructure and technology, posing financial risks for farmers and energy producers. Addressing these challenges involves balancing the incentives for renewable energy adoption with the economic impacts on stakeholders and ensuring the stability of the energy grid.

Another challenge is the need for continuous policy adjustments to keep pace with technological advancements and market conditions [5]. The legal framework must remain flexible and adaptive to ensure that it continues to provide effective incentives for renewable energy while minimizing potential negative impacts on the economy and society.

By exploring these case studies, it becomes evident that while legal frameworks can significantly advance sustainable practices within the water-energy-food nexus, they must be carefully designed and implemented to navigate the complex interplay of environmental, economic, and social factors. Continuous evaluation and adaptation of these legal approaches are essential to address emerging challenges and capitalize on new opportunities for sustainable development.

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Reference List to Legal Consideration in Practice from Case Studies

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Legal Steps toward Integrated Water Resources Management

By: Pavithra Rajendran

It is noteworthy that Integrated Water Resources Management (IWRM) has been incorporated into the legislation of several jurisdictions. The Water Act (2007) in Australia, Federal Law No. 9.433/1997 (known as the Water Resources Law) in Brazil, the 1998 and 2002 Water Laws of China, and the Water Policy and Water Law (2011) of Rwanda are some examples. However, whether these laws fully align with all international and regional standards of IWRM remains a question. South Africa's National Water Act of 1998 and Water Service Act (1997) and European Union Water Framework Directive (WFD, 2000) are often underscored as a good example, as it comprehensively addresses both IWRM and environmental principles at large. In this context, this section discusses the judicial approaches of South Africa and European Union.

South Africa

The cases handled by the Constitutional Court and High Courts of South Africa apply Integrated Water Resources Management (IWRM) principles and the rights enshrined in the Constitution of South Africa. In this context, cases typically adopt a rights-based approach in conjunction with IWRM principles. Courts commonly rely on the fundamental Bill of Rights, particularly the Right to access sufficient water [1]. Additionally, certain cases delve into water management issues through the lens of IWRM principles [2] notably emphasizing the principle of a Participatory Approach and recognizing the economic value of water.

In the case of Mazibuko v City of Johannesburg (2009), the central issue revolved around the constitutionality of the City of Johannesburg disconnecting water services due to non-payment by residents. Consequently, the court was compelled to interpret the Right to Access Sufficient Water, particularly considering this issue. The constitutional court emphasized the provisions of the constitution and Water Service Act to recognize the 'right to sufficient water' [3].

The Constitution of South Africa stipulates the following:
Everyone has the right to have access to—
(a) health care services, including reproductive health care;
(b) sufficient food and water; and
(c) social security, including, if they are unable to support themselves and their dependents, appropriate social assistance.
(2) The state must take reasonable legislative and other measures, within its available resources, to achieve the progressive realization of each of these rights.
(3) No one may be refused emergency medical treatment

Moreover, section 3 of Water Service Act highlights:
(1) Everyone has a right of access to basic water supply and basic sanitation.
(2) Every water services institution must take reasonable measures to realize these rights.
(3) Every water services authority must, in its water services development plan, provide for measures to realize these rights.
(4) The rights mentioned in this section are subject to the limitations contained in this Act

Through these explanations, the constitutional court emphasized that the right to access sufficient water entails obtaining access to basic water supply as stipulated in section 1 of the Water Service Act. Accordingly, it ensured that both the ‘quantity’ and ‘quality’ of water are important considerations in recognizing the right to access sufficient water. Moreover, the court also mentioned that water should comply with the 'compulsory regulatory standards' provided by the Minister through Gazette No. 22355, Notice R509 of 2001 (8 June 2001).

South Africa

The court also linked right to access sufficient water with International Bill of Rights standards, especially with following article of ICESCR (1966) (p 20):

Each State Party to the present Covenant undertakes to take steps, individually and through international assistance and co-operation, especially economic and technical, to the maximum of its available resources, with a view to achieving progressively the full realisation of the rights recognised in the present Covenant by all appropriate means, including particularly the adoption of legislative measures.

This approach to interpreting water resources, adopted in several cases—namely, Borbet South Africa (Pty) Ltd and Others v Nelson Mandela Bay Municipality, (2014) and Berg River Dam Case (2011) affirms that water resources should be protected by legislation, considered a constitutional right of the people, and managed in alignment with sustainable development principles [4, 5]. Significantly, in the 2011 Berg River Dam case, the Western Cape High Court highlighted the importance of conducting comprehensive environmental impact assessments in line with the requirements of the National Water Act before approving large-scale water infrastructure projects to comply with sustainable development principles.

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European Union

Cases addressed by the European Human Rights Commission and Court mostly underscore and emphasize sustainable, equitable, and participatory management of water resources, which are core aspects of IWRM [6]. In the case of Bund für Umwelt und Naturschutz Deutschland eV v Bundesrepublik Deutschland (2015), Article 4(1)(a)(i) to (iii) of Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000, establishing a framework for Community action in the field of water policy, was explained [7].

The issue originally arose in Germany regarding the construction of a deepening project for the Weser River. An environmental NGO named BUND challenged the project, arguing that it would lead to the deterioration of the river's ecological status, contrary to the objectives of the water policy outlined in Directive 2000/60/EC. In this context, the European Court (Grand Chamber) undertook the responsibility of explaining the aims of the water policy in Directive 2000/60/EC [8].

The court highlighted parts of the preamble of Directive 2000/60/EC, which emphasize the protection and sustainable management of water (Recital 16 of the Preamble), the quality of water in alignment with environmental protection (Recital 25 of the Preamble), and the limited exceptions when prohibition of deterioration Directive 2000/60/EC can be acceptable (Recital 32 of the Preamble). These exceptions include:

[i]f the failure is the result of unforeseen or exceptional circumstances, in particular floods and droughts, or, for reasons of overriding public interest, of new modifications to the physical characteristics of a surface water body or alterations to the level of bodies of groundwater, provided that all practicable steps are taken to mitigate the adverse impact on the status of the body of water.

The court found that these exceptions did not cover the case and stated that exemptions to the prohibition of deterioration must be interpreted strictly and applied only in exceptional circumstances, ensuring compliance with the detailed conditions set out in Directive 2000/60/EC. Therefore, the European Union considers its policies related to IWRM as mandatory for member states, allowing exceptions only in limited, justifiable instances.

European Union

The court affirms following obligations of the States and rules pertaining to the interpretation of Article 4(1)(a)(i) to (iii) of Directive 2000/60/EC:

- Prohibition of Deterioration: Member states have to prevent the deterioration of the status of all bodies of surface water, prohibiting any project or activity that would reduce the status of a water body, even by one quality element class.
- Achieving Good Status: Member states should protect, enhance, and restore all bodies of surface water to achieve "good status" by a specified deadline.
- Strict Interpretation of Exemptions: Any exemptions to the prohibition of deterioration must be interpreted strictly and applied only in exceptional circumstances, permissible only if they meet the stringent conditions laid out in the Directive to ensure environmental objectives are not compromised.
- Binding Obligations: The obligations under Article 4(1)(a) are binding on member states, reinforcing the mandatory nature of the EU's water management policies and ensuring adherence to the principles of sustainable, equitable, and participatory water management as set out in the Directive.

Legal Considerations toward IWRM

Incorporating Integrated Water Resources Management (IWRM) principles into domestic and regional legal frameworks ensures comprehensive and inclusive water management policies, addressing the needs of various stakeholders, including marginalized communities. Adopting IWRM can enable equitable distribution and use of water resources, essential for sustainable development.

South Africa and the European Union offer insightful examples of effectively implementing IWRM within legal systems. In South Africa, IWRM is closely tied to the constitutional right to access sufficient water, upheld by the judiciary to comply with national legislation and international human rights standards like the International Covenant on Economic, Social and Cultural Rights (ICESCR). Landmark cases highlight the necessity of providing both quantity and quality of water, promoting sustainable water management within a constitutional framework. This approach encourages other jurisdictions to integrate IWRM through constitutionally guaranteed civil and socio-economic rights.

The European Union's Water Framework Directive (WFD, 2000) illustrates a structured, obligatory approach to water management among member states. The EU emphasizes sustainable, equitable, and participatory water resource management, with strict standards and clear deadlines for achieving "good status" of water bodies. The binding nature of these directives ensures uniformity across the EU, preventing deterioration and promoting sustainable water use. This approach demonstrates how regional and international bodies can enforce IWRM as an obligation for state parties.

Together, South Africa and the European Union exemplify the effectiveness of integrating IWRM principles within different legal and jurisdictional frameworks. This integration compels governments and stakeholders to adopt a holistic and sustainable approach to water management, improving water security, environmental outcomes, and quality of life for communities.

Reference List to Legal Steps toward Integrated Water Resources Management

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Practical Summary

Nexus approaches recognize the complex interdependencies within the WEF sectors. Effective legal frameworks must consider these interdependencies to avoid unintended consequences and maximize synergies. This requires a multidisciplinary analytical lens and continuous refinement of policies based on emerging challenges and opportunities. The examination of legal frameworks in addressing the Water-Energy-Food (WEF) nexus reveals several key lessons, advantages, and pitfalls essential for practitioners in the legal and policy-making fields.

Key Lessons

Integrated Approaches

Legal mechanisms must facilitate integrated approaches to address the interdependencies within the WEF nexus. Case studies from Brazil, the Nile Basin, and Germany illustrate the opportunities of PPPs, transboundary cooperation, and renewable energy legislation in achieving sustainable outcomes.

Flexibility and Adaptability

Legal frameworks need to be flexible and adaptable to technological advancements and changing environmental conditions. This ensures that policies remain relevant and effective over time.

Stakeholder Engagement

Successful implementation of legal frameworks requires active engagement from all stakeholders, including governments, private sector, civil society, and local communities. This ensures that diverse perspectives are considered and that policies are inclusive.

Advantages of Legal Mechanisms

Enforceable Commitments

Legal frameworks provide structured and enforceable commitments, which enhance accountability and ensure that policies are adhered to.

Promotion of Best Practices

Legal mechanisms can promote the adoption of best practices and norms, as seen with the PPP law in Brazil and the Renewable Energy Sources Act in Germany.

Conflict Resolution

Legal frameworks, particularly in transboundary contexts, provide mechanisms for dialogue and cooperation, helping to resolve conflicts and promote sustainable resource management.

Pitfalls of Legal Mechanisms

Regulatory Hurdles

Implementation can be hampered by complex regulatory environments, as seen in Brazil's PPPs in the irrigation sector. Streamlining regulations and ensuring clear guidelines are essential.

Disparities in Resources

Differences in technical and financial capacities among stakeholders can lead to unequal participation and benefits. This is evident in the Nile Basin Initiative, where varying capacities among member states pose challenges.

Balancing Objectives

Aligning the diverse objectives of public and private stakeholders can be complex. Legal frameworks must balance economic, social, and environmental goals to ensure holistic and sustainable outcomes.

Recommendations to Practitoners

Holistic Policy Design

Design policies that integrate the WEF sectors, ensuring that interventions in one area do not negatively impact others.

Capacity Building

Invest in building technical and financial capacities across all stakeholders to ensure equitable participation and benefit-sharing.

Continuous Monitoring and Adaptation

Establish mechanisms for continuous monitoring and policy adaptation to respond to technological advancements and environmental changes.

Stakeholder Engagement

Foster inclusive dialogue and collaboration among all stakeholders to ensure policies are well-informed and widely supported.

Transboundary Cooperation

Strengthen legal frameworks for transboundary cooperation to manage shared resources sustainably and equitably.

Legal mechanisms play a crucial role in advancing sustainable practices within the WEF nexus. By holistically considering the complex interdependencies and involving diverse stakeholders, legal frameworks can effectively promote integrated and sustainable resource management, contributing to long-term environmental, economic, and social benefits.

Acknowledgements

MEDRC's Transboundary Waters Practitioner Briefing series has been developed for industry practitioners and government officials at the request of MEDRC's member countries. The briefings are meant to be informative and practical, providing an overview of the subject matter material, while remaining accessible to various backgrounds and disciplines. The briefings serve to develop shared knowledge and serve as a basis for further discussions between partners. If you would like to learn more about these subjects, please see the section 'Sources for Further Learning'.

Sources for Further Learning

The Intergovernmental Panel on Climate Change Reports - https://www.ipcc.ch/

PeaceRep - https://peacerep.org/

United Nations Framework Convention on Climate Change - https://unfccc.int/

Centre for Climate Engagement - https://climatehughes.org/

European Parliament - https://www.europarl.europa.eu/portal/en

Climate Security Mechanism (CSM) - https://www.unep.org/topics/fresh-water/disasters-and-climate-change/climate-security-mechanism-csm

UN Climate Security Mechanism Progress Report (2023) - https://mptf.undp.org/sites/default/files/documents/2024-08/csm_2023_progress_report.pdf

Organisation for Economic Co-operation and Development (OECD) - https://www.oecd.org/en.html

Oxford Academic - International Climate Change Law by Daniel Bodansky, Jutta Brunnée & Lavanya Rajamani - https://academic.oup.com/book/57770

World Bank - https://www.worldbank.org/en/topic/climatechange

World Bank PPPLRC - https://ppp.worldbank.org/public-private-partnership/climate-smart/climate-smart-clean-technology-ppps/climate-smart-ppp-legal-and-regulatory-framework

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