

# ANCHORING WATER DEMAND MANAGEMENT

Articulating objectives and potential roles  
for the legal framework

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# Anchoring Water Demand Management

## Articulating objectives and potential roles for the legal framework

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### Abstract

The global march towards water scarcity has been described as the world's biggest water-related problem. However, many countries can and do modify their path by taking policy and investment decisions that affect their water resources, their patterns of water use, and the broader structural transformation of their economy. Water demand management is one response which can help to address the fundamental driver of water scarcity as an imbalance between supply and growing demand. The legal framework is one possible tool that can be used to support the sustainable water resources management practices necessary to realize the outcome of water demand management and the long-term objective of water security. Specifically, it can contribute to water demand management by creating mandates that provide support to (a) water information systems, (b) inclusive planning, (c) permits for water abstraction, (d) strong and context-appropriate enforcement, and (e) in highly-developed systems, economic incentives to reduce or reallocate water uses.

**Keywords:** Water demand management; water security; law; legal framework; SDG6

### 1. Trends toward water scarcity

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As countries develop their economies, they have tended to use more and more of their available water resources. Farms, factories and cities all need more water to grow. Eventually, when the amount of water taken from the environment begins to reach the limits of the water available in the environment, this is referred to as water scarcity.<sup>2</sup> This march towards water scarcity has been described as the world's biggest water problem.<sup>3</sup> At the global level, as water scarcity increases, it may eventually reach levels deemed to pose unacceptable risks to human development.<sup>4</sup> However, the present global picture is more complicated when looking at individual countries and different times of the year.<sup>5</sup> Some countries are barely tapping their available water resources, like Central African Republic; and, some countries are already

operating far beyond their naturally-available renewable water resources, like Saudi Arabia.<sup>6</sup> Both water scarce and water-abundant countries – on average – appear to be marching up a default path of water resources development towards increasing water scarcity.

Looking backward, this march up the default path of water resources development has largely been driven by the expansion of area equipped for irrigation in developing countries.<sup>7</sup> Between the 1960s and 2000s, the global land area equipped for irrigation doubled, and more than 80% of this expanded area was in developing countries.<sup>8</sup> This irrigation expansion was crucial for feeding the world's growing population during the past fifty years.<sup>9</sup> But now, some countries are "overbuilt," where the extent of irrigation development creates demands for water resources that the local environment cannot satisfy.<sup>10</sup> In

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<sup>2</sup> Brown & Matlock, 2011, p. 1; FAO, 2012, p. 11; Damkjaer & Taylor, 2017, p. 513.

<sup>3</sup> Ward & Pulido-Velazquez, 2008, p. 18219.

<sup>4</sup> Rockström, et al., 2009, pp. 472-473; Steffen, et al., 2015, pp. 5-6; Jaramillo & Destouni, 2015, p. 1217c.

<sup>5</sup> Hoekstra, et al., 2012, pp. 6-8.

<sup>6</sup> Molle, 2008, p. 217.

<sup>7</sup> Scheierling & Treguer, 2016, p. 2.

<sup>8</sup> Alexandratos & Bruinsma, 2012, p. 114.

<sup>9</sup> Schoengold & Zilberman, 2007, p. 2960.

<sup>10</sup> Molle, 2008, p. 217.

contrast, in recent decades, water withdrawals have been largely stable in developed countries.<sup>11</sup> The location-specific impact of this irrigation development becomes clear as many countries – such as those in the Middle East and North Africa – now experience water scarcity.<sup>12</sup>

Looking forward, unless modified by policy and investment decisions, it is expected that many countries will continue toward water scarcity – albeit with different speeds and driving factors.<sup>13</sup> The OECD forecasts that global demand for water resources will increase by more than 50 percent during the first half of the 21<sup>st</sup> century.<sup>14</sup> Whereas past growth was driven in large part by irrigation development, it is expected that this future demand growth will be driven by increasing needs for water for industry, electricity generation, and domestic consumption.<sup>15</sup> As expected, more dense populations for the same water resources tend to increase levels of water scarcity, and more urbanized populations tend to be both more water productive and water scarce. FAO now predicts that the extent of irrigation development – in terms of arable irrigated land area equipped for irrigation – has already largely plateaued around the year 2010, and is expected to grow only slightly from now until 2050.<sup>16</sup> Most of the limited future expansion of irrigation area is expected to continue to take place in developing countries; but even here, many countries are now reaching limits in their available land area or water resources.<sup>17</sup>

The actual paths that countries end up taking in the context of their economic development are the subject of several major debates in the literature. Over the last two decades, there has been much discussion for and against the idea that environmental degradation – including water scarcity – tends to worsen as incomes rise, and then naturally starts to improve after countries reach a certain threshold level of development. This curved trajectory is referred to as the environmental Kuznets curve (EKC) hypothesis.<sup>18</sup> The EKC is also closely related to the

concept of decoupling in this context. UNEP defines decoupling in this context as “the ability of an economy to grow without a corresponding increase in environmental pressure”; at the level of individual countries, decoupling GDP growth from water resources depletion is particularly important as countries reach increasing levels of water scarcity.<sup>19</sup> However, some contend that the observed decoupling in some developed countries has been offset by increased extraction in developing countries – so the world population’s pressure on nature resources still increases even if some countries show improvements.<sup>20</sup>

However, many countries can and do modify their path by taking policy and investment decisions that affect their water resources, their patterns of water use, and the broader structural transformation of their economy.<sup>21</sup> Across all the discussions and debates about specific paths, one thing is clear: all countries need to consider tools to shape and possibly modify their path towards water scarcity, but not all countries will use tools in the same way or for the same intermediate objectives.<sup>22</sup>

## 2. Water demand management as a response

In response to growing water scarcity at the global and country levels, countries have two basic options at their disposal: (a) supply-side interventions – increasing the amount of water available locally through infrastructure development or technical solutions; or (b) demand-side interventions – managing, freezing, or even reducing demands on water resources, hereinafter referred to as water demand management. Historically, many interventions in response to water scarcity have focused on the first option – supply-side interventions investing in infrastructure to expand supply, expand storage, or move water around.<sup>23</sup> Supply-side interventions play an important role in many contexts. However, supply-side interventions have an important limitation in that they do

<sup>11</sup> OECD, 2012, p. 214.

<sup>12</sup> FAO, 2017, p. 86.

<sup>13</sup> Grey & Sadoff, 2007, pp. 567-568.

<sup>14</sup> OECD, 2012, p. 217.

<sup>15</sup> OECD, 2012, p. 217.

<sup>16</sup> Alexandratos & Bruinsma, 2012, p. 115; FAO, 2017, pp. 36-38.

<sup>17</sup> FAO, 2011, p. 42; Place & Meybeck, 2013, p. 6; FAO, 2017, p. 37.

<sup>18</sup> Stern, 2004, p. 1419; Jia, et al., 2006, pp. 189-190; Grey & Sadoff, 2007, pp. 567-568; Katz, 2015, pp. 212-213; Miglietta, et al., 2017, pp. 27-28.

<sup>19</sup> UNEP, 2015, p. 8.

<sup>20</sup> Wiedmann, et al., 2015, pp. 6274-6275; Ward, et al., 2016, pp. 10-12.

<sup>21</sup> Hatfield-Dodds, et al., 2015, p. 51.

<sup>22</sup> Kampragou, et al., 2011, p. 467.

<sup>23</sup> UNEP, 2015, p. 11.

not address the drivers of increased water scarcity, and instead, often only temporarily mitigate symptoms.

Accordingly, this note focuses on water demand management as a response which can help to address the fundamental driver of water scarcity as an imbalance between supply and growing demand. Definitions of water demand management in the literature have ranged from simple statements to more complex sets of factors and methods.<sup>24</sup> Summing up these definitions, water demand management has been distilled as “getting the most from the water we have,” “achieving desirable demands and desirable uses,” and “any action that reduces the amount of freshwater we use.”<sup>25</sup>

Water demand management is not only relevant for countries that are deep into water scarcity; it is also important for countries such as Central African Republic who may wish to further develop their water resources but not end up deep in water scarcity in the coming decades. Thus, water demand management is widely recognized as a critical outcome of broader sustainable water management, in line with Goal 6 of the Sustainable Development Goals and in particular, Target 6.4 on sustainable water withdrawals.<sup>26</sup> It is also important to

realize that water demand management is not a new concept; the concept (or key elements of it) has been discussed for decades as an important policy priority for countries to pursue.<sup>27</sup> But, putting water demand management into practice has faced many obstacles, and it remains an elusive goal in many country contexts.<sup>28</sup>

Progress on water demand management in the coming decades will require an “all hands-on deck” approach with the effective use of all tools available to governments and the recognition of multiple perspectives.<sup>29</sup> Thus, for example, water demand management has been approached from the perspectives of environmental psychology and water user behaviors, on-farm technologies, institutional design, social innovation, and economics, among others.<sup>30</sup> The subject of this note is one additional tool available for countries: the *legal framework*, a.k.a. the hierarchy of legally-binding instruments from the constitution to laws, regulations, and subsidiary legal instruments. This note intends to review and focus the ongoing discussion of the potential role that the legal framework – and by extension, legislators and regulators – can play in supporting water demand management in the coming decades.



**Figure 1.** Linking the legal framework with water demand management and water security.

### 3. Five core roles for the legal framework

The legal framework is one available tool that can be used to support the water resources management practices necessary to realize the outcome of water demand management and the long-term objective of water security (see **Figure 1** above). Water security is an

overarching objective that has been defined as “the availability of an acceptable quantity and quality of water for health, livelihoods, ecosystems and production, coupled with an acceptable level of water-related risks to people, environments and economies.”<sup>31</sup> In this context, the objective of water security encompasses achieving an acceptable level of impacts and risks from water scarcity.

<sup>24</sup> Brooks, 2006, pp. 522-527.

<sup>25</sup> Brooks, 2006, p. 522; Savenije & van der Zaag, 2002, p. 100.

<sup>26</sup> UN Water, 2016, p. 13.

<sup>27</sup> UN, 1977, pp. 104-111; FAO, 1993, p. 294; Gleick, 2000, pp. 135-136; Wolfe, 2009, p. 474.

<sup>28</sup> Kampragou, et al., 2011, p. 466.

<sup>29</sup> Tortajada & Joshi, 2013, p. 2729.

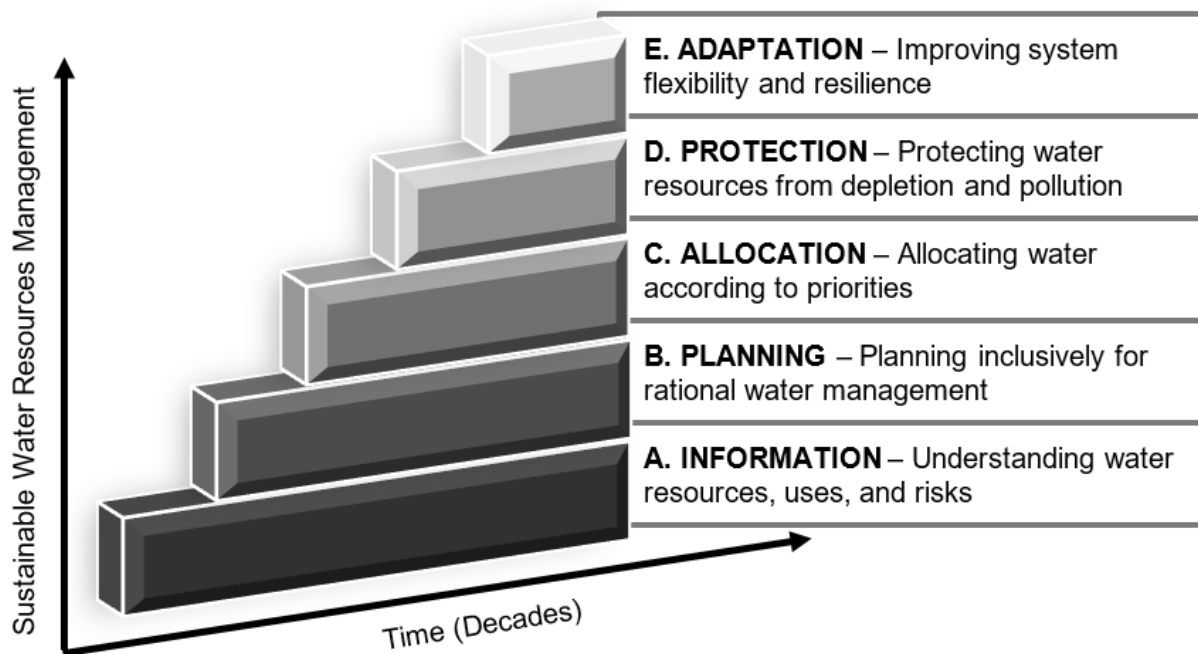
<sup>30</sup> Russell & Fielding, 2010; Pereira, et al., 2002; Brooks & Wolfe, 2007; Wolfe, 2009; Herrington, 2006.

<sup>31</sup> Grey & Sadoff, 2007, p. 545.

The legal framework can serve a specific purpose to create mandates for durable institutional action over time and create legally-enforceable obligations on stakeholders.

Traditionally, there has been a missing link between discussions of water demand management and discussions of the legal framework. But, the disconnect has often been a matter of language but not substance. Thus, there is a significant body of literature on water law which has been developed to provide guidance to legislators and regulatory drafters. But, this guidance most often does not explicitly focus on or draw the link between law and water demand management.<sup>32</sup> Nevertheless, many of the legal elements covered in these legal guidance documents are relevant for water demand management and can play an important role. Conversely, the technical literature on water demand management will frequently mention the legal framework, but only briefly among the list of factors necessary for water demand management.<sup>33</sup>

To connect these two usually-separate tracks of discussion – technical and legal – the subsections below will utilize the building blocks model which has been employed by the World Bank’s *EBA* project and builds off past works in the water sector and beyond.<sup>34</sup> As illustrated in **Figure 2** below, building blocks are sequenced with successors following logical precursors in the development of a comprehensive legal framework to support sustainable water management. Thus, for example, water resources planning without adequate information on water resources and water uses is largely meaningless. From this perspective, there are at least five potential roles that the legal framework can play in supporting water demand management. The following subsections will explore how the legal framework can contribute to water demand management in each of these five roles.



**Figure 2.** Five basic roles for the legal framework in water demand management, following the building blocks model used by the World Bank’s *EBA* Project.

<sup>32</sup> Burchi & D’Andrea, 2003; Salman & Bradlow, 2006; Grigg, 2008; Vapnek, et al., 2009; UNEP, 2010.

<sup>33</sup> FAO, 2012, p. 19; Saleth, et al., 2016, p. 4.

<sup>34</sup> Garthwaite, et al., 2017; van Rijswick, et al., 2014; De Stefano, et al., 2014; Havekes, et al., 2013; Araral & Yu, 2013; Kampragou, et al., 2011; Svendsen, et al., 2005; Saleth & Dinar, 2004.

## A. Information - Understanding water resources, uses and risks

Before embarking on any actions related to water demand management, it is necessary to have a strong understanding of the baseline situation for available water resources and existing water uses.<sup>35</sup> The legal framework has a potentially significant role to play in supporting this by mandating the creation and ongoing maintenance of the information systems necessary to inform and guide any initiatives for water demand management. This follows from the proposition that you cannot manage well what you do not understand well, and fits within the broader information needs of sustainable water resources management practices.<sup>36</sup>

Much of the discussion in the literature of demand management has tended to focus on the perspective of water utilities. However, particularly in the context of agriculture, which tends to be largest water user in most countries, the legal framework's requirement for a water user registry can be a critical supporting feature for understanding all major water uses before designing interventions or programs. Based on EBA Water data, it is estimated that more than 60 percent of countries have put in place legal provisions which require the creation and maintenance of a registry of water users (sample = 62 countries).<sup>37</sup> Such provisions are found across regions and socio-economic contexts, indicating a broad recognition of the importance of developing a deep understanding of water uses as a precursor for further action.

To support water demand management objectives, legal provisions requiring the creation and maintenance of a water user registry can and should be tailored to individual country context, and may be as simple or as complicated as desired for local country needs and the stage of development of a country's water management system. For example, with respect to groundwater use, the state

of Maharashtra in India succinctly requires that the state authority "shall ensure the registration of all the owners of wells both in notified and non-notified areas of the State, in the manner as may be prescribed."<sup>38</sup> In contrast, Spain's legal framework contains extensive details of requirements for the structures and processes necessary for the operation of the water user registry.<sup>39</sup> Both examples satisfy the underlying objective in relation to water demand management by providing information to water managers about existing water uses.

Water demand management is also complemented by legal provisions requiring the creation of water resources inventories and the execution of ongoing water resources monitoring.<sup>40</sup> Water demand management requires a solid understanding of how much water is available for use. It is estimated that more than three quarters of countries have put in place legal provisions requiring the creation and maintenance of a water resources inventory, as well as ongoing water resources monitoring for quality and/or quantity aspects (sample = 62 countries).<sup>41</sup>

Across all water information systems, accessibility of that information for the public takes critical importance for building the public awareness and buy-in necessary for water demand management. Here the legal framework can play a critical role in mandating that (non-confidential) information from water resources inventories, water user registries, and ongoing water resources monitoring be made publicly available. But, this is an aspect which is not very common across countries, though appears to be more common lately. It is estimated that only 45 percent of countries legally require that information from a water resources inventory be made publicly available; this figure drops to 40 percent for water user registry information and water resources monitoring information.<sup>42</sup>

## B. Planning - Planning inclusively for rational water management

<sup>35</sup> Ward & Pulido-Velazquez, 2008, p. 18219.

<sup>36</sup> UN High Level Panel on Water, 2016, pp. 20-21; Stewart, 2015, p. 80; Pegram, et al., 2013, p. 43; Solanes & Gonzalez-Villarreal, 1999, pp. 25-27; Vapnek, et al., 2009, pp. 134-135.

<sup>37</sup> World Bank, 2017.

<sup>38</sup> [INDIA] Sec. 7, Maharashtra Groundwater (Development and Management) Act, 2009.

<sup>39</sup> [SPAIN] Art. 80, Royal Legislative Decree No. 1/2001 Approving the Consolidated Text of the Water Law, 2001; Art. 189, Royal Decree No. 849 Public Water Regulation, 1986 (as amended).

<sup>40</sup> WMO, 2012; Stewart, 2015; Hamilton, 2015.

<sup>41</sup> World Bank, 2017.

<sup>42</sup> World Bank, 2017.

Inclusive planning processes can help to build consensus among stakeholders for the often-difficult choices inherent in water demand management. The legal framework has a significant potential role to play in supporting this through requirements for the involvement of water users in planning and decision making, and through mandates for water resource planning at the national and subnational (such as basin) levels. Achieving desirable demands and desirable withdrawals requires a definition of what is locally “desirable” through a (preferably consultative and inclusive) process for priority setting and planning.

First, priority setting for allocation is an important role for the legal framework in determining what is a desirable water use. It is estimated that 73 percent of countries use their legal framework to establish a priority order between different types of water uses, or to require a decentralized process for establishing a priority order for different types of water uses (World Bank, 2017). For example, Kenya’s legal framework requires that a “state scheme shall take precedence over all other schemes for the use of water or the drainage of land.”<sup>43</sup> Uruguay’s legal framework provides that “the supply of drinking water to the population is the main priority of the use of water resources. Other uses shall be determined taking into account the priorities established at the level of regions, river basins, and aquifers.”<sup>44</sup> Colombia’s legal framework provides a more detailed listing of its priority for water allocation at the national level, listing in order: “(a) use for human, collective or community consumption, whether urban or rural; (b) use for individual domestic needs; (c) community agricultural uses, including aquaculture and fisheries; (d) individual agricultural uses, including aquaculture and fisheries; (e) hydroelectric power generation; (f) industrial or manufacturing uses; (g) mining uses; (h) community recreational uses, and (i) individual recreational uses.”<sup>45</sup> Each of these examples satisfies the underlying objective in relation to water demand management of helping to define what is a desirable use.

Moving beyond priority setting, the concept of water resources planning inherently involves a balancing of supply and demand in light of national and local priorities, and thus can help to set the forward-looking objectives for water demand management in a given context. It is estimated that the legal frameworks of more than 70 percent of countries require national-level water planning, and roughly an equal number require basin-level planning (a set which does not completely overlap, sample = 62 countries).<sup>46</sup> For example, the legal framework of Malawi provides that the minister responsible for water resources may “...require the Authority to – prepare, review and keep up-to-date, a comprehensive plan for the investigation, use, control, protection, conservation, management, and administration of water resources for the nation.”<sup>47</sup> Notably, the same article goes on to provide that water demand management programs are among the listed required features of national water planning in Malawi. As a second example, Spain’s legal framework is relatively unique in that it explicitly assigns to basin organizations the duty of undertaking programs for water demand management, in line with broader water planning objectives.<sup>48</sup>

Across all planning and priority setting initiatives, the legal framework can play a more comprehensive role for water demand management by requiring public consultation and participation in these processes. For example, the legal framework of Armenia lists both national-level water resources management plans and basin-level water resources plans as documents that require public notice prior to finalization.<sup>49</sup> More expansively, under the legal framework of Benin, the ministry responsible for water resources must establish consultative processes for water planning which solicit the input of affected populations.<sup>50</sup> However, while such legal provisions are somewhat common, they are not widespread across all regions and contexts. Overall it is estimated that 53 percent of countries require at least some form of public notice, consultation or participation in their water resources planning processes (sample = 62 countries).<sup>51</sup>

<sup>43</sup> [KENYA] Sec. 20, Water Act, No. 43, 2002 [Replaced in 2016].

<sup>44</sup> [URUGUAY] Art. 8, Law No. 18610 on the National Water Policy, 2009.

<sup>45</sup> [COLOMBIA] Art. 2.2.3.2.7.6, Decree 1076 by Which the Single Regulatory decree is Issued for the Environment and Sustainable Development Sector, 2015.

<sup>46</sup> World Bank, 2017.

<sup>47</sup> [MALAWI] Art. 35, Water Resources Act, 2013.

<sup>48</sup> [SPAIN] Art. 24, Royal Legislative Decree No. 1/2001 Approving the Consolidated Text of the Water Law, 2001.

<sup>49</sup> [ARMENIA] Art. 20, Water Code, 2002.

<sup>50</sup> [BENIN] Art. 11, Law No. 2010-44 on Water Management, 2010.

<sup>51</sup> World Bank, 2017.

### C. Allocation - Allocating water according to priorities

Modern permit systems for water abstraction and use are a critical tool for water demand management, serving a dual function by (1) providing a reporting mechanism to provide the water manager with information on water use, and (2) providing a legal control mechanism by which it is possible to restrict the amount of water abstracted from the environment.<sup>52</sup>

The fundamental legal provision with respect to water demand management is a prohibition against abstracting water without prior permission from the government through a permit, license, concession, etc.<sup>53</sup> Globally, the overwhelming majority of countries have used their legal frameworks to establish this prohibition. It is estimated that more than 82 percent of countries have included a basic legal provision against abstracting water without a permit (sample = 62 countries).<sup>54</sup> For example, the legal framework of Rwanda establishes a three-tier system of declarations, authorizations and concessions with escalating administrative review depending on the scale of water abstraction.<sup>55</sup> The characteristics and details of this prohibition can and should be tailored to individual country context, and most countries have included exemptions to protect smaller water users and customary water uses. For example, Zambia's legal framework explicitly exempts from permit requirements any abstraction of water for domestic and non-commercial purposes.<sup>56</sup>

The legal framework can play a more comprehensive role for water demand management by fleshing out more details of how to obtain a permit, introducing public notice requirements before a decision is made on new permit applications, and clearly specifying the duration for permits. However, many countries that have introduced the basic requirement to not abstract water without a permit have not yet introduced the details mentioned above. Approximately 44 percent of countries require a

period of public notice before decisions on new water abstraction permit applications, and even fewer of those specify basic details about the public notice required, such as the means of notice or its duration (sample = 62 countries).<sup>57</sup> Such procedural requirements and the conditions attached to permits, such as limits on the volume abstracted, are the central legal controls underpinning a command perspective on water demand management.

### D. Protection – Protecting water resources from depletion and pollution

Water demand management requires enforcement of norms and expectations to protect water resources from depletion and pollution. The legal framework has a significant potential role to play in water demand management by building and enforcing compliance with restrictions on water abstraction and use. The defining characteristic which sets the legal framework apart from other policy tools is precisely its legal enforceability. This provides the “teeth” necessary to ensure compliance with the permit conditions discussed above, and to make reductions in demands and adjust the balance between water supply and demand.

At a basic level, it is widespread for legal frameworks to specify offenses and penalties for violations of water abstraction requirements, and to provide for official inspection powers to check for compliance. It is estimated that the legal frameworks of more than three-quarters of countries specify at least some basic offenses and penalties for water abstraction-related violations (sample = 62 countries).<sup>58</sup> The specificity of the offenses and the severity of the penalties may vary considerably according to country context. For example, the legal framework of Nepal allows for a fine of up to 5,000 Nepalese Rupees and corrective action (closing the abstraction point) in the case of water abstraction without a permit or against the terms of a permit.<sup>59</sup> In Greece, fines for similar offenses can be up to 10,000 euros.<sup>60</sup>

<sup>52</sup> Ward & Pulido-Velazquez, 2008, p. 18219; Speed, et al., 2013, pp. 92-93.

<sup>53</sup> Hodgson, 2006.

<sup>54</sup> World Bank, 2017.

<sup>55</sup> [RWANDA] Art. 34, Law No. 62/2008 Putting in Place the Use, Conservation, Protection and Management of Water Resources Regulations, 2008 [Currently subject to revision].

<sup>56</sup> [ZAMBIA] Art. 70, Water Resources Management Act, No. 21, 2011.

<sup>57</sup> World Bank, 2017.

<sup>58</sup> World Bank, 2017.

<sup>59</sup> [NEPAL] Sec. 22, Water Resources Act, 1992.

<sup>60</sup> [GREECE] Art. 13, Joint Ministerial Decree 146896, 2014.



Even more directly relevant for water demand management, the legal framework can contain special provisions which allow for the curtailment of existing permitted water uses in cases of water stress. Without such powers, the quasi-property right nature of water abstraction permissions could make it legally difficult to curtail water uses when necessary. It is estimated that the legal frameworks of 81 percent of countries provide at least some legal powers for a government entity in case of water stress (however defined by each individual legal framework).<sup>61</sup> For example, the legal framework of Peru explicitly provides that water abstraction permits may be revoked in case of water resource scarcity, if a formal declaration of need has first been made by the national authority responsible for water resources.<sup>62</sup>

#### E. Adaptation - Improving system flexibility and resilience

In the most highly-developed water management systems, accurate information, clear incentives, and a certain amount of flexibility can allow water users to understand the full picture of risks from water scarcity, and then change and shift over time in response to changing conditions. The legal framework has a significant potential role to play in supporting this by establishing economic incentives and market-based mechanisms for the reduction and reallocation of water demands. However, it is important to underline here that such incentives and mechanisms require a strong foundation in comprehensive water information, planning, allocation, and enforcement systems for their eventual effectiveness. Nevertheless, it is estimated that 65 percent of countries have already put in place the minimum legal foundation necessary to charge for the amount of abstraction of water resources – a legal obligation on water abstractors to pay a royalty fee, conceptually distinct from any charges for distribution service operation and maintenance.<sup>63</sup> For example, the legal framework of Senegal concisely provides that abstraction of water resources is subject to an obligation to pay a fee.<sup>64</sup> This legal foundation allows for the incorporation of pricing incentives meant to affect the overall demand for water resources, or a reallocation toward higher value demands.

When it comes to reallocation, around 42 percent of countries have put in place the legal foundation to allow for transfers of water abstraction permits.<sup>65</sup> When permit transfers are legally possible, it is common to require the notification of or consent from the permit issuing authority. Thus, for example, the legal framework of Serbia allows for the transfer of water abstraction permits only with the consent of the issuing authority.<sup>66</sup> Without a legal provision obligating users to pay for the amount of water abstracted and a water provision allowing for permit transfer (with notice or consent of the authority), many of the economic incentives for water demand management proposed in the literature would not be legally possible.

#### 4. Designing law as a tool

In summary, what are some of the ways that the legal framework can be used as a tool to contribute to water demand management? The legal framework can contribute to water demand management by including legal provisions that provide support to (a) water information systems, (b) inclusive planning, (c) permits for water abstraction, (d) strong and context-appropriate enforcement, and (e) in highly-developed systems, economic/market-based incentives to reduce or reallocate water uses. The role of the legal framework will be slightly different depending on where a country finds itself in terms of water resources development and economic development. For a country with relatively low levels of water resources utilization, the priorities for water demand management are more forward-looking and about prevention (ensuring that the country does not rapidly end up with high levels of water scarcity). For those countries already with high levels of water scarcity, water demand management is an immediate priority about management and mitigation of the current situation. However, across both scenarios, the basic supporting legal tools are similar – the difference is in how the legal provisions are applied to match the circumstances on the ground. Similarly, available legal provisions across low income and high income countries may look slightly

<sup>61</sup> World Bank, 2017.

<sup>62</sup> [PERU] Art. 72.4, Law No. 29.338 on Water Resources, 2009.

<sup>63</sup> World Bank, 2017.

<sup>64</sup> [SENEGAL] Art. 16, Law No. 81-13 on the Water Code, 1981.

<sup>65</sup> World Bank, 2017.

<sup>66</sup> [SERBIA] Art. 125, Law on Water, 2010.

different in form, but will share many underlying basic objectives.

Of course, merely enacting a legal provision is not the end goal. In the context of water demand management, legal provisions are only helpful to the extent that they are implemented and used as a tool in the pursuit of desired outcomes of water demand management. For that, it is required to also bring in adequate funding, political will, overall rule of law, public education, staff capacity etc., among other factors. These other factors can often obscure the role of the legal framework when looking at the big picture. But, from the perspective of the public sector as a water resource manager, the legal framework can provide critical support in the form of mandates for continued durable action over time, and obligations to support the adoption of behaviors supportive to water

demand management objectives. From the perspective of water users, the legal framework can also provide critical support by providing clarity and security of rights as water scarcity and potentially competing demands grow.

## 5. Acknowledgements and Disclaimer

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