doi: 10.2166/9781789062786_0025

Chapter 3

Allocations and legal trends in the 21st century

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ABSTRACT

Around the world, allocating water is a major task of national and sub-national water laws. Although each jurisdiction develops its laws uniquely in response to local conditions, common trends emerge across multiple jurisdictions. The 21st century has seen a geographic broadening of administrative planning and permitting or licensing arrangements for allocating traditional water sources. Allocation regimes also increasingly cover non-traditional water sources that previously fell outside their bounds, including brackish groundwater, rainwater and recycled water. Recognizing interactions between sources is of increasing concern to allocation regimes. Legal developments also provide for an increasing array of water users and other participants in allocation processes. Traditionally, allocation arrangements have centered on significant agricultural, municipal, industrial and other commercial uses. More recently, water law increasingly contemplates granting allocations to, or controlling, uses for environmental purposes and cultural purposes, and broadening access beyond current water rights holders under water market rules. Both constitutional and water laws increasingly recognize a human right to water, and increasingly inclusive processes apply to formulating water plans that guide or influence allocation regimes. These developments are not uniformly present, or present to the same degree, in all jurisdictions. However, encouragingly, they demonstrate increased recognition of the need to respond to water scarcity and give greater attention to equity and inclusion among water users and participants in allocation regimes.

Keywords: Allocation, environmental flows, groundwater, human right to water, law, participation, water licensing, water planning, water transfers, water user institutions

3.1 INTRODUCTION

Around the world, allocating water is a major task of national and sub-national water laws. Although each jurisdiction develops its laws uniquely in response to local conditions, overarching global legal trends have emerged over time, carrying important implications for agricultural water uses. First, water law increasingly uses administrative planning and permitting systems to cover more water sources, including those that traditionally have been less regulated, and it does so in more complex ways. Second, it increasingly both accommodates and controls more diverse social and environmental, as well as economic, stakeholders, such as water users and participants, in administrative regimes.

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While both categories of trends are notable, they are not without difficulties and challenges. These point to varying gaps between law on paper and law in practice, and, in some cases, more fundamental questions about the appropriateness of reform directions.

This chapter synthesizes insights into these overarching legal trends and accompanying difficulties and challenges in 21st century reforms to allocating water between water users, with a focus on implications for the agricultural context. More detailed, jurisdiction-specific discussion follows in subsequent chapters. As befits these introductory purposes, the chapter draws on secondary literature,[1] attempting to represent as many countries as possible, especially those that are less frequently discussed in the literature. A number of important matters fall outside its scope, including allocations between nations or sub-national jurisdictions; detailed institutional aspects of water allocation regimes; water charging arrangements; and, except as they relate to 'formal' allocation laws, customary regimes for water allocation, which are in particularly wide use in Africa (Schreiner & van Koppen, 2020).

3.2 THE GLOBAL GROWTH AND DEVELOPMENT OF ADMINISTRATIVE REGIMES FOR ALLOCATING WATER

3.2.1 Adoption of permitting and planning systems across more nations

Across diverse jurisdictions, a common starting point for formal legal water allocation systems is the vesting of water resources in the state (e.g. Indonesia, Kenya: Dai *et al.*, 2017; Israel, Nicaragua: Global Legal Research Center, 2013; Bangladesh, Bhutan: Hirji *et al.*, 2018).[2] Water is still capable of being privately owned in some jurisdictions, and this occurs much more commonly for groundwater than for surface water (e.g., Austria, Japan, Portugal, some areas of the USA: OECD, 2015), but these are best considered 'isolated pockets' of water allocation regimes (Burchi, 2019).

Public control of water is associated with the increasingly common use of administrative regimes to allocate water, often by using statutory water plans and state permitting systems (China, Kenya, South Africa: Dai *et al.*, 2017; Tanzania, Kenya, Burkina Faso, Swaziland: van Koppen, 2017). These administrative regimes advantageously 'allow[] prospective consideration of the consequences of allocation … [and] a systemic approach to consideration of the secondary impacts of management actions' (Cosens, 2018). They are also able clearly to define the relevant entitlements, which is considered vital to an allocation system (Hirji *et al.*, 2018; OECD, 2017). However, these advantages of administrative regimes can only reliably be secured if the management plans are binding on water allocation decisions. Otherwise, they may act as mere plans 'on the shelf', with reduced on-ground influence on allocations. In a recent World Bank survey of 101 countries, 65 required water management plans that were binding on water allocation decisions, and 63 required a permit to abstract water accompanied by a public notice and comment process (World Bank, 2019). In other jurisdictions, water plans are a mere consideration (Finland: Soininen, 2014) and do not bind water permit decisions. In some cases, water planning and permitting regimes only apply to some parts of jurisdictions that are considered particularly water-stressed (Australia: Cosens, 2018) or where environmental problems are significant (New Zealand: Daya-Winterbottom, 2014). There is also great diversity in the scale at which water planning occurs, from the national level (Nepal: Hirji *et al.*, 2018) to the state level (states of the western USA: Cosens, 2018), to the local watershed level (some areas of Australia, California, USA: Cosens, 2018; South Africa: Pejan *et al.*, 2014). Though it appears

[1]For reasons of feasibility and accessibility to a broad readership, where possible, the materials cited rely preferentially on readily available books, reports and multidisciplinary journal articles that discuss multiple national jurisdictions, rather than law journal articles, which usually discuss a single jurisdiction and are often only accessible through legal databases.

[2]For clarity and brevity, where a reference describes particular national legislative systems, these are stated in parentheses with the reference.

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relatively rare, some jurisdictions are attempting to link statutory water plans with land use plans (e.g. Vietnam, Ecuador, California, USA, Japan, Zambia, Tanzania: Burchi, 2019).

A key task of administrative allocation regimes is adapting allocations to scarcity. At the level of individual allocations, a variety of mechanisms for adapting to reduced water availability have emerged in different water allocation regimes over the last two decades. Some statutes expressly allow regulators to reduce licensed abstraction volumes in response to reduced availability, with or without compensation (Ecuador, Tanzania, Namibia, Zambia: Burchi, 2019). Others now specify allocations as 'shares' of the available resource, rather than as absolute volumes (Australia, also considered in England and Wales: Burchi, 2019). At the extreme, reduced water availability may lead water regulators to restrict the granting of permits that draw from certain sources for agricultural uses in favor of drinking water, as is occurring in the Netherlands in relation to dwindling fresh groundwater (Dai *et al.*, 2017).

At the level of water planning instruments, climate change and associated reductions in water availability are increasingly considered (India; Rufiji Basin, Tanzania: Hirji *et al.*, 2018), but this is far from the case in all jurisdictions (Afghanistan, Bangladesh, Bhutan, Nepal, Pakistan, Sri Lanka: Hirji *et al.*, 2018). More generally, growing use of groundwater is frequently suggested as a climate change adaptation measure (Hirji *et al.*, 2018). This highlights the increasing need to ensure sustainable groundwater allocation regimes are in place, particularly given that millions of wells globally are at risk of running dry with even modest reductions in water table levels (Jasechko & Perrone, 2021).

3.2.2 Application of permitting and planning regimes to more water sources

As administrative permitting and planning regimes are covering water sources in more nations, these regimes also appear to be applied to an increasing range of water sources within nations. This is consistent with formal allocation regimes having increasing benefits when water sources are used more intensively (OECD, 2017).

From a traditional focus on surface water, water allocation laws have increasingly broadened to allocate access to groundwater (Mechlem, 2016), even in comparatively water-rich regions (British Columbia, Canada: Mechlem, 2016). Indeed, permitting arrangements for groundwater allocations are now considered to be 'the central element' of groundwater laws to control demand (Mechlem, 2016). In some cases, significant recent changes to groundwater allocation have been triggered by changes to surface water allocation. In Australia, where sub-national states have historically controlled water allocation, the federal Parliament's first legislative foray into this area was prompted by concerns about over-allocation of surface water to agriculture, but the resulting legislation introduces comprehensive caps on allocation of both groundwater and surface water for consumptive purposes. This federal intervention instituted the first such controls on groundwater in some areas, which had not previously been subject to state-level caps on allocation (Nelson, 2018). By contrast, India's national government has encouraged, but not required, states to adopt groundwater-specific legislation that often includes permitting regimes in notified areas. However, rather than adopting this permitting approach, some irrigation-dependent states have favored incentive-based approaches to crop diversification and micro-irrigation to address sustainability concerns (Cullet, 2009). A still-common alternative to direct groundwater allocation and permitting systems is land-based restrictions, such as restricting the construction of new wells or regulating the allowable expansion of irrigated land (OECD, 2015).

Water management regimes also increasingly cover sources that have not traditionally been regulated, including brackish groundwater, rainwater and recycled water, as well as water that is a by-product of industrial processes (OECD, 2015). However, there are diverse approaches to formalizing access to non-traditional sources, and many commentators indicate the need to create improved and legally certain allocation frameworks for non-traditional sources (Hirji *et al.*, 2018; OECD, 2017). In Africa, commentators have noted a largely unmet need for law reform to facilitate irrigated agriculture using wastewater (African Union, 2020).

A different perceived solution to scarcity has attracted significant attention, and the development of legal frameworks, in some western jurisdictions: managed aquifer recharge, or aquifer storage

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and recovery (e.g. California, Texas, Florida, USA: Bray, 2020). These practices involve intentionally placing water into aquifers for later use using injection wells or infiltration ponds, which raises initial permitting considerations related to water quality impacts (Bray, 2020). Associated permitting regimes for the 'recovered' water must deal with many complex issues, including the percentage of the stored water that is recoverable and where it may be recovered, preventing others extracting it, and allowable rates of recovery (Nelson & Casey, 2013). There is some evidence of over-reliance on managed aquifer recharge as a solution to water scarcity problems in some jurisdictions, and perhaps under-preparedness for its potential legal complexity (e.g. California, USA: Ulibarri *et al.*, 2021). Managed aquifer recharge occurs in jurisdictions outside the USA (e.g. Kitui District, Kenya: Clifton *et al.*, 2010; Kumamoto, Japan: OECD, 2017; India: Sakthivel *et al.*, 2015; European jurisdictions: Sprenger *et al.*, 2017). However, significant analysis of the accompanying legal arrangements, including how formal water allocation regimes accommodate these practices, has been rarer (e.g. Clifton *et al.*, 2010; OECD, 2017).

3.2.3 Increasing complexity of permitting and planning

Allocation regimes are also increasing in their complexity. The issue of recognizing interactions between water sources, particularly groundwater and surface water, has characterized important legal developments across several jurisdictions (OECD, 2015; states of the western USA: Trout Unlimited, 2007; states of the eastern USA: Weston, 2008). For example, water allocation reforms in the laws of the Australian states have been driven by an intergovernmental National Water Initiative policy agreed in 2004, which highlighted the need to manage interconnected surface water and groundwater in an integrated manner (Cosens, 2018). In some places, innovative legal mechanisms provide for groundwater users to 'offset' or mitigate their indirect use of connected surface water, for example by purchasing or leasing (and not using) rights to connected surface water, or 'pumping and dumping' water from unconnected sources into streams that would be depleted by a groundwater pumping proposal (states of the western USA: Nelson, 2015). In these contexts, integrating groundwater and surface water refers to considering connections between surface water and groundwater to ensure that the use of one does not unintentionally impact the other. Integration can also refer to the 'complementary use of surface water and groundwater' to increase productivity (World Bank, 2006). The latter approach can be facilitated by allocation regimes that allow users to switch between surface water and groundwater (e.g., some western states of the USA: Thompson, 2011).

3.2.4 Implementation challenges to permitting and planning systems

Putting to one side trends in law 'on paper', as time passes, commentators increasingly recognize that rather than being a panacea for water problems, allocation permitting and planning regimes carry their own challenges. This is the case even in jurisdictions in which they are well-established, as in New Zealand, where regional plans define the quantum of water available for irrigation, industry and the environment, and set out rules for water allocation (Daya-Winterbottom, 2014). There, uncertainties have emerged where regional plans lack rules about how to consider competing applications to use the same water resource, and the statute itself is silent on the matter (Daya-Winterbottom, 2014). South Africa initially sought to implement a system of 21 catchment management strategies, which relate to water management decisions, based on catchment boundaries, but subsequently revised this proposal to 9 due to 'operational challenges' (Pejan *et al.*, 2014).

In some jurisdictions, rollouts of area-based permitting systems, or their implementation, have stalled, partially because they require greater administrative resources than are available in lower income countries (South Africa, Tanzania, Malawi, Ghana: van Koppen, 2017). Some African jurisdictions lack sufficiently secure agricultural water rights in general to facilitate private investment in irrigation, for example, where government departments lack the administrative capacity to issue small water user permits (African Union, 2020). Social equity concerns pose a further challenge to permitting systems in some jurisdictional settings, discussed further below.

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3.3 ACCESS TO WATER FOR MORE WATER USERS, AND PARTICIPATION BY MORE STAKEHOLDERS

The past two decades have also seen legal developments that recognize an increasing array of water users and other participants in allocation and re-allocation processes, achieved through both market and non-market mechanisms. Traditionally, allocation arrangements have centered on significant agricultural, municipal, industrial and other commercial uses. More recently, environmental and social equity concerns are prompting some jurisdictions to recognize more diverse water users either within water allocation systems, or in a way that constrains the grant or exercise of formal allocations.

3.3.1 Human right to water

International recognition of the human right to water emerged in the early 21st century, notably with the United Nations Committee on Economic, Social and Cultural Rights issuing a General Comment on the right to water, in 2002, and a United Nations General Assembly resolution in 2010 (Winkler, 2017). The right is considered to encompass both distributive and procedural components (Hey, 2009), both of which are relevant to water allocation laws. Conceptually, the distributive aspect either supports directly allocating water to beneficiaries of the right, or constraining allocations to others in order to protect access for beneficiaries of the right. The procedural aspect intersects with a greater focus on the participation of more diverse stakeholders in water allocation and management processes.

International right-to-water developments have been accompanied by diverse jurisdictional approaches to the issue as, some have argued, is entirely appropriate (Lugaresi, 2014). An increasingly common trend in less wealthy nations is to constitutionalize the right to water in itself (e.g., Ecuador, Bolivia, Gambia, Uruguay) or jointly with another right (Ethiopia, Kenya, Uganda, Panama, South Africa, Nicaragua, Democratic Republic of Congo), such as a right to health or food (Lugaresi, 2014). In other nations, courts have recently interpreted older constitutional rights provisions as encompassing the human right to water where the constitutional text does not explicitly refer to water (e.g., Argentina: Onestini, 2017). Other, weaker, approaches include legislatively requiring agencies to consider the human right to water when taking action in relation to policies, regulations and grant criteria (Nelson & Quevauviller, 2016).

While the diversity of approaches to providing for a human right to water makes it difficult to generalize about its possible effects on allocating water for agricultural purposes, several possibilities emerge. Agricultural uses of water may be constrained if they threaten the human right to water (Soininen, 2014), even if the right is not accompanied by allocations that appear in formal permitting or planning systems. This could conceivably include threats to quantity as well as quality, although the latter appear most prominently in the literature (e.g. Argentina: Onestini, 2017). Though international conceptions of the human right to water appear restricted to domestic and sanitation uses, and have been criticized for this (van Koppen, 2017), national conceptions of the right may extend to subsistence agriculture, thereby placing water allocations for subsistence agriculture (covered by the right) in tension with those for large-scale agriculture (not covered by the right). Comprehensive comparative analysis of how constitutional courts interpret the potential for competing rights in this context remains relatively limited.

3.3.2 Water for environmental purposes

Environmental uses of water traditionally have been under-represented in water allocation regimes, but this is now changing, with implications for the allocation of water for agricultural purposes. Water laws increasingly contemplate securing water for environmental purposes in one of two broad ways: 'rules-based' approaches protect water for the environment by controlling the way that water is allocated for consumptive purposes, including agriculture; and 'rights-based' approaches allocate water directly to environmental purposes (Horne *et al.*, 2017). The latter, which may allocate water to statutory

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holders of environmental water (O'Donnell, 2018), appear relatively rare in a global sense. These latter approaches are also currently largely restricted to the surface water context, though there is potential, and arguably value, in extending them to groundwater (Nelson, 2022), as has occurred with rules-based approaches (Australia: Pierce & Cook, 2020; western USA: Saito *et al.*, 2021).

Under rules-based approaches, water for environmental purposes is not formally conceived as a use that is subject to allocation permit systems, but environmental purposes nonetheless constrain access to water for uses that hold or require formal allocations. This is the case, for example, where water for basic needs, ecosystems or both, is conceived of as a 'reserve' that is not available for allocation (Kenya, South Africa: Dai *et al.*, 2017), or where the judicially developed public trust doctrine obliges government trustees to supervise and protect water as a trust resource (USA as a matter of state law, India: Scanlan, 2017). Other nations subject consumptive uses to temporal or spatial rules on withdrawing water, with overall caps on extraction calculated by reference to ecological requirements, or require environmental matters to be considered in water allocation permitting processes on a case-by-case basis (western USA, Australia: Horne *et al.*, 2017; Nelson, 2013).

Within permitting processes, environmental issues may be considered under formal environmental impact assessment-like processes (e.g. Peru, Honduras: Burchi, 2019); or using broader and vaguer 'principles' (western USA, Australia: Nelson, 2013; western USA: Squillace, 2020). Increasing attention to the environmental implications of permitting water uses in Finland's 2012 Water Act has led to a statutory test that requires balancing of harms and benefits, though its practical application is made difficult by the lack of a hierarchy or weighting criteria (Soininen, 2014). Similarly, New Zealand's Court of Appeal has determined that the legislated sustainable management principles considered in the context of water allocation decisions require taking a 'balanced judgment' in relation to competing considerations (Daya-Winterbottom, 2014). While facilitating contextualized decision-making, this approach raises questions about the scope of administrative discretion, and the possibility of widely divergent local approaches in the absence of specific guidance material (Daya-Winterbottom, 2014).

These developments may pose challenges to new and established agricultural water uses in a variety of ways. Rules-based approaches constrain the amount of water available for agricultural allocations, and rights-based approaches place environmental water holders in more direct competition with agricultural users. Some legal approaches may allow for re-allocating agricultural water to environmental purposes. This may occur where rules are newly established or adapted in response to new information, such as revised caps on total consumptive allocations to reflect new information about greater environmental water needs. New environmental concerns may prompt pressure on governments to decline the renewal of time-limited consumptive allocation permits (India: Scanlan, 2017). In some contexts, environmental water holders may purchase agricultural water to dedicate to environmental purposes (see Section 3.3.3 below). In others, the public trust may require the government to revise previously issued permits to secure ecological outcomes (California, USA: Scanlan, 2017). In other cases, this is less clear in relation to agriculture, specifically: India's adoption of the public trust occurs alongside preferences for both domestic and agricultural requirements over commercial uses (Scanlan, 2017), making its implications for agricultural water uses less clear.

The practical implications for agriculture of these developments may also be limited by design, or by incomplete implementation. In some places, legal mechanisms that secure water for ecological needs are only active during drought (Netherlands, China: Dai *et al.*, 2017). In others, legislation or policy may recognize the need to allocate water for the environment, but not yet systematically do so (Bangladesh, Bhutan, India, Nepal, Pakistan: Hirji *et al.*, 2018). Similarly, growing statutory and judicial recognition of the legal personality of rivers and other water bodies around the world (e.g., Aotearoa New Zealand, India, Bangladesh, Colombia: O'Donnell, 2021) certainly carries strong rhetorical weight. However, these developments universally appear to lack water rights for rivers (O'Donnell, 2021), so impacts on agriculture are likely to be less direct than competition for allocations. Formal pro-ecology policy declarations in the context of water allocations in other jurisdictions (e.g., 'ecological civilization' in China: Jia & Zhu, 2020) also carry uncertainties about

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the extent to which, and how, they might be implemented in practice, and affect new or existing agricultural water allocations on the ground.

3.3.3 Transferring allocated water

As well as recognizing the legitimacy of new classes of water use, such as ecological uses, water law reforms increasingly provide for transferring water between established categories of uses. In some cases, it may be more palatable to establish a new allocation system if the system affords users flexibility through a water transfer or water market system (e.g. California: Nylen *et al.*, 2017).

Re-allocating water from agricultural to urban purposes is increasing around the world, with a systematic review having identified 103 major rural-to-urban re-allocation projects undertaken from 2000 to 2018, with most occurring in Asia and North America (Garrick *et al.*, 2019b). Whether re-allocations are voluntary or involuntary, they occur in the context of legal and institutional frameworks dealing with water rights (Garrick *et al.*, 2019a), and can take a variety of administrative, negotiated and judicial guises, of which market-based transactions are one. Interestingly, most rural-to-urban re-allocations around the world do not occur under formal market and trading rules, but as administrative decisions to re-allocate water, and under formal negotiated agreements (Garrick *et al.*, 2019b). Despite a general trend of recognizing the economic value of water (Dai *et al.*, 2017), including through the development of markets, the practical prominence of this concept in the context of rural-to-urban re-allocations appears muted. Rural-to-urban re-allocations also tend to concern surface water more than groundwater (Garrick *et al.*, 2019b), but more generally, markets are also developing in relation to groundwater allocations (western USA, Australia, New Zealand, Chile, Mexico, Spain: OECD, 2015). The development of water markets, and facilitative laws and regulations, have enabled the transfer of allocations of agricultural water between users to varying degrees in different jurisdictions. Some jurisdictions allow only intra-sectoral transfers (e.g. farmer to farmer) (e.g. Honduras: Burchi, 2019); and others expressly ban transfers or implicitly do so by tying water rights to land (e.g. Peru, Zambia: Burchi, 2019).

Where transfers are facilitated by law, permits and operational rules for re-allocations are considered critical for making re-allocations effective and equitable; and conversely, uncertainty about who owns water is a common cause of controversy in re-allocations (Garrick *et al.*, 2019a). It is possible to establish water markets for diverse types of rights, though trading is more complex and time-consuming in some situations. In Australia's much-discussed Murray-Darling Basin, the high activity of agricultural water markets is facilitated by laws that require a transfer of a typically perpetual water right to be consistent with a watershed plan, avoiding the need to assess transaction-specific third party impacts, including to 'donor' agricultural communities, and thereby reducing transaction costs (Cosens, 2018). Trade of older-style, time-limited rights that are associated with specific parcels of land (termed 'take and use licenses' in Victoria, e.g.) is also possible, though more time-consuming. In the western USA, the heavy regulation of water transfers more closely analyses third party impacts than occurs in Australia, but dramatically increases transaction costs (Cosens, 2018).

3.3.4 Water for other consumptive users

In some ways, the converse of allocation regimes allowing for, and legitimating, more diverse water uses, is the legal trend of requiring formal allocations for more types of water uses—in other words, seeking to bring more uses under closer legal control. While not yet common, some water allocation regimes are seeking to encompass indirectly used water, which was formerly exempt from formal allocation permit requirements. This has occurred, for example, in relation to water use by trees in dryland tree farms (South Australia, Australia: Burchi, 2019) and water that is a by-product of mining and oil and gas production (New South Wales, Australia: Nelson, 2018; western states of the USA: Thorne & Caile, 2013). This trend may protect agricultural water uses from the effects of what might otherwise be unregulated and uncontrolled withdrawals, and reflects the concern of water allocation regimes to better regulate the cumulative effects of water withdrawals.

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3.3.5 Implementation challenges to facilitating access

While there is increasing legislative recognition of the importance of water for both environmental and other public benefit uses, barriers remain to the wide availability of water allocations for more diverse water users. In some cases, even relatively recently introduced water allocation permit systems may tie water permits to land ownership, which marginalizes the landless, especially women (Kenya: Dai *et al.*, 2017; sub-Saharan Africa: van Koppen, 2017). This is especially a concern in relation to groundwater (OECD, 2015), though there is an increasing trend of separating even groundwater rights from land ownership (Mechlem, 2016). Many allocation systems in former colonies have only recently begun addressing water rights for Indigenous peoples based on historical uses or in other ways (Macpherson *et al.*, 2018). Some jurisdictions focus on providing rights in the form of spiritual and cultural rights rather than for commercial uses (Australia: Macpherson *et al.*, 2018) that would enable Indigenous peoples to access water for agriculture or other forms of economic development. The latter approach is more common in Latin America (Macpherson *et al.*, 2018). Concerns can even arise with legally strong, constitutionally based forms of protection: despite South Africa's strong constitutional focus on social equity, and a constitutional commitment of government to bring about equitable access to water resources (Pejan *et al.*, 2014, citing s25 South African Constitution), little of the intended redistribution of rights to water has occurred in practice (South Africa: van Koppen, 2017).

Some commentators suggest that the growing use of state permit systems to allocate water is fundamentally in tension with the human right to water. This may be particularly the case in agrarian low- and middle-income countries where permit regimes 'annul' customary law and introduce a 'bias towards single water uses', rather than domestic water and subsistence agriculture, ultimately 'finishing the unfinished business of colonialism' (van Koppen, 2017). Some recent water allocation legislation deals with this by formally recognizing uses established under customary law, accompanied by mechanisms such as local accreditation measures (Bhutan), a requirement to consider traditional uses when deciding on new abstraction applications (Zambia, Namibia), or according customary rights a generic priority or equal status to 'modern' permits (Peru, Tanzania) (Burchi, 2019). If well implemented, such measures would presumably go some way to protecting traditional, small-scale agriculture from the adverse effects of newer, large-scale agricultural withdrawals.

3.3.6 More diverse participants in processes that influence allocations

As well as substantive changes to the scope of water allocation regimes, procedural reforms that relate to stakeholder participation may indirectly influence allocations. The 21st century has seen a reduced role for central governments in the irrigation sector globally, away from a bureaucratic, top-down approach, and towards a paradigm of participatory irrigation management and water user associations (India: Cullet, 2009; World Bank, 2006), and frequent decentralization of control to the river-basin level (Dinar, 2005). Influenced at least in part by developing international norms, national-level allocation regimes have broadened stakeholder processes to involve water users in water resources management processes (Brantas River Basin, Indonesia: Dai *et al.*, 2017; Guatemala, Lao PDR, Sierra Leone, reforms from 2016–2018: World Bank, 2019).[3] In some places, First Nations peoples, who traditionally have been disempowered or disadvantaged within these regimes, are increasingly considered in reforms or reflected in developments in rights claims (Macpherson, 2019; Womble *et al.*, 2018).

However, these reforms have not escaped critique. Establishing new water users' institutions, rather than using existing local institutions, can threaten equity: new institutions may represent only landowner farmers, often privileging high-status men, when 'irrigation is an issue which concerns not only landowners but everyone else as well', including through impacts on domestic users and women who may not be perceived to be water users (Egypt: Barnes, 2015; India: Cullet, 2009). Sometimes, 'participation' may amount to simple notification of decisions or other shallow mechanisms, rather

[3] For information for 101 countries on whether a country requires water users to be represented in water resource management institutions, see https://eba.worldbank.org/en/data/exploretopics/water.

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than influence on decision-making processes (Kenya, China: Dai *et al.*, 2017). Even in jurisdictions that have long traditions of involving stakeholders in allocation-related processes like water planning and permit decision-making, participation may not extend to the ready availability of court challenges to water plans or already granted permits (Netherlands: Dai *et al.*, 2017). The practical effectiveness of participation provisions may also be affected by a lack of interest or awareness on the part of stakeholders (Netherlands: Dai *et al.*, 2017). In other regions, central agencies may be reluctant to give up power, or state-supported decentralization may be perceived to erode local allocation traditions in favor of new arrangements that are inadequately resourced (Middle East/North Africa region: Closas & Villholth, 2020). Even when political trends support increased stakeholder representation, and environmental trends lead to legal restrictions on access to water (see above Section 3.3.2), corruption, existing power disparities, and 'local tyrannies' may frustrate the achievement of these aims on the ground (Middle East/North Africa region: Andersson & Ostrom, 2008; Closas & Villholth, 2020). Further investigation of the effects on equity of the push to decentralize institutions with power over water allocations is warranted.

3.4 REFLECTIONS AND CONCLUSION

These developments are not uniformly present, or present to the same degree, in all jurisdictions. Apparently similar developments may also mask surprising legal differences, like different definitions of 'groundwater' (Nelson & Quevauviller, 2016). However, the generalized emergence of these overarching categories of developments – allocation regimes that facilitate access to more water sources, for more water users – is perhaps unsurprising against larger biophysical and socio-political trends.

Allocation rules that broaden the water sources contemplated by allocation rules and recognize greater complexity in physical water sources respond to increasing competition for water and water scarcity and the need to steward it more carefully. Allocation systems are becoming more elaborate, in line with increasing use. However, it is unclear to what extent increasingly complex allocation systems are being introduced preventatively, ensuring that 'the basic building blocks of a robust regime [are] put into place at an early stage to avoid lock-in to unsustainable use and allow for adjustment at least cost, as needed, over time' (OECD, 2017). Future empirical research on the triggers for these legal changes would help resolve this issue.

Allocation rules that expand the range of legitimate water uses and participants in allocation regimes mirror the more diverse voices and values increasingly safeguarded – or at least debated – across other areas of law. The interactions and relationship between substantively providing for new water users/uses to improve distributional equity, and broadening procedural stakeholder involvement processes, provide a fertile ground for further investigation.

Explicitly recognizing these trends is important for several reasons. First, it underscores that further legal change may be needed to fully operationalize these developments. This includes better monitoring and compliance; reliable, trusted and readily accessible information about water sources and water allocations; and coordination between jurisdictional allocation regimes (Mechlem, 2016). Enforcement problems associated with permit systems are noted in a wide range of jurisdictions (Kenya: Dai *et al.*, 2017), especially in relation to agricultural water use and use of groundwater (e.g. illegal or unregulated wells) (e.g. southern Europe, Mexico: OECD, 2015). Similar concerns may arise about the legal clarity and certainty of the governing water allocation legislation (Kenya: Dai *et al.*, 2017; New Zealand: Daya-Winterbottom, 2014; states of the western USA: Squillace, 2020). On the other hand, some perceive that the practical difficulty of implementing a legal system of water allocations relates to tensions with underlying views of water as a social good (Kenya: Dai *et al.*, 2017), which raises questions about its appropriateness in the first place. Second, recognizing these trends raises questions about ways of more fully reflecting the values underlying them through better integrating water law and other areas of law to which these trends speak, for example biodiversity-focused

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environmental laws, broader natural resources laws, and cultural heritage laws (Nelson, 2020; Nelson *et al.*, 2018). Finally, recognizing these trends facilitates the achievement of a key goal of this book: cross-jurisdictional learning about responses to common challenges.

ACKNOWLEDGEMENTS

I gratefully acknowledge the support of the Australian Research Council (#DE180101154), feedback from Amanda Cravens, A. R. Siders, Nicola Ulibarri, Christina Babbitt and Josselin Rouillard, and research assistance by Lucas Volfneuk and the Melbourne Law School's Academic Research Service.

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