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## COMPARING COLONIAL WATER LEGACIES: FLOW AND STAGNATION IN LEGAL DEVELOPMENT

Erum Sattar<sup>†</sup>

### I. INTRODUCTION

In 1965 Lon Fuller wrote an article, *Irrigation and Tyranny*,<sup>1</sup> that is perhaps little known by scholars other than legal theorists of irrigation. In it, he recounted his personal interest in the ideas of the great irrigation theorist Karl Wittfogel, specifically, Wittfogel's idea of a “hydraulic civilization.”<sup>2</sup> Fuller observed that:

The historian Karl Wittfogel suggested that the need for a highly developed irrigation system aided the rise of despotism, but later investigations into Wittfogel's examples have challenged the validity of his theory as a *general explanation* [emphasis mine]. Nevertheless, those who control a resource as essential as water have a potentially huge capacity to wield power over others, so Wittfogel's theory does contain a kernel of truth.<sup>3</sup>

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<sup>1</sup> See Lon L. Fuller, *Irrigation and Tyranny*, 17 STAN. L. REV. 1021, 1024 (1965).

<sup>2</sup> KARL A. WITTFOGEL, *ORIENTAL DESPOTISM: A COMPARATIVE STUDY OF TOTAL POWER* (1957).

<sup>3</sup> PER MOLANDER, *THE ANATOMY OF INEQUALITY: ITS SOCIAL AND ECONOMIC ORIGINS—AND SOLUTIONS* 39 (2016).

Fuller's interest in Wittfogel arose from a childhood spent in the Imperial Valley in California, one of the most agriculturally productive regions in the United States, but which, despite that productivity, receives on average only two inches of rainfall a year. Fuller claims that, while growing up in the Imperial Valley, he experienced neither tyranny, as Wittfogel's theory may have suggested, nor a reigning ethos of individualism, as the widespread myth of conquering the great American west may suggest. Instead, he grew up with a feeling of community in an irrigation district that comes from people living in, and together conquering, nature's constraints in such an area. His principal assertion is that, in order to assess a government's political use of its water management and control, one "must enter into a more exacting scrutiny of the administration and the general moral atmosphere within which administration takes place."<sup>4</sup> Rich with insight, Fuller's article explained that it is deeply difficult to make water-sharing in an arid or semi-arid environment (the environment in which large-scale irrigation occurs) possible, without the development of complex social forms of distribution, adjudication, and authoritative decision-making.

In this article I take up Fuller's challenge. My goal is to offer an "exacting scrutiny of the administration and the general moral atmosphere within which administration takes place" in two post-colonial water-sharing systems, and from that scrutiny to draw out more general lessons about how the vital resource of water might be managed to promote and enable – or at the very least, not to impede or disable – flourishing lives for those who live under regimes of water management.

The article begins with an analysis of the ways in which property in water has been distributed and fought over or adjudicated in two common-law jurisdictions. I start with the Indus basin in modern-day Pakistan, which contains the world's largest contiguous irrigation network. Here, the control of water to date remains relatively fixed in the terms in which colonial administrators designed the system as blocked from adaptive change to changing

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<sup>4</sup>Fuller, *supra* note 1, at 1024.

circumstances. This is primarily because the country, upon Partition from India in 1947, inherited the bulk of the irrigation system that the British laid, mainly in the Punjab province during their reign in the Indian sub-continent. By contrast, America, another inheritor of British common law, was bequeathed the riparian water law doctrine. This idea has ancient standing based on the principle that running water cannot be owned. Justinian addressed water use in his compiled *Institutes* thus, “By natural law these things are common to all: the air, running water, the sea, and as a consequence the shores of the sea.”<sup>5</sup> From that initial inheritance, the country went on to chart a very different course and evolve legal concepts of water use as an adaptation to society’s changing conceptions of the uses to which it wanted to put water.

## II. TWO WATER LAW SYSTEMS

### A. *Stagnant Water Policies Under the “Empress of India,” her Canal and Drainage Act of 1873, and Its Amendment*

In 1765 the chartered East India Company assumed the crucial task of revenue collection in the prized Bengal province from the young Mughal Emperor Shah Alam who “had no land and no money.”<sup>6</sup> In light of this assumption of responsibility, in less than a century Queen Victoria assumed the mantle of “Empress of India.”<sup>7</sup> The Company, as it was commonly known, followed in time by the British Empire, created an across- the-board rapaciously extractive scheme for heavy revenue generation. I now briefly situate the

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<sup>5</sup> Samuel C. Wiel, *Theories of Water Law*, 27 HARV. L. REV. 530, 530 (1914).

<sup>6</sup> WILLIAM DALRYMPLE, *THE ANARCHY – THE EAST INDIA COMPANY, CORPORATE VIOLENCE, AND THE PILLAGE OF AN EMPIRE* (2019).

<sup>7</sup> The grand coronation, the Delhi Darbar, to project imperial power onto India’s hierarchy of extant and created rulers and princes in addition to areas that were under direct English rule occurred in 1871 although Britain had ruled India since 1858 with the adoption of the first Government of India Act after the Uprising or Mutiny in 1857 against company rule (“Company Raj”) by the East India Company.

driving forces behind the colonization project of the British in India, from geopolitics to the pacification of the native population, which implicated the control of water and resulted in the construction of the largest contiguous canal irrigation network in the world.

Prior to Queen Victoria's assuming an imperial title, Britain's political class was deeply concerned about the advancing Russian conquest of Central Asia which meant that the Russians were only a few days' march from English dominions in India. The Queen's assumption of the new title reflected the depth of England's commitment to keeping India, the crown jewel within its realm.<sup>8</sup> At the same time, to help stave off the effects of famines in India (the conditions for which the British themselves initiated with the heavy agrarian land taxation regime they put in place) and to develop a reliable land settlement and revenue scheme for the government, the British undertook large-scale land irrigation and water transfer schemes with the goal of settling newly-defeated Indian soldiers in the northwestern Indian state of Punjab, part of which came to Pakistan at Partition.<sup>9</sup> The government evaluated these schemes for their profitability and their overall ability to provide promised returns to investors in London. It is important to recognize that the British Raj placed more weight on an irrigation scheme's profitability and less on providing people with the property rights, even though it was well understood at the time that a grant of property rights might well have opened a path to the development of a freer and more productive society. When the American Civil War blocked the flow of cotton to mills in England, developing canal irrigation in India to grow more cotton as well as other primary commodity crops to stave off recurring famines acquired even more urgency. Primarily though, the economic feasibility of canal works increased due to increased projections for the sale of cash crops, in particular cotton for the mills of Manchester.<sup>10</sup> In short, the colonial government had a complex set of reasons for undertaking large-

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<sup>8</sup> Daniel Thorner, *The Royal Titles Bill of 1876*, in LAND, LABOUR & RIGHTS: 10 DANIEL THORNER MEMORIAL LECTURES 1, 1-16 (Alice Thorner ed., 2002).

<sup>9</sup> IMRAN ALI, *THE PUNJAB UNDER IMPERIALISM, 1885-1947* (2003).

<sup>10</sup> D. A. Farnie, *The English Cotton Industry and the World Market*, 39 J. ECON. HIST., 1815, 1815-96 (1979).

scale water-carrying irrigation schemes, none of which was focused on improving the economic lot of the people over whom imperial rule was imposed. Instead, their overwhelming motivation was to achieve social and state stability by means of creating and maintaining a loyal peasantry that was dependent on the colonial bureaucracy for delivery of water to the newly-settled lands of the Punjab. In turn, they would rely on this land, and this people, to be a bulwark against Russian expansion through Afghanistan into India while also providing a permanent and reliable revenue stream for the imperial government.<sup>11</sup> As we'll see, this was in sharp contrast, around the same period, to the development of water use concepts and doctrines as enunciated and adjudicated in the language of the law in America.

By definition, a colonial project is designed primarily to extract revenue, not to improve the lives of colonial subjects more than minimally necessary to forestall resistance and rebellion. It is that imperial motive for Britain's design of the canal irrigation system and its attendant design of water rights that concern us here. We are now fast approaching the 150th anniversary of the innocuous-sounding Canal and Drainage Act of 1873 (hereinafter "CDA/Act") that the British colonial rulers designed. The conundrum that concerns us here is why, seventy years after Independence in 1947, present-day Pakistan, the area of India with the bulk of the Indus basin canal irrigation network, has not moved past this inherited system of water rights. The question is particularly pressing if, as I suggest, the regressive system of colonial water rights allocates over ninety percent of the country's freshwater to irrigation. That system of water allocation made it difficult to move water even towards growing non-commodity crops, and farmers who wish to redirect water in this way have to undertake a lengthy application process within the maze of the irrigation bureaucracy. The difficulty of moving water away from uses, I suggest, helps explain Pakistan's dismal and regressive social and economic outcomes ranging from

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<sup>11</sup> See generally Shashi Tharoor, 'But What about the Railways . . . ?' *The Myth of Britain's Gifts to India*, THE GUARDIAN (Mar. 8, 2017 9:25 AM), [https://www.theguardian.com/world/2017/mar/08/india-britain-empire-railways-myths-gifts?CMP=share\\_btn\\_fb](https://www.theguardian.com/world/2017/mar/08/india-britain-empire-railways-myths-gifts?CMP=share_btn_fb).

an economy that to date relies on close to a quarter of GDP production from agricultural products. What explains the prevalence of the system of colonial-era water rights given that the British built with the minimum investments necessary and certainly with very little concern for the welfare and uplift of farmers? I will expand a bit on the basic reason I've already identified – regard for the economic interests, first and foremost, of colonial rulers, but, my primary purpose is to open up a potentially revealing and instructive dialogue with another system that shares a common law inheritance, one that evolved different legal doctrines for assignment of water rights than the doctrines those distinct colonial subjects had inherited.

Before we proceed further, we must be clear that we are concerned *vis-à-vis* British rule in India with two types of technologies. The first is the technology of large-scale gravity-fed canal irrigation built over unprecedented scale in the nineteenth century according to an idealized belief in scientific design. The second is the technology of law, specifically the law as embodied in legislation by the colonial rulers, the precise terms of which I suggest was itself possible and became fixed in the way it did because it came about in a period of colonial rule. In America by contrast we are concerned with the technology of the common law whereby judges evolved doctrines and rights over time case-by-case to suit local conditions and society's ever-newer felt needs.

Lest it seems that I'm suggesting that British colonial powers were overwhelming powerful and therefore designed and built and constructed what became the world's largest contiguous canal irrigation network according to idealized nineteenth century scientific technocratic parameters which they professed a desire to do, let me be clear that they did not and indeed could not as Gilmartin has shown. Although they were powerful enough to build canals and thus shape the physical geography of the land and through the use of legislation, the legal geography what is perhaps ironic is that from the very start of their idealized "scientific

empire,” to use Gilmartin’s apt phrase,<sup>12</sup> colonial administrators had to accommodate their designs to the desires of powerful local families who sought favors in return for allegiance to the imperial rulers. This meant that even though engineers sought to put in place a highly controlled engineering system, one to which society would have to adapt, in many ways it was the system that had to adjust to local political realities and from the very start, real-world social, blood and family, and political relations intruded on the scientific system designed by engineers. Nevertheless, and despite these challenges, the official system in the form of the CDA remains fixed and it is still the state and its bureaucracy that is meant to operate the system and tie social groups and individual irrigators to it. This raises the not insignificant problem of corruption when irrigators have to find a way to bribe low-level staff of the irrigation bureaucracy to obtain water beyond their mandated shares. To do so, all levers of power and influence are deployed from outright financial inducements to more subtle forms of social and familial pressure within the broader framework of kinship ties.

I acknowledge that while the terms of the evaluation may be present-ist, in that I evaluate these historical developments from the lens of the present, that nevertheless this is the correct lens through which to view them. I suggest that we can and should ask the comparative and contrastive questions of the outcomes from the two common-law systems as they evolved in the two places of our study. This is because at its core, the structural and legal changes the British put in place in India were always meant to achieve instrumental ends and American doctrine specifically evolved to include concepts of beneficial use by which society began to evaluate water-use decisions in terms of what they were accomplishing. Hence, we can certainly question what has been achieved under them and they can be evaluated on whether and to what extent they are achieving the social goals of the moment, given they are the laws by which the two societies continue to govern

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<sup>12</sup> See David Gilmartin, *Scientific Empire and Imperial Science: Colonialism and Irrigation Technology in the Indus Basin*, 53 J. ASIAN STUD. 1127, 1127 (1994).

themselves. While this is an evaluation of the laws themselves and their relevance for the present moment, more directly, it is an evaluation of legal and bureaucratic actors and of society and users more broadly in their interactions with each other and with water. Given the Indus' relative legal underdevelopment, we are concerned to discover a salutary path forward that lawmakers and the bureaucratic decision-makers, both national and international who are responsible for keeping the system in place, both what exists as well as who controls it and the related issue of how they access power through it – and perhaps more importantly, how they hold on to that power and keep others out – and down, can adopt. The motivating question then becomes, what purposes is the legislation now serving given what we know of its origins and of the purposes for which it was put into place.

Under the CDA a vast bureaucracy has been created, responsible for overseeing the largest contiguous irrigation network in the world covering an area of over 36 million acres.<sup>13</sup> The entire irrigation network is entrusted to officers of the Irrigation and Revenue department who have the powers of Judicial Officers.<sup>14</sup> Further, under the amendment of the CDA effected by section 27 of the Canal and Drainage Act of 1975 (“Punjab Amendment”), the Collector, Commissioner and the Canal Officers have the powers of Civil Courts under the 1908 Code of Civil Procedure, such that they can enforce attendance of any person and conduct examinations under oath, require discovery and production of documents, and requisition records from any court or office, in addition to having many other powers enjoyed by Civil Courts.<sup>15</sup> The government is responsible for designing irrigation policy. To do so, it relies on international experts and organizations to devise policy recommendations which it then has the choice of adopting and, more

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<sup>13</sup> *Irrigation System in Pakistan*, WATERINFO <https://pfd4pro.com/view/water-resources-of-pakistan-waterinfo-net-pk-520443.html> (last visited Apr. 7, 2022).

<sup>14</sup> See DIL MUHAMMAD, INTERNATIONAL IRRIGATION MANAGEMENT INSTITUTE, LEGAL FRAMEWORK FOR IRRIGATION MANAGEMENT IN PUNJAB AND SINDH PROVINCES, PAKISTAN (1998).

<sup>15</sup> See Merajuddin Farani, *The Canal and Drainage (Punjab Amendment) Act (XXXII of 1975) in*, MANUAL OF CANAL AND DRAINAGE LAWS 119 (2005).

crucially, of implementing, in light of its discretionary decisions about local conditions and negotiations between the different existing stakeholders. It is also given the responsibility of acquiring water for public use, fixing irrigation water rates, appointing staff, and framing their own rules themselves. Canal officers are responsible for all operational decisions including, but not limited to, such routine decisions as fixing a “*warabandi*” schedule (time allocation of water to individual plots), settling disputes, sanctioning a new watercourse, authorizing water use from an existing watercourse, transferring watercourses from one person to another, adjusting claims between users jointly using a watercourse, stopping supply to any or all users on a watercourse, and levying fines for unauthorized use or wastage of canal water. Canal officers are responsible for all aspects of the supply and continuing forms of use of irrigation water.

This highly bureaucratized water provision regime is a major hurdle in the way of moving towards a more flexible scheme in which users play a greater role in the management of the scheme and the eventual types of uses to which the water is put on which they so overwhelmingly rely. There are two distinct strands of the problem of self-governance and change that interest us here: the fact that farmers have very little or no say in how the system is run above the outlet (they are receivers of the quantities and times at which irrigation bureaucrats release supplies to them), and they or other potential users who may wish to put the water to different uses (such as, for example, drinking water supplies for urban areas) are unable to effect any such change of purpose. This inability to change the uses to which water is put, such that the irrigation distribution system is not designed to move any water out of largely economically low-value and a heavily subsidized system of irrigation and agricultural production, is a major developmental challenge to the nation’s growth that policy makers for the most part don’t even begin to acknowledge. The policy discourse is overwhelmingly focused on operating the system and making that operation as per system design criteria, just somehow, be better. In some ways this goes back to the desires of colonial engineers who were motivated to run society in terms of the rigidity of their

irrigation canals but who did find that as powerful as the canals were in shaping rural geography, in many ways, it was the canals that had to yield to the expediency of social structures.

This highly fixed system is a major hurdle to any reform efforts. At the lowest level of the irrigation hierarchy, the canal “*patwari*” (revenue officer), measures irrigated land at the individual farm level and assesses water rates for the agreed (read: mandated) crops for each farmer given the constraint on crop choice by the expected availability of irrigation water in a particular area. The reach of the irrigation bureaucracy goes further and deeper into the rural Indus basin than perhaps any other government organ – and certainly none that is more economically significant. Overall, the entire irrigation sector is entrusted to the bureaucracy with a limited role for users, or at most, a limited and circumscribed role with none at all for non-users.

From Elinor Ostrom’s extensive studies of irrigation systems, we know that one-way supply-side rigidity means that there are significant “perverse incentives to circumvent inflexible regulations and to seek personal advantage in ways that decrease irrigation benefits for fellow users.”<sup>16</sup> All possible manner of perverse incentives are to be found operating across all sizes of farm holdings that exponentially benefit larger farmers in the Indus, including the use of a range of corrupt practices<sup>17</sup> that corrode the fabric of trust and cooperative decision-making, a trust that would be necessary for better social outcomes and improved overall individual gains.

### B. *Flowing and Reconceived Water Policies in Post-Colonial America*

I lay out the transformation in the concept of water use that occurred in America in detail below but briefly here, for the purpose of comparison, American post-colonial water management was built on the colonial-era base of the existing legal order whose

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<sup>16</sup> ELINOR OSTROM, CRAFTING INSTITUTIONS FOR SELF-GOVERNING IRRIGATION SYSTEMS (1992).

<sup>17</sup> Jean-Daniel Rinaudo, *Corruption and Allocation of Water: The Case of Public Irrigation in Pakistan*, 4 WATER POL’Y 405 (2002).

conservative thrust was to bind society to a limited, primarily a singular productive option, that is, of low-value agriculture and husbandry with a domestic bias in the uses of water. Through legal conceptual change, slowly achieved by the workings of individual cases and subsequently with the passage of the Mill Acts, citizens in eighteenth- and nineteenth-century America began to change the conceptual categories of property in water so as to realize their individual and society's potential in new ways. This can be understood as the idea of development as freedom of a process of engagement,<sup>18</sup> described by Morton Horwitz as the process whereby there was a "Transformation in the Conception of Property" beginning crucially, with "Water Rights and Economic Development."<sup>19</sup>

Horwitz's study in the relevant part is geographically focused on the water-rich Northeast of the United States. It is perhaps an interesting quirk of history that the "antidevelopment doctrines of the common law first clashed with the spirit of economic development"<sup>20</sup> in a place of hydrological bounty, such that, within the United States, the inadequacy of the common law conception of water (enabling it to flow largely unfettered and unreduced past a riparian property) began long before the opening up of the far harsher American West. This change of doctrines in which the legal doctrine of riparian rights was pushed out by the doctrine of prior appropriation happened in response to different environmental conditions and in time the doctrines came to be overlaid with evaluations of the reasonable and beneficial uses to which society was putting its water resources.

The starkness of the transformation in a place of relative hydrological bounty (the case of the American northeast) is even more relevant a world away in the semi-arid Indus, and but for another quirk of history in the form of colonial rule that checked the advance of any such new ways of engagement in the Indus, Horwitz's explanatory thesis is of even greater relevance in a semi-

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<sup>18</sup> AMARTYA SEN, DEVELOPMENT AS FREEDOM 27 (2001).

<sup>19</sup> MORTON HORWITZ, THE TRANSFORMATION OF AMERICAN LAW 1780-1860 34 (1977).

<sup>20</sup> *Id.*

arid environment. This is because in conditions of hydrological stress and increasingly in a world with a rapidly changing climate, society's reliance on being able to use water in ways that match its changing needs is even more pressing. Not being able to achieve these adaptations is a sure way to acute social stagnation, particularly rural. This is because with the passage of time and with the uncertainty of a changing climate, ever greater stress is placed by a greater number of people on what is the same or is even a reduced amount of a resource. This in turn contributes to unhealthy competition, instead of a virtuous dynamism-producing competition. In the prevailing colonial era scheme in the Indus, the check on any new non-irrigation uses by the extant colonial fiat was more devastating, since it occurred in a water-stressed environment (albeit a condition of environmental and social stress resulting from the very creation of a vast irrigation empire with its heavy water use to enable farmers to produce for the market to begin with), an additional layer of suppression to add to the program of control installed in the Indus. The history of the canal colonies of the Indus, in which water was brought onto what were called "wastelands" and previously unsettled land for the purposes of a program of settlement as part of a colonial project, the irony of the additional layer, of preventing new ways of engagement by those settled on and who work the land should not be lost on us. In the Indus the shackles on the colonial legal and economic imagination, even after Independence at the beginning of its seventh decade, have not been thrown off. By contrast, as we'll see in further detail below, in early post-colonial America, legal categories were reimagined precisely to provide greater opportunity to users and society.

An insufficiently acknowledged feature of the British colonization (at least by national policy-makers and international development experts, as I show elsewhere<sup>21</sup>) was that while the imperial project was put in place to transform society, it had what can be described as precise objectives of controlling the population

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<sup>21</sup> See Erum Sattar, *Water as Power: The Law and Politics of Federalism in the Indus Basin* (May 25, 2017) (unpublished S.J.D. dissertation, Harvard University) (on file with author).

subject to colonial rule as I described above briefly. Thus, for example William Joynson-Hicks, home secretary in the 1928 Conservative government of Stanley Baldwin, said that “we conquered India by the sword and by the sword we shall hold it. I am not such a hypocrite to say we hold India for the Indians.”<sup>22</sup> However admirable this is as self-awareness, it is also quite frank in its acknowledgment of the divergence between concern for the colonial ruler’s benefits and the well-being of colonial subjects. Such frank and well-supported admissions put paid to claims, often advanced by apologists who tried to show that the colonial regime was on balance more benevolent than exploitative and that the objectives and means of colonial control benefitted native subjects of colonization.<sup>23</sup> Why then do the post-colonial state’s government officials, as well as international experts, hold onto the notion that the vast irrigation network bequeathed to the Indus is a vital asset with immense potential for national development? Perhaps it is because of the success of what Elizabeth Whitcombe has suggested was the view advanced by the imperial government that was keen to be seen as “proprietor-in-chief, autocratic but benevolent.”<sup>24</sup> Given official self-understanding in the Indus, does this mean that the colonists succeeded in their goal and the locals have indeed been colonized in their very self-understanding flowing from the experience of colonization?

By focusing on the state’s lack of focus on this question I do not mean to imply that the state is the only actor that should determine these important questions. That indeed is the problem of the colonial-era regime that continues, such that the state made all the allocative decisions. I am instead advocating that the space for other actors to be able to put water to new and different uses is precisely what needs to be opened up, both legally and politically. For the present purposes the question is limited: why does the state continue

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<sup>22</sup> Tharoor, *supra* note 11.

<sup>23</sup> See generally UTSA PATNAIK & PRABHAT PATNAIK, *A THEORY OF IMPERIALISM* (2016).

<sup>24</sup> Elizabeth Whitcombe, *Whatever Happened to Zamindars? in PEASANTS IN HISTORY: ESSAYS IN HONOUR OF DANIEL THORNER* 156 (E. J. Hobsbawm et al., eds., 1980).

in going down a colonially conceived path and continue efforts to build on its inherited water governance edifice in the ways in which it was initially conceived rather than creating and acting within a space that allows for new ideas?

I suggest that what helps explain these actions is a fundamental inherited disconnect: of the rulers from the natives that continues even after nationhood and the formation of a new country in 1947. Unlike in the American West, where, in Daniel McCool's terms, the Anglos help the Anglos and largely keep the Natives excluded from the gains that come from large-scale water management, including from putting it to society's changing conceptions of efficiency. Had the colonized in India not been from the "native races," McCool's conclusion about the privileged "Anglo" settlers in the American West vis-à-vis the Natives would have more closely reflected their privileged status and fate and all state aid, particularly in the reconceptualization of notions of property by courts and legislatures, provided to them for their advancing and developing notions of development that made fundamental legal concepts malleable.<sup>25</sup> McCool's thesis suggests that there might well have been greater room for changing concepts of property and water had the rulers been of the same racial profile as the ruled, and that, perhaps, colonial rule checked those impulses in society where the natives, because they were the other, could not gain the same privileges they may have if they had not been racially different. Meanwhile, it was the creation of a privileged class with larger irrigated landholdings whose interests became important and who gained power in the successor state.

While there is a vast literature on path dependence that may help to explain some of this phenomenon,<sup>26</sup> I suggest that the problem is more complex than that of the privileging of large landholders. The fuller explanation of what we see in the Indus is the internalization by the bureaucracy and the politicians of the idea that "we are an

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<sup>25</sup> See generally DANIEL CRAIG MCCOOL, *NATIVE WATERS: CONTEMPORARY INDIAN WATER SETTLEMENTS AND THE SECOND TREATY ERA* (2002).

<sup>26</sup> See, e.g., Paul Pierson, *Increasing Returns, Path Dependence, and the Study of Politics*, 94 AM. POL. SCI. REV. 251, 251-67 (2000).

agrarian nation.” But being a low economic value creating agrarian nation is precisely what keeps the bulk of the population from rising above its received limited endowment base. Precisely, the conditions that eighteenth and nineteenth century Americans were finding ways to rise above.

It will be useful for me here to detail the complex and interconnected processes that Horwitz describes, the ways in which the transformation in the conception of water rights played out in the first half of the nineteenth century in the United States such that what happened in the sphere of the legal control of water “reveal[s] the basic structure of thought about all forms of property in the nineteenth century.”<sup>27</sup> To prepare the way for his analysis, I will briefly lay out the economics of agriculture and the scale of rural stagnation in the Indus to help us more easily contrast this with the dynamism of legal, social and economic change resulting from “utilitarian theories of property.”<sup>28</sup>

Horwitz explains that, in early nineteenth-century America, “As property rights came to be justified by their efficacy in promoting economic growth, they also became increasingly vulnerable to the efficiency claims of newer competing forms of property.”<sup>29</sup> As Horwitz suggests, society must begin where it is such that in a primarily low-value agricultural economy with a low capital development base, the most natural resource on which new ideas about efficiency can begin to operate is water because that necessarily is in broad use. It is precisely when the greatest diversity of interests and actors feel empowered to act on their primary resource according to their changing needs and conceptions of efficiency that the habit develops of seeing and interacting with other resources in ways that are similarly both creative and destructive. Through this dynamic engagement, society can begin to move beyond its received structures vis-à-vis its natural and created resource base.

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<sup>27</sup> HORWITZ, *supra* note 19, at 35.

<sup>28</sup> *Id.* at 34.

<sup>29</sup> *Id.*

This process of ever newer forms of claims being able to displace older rights is of course deeply destabilizing as Horwitz recognizes. But it is also one that prevents social stagnation and is one that the Indus acutely needs for its people have been too long tied down by a regime of loyalty-producing property, especially in water, designed to serve imperial ends including those of pacifying a conquered people and providing them some limited means of food production within the broader history of recurrently brutal and devastating famines in India under colonial rule – a dozen major events in total.<sup>30</sup> In the modern era, the famines at least are a thing of the past but have given way to large-scale malnutrition, hunger, and childhood stunting affecting in parts of the country, forty percent of the population – figures as bad as some of the worst affected countries of sub-Saharan Africa.<sup>31</sup>

“Practical experience” is one of the three foundations of the design of institutions of public administration that Vincent Ostrom wrote about (the other two are “collaboration” and “creativity”). Looking at the structure of the colonial-era CDA, what we see instead is that the Act does not take account of the lived experience of individual irrigators and irrigating communities.<sup>32</sup> There is no room for farmer input and collaboration with the irrigation bureaucracy on the actual operation of the canals, nor on the timing or the flow of water, for that is all a matter of a system designed at a much larger scale into which individual irrigators are meant to fit. This extends to the mandating of what is to be grown in a particular area such that canal commands are provided with fixed water allocations for the growing of particular crops in the two growing seasons. A farmer who wishes to plant what are characterized as

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<sup>30</sup> In a masterful new study of the East India Company, William Dalrymple has a chapter, ‘Racked by Famine’ that details the mass hunger and suffering British rule caused in India. DALRYMPLE, *supra* note 6, at 215-58.

<sup>31</sup> See Adnan Khan & Ayesha Khan, *Main Findings of the National Nutrition Survey of 2011*, USAID RSCH. & DEV. SOLS. (Dec. 2013), [https://www.researchgate.net/publication/271543190\\_MAIN\\_FINDINGS\\_OF\\_THE\\_NATIONAL\\_NUTRITION\\_SURVEY\\_OF\\_2011](https://www.researchgate.net/publication/271543190_MAIN_FINDINGS_OF_THE_NATIONAL_NUTRITION_SURVEY_OF_2011).

<sup>32</sup> See Barbara Allen et al., *Vincent Ostrom*, 45 PS: POL. SCI. & POLITICS 792, 793 (2012).

gardens or orchards (normally higher value crops) that require more water than is allocated for growing the primary seasonal staple crops (such as rice or wheat) has to make a special application prior to planting for the supply of such additional water. The first hurdle that he has to overcome is that of the water supply infrastructure. Whether such further allowance is granted depends on the limit of the installed outlet capacity, which means that farmers are bound by the physical design limitations of the water supply infrastructure in their area. But the limitations are even more restrictive when we focus on what they allow and the ways in which they allow it. If farmers are able to overcome this first order hurdle (which is beyond their own ability to affect in any way), the rules specify that the additional planting is restricted to eighteen acres. Where such additional water supply is available, the Provincial Irrigation Department at its discretion may authorize the additional supply. This authorization will only be valid for a period of one year and to the extent a portion of the authorized area is not planted with the proposed new crop(s), the authorization for this extra water will stand cancelled for any area that is not so planted. This implies either that the farmer will have to self-report this lack of use, which is unlikely to be in his interest, or more likely that the irrigation department retains the power to check on whether the extra water is being put to the authorized uses. If we think that these are severe restrictions, tracing this provision further makes it clear that the authorization is even more limiting. This is because even before the additional authorization for water is made, the farmer has to find the extra water that he will need for the planting from his existing supplies. Focus on that for a moment – the system demands that the new planting be undertaken not from newly made available supplies, because that water will only be released six months after planting of the garden. This of course leaves the farmer with the structural bind of water unavailability at the crucial time of planting and the immediate further water needs of plants.<sup>33</sup> As we can see, to get additional water supplies and to change planting patterns demands a

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<sup>33</sup> See *Rules for Extra Supply of Canal Water for Gardens and Orchards, Canal and Drainage Rules under CDA 1873*, in Farani, *supra* note 15, at 178-79.

huge prior commitment from the farmer. Given how difficult it may be to find and redirect these “additional” supplies prior to actually receiving them means that a farmer has to find the water he can use in this new way from within his existing authorized supply. This means that a farmer who is determined to plant and establish a garden crop will need to pull water from existing crops, thus stressing them even more in order to expand and diversify his crop mix. The choices facing the farmer and the level of bureaucratic and structural control of his most important decisions regarding the choice of what to plant are not easy hurdles to overcome.

*C. American Water Doctrines: Riparianism and Prior Appropriation*

Riparianism is the common law of rivers.<sup>34</sup> The rationale behind the riparian law that America as a British colony received was that there can be no property in running water. This, as we saw, is a concept of long-standing acceptance, as captured in Justinian’s Institutes.<sup>35</sup> As Wiel highlights, given that property in running water is accepted as being held in common and by the public, the law recognizes and regulates only the rights of flow and use of water and not property in water itself.<sup>36</sup> It is important to note that once the debate has moved past whether there is any possibility of having property in free-flowing water itself and on to the terms on which use of that flowing water is recognized by the law, there is significant contest about the underlying rationale for such recognition, and from these contests arise the primary doctrines as well as the attendant change from riparianism to prior appropriation overlaid as they are with notions of beneficial and reasonable use as I briefly chart below.

For practical purposes what is the outcome of underlying riparian idea? Can it be that if water is somehow captured and put to

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<sup>34</sup> See Arthur Maass & Hiller B. Zobel, *Anglo-American Water Law: Who Appropriated the Riparian Doctrine?*, 10 PUB. POL’Y 109, 109 (1960).

<sup>35</sup> Wiel, *supra* note 5, at 530.

<sup>36</sup> *Id.*

use, that it is no longer free flowing and hence someone can own it? Or can own the right to use it? And what in functional fact is the difference if we can own use after all as it were? Before we grapple with the ramifications of the implications of this riparian concept of non-ownership, we must first make explicit a corollary of the idea. Because no one owns free-flowing water, no person's use can interfere with another's. That is, there must, according to this idea, be no interference of the enjoyment of the right of one person to use water by another's use. An immediate sense of relative rights arises. My right to unfettered use of water extends until my right interferes with your unfettered right. This is the essence of the riparian doctrine. Almost by definition, proximity to a source of flowing water, either in the form of land abutting the water source or the water flowing on the land in question is a necessary condition for the riparian doctrine to operate. In short, land ownership is a necessary condition of a riparian right. Only when there is more than one co-sharer of a source of flowing water in its natural state does the doctrine become a functional possibility.

Here we should also make explicit at least two additional assumptions that underpin the riparian doctrine. One is of a state of society and economy in which there exists a relatively low-value and low-volume use of water primarily for domestic uses and animal husbandry.<sup>37</sup> In this scenario no one co-sharer of water is putting it toward any kind of use that would take so much water out of a shared stream that would thereby affect the uses of another on the same source. So, in addition to the riparian doctrine being relevant for a particular kind of hydrological setting, e.g. running streams with co-sharers, it also makes a fundamental underlying assumption about the relative uses to which co-sharers are putting the water that flows by or through their property. Hence under different conditions, the doctrine can become stressed from two sources. As we'll see, this occurred as the riparian doctrine itself was overlaid over time with concepts of "beneficial use" and when it yielded to the doctrine of "prior appropriation" in the American west.

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<sup>37</sup> See Samuel C. Wiel, *Fifty Years of Water Law*, 50 HARV. L. REV. 252, 252-53, 300 (1936).

In contrast to the doctrine of riparianism, the prior appropriation doctrine is one that arose in very different hydrological conditions, conditions in which water was scarce and first users needed more certainty in knowing that they had a right to use the waters they were expending resources to divert.<sup>38</sup> In this way, unlike the riparian idea of non-interference with another's use – or even *non-use*, since there is no requirement that a riparian landholder has to put water to any kind of use at all to be able to hold a right to do so – the prior appropriation doctrine prioritizes a first user above all others. Historically as we'll see below, its starting premise has been that water should be used for commercial gain. Indeed, the first pressure on the riparian doctrine came from settlers moving west who needed to establish stable claims to scarce water sources for making long-term and stable mining claims a profitable activity. Thus, it is the great California Gold Rush in the middle of the nineteenth century in which riparianism gave way to prior appropriation.<sup>39</sup> This original impetus to abandon the riparian doctrine on the part of those who migrated west from the east of the country with its greater water bounty didn't for long stay limited to the special case of mining with its high risks and quick potential gains. It soon spread to that other great user of water: large-scale irrigation.<sup>40</sup>

### III. ENGLAND BEQUEATHS THE LAW

The British in India built a state-controlled irrigation regime in which the scientific and technical control of nature was meant to shape and fix society – that is, in many ways to subordinate it and fix it in time, as confined by the language of the law – one particular way in which this is done in defining the system of water turns or shares in the Indus. To contrast this with the “working” principles that Willard Hurst identified that flow from the central principle of the American legal order, “that law exists for the benefit of people and not people for the benefit of law” in his masterful study of the

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<sup>38</sup> Maass & Zobel, *supra* note 34.

<sup>39</sup> *Id.*

<sup>40</sup> *Id.* at 110.

release of energy, such that “Such a legal order cannot in the long run be true to itself and at the same time be better than the values or vision of its beneficiaries.” He identified three strands of nineteenth-century public policy in America: that “human nature is creative” and that there was broad social agreement that this release should be supported; that the “Corollary to the creative competence” is that people should be able to exercise “a wide practical range of options” and that “These propositions have special significance for the future of mankind.”<sup>41</sup> Hayek’s contention that “the aim of law should be to improve equally the chances of all” is a similar idea and as he says “All that law can do is to add to the number of favourable possibilities likely to arise for some unknown person and, thus to build up an increasing likelihood that favorable opportunities will come anyone’s way.”<sup>42</sup> It is precisely this process that may be set in motion that opens up more opportunities for more and different people, that of, in Hayek’s terms, “catallaxy,” that stands blocked for the bulk of the Indus basin’s rural poor. But can we really expect that the opening up of space for greater participation and contestation of allocative decisions may actually benefit the mass of the rural poor? Our evidence is that it is happened before. As Horwitz shows, once society begins to conceive of water as a tool for economic development, it broadens its terms of engagement with it which necessarily involves more people in new and different and previously un-envisaged ways engaging with water as a resource. While it is undeniable that the most “favorable opportunities” will likely accrete to those best placed to take advantage of them, in other words, the already more privileged, it is within the bounds of a peaceful transition, the idea least likely to encounter resistance and pushback from society’s already privileged while at the same time

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<sup>41</sup> JAMES WILLARD HURST, *LAW AND THE CONDITIONS OF FREEDOM IN THE NINETEENTH-CENTURY UNITED STATES* 5-6 (1956).

<sup>42</sup> *See generally* FRIEDRICH A. VON HAYEK, *LAW, LEGISLATION AND LIBERTY: A NEW STATEMENT OF THE LIBERAL PRINCIPLES OF JUSTICE AND POLITICAL ECONOMY* (2012); *see also* Friedrich A. Von Hayek, *Volume II, The Mirage of Social Justice and Chapter 10: The Market Order or Catallaxy*, in *LAW, LEGISLATION AND LIBERTY: A NEW STATEMENT OF THE LIBERAL PRINCIPLES OF JUSTICE AND POLITICAL ECONOMY* 288 (2012).

actually expanding the range of possible interactions that may open up to the less privileged. As Hayek explains:

Much of the knowledge of the individuals which can be so useful in bringing about particular adaptations is not ready knowledge which they could possibly list and file in advance for the use of a central planning authority when the occasion arose; they will have little knowledge beforehand of what advantage they could derive from the fact that, say, magnesium has become more cheaper than aluminum, or nylon than hemp, or one kind of plastic than another; what they possess is a capacity of finding out what is required by a given situation, often an acquaintance with particular circumstances which beforehand they have no idea might become useful.<sup>43</sup>

It is likely that irrigators have latent repressed and unexpressed knowledge (because there is no room for such expression in the current legal regime) of better ways to engage with and use water within irrigation (even if for the moment we keep off the table the option of moving water to other uses outside of irrigation). Certainly, those outside of irrigation, growing and thirsty urban areas, have limited ability to develop ways to move water out of irrigation. Further, who and how is looking after the basin's ever-graver environmental needs? Surely, a drastically changing climate also demands serious custodianship from human society and preventing norms from developing to tackle them because property in water is locked up in irrigation is a disservice that threatens long-term sustainability.

Taken together, these are grave problems and lock people into existing and ever-degrading ways of life on a shrinking and depleting resource base while disallowing them from developing new relations with a vital and threatened natural resource. It is the ability to experiment, of having the possibility of discovering other ways to engage with water, given what people know and what they could discover if they had to the ability to open up new ways of engaging with it within and outside of irrigation, that remains closed off in the Indus. If irrigation bureaucracies in theory at least, control

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<sup>43</sup> *Id.* at 338.

allocations according to a precisely defined engineering system, it is hard to see where the possibility of experimentation on the part of users and others can come from such that knowledge that they could possibly bring to bear on the water sector is locked up as there is no place for it to be manifest and be of use. This must change as too much destitution and environmental degradation flows from the existing heavily controlled bureaucratized regime.

A. *The Paternalism of Colonial Legislation in India*

The impressions of American engineers visiting British Indian irrigation canals at the end of the nineteenth century are particularly revealing. Perhaps significantly, Central Valley commissioners described the attitude of British colonial officials in India as paternalistic towards cultivators as they were concerned with the performance of the farmers for the overall profitability of the irrigation schemes. At the same time, it is perhaps ironic that commissioners described the attitude of colonial administrators with approval, “It was generally held that the property in water could not safely be intrusted [in original] to private hands; that the ignorant cultivators would, without the intervention of the government, be helpless against a powerful corporation ... At this time it was thought by the government that the profits of irrigation were great and immediate, and that they should inure to the government and not to the corporation.”<sup>44</sup> The views of the commissioners from the nineteenth century are deeply revealing for our purposes, for at a minimum, they show that the imperial state did not view itself as an agent of private financial interests in London who were in fact the financiers of the Canal Colonies and who had made the investments

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<sup>44</sup> James. L. Wescoat Jr., *Wittfogel East and West: Changing Perspectives on Water Development in South Asia and the US, 1670-2000*, in CULTURAL ENCOUNTERS WITH THE ENVIRONMENT: ENDURING AND EVOLVING GEOGRAPHIC THEMES, 120 (A. B. Murphy and D. L. Johnson eds., 2000) (quoting Report on the Board of Commissioners on the Irrigation of the San Joaquin, Tulare and Sacramento Valleys of the State of California, 1874. U.S. Congress House of Representatives, 43rd Cong., 1st sess., Ex. Doc. No. 290, Washington, D.C.: Government Printing Office).

in the first place based on their expected profitability. At the same time the state viewed the farmers paternalistically and saw them in need of protection from corporations (who may after all buy them out and put the water to non-farming or towards larger farming interests thus destabilizing the very same rural society on which the state depended – particularly for the recruitment of its Army<sup>45</sup>) which despite the fact that it owed guaranteed returns to financiers, it nevertheless conveniently was not. When we look behind mere terms the state being beholden to bondholders while being in a position to receive the expected revenue stream from newly-settled land through the recovery of land and water taxes puts it in much the same place as an unscrupulous corporation but an even more powerful one given it had and acted on the power to keep farming interests tied within its canal scheme and to its own provision of the crucial water needed for rural livelihoods. It is certainly true that a state as we have seen under the legal regime installed in the colonial era and that continues to the present-day, can in fact manage to operate a system, lest we forget, built initially for goals of control, pacification and revenue generation, in a way that keeps the extended benefits that could accrue to individuals and society broadly conceived off the proverbial negotiating table across which it interacts with farmers and other potential non-farm users. The real story of the interests that operate in the Indus is the privileging of that which is already built (its extensive system of irrigation canals) what scholars have analyzed in the extensive literature on path dependence that contrary to a simpler view is both predictive in the sense that it builds on existing endowments yet because of the very diversity of society, makes the exact variables that may be amenable to change, unpredictable.<sup>46</sup> We do know that larger farmers are able

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<sup>45</sup> See generally RAJIT K. MAZUMDER, *THE INDIAN ARMY AND THE MAKING OF PUNJAB* (2003).

<sup>46</sup> See Pierson, *supra* note 26, at 253; see also Dillon Tatum, *The Paradox of Path Dependence: The Problem of Teleology in International Theory*, E-International Relations (July 16, 2012), <http://www.e-ir.info/2012/07/16/the-paradox-of-path-dependence-the-problem-of-teleology-in-international-theory/>; Oona A. Hathaway, *Path Dependence in the Law: The Course and Pattern of Legal Change in a Common Law System*, 86 IOWA L. REV. 601 (2001).

to access more than their allocated share of canal waters that in doing so they utilize a diverse set and types of pathways of influence including directly via elections and indirectly via marriage and other alliances of influence that develop both political power as well as accrete and can bring to bear greater financial clout in the form of illegal payments to the irrigation bureaucracy.

*B. The Common Law in America*

In focusing on the law and its importance for economic development, I am undertaking a Weberian analysis for one particular resource.<sup>47</sup> In the main, I am focused on the development of law on one resource, water, but as Horwitz has shown, in no way can this be assumed to be a limited undertaking especially as in early America, it affected “all forms of property in the nineteenth century” – a truly vast impact indeed.<sup>48</sup> My contention is that by focusing on a single piece of legislation, the CDA, that regulates access to water for irrigation across a huge connected basin, we can begin to look at law’s inter-relatedness in society such that by focusing on the effects of a single piece of legislation we can open up an inquiry into broader social structures. As Justice Breyer said:

Law is a social institution. It exists to help people. If we think of it in that way and of the benefits it can bring people living together, it makes sense to ask what its purpose is and what part of this large institution—the courts? the legislature? the city council?—is best situated to resolve the problem.<sup>49</sup>

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<sup>47</sup> David M. Trubek, *Max Weber on Law and the Rise of Capitalism*, 1972 WIS. L. REV. 720 (1972).

<sup>48</sup> HORWITZ, *supra* note 19, at 35.

<sup>49</sup> Lincoln Caplan, *A Workable Democracy, The Optimistic Project of Justice* Stephen Breyer, HARV. MAG. (Mar-Apr. 2017), [http://harvardmagazine.com/2017/03/a-workable-democracy?utm\\_source=Harvard+Magazine+eNews&utm\\_campaign=0a1a008483-EMAIL\\_CAMPAIGN\\_2017\\_02\\_17&utm\\_medium=email&utm\\_term=0\\_d59fecc95b-0a1a008483-85084433](http://harvardmagazine.com/2017/03/a-workable-democracy?utm_source=Harvard+Magazine+eNews&utm_campaign=0a1a008483-EMAIL_CAMPAIGN_2017_02_17&utm_medium=email&utm_term=0_d59fecc95b-0a1a008483-85084433).

I accept this underlying characterization as well as rationale for law and my working assumption is that a close study of the CDA in these terms can yield rich results. In the main, it leads to the understanding that water law and our legal and institutional categories for understanding and managing water can help us see the somewhat enabling but overall stifling ways in which a colonial-era legal regime binds people in relative place thus disabling the possibility of their fuller development through a dynamic interaction with their primary resource of water and potential thriving. People develop evermore capacity by learning to interact with a resource and in an agrarian economy, the resource they are most intimately connected with is water. My suggestion is that by developing their relationship to water in ever newer ways they will be able to reframe the very conditions of their economic and social lives. As a further complimentary benefit, it is certainly conceivable that given the habits of mind that would be unleashed, people could certainly take the experience of reworking their relationship with water and applying it to other natural and other resources. There is no real way to see the end of where this process will take us. And I am certainly aware that there is enough of a tendency for resources to be appropriated by the most-well endowed. Nevertheless, I believe that it is better to trust the abilities of a wider group of people to fight and to contest the uses to which society puts its resources or else all we have to look forward to is ever more reification of the same. This given great social and environmental change, should no longer be acceptable.

Horwitz explains that, “Change in common law doctrine, however, is rarely abrupt, especially when a major transformation in the meaning of property is involved.”<sup>50</sup> Therefore, it may have been that even if the lessons or outcomes had been easy to transfer, it is unclear that they were visible enough to do so, certainly, unlike traveling experts, this was likely the case for those involved with the process of change. In this process of legal conceptual change, neither what is decided nor the actors involved in bringing about the

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<sup>50</sup> HORWITZ, *supra* note 19, at 38.

change are easy to distil and replicate in another place with its own particular history. For as Horwitz admits:

The plan that the historian sees in retrospect, however, was not what the participants in this process saw. They were simply guided by the conception of efficiency prevailing at the moment. Practical men, they may never have stopped to reflect on the changes they were bringing about, nor on the vast differences between their own assumptions and those of their predecessors.<sup>51</sup>

This is certainly true of the participants and the distance the legal historian has from the period of study that enables the development of significant insights into actors and processes.

According to Horwitz, the conception and uses of water changed from privileging unhampered water use in an economy with a low economic base to conceiving of water as an essential component of the economic development that society had come to value and aspired to. From his study, “It is important to appreciate the central role that the refashioning of American water law to the needs of industrial development played in the more general transformation of the law of property in the nineteenth century.”<sup>52</sup> Recalling this fact, of the importance of water law to helping change society’s structure from primarily agrarian to industrial is surely crucial to the work of development. Especially the kind of vastly regressive irrigated agriculture currently in place in the Indus. The processes by which such change happened in the United States should be of central interest to users, non-users, planners as well as experts given, perhaps other than traditional irrigating users locked in to a particular way of life, they may be aspiring to similar ends. Meanwhile, Ostrom’s starting point is that adequate physical capital is a sine qua non “in achieving enhanced benefits” but that this is just the beginning of a useful analytic of irrigation systems that involves an equally important understanding of their institutional design, the rules and norms that users operate under every day.<sup>53</sup>

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<sup>51</sup> *Id.* at 34.

<sup>52</sup> HORWITZ, *supra* note 19, at 40.

<sup>53</sup> OSTROM, *supra* note 16.

This is especially important given the likelihood of the end of the era of expansion of irrigated areas and the need for additional benefits and efficiency gains to flow from improvements in the management of and engagement with existing irrigation works. The main benefit of such engagement is that it is in the ongoing process of the crafting of institutions that we can appreciate the context-specific and unique nature of individual systems, even if they are interlinked parts in a larger whole. On the whole though, this insight is of more limited use to the concerns about broader processes of social change.

#### IV. TWO INSTRUMENTAL CONCEPTIONS OF WATER

It is important for us to keep in mind that in both the jurisdictions being compared, the Indus and America, there is broad acceptance of the fact that water is an elemental resource for society's stability and growth and hence is conceived of as having to yield to an instrumental vision. Property in water, or more specifically, property in water use, is conceived of as a social good for which as we've seen various rules and doctrines have been evolved. Reminding ourselves again of the importance of the idea of a rivalry for the types of uses and the justifications for it that are behind the uses to which water is put is important because it makes explicit the terms on which the analysis is done. Contestation about the uses to which water is put is always a reality. In the Indus, with the system put in place under colonial rule water is most certainly put to use such that ninety-five percent of water is rigidly fixed for irrigated agriculture. In this sense, agriculture won the battle and the colonial state set in place interests that have prevailed in the six decades since Independence. Meanwhile in America, society's ever-newer uses of water under changing and adaptive doctrines that are themselves open to contestation and interpretive manipulation mean that the primary allocative decisions were not taken in a time under external rule. In addition, this instrumental vision of water-use at least contains within it the possibility that actors wishing to put it toward habitat and species protection could do so e.g., in the form of instream water allocations. This is not to say at all that water could

not through similar mechanisms be claimed and put towards uses for profit for it is every day from water bottling companies to industrial agriculture. The difference though is that because the battle is fought in doctrinal terms and through the manipulation and adaptation of legal interpretive concepts, Fuller's sense that it is precisely the sophistication that society evolves to resolve disputes and make authoritative judgements and decisions that determines social outcomes is correct. I would suggest though that this general framework of the sophistication of the terms of debate would work well for hydrologically wet as well as dry conditions. With global weather and climate patterns likely to change and become increasingly more erratic placing greater stress on natural resources, the strength and adaptive capacities of our legal concepts and institutions will become ever-more relevant.

*A. Fixed Uses in the Indus*

The CDA mandates a fixed time allowance "warabandi" of water allocation and prohibits even the buying and selling of irrigation water turns for the use of nearby landowners much less across society's other potential uses for water such as for use in cities or for potential environmental uses (assuming of course that the political will for such transfers for the environment could be found). Looking at the process by which and the level of detail at which the Act mandates water turns highlights the central role of the irrigation bureaucracy – the opposite of a system in which people feel empowered to exercise a range of options "as to what they do and how they are affected by circumstance."<sup>54</sup> Under the Act, the Divisional Canal Officer (DCO) sanctions water turns or "warabandi" under section 68 that is binding on all the share-holders of a particular "mogha" (water outlet) and it is only this official sanctioning that makes a fixed "warabandi" possible. The officer below the DCO, the Sub-Divisional Canal Officer (SDCO) makes the "warabandi" list that includes the following details: name of the shareholders; numbers of the squares (correlates to the land revenue maps of the area that show the actual plots of land); the area of the

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<sup>54</sup>HURST, *supra* note 41, at 6.

lands; the period of the water turn; the last “nanka” (point) from where the water is to be brought; and, the person entitled to the “nikal” (turn) of water.<sup>55</sup> It is then the irrigation bureaucracy that specifies, fixes and lists water entitlements to a granular level. This level of legal fix-ed-ness, laid in place by a colonial era bureaucratic legal foundation perpetuated by the post-colonial state’s successor bureaucracy, which even excludes civil courts from hearing any cases seeking to reallocate water towards other uses, condemns rural society to its fate, while only protecting it from the vicissitudes of world market agricultural commodity prices by heavy government subsidies and agricultural support prices thus burdening not only the country’s finances but also increasing prices for domestic consumers. Further, the system prevents actors in society more broadly from advocating for other potential uses for water including options such as leaving water in its natural channels thereby privileging in-stream uses that are important for fish and habitat preservation within a paradigm of environmental protection.

*i. Inequity in Water Distribution*

Perhaps no system works as designed by binding people to and fixing them to itself. “...the assumption behind the “*warabandi*” concept (the time for which a plot of land is supposed to receive irrigation water) is that there is no conveyance loss in the watercourse and time equity system will provide reasonable level of volume equity – [this is] completely a false assumption.”<sup>56</sup> This means that the very basis of the system of irrigation entitlements to farms is no longer if indeed it ever was, actually delivered or valid in practice. Enforcing a forced shortage on farmers in the basin in the name of equitable apportionment). The belief in engineering to transform nature and society stemmed from the strong rule of the colonizer who could shape both the geography and society in

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<sup>55</sup> MUHAMMAD HUSSAIN JAHANIA, EXHAUSTIVE COMMENTARY & UP-TO-DATE CASE LAW ON CANAL & DRAINAGE ACT, 1873 147 (1986).

<sup>56</sup> JOHN BRISCOE & USMAN QAMAR, PAKISTAN’S WATER ECONOMY: RUNNING DRY (2008).

unprecedented ways, but within limits. When a design parameter met a block, such as the collective bargaining power of “*baradari*” (extended family/kin), the rulers worked to co-opt but with increasing pressures on the system, designers insisted on the superiority of their CDA scheme that vested overwhelming power in the bureaucracy and demanded that society work within it. Studies repeatedly show that the scheme does not work as designed (to deliver a reliable timed allocation of water “*warabandi*” to every farm under the *command* of a canal – note the language of command that implies that the state can through its control of water command people and their land) and that we can see extreme water stress on lands roughly halfway down the length of a canal from its head. This means that those farmers who are near the head of a canal take much more than their share (as designed in the equitable CDA scheme) while canal “tails” further along the length of the channel run dry and poverty follows the dry channels. How social pressures operate on the canal irrigation bureaucracy (which perhaps ironically is the one that has been coopted by society and “*baradari*” blood and family ties) and is open to all kinds of social, political and economic inducements to increase the sizes of outlets for instance to allow certain farmers to take more than their designed share remains a challenge. I suggest that this manipulation flows from and is in face the very function of the foundational, inherited and maintained scheme at the base of Indus basin irrigation. The fixed scheme creates and accelerates pressures that act on users, leading to a vicious feedback loop of actions that undermine the scheme even further. Given there is such widespread erosion of the system, opening it up to greater contestation across uses may be a desirable way to release some of the pressures it will continue to increasingly face.

In the “*warabandi*” system of timed irrigation water turns, the state provides water in return for massive control over people. The power flows from the power to dispense the ability to earn a living. People cede power for their financial livelihoods. The state gets bigger and spreads water ever further to extend its reach and to ensure its continuance such that the spread of canals became the

state's "central nervous system."<sup>57</sup> To take this analogy further and bring it into the present, while the connective tissue, the villages, remained weak, the state via its operation of the canals, became stronger.

The nineteenth century system of irrigated agriculture built in the Indus relies on the stability of water flows as well as the quantities of water received adapted to its two planting seasons in summer and winter, respectively, "*kharij*" and "*rabi*." But grave environmental changes such as faster glacial melt are occurring with ever more variability that will make it harder with the passage of time to bank on the relative stability of both the timing as well as volume of flows that planners have relied on to date. At a minimum, there are observed temperature increases<sup>58</sup> with ever-more alarming news piling on. Temperatures are rising at alarmingly sustained rates.<sup>59</sup> Farmers and planners will need to adapt to such dramatic changes, whether they are a single alarming figure or indicate a new normal. Evidence of such adaptive mitigation efforts in the Indus are not visible. Given that a significant increase in temperature has immediate impacts even in the year it is recorded will mean that farmers will need coping strategies in the present/short term. Of course, crops may have a more difficult time adapting to the changing weather and seasonal planting patterns and farmers will have to adapt in the short term to crop requirements. Further, higher temperatures will impact the rate of glacial melt affecting when rivers rise for the summer and the related effects of earlier water

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<sup>57</sup> DONALD WORSTER, *RIVERS OF EMPIRE: WATER, ARIDITY AND THE GROWTH OF THE AMERICAN WEST* 37 (1992).

<sup>58</sup> Huizhong Wu, *Mercury Rising: India Records its Highest Temperature Ever*, CNN (May 23, 2016, 12:35 AM), <https://www.cnn.com/2016/05/20/asia/india-record-temperature/index.html>.

<sup>59</sup> Hannah Cloke, *Heatwave 'Completely Obliterated' the Record for Europe's Hottest Ever June*, THE CONVERSATION (July 3, 2019), <https://theconversation.com/heatwave-completely-obliterated-the-record-for-europes-hottest-ever-june-119801>; *The 10 Hottest Global Years on Record*, CLIMATE CENTRAL (Feb. 6, 2019), <https://www.climatecentral.org/gallery/graphics/the-10-hottest-global-years-on-record>.

availability that may arise in the form of both higher summer flows during the monsoon in the form of flooding.

How social pressures operate on the canal irrigation bureaucracy (which perhaps ironically is the one that has been coopted by society and “*baradari*” blood and family ties) and is open to all kinds of social, political and economic inducements to increase the sizes of outlets for instance to allow certain farmers to take more than their designed share remains a challenge. Given the importance of water supplies, this manipulation flows from and is in fact the very function of the foundational, inherited and maintained scheme of Indus basin irrigation. The fixed scheme creates and accelerates pressures that act on users, leading to a vicious feedback loop of corrupting actions that undermine the equitable design and operation of the scheme even further. Given there is such widespread erosion of the system, opening it up to transparent contestation across users and uses may be one virtuous way to release some of the pressures the system faces.

ii. *Hunger and Stagnation*

What was known when the system was designed, that the rural areas were trending towards a starvation diet of starch<sup>60</sup> remains true to the present with the National Nutrition Survey in 2011 showing, for instance, that the nutrition status of children under the age of five has shown no improvement over the previous nearly half-century of the country’s existence and that nearly sixty percent of households are food insecure with women particularly at risk.<sup>61</sup> Given this wide-scale destitution, we must pause and ask, what ends the massive agriculture and water use apparatus is serving. Even if this is a question that does not concern or come up in any of the official policy documents on water-use planning, it is not a question in all good conscience that we can any longer ignore. Given this, asking the “ends” question is a legitimate exercise. If a vast irrigation

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<sup>60</sup> Richard Nations, *The Economic Structure of Pakistan: Class and Colony*, NEW LEFT. REV. (1971) (quoting Mohammad Irshad Khan, *Aggregate Analysis of Food Consumption in Pakistan*, 9 PAK. DEV. REV. 426 (1969)).

<sup>61</sup> Khan & Khan, *supra* note 31.

network cannot at a minimum provide inhabitants of one of the great river basin civilizations of the world with a minimally adequate source and amount of nutrition, what is the worth and real purpose of the vast irrigation and agriculture bureaucracy operating the extant legal and economic system. This is not to suggest that the basin produce enough food to be indigenously food secure for certainly this is a largely irrelevant and outdated question in an era of globalization and global food markets particularly staple commodity grains but rather to help water planners think about the question that should absorb them. They need to move beyond thinking about the minimum safety net of famine protection and creating a loyal rural majority – the motivating questions for colonial administrators. In the 21<sup>st</sup> century, the aspirations of people for the quality of lives they wish to have and what they wish for their next generations are greater – and colonial forms of property will never be able to satisfy them. We know of course that this does not mean that there are no limits to human exploitation of the environment for certainly we know evermore every day that there are. And significant challenges have emerged that society will have to tackle on different scales – from the local to the global. But we also know that responses have also emerged that enable better custodianship of the environment more broadly and of our water resources more specifically that more affluent societies are significantly turning their attention to.

### B. *Adaptive Changes in America*

By contrast, at approximately the same times during the eighteenth and nineteenth centuries at another place, in processes described by the legal historians Willard Hurst in *Law and the Conditions of Freedom*,<sup>62</sup> and Morton Horwitz in his *The Transformation of American Law*,<sup>63</sup> we see a people taking charge of their destinies and putting the law and its concepts and thereby their natural resources, toward ever-newer instrumental ends. This

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<sup>62</sup> HURST, *supra* note 41.

<sup>63</sup> HORWITZ, *supra* note 19.

“release of energy” as Hurst calls it has led to vastly superior outcomes.<sup>64</sup> In no way do I wish to suggest that these “new” ways of dealing with timeless resources in America has not created its own set of complex problems, of inequity, the accretion of vast power and ecological degradation as Donald Worster has described in *Rivers of Empire*.<sup>65</sup> And as Daniel McCool has starkly shown, the vast ongoing injustices on the water resources of the original native and diverse inhabitants of America endure.<sup>66</sup> But the scale of human and ecological suffering in the Indus is also great, to the continuing benefit of a powerful landed minority coupled with the conditions of dependence that smaller landholders are made to endure. Essentially, in the Indus basin, people are blocked from even the opportunity of interacting with their water resources in ways not mandated and authorized by the continuing colonial legal regime that allocates approximately ninety-five percent of freshwater for low-value irrigation. Surely, it behooves us to contribute to the development of new ways of thinking that may open up people’s more potentially progressive norms of dealing with water. This is what Amartya Sen describes more broadly as “the freedom of people to act as they like in deciding on where to work, what to produce, what to consume.”<sup>67</sup>

Eighteenth and nineteenth century America saw the development of the idea that there are other means to change society, or to change the way we think about a natural resource such as water. This idea developed first under economic pressures that led to the eventual passage of the Mill Acts in several Northeastern states after years of judicial reconceptualization of property, its allowed uses and the social values that water in particular had to live up to. As Horwitz has explained: “[T]he [then] prevailing ideal of absolute property rights arose in a society in which a low level of economic activity made conflicts over land user extremely rare.” But once the goal became economic development, then property too became instrumentalized so that it could be put to “productive use and

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<sup>64</sup> This is the title of Hurst’s first chapter. See HURST, *supra* note 41.

<sup>65</sup> WORSTER, *supra* note 57.

<sup>66</sup> MCCOOL, *supra* note 25.

<sup>67</sup> SEN, *supra* note 18, at 27.

development.”<sup>68</sup> In essence the process of the transformation in the conception of property was complete by the time of the Civil War (1861 – 1865). These acts reflected a change in long-cherished conceptions of the "natural" use of water that had privileged relatively low-value agriculture far removed from large-scale modern-day irrigation versus other uses such as energy production to which water was just beginning to be put through the construction of dams. Something had to give, and legal ideas and ideals is what gave thus enabling a transition to a new relationship of society to its natural resource of water reconceptualized in a way to support ever more economic development. However, this idea did not get picked up and transferred to the Indus through professional study groups as part of any agency or professional group's core interests. In America, conceptions of private property were what changed in response to society's felt needs slowly yet dramatically over time and courts helped enable that change by using the language of the law in response to new pleadings by lawyers on behalf of clients. Tort concepts necessarily also evolved alongside property concepts such that courts could balance the interests at stake and decide what harm deserved compensation and what was to be left uncompensated so that relatively unfettered development could be undertaken.

As Horwitz shows, it was the anti-development bias of the unfettered “natural use” doctrine and often “natural” was equated with “agrarian”<sup>69</sup> by which water was supposed to reach another's property unhampered. This conception necessarily tied land and water together. Even though in the Indus, water was conceived by the British to be brought onto land for productive use in the form of irrigation for subsistence plus commercial agriculture, instead of being severable from land (which a fully conceived notion of productive use would lead to), from a partial colonial transformation in the conception of property to an impartial notion of property that has the possibility of serving broader interests, impartially, it was instead tied to land in a new way – for irrigated agriculture.

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<sup>68</sup> HORWITZ, *supra* note 19, 31.

<sup>69</sup> *Id.* at 32.

Ironically, it is this use for irrigated agriculture (originally conceived of as productive) that has become the non-negotiable “natural use” of water in the Indus. As far as the country’s planners and official water organizations are concerned, water remains fixed for agriculture – even when it is heavily subsidized and leads to low yield production, procurement of which is in turn supported by agricultural support prices. Whereas in America, the economic pressures to use water in new ways came early, it was “the rise of large New England cotton mills after 1815 [that] intensified the conflict” over the types of uses to which water could be put.<sup>70</sup> The right to flow came with land so interference with the flow of another landowner was an “unlawful invasion of his property.”<sup>71</sup> This meant that any use of water that affected another’s use of land was an injury and hence necessarily “an unlawful invasion of his property.”<sup>72</sup> It was this interpretation that gave way to new legal interpretations from within the common law when it became clear that water was a valuable tool to support society’s new ideas of economic development and growth. The question that concerns us is whether they are the same vision differently implemented or whether they are two entirely different visions. The first vision in the United States accepted that water use could change and hence legal concepts responded to and enabled society’s changing needs. And kept on doing so towards uses that produced ever more economic value such that water could move to urban areas or in time with society’s developing desire for environmental protection and ecosystem preservation. By contrast, the other established under colonial rule in the Indus certainly accepted that water had to be put to productive use but immediately defined that use as irrigated agriculture and locked property away in water for that purpose. This means that the idea of property in water in the Indus though an instrumental one is fixed for a particular low-value use. This similar vision differently implemented is explained by a people living in a country in which they are free to define their own best interests

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<sup>70</sup> *Id.* at 274.

<sup>71</sup> *Id.* at 35.

<sup>72</sup> *Id.*

versus a people living under colonial rule who had no such ability. It was the very fixing of them on land in a particular way that continued to keep them subsequently tied in similar ways. The continuation of this regressive property system is partially explained by the winners under it who can access much more than their “equitably” defined shares.

*i. The Idea of Water as a Resource*

As we’ve seen earlier, the state is certainly committed to a conception of water as a resource for economic development. If we take the stated goal as a given, that planners want to use control of water and think of water as a “resource” to aid in the development agenda, we must ask, why the gap between their goal and the fixed state of water rights as we find them. Why can’t they harness water more fully and perhaps very differently in the present from the ways in which colonial administrators may have imagined it for their conception of “development”? We must ask, if there is indeed consensus about the real goal that everyone wants to bring about, what is holding back progress toward the consensus?

As Horwitz shows, the eighteenth and nineteenth century shift towards managing land and water for economic development in America meant that from a low level of economic development in which the absolute right over unfettered and largely unused water was expected to continue flowing past property was upheld, society gradually shifted towards a dynamic new understanding of its relationship to water. To produce power for instance, riparian property owners were allowed to dam water flowing past their property. Damming a river or stream necessarily floods nearby land. There were then fundamental conceptual changes that came about in both concepts of property and tort – in the harm that property owners diverting or damming a stream were allowed to effect sometimes upon the payment of compensation to the property owner harmed by the new use. It is the habits of mind that such an organically changing relationship with a critical natural resource both demonstrates as well as unleashes that we must study for lessons. How does an organic effort begin in a society with a

particular form of a long-standing relationship to property in water? How does it come about and how may it be guided towards economic development as well as for long-term environmental sustainability?

The social, political and economic pressures that nineteenth century American society felt to grow out of its low economic resource base are easy enough to understand. The legal concepts about riparian use that it had inherited from England were only possible at a low level of economic activity. It was the low level of economic activity that made riparian uses of little interference with another's expectation possible in the sense that each owner could expect to enjoy the unfettered use of land and water flowing past their property. In some sense, it is the nature of competing uses that changed such that from the earlier level playing field in which each could enjoy their property, to a system in which economic development became an aspirational goal, it was the competing uses that had to be modulated and balanced against each other. In this almost Machiavellian process as Horwitz describes it:

How better to develop an economy than initially to provide the first developers with guarantees against future competitive injury? And once development has reached a certain level, can the claims of still greater efficiency through competition be denied? By changing the rules and disguising the changes in the complexities of technical legal doctrine, the façade of economic security can be maintained even as new property is allowed to sweep away the old.<sup>73</sup>

In short, there has been a fundamental shift in the understanding of a resource such a water as a necessary component of economic development and an a priori commitment to managing resources for economic development has led to a significant shift in society's management of it. This process is one of an onward march towards that vision of continuous development – mediated by the law. The only choice that policy makers may have is whether they make these processes explicit or work to bury them in “technical legal doctrine.”

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<sup>73</sup> *Id.* at 34

So, what were these new pressures at the time? In the main, it was society's need for electric power. As Horwitz has shown:

The extensive construction of mills and dams at the end of the eighteenth and beginning of the nineteenth centuries gave rise to the first important legal questions bearing on the relationship of property law to private economic development. ... As a result, the evolving law of water rights had a greater impact than any other branch of law on the effort to adapt private law doctrines to the movement for economic growth.<sup>74</sup>

In the Indus, to great continuing harm, it is precisely this process of evolution which may have occurred on its own, perhaps in different directions away from locking away property in water for large-scale low-value irrigation, which of course we can never know for certain given the enormity of the counter-factual we are confronted with, that was closed off. But armed with this insight, perhaps we can enable a process of legal evolution to begin. And unleash a process of legal conceptual change potentially leading to great economic and social transformation that policy makers once they see new constituencies developing around them may be able to support.

## V. CONCLUSION

It is important for us to keep in mind that in both of the post-British-colonial jurisdictions I have compared in this paper, the Indus and America, there is broad acceptance of the fact that water is a vital resource for society's stability and growth. Property in water, or more specifically, property in water use, is conceived of as a social good for which, as we have seen, various rules and doctrines have been evolved. Reminding ourselves again of the importance of the idea of a rivalry between competing potential uses of water and the justifications for the uses to which water is put is important because doing so makes explicit the stakes of the interpretive

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<sup>74</sup> *Id.*

endeavor. There is always, in every society across both globe and time, contest about the uses to which water is put. In the Indus, the system put in place under British colonial rule brought it about that approximately ninety-five percent of water was rigidly fixed for irrigated agriculture. In this sense, agriculture won the battle and the colonial state set in place interests that have prevailed in the six decades since Independence. Meanwhile, in America, society's ever-newer uses of water under changing and adaptive doctrines that are themselves open to contestation and interpretive manipulation mean that the primary allocative decisions were not made under external rule. In addition, this instrumental vision of water-use at least contains within it the possibility that actors wishing to put the resource for instance toward habitat and species protection could do so, for example, in the form of instream water allocations. This is not to say that water could not through the use of the same concepts be claimed and put towards for instance, commercially profitable uses such as by water bottling companies and for industrial agriculture. The difference is that in America, because the battle is fought in doctrinal terms and through the manipulation and adaptation of legal interpretive concepts, Fuller's sense that it is precisely the sophistication that society evolves to resolve disputes and make authoritative judgements and decisions that determines social outcomes is useful for understanding the terms of the debate as well as how actors can ally themselves with particular discourses or water concepts and regimes. I would go further and suggest that this general framework of the sophistication of the terms of debate and analytic concepts would work well for hydrologically wetter conditions just as it did for Fuller in the dry Imperial Valley. With global weather and climate patterns likely to become increasingly erratic, placing greater stress on natural resources, the strength and adaptive capacities of our legal concepts and institutions will become ever-more relevant and predictors and enablers of human and ecological thriving.