

LAW AND WATER SECURITY IN ASIA AND THE PACIFIC

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Abstract: The challenges to water security in Asia and the Pacific are well-known, but the options for paths to improved water security are less well understood, particularly when it comes to understanding the role that the legal framework can play. Using newly available datasets, this paper will first propose a model to analyze the role of the legal framework along with other determinants of water security. Then, the paper defines four categories of countries by the relationship between water security and the comprehensiveness of the national legal framework. An initial exploration of disparities between water security and legal frameworks affirms the need for a more nuanced dialog on the factors necessary for translating a comprehensive legal framework to improved water security outcomes. A comprehensive legal framework is not independent from other factors, and it cannot substitute for other critical factors. But, by setting mandates, such as a requirement to undertake consultative planning, the legal framework sets the bar for water management in a country. Whether countries in Asia and the Pacific reach the bar they have set for themselves depends on several identified factors.

Keywords: Law; legal framework; water security; sustainable water management; sustainable development goals

1. Introduction

The most recent *Asian Water Development Outlook* (AWDO) report from the Asian Development Bank summarizes leading analyses of the region by stating that “Asia and the Pacific is the global hotspot for water insecurity” (ADB, 2016). But, what does this mean for the region and what can countries do about it? On the first point, the AWDO’s National Water Security Index (NWSI) provides an important and comprehensive examination of water security across Asia and the Pacific. Thus, the water security outcomes which governments in the region seek face a number of prominent challenges and risks. Overall, the region faces relatively high risks related to extreme events from droughts to floods (ADB, 2016). Furthermore, rapid population growth and urbanization have begun to place high demands on water resources locally. Recent modeling work suggests that socioeconomic growth and accompanying increases in demands for industrial and municipal water uses will grow to play an even more important role in driving localized water insecurity in the region as we move forward toward the year 2050 (Fant, et al., 2016). This growth also adds to pressure on water quality, as parts of Asia and the Pacific already face some of the largest global challenges related to water pollution (UNEP, 2016).

The challenges to water security in Asia and the Pacific are well-known, but the options for paths to improved water security are less well understood, particularly when it comes to understanding the role that the legal framework can play. In its most basic conception, water security is the desired final outcome of sustainable water management – “the availability of an acceptable quantity and quality of water for health, livelihoods, ecosystems and production, coupled with an acceptable level of water-related risks to people, environments, and economies” (Grey & Sadoff, 2007). Water security is affected both by a country’s current and future hydrologic conditions and socio-economic conditions, as well as the water resources management actions that the country undertakes to cope with its situation (Grey & Sadoff, 2007).

With a region this large and diverse, the situations of individual countries may vary tremendously, and this has implications for any examination of law and its potential to support water security objectives. To be maximally effective, a country’s legal framework must be well-tailored to the particular country context, encompassing hydrologic and climactic conditions, socio-economic and institutional factors, and the overall level of development of the country’s water management system and economy as a whole (Shah, et al., 2014) (Caponera, 1992).

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Accordingly, as a preliminary exploration, this paper will examine potential roles for law in supporting water security objectives in several different contexts observed across Asia and the Pacific. First, this paper will introduce a simple model for examining water law as one of several inputs which, when taken together, have the potential to support improvements in country-level water security. Then it adds data to this model, using a new comparative dataset on water law produced under the World Bank's *Enabling the Business of Agriculture* (EBA)³ project, in conjunction with the AWDO NWSI data,⁴ introduced above. Finally, the paper will explore four categories of countries defined by the relationship between water security and the observed comprehensiveness of the legal framework. These four categories will help to explore how patterns and discrepancies between law and water security indicators may provide some potential clues for possible paths to improving water security in different country contexts.

The relationship between law and water security

Water management as a field has been driven by technical advances, and less attention has been paid to the legal framework. Where mentioned, publications will often either briefly indicate that a strong legal framework is a precondition for everything else discussed in the report (UNESCO, 2009) (WWAP, 2015), or independently list some form of improvement or development of the legal framework as one of the options or priorities for countries to pursue. For example, the AWDO lists the “policy and legal regime” as one of several indicative priorities for countries to consider – along with managing ecosystem impacts, water pricing and subsidies, and capacity building (ADB, 2016).

However, there is a perspective which is process based – viewing water law neither as an independent focus area nor a meaningful outcome in of itself. Under this view – illustrated in **Figure 1** below – water law is one of several inputs which work together to help support the practices and outputs which make up modern, sustainable water management. This is in line with process models

employed in other fields like monitoring and evaluation (Parsons, et al., 2013).

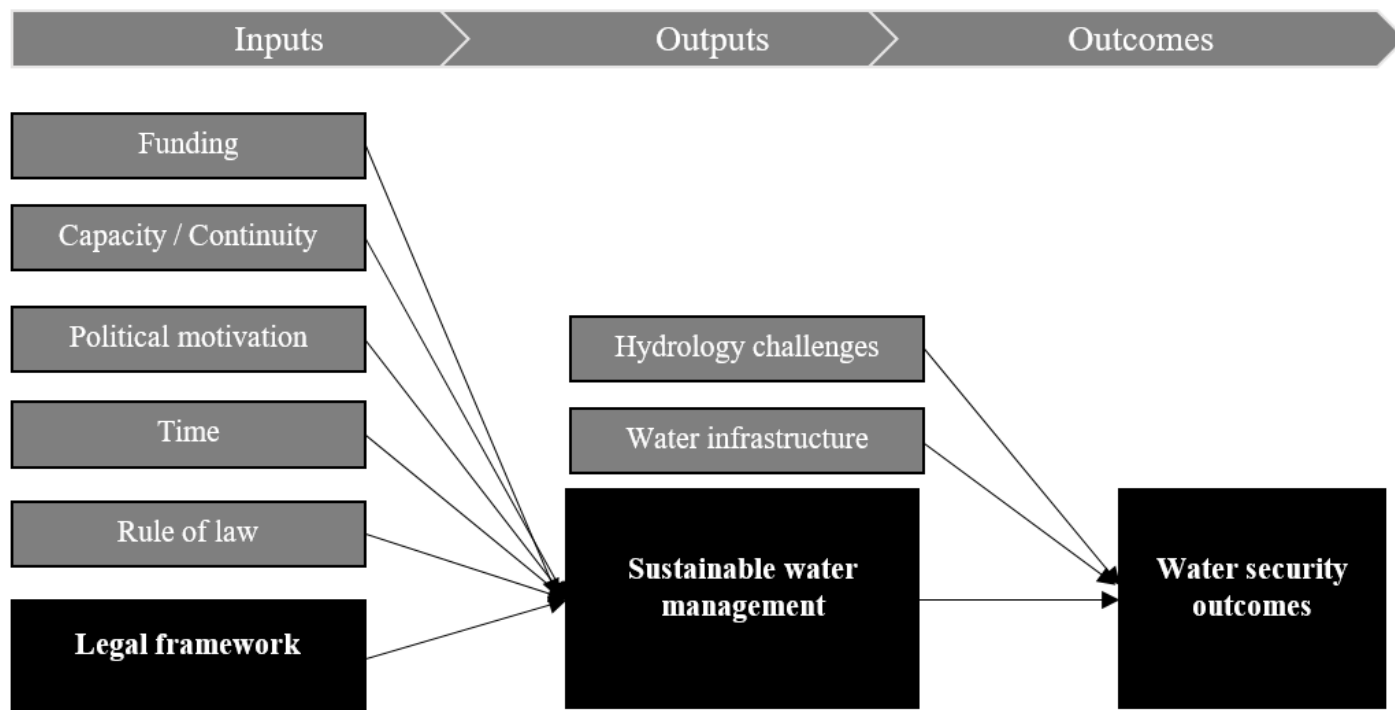
Sustainable water management itself is defined by technical water specialists and represents an evolving understanding of water management practices which can contribute to improved water security under a given country context. Of the many factors which can affect the extent to which sustainable water management practices are implemented in a given country, several major ones which are shared across countries are depicted in the simple diagram above. Thus, beyond the legal framework, effective implementation of sustainable water management practices can either be supported or constrained by levels of funding, internal technical capacity and capabilities, political motivation, continuity of leadership and staff, overall rule of law, and time (Shah, 2016) (Sadoff, et al., 2015). Many sustainable water management practices, such as developing a water information system, can be expensive and can require significant technical capabilities across several engineering and science disciplines. Studies have consistently observed the strong role of country income level for water security outcomes (ADB, 2016). With respect to time, even with the most efficient implementation, it can take years to develop water information systems, undertake collaborative planning and set up allocation systems; time is a particularly important consideration given how many countries have undertaken legal reforms in just the past few years.

Among these inputs, the legal framework can play a foundational role by guiding how funding and capacity are applied towards sustainable water management (Grigg, 2011) (Mechlem, 2016) (Vapnek, et al., 2009). By setting mandates for core water management practices, such as requirements to undertake consultative planning, the legal framework sets the bar for water management in a country. Whether a country reaches the bar they have set for themselves depends on the factors discussed above, and the bar needs to be pragmatic in considering country context. Shortcomings in any of these factors may have the potential to derail progress towards implementation of sustainable water management practices. Likewise,

³ Full data and further information on the EBA project are available at: <http://eba.worldbank.org>.

⁴ Data available in the AWDO report at: <https://www.adb.org/sites/default/files/publication/189411/awdo-2016.pdf>

Figure 1. Examining the relationship between indicators for law and other necessary preconditions, sustainable water management practices, and water security outcomes.



strong inputs in any of these areas may help to compensate for shortcomings in other inputs. Extending the analogy, some countries may jump high without a bar to aim for (without a comprehensive legal framework), but without a bar to guide activities, there may be long-term fluctuations due to changing funding levels, capacities, and motivation. Law also can help to contribute to ground-up approaches to sustainable water management by setting roles and expectations for water users. However, even when implementing sustainable water management practices, it is important to note that some countries face more challenging hydrologic situations or infrastructure limitations which will pose challenges for water security even if current best water management practices are implemented well (Grey & Sadoff, 2007) (ADB, 2016).morph its informal water economy into a formal one” (Shah & van Koppen, 2016).

Exploring paths forward with comparative data

It is proposed that the simple diagram above can also be used to begin to build a more nuanced picture to identify constraints and possible paths forward towards improved water security. To begin to fill in this picture, there are several recent datasets which can help to better understand the relationship between law, water security, and the other factors discussed above. Available data are discussed in the **next section** below.

In summary, drawing from the EBA dataset, it is possible to construct an index (0-100) for legal framework comprehensiveness, examining selected elements of the legal framework that may impact on water resources management and individual water use for irrigation. The 2017 EBA dataset includes 44 data points which identify the presence or absence of legal elements within domestic legal frameworks, current as of June 2016 (World Bank, 2017). In addition, beyond the legal framework, the EBA dataset also includes five additional data points which collect basic information on the extent of implementation of limited aspects of sustainable water management practices. For the implementation of sustainable water management practices, the ongoing work for the development of monitoring indicators for progress under the sixth Sustainable Development Goal (SDG6) on water – specifically Target 6.5 on integrated water resources management – will provide a strong future basis (UN Water, 2015) (UNEP, 2017) (UN Water, 2017). Finally, on the right side of this diagram (outcomes), the NWSI can provide new comprehensive

insights into water security outcomes for countries in the Asia and Pacific region.⁵

Description of data

The data published by the World Bank's *Enabling the Business of Agriculture* (EBA) project was collected in 62 countries spread across regions, income groups, and hydrologic contexts through a hybrid approach involving both in-house legal research and assessment, and inputs and corroboration from knowledgeable contributors in the form of survey responses. The resulting dataset was then validated by government counterparts. For each data point, the EBA dataset provides a numerical score (0-1) for the extent to which an element has been observed in the legal framework. For the present purposes, these individual data point scores have been aggregated within five indicator areas – information, planning, allocation, protection, and system efficiency, drawing from the experience of several comparative studies (World Bank, 2017) (van Rijswijk, et al., 2014) (De Stefano, et al., 2014) (Havekes, et al., 2013) (Araral & Yu, 2013) (Svendsen, et al., 2005) (Saleth & Dinar, 2004). **Table 2** in the **annex** below lists each data point grouped by these five indicators. A score for each indicator is obtained by dividing the number of observed legal elements by the number of elements possible. The five indicator areas are averaged and multiplied by 100 to provide a score from 0 to 100. This score is used to provide a proxy for the comprehensiveness of a country's legal framework for sustainable water management (hereinafter referred to as "legal framework comprehensiveness").

In addition, beyond the legal framework, the EBA dataset described above also includes five additional data points (0-1) which collect basic information on the extent of implementation of limited aspects of sustainable water management practices, namely (a) the establishment of basin institutions, (b) basin-level planning, (c) water resources inventories, (d) water user registries, and (e) water resources monitoring. A score for implementation on a scale from 0 to 100 is calculated by dividing the number of implementation elements observed by the maximum possible number of elements (5), and then

multiplying by 100. It is however important to note that these five data points only examine the availability of documentary evidence of at least partial implementation, which is given a full score of 1; no implementation at all is given a score of 0. Therefore, for example, a country could receive a score of 100 on implementation even if they have completed only one basin plan among many basins.

Next for outputs, with respect to hydrology, many countries have established water information systems for the collection of data on their hydrology and the extent of water-related infrastructure. FAO Aquastat is an important repository of this data for comparative analysis, but the current relevance and quality of the data will depend on the nature of country-level data collection efforts; some data may be several years old. FAO Aquastat also maintains data of a similar quality level on the extent of irrigation infrastructure and dam storage. For the implementation of sustainable water management practices, the ongoing work for the development of monitoring indicators for progress under the sixth Sustainable Development Goal (SDG6) on water – specifically Target 6.5 on integrated water resources management – will provide a strong future basis (UN Water, 2015) (UNEP, 2017) (UN Water, 2017).

Finally, for outcomes, the development of comprehensive, comparative indicators for water security has faced some challenges in the past (Fekete & Stakhiv, 2014). A range of indicators have been proposed over time, including many that focus on broader aspects of governance (OECD, 2015), but many face limitations in terms of the availability of data inputs for broader comparative analysis (GWP, 2013). However, on a regional level, the NWSI can provide new comprehensive insights into water security outcomes for countries in the Asia and Pacific region.

The NWSI incorporates five interdependent dimensions: household water security, economic water security, urban water security, environmental water security, and resilience to water-related disasters (ADB, 2016). The household water security dimension incorporates available data related to access to piped water supply,

⁵ The 2017 EBA dataset intersects with the 2016 NWSI dataset for 17 countries: Armenia, Bangladesh, Cambodia, Georgia, India, Kazakhstan, Korea, Kyrgyz Republic, Lao PDR, Malaysia,

Myanmar, Nepal, Philippines, Sri Lanka, Tajikistan, Thailand, and Vietnam.

access to improved sanitation, and hygiene. The economic water security dimension incorporates data related to information on reliability of supply, water stress, and data availability, as well as sectoral considerations for agriculture, energy, and industry. The urban water security dimension incorporates data related to piped urban water supply access, urban wastewater collection, economic damage from floods and storms, and river health. The environmental water security dimension incorporates data related to river health, flow regulation, and environmental management. The resilience to water-related disasters dimension incorporate available data related to exposure, vulnerability, and coping capacity for disasters. Each dimension is scored and contributes one-fifth of an overall score (0-100) for how far countries have progressed toward national water security (ADB, 2016).

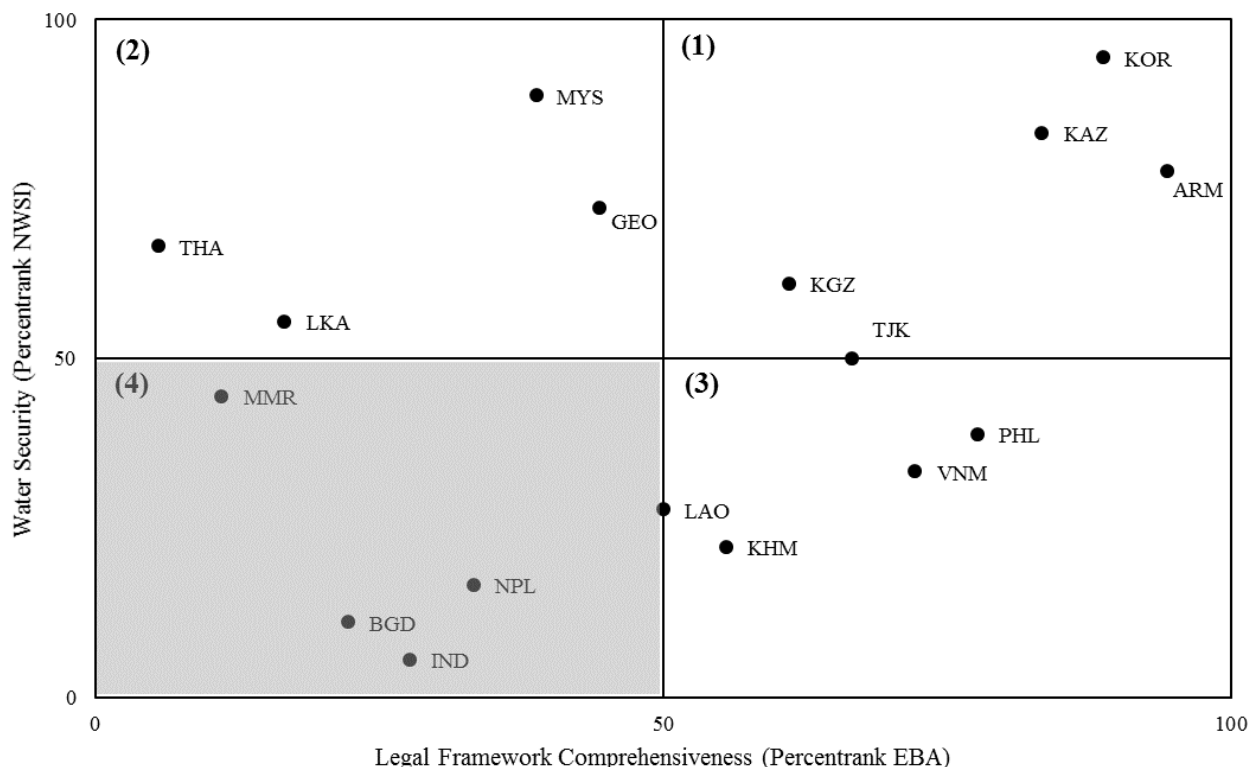
Observed scenarios in Asia and the Pacific

The following sections will take a deeper look at countries which fall within four categories for scenarios defined by the relationship between water security (NWSI) and the comprehensiveness of the national legal framework

(using data from the EBA Water dataset). The categories are: (1) those countries with relatively comprehensive legal frameworks combined with a high level of water security; (2) those countries with relatively less comprehensive legal frameworks but still a high level of water security; (3) those countries with relatively comprehensive legal frameworks but relative water insecurity; and finally (4) those countries with less comprehensive legal frameworks and water insecurity. These scenarios are illustrated in **Figure 2** below which plots NWSI against a constructed index for legal framework comprehensiveness using EBA Water data. Values for NWSI and legal framework comprehensiveness have been distributed by exclusive percent rank, where the four quadrants below are defined by the median value for the two data sets.

While scattered upon first glance, it is suggested that this type of plot may actually serve a diagnostic function to provide clues on viable paths forward towards improved water security. This can be combined with similar plots which compare law on the books with implementation of sustainable water management practices, and implementation with water security, to further pinpoint

Figure 2. Water security versus comprehensiveness of the legal framework (ADB NWSI, EBA).



possible constraints (not displayed here for space considerations).

Water security with a comprehensive legal framework

The Republic of Korea (South Korea - KOR), Kazakhstan (KAZ), Armenia (ARM), Kyrgyz Republic (KGZ), and Tajikistan (TJK) have put in place a relatively comprehensive legal framework, and have also achieved relatively high levels of water security under the NWSI. As shown in **Table 1** below, these countries tend to be more wealthy than the full set of countries; however, with Korea excluded, the other four countries actually tend to be less wealthy than average. The AWDO finds that water security tends to be closely correlated with income, but interestingly also notes that these four former Soviet countries outperform expectations based on gross domestic product (Armenia, Kyrgyz Republic, Kazakhstan and Tajikistan) (ADB, 2016).

Each of these countries has undertaken major legislative reforms over the past 20 years. The result is a relatively modern, consolidated, and comprehensive legal framework with broad legal support for sustainable water management. Thus, Korea's legal framework is anchored by the 1999 *River Act*, and further supported by a suite of regulations and supporting legislation for the management of individual basins. Armenia introduced a new *Water Code* in 2002 and has further supported this instrument with a detailed *Law on Water User Associations and Federations of Water User Associations* (2002). Similarly, Tajikistan, Kazakhstan, and the Kyrgyz Republic each put in place new consolidated *Water Codes* in 2000, 2003, 2005 respectively.

Overall, the legal frameworks of these countries tend to be very comprehensive when it comes to legal provisions which support water information systems and planning processes. With the exception of the Kyrgyz Republic, each of these countries also has a comprehensive basis in the legal framework for demand management and sustainable water withdrawals. These legal frameworks typically provide a modern permit system to sustainably manage water abstraction and use for major uses like agriculture. Note that the Kyrgyz Republic amended its *Water Code* after enactment to remove certain core provisions for water permit systems. These water allocation mechanisms will be especially critical in the future, as countries in this group already tend to have

relatively limited available water resources per capita (FAO, 2017).

Water security despite a less comprehensive legal framework

Georgia (GEO), Malaysia (MYS), Sri Lanka (LKA), and Thailand (THA) have achieved relatively high levels of water security on the NWSI despite having a relatively less comprehensive legal framework in place. The legal frameworks of these countries tend to be less recent and less consolidated. Thus, although Georgia's 1997 *Law on Water* (No. 936) started out as a relatively comprehensive anchor for the legal framework, core provisions have been more recently repealed – leaving much of water management within the more general framework of environmental management legislation. In Malaysia, water resources management is primarily a state subject with individual state enactments varying in comprehensiveness; Malaysia's federal system for water resources management will be the subject of deeper study in future work. Sri Lanka's legal framework for water management consists of the *Irrigation Ordinance* (1946) and subsequent amendments, as well as a range of institution-focused legislation such as the *Mahaweli Authority Act* (1979). Similarly, Thailand's legal framework for water includes a mix of *Irrigation Acts* from the 1930s and 1940s, as well as the more recent *Groundwater Act* (1977) and the *Enhancement and Conservation of National Environmental Quality Act* (1992).

However, these countries tend to be wealthier than the full set of countries and perform better on indicators for the rule of law (WGI, 2016). Despite having relatively less-comprehensive legal frameworks, it is possible that these countries have been able to compensate with other input factors, such as strong funding support, strong rule of law, dedicated political will, and a critical mass of technically-capable water management professionals. Possibly as a result, this group manages to display relatively strong performance on the implementation of sustainable water management practices among those aspects covered by EBA data. In translating those practices to water security, it appears that this group also may have relatively favorable hydrology; for example, as shown in **Table 1** above, levels of available water resources per capita vary but on average are close to the average for the full set. In the long term, building a more comprehensive legal

Table 1. Factors and outcomes for water security using available data (EBA, ADB, FAO, WGI).

	Input	Output	Outcome	Additional Factors (FAO and WGI)		
	Legal Framework Comprehensive ness (EBA)	Implementation of Sustainable Water Management Practices (EBA)	Water Security (2016 NWSI Average)	Gross national income per capita (2015 - USD)	WGI Rule of Law (2015)	Total renewable water resources per capita
Asia-Pacific Average (n=17)	38.8	51.8	50.3	4857.8	-0.3	11326.9
Group 1 Average (n=5)	64.0	64.0	61.7	9062.0	-0.4	3333.8
Korea, Rep.	73.5	100.0	74.4	27440.0	1.0	1386.0
Kazakhstan	65.7	60.0	70.2	11580.0	-0.4	6150.0
Armenia	80.1	100.0	68.1	3880.0	-0.3	2574.0
Kyrgyz Republic	49.3	40.0	51.9	1170.0	-1.0	3976.0
Tajikistan	51.1	20.0	43.8	1240.0	-1.0	2583.0
Group 2 Average (n=4)	17.9	65.0	61.0	6037.5	0.2	10989.3
Georgia	31.4	40.0	64.9	4160.0	0.3	15832.0
Malaysia	28.9	80.0	73.4	10570.0	0.6	19122.0
Sri Lanka	10.1	80.0	51.4	3800.0	0.1	2549.0
Thailand	1.3	60.0	54.4	5620.0	-0.1	6454.0
Group 3 Average (n=4)	50.9	70.0	39.0	2080.0	-0.6	23452.5
Philippines	62.5	100.0	40.4	3540.0	-0.3	4757.0
Vietnam	58.1	60.0	40.2	1980.0	-0.3	9461.0
Lao PDR	37.1	80.0	38.0	1730.0	-0.8	49030.0
Cambodia	46.0	40.0	37.5	1070.0	-0.9	30562.0
Group 4 Average (n=4)	16.1	5.0	36.6	1200.8	-0.7	9530.5
Nepal	23.8	0.0	37.3	730.0	-0.7	7372.0
India	19.0	20.0	33.1	1590.0	-0.1	1458.0
Bangladesh	18.6	0.0	35.3	1190.0	-0.7	7621.0
Myanmar	2.9	0.0	40.8	1293.3	-1.2	21671.0

framework may bring additional benefits for these countries in helping to ensure that funding and capacity is directed rationally.

Water insecurity despite having a comprehensive legal framework

The Philippines (PHL), Vietnam (VNM), Lao PDR (LAO), and Cambodia (KHM) have put in place a relatively comprehensive legal framework, but still face relative water insecurity under the NWSI. As one positive factor, the legal frameworks of these countries tend to be relatively recent and consolidated. With the exception of the Philippines, these countries tend to have undertaken legal reforms within the past twenty years. The legal framework of the Philippines is anchored by the 1976 *Water Code* and its amended implementing rules and regulations. Vietnam put in place a new *Law on Water Resources* in 2012, and has since promulgated a number of new supporting regulations. Lao PDR enacted a new *Water and Water Resources Law* in 1996 and a new *Irrigation Law* in 2013. Cambodia's legal framework is anchored by 2007's *Law on Water Resources Management*. While generally comprehensive, one notable weak spot among the legal frameworks of the countries in this group is in the area of supporting water information systems; such water information systems form the foundation for effective water planning and allocation.

Here again, the disparity between a comprehensive legal framework and water insecurity can provide an important diagnostic function. Upon deeper country-level analysis, it may be that viable paths forward toward water security may need to focus on addressing constraints among other factors beyond the legal framework. For example, beyond their relatively comprehensive legal frameworks, these four countries tend to be less wealthy than the average for the set of countries considered for this analysis. It could be that this may have negative implications for the amount of funding which can be allocated to water management. Limited funding may also have implications for a limited technical capacity to pursue sustainable management of water resources. In addition, the relatively recent enactment of some of these legal frameworks may provide indications of the importance of allowing time for implementation of a new legal framework. These are all factors which need to be explored further in deeper analysis within the countries. In particular, it is important to recall here that the EBA implementation data points only provide an indication of whether there has at least been some documentary evidence of implementation, versus no implementation at all.

Water insecurity with a less comprehensive legal framework

Nepal (NPL), India (IND), Bangladesh (BGD), and Myanmar (MMR) face relative water insecurity, and have not yet put in place comprehensive legal frameworks. Each of these countries has undertaken some relatively recent legislative activity in response to perceived water security threats, but the legal framework is still less comprehensive than the level observed across other countries in the region. Nepal's legal framework is anchored by 1992's *Water Resources Act* and its supporting *Water Resources Rules* (1993) and *Irrigation Rules* (2000). As with Malaysia above, in India, water resources management is primarily a state subject with individual state enactments varying in comprehensiveness; India's federal system for water resources management will be the subject of deeper study in future work. Bangladesh enacted a new *Water Act* in 2013, and Myanmar put in place a new *Environmental Conservation Law* in 2012 and the *Conservation of Water Resources and Rivers Law* in 2006. The legal frameworks of these countries tend to be especially limited in those areas which are critical for long-term demand management, such as permit systems which control the volume of water use.

The severity of the water security challenges among these countries warrants a closer look at all possible tools at their disposal – including possibly a deeper review of the strengths and weaknesses of their legal frameworks for water management. Overall, these four countries are significantly less wealthy than the average for the set, and perform worse on broader indicators for the rule of law. When combined with the lack of legal mandates, these factors may present significant challenges for the implementation of sustainable water management practices.

Conclusions

There is a common refrain: why care about water law when so many countries have good laws but poor outcomes in terms of water security? However, law does have a potential role to play to setting mandates and objectives and ensuring that desired practices are carried out over the long term. This role is often obscured by the countervailing influence of other factors.

Moreover, examining these seventeen countries in the Asia and Pacific region provides some initial evidence in support of a more nuanced model for how legal frameworks can contribute to water security, along with a potentially valuable dialog where discrepancies can provide a preliminary exercise in advance of deeper

country-level and local-level assessments. Pending deeper assessment, discrepancies between comprehensive legal frameworks and the implementation of sustainable water management practices may help to direct analysis towards possible constraints from inadequate funding, political will, staff capacity, time, and other inputs. It may also point to the need for more time to implement a new legal framework. Similarly, pending deeper assessment, discrepancies between the implementation of good water management practices and water security outcomes may help to direct analysis towards constraints from hydrologic conditions and inadequate infrastructure. Moving forward, as data for more countries becomes available, an econometric

exploration of the role of law and other factors in supporting water security may provide further clues.

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Annex - Table 2. Indicators utilizing EBA Water legal data points to construct an overall index for legal framework comprehensiveness.**INFORMATION - Understanding water resources and water use**

Water resource inventory: a mandate for the development of a water resources inventory
 Water user registry: a mandate for the creation and maintenance of a registry of water users
 Monitoring: a mandate for water resources monitoring
 Inventory updating: a requirement to update the water resources inventory on a defined basis
 Public availability of inventory: a requirement for the inventory to be made publicly available
 Public availability of registry: a requirement for registry information to be made publicly available
 Monitoring plan: a mandate for the development of a water resources monitoring plan
 Monitoring plan updating: a requirement to update the monitoring plan on a defined basis
 Public availability of monitoring results: a requirement for monitoring results to be made publicly available

PLANNING - Planning inclusively for rational water management

Groundwater management: a mandate to manage groundwater resources
 Basin institutions: support for the creation of institutions to manage water at the basin level
 Basin institution functions: a specification of the functions of basin institutions
 Organizational structure: a specification of the internal organization of basin institutions
 Representation of water users: mandatory representation of water users in water management institutions
 National water planning: a mandate for national water planning
 Basin planning: a mandate for basin planning
 Basin plan components: a specification of the required components of basin plans
 Public consultations: a requirement for public consultation during the preparation of basin plans
 Basin plan updating: a requirement to update basin plans on a defined basis
 Plan compliance: a provision making basin plans binding over allocation decisions

ALLOCATION - Allocating water sustainably

Permit and declaration systems: a requirement to obtain a permit before abstracting and using water for irrigation
 Priority orders: a definition or a requirement to define a priority order for allocations
 Permit application procedures: a specification of the procedures necessary to apply for a permit
 Pre-decision public notice: a requirement for pre-decision public notice of permit applications
 Public notice duration: a specification of the required duration of public notice
 Public notice means: a specification of the acceptable means of public notice
 Permit duration: a specification of the duration of permits
 Permit renewal: a specification of the renewal procedure for permits

PROTECTION - Building compliance to protect sources

Standard permit conditions: mandatory standard permit conditions
 Record keeping: a requirement for water users to keep records of the amount of water abstracted
 Inspections: powers for inspections for compliance of water-related obligations
 Offenses for violations: a specification of key water offenses and penalties
 Special measures for water stress: defined powers to take actions in case of water shortage
 Legal effects of special measures: powers to curtail permits and restrict new issuances in case of water shortage
 Formal drought declarations: a requirement for a formal drought declaration before curtailing permits
 Water quality standards: a prescription of water quality standards for irrigation

EFFICIENCY - Improving system efficiency and resilience

Conservation and efficiency: specific mechanisms for the promotion of water conservation and efficiency
 Obligation to pay: an obligation on water users to pay charges for abstraction
 Setting charges: a mandate to set charges for water abstraction
 Charge calculation: a specification of how water charges are to be calculated
 Collecting charges: a mandate to collect charges for water abstraction
 Permit transfers: a specification that permits are transferrable
 Transfer notification: a requirement to notify the government in the event of a transfer
 Transfer procedures: a specification of procedures for transferring permits