

Water Property Rights in India

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As Indian states continue to revise and reform their water laws in response to the escalating water crises, property rights in water instruments and their effect on water governance gain importance. Based on the examination of 153 law and policy documents shortlisted to 64, it is found that (i) India has a plural governance model with provincial water statutes; (ii) these laws avoid addressing the underlying landownership-related groundwater and riparian rights, and instead perpetuate water rights linked to the land through a registration process; (iii) new state-issued permits provide quasi-property rights to permit holders but how this relates to point (ii) is unclear; and (iv) as most water is over-allocated, reallocating water will be challenging, given the above property rights system.

Globally, countries are struggling to govern water due to increasing human demands, climate variability and change, and the recognition of water for nature (UN-Water 2021). Worldwide basins are “closing” with demand exceeding supply. Many African and Asian countries are trying to reconcile historical rights with modern governance principles, facing challenges in water (re)allocation (Bosch et al 2021). Indian states too are reforming their water laws and face similar challenges. However, the literature reveals a notable gap; previous studies have predominantly examined water law in abstraction, but not in its more institutional and practical forms, particularly regarding who owns and holds property rights in water. Hence, we ask: How are “property” rights in water instruments organised across the 28 Indian states and how do these affect water governance? A state’s capacity to (re)allocate water among users is a key governance concern (Bosch and Gupta 2023; Gupta et al 2013). We focus on state laws since water is a state matter in India, except in relation to interstate and international water issues.

We identified 153 relevant surface and groundwater laws from an online database (IELRC 2022) shortlisting 64 documents for systematic analysis (Appendix). We categorise the laws that are currently in place into three clusters: (i) irrigation (mid-20th to early 21st centuries); (ii) groundwater (late 20th to the beginning of the 21st century); and (iii) water resources laws (first introduced in 2006, and the latest enacted in 2021).

We begin by reviewing the evolution of water property rights between 1858 and 1947. We then assess: (i) water allocation instruments, (ii) property rights allocated through these instruments, and (iii) how these instruments affect water reallocation.

Evolution of Property Rights in India

India’s water governance has evolved from the Hindu water law, through Islamic influence, to British influence during colonisation (Cullet and Gupta 2009). We focus on the evolution of water property rights in the colonial and postcolonial periods.

Under British colonisation, water was regulated to enhance the economy through irrigation (Cullet and Gupta 2009). Common law principles were introduced through the Indian High Courts Act, 1861 (Chandrachud 2015). Different rules addressed surface water and groundwater (Cullet 2014). This led to riparian rights for surface water and strong rights to groundwater, enforced through court judgments and codified in the Indian Easements Act, 1882, in Articles 7(b) and (g) (Cullet and Koonan 2017a; Upadhyay 2009).

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Riparian rights belong to landowners and empower them to use water (usufructuary rights) flowing along the land (Upadhyay 2009; Cullet 2012b; Puthucherril 2009). As stated in Article 2(a) of the Indian Easements Act, the riparian rights are limited by the government's right to

regulate the collection, retention and distribution of the water of rivers and streams flowing in natural channels, and of natural lakes and ponds, or of the water flowing, collected, retained or distributed in or by any channel or other work constructed at the public expense for irrigation.

However, even if the state declares that it controls water, it does not become the absolute water resource owner as courts have clarified; the states' right to use surface water cannot be extended arbitrarily to curtail riparian rights (Upadhyay 2009). However, Indian states did appropriate control over surface waters through irrigation acts (Cullet and Gupta 2009; Cullet and Koonan 2017a, 2017b) and by the power of eminent domain (the state's right to take private land for public purposes). In practice, it gives the government considerable control over water (Cullet and Koonan 2017a).

Unlike surface water, the prohibition of water property rights did not apply to groundwater (Cullet and Koonan 2017a). In India, landowners have groundwater property rights, as groundwater is a chattel of land (Puthucherril 2009). The courts applied common law to allow landowners unlimited rights to groundwater (Cullet 2014) except when the water noticeably reached a surface water channel (Cullet 2012a) or clearly flowed in a specific direction (Cullet 2014).

Post-independence, colonial water legislation continued under Article 372 of the Constitution (1949)¹ and no comprehensive legal framework has been adopted (Cullet and Gupta 2009). While state water ownership has been abolished and surface water falls under public trust, riparian and groundwater rights continue to exist and are upheld in court cases.

Water Access and Allocation Instrument Design

Since 1900, water governance periods include (i) irrigation rules under the British; (ii) post-1950 groundwater laws following the national model groundwater law (Cullet 2018); and (iii) post-2000, the shift towards an integrated approach to surface water and groundwater.

Surface Water Allocation

We assess how the irrigation acts (excluding those on groundwater and integrative acts) address surface water allocation. Irrigation acts address water use management in state government-owned/controlled irrigation schemes² to which riparian rights do not apply. Article 3(3) in Bihar's Irrigation Act, 1999 states:

No rights shall be acquired against the government under the provisions of the Indian Easements Act, 1882 in the water of any river, natural stream or natural drainage channel, lake or other natural collection of water, which supply water to a canal³ existing or under construction at the commencement of this Act or any of whose water will supply the canal when constructed.

Moreover, state governments may also apply for water allocation through an irrigation projects. Article 4 in Gujarat's Irrigation Act, 2013 states:

Whenever it appears expedient or necessary to the Government ..., the State Government may ... declare that the said water shall be so applied or used after such date as may be specified in the said notification.

The same provisions exist for Haryana, Karnataka, Maharashtra, Rajasthan, and West Bengal.

In designated irrigable areas—for example, assured irrigable command area (Article 49, Bihar Irrigation Act, 1999) or land under irrigable command of a canal (in Goa)—an authorised person (divisional canal officer in Bihar, canal officer in Chhattisgarh, Goa, Gujarat, Haryana, and Karnataka, and irrigation officer in Kerala and Rajasthan) regulates water supply for irrigation through irrigation timing, supply period, supply volume, and supply areas.

Occupiers of land within these areas are entitled to water supply from the state government-owned irrigation works. However, they have to apply for inclusion (in Chhattisgarh, Goa, and Uttar Pradesh this entails obtaining an irrigation agreement; in Gujarat, Karnataka, Maharashtra, Rajasthan, West Bengal, and Assam this means obtaining permission; in Haryana, a written contract; and a licence in Kerala and Odisha). The supplied water use is subject to conditions, including payments and regulation by the canal officer. Some states, for example, Karnataka, allow water supply after a specified period (Article 28[2], Karnataka Irrigation Act, 1965).

The state's control of surface water abstraction is limited to its irrigation schemes. Outside these schemes, riparian rights apply. However, Kerala and Punjab regulate the state's surface water abstraction. Moreover, only 15 of the 28 states have enacted an irrigation law. Thus, riparian rights continue to be valid in most parts of India.

Groundwater Governance Instruments

We examine the 17 acts that govern groundwater rights.⁴

Notified areas: All states (17 out of 17) have granted a responsible authority the power to notify a specified area for the control and regulation of groundwater, referred to as a notified area or overexploited area. While the provisions on the declaration of a groundwater management area differ, the scope is the same in that it identifies critical groundwater areas that should be governed.

For example, Article 5 of the Assam Ground Water Control and Regulation Act, 2012 states that

If the State Authority is of the opinion that it is necessary or expedient in the public interest to control and/or regulate the extraction or the use or both of ground water in any form in any area it may advise the State Government to declare any such area to be a notified area for the purpose of this Act with effect from such date as may be specified therein.

This provision is similar to the groundwater acts in all states except West Bengal. Article 11 in the Telangana and Andhra Pradesh Water, Land and Trees Act, 2002, states,

The Authority may on the advice of the technical expert, declare a particular ground water basin as over exploited for a period of not more than six months which, after review, may be extended for a further period of not more than six months at a time.

Registration: Designating a notified area allows states to require users to register existing wells and/or obtain permission to extract and use groundwater. All states with a groundwater act require existing groundwater wells and/or groundwater use to be registered. Nine of the 17 states require the registration of existing wells, while 10 of the 17 states require groundwater users to register their use.

For example, Article 7 of the Bihar Ground Water (Regulation and Control of Development and Management) Act, 2006 states:

Every existing user of ground water in notified areas ... shall ... apply to the Authority for grant of a certificate of Registration recognizing its existing use ... [and] if the Authority is satisfied that it shall not be against the public interest to do so, it may grant, subject to such conditions and restrictions as may be specified, a certificate of Registration authorizing the continued use of ground water.

Similar provisions are present in the groundwater acts of Himachal Pradesh, Kerala, Maharashtra, Odisha, Goa, and Punjab.

Some states also require the registration of existing wells (10 out of 17) or users (five out of 17) in non-notified areas, that is, the whole state. For example, Article 7 of the Assam Ground Water Control and Regulation Act, 2012 states:

Every existing user of ground water in the State shall ... apply to the State Authority for grant of a Certificate of Registration recognizing its existing use.

The authorities may refuse to register an existing user/well based on the purpose for which the water is to be used, the availability of groundwater, or its quality with reference to its purported use. This holds for the states of Assam, Bihar, Chhattisgarh, Himachal Pradesh, and Karnataka. Until a decision is made on the application, the applicant can continue using groundwater.

Following registration, 12 out of the 17 states allow the registration to be altered, amended, or varied. For example, Article 14 of the Karnataka Groundwater (Regulation and Control of Development Management) Act, 2011 holds that the authority may “at any time after the ... certificate of registration ... has been granted, ... alter, amend or vary the terms of the permit or certificate of registration, as the case may be.” This can be for technical reasons (as in Assam, Bihar, Chhattisgarh, Goa, Karnataka, and Kerala), to promote state interest (Jharkhand), to prevent falling groundwater levels, or to protect water quality (Tamil Nadu).

Permission: All 17 laws require permission in the specified areas to sink wells, or extract and use groundwater. The area of application of the requirement of permission differs between states. The states of Andhra Pradesh, Assam, Bihar, Chhattisgarh, Goa, Haryana, Himachal Pradesh, Karnataka, Kerala, Maharashtra, Odisha, Tamil Nadu, Telangana, and Uttar Pradesh require permission for drilling/digging wells in notified areas. Article 2 of Assam Ground Water Control and Regulation Act, 2012 states that

Any user of ground water ... desiring to sink a well in the notified area for any purpose ... shall apply to the State Authority ... for grant of a permit for this purpose, and shall not proceed with any activity connected with such sinking unless a permit has been granted by the State Authority.

Furthermore, several states require permission in non-notified areas. For example, Jharkhand requires all groundwater

users to obtain a permit,⁵ Maharashtra prohibits the drilling of deep wells within the notified and non-notified areas, for agriculture or, industrial usage,⁶ and West Bengal requires all users willing to sink a well for groundwater use to obtain a permit.⁷ Once the permission is granted, most states (12 out of 17) allow the permission to be altered, amended or varied.

Domestic use exempted: While all laws require users to register or obtain permission to use groundwater and/or wells in certain areas, most laws (12 out of 17) exclude this requirement for domestic use. States have different provisions that exempt domestic use, for example, “if the well is proposed to be fitted with a hand operated manual pump or water is proposed to be withdrawn by manual devices,”⁸ or the “sinking of any well for public drinking purpose and hand pump for public or private drinking water purpose shall be exempted.”⁹ Thus, states are governing groundwater resources, however, this is mostly limited to specified areas. Moreover, these laws are superimposed on existing common law principles, maintaining landowners’ strong groundwater rights.

Surface Water and Groundwater

Following the century-long regulation of surface water and groundwater separately, there has been a shift to integrated governance of surface and groundwater since 2000. In India, 10 states have established an authority to do so.

Entitlement: Two out of 10 states, namely Arunachal Pradesh and Maharashtra require state permission for all water use. For example, Article 14 in the Arunachal Pradesh Water Resources Act, 2006 states that

From the date of commencement of this Act, no person [including individual, group of individuals, all local authorities, association, societies, companies, etc] shall use any water source without obtaining the Entitlement from the respective River Basin Agency.

The eight other states are not as explicit, stating that the established authority shall determine the distribution of entitlements for various categories of use and the equitable distribution of entitlements of water within each category of use. Here, an entitlement implies state authorisation to use the water for specified purposes.

In allocating water resources, different instruments are developed, including aggregate bulk water entitlement,¹⁰ bulk water entitlement,¹¹ individual water entitlement,¹² or groundwater entitlement (subsurface entitlement).¹³ These entitlements are subject to terms and conditions in seven of the 10 states (Arunachal Pradesh, Himachal Pradesh, Maharashtra, Rajasthan, Uttar Pradesh, Uttarakhand, and Punjab). States are required to establish a system of enforcement, monitoring, and measurement of the entitlements in seven of the 10 states, namely Arunachal Pradesh, Haryana, Himachal Pradesh, Maharashtra, Rajasthan, Uttar Pradesh, and Uttarakhand. Five of the 10 states have the power to review the entitlement.

Construction: Rather than focusing on permitting water use, one state, namely Punjab, regulates infrastructure construction.

Article 15 in the Punjab Water Resources (Management and Regulation) Act, 2020 reads:

The Authority may issue directions regarding the development, management, or use of water which may include the ... (i) construction and installation of any new structure for extraction of groundwater through energized means; (ii) conditions subject to which the construction and installation of any new or existing water extracting structures may be allowed; (iii) conditions for operation of existing water extracting structures and their reinstallation; ... (vi) specifying areas in which an industrial operation or process or class of industrial operations or processes utilizing groundwater shall not be carried out or shall be carried out subject to certain conditions and safeguards; (vii) optimal use of surface water for irrigation, industrial or domestic use.

Domestic use exempted: A few laws exempt domestic water use from the requirement to obtain permission. Arunachal Pradesh and Maharashtra explicitly state that no entitlement shall be required in the case of any borewell, tube well or other wells which are being used for domestic purposes. Furthermore, Punjab's Water Resources (Management and Regulation) Act, 2020 requires no directions to be issued for the extraction of water for drinking and domestic use.

Existing use: The laws are largely silent on the governance of existing use. Four out of the 10 states address existing water use. Article 14(2) in the Arunachal Pradesh Water Resources Regulatory Authority Act, 2006 and Article 14(2) in the Maharashtra Water Resources Regulatory Authority Act, 2005 state that

[The] use of the water for the purposes of agriculture, through any existing well, bore well, tube well in the command area of a project on the date of commencement of this Act, shall be allowed to continue till date as may be notified by the Authority.

Similarly, Article 12(4) of the Haryana Water Resources (Conservation, Regulation and Management) Authority Act, 2020 and Article 15(4) of the Punjab Water Resources (Management and Regulation) Act, 2020 state:

The Authority may ... issue directions ... regarding the development, use, management, and conservation of water resources which may include ... users drawing groundwater to register the extraction structure with the Authority or with such entity, as may be specified by the Authority within a given period.

States are required to implement a water allocation permit system which includes terms and conditions. Although this does not abolish common law principles, this is a step towards governing water, both surface water and groundwater, across the states.

Water budget: The states that have a water resources authority act refer to a water budget. For example, six of the 10 states (Arunachal Pradesh, Maharashtra, Himachal Pradesh, Rajasthan, Uttar Pradesh, and Uttarakhand) call for the establishment of an authority or a commission to determine and declare, annually or seasonally, the quota/amount of water available within a system to be used as an allocated percentage of the entitlements duly issued by the commission. Haryana and Punjab require developing an integrated state water plan to help develop, manage, and conserve the state's water resources, including water allocation. Andhra Pradesh and Jharkhand require the authority to determine the water requirement for

various categories of users (such as irrigation, municipal, rural drinking water, industry, and so on) on a yearly or seasonal basis. None of the laws specify the water allocation priority, although some acts mention this should be specified in the policies, or state that the authority has the mandate to specify this.

Water 'Property' Rights

We analyse the nature of property rights a holder of an entitlement holds, by looking at what rights are allocated based on the three categories of laws discussed before.

Surface Water

Water use right: The common law riparian rights system gives every landowner a right to abstract surface water running past their land. In the state government-owned irrigation schemes, water use is subject to permission, and specified terms and conditions.

Temporal dimension: The riparian rights, as an integrated part of landownership, are in perpetuity (until the system is abolished). The water use canal rights, the rights to use water from a government irrigation scheme, do have a temporal element. For example, Article 45 in the Chhattisgarh Regulation of Waters Act, 1949 states that

[An] Agreement may be made, between the State Government and the permanent holders of land for the supply of water for irrigation either for a short term not exceeding one year or for a long term exceeding one year.

Regarding the agreement, Article 27(4) in the Haryana Canal and Drainage Act, 1974 states that if "the period has not been specifically mentioned, it shall be deemed to have been made for one year unless such contract or agreement is renewed for another year."

Other states, while not specifying the period for which the agreement is valid, specify a period regarding the distribution of water. For example, Article 49 in the Bihar Irrigation Act, 1997 states the canal officer may regulate "(i) the time for letting out water for irrigation; (ii) the period of supply; (iii) the quantity of supply; and (iv) the areas to be supplied at different times."

Dispute resolution: Regarding the state-owned irrigation schemes, 13 out of 14 states¹⁴ have some sort of provision in place that allows for dispute resolution, which is reflected in the possibility of appealing against the decision of a responsible authority. For example, Article 43 in the Gujarat Irrigation and Drainage Act, 2013 states that "any person aggrieved by the order of the canal-officer may make an appeal to the Appellate Authority to whom the canal-officer passing the order is subordinate." Furthermore, the act states that the appellate authority has the same powers as vested in the court and that

No suit, prosecution or other legal proceedings shall lie against the State Government or any officer or employee of the Government for anything which is in good faith done or intended to be done in pursuance of the provisions of this Act or any rule, notification made

or issued thereunder. (Article 44, Gujarat Irrigation and Drainage Act, 2013)

The purport is the same in the various laws in that they can appeal against a decision, that no further appeal is possible, and that no court is involved.

Compensation: Eight out of 16 states¹⁵ allow for claiming compensation, but the provisions and grounds vary, for example, Article 26 of the Goa, Daman and Diu Irrigation Act, 1973 reads:¹⁶

Compensation may be awarded in respect of any substantial damage caused by the exercise of any of the powers conferred by this Act, which is capable of being ascertained, [including] [i]f the supply of water to any land irrigated from a canal is interrupted.

Alienation: Most states (11 out of 16) have a provision in place that specifies the grounds on which a water use right can be alienated. Alienation is permitted in two ways, first, in 10 out of 16 states (Assam, Bihar, Goa, Gujarat, Haryana, Karnataka, Maharashtra, Odisha, Rajasthan, and West Bengal), when land is transferred, the associated water use rights are also transferred. For example, as stated in the Assam Irrigation Act, 1983:

The right to be supplied with water from any irrigation work or supply for the purpose of irrigating any particular land or other immovable property shall be deemed to be attached to such land and shall pass on the transfer or on the transfer of such or immovable property, as the case may be.

Second, eight out of 16 states (Bihar, Goa, Gujarat, Haryana, Maharashtra, Odisha, Rajasthan, and West Bengal) allow the sale or subletting of a water use right. For example, as stated by Article 55 of the Bihar Irrigation Act, 1997:

Except with the permission of the Superintending Engineer no person entitled to use the water of any irrigation work shall sell or sublet or otherwise transfer his right to such use or use it for unauthorised purposes.

Groundwater

Water use rights: The common law groundwater principles are still in effect, giving any landowner the right to extract groundwater on their land. However, most states regulate groundwater use in specified areas through permissions and registration, which are subjugated to specified conditions and restrictions. This allows states to control and regulate the uncapped groundwater rights, by specifying the maximum volume of water that can be abstracted. Moreover, once registered, or given permission, most states (12 out of 15) allow the alteration, amendment, or varying of registrations. The conditions of the registered and permitted groundwater use can in turn be amended, allowing the governance of groundwater resources by the government.

Temporal dimension: Common law groundwater rights that are an integrated right of landownership are perpetual in nature. Other than determining the volume of water seasonally or annually, the perpetual nature of the water rights is left untouched since none of the laws specify the period for which the entitlements are valid or when they end. Only Goa by Article 5

of the Goa Ground Water Regulation Act, 2002 specifies a time limit on registrations and permissions, stating

[these] shall be valid for a maximum period of five years from the date of issue of the certificate of registration or the permission, as the case may be, and after expiry of the period of five years, the well shall have to be freshly registered in accordance with the procedure laid down herein.

Dispute resolution: The groundwater laws do not have a provision in place that organises the dispute settlement. However, all 15 states have a provision in place on the “protection of action taken in good faith.” For example, Article 16 of the Goa Ground Water Regulation Act, 2002 states that

No prosecution, suit or other legal proceeding shall be instituted against the Government, the State Authority or any other officer of the Government or any Member or other employees of the State Authority for anything done or intended to be done in good faith under this Act or the rules made thereunder.

Most states (13 out of 15)¹⁷ have a provision in place that allows an aggrieved person to appeal against a responsible authority within a period ranging from 30 to 60 days. For example, Article 24 of the Assam Ground Water Control and Regulation Act, 2012 reads:

Any person aggrieved by a decision or action of the State Authority under this Act may, within a period of thirty days ... appeal to such appellate authority as may be specified by the State Government in this behalf.

Moreover, three of the 15 states (via the Karnataka Ground Water [Regulation and Control of Development and Management] Act, 2011; the Haryana State Groundwater Management and Regulation Bill, 2013; and the Tamil Nadu Groundwater [Development and Management] Act, 2003 [Repealed]) put a bar on jurisdiction by a civil court, stating

No Civil Court shall have jurisdiction to entertain or decide any suit or other proceedings in respect of any matter which the Government or the Authority is empowered by this act to determine and no injunction shall be granted by any court, in respect of any action taken or proposed to be taken by the Government or the Authority in exercise of the powers conferred by or under this Act.

Compensation: Four of the 15 states have a provision for claiming compensation, for example, Article 12 of the Goa Ground Water Regulation Act, 2002 states

Where an order of permanently closing or sealing of an existing well is made ... the Ground Water Officer may ... make an order for payment of compensation which shall be not less than the market value of the well and structures thereon No such compensation shall be paid in the case of temporary closing down of an existing well in an over exploited area.

Most states (nine out of 15) have a provision in place that clearly state no compensation can be claimed. For example, Article 51 of the Maharashtra Groundwater (Development and Management) Act, 2009 states

No person shall be entitled to claim any damages or compensation from the government for any loss sustained by him by virtue of any action taken under this act.

Alienation: There is no legal basis for trading groundwater (Parikh 2007) and the groundwater laws are quiet on trading

water rights/entitlements. The Uttar Pradesh Ground Water (Management and Regulation) Act, 2019 prohibits the selling of water, and states

the holder of authorization certificate/No-objection certificate shall be prohibited from selling, by whatever name or form, ground water extracted under the authorisation to someone else for commercial use and/or gain.

However, six states (Assam, Jharkhand, Karnataka, Maharashtra, Odisha, and Uttar Pradesh) define groundwater users in a similar manner to Article 2 of the Assam Ground Water Control and Regulation Act, 2012:

person or persons or an institution including a company or an establishment, whether government or non-governmental who or which extract or use or sell ground water for any purpose including domestic use, made either on a personal or community basis.

Water (Surface Water and Groundwater)

Water use right: All states define water rights. A few states (Arunachal Pradesh, Maharashtra, and Rajasthan) define allocation as in the Maharashtra Water Resources Regulatory Authority Act, 2005:

the portion or percentage of an Entitlement declared annually or seasonally by the Prescribed Authority to be made available to the holder of an Entitlement based upon the availability of water for the period within the sub-basin, river basin, project or storage facility for that season or year; and during water crisis or scarcity on the principle of proportionate entitlement.

Similarly, other states (Himachal Pradesh, Uttar Pradesh, and Uttarakhand) refer to a quota, which is defined as a volumetric quantity of water made available to an entitlement holder, derived by multiplying an entitlement by the annual or seasonal allocation percentage.

Moreover, Haryana and Jharkhand define subsurface entitlement as an entitlement to a volumetric quantity of water to be extracted in the command area. Eight states that allocate water through granting entitlements cap the volume of water that can be abstracted under the existing common law.

In five out of 10 states, entitlements need to be reviewed. According to both the Maharashtra and Arunachal Pradesh acts, entitlements may be reviewed at intervals of at least three years. This should only happen if there are concerns about the sustainability of the level of allocation. The acts of Himachal Pradesh, Uttar Pradesh, and Uttarakhand state that the authority has the power to periodically review the entitlement as and when considered necessary. The provisions on the review of entitlements are not further elaborated upon and none specify what conditions can be reviewed. Also, as the conditions attached to the entitlements are not specified, this remains unclear.

Temporal dimension: Riparian rights, which are integrated with landownership, are perpetual in nature. Other than determining the volume of water seasonally or annually, the perpetual nature of the water rights is left untouched since the laws do not specify the period for which the entitlements are valid.

Dispute resolution: Five of the 10 states address dispute settlement, which is similar in all states and reads:

(1) The Government shall by general or special order issued in this behalf authorise any competent officers for each River Basin Agency as Primary Dispute Resolution Officer, to resolve the disputes regarding the issuance or delivery of water Entitlement under the Act. (2) The Primary Dispute Resolution Officer shall follow such procedure as may be prescribed while hearing the disputes.¹⁸ (3) Any person aggrieved by an order of the Primary Dispute Resolution Officer may, within sixty days from the receipt of such order, prefer an appeal to the Authority: Provided that, the Authority may entertain an appeal after the expiry of the said period of sixty days if it is satisfied that the aggrieved person had sufficient cause for not preferring the appeal within the said period of sixty days. (4) The Authority shall follow such procedure while hearing the appeals as may be prescribed.¹⁹

Compensation: The laws avoid discussing compensation. However, the Arunachal Pradesh Water Resources Regulatory Authority Act, 2006, and the Maharashtra Water Resources Regulatory Authority Act, 2005 state that

Aggregate Bulk Water Entitlements will be considered as Bulk Water Entitlements under the provisions of this Act except that they shall not be a usufructuary right and will only be adjusted by the Authority if there is a compensating change, under the provisions of this Act, to any component Bulk Water Entitlement that comprise part of the Aggregate Bulk Water Entitlement [and] in the event that any Water User Entity wishes to use its category priority to mandate a change in the use or volume of any entitlement, that entity must demonstrate in a public hearing before the Authority, that it has exhausted all attempts to conserve, increase efficiency and manage its demand of water within its entitlement and has exhausted all opportunities to increase its entitlement through a transfer within the voluntary, market-based economy. If, after such a public hearing, the Authority deems such a mandated transfer, on either an annual or permanent basis, to be legal and necessary in the interest of the people of the State, the Authority shall then determine a fair and just compensation as determined by the market value of the water resource, to be paid to the Entitlement holder by the entity exercising the mandated user category preference.

Alienation: Arunachal Pradesh and Maharashtra in their respective acts allow the trading of water entitlements. These states mandate that the authority shall

fix the criteria for trading of water entitlements or quotas on the annual or seasonal basis by a water entitlement holder, ... [e]ntitlements ... are deemed to be usufructuary rights which may be transferred, bartered, brought or sold on annual or seasonal basis within a market system and as regulated and controlled by the Authority as established in the rules of the Authority [and the] [q]uotas of water determined by the seasonal or annual allocation assigned to an entitlement shall be volumetric usufructuary right which may be transferred, bartered, bought or sold on an annual or seasonal basis within a market system as established and controlled by the rules of the Authority.

Furthermore, the permanent transfer of entitlements is subject to approval by the responsible authority. The other six states do not mention water trading or that entitlements are usufructuary rights.

Conclusions

We examined how property rights in water access and allocation instruments are organised in India. The following conclusions are arrived at.

First, India's federal water governance system exhibits plural²⁰ governance elements, attributed to the presence of multiple

often overlapping laws governing state water, leading to incoherence between and within states (Appendix). British common law colonial principles continue to exist empowering landowners with strong rights to water, institutionalised in court cases and the Indian Easements Act, 1882. To increase state control of water, this system is superimposed by irrigation laws in 15 out of 28 states, groundwater laws in 15 states, and more recently water resources regulatory authority laws for integrated governance of surface water and groundwater in 10 states.

Second, these laws avoid addressing the underlying common law water property rights codified in the Indian Easements Act, 1882. The national government wants to abolish (expropriate) these rights, however, none of the 28 states has done so. Instead, the states perpetuate water rights linked to the land through a registration process that solidifies and formalises the historically unequal water use based on landownership.

Third, 10 states have a water resources regulatory authority act that aims to govern water through a full-fledged water use permit system. However, only one regulatory authority is functional (Cullet 2021), and thus, the transition to a state-wide permit system is yet to commence in nine states. Water allocation through permits may change historic rights but would imply quasi-property rights in water, especially where permit holders may trade their entitlements or have a right to compensation when the permit conditions are changed.

Fourth, as most of India's water is over-allocated, reallocating water will be complicated given the aforementioned (quasi-)property rights system. Although this paper is based on legal documents and not on ground truthing, it reveals that there are fundamental flaws in water governance design and climate, and future proofing has not been accounted for.

NOTES

- 1 Except "The Indian Independence Act, 1947 and the Government of India Act, 1935, together with all enactments amending or supplementing the latter act, but not including the Abolition of Privy Council Jurisdiction Act, 1949" (Article 395 of the Constitution of India).
- 2 For example, Article 2 in the Bihar Irrigation Act, 1999 defines irrigation works.
- 3 See Article 2(2), Gujarat Irrigation and Drainage Act, 2013 that defines canal.
- 4 The following 15 states have a groundwater law in place: Assam, Bihar, Chhattisgarh, Goa, Haryana, Himachal Pradesh, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Nagaland, Odisha, Uttar Pradesh, and West Bengal. Andhra Pradesh and Telangana have a water, land, and trees act governing both surface and groundwater water.
- 5 Article 10, Jharkhand State Ground Water Development and Management (Regulation and Control) Act, 2019.
- 6 Article 8, Maharashtra Groundwater (Development and Management) Act, 2009.
- 7 Article 7, West Bengal Ground Water Resources (Management, Control and Regulation) Act, 2005.
- 8 Article 6, Assam Ground Water Control and Regulation Act, 2012; Article 9, Bihar Ground Water (Regulation and Control of Development and Management) Act, 2006; Article 7, Chhattisgarh Ground Water Regulation and Control of Development and Management) Act, 2012.
- 9 Article 10, Andhra Pradesh Water, Land and Trees Act, 2002; Article 10, Telangana Water, Land and Trees Act, 2002.
- 10 Defined as an aggregate of entitlements issued to a group or association of water user entities for joint management of the bulk water entitlements.
- 11 Defined as a volumetric entitlement to a share of the surface water resources produced by a project, river system, or storage facility, for a specific category or categories of use, and deliverable within a specific period of time as specifically provided in the order granting the entitlement.
- 12 Defined as any authorisation by the authority to use the water other than bulk water entitlement or an aggregate bulk water entitlement.
- 13 Defined as an individual or bulk water entitlement to a volumetric quantity of water to be

extracted, from a tube well, borewell or other well or by any other means of extraction of sub-surface water.

- 14 The 14 states that have an irrigation law in place governing surface water resources are: Assam, Bihar, Chhattisgarh, Goa, Gujarat, Haryana, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Punjab, Rajasthan, and West Bengal.
- 15 The 16 states include the 14 states have an irrigation law in place governing surface water resources and Andhra Pradesh and Telangana that have a water, land, and trees act governing both surface water and groundwater.
- 16 A similar provision is present in the Gujarat Irrigation and Drainage Act, 2013.
- 17 Assam, Bihar, Chhattisgarh (bill), Goa, Haryana (bill), Himachal Pradesh, Jharkhand, Karnataka, Kerala, Maharashtra, Odisha (bill), Tamil Nadu (repealed), Uttar Pradesh, and West Bengal.
- 18 Sections (1) and (2) are also provisions in the Jharkhand Water Resources Regulatory Authority Act, 2014, and Andhra Pradesh Water Resources Regulatory Commission Act, 2009.
- 19 Arunachal Pradesh Water Resources Regulatory Authority Act, 2006; Rajasthan Water Resources Regulatory Act, 2012; and Maharashtra Water Resources Regulatory Authority Act, 2005.
- 20 We define legal pluralism as "multiple systems of rules that apply to the same situation (or jurisdiction)" (Bavinck and Gupta 2014: 78).

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Appendix: Laws Included in the Analysis, India

States	Laws Governing Surface Water		Laws Governing Groundwater		Laws Governing Water (Surface Water and Groundwater)
	Surface Water Law in Place	Surface Water Governed in Other Law	Groundwater Law in Place	Groundwater Governed in Other Law	
1 Andhra Pradesh		Andhra Pradesh Water, Land and Trees Act, 2002		Andhra Pradesh Water, Land and Trees Act, 2002	Andhra Pradesh Water Resources Regulatory Commission Act, 2009
2 Arunachal Pradesh					Arunachal Pradesh Water Resources Regulatory Authority Act, 2006
3 Assam		Assam Irrigation Water Users Act, 2004 The Assam Farmers (Group Irrigation) Act, 1978	Assam Ground Water Control and Regulation Act, 2012		
4 Bihar		Bihar Irrigation Act, 1997	Bihar Ground Water (Regulation and Control of Development and Management) Act, 2006		
5 Chhattisgarh		Chhattisgarh Sinchai Prabandhan Me Krishkon Ki Bhagidari Adhiniyam, 2006 (Farmers' Participation in Chhattisgarh Irrigation Management Act, 2006) The Chhattisgarh Regulation of Waters Act, 1949	Chhattisgarh Ground Water (Regulation and Control of Development and Management) Bill, 2012		
6 Goa		Goa, Daman and Diu Irrigation Act, 1973	Goa Ground Water Regulation Act, 2002		
7 Gujarat		Gujarat Irrigation and Drainage Act, 2013 Gujarat Irrigation and Drainage (Amendment) Act, 2019			
8 Haryana		Haryana Canal and Drainage Act, 1974	Haryana Preservation of Subsoil Water Act, 2009 Haryana State Groundwater Management and Regulation Bill, 2013 Haryana State Groundwater Management and Regulation Bill, 2008		Haryana Water Resources (Conservation, Regulation and Management) Authority Act, 2020
9 Himachal Pradesh		Himachal Pradesh Water Supply Act, 1968 The Himachal Pradesh Minor Canals Act, 1976	The Himachal Pradesh Ground Water (Regulation and Control of Development and Management) Act, 2005		Draft Himachal Pradesh Water Regulatory Authority Act, 2011
10 Jharkhand			Jharkhand State Ground Water Development and Management (Regulation and Control) Act, 2019		Jharkhand Water Resources Regulatory Authority Act, 2014
11 Karnataka		Karnataka Irrigation Act, 1965	Karnataka Ground Water (Regulation and Control of Development and Management) Act, 2011		
12 Kerala		The Kerala Irrigation and Water Conservation Act, 2003 Kerala Conservation of Paddy Land and Wetland Act, 2008	The Kerala Ground Water (Control and Regulation) Act, 2002		
13 Madhya Pradesh		Madhya Pradesh Peya Jal Parirakshan Adhiniyam, 1986 Madhya Pradesh Irrigation Act, 1931		Madhya Pradesh Peya Jal Parirakshan Adhiniyam 1986 Andhra Pradesh Water, Land and Trees Act and Rules, 2002	
14 Maharashtra		The Maharashtra Irrigation Act, 1976 Maharashtra Management of Irrigation Systems by the Farmers Act, 2005	Maharashtra Groundwater (Development and Management) Act, 2009		Maharashtra Water Resources Regulatory Authority Act, 2005/2011
15 Manipur					
16 Meghalaya					Meghalaya Integrated Water Resource Management Bill, 2015
17 Mizoram					

(Continued)

Appendix: Laws Included in the Analysis, India (Continued)

States	Laws Governing Surface Water		Laws Governing Groundwater		Laws Governing Water (Surface Water and Groundwater)
	Surface Water Law in Place	Surface Water Governed in Other Law	Groundwater Law in Place	Groundwater Governed in Other Law	
18 Nagaland			The Nagaland Groundwater (Regulation and Control of Development and Management) Bill, 2020 [Not online]		
19 Odisha		The Orissa Irrigation Act, 1959 The Orissa Pani Panchayat Act, 2002	Orissa Ground Water (Regulation, Development and Management) Bill, 2011		
20 Punjab		The Punjab Irrigation and Drainage Authority Act, 1997 The Punjab State Tube Well Act, 1954 Punjab Minor Canals Act, 1905			Punjab Water Resources (Management and Regulation) Act, 2020
21 Rajasthan		The Rajasthan Farmers Participation In Managemnt of Irrigation Systems Act, 2000 The Rajasthan Irrigation and Drainage Act, 1954 The Rajasthan Minor Irrigation Works Act, 1953 The Rajasthan Lands Special Irrigation Charges Act, 1953			Rajasthan Water Resources Regulatory Act, 2012
22 Sikkim					
23 Tamil Nadu		The Tamil Nadu Farmers Management of Irrigation Systems Act, 2000	Tamil Nadu Groundwater (Development and Management) Act, 2003 (Repealed)		
24 Telangana		The Telangana Water, Land and Trees Act, 2002 (Act No 10 of 2002) The Andhra Pradesh Irrigation (Construction and Maintenance of Water Courses) Act, 1965		The Telangana Water, Land and Trees Act, 2002. (Act No 10 of 2002)	
25 Tripura		Tripura Jal Board Act, 2020			
26 Uttar Pradesh		The Uttar Pradesh Participatory Irrigation Management Act, 2009	Uttar Pradesh Ground Water (Management and Regulation) Act, 2019		The Uttar Pradesh Water Management and Regulatory Commission Act, 2008
27 Uttarakhand					The Uttarakhand Water Management and Regulatory Act, 2013
28 West Bengal		Bengal Irrigation Act, 1876 Bengal Canals Act, 1864	The West Bengal Ground Water Resources (Management, Control and Regulation) Act, 2005		

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