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Assessment of Ground Water Law in India and Associated Individual Responsibility towards Environmental Sustainability

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ABSTRACT

Groundwater law in India gives individual landowners immense control over groundwater. This is inappropriate in a context where groundwater is now the primary source of water for the realization of the human right to water. This also fails to provide the basis for effective protection of groundwater at aquifer level. According to a 2016 study, aquifer depletion in agricultural regions could threaten nearly half the world's food sources and deny 1.8 billion people from reliable access to water by 2050. The same study projects that aquifers in India's Upper Ganges basin may be depleted within 25 years. This alarming vulnerability calls for immediate policy action from central and state governments.

This paper will mainly be focusing on three aspects: a) India's existing policies to preserve ground water and use it in the most efficient manner, b) environmental reforms, the Government of India is trying to achieve and c) In addition to this, this article argues that groundwater law must be reconnected to around a new set of principles that recognize the common nature of groundwater, its importance, the need for a governance framework starting at the local level and the need for a stronger aquifer protection regime.

Further this study, would focus upon behavioral management i.e. towards environmental sustainability, an ideal combination of conservation, awareness about moral and social responsibility among the citizens of India through campaigns and innovative technologies that would successfully arrest continued groundwater loss and possibly reverse it.

Keywords: *ground water conservation, environmental principles, regulation of laws, sustainable development goals, behavioral management.*

I. INTRODUCTION

Ground water is the water that seeps through rocks and soil and is stored below the ground.² Water is stored in the rocks known as aquifers. These are composed of sand, gravel, limestone or sandstone. The underground (hydrogeological) setting of ground water defines the potential

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² Roopal Suhag, *Overview of Ground Water in India*, PRS (Nov. 10, 2017, 10:04am) , <http://www.prsindia.org/administrator/uploads/general/1455682937~~Overview%20of%20Ground%20Water%20in%20India.pdf>.

of this resource and its vulnerability to irreversible degradation.³

The following statistics of depletion of India's ground water is beyond depressing. As of April 2015, the water resource potential or annual water availability of the country in terms of natural runoff (flow) in rivers is about 1,869 Billion Cubic Meter (BCM)/year.⁴

However, only 1,123 BCM/year is usable water resources of the country. According to a report in 2012, India uses over a quarter of the global groundwater (230 billion cubic meters), making them the largest user. Out of the 1,123 BCM/year, the share of surface water and ground water is 690 BCM/year and 433 BCM/year respectively.⁵ Setting aside 35 BCM for natural discharge⁶, the net annual ground water availability for the entire country is 398 BCM.⁷

Due to the ever-increasing population, water's national per capita annual availability of water has severely depleted from 1,816 cubic meters in 2001 to 1,544 cubic meters in 2011. This marks an alarming reduction of 15%. Depletion of Groundwater at this rate has highlighted the Green Revolution in India. According to a 2016 report by the Indian parliamentary committee on restructuring the Central Water Commission and the Central Ground Water Board, "the growing dependence on groundwater has taken the form of unsustainable over-extraction, which is lowering the water table and adversely impacting drinking water security."⁸

Groundwater irrigation during rainfall deficit though helps in productivity but is not at all sustainable. According to the central groundwater board, 15 percent of the administrative blocks are overexploited (more water is extracted than is replenished each year) and are growing at a rate of 5.5 percent per annum.⁹ Experts in the World Bank Report claim that if the same practices are allowed to continue, in next twenty years 60% of the nation's aquifers will almost dry up. This is mainly because of the simple reason that India exploits more groundwater than it naturally replenishes. This will lead to affecting more than a quarter of the country's harvest which thus calls for an urgent need to change the status quo.

According to a 2016 study, aquifer depletion in agricultural regions could threaten nearly half

³ *Id.*

⁴ Water and Related Statistics, April 2015, Central Water Commission, <http://www.cwc.gov.in/main/downloads/Water%20&%20Related%20Statistics%202015.pdf>.

⁵ Deep Wells and Prudence: Towards Pragmatic Action for Addressing Ground water Overexploitation in India, The World Bank, March 2010, <http://siteresources.worldbank.org/INDIAEXTN/Resources/295583-1268190137195/DeepWellsGroundWaterMarch2010.pdf>.

⁶ Natural discharge occurs as seepage to water bodies or oceans in coastal areas and as transpiration by plants whose roots extend up to the water table.

⁷ Central Ground Water Board website, FAQs, <http://www.cgwb.gov.in/faq.html>.

⁸ Asit K. Biswas & Kris Hartley, *From Evidence to Policy in India's Groundwater Crisis*, The Diplomat (July 22, 2017, 10:20 am), <https://thediplomat.com/2017/07/from-evidence-to-policy-in-indias-groundwater-crisis/>.

⁹ Agriculture Census Division, Ministry of Agriculture, Government of India. 2006. "Agricultural Census of India Database."

the world's food sources and deny 1.8 billion people reliable access to water by 2050.¹⁰ It also shows that the aquifers located in India's Upper Ganges may well be depleted in next twenty five years. Irrigation practices are mainly dependent on the use of ground water rather than surface water. Statistics show us that Indian irrigation is very much dependent on the use of wells (around 62%) followed by canals (only around 25%). Thus, calls for an urgent and immediate action plan from the central and state governments.

Institutional Framework: The Central Ground Water Board is dependent on the District Collector in each state. The Collector has the powers to implement the suggestions or corrective measures provided by the Central Ground Water Board.¹¹

<i>Institution</i>	<i>Role</i>
Central Water Commission	Initiating and coordinating schemes for the conservation and utilisation of water resources in the country in collaboration with state governments; and monitoring water quality
Central Ground Water Board	Developing and disseminating technology related to sustainable use of ground water; monitoring and implementing policies for the sustainable management of ground water resources; estimating ground water resources
Central Ground Water Authority	Constituted under Section 3(3) of the Environment (Protection) Act, 1986 to regulate and control development and management of ground water resources; can resort to penal actions and issue necessary regulatory directives
Central Pollution Control Board	Implementation of the Water (Prevention and Control of Pollution) Act, 1974 which seeks to restore water quality

Sources: Ministry of Water Resources; Lok Sabha Question 2157, March 10, 2015; PRS.

II. LEGISLATIVE AND POLICY FRAMEWORK

Lack of proper legal framework pertaining to conservation and use of ground water has given an open path to exploitation of these resources, mainly because of the fact that riparian rights govern extraction of ground water. It means that any person, through these rights, possessing a piece of land can extract ground water without any cost. Currently, the Easement Act, 1882

¹⁰ *Supra* note 8.

¹¹ Roopal Suhag, *supra* note 2.

provides every landowner with the right to collect and dispose, within his own limits, all water under the land and on the surface.¹² This makes it difficult to regulate the extraction and usage of ground water. The situation worsens as¹³,

[...] most states provide huge electricity subsidies to the farming sector. In large agricultural states such as Punjab and Tamil Nadu, farmers get free electricity. In other states, electricity is not metered but provided at a flat rate based on horse power of the pumps used for groundwater extraction. The central governments assured minimum support pricing policy distorts the prices of food grains such as wheat, and more importantly, paddy incentivizing growing paddy in areas not conducive for it. These factors compound the depletion problem. (Original quotation)

Framing of rules and regulations regarding ground water extraction and use falls under the head of the State list of the Indian Constitution. This means that the responsibility of making laws falls on the shoulders of the state governments while a broader set of guidelines or a broad structure is provided by the central government to them. The central government in 2011 came up with the Model Bill for Ground Water Management, based on this model the state governments were asked to make and implement laws. In addition, it outlined a National Water Policy in 2012 articulating key principles relating to demand management, usage efficiencies, infrastructure and pricing aspects of water.¹⁴ Further, the central government enacted a National Water Framework Bill in 2013.

Among the doctrine's implications in India, as interpreted by the Supreme Court, are that the state cannot abdicate responsibility over natural resources even in the absence of enacted legislation. Further, the laws of nature and the ecosystem must inform all social institutions, which should for instance mean that the hydrological cycle should guide regulation of common water sources.¹⁵ Originally, this doctrine laid down that the state has the pre-existing rights over flowing (surface) water, and the scope of its application and whether it could be upheld in regards to groundwater was previously considered limited.

The Supreme Court has however mentioned in passing that '[d]eep underground water belongs to the state in the sense that doctrine of public trust extends thereto.'¹⁶ The consequence is that the state and its institutions are accountable to the public for groundwater protection, a fact that

¹² Section 7 (g), Indian Easement Act, 1882.

¹³ *Sheetal Sekhri*, Sustaining Groundwater: Role of Policy Reforms in Promoting Conservation in India, NCAER, http://www.ncaer.org/uploads/photo-gallery/files/1420793448ipf-vol_9.pdf#page=174.

¹⁴ Roopal Suhag, *supra* note 1.

¹⁵ *M.C. Mehta v. Kamal Nath*, (1997) 1 S.C.C. 388.

¹⁶ *State of West Bengal v. Kerosam Industries* (2004) 10 SCC 201.

has served as the underpinning of the recent legislative paradigm shift.¹⁷

In *Hindustan Coca-Cola Beverages (P) Ltd. vs. Perumatty Grama Panchayat*,¹⁸ the Coca-Cola Company received a license from the Plachimada panchayat in Palakkad district of Kerala to use the groundwater for the necessary production. However, later, Coca-Cola was asked to shut the plant by the panchayat. The plant caused deterioration of the water quality and lowering of the water table. Unhappy by this the company challenged the order of the Panchayat before the Kerala High Court. The authority of the panchayat to regulate the use of ground water by private individuals and the right of a landowner to extract ground water are in conflict. The High Court after carefully observing the facts and rule of the case ruled in favor of the panchayat. The Court opined that even if the regulations relating to ground water were not in place, the Government still has the responsibility to protect the ground water from exploitation under the principle of Public Trust Doctrine. Also, if the excessive exploitation is not regulated it can lead to harmful effects on environment. Not convinced by the judgment the Company approached the two Judge Bench of the High Court on appeal. It observed that as there is no law in place to prohibit groundwater extraction the order issued by the Panchayat stands invalid. The case is pending before the Supreme Court.

Key Questions for legal regulation of groundwater:¹⁹

[...]The legal framework for groundwater management should provide answers to key questions such as who can access groundwater, where, for which purposes and under which conditions? How are aquifers protected against depletion and pollution? According to which criteria are the finite resources of non-recharging aquifers to be allocated and protected? What kind of monitoring and planning tools have to be used? How will private and public interest be balanced and how are stakeholders to be involved in decision-making and management processes? (Original quotation)

The Centre Government has sought to rectify the absence of a comprehensive, federal law to formally regulate India's groundwater resources by way of introducing Model Groundwater Bills. The Model Bills and National Water Policy address the governance of ground water under the public trust doctrine.²⁰ The concept of public trust doctrine ensures that resources meant for public use cannot be converted into private ownership.²¹ Government being the trustee has the

¹⁷ Water Governance Facility (2013) Groundwater Governance in India: Stumbling Blocks for Law and Compliance. WGF Report No. 3, SIWI, Stockholm.

¹⁸ 2005 (2) KLT 554.

¹⁹ *Supra* Note 18.

²⁰ *Id.*

²¹ Statement of Objectives and Reasons, Draft Model Bill for the Conservation, Protection and Regulation of

responsibility to protect and preserve this natural resource for and on behalf of the beneficiaries, that is, the people.²²

The government has to ensure that they provide ‘the people’ with clean and drinkable water as it is now a fundamental right under Article 21 of the Indian Constitution. The bills and the policy also enshrine the principle of sustainable development. The overall goal of sustainable development (SD) is the long-term stability of the economy and environment; this is only achievable through the integration and acknowledgement of economic, environmental, and social concerns throughout the decision-making process.²³

State governments, by adopting the models and policy, have introduced regulations that will help in reversing these trends of rapidly decreasing ground water. One of the most common and mandatory policy that has been adopted by the states is the installation of rainwater harvesting on the roofs of buildings. In 2001, Delhi was the first state to implement this regulation. Other States that later implanted the same include Madhya Pradesh, West Bengal, Andhra Pradesh, Kerala, Bihar, Tamil Nadu and Rajasthan.

The new Model Bill introduced a large number of progressive approaches including that groundwater is a common heritage of the people and that the state at all levels is its public trustee. It contains objectives and principles that go beyond regulation of groundwater, such as laying down everyone’s right to water. The Bill, against prioritizing groundwater for drinking (domestic) purposes provides for groundwater protection zones and security plans. This is to promote aquifer recharge and protect against quality deterioration. The Draft Model Building Bye-laws of 2015 mandates construction of rain water harvesting system in buildings having a plot size of 100 sq. m or more.²⁴

The National Ministry of Water Resources’ Water Policy aims to govern the planning and development of the country’s water resources and their optimum utilization. The first such Policy was adopted in 1987 with subsequent reviews and updated versions adopted in 2002 and in 2012. Not until the 2012 version has it been explicit on groundwater. The National Water Policy suggests the need for pricing of water beyond basic needs. Establishment of Water Regulatory Authority (WRA) in every state will regulate the same by introducing policies

Groundwater, 2011, http://www.planningcommission.nic.in/aboutus/committee/wrgrp12/wr/wg_model_bill.pdf

²² Water Rights and Principles of Water Resource Management, Chhatrapati Singh, N.M. Tripathi, 1991.

²³ The Concept of Sustainable Development: Definition and Defining Principles Rachel Emas, Florida International University Brief for GSDR 2015 https://sustainabledevelopment.un.org/content/documents/5839GSDR%202015_SD_concept_definiton_rev.pdf

²⁴ Lok Sabha Unsattred Question No. 716, Ministry of Water Resource, River Development and Ganga Rejuvenation, answered on December 3, 2015, <http://164.100.47.192/Loksabha/Questions/QResult15.aspx?qref=24795&lno=16>

relating to fair pricing for different uses.

World Bank support for the better delivery of irrigation water ranges from projects covering large irrigation infrastructure to local tanks and ponds. Projects also support the strengthening of water institutions in several states (Andhra Pradesh, Karnataka, Maharashtra, Rajasthan, Tamil Nadu, Uttar Pradesh) improved groundwater management practices (for instance, in the upcoming Rajasthan Agriculture Competitiveness Project).²⁵ Sustainable agricultural practices through watershed and rainfed agriculture development (Karnataka, Himachal Pradesh, Uttarakhand), soil reclamation efforts (Uttar Pradesh) and, more recently, improved groundwater management practices (for instance, in the upcoming Rajasthan Agriculture Competitiveness Project).²⁶

The limited legislative power in the field does not mean that the Centre lacks mandate to formally regulate groundwater issues. In 1997, the Supreme Court ruled that the Centre Government was empowered to constitute an authority that, in turn, would be empowered to regulate and control groundwater management and development to ensure its long-term sustainability.²⁷ Following the Court order, the Central Ground Water Board (CGWB, set up in 1970) was constituted as an Authority (CGWA). The combined CGWB/CGWA institution is organized as a subordinate office of the Ministry of Water Resources.²⁸

However, the lack of proper guidelines and legally enforceable mechanisms makes implementation ineffective. Following are few examples of the implementation of the statute relating to construction of Rain Water Harvesting system. Till 2016, 30 states and UTs have made construction of rain water harvesting system mandatory. Incentives to pump less water such as levying electricity charges or community monitoring of use have not yet succeeded beyond sporadic initiatives.²⁹

State	Year Passed	Description
Delhi	2001	RWH mandatory for all new buildings with more than 100 sq m roof area and all newly developed plots of land larger than 1,000 sq. m. Also, mandated RWH by March 31,

²⁵ <http://www.worldbank.org/en/news/feature/2012/05/17/india-agriculture-issues-priorities>

²⁶ *Id.*

²⁷ *M.C. Mehta v. Union of India*, 1997, applying Article 253 of the Constitution together with the Environment (Protection) Act, 1986

²⁸ Water Governance Facility (2013) Groundwater Governance in India: Stumbling Blocks for Law and Compliance. WGF Report No. 3, SIWI, Stockholm

²⁹ <http://www.worldbank.org/en/news/feature/2012/05/17/india-agriculture-issues-priorities>

		2002 for all institutions and residential colonies in notified areas (south and southwest Delhi, and adjoining areas) and all buildings in notified areas that have tube wells.
Andhra Pradesh	2002	Andhra Pradesh Water, Land and Tree Act, 2002 stipulates mandatory provision to construct RWH structures at new and existing constructions for all residential, commercial and other premises and open space having area of not less than 200 sq m in the stipulated period, failing which the authority construct such RWH structures and recover the cost incurred along a prescribed penalty.
Tamil Nadu	2003	Vide Ordinance No. 4 of 2003 dated July 2003 mandates RWH facilities for all existing and new buildings. Like Andhra Pradesh, the state may construct RWH facilities and recover the cost incurred by means of property taxes
Kerala	2004	Roof top RWH is mandatory for all new buildings as per Kerala Municipality Building (Amendment) Rules, 2004
Madhya Pradesh	2006	The State Govt. vide Gazette notification dated 26.8.2006, has made roof top RWH mandatory for all buildings with plot size larger than 140 sq. m. Also there is a 6 percent rebate in property tax to individuals for the year in which the individual installs roof top RWH structures

Rajasthan	2006	Roof Top RWH is mandatory in state-owned buildings and all buildings with plots larger than 500 sq m in urban areas.
Bihar	2007	The Bihar Groundwater Act, enacted in 2007, mandates provision of RWH structures for buildings with plots larger than 1000 sq. m.
West Bengal	2007	Vide Rule 171 of the West Bengal Municipal (Building) Rules, 2007, mandates installation of RWH system on new and existing buildings

Source: <http://www.rainwaterharvesting.org/Policy/Legislation.htm#> State profiles at http://cgwb.gov.in/gw_profiles/st_ap.htm

<http://www.cseindia.org/content/legislation-rainwater-harvesting>.

III. GROUNDWATER GOVERNANCE

Groundwater Governance - A Global Framework for Action is a joint project supported by the Global Environment Facility (GEF) and implemented by the Food and Agriculture Organization of the United Nations (FAO), jointly with UNESCO's International Hydrological Programme (UNESCO-IHP), the International Association of Hydrologists (IAH) and the World Bank.³⁰

The project aims to:

- (i) raise awareness of the paramount importance of sustainable groundwater resources management in averting the impending water crisis; and
- (ii) influence political decision making for better stewardship of groundwater resources.³¹

For the World Bank (1991), governance is, simply put, “the exercise of political authority and the use of institutional resources to manage society's problems and affairs.” However, Saunier and Megnack provide us with a more direct definition of governance in *Dictionary and Introduction to Global Environmental Governance* (2007). It states that:³²

³⁰http://www.groundwatergovernance.org/fileadmin/user_upload/groundwatergovernance/docs/Thematic_papers/GWG_Thematic5_8June2012.pdf

³¹ *Id.*

³² *Id.*

[...] Groundwater governance is the process by which groundwater is managed through the application of responsibility, participation, information availability, transparency, custom, and rule of law. It is the art of coordinating administrative actions and decision making between and among different jurisdictional levels - one of which may be global.

Saunier and Megnack add further, "Governance is the sum of the many ways individuals and institutions, public and private, manage their common affairs." It is common knowledge that it is through domestic and international laws that public policy is designed, implemented and achieved. It is on the international conventions and treaties that domestic laws are framed.

Earlier, few decades back, the government relied upon plan and control approach which was engineering centered. In many countries, groundwater management decisions are made and interventions planned in (partly decentralized) governmental entities such as ministries and departments dealing with water resources, agriculture, mining, rural development and, increasingly, departments on urban development and spatial planning and the environment.³³ They are helped by research institutes by providing them with data and expert knowledge in order to stay informed.

This approach focuses on the protection of aquifers against depletion, monitoring of groundwater quantity and quality. Resulting from the notion of the importance of environmental sustainability, some forward-thinking groundwater resources managers have begun to include the management of groundwater-dependent ecosystems as part of their management activities.³⁴ Aquifer protection policies like those operationalized through the Groundwater Directive of the European Union Water Framework Directive oblige the member states to take measures to avoid aquifers being contaminated by land use activities.³⁵

The main criticism of the classical approach is that it works on a number of presumptions. First, it assumes the ability to identify and quantify the nature of interactions and to clearly define the boundaries of systems. Second, it presumes that the social institutions have the capacity to successfully implement and regulate the provisions in a planned and integrated fashion.

Many historical and more recent examples exist where bottom-up approaches towards water management have been working well. Most of these approaches have been in the field of surface water irrigation but groundwater examples exist as well. Some of the historical case studies

³³ *Id.*

³⁴ *Id.*

³⁵ *Id.*

described in section 7 and the ancient remnants of rather complicated water infrastructure like qanat systems in former Mesopotamia or related to ancient Indian cultures in South America indicate that complicated systems of more formal or informal (ground)water management must have been existent throughout human civilization. Extensive work by the Ostrom⁰ school managed to distill various factors that foster or limit such approaches like the level of salience, homogeneity of users groups and the existence of effective conflict resolution mechanisms.

The UNDP Water Governance Facility at SIWI (WGF) provides strategic water governance support to developing countries to advance socially equitable, environmentally sustainable and economically efficient management of water resources and water and sanitation services to improve the livelihood of poor people.³⁶ The UNDP's concept of water governance is defined by the political, social, economic and administrative systems that are in place and which directly or indirectly affect the use, development and management of water resources and the delivery of water services at different levels of society.³⁷ Importantly, the water sector is also affected by decisions and development outside of the water sector.

Applied to groundwater resources, this concept addresses the following aspects:

1. Principles such as equity and efficiency in water resource and services allocation and distribution, the need for integrated water management approaches and the need to balance water use between socio-economic activities and ecosystems;
2. The formulation, establishment and implementation of water policies, legislation, institutions and water administration based on aquifer conditions and hydrogeological characteristics rather than administrative boundaries;
3. Clarification of the roles of government, civil society and the private sector and their responsibilities regarding property rights, management and administration of water resources and services.³⁸

The legal framework for groundwater in India is presently restricted by two main elements. First, it is one of the few systems in the world where groundwater rights are not formally vested in the state (in the meaning of the government and its authorities).³⁹ Second, the competence to legislate on water related issues is left with the individual States rather than the Centre (the federal Government). Though not for the first time, the Centre is now attempting to pull the

³⁶ Water Governance Facility (2013) Groundwater Governance in India: Stumbling Blocks for Law and Compliance. WGF Report No. 3, SIWI, Stockholm.

³⁷ *Id.*

³⁸ Adapted from UNDP's Water Governance Facility, www.watergovernance.org/whatiswatergovernance

³⁹ Texas, USA, and Pakistan are other jurisdictions where the 'rule of capture' allows landowners to extract groundwater from under their lands, even if the water is drained from beneath the land of others.

numerous State legislators in one direction towards a uniform understanding and approach to the various governance components that are deemed necessary.

The fundamental change in principles, approach and strategies of water management that is proposed is motivated by insights into how India is facing a major water crisis. Against increasing uncertainties and unpredictability that climate change brings, groundwater recharge also needs to be managed and aquifers viewed more from a strategic storage point of view.⁴⁰

IV. ALTERNATIVE WATER POLICY FOR INDIA: WILL OF THE PEOPLE TOWARDS SUSTAINABLE DEVELOPMENT

The first right to groundwater should be to the concerned community and not to an individual on land-ownership basis. In areas with scarcity of water, the respective community organizations should have the right to inspect and monitor the use of groundwater by private landowners to ensure that groundwater beyond permissible limits is not being withdrawn. Diversion of groundwater to urban areas or for industrial use without consent of the gram sabha/village community should also not be permitted. In canal-irrigated areas, groundwater planning should be integrated with the water supplied through the canal system so as to avoid water-logging and also utilize public or private funds of the community and local management talent.

Development of groundwater resources should be so regulated as not to exceed the recharging possibilities, as also to ensure social equity. The detrimental environmental consequences of over-exploitation of groundwater need to be effectively prevented by legislation and its enforcement by local government bodies, RWAs and gram sabhas, who will have to play a vital role in this.

To give teeth to their actions the Central and State governments should enact suitable legislation and notify the permissible water depths to which ground water depletion will be permitted for each region/ block/ gram sabha/ watershed after identifying the special problems of each area. Groundwater recharge projects should be developed and implemented with community participation for augmenting the available supplies. There should be a reassessment of groundwater quantity and quality every 5 years.

The Government should transfer the authority for regulating groundwater use to the lowest level, the Gram Sabha. In this case the Government should have the responsibility of laying down the rules and regulations and then monitoring the implementation. In case of default the

⁴⁰ <http://mowr.gov.in/writereaddata/linkimages/MissionDocument8395131900.pdf>

Gram Sabha should be penalized and would in turn would be authorized to collect it from individuals or groups as necessary.

In order to discourage excessive use of ground water, the electricity and diesel should be supplied at the market rate and should not be subsidized. However, it should be ensured that the electricity is supplied for 12-16 hours per day without interruption. This would also encourage use of other means of energy. In case subsidies are to be given to the marginal and poor farmers, these should be designed and targeted in such a way that the subsidies reach only the targeted beneficiaries and not the better-off farmers. Over-exploitation of groundwater should be avoided near the coast to prevent ingress of sea water and also from excessive saline layers of aquifers.

V. CONCLUSION

If natural resources of any kind are to be developed in a sustainable manner and its equitable distribution ensured, then the nature of rights on it need to be defined and enforced. It is important to determine whether rights on groundwater are individual or group rights, positive or negative rights, private or public rights, usufructory or riparian rights and so on. Ground water is people's water and is loosely regulated.

Constitutionally, water is a state subject, and despite the Union government's intentions to bring about a pan-India ground water law, most state governments exercise little control over this common pool resource. I believe the lack of regulation has created both a crisis and an opportunity.

India draws more groundwater per annum than the US and China combined. This crisis comes from unsustainable over-extraction, perversely incentivized by agricultural subsidies and energy mismatches. That is a story familiar and oft repeated. Reformed legislation must be coupled with improved institutional arrangements and strengthened capacity for implementation and enforcement.

Approximately 30 million, mostly private wells in the country offer an opportunity to use ground water wisely, without the financial and ecological issues that come with both small and large-scale surface water transfers. Groundwater supplies around 70% of all our water needs across agriculture, industry and domestic water. Ironically, most public investments have been made in surface water – dams and canals for irrigation, pipelines for water to industry and to cities.

Enough data suggests this approach yields diminishing returns. Unfortunately, people abstract

ground water as if it were an infinite resource, because it is invisible. Public funds can enable rural communities to use good science to understand aquifers, and build their capacity to manage those aquifers as renewable resources and not as inexhaustible taps. Let's activate these public funds.

Law and its processes have to be understood as resources for such regulation. It is an effective resource because it can lay down certain equitable standards for the use of the resource and it also has the potential through sanctioning mechanisms to check deviance. However, at this juncture it can be said that a case for legal regulation has at least to be considered.

Improved understanding of hydrogeology is supposed to lead to a stage where the norm system is fundamentally altered and the perception of groundwater as a shared, common property penetrates actions and decision-making at all levels. There is, however, little experience from such a new order.

In order not to let the prevailing culture of non-compliance stand in the way of law as an enforceable instrument, it would seem necessary to reform both law and the conditions surrounding the very implementation process. Only when the need for reform is internalized and translate into altered conduct at the top can law become a viable tool for change towards a society that takes its groundwater resources seriously.
