

GROUNDWATER GOVERNANCE IN INDIA: A STUDY OF SOCIO-LEGAL ISSUES

Thesis Submitted for the Award of the Degree of

DOCTOR OF PHILOSOPHY

in

Law

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I, **Jasleen Kaur Sidhu Registration no 41800919**, hereby declare that this report entitled “**Groundwater Governance in India: A Study of Socio-Legal Issues**” is my original work, produced solely by me. Any ideas, concepts, data, or text derived from the work of others have been appropriately cited and referenced. Any assistance received in the preparation of this report has been duly acknowledged. This report has not been submitted for any other degree or qualification at any other university or institution. I understand that any act of academic dishonesty, including plagiarism, may result in disciplinary action.

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This is to certify that the work reported in the Ph.D. thesis entitled “**Groundwater Governance in India: A Study of Socio-Legal Issues**” submitted in the fulfilment of the requirement for the award of degree of **Doctor of Philosophy (Ph.D.)** in School of Law, is a research work carried out by **Jasleen Kaur Sidhu, Registration no 41800919** is a bonafide record of her work carried out under my supervision and that no part of the thesis has been submitted for any other degree, diploma of equivalent course .

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ABBREVIATIONS

| | |
|--------|--|
| A.D. | - Anno Domini |
| AIR | - All India Reporter |
| All | - Allahabad |
| Art. | - Article |
| ASP | - Activated Sludge Process |
| B.C. | - Before Christ |
| Bom | - Bombay |
| Cal | - Calcutta |
| CE | - Common Era/Christ Era |
| CEA | - Central Electricity Authority |
| CETP | - Common Effluent Treatment Plant |
| CGWB | - Central Ground Water Board |
| CPHEEO | - Central Public Health and Environmental Engineering Organisation |
| CRF | - Calamity Relief Fund |
| CSD | - Commission on Sustainable Development |
| CWC | - Central Water Commission |
| DIP | - District Irrigation Plan |
| DPCC | - Delhi Pollution Control Committee |
| DRC | - Dispute Resolution Committee |
| DSS | - Decision Support System |
| DVC | - Damodar Valley Corporation |
| e.g. | - <i>exempli gratia</i> , for example |
| ed. | - edition |
| EPW | - Economic and Political Weekly |
| etc. | - <i>et cetera</i> , and other things/and so on |
| EWS | - Early Warning System |
| GPIs | - Grossly Polluted Industries |
| GWP | - Global Water Partnership |
| GWPO | - Global Water Partnership Organisation |
| ICESER | - International Covenant on Economic Social and Cultural Rights |
| IELRC | - International Environmental Law Research Centre |
| ILR | - Indian Law Reports |

| | |
|--------|--|
| IMD | - Indian Meteorological Department |
| IPC | - Indian Penal Code |
| IWMP | - Integrated Watershed Development Programme |
| IWRM | - Integrated Water Resources Management |
| JCWR | - Joint Committee on Water Resources |
| Kar | - Karnataka |
| Ker | - Kerala |
| Ltd. | - Limited |
| M. ha | - Million Hectare |
| Mad | - Madras |
| MDG | - Millennium Development Goals |
| MLD | - Million Litres Per Day |
| MW | - Mega Watts |
| MWRRRA | - Maharashtra Water Resources Regulatory Authority |
| NBA | - National Biodiversity Authority |
| NCIWRD | - National Commission for Integrated Water Resource Development |
| NHPC | - National Hydroelectric Power Corporation |
| NMC | - Nagpur Municipal Corporation |
| NPP | - National Perspective Plan |
| NRDWP | - National Rural Development Water Programme |
| NRLP | - National River Linking Project |
| NWC | - National Water Commission |
| NWDA | - National Water Development Agency |
| NWDP | - National Watershed Development Programme |
| NWIS | - National Water Informatics Centre |
| ODF | - Open Defecation Free |
| p. | - Page |
| Pat. | - Patna |
| PIM | - Participatory Irrigation Management |
| PMGY | - Pradhan Mantri Gramodaya Yojana |
| PMKSY | - Pradhan Mantri Krishi Sinchayee Yojana |
| Prof. | - Professor |
| PSIRU | - Public Services International Research Unit |
| Pvt. | - Private |
| Raj. | - Rajasthan |

| | |
|--------|--|
| SBC | - Sequential Batch Reactor |
| SBM | - Swachh Bharat Mission |
| SC | - Supreme Court |
| SCALE | - Supreme Court Almanac |
| SCC | - Supreme Court Cases |
| Sec. | - Section |
| SIA | - Social Impact Assessment |
| SIP | - State Irrigation Plan |
| Smt. | - Shrimati (a word in Hindi Language means Mrs.) |
| STP | - Sewage Treatment Plants |
| Supp | - Supplement |
| Supra | - Latin, for above |
| SYL | - Sutlej-Yamuna Linkage |
| TAC | - Technical Advisory Committee |
| TAMP | - Tariff Authority for Major Ports |
| TNI | - Transnational Institute |
| TSC | - Total Sanitation Campaign |
| TSS | - Total Suspended Solids |
| U.P. | - Uttar Pradesh |
| UNDP | - United Nations Development Programme |
| UNEP | - United Nations Environment Programme |
| UNESCO | - United Nations Educational, Scientific and Cultural Organisation |
| UPWMRC | - Uttar Pradesh Water Management and Regulatory Commission |
| v. | - Versus, against |
| Vol. | - Volume |
| w.e.f. | - With effect from |
| W.P. | - Writ Petition |
| WHO | - World Health Organisation |
| WUA | - Water Users Association |

CHAPTER-1

INTRODUCTION AND HISTORICAL BACKGROUND OF GROUNDWATER GOVERNANCE

Water plays a crucial role in the creation of everything we produce. While it is a renewable resource, only a finite amount of it is available. Its need, demand, and competition continue to expand with the increase in population. The potential water scarcity due to population growth and its consequences are a cause of serious concern for sustainable development. The widening gap between demand and availability, mainly arising from ill-designed policies, 'vote-bank' politics, institutional fragmentation, unenforceable legal framework, low accountability, and so on, is generally considered a governance problem. The third United Nations World Water Development Report¹ has warned about the vastly severe consequences of the current unsustainable and inequitable water use.

Integrated water resources management (IWRM) is a process comprising the promotion of coordinated development and management of land, water, and other related resources to maximize the consequential economic and social welfare equitably without compromising the sustainability of vital ecosystems². Water governance to achieve IWRM encompasses the existing social, political, administrative, and economic systems that affect the utilization, management, and development of groundwater resources and water services delivery at society's various levels. Sound scientific regulations are necessary to counsel the behaviour regarding the use and misuse of water to reduce the pressure on available groundwater resources.

1.1 Land and Water Resources in India

India is a land rich in diverse natural resources, including surface water resources. Out of the total annual precipitation of around 4000 km³, surface water, and replenishable groundwater availability have been estimated as 1869 km³ (Table 1)³. However, only about 1123 km³ (690 km³ from surface water and 433 km³ from groundwater) can be

¹ The United Nations World Water Development Report Available at <https://en.unesco.org/themes/water-security/wwap/wwdr/2020> (Last visited on 2.2.2021)

² Technical Advisory Committee of Global Water Partnership, *Integrated Water Resources Management* 9 (GWP, Stockholm, 2000)

³ Central Water Commission, Govt. of India, "Annual Report 2023-24", (Ministry of Jal Shakti, 2024).

used properly due to numerous topographic constraints and uneven and unequal spatio-temporal distribution of water. Thus, its regulation and management play a significant role in the country's development. As the population of India is estimated to increase to 1.5 billion by the year 2030 and 1.59 billion by 2040, the total available water resources will not be sufficient to meet the overall water requirements due to the increasing domestic, industrial, and agricultural sectors of the economy. Water availability per person per year was reduced from 5178 m³/person/year in 1951 to 1820 m³/person/year in 2001 and 1441 m³/person/year in 2015. If this trend continues, India will become a "Water Stressed"⁴ state, as the supply level will decrease to 1306 m³/person/year by 2031 and 1174 m³/person/year by the year 2050. We are racing from a water-stressed to a water-scarce country. The increase in pollution will further worsen the situation as it will restrict the availability of utilizable water.

Table 1.1: India's Water Resources

| Item | Volume |
|---|---------------|
| Geographical area | 329 M. ha. |
| Total cultivable land (2019-20) | 183 M. ha. |
| Gross sown area (2021-22) | 219.16 M. ha. |
| Net sown area (2021-22) | 141.01 M. ha. |
| Major river basins (catchment area > 20,000 sq. km) | 12 |
| Medium River Basins (catchment area < 20,000 sq. km.) | 46 |
| Average annual Precipitation | 4000 BCM |
| Avg. precipitation during Monsoon (Jun-Sept) | 3000 BCM |
| Natural Runoff | 1986.5 BCM |
| Estimated utilizable surface water resources | 690 BCM |
| Total utilizable groundwater resources | 433 BCM |
| Total annual utilizable water resources | 1123 BCM |
| Ultimate irrigation potential | 140 M. ha. |
| Net irrigated area (2021-22) | 77.92 M. ha. |
| Gross irrigated area (2021-22) | 120.38 M. ha. |
| Number of Groundwater Structures (as per 6 th MI Census) | |
| i. Dug Wells | 82,78,425 |
| ii. Shallow Tubewells | 55,85,839 |
| iii. Medium Tubewells | 43,18,275 |
| iv. Deep Tubewells | 37,50,260 |
| v. Total | 2,19,32,799 |
| Total food grain production during 2022-23 | 329.69 MT |
| Source: compiled by the author from Agricultural Statistics at a Glance 2023 and Annual Report of CWC | |

⁴ Annual per-capita water availability of less than 1700 cubic meter is considered as 'water stressed' condition whereas annual per-capita water availability below 1000 cubic meters is considered as 'water scarce'(Ministry of Jal Shakti, Govt. of India Press release available at <https://pib.gov.in/PressReleaseIframePage.aspx?PRID=2002726> (visited on 1 March,2025) .

Out of a cultivable area of about 183 million ha., the country's net sown area is 139.90 million ha, with a cropping intensity of about 151 percent. However, only 75.46 million ha is irrigated by both surface and groundwater. As per the 6th Minor Irrigation Census, 2,19,32,799 groundwater structures throughout the country extract about 241.34 billion cubic meters (BCM) of Groundwater for domestic, agricultural, and industrial use annually (Table 1.2). However, only about 73 percent of GW assessment units have been categorized as "safe" (having groundwater extraction of less than 70 percent of their annual recharge) as per the 'Dynamic GW Resources of India' report published by the Central Groundwater Board for 2024. Out of the remaining, about 11 percent are 'overexploited,' i.e., having GW extraction of more than 100 percent of their annual recharge, and thus, they are facing a declining GW level situation.

Table 1.2: Groundwater Scenario in India (2004-20024)

| S. No. | Year | 2004 | 2011 | 2017 | 2024 |
|---|---|--------------------------------|---------------|---------------|------------------|
| 1 | Net Annual Groundwater Availability (BCM) | 399 | 398 | 392.7 | 406.19 |
| 2 | Annual Groundwater Draft for Irrigation, Domestic and Industrial Uses (BCM) | 231 | 245 | 248.69 | 245.64 |
| 3 | Categorization of Units | | | | |
| | (a) Safe (<70%) | 4078 (71%) | 4530 (69%) | 4310 (63%) | 4951 (73.39%) |
| | (b) Semi-Critical (70%-90%) | 550 (10%) | 697 (11%) | 972 (14%) | 711 (10.54%) |
| | (c) Critical (90%-100%) | 226 (4%) | 217 (3%) | 313 (5%) | 206 (3.05%) |
| | (d) Over-Exploited (>100%) | 839 (15%) | 1071 (16%) | 1186 (17%) | 751 (11.13%) |
| | (e) Saline | 30 (1%) | 92 (1%) | 100 (1%) | 127 (1.88%) |
| | 4 | Total number of units assessed | 5723 | 6607 | 6881 |
| 5 | Stage of Groundwater Development (%) | 58 | 62 | 63.33 | 60.47 |
| Source: Dynamic Groundwater Resources of India, CGWB, various issues. | | | | | |

1.2 Groundwater Governance

The intensive exploitation of groundwater started in various semi-arid areas of the world in the second half of the twentieth century, mainly due to developments in well drilling and pumping technology, coupled with subsidies for well construction and operation i.e. power. It created the need for good governance to ensure the sustainable use of GW resources and a wide range of activities to support its management. The

concept of GW governance was introduced in the late 2000s, shortly after that of water governance. Foster et al. (2009) defined it as '*the exercise of appropriate Authority and promotion of responsible collective action to ensure sustainable and efficient utilization of groundwater resources for the benefit of humankind and dependent ecosystems.*'⁵ The concept of governance is evolving with time and is now being differentiated from groundwater management. While management is a specific day-to-day function to ensure optimal and efficient groundwater use, governance is the decision regarding which management functions to perform, when, for what purpose, and by whom. So, to differentiate groundwater governance from management, Villholth K.G. et al. (2018) have defined Groundwater governance as '*the framework encompassing the processes, interactions, and institutions, in which actors (i.e., Government, private sector, civil society, academia, etc.) participate and decide on management of Groundwater within and across multiple geographic (i.e., sub-national, national, transboundary, and global) and institutional/sectoral levels, as applicable.*'⁶ Various remedial measures applied in different countries for improving groundwater governance are given in Table 2. Legal frameworks are one of the most popular components of improving groundwater governance at the national level.

India faces serious water resource regulation challenges, which thwart its efforts for socio-economic development and economic growth. These have put recent achievements in improving drinking water access in great jeopardy. The demand for goods, food, water, and energy is the driver that affects the hydrological cycle and puts the natural ecosystem under stress. The green revolution in the country and the resultant food security achieved in the mid-60s was effective governance and essentially an outcome of increased groundwater use pumped by subsidized or free electricity (Mukherji et al., 2012). Today, groundwater use for agriculture in the country, with almost 21.9 million groundwater structures⁷, is the world's highest. Continuously increasing depletion of the water table and the resultant water shortage threaten food production and livelihoods in rural areas.

⁵ Foster, S., Héctor Garduño, Albert, et. al., *Groundwater Governance: conceptual framework for assessment of provisions and needs* 3 (GW•MATE Strategic Overview Series, World Bank, Washington D.C.,2009)

⁶ Villholth K.G. and K.I. Conti, "Groundwater governance: rationale, current state and heuristic framework" in Villholth K.G. and K.I. Conti, et. al. (eds.), *Advances in Groundwater Governance* 14 (CRC Press, Schiphol Weg, Leiden, 2018)

⁷ Mukherji, A, Facon, T, et. al., "Growing more food with less water: how can revitalizing Asia's irrigation help?" accessed at <https://www.ircwash.org/biblio/author/16082> on 21/2019.

About half of the irrigated area in the country is receiving groundwater-based irrigation, usually characterized by inefficient practices. The risks tied to a continued race to the bottom are potentially devastating, with freshwater scarcity encouraging migration from villages to cities, already suffering from poor water supply and sanitation services⁸. Many urban dwellers face enormous problems relating to the inadequacy of public service deliveries and unreliable infrastructure, forcing people to fend for themselves. About 85 percent of domestic users in rural areas⁹ and about 50 percent of urban dwellers rely on self-supply and Groundwater.

Table 1.3: Options and opportunities for improving groundwater governance¹⁰

| Component | Common or occasional deficiencies |
|----------------------------------|--|
| Actors | <ul style="list-style-type: none"> • Enhancing political commitment • Creating and developing leadership • Institutional reforms • Involvement of the private sector • Involvement of local stakeholders • Improving cooperation through accountability and transparency • Capacity building • Funding and financing • The role of international organizations and partnerships |
| Legal frameworks | <ul style="list-style-type: none"> • Legal reforms • Bringing groundwater resources under public control • Legally enforceable regulations • Legal instruments for transboundary aquifers |
| Policies and planning | <ul style="list-style-type: none"> • Aligning groundwater management with macro-policies • Adopting suitable principles and approaches • Adopting IWRM and related approaches (conjunctive management, MAR) • Establishing policy and planning linkages with interrelated sectors • Introducing periodic and coherent groundwater management planning |
| Data, information, and knowledge | <ul style="list-style-type: none"> • Structural provisions for data and information and awareness • Modern technologies for data acquisition and information management • national or international projects and programs • Cooperation with the private sector • Making groundwater information available • Awareness raising and lobbying |

⁸ Ministry of Water Resources, River Development and Ganga Rejuvenation, 2017 available at <https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1514500> (visited on 14.1.2021)

⁹ Jayanta Bandyopadhyay, *Water Ecosystem and Society* 4 (Sage Publications India Pvt. Ltd., New Delhi, 2009).

¹⁰ Food and Agriculture Organization of the United Nations (FAO), “The State of Food and Agriculture: Climate Change, Agriculture and Food Security 2016” available at <http://www.fao.org/3/a-i6030e.pdf> (visited on 1 March 2021)

However, it may be a complementary source for many more. Further, the groundwater quality is also deteriorating rapidly due to increasing over-exploitation from an increasing depth and encroachment of recharge areas. Around the globe, India is probably the most extensively affected by groundwater depletion. A long-term declining trend in the groundwater table has been observed in the country based on water level data from observation wells. Data from the National Aeronautics and Space Administration's satellite support this observation¹¹. The available information about the hydrogeological characteristics of different parts of the country and regional and local groundwater recharge rates and extraction is limited. The situation is further aggravated by increasing weather aberrations. Variations in monsoon rainfall coupled with climate change make it increasingly difficult to reliably predict the water availability and consequent change in potential groundwater recharge.

Accountability requires an adequate legal framework wherein responsibilities, obligations, and rights are well-defined. The legal frameworks can significantly turn policy decisions into rights and obligations, enhancing governance efficiency. The law becomes more effective when coupled with other incentives, such as physical (e.g., fencing of protection areas for drinking water, installation of water-conserving fixtures), economic (e.g., fees and taxes), and behavioural instruments (e.g., education and information for raising awareness). Their integration must provide for trade-offs that adversely affect equity in water allocation. For example, providing power and water-related subsidies to users is eventually a political decision with vast implications beyond the targeted group.

Cullet argues that the water sector during the last 15-20 years has been predisposed mainly towards non-binding policy instruments for reforming basic framework rather than law¹². Policy plays an essential role as a precursor to the propagation of obligatory legal regulations; however, their absence results in a democratic deficit. Groundwater, owing to its invisibility as a resource, is usually considered to be inherently difficult to control. Its regulation through laws and subsequent enforcement through prescribed rules are often challenging due to a lack of scientific competence,

¹¹ Ramaswamy R Iyer, *Water: Perspectives, Issues, Concerns 77* (Sage Publications, New Delhi, 2003)

¹² Philippe Cullet, "Rethinking the Right to Water to Ensure its Realisation for All" 54 JILI 28 (2012).

technical and financial constraints, the absolute number of groundwater users, and thus the difficulties in monitoring them.

For groundwater regulation, the legal framework in India is constrained presently by two main elements. Firstly, Groundwater rights are not formally vested in the 'state,' and secondly, instead of the Federal Government, the individual States are responsible for legislating on water-related issues. States have enacted acts giving their governments the power to regulate the development and use of surface and groundwater within their jurisdiction. These laws, supplemented by rules prescribed under these Acts regarding the allocation of canal water and irrigation scheduling, regulation of groundwater extraction in canal commands, and penalties for violating these rules, have been instrumental in loosely managing water use in agriculture. The lack of a clear and well-defined framework of laws covering different aspects of groundwater use provides enough space for shortsighted, arbitrary, and opaque decision-making. The need for more effective interventions to check groundwater decline and problems relating to its quality is growing. Many leading social figures, organizations, and technical experts have shed light on the gravity of the emerging groundwater situation and stressed the need to address the bundle of looming issues concerning water through sound legislation and its practical implementation. Thus, there is an urgent need to move towards a new paradigm for regulating groundwater use and its conservation, protection, and management to achieve the goal of sustainable management of water resources in the country. Thus, this study proposes to develop a fundamental universal law encompassing basic principles to address the different issues about the regulation of groundwater resources¹³. International law states that ideal conditions are hard to achieve locally. To achieve the goals and objectives of a global legal framework, domestic laws are to be framed and implemented in tune with them.

1.2.1 Its Institutional Aspects

GW is one of India's most precious and fragile resources; a complete knowledge of its legal and governance aspects is necessary to examine its economic, sociological, and scientific perspectives. Because state governments, not the federal Government, enact

¹³ Government of India, Ministry of Water Resources, "National Water Policy 2012" Available at <https://nwm.gov.in/> (visited on 5.1.2021)

water laws, most states have approved legislation that applies solely to their jurisdiction. Canal networks based on surface water have been the focus of the Indian water administration. As the groundwater table is depleting, groundwater management and governance are severe concerns in all parts of the country. The UNDP¹⁴ has defined groundwater governance as a set of social, political, administrative, and economic institutions that impact water resource use, development, and management and assure equity and efficiency in water services and distribution. It also comprises developing, establishing, and implementing water institutions, administrative policies, and laws. It also includes the duties and roles of government, private sector, and civil society in groundwater management. The four critical elements of groundwater governance¹⁵ are law and customs, transparency, participation, and information, which need efficient processes and the 'art' of decision-making and effective implementation through administrative action. The problems of groundwater resource management require strong scientific regulation for its use and governance. The GW governance theory¹⁶ delineates that legal frameworks are essential for successful governance, translating policy decisions into rights and obligations and creating a democratic groundwork for accountability and authority for resource management. Groundwater has essential linkages to the governance of environmental and other land and water resources, e. g., changes in land use can affect recharge rates and quality, so the land use regulations must be included when discussing groundwater governance¹⁷.

As an unseen resource, groundwater is considered intrinsically problematic to regulate. Most water laws focus on surface water, ignoring groundwater's practical value. Due to unclear water rights, groundwater usage is often considered limitless¹⁸. Enforcing formal groundwater regulations has always been difficult due to the large

¹⁴ UNDP–SIWI Water Governance Facility, “A Decade of Support for Water Governance Reform”, Final Report of the GoAL WaSH Programme. Stockholm International Water Institute, Stockholm (2021).

¹⁵ Kulkarni, H. and Shah, M., “Punjab water syndrome: Diagnostics and prescriptions” 48 *Economic & Political Weekly*, 64–73, (2013).

¹⁶ Mechlem, Kerstin, “Groundwater Governance: A Global Framework for Country Action”, Thematic Paper 6: Legal and Institutional Frameworks (June 2012). Global Environment Facility (GEF), Available at: <https://ssrn.com/> (visited on 13.01.2021)

¹⁷ Foster, S. and Garduño, H., “Groundwater-resource governance: Are governments and stakeholders responding to the challenge?”, *Hydrogeology Journal*, 21(2), 317–320. (2013)..

¹⁸ Cullet, P., “Governing water to foster equity and conservation: Need for legal instruments”. *Economic & Political Weekly, Web Exclusive*, 51(53) (2016). Available at <https://www.epw.in/journal/2016/53/web-exclusives> (visited on 28 Feb. 2021)

number of users, lack of updated scientific data, monitoring issues, and financial and technological limitations. Developing a policy framework for GW governance, its regulation through appropriate legislation, and its implementation and enforcement are different stages for efficient GW management. However, various reforms and policies made at municipal, state, and Union levels have exacerbated GW overexploitation and depletion.

Groundwater mining by individuals with the means to dig deeper has increased due to landowners' monopoly on its use. It has also hindered the government's efforts to address groundwater exploitation since it threatens politically influential populations who profit from such arrangements and have exploited the established institutional system. Further, the dry riverbeds are emotionally more threatening than depleting GW levels; thus, the states have ignored the issue and allowed landowners to pump as much water as needed through legal structures or energy subsidies, promoting unabated GW use. The land distribution in rural areas is inequitable; more than 80% of landowners are marginal and small farmers (owning > 2 ha. of land). Thus, in a scenario riddled with social injustice, it is crucial to formulate suitable legislative, regulatory, and judicial guidelines to achieve sustainable GW management for agriculture and other usages, particularly where agricultural economies mainly depend on GW irrigation.

1.3 Groundwater Regulation in Punjab and its Current Situation

Punjab, located in the northwestern part of India, is a small state comprising 1.54 percent of the total geographical area and a little over 2 percent of the total population in the country (Economic and Statistical Organisation, 2019). Groundwater has played a dominant role in food grain production and the income security of farmers in the state. It is a significant contributor of wheat and the second-largest paddy to the central pool of the country. However, its relative contribution has declined due to agricultural production improvement in other states (Jasdev Singh *et al.*, 2012). Still, the sustainability of agriculture in Punjab is crucial for the State's economy and food security in India. Groundwater irrigation has been chiefly accountable for making Punjab the 'food bowl' of the country, as nearly 72 percent of its area is irrigated by tubewells and 28 percent by canals. There has been a steady increase in dependence on Groundwater in Punjab

after the government policy of subsidized power, and then a free power for agriculture pump sets was introduced in the 1990s¹⁹. A recent report by the Central Ground Water Board²⁰ has warned of a dystopian future for Punjab as at the current rate of groundwater extraction, "all available groundwater resources in the state till the depth of 300 meters will dry up in next 20 to 25 years.", which is likely to have severe implications for the development of agriculture, national food security, alleviation of poverty and future growth. Thus, Punjab is a high-priority area for groundwater management. It is an area with intense competition for water and a place of water-driven ecosystem degradation, such as falling groundwater tables and drying rivers.

Table 1.4: Groundwater Situation in Punjab (2024)

| S. No. | Name of District | Total Assessed Units | Number of units with more than 70 % extraction of annual recharge | | | | %age of units with more than 70 % extraction | Stage of Ground Water Extraction (%) |
|--------|------------------|----------------------|---|----------|---------------|-------|--|--------------------------------------|
| | | | Over-exploited units | Critical | Semi-critical | Total | | |
| 1 | Sangrur | 8 | 8 | | | 8 | 100.00 | 313.24 |
| 2 | Malerkotla | 2 | 2 | | | 2 | 100.00 | 302.65 |
| 3 | Jalandhar | 12 | 12 | | | 12 | 100.00 | 254.54 |
| 4 | Moga | 5 | 5 | | | 5 | 100.00 | 228.65 |
| 5 | Patiala | 14 | 14 | | | 14 | 100.00 | 221.96 |
| 6 | Kapurthala | 3 | 3 | | | 3 | 100.00 | 218.84 |
| 7 | Barnala | 9 | 9 | | | 9 | 100.00 | 214.49 |
| 8 | Ludhiana | 5 | 5 | | | 5 | 100.00 | 212.54 |
| 9 | Fatehgarh Sahib | 5 | 5 | | | 5 | 100.00 | 207.07 |
| 10 | Tarn Taran | 8 | 8 | | | 8 | 100.00 | 191.65 |
| 11 | Amritsar | 10 | 10 | | | 10 | 100.00 | 177.11 |
| 12 | Mansa | 11 | 8 | 1 | 1 | 10 | 90.91 | 136.4 |
| 13 | Faridkot | 3 | 1 | 1 | 1 | 3 | 100.00 | 127.22 |
| 14 | Ferozpur | 3 | 3 | | | 3 | 100.00 | 122.28 |
| 15 | Gurdaspur | 5 | 3 | | 1 | 4 | 80.00 | 121.83 |
| 16 | Nawanshahar | 10 | 6 | | 3 | 9 | 90.00 | 116.24 |
| 17 | Bathinda | 6 | 3 | 1 | | 4 | 66.67 | 110.78 |
| 18 | S.A.S Nagar | 9 | 5 | 1 | 1 | 7 | 77.78 | 108.61 |
| 19 | Hoshiarpur | 5 | 2 | | 1 | 3 | 60.00 | 103.12 |
| 20 | Ropar | 5 | 2 | | 1 | 3 | 60.00 | 96.08 |
| 21 | Fazilka | 5 | 1 | | 1 | 2 | 40.00 | 62.20 |
| 22 | Pathankot | 6 | | | 2 | 2 | 33.33 | 51.40 |
| 23 | Muktsar | 4 | | | | 0 | 0.00 | 22.77 |

¹⁹ Dik Roth and Linden Vincent (eds.), *Controlling the Water* (Oxford University Press, New Delhi, 2013).

²⁰ Central Ground Water Board, "Ground Water Year Book- India 2018-19" available at <http://cgwb.gov.in/GW-Year-Book-State.html> (visited on 6.2.2021)

Apart from propagating and incentivizing various technological measures for groundwater conservation, the State promulgated the 'Preservation of Sub-soil Water Ordinance' in 2008 which was enacted as an Act in 2009, to prohibit the sowing of paddy nurseries and their transplanting before 10th May and 10th June, respectively. The Government enacted 'The Punjab Water Resources (Management and Regulation) Act, 2020' to provide for the management and regulation of water resources of the State to ensure the judicious, equitable, and sustainable utilization and management thereof. The Act provides for setting up the 'Water Regulation and Development Authority' to ensure the State's development, management, and conservation of water resources as per the Integrated State Water Plan (ISWP). The Authority may issue directions regarding the development, management, or use of water to minimize the wastage or misuse of water and to promote recycling and reuse of water; water conservation and groundwater recharge, including rainwater harvesting; and so on.

1.3.1 Current GW use

As per the 2024 Report prepared by CGWB²¹, the total annual GW recharge in Punjab has been estimated as 18.94 BCM, and after accounting for some factors, the extractable GW quantity has been assessed as 17.07 BCM. The annual GW withdrawal has been estimated at 28.02 BCM; thus, the Stage of GW Extraction works out at 165.99 %. An analysis of information provided in Table 1.3 brings out that in 9 districts of the State, all the assessed units (100%) are over-exploited, and the stage of GW extraction is more than 200 percent, it being as high as 250 percent or more in Moga, and Jullundur and highest in Sangrur (<300 %). In 15 out of the total 23 districts in the State, the 100 percent assessed units have a GW withdrawal of more than the 'safe' category, i.e., more than 70 percent of the annual recharge. Thus, out of a total GW recharge area of about 50344.68 sq. km., 36939.63 sq. km. area is over-exploited (73.37 percent). However, an area of 43281.71 sq. km. (about 86 percent) has a GW extraction of more than the safe limit of 70 percent. Consequently, the GW levels in almost the whole state are declining despite the state's various technical and legal initiatives. The primary culprit for this decline is the

²¹ Central Ground Water Board, Govt. of India, "National Compilation on Dynamic Ground Water Resources of India 2024" (December, 2024)

increase in area under paddy and the methods of raising this crop along with the policy of free power supply to the state's agricultural sector.

Around half of the states in the country have passed the Acts by now, and some are in the final process of enacting the laws. Others are reluctant for different reasons, usually due to a lack of political will. However, the enacted Acts and pending Bills mostly follow the orthodox command and control approaches of regulating extraction in CGWA-notified areas only. These lack regulations for releasing pollutants, safeguarding natural protected areas, and demarcating drinking water protection zones. The assessment and monitoring are primarily carried out for administrative units, e.g., a development block instead of the watershed. Indeed, legal reforms in the water sector are mainly limited to changes in the management system, failing to address human and social issues effectually²² Further legal and policy reforms are necessary even today to provide an effective solution to existing problems of regulation of groundwater resources for their sustainable use.

1.3.2 The emerging GW Situation

Groundwater is a critical resource for drinking water, agriculture, and industry in India, supporting over 60% of irrigation and 85% of rural water supply. However, its unsustainable extraction, poor governance, and legal ambiguities have led to severe depletion, contamination, and inequitable access. Despite various policies and judicial interventions, groundwater governance in India remains fragmented, with multiple agencies involved but lacking coordination. The legal framework primarily treats groundwater as private property, allowing unchecked extraction by landowners, which exacerbates social and economic inequalities. Marginalized communities, small farmers, and urban poor often face water scarcity, while industrial and large agricultural users overexploit groundwater. Additionally, environmental concerns such as aquifer depletion, saline intrusion, and pollution pose long-term risks to sustainability. This study aims to analyze the socio-legal challenges in groundwater governance in India, examining the gaps in legal frameworks, policy implementation, and the role of customary rights. It will explore how existing laws and governance structures can be reformed to ensure equitable, sustainable, and legally robust

²² Central Ground Water Board, Govt. of India, “Dynamic Ground Water Resources of India 2024” (December, 2024)

groundwater management. Punjab, known as the “Granary of India,” is facing a severe groundwater crisis due to decades of over-extraction for intensive agriculture, primarily wheat and rice cultivation. The state’s groundwater levels are declining at an alarming rate, with nearly 80% of groundwater blocks overexploited. This overuse, coupled with weak regulatory enforcement and fragmented legal frameworks, has led to a governance crisis that threatens both water security and socio-economic stability. Despite various legal and policy interventions, groundwater governance in Punjab remains ineffective due to the lack of a clear, enforceable legal framework, decentralized and uncoordinated management, and limited community participation. The current legal system largely treats groundwater as private property, allowing large-scale farmers and industries to extract water freely, often at the cost of small farmers and marginalized communities who face water scarcity. Additionally, groundwater contamination from agrochemicals, industrial discharge, and excessive pesticide use has raised public health concerns. This study aims to critically analyse the socio-legal challenges in groundwater governance in Punjab, focusing on policy gaps, legal ambiguities, and socio-economic impacts. It will explore how existing laws, judicial interventions, and community-based governance models can be reformed to ensure equitable, sustainable, and legally robust groundwater management in the state.

1.4 Review of literature

There is a tendency to modernize domestic legal framework for water to achieve better groundwater management and protection. Normally, groundwater resources are vested in the state or put under state control, except for a few jurisdictions. A standard approach has been to replace property minded doctrines with Government administered legislations, allowing a permit-based access to groundwater resources. In the countries with highly formalized water economies, the water rights systems with registration, metering, charging and other obligations worked very well. The United States and Australia which are characterized by small numbers of large users and low population density have successfully implemented such principles where as these have often failed in India and other regions, due to de facto open access to groundwater, high population density, multitudes of tiny private users, and little information about the characteristics of aquifers.

The legal frameworks in Indian States have faced the issues of integration of local institutional arrangements, customary water uses, and the de minimis abstractions into a formal governance framework because such integration must protect existing rights, and account for existing values, perceptions, and structures. Such water governance frameworks have to be non-discriminatory, accountable, participatory, transparent, and take into account the implications of the land-water interface. General key factors for laws that work in practice are high quality of the legal provisions, which address all relevant issues and are fair, equitable, coherent and enforceable; well sequenced and planned processes of transition and change; operational capacity of the water administration to implement the law; social consensus that supports compliance; stakeholder participation in legislative, planning and management processes, including user groups; and coherent and supportive wider socio-economic trends and policies. The framework for water governance can be successfully implemented only if it is supported by suitable technical solutions, awareness raising, enabling policies, and appropriate financial, administrative and human resources.

1.4.1 Water Governance from Vedic to Colonial Period

Water has been the driving force of almost every civilization from time immemorial. A great importance was attached by people to a suitable and adequate supply of water for different purposes like agriculture activities, cooking, drinking, washing etc. Historically, the Indus Valley civilization, which flourished around 2500 B.C, was known for well-planned structures of water supply, drainage, sewage, and storage, however, legal norms in respect of water use began to emerge with the inception of Vedic social order²³. The laws of Manu *Samritis*.²⁴ in this period (from 1500 to 500 BCE) addressed issues related to the regulation of water such as water pollution and its impact on health.²⁵ Water was considered as the essence of life and purity of

²³ Radha Krishnamurthy, "Water in Ancient India" 31(4), Indian Journal of History of Science 327 (1996) available at <http://indiascienceheritage.gov.in/pdf/Earth%20Sciences/Water%20in%20Ancient%20India.pdf> (Visited on 30 March 2020).

²⁴ Phillipe Cullet "Evolution of Water Law Policy in India" in Joseph W. Dellapenna & Joyeeta Gupta (eds.), *India: Evolution of Water Law and Politics of Water* 161 (Springer Academic Publishers, Dordrecht, 2009)

²⁵ Phillipe Cullet and Sujith Koonan (ed), *Water Law in India* 1 (Oxford University Press, New Delhi, 2011).

water was a moral value.²⁶ The waters were considered to be purifying in the spiritual context.²⁷ During pre-colonial Hindu and Muslim rule in India, the ancient religious text commentaries and stone inscriptions reflect references to ethical, moral, social, spiritual, and ecological principles which were applied to water management.²⁸ Since ancient times deficiencies of rainfall were overcome by means of one or the other form of artificial reservoirs, ponds, canals, lakes, tanks, wells, etc.

British did not interfere with local customs and rules until 1857 unless these affected their policies for colonial expansion and the need to amass wealth. During British times, rights to water and control over water were regulated through the progressive introduction of common law principles, emphasizing the rights of landowners to access water. For groundwater, landowners had a virtually unlimited right to access water under their holdings. The Indian Easements Act, 1882 enshrined common law principles, which evolved over the years and noticeably survived till date (Getzler 2004), mostly through rulings by English and Indian courts during the 19th and early 20th century and provided the “*right to every owner of land to collect and dispose within his own limits of all water under the land*”²⁹. Another most critical enactment was the Northern India Canal and Drainage Act 1873, which regulated irrigation, navigation, and drainage. This Act recognized the Government's right to ‘*use and control for public purposes the water of all rivers and streams flowing in natural channels, and of all lakes.*’³⁰

1.4.2 Evolution of Legal Framework under Indian Constitution

Many provisions in the Constitution relating to water specify the legislative jurisdiction of the Union and State Governments, including local bodies. The Seventh Schedule of the Constitution expressly defines 'water' as a state subject, thus providing a significant part of legislative control for water-related issues to the states

²⁶ Chaturvedi, R. G., *Manu Samriti: The Constitution of Vedic Society* 203 (Universal Law Publishing Co. Pvt. Ltd., New Delhi, 2010).

²⁷ Deepa Joshi and Benfawcett, “Water Hindu Mythology and Unequal Social Order in India” in Terje Tvedt and T. Oestigaard (eds), *A History of Water Volume 3: The World of Water* 121 (I.B.Tauris, London, 2006).

²⁸ Farhat Naz and Survanan ,V. S., “Water Management Across Space and Time in India” available at <https://www.econstor.eu/bitstream/10419/88305/1/639006426.pdf> (Visited on 30 March 2020).

²⁹ The Indian Easements Act, 1882 (Act No. 5 of 1882), s 7(b) as available at <https://www.indiacode.nic.in/bitstream/123456789/2349/1/A1882-05.pdf> (visited on 20.1.2020)

³⁰ The Northern India Canal and Drainage Act 1873 (Act No. 8 of 1873), preamble as available at https://www.indiacode.nic.in/bitstream/123456789/7684/1/northern_india_canal_and_drainage_act.pdf (visited on 20.1.2020)

(leaving only inter-state river waters for the union government)³¹. Part III and IV of the Schedule contain the general principles and policies for natural resources management, including water resources, and thereby guarantee the fundamental right to the citizens for free access and use of water³². The right to life makes it obligatory for the State to assure an equitable distribution of the resources and ensure their environmental and ecological improvement and preservation³³. Under the Constitution, some fundamental duties to this effect have been imposed on the citizens too.

Article 15(2) of the Constitution, recognizing the need for equal access to water, provides explicitly that "*no citizen shall on grounds only of religion, race, caste, sex, place of birth or any of them be subject to any disability, liability, restriction or condition with regard to the use of wells, tanks, bathing ghats, etc.*"³⁴ Sub-clause 2b of Article 15 relating to "the use of wells, bathing ghats, roads and places of public resort maintained wholly or partly under the funds provided by the state or dedicated to the use of the general public." This expression qualifies the provision of equal access to each of the places mentioned in sub-clause (b) but excludes a privately owned well or tank.

The right to life provided under the Constitution (Article 21)³⁵ has been commonly interpreted by the Apex Court to include all facets of life. In India, the Constitution does not explicitly recognize the human right to water. Yet, the courts have time and again asserted its existence in many cases. While the judiciary has confirmed the Constitutional right but at present real problems regarding the human right to water in the country are its actual content and active realization. Due to the absence of a legal framework, the courts have not elaborated the fundamental components of this right. The right to access to water and the right to pollution-free water have also been considered as part of the right to life under Article 21 of the Constitution of India. This is due to profuse and advanced explanation or interpretation of the fundamental

³¹ Basu, D. D., An introduction to Constitution of India, 46 (PEE Hall, New Delhi 2020)

³² Philippe Cullet and Sujith Koonan (eds.), *Water Law in India* 13 (Oxford University Press, New Delhi, 2011).

³³ Chauhan, B. R., *Settlement of International and inter-state water disputes in India* 24 (Indian Law Institute New Delhi, 1992)

³⁴ The Constitution of India, Art 15 available at https://www.indiacode.nic.in/bitstream/123456789/15240/1/constitution_of_india.pdf (visited on June 20, 2020)

³⁵ The Constitution of India, Art 21 available at https://www.indiacode.nic.in/bitstream/123456789/15240/1/constitution_of_india.pdf (visited on June 20, 2020)

right to life under Article 21 by the Apex court and several high courts in a series of cases.

The Directive Principles of State Policy recognize the principle of "equal access to material resources of the community." Article 39(b) provides that "*the state shall, in particular, direct its policy towards securing that the ownership and control of the material resources of the community are so distributed as best to subserve the common good.*"³⁶ The statement "material resources of the community" in clause (b) includes all things capable of producing wealth for the community. Article 47⁵⁵ of the Constitution assigns the State a responsibility "*to raise the standard of nutrition and living and improve public health.*" Article 51-A (g) imposes a fundamental duty on every citizen of India "*to protect and improve the natural environment including forests, lakes, rivers, wildlife and to have compassion for living creatures.*"⁵⁵ The legislative powers have been separated between the State Legislative Assemblies and the Parliament, mostly based on The Government of India Act, 1935, which gave control to the provinces relating to water supply, water storage, hydropower irrigation, canals, drainage, and embankments, and to the Governor-General regarding disputes between princely states or provinces, who could appoint a commission to investigate and examine a conflict if deemed appropriate. Taking a cue from the 1935 Act, the Constitution provided a vital role to the states in water management by incorporating water in the state list, recognizing the diverse conditions existing in different forms³⁷.

Article 245 of the Constitution provides that the "*Parliament makes laws for the whole or any part of the country and a legislature of the state for the whole or any part of the State's territory.*"³⁸ The Parliament has exclusive powers to make laws on subjects given under Union List (List I) of the Seventh Schedule. Entry 56 in List I is related to "*regulation and development of interstate rivers and river valleys to the extent to which such regulation and development under the control of Union are stated by the Parliament by law to be of public interest.*" In exercise of this power, the Parliament passed the River Boards Act, 1956 which provides "*a framework to set river boards by the Union Government to advise the state governments relating to the regulation or development of an inter-state river or river valley.*" The River Boards

³⁶ *Id.*, art 39,47,51.

³⁷ Philippe Cullet, "Water Law in India" available at <http://www.ielrc.org/content/w0701.pdf> (Visited on 24.1.2021).

³⁸ *Supra.* note 35, Art 245, 246 (Seventh Schedule).

can advise the States on various issues including, optimum use of water resources, water conservation, working and promotion of water supply, irrigation, drainage, or flood control schemes.

The Constitution provides for the Constitution of tribunals to resolve the disputes between the states under Article 262 concerning river water distribution. Accordingly, the Parliament has enacted the Inter-State Water Disputes Act, 1956, which provides for the adjudication of inter-state river disputes among states by setting up the tribunals to adjudicate the conflict.⁵⁷

Constitution also allows the Parliament under Article 252 to legislate in any area in which states have exclusive rights to legislate, provided that the states' prior consent has been obtained. "Water (Prevention and Control of Pollution) Act, 1974" was enacted under this article to prevent water pollution and maintain and restore the water resources. The water boards are empowered under this Act to lay down the regulations and standards for prevention and control of pollution³⁹. The legislative competency concerned with water under the Constitution is State List-Entry 17, the Union List-Entry 56, and Article 262. Entry 17 in the State List provides for "*water supplies, irrigation and canals, drainage and embankments, water storage and hydropower.*" But it is not an unqualified entry and its provisions are subject to the conditions of Entry 56 in the Union List, which includes "*Regulation and development of interstate rivers and river valleys to the extent to which such regulation and development under the control of Union are declared by Parliament by law to be expedient in the interest of the public*". Article 262 provides regarding "*adjudication of disputes relating to waters of interstate rivers or river valleys (1) Parliament may by law provide for the adjudication of any dispute or complaint with respect to the use, distribution or control of the waters of, or in, any inter-state river or river valley (2) Notwithstanding anything in this Constitution, Parliament may by law provide that neither the Supreme Court nor any other court shall exercise jurisdiction in respect of any such dispute or complaint as is referred to in clause (1) for coordination between States.*" The subject matter of water is included in the Union list as well as State List and is not listed in the Concurrent list, but by virtue of Entry 201 in the Concurrent List, namely "*economic and social planning.*", the approval of

³⁹ Chhatrapati Singh, *Water Laws in India* (Indian Law Institute, Delhi, 1992)

Union Government is necessary to include hydropower, major and medium irrigation, flood control and multipurpose projects in national plan.

Local Government entities at the city (municipalities/corporations) and village level (panchayats) constitute the third tier under the Constitution⁴⁰, created by the 73rd and 74th Amendments, namely, the village panchayats and the city Nagarpalika. Subjects entrusted to the Panchayats and Nagarpalikas are laid down in the Eleventh and the Twelfth Schedule to the Constitution. Similarly, municipalities have been empowered for water supply to domestic, industrial, and commercial sectors, sanitation, and watershed development. Panchayats have been given explicit powers and responsibility regarding water and related issues, viz. minor irrigation, drinking water supply, and watershed development as well as fisheries in rural areas⁴¹. These significant changes, incorporated in the Constitutional amendments, have not been executed so far at the local level across the country. Still, these can effectively empower the democratically elected local bodies.

Vishwa Ballabh (2008) has explored water governance⁴² from neo-classical, public administration, institutional economics, cooperative action, purposeful democracy, and politico-economic perspectives. He has suggested reforming water markets in India through re-orientating and reforming policy primacies and methods as well as the institutional set-up. Jayanta Bandyopadhyay (2009) conceives water management⁴³ as a multi-disciplinary and multi-dimensional subject that requires a comprehensive approach involving economic, sociological, and ecological dimensions. Biswas A.K. *et al.* (2009) broadly examined the present status of water use practices in Bangladesh, India, and Nepal, while discussing the physical, socio-economic, and institutional aspects of water availability, irrigation management, generation of hydropower, water supply, and sanitation in these nations⁴⁴.

A. Vaidyanathan (2010) has focused on setting up efficient institutional arrangements coupled with updated and advanced use of technology. This book provides a

⁴⁰ Supra. note 35, Art 243.

⁴¹ The India Infrastructure Report 2011 (Oxford University Press, New Delhi, 2011).

⁴² Vishwa Ballabh, *Governance of Water: Institutional Alternatives and Political Economy* 21 (SAGE Publications Ltd, 2008)

⁴³ Jayanta Bandyopadhyay, *Water, Ecosystems and Society: A Confluence of Disciplines* 1 (SAGE Publications India Pvt. Ltd., New Delhi, 2009).

⁴⁴ A.K. Biswas, R. Rangachari *et.al.* (eds.), *Water Resources of the Indian Sub-continent* 149 (Oxford University Press, New Delhi, 2009).

comprehensive analysis of water-related issues and recognizes the drawbacks in the present water governance system⁴⁵. Philippe Cullet and Sujith Koonan (2011) have highlighted the lack of legal material on water law despite vast content on environmental law and the policy framework for water use in India. While discussing various issues, such as center-state relations, management, distribution, and control of water irrigation, pollution, and water-related activities such as power generation and fisheries, it brings out contradictions in the water laws due to dissimilarities at the level of their implementation, i.e., at the national, state, municipal and Panchayat level. Ramaswamy R. Iyer (2009) has depicted in his book a broad overview of the legal issues relating to water and presents constitutional perspectives concerning water in India, drawing attention to the dangers of centralization and stressing the importance of legal pluralism and the provision of space for people's initiatives⁴⁶.

A. Vaidyanathan (2013) has done an inclusive examination of different issues concerning water, including the availability of water resources, the evolution of water control, problems of implementation, and water management in India⁴⁷. Shyam Divan and Armin Rosencranz (2014) provide comprehensive scrutiny of environmental law⁴⁸, including the “constitutional and legislative provisions, judicial trends and attitude on water pollution control and abatement”. Brahma Chellaney (2014) studied the issues and relations between water and peace globally, highlighting that “water plays an increasingly important and often overlooked role in most of the major issues currently affecting international relations”⁴⁹.

Asit K. Biswas *et al.* (2006) critically examined the paradigm of IWRM⁵⁰ and its current implementation status in the real world objectively and without being dogmatic about it. Dick Roth and Linden Vincent (2016) explored contemporary irrigation water control in India and Nepal and analyze “relationships between water

⁴⁵ A. Vaidyanathan, *Water Resources Management* 32 (Oxford University Press, New Delhi, 2010).

⁴⁶ Ramaswamy R Iyer (ed.), *Water and the Laws in India* 3 (Sage Publications India Pvt Ltd., New Delhi, 2009).

⁴⁷ A. Vaidyanathan. , *Water Resources of India* 3 (Sage Publications India Pvt Ltd., New Delhi, 2013)

⁴⁸ Shyam Diwan and Armin Rosencranz, *Environmental Law and Policy in India* 583 (Oxford University Press, New Delhi 2014).

⁴⁹ Brahma Chellaney, *Water Peace and War* 251(Oxford University Press, New Delhi, 2014).

⁵⁰ Biswas, A. K. (2008)., Integrated Water Resources Management: Is It Working? *International Journal of Water Resources Development*, 24(1), 5–22. <https://doi.org/10.1080/07900620701871718>

sources, technologies, and institutions concerning wider agrarian, socio-political and environmental changes”⁵¹.

1.4.3 Evolution of International Water Law

The major challenge of the twenty-first century is the sustainable governance of water resources. The focus was earlier on identifying a water resource, the technology required for its exploitation, and the funds' arrangement. The priority is to adopt efficient and effective ways for sustainable use of the available freshwater before it becomes scarce. The history of international water treaties dates to 2500 BC, when the two Sumerian city-states of Lagash and Umma agreed to settle a water dispute along the Tigris River.⁵² Subsequently, many water treaties have appeared. According to the Food and Agricultural Organization, there are more than 3,600 treaties concerning international water resources that appeared since 805 AD⁵³. International water law is well developed on navigation on international watercourses and trans-boundary issues. However, “it is progressively evolving to cover other matters, viz. sharing of water, drinking water supply and sanitation, water pollution, groundwater depletion, and rights and ownership perspectives”⁵⁴.

The need for regulation on non-navigational aspects is emerging as the central purpose of global water law as competition for its use between countries sharing this increasingly scarce resource is growing. It is being felt that national law and policies alone are not sufficient to address the issues effectively. A multi-lateral framework for the cooperation amongst nations sharing transnational watercourses has been provided by the 'Convention on the Law of the Non-navigational use International Watercourses, 1997' regarding navigational matters and use of their waters. The fundamental principles laid by the Convention for the use of transnational watercourses are the 'equitable and reasonable utilization' of waters and 'the obligation

⁵¹ Dik Roth and Linden Vincent (eds.), *Controlling the Water* 32 (Oxford University Press, New Delhi, 2013).

⁵² Peter H S., Mesopotamia 2550 B.C.: The Earliest Boundary Water Treaty. *Global Journal of Archaeology and Anthropology*. 2018; 5(4): 555669. DOI: 10.19080/GJAA.2018.05.555669

⁵³ United Nations Food and Agriculture Organization (1984). *Systematic index of international water resources treaties, declarations, acts and cases, by basin, Vol. II*. Legislative Study 34 available at <https://www.fao.org/4/ak470T/ak470T.pdf> (visited on 12.8.2021)

⁵⁴ Philippe Cullet and Sujith Koonan (eds.), *Water Law in India: An Introduction to Legal Instruments* 88 (Oxford University Press, New Delhi, 2011).

not to cause significant harm⁵⁵ to neighbours. The Convention also urges the countries to facilitate cooperation for the protection, development, and sustainable use of trans-boundary water resources. 'The Convention on Environmental Impact Assessment in a Trans-boundary Context, 1991' provides that the States agreeing to it are under a general obligation to consult and inform each other about all major projects under consideration that may have a substantial adverse environmental impact across territories. Another convention, 'The UN-Water Convention, 1997',⁵⁶ opened to all UN Member States in February 2013, has turned into a global legal framework for transboundary water cooperation from a regional instrument. India is yet to sign it, probably due to apprehension of losing control over transboundary freshwaters flowing into it. The 'United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, particularly in Africa, 1994 is the only legally binding international agreement linking water and Desertification to sustainable land management. It specifically relates to drylands, viz. the arid, semi-arid, and dry sub-humid areas, and recognizes the rehabilitation, conservation, and sustainable water management as key to combating their Desertification.

Several international treaties are directly or indirectly connected to water, but different countries define and elaborate these doctrines as per their benefits and interests. The existing international water law lacks comprehensive coverage and uniform global application as it encompasses only certain specific aspects of the use and sharing of water.

1.4.4 National Water Policy

Historically, groundwater policy development and implementation have been guided by expert science, but many of the environmental problems being complex are a challenge. By the 1980s, it was clear that the lack of a national water policy was a significant obstacle to the development of coherent water policies, which led to the development of the National Water Policy (1987) that was reformulated in 2002, and updated in 2012. The policy advocates that groundwater should be managed as a

⁵⁵ UN General Assembly, Convention on the Law of the Non-navigational use International Watercourses, 1997, *GA Res 51/229*, Supplement No. 49 (A/51/49), (21 May 1997).

⁵⁶ The United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, particularly in Africa, 1994 available at <http://www2.unccd.int/convention/about-convention> (visited on 28.1.2021).

community resource, held by the State under the public trust doctrine to achieve sustainable and equitable development of water resources, livelihood protection, and food security for all. These being 'quasi-scientific,' require more than scientific knowledge for problem-solving. The primary objective of the 2012 Policy⁵⁷ is *"to take cognizance of the prevailing situation of water resources, to propose a framework for the creation of an overarching system of laws and institutions, and prepare a plan of action with a unified national perspective."* Some of the key provisions are summarized as under:

- ❖ Planning the use and recycling of water for improving availability;
- ❖ Establishing a national information system with a network of and databases and data banks;
- ❖ Regulating the exploitation of groundwater;
- ❖ Stress on impact assessment of projects on environment and human settlements;
- ❖ Emphasis on preparing safety guidelines for water-related structures, including storage dams;
- ❖ Providing the highest priority to drinking, followed by irrigation, hydropower, ecology, industrial requirement, navigation, and other uses;
- ❖ Rationalization of water rates for surface water and groundwater taking into consideration the interests of small and marginal farmers; and
- ❖ Participation of farmers and voluntary agencies in water administration.

The other aspects relating to water quality, conservation of water, flood and drought management, water zoning, erosion, etc., have also been included in the policy document. The revised policy has also prioritized that the water may be treated as a social good for basic drinking water and sanitation needs, a community resource under state ownership, and due attention to environmental requirements such as base river flows. Not until the 2012 version, the policy has been explicit on groundwater. The policy issues relating to groundwater governance require the involvement of

⁵⁷ Government of India Ministry of Water Resources, "National Water Policy 2012" Available at <https://nwm.gov.in/> (visited on 5.1.2021)

members of affected communities for combining local knowledge, values, beliefs, and expert science during problem-solving processes. The new policy still falls short of preparing the nation for the optimal development and management of water resources in the 21st century. Further, as water is a state subject, the national policy can only act as a guideline for the States to formulate their water policy⁵⁸.

1.4.5 Water Pollution Control

The country is facing a massive challenge in terms of water pollution despite being rich in water resources. The Water (Prevention and Control of Pollution) Act, 1974 governs the water pollution control in the country, enacted by the Parliament under Article 252(1) of the Constitution to protect and preserve the major watercourses, i.e., the rivers of India. The pollution' of water under this Act is defined as "*such contamination of water by the discharge of any sewage or trade effluents, or of any other liquid, gaseous or solid substance into water (whether directly or indirectly) as may, or such alteration of physical, chemical or biological properties of water, or is likely to, create a nuisance or render such water harmful or injurious to public health or safety, or domestic, commercial, industrial, agricultural or other legitimate uses, or to the life and health of animals or plants or of aquatic organisms.*"⁵⁹ The statement for objects and reasons of 'the Act' clearly brings out as "*increasing urbanization and industrial growth have contributed to increased pollution of rivers and streams which assumed considerable importance and urgency in recent years. Hence it is essential to ensure that the domestic and industrial effluents are not allowed to be discharged into the watercourses without adequate treatment as such, discharges of drinking water, and supporting fish life and for use in irrigation. Pollution of rivers and streams also causes increasing damage to the country's economy*". This Act was amended in 1978 and was again revised in 1988 to ensure compatibility with 'the Environment (Protection) Act, 1986'. The Act, among other things, provides for the Constitution of Central, State, and joint Boards for preventing water pollution. These Boards are empowered by the Act to draw samples of water, get these analyzed, take cognizance of offenses, and impose penalties for offenses by various individuals and organizations, including government departments. The primary functions of the Central Pollution Control Board are "*to advise the Central*

⁵⁸ Vishwa Ballabh, *Governance of Water* 21 (Sage Publications, New Delhi, 2008).

⁵⁹ The Water (Prevention and Control of Pollution) Act, 1974, section 2(e)

*Government on various matters related to water pollution, coordinate the activities of 'State Pollution Control Boards', sponsor investigation and research concerning water pollution and develop an inclusive plan for control and prevention of water pollution."*⁶⁰ Since 1982, the Central Board has been attached to the Union Government's Department of Environment, Forests, and Wildlife. The Act enables the State Boards "to prescribe standards for the discharge of effluent or the quality of the receiving waters."

Subsequently, the Parliament enacted "The Water (Prevention and Control of Pollution) Cess Act, 1977 (Act No. 36 of 1977)" to raise resources for Central and State Pollution Control Boards. The main objective of the Act is "to provide for the levy and collection of cess on water consumed by persons carrying on certain industries and by local authorities to augment the resources of the Central Board and State Boards under the Water (Prevention and Control of Pollution) Act, 1974 for the preservation and control of water pollution."⁶¹ The Central Government is empowered by this Act to impose a cess on water consumed by industries listed in Schedule I of the Act. Specified industries and local authorities are subject to the Cess if they use water for purposes listed in Schedule II of the Act.

Most courts concluded that water cess is a tax which Parliament is authorized to impose under Entry 97, List I of Schedule VII of the Constitution. For instance, in *Tata Iron and Steel Company Ltd. (TISCO) v/s. The State of Bihar*, a division bench of the Patna High Court, concluded that the Cess imposed under the Act was within the legislative competence of Parliament.

In 1991, this Act was amended to provide for a rebate of Cess @ 25% of the Cess payable under this Act to any person or local authority if it installs any sewage or effluent treatment plant. The Act also denies entitlement to rebate if any person or Authority in case it consumes water over the maximum limit prescribed for such entity or fails to comply with any of the provisions of Section 25 of the Act or any of the standards laid down by the Central Government under 'the Environment (Protection) Act, 1986'. This Act is umbrella legislation to provide a framework to coordinate various authorities' activities under the previous laws such as 'the Water

⁶⁰ *Id.* s 17 at 12.

⁶¹ The Water (Prevention and Control of Pollution) Cess Act, 1977, available at <https://cpcb.nic.in/upload/home/water-pollution/A1977-36.pdf> (visited on 11 December, 2020)

Act' and 'the Air Act.' The Environment (Protection) Act extends to water quality and the control of water pollution. Section 2 (A) of the Act states that "*the environment includes water and the interrelationship between and between water and human beings and other living creatures such as plants, micro-organisms, and property.*"⁶² The "environment pollutant" is defined as "*any solid, liquid or gaseous substance present in such concentration as may be, or tend to be, injurious to environment.*"⁶³

This Act authorizes the Central Government to 'establish standards for the quality of the environment and its various aspects'⁶⁴ and 'emission or discharge of environment pollutants' from any source⁶⁵. "Stringent penalties are prescribed for the violation of the provisions of the Act."⁶⁶ Further, "Jurisdiction of the civil court is barred under the Act." 'The Air (Prevention and Control of Pollution) Act, 1981' and 'the Water (Prevention and Control of Pollution) Act, 1974' were amended to bring their provisions in conformity with those of 'The Environment (Protection) Act, 1986'. The Act increased the penalties for any of its contraventions compared to those envisaged under 'the Water Act, 1974'. The Environment (Protection) Act has been criticized as being ineffective and only designed to fulfill the international obligations of the Stockholm Conference.

1.4.6 Central Groundwater Law

India's legal system, based on the British common law principles, gives weightage to court rulings, which are applied along with customary and statutory law, universal law principles, and doctrines. There are overlaps and gaps between the various statutes and judicial pronouncements, and the courts and the authorities usually face the challenge of interpreting them before their implementation. Public health, sanitation, land, and water are primarily included in the State's jurisdiction in the Constitution (Seventh Schedule, State list, entry 17). 'Water' includes water supply, water storage, hydropower, canals, irrigation, drainage, and embankments. It is understood to include groundwater, but inter-State rivers are explicitly excluded. The Centre has a mandate to regulate groundwater as held by the Apex Court in 1997 that under

⁶² The Environment (Protection) Act 1986 (Act No.29 of 1986), s 2(a), available at https://www.indiacode.nic.in/bitstream/123456789/4316/1/ep_act_1986.pdf (visited on 11 December,2020)

⁶³ *Id.* s 2(b) at 2.

⁶⁴ *Id.* s 3(2)(iii) at 12.

⁶⁵ *Id.* s 3(2)(iv) at 12.

⁶⁶ *Id.* s 15 at 277.

Environment (Protection) Act, 1986 read with Article 253 of the Constitution, the Central Government may establish an institution to regulate and control groundwater development and management in the country for ensuring its sustainable use in the long-run⁶⁷. Accordingly, CGWB was constituted as Central Ground Water Authority (CGWA), which monitors groundwater level behavior through a network of observation wells and carries out periodic assessments of the groundwater situation in the country. This Authority has also prohibited the construction of new groundwater structures in the notified areas. Guidelines for groundwater extraction through electrical pumps for drinking and other purposes have also been issued.

Although the Central Government would find it challenging to enact groundwater legislation due to incompetence under the constitutional scheme but the first attempt dated back to 1970 when such a first model bill was passed. The Model Bill to regulate, control, conserve, protect and manage the groundwater was first framed in 1970 and since then has been revised in 1992, 1996, 2005, and 2011, and more recently in 2016. These Bills provide only for ensuring more sustainable water use in the future. Still, in areas with prevailing water scarcity, it does not offer any measures to check the groundwater misuse⁶⁸. The draft Model Bill for "the Conservation, Protection, Regulation, and Management of Groundwater" circulated in August 2016 provides that the Act is to restore and ensure groundwater security through the availability of adequate quantity and good quality all users in rural and urban areas⁶⁹. It asserts that a severe groundwater crisis prevails due to excessive overdraft and groundwater contamination. It recognizes the application of the 'public trust doctrine' and provides groundwater in its Natural State as a 'common pool resource,' and private property rights in groundwater are inappropriate.

1.4.6.1 Salient features of Draft Groundwater Bill, 2016

'Draft Model Groundwater Bill, 2016' is based on the subsidiary's principles, equitable distribution in an integrated approach. According to it, the State should act as a public trustee of groundwater, which should be considered a common pool resource to

⁶⁷ M.C. Mehta v. Union of India 1987 SCR (1) 819

⁶⁸ Planning Commission, Report of the Expert Group Government of India, Planning Commission, 2007 available at http://planningcommission.nic.in/reports/genrep/rep_grndwat.pdf (visited on 23.1.2021)

⁶⁹ International Environmental Law Research Centre, *Model Groundwater (Sustainable Management) Act 2016* available at <https://www.ielrc.org/content/e1605.pdf>

ensure that groundwater is protected, conserved, regulated, and managed. Objectives of the Act⁷⁰, as provided under the Model Bill, are to ensure that groundwater is protected, preserved, regulated, and managed to achieve the following purposes.

- a. practical realization of the fundamental right to life through the provisions for life;
- b. fulfillment of basic needs, e.g., food security, necessary human, livestock, and aquatic life needs;
- c. sustainable use of groundwater in the public interest;
- d. adoption of an integrated approach in the management of groundwater;
- e. implementation of the principle of subsidiarity;
- f. protection of the ecosystems and their biological diversity; and
- g. protection against gender discrimination and past inequalities in access to groundwater.

The Model Bill also sets binding national water quality standards and pushes for a national water security plan. It prioritizes meeting the right to water for life, followed by allocation for achieving food security, supporting sustenance, sustainable agricultural livelihoods, and ecosystem needs. The Bill also provides for dispute resolution by mediation or conciliation at an appropriate level.⁷¹ The Central Bill proposes, among other things, the compulsory registration of bore well-owners, mandatory permission for sinking a new borewell, creation of a groundwater regulatory body, restrictions on the depth of borewells, and establishment of protection zones around sources of drinking water.⁷²

It provides for the Constitution and membership of the State Groundwater Advisory Council and District Groundwater Council⁷³. The State Groundwater Advisory Council shall provide advice and support to all groundwater bodies constituted under this Act⁷⁴. The Institutional framework in rural areas is as under:

⁷⁰ *Id.* at 3

⁷¹ *Id.* at 22

⁷² *Id.* at 25

⁷³ *Id.* at 11-12

⁷⁴ *Id.* at 8-10

- Gram Panchayat Groundwater Sub-Committee
- Block Panchayat Groundwater Sub-Committee

In urban areas, the institutional framework is as under:

- Ward Groundwater Committee
- Municipal Water Management Committee

At the district level, it is as under:

- District Groundwater Council
- Groundwater Grievance Redressal Officer to be nodal officer for implementation of Act.
- Information and monitoring cell and supporting institutes at all levels.

However, the Bill lacks sufficient elucidation on the institutions and mechanism for implementation. These uncertainties may result in a delay in execution, particularly in cases where laws and institutions have overlapping. However, the Bill retains the emphasis on the development of river basins. It suggests establishing river basin authorities and water regulatory authority, but the composition and role of these authorities are not well-defined. Furthermore, their relationship with the Union and state governments remains unclear. It is also ambiguous whether the authorities will have any controlling or governing power over the state governments, including their agencies or not. Majority politics increasingly drive water regulation in our country. It has primarily been detached from international trends, practices, and scientific knowledge.

1.4.7 State Groundwater Legislations

'The Model Bill to regulate and control the development and management of groundwater' was largely ignored by the states for about three decades. It is only over the past fifteen years that states and Union territories have started adopting groundwater legislations. In response to the Model Bill, so far, 21 States / Union territories have adopted and implemented groundwater legislation⁷⁵. These States are

⁷⁵ Govt. of India, National Ground Water Management Improvement Scheme, *Press Information Bureau, Delhi*, 20 July 2023, available at <https://www.pib.gov.in/PressReleaseIframePage.aspx?PRID=1941105>

Andhra Pradesh, Assam, Bihar, Goa, Himachal Pradesh, , Karnataka, Kerala, West Bengal, Telangana, Maharashtra, Nagaland, Himachal Pradesh, Uttar Pradesh, Odisha and Punjab and the Union territories are Lakshadweep, Puducherry, Chandigarh, Jammu and Kashmir, Ladakh, and Dadra, and Nagar Haveli.

The basic framework is directly derived from the current Model Bill in all the states/UTs that have adopted groundwater statute. Several states have enacted laws based on the Model Bills of 1992 and 1996. While the comprehensive structure is similar, few differences can be noted in the different state Acts. These statutes vary in their extent as some apply only to notified areas while others apply to groundwater in the State. Besides, few earlier legislations emphasized mainly on the groundwater use for drinking water supply. Andhra Pradesh is one of the states that have enacted groundwater law on a broader framework linking surface and groundwater in the context of environmental protection⁷⁶.

The groundwater Acts aim to set up a new institutional structure in the respective states. Water law reforms, despite being State-specific, are identical on account of being based on similar policy interventions at the national level. Firstly, states like Andhra Pradesh fostered the 'participatory irrigation management' for its farmers through the Andhra Pradesh Farmers Management of Irrigation Systems Act 1997. Rajasthan followed it through enacting of Rajasthan Farmers' Participation in Management of Irrigation Systems Act 2000 and Maharashtra through Maharashtra Management of Irrigation Systems by Farmers Act 2005. Secondly, several states viz. Andhra Pradesh, Punjab, and Maharashtra have enacted legislations to restructure the water institutional framework by establishing and restructuring their Water Resources Development Corporations. New water authorities were set up to implement the reforms and shift the power from existing water bureaucracies to the farmers. The case study of the implementation of Groundwater law in the States of Karnataka, Maharashtra, and Gujarat illustrate the importance of several aspects of 'Groundwater governance': that of a minimum of institutional arrangements being in place at both the legislation and implementation stage (Karnataka); of legitimacy, political will and

⁷⁶ Philippe Cullet, "Rethinking the Right to Water to Ensure its Realisation for All" 54 JILI 28 (2012).

a basic technical understanding for hydrogeology (Maharashtra); and of an out of the box and adaptive learning approach (Gujarat), respectively⁷⁷).

Indian law does not recognize ownership in groundwater. The Supreme Court has interpreted groundwater as a de facto private good, but the State cannot abdicate responsibility for natural resources even in the absence of an enacted Act⁷⁸. The Apex Court has also contributed by pushing the limits for groundwater protection by ordering the setting-up of the Central Ground Water Authority and empowering it with immense control. However, the Hon'ble Court's decision in the much-publicized case of extraction of 500m³ of groundwater daily by a beverage company as a right being landowner is awaited since 2005⁷⁹.

1.4.8 Groundwater Regulation in Punjab

Punjab, located in the northwestern part of India, is a small state comprising 1.54 percent of the total geographical area and a little over 2 percent of the total population in the country (Economic and Statistical Organisation, 2019). Groundwater has played a dominant role in the food grain production and the income security of farmers of the State. It is the largest contributor of wheat and the second-largest paddy to the central pool of the country. However, its relative contribution has been declining due to agricultural production improvement in other states (Jasdev Singh *et al.*, 2012). Still, the sustainability of agriculture in Punjab is crucial for the State's economy and food security in India. Groundwater irrigation has been mostly accountable for making Punjab 'food bowl' of the country as nearly 72 percent of its area is irrigated by tubewells and 28 percent by canals. There has been a steady increase in dependence on Groundwater in Punjab after the government policy of subsidized power, and then a free power for agriculture was introduced in the 1990s⁸⁰. A recent report by the Central Ground Water Board⁸¹ has warned of a dystopian future for Punjab as at the current rate of groundwater extraction, "all available groundwater resources in the state till the depth of 300 meters will dry up in next 20 to 25 years.", which is likely to have severe implications for the development of agriculture, national food security,

⁷⁷ P. Cullet, R. Madhav, *et al.*, (eds.), *Water Governance in Motion* (Cambridge University Press, New Delhi, 2010).

⁷⁸ M.C. Mehta v. Kamal Nath 1997 1 SCC 388,

⁷⁹ Perumatty Grama Panchayat vs. Hindustan Coca-Cola Beverages, 2005 (3) KLT 10

⁸⁰ Mukherji *et al.*, 2012. available at http://www.iwmi.cgiar.org/iwmi-tata/PDFs/2012_Highlight-36.pdf

⁸¹ CGWB, 2018 available at <http://cgwb.gov.in/GW-Year-Book-State.html> as visited on 6.2.2021

alleviation of poverty and future growth. Thus, Punjab is a high-priority area for groundwater management. It is an area with intense competition for water and a place of water-driven ecosystem degradation, such as falling groundwater tables and drying rivers. Apart from propagating and incentivizing various technological measures for groundwater conservation, the State has recently taken the following initiatives:

- i) The 'Preservation of Sub-soil Water Ordinance' was promulgated in 2008. Subsequently, this has been enacted as an Act in 2009⁸², which prohibited sowing of paddy nursery and its transplanting before 10th May and 10th June respectively to avoid the high evaporation rates in early summer, and its implementation has a robust effect on reducing groundwater depletion.
- ii) Management of groundwater suffered from the fragmentation of responsibility as many agencies in various sectors had mandates relevant to groundwater, without any coordination among themselves. A new Directorate of Groundwater Management was created in October 2017 to focus on designing policies, programs, and strategies for utilization, conservation, and management of groundwater resources in the State in an equitable, judicious, and sustainable manner.
- iii) The Government enacted 'The Punjab Water Resources (Management and Regulation) Act, 2020'⁸³ to provide for the management and regulation of water resources of the State for ensuring the judicious, equitable, and sustainable utilization and management thereof. The Act provides for the setting-up of 'Water Regulation and Development Authority' to ensure development, management, and conservation of water resources of the State as per the Integrated State Water Plan. The Authority may issue directions regarding the development, management, or use of water, which may include construction and installation of any new structure for extraction of groundwater through energized means; conditions for allowing the construction and installation of any new or existing water-extracting facility; requirements for operation and reinstatement of existing water-extracting structures; restrictions on the use of groundwater; installation and maintenance of

⁸² Available at https://agri.punjab.gov.in/sites/default/files/Pb_preservation_of_Subsoil_Act%202009.pdf (visited on 20.1.2021)

⁸³ Available at https://prsindia.org/files/bills_acts/acts_states/punjab/2020/Act_%20No.%202%20of%202020%20Punjab.pdf (visited on 20.1.2021)

instruments for measuring the quality and level of groundwater and for volumetric measurement of the quantum of groundwater extraction; efficient use of water and to minimize the wastage or misuse of water and to promote recycling and reuse of water; water conservation and groundwater recharge, including rainwater harvesting; and so on.

Around half the states in the country have passed the Acts by now, and some are in the final process of enacting the laws. Others are reluctant for different reasons, usually lack political will. But the enacted Acts and pending Bills mostly follow the orthodox command and control approaches of regulating extraction in CGWA-notified areas only. They lack regulation of release of pollutants, safeguarding of natural protected areas, and demarcation of drinking water protection zones. The assessment and monitoring are mostly carried out for administrative units, e.g., a development block instead of the watershed. Indeed, legal reforms in the water sector are mostly limited to changes in the management system, and they fail to address the human and social issues effectually⁸⁴. As a strategy to provide an effective solution to existing problems of regulation of groundwater resources for their sustainable use, further legal and policy reforms are necessary even today.

1.5 Statement of the Problem

Groundwater is a critical resource for drinking water, agriculture, and industry in India, supporting over 60% of irrigation and 85% of rural water supply. However, its unsustainable extraction, poor governance, and legal ambiguities have led to severe depletion, contamination, and inequitable access. Despite various policies and judicial interventions, groundwater governance in India remains fragmented, with multiple agencies involved but lacking coordination. The legal framework primarily treats groundwater as private property, allowing unchecked extraction by landowners, which exacerbates social and economic inequalities. Marginalized communities, small farmers, and urban poor often face water scarcity, while industrial and large agricultural users overexploit groundwater. Additionally, environmental concerns such as aquifer depletion, saline intrusion, and pollution pose long-term risks to sustainability. This study aims to analyze the socio-legal challenges in groundwater governance in India, examining the gaps in legal frameworks, policy implementation,

⁸⁴ Vishwa Ballabh, *Governance of Water 21* (Sage Publications, New Delhi, 2008).

and the role of customary rights. It will explore how existing laws and governance structures can be reformed to ensure equitable, sustainable, and legally robust groundwater management. Punjab, known as the “Granary of India,” is facing a severe groundwater crisis due to decades of over-extraction for intensive agriculture, primarily wheat and rice cultivation. The state’s groundwater levels are declining at an alarming rate, with nearly 80% of groundwater blocks overexploited. This overuse, coupled with weak regulatory enforcement and fragmented legal frameworks, has led to a governance crisis that threatens both water security and socio-economic stability. Despite various legal and policy interventions, groundwater governance in Punjab remains ineffective due to the lack of a clear, enforceable legal framework, decentralized and uncoordinated management, and limited community participation. The current legal system largely treats groundwater as private property, allowing large-scale farmers and industries to extract water freely, often at the cost of small farmers and marginalized communities who face water scarcity. Additionally, groundwater contamination from agrochemicals, industrial discharge, and excessive pesticide use has raised public health concerns. This study aims to critically analyze the socio-legal challenges in groundwater governance in Punjab, focusing on policy gaps, legal ambiguities, and socio-economic impacts. It will explore how existing laws, judicial interventions, and community-based governance models can be reformed to ensure equitable, sustainable, and legally robust groundwater management in the state.

1.6 Significance of the Study

Groundwater plays a crucial role in India’s water security, supporting agriculture, drinking water supply, and industry. However, unregulated extraction, fragmented legal frameworks, and weak enforcement have led to groundwater depletion, contamination, and inequitable access. This study on “Groundwater Governance in India: A Study of Socio-Legal Issues” holds significant importance in multiple ways: Policy and Legal Reforms- Identifies gaps in existing groundwater laws and governance structures. Provides recommendations for a comprehensive and enforceable legal framework for sustainable groundwater management. Helps policymakers design effective water conservation strategies. Environmental Sustainability-Highlights the impact of over-extraction, pollution, and climate change on groundwater resources. Promotes sustainable water management practices to

prevent further depletion. Socio-Economic Equity and Justice-Examines how current laws affect small farmers, marginalized communities, and urban poor. Suggests measures to ensure equitable access to groundwater resources. Addresses the role of customary rights and local governance in water distribution. Scientific and Technological Contributions-Encourages the adoption of data-driven governance, including remote sensing and GIS-based monitoring of groundwater levels. Supports integrating traditional water conservation methods with modern legal frameworks. Contribution to Academia and Research Adds to the growing body of water law, environmental policy, and governance studies. Provides a socio-legal perspective on groundwater governance, bridging law, environment, and social justice. Judicial and Institutional Strengthening Helps courts and regulatory bodies understand the legal complexities of groundwater management. Suggests ways to strengthen institutional coordination among central, state, and local governments. This study aims to offer a holistic approach to groundwater governance, balancing legal, environmental, and social perspectives. By identifying challenges and proposing reforms, it can contribute to sustainable, equitable, and legally robust groundwater management in India.

1.7 Research Gap

Groundwater governance in India is a critical yet underexplored area, particularly from a socio-legal perspective. While there is extensive literature on groundwater depletion, technical aspects of groundwater management, and policy frameworks, significant gaps remain in understanding the intersection of social equity, legal enforcement, and institutional effectiveness. Lack of a Comprehensive Legal Framework India does not have a unified national law governing groundwater; instead, fragmented state-level regulations and local customary practices shape groundwater governance. The effectiveness of these legal frameworks in ensuring sustainable and equitable groundwater access remains understudied. Implementation and Enforcement Gaps Existing groundwater laws and policies often remain ineffective due to weak enforcement mechanisms, bureaucratic inefficiencies, and political influences. However, limited research has analyzed how these governance failures impact marginalized communities, farmers, and small-scale users. Social Inequalities in Groundwater Access Most studies focus on groundwater depletion and management from an environmental or economic perspective, but fewer examine how socio-legal frameworks address disparities in groundwater access, particularly

concerning caste, gender, and rural-urban conflicts. Role of Customary Practices and Community Participation Despite the legal emphasis on decentralized governance, there is limited research on how traditional water-sharing practices, informal institutions, and community-based initiatives interact with formal groundwater laws. Understanding these interactions is crucial for effective policy recommendations. Groundwater and Climate Change Adaptation Although climate change significantly impacts groundwater availability, research on whether existing legal and institutional mechanisms incorporate climate adaptation strategies remains inadequate. The role of law in promoting sustainable recharge, water conservation, and climate-resilient governance needs further exploration. Transparency, Data Availability, and Public Participation Groundwater data accessibility remains limited, restricting public participation in governance decisions. While some studies highlight data-related challenges, few have examined how legal and policy reforms can enhance transparency and community involvement in groundwater management. This research aims to fill these gaps by critically analysing the socio-legal dimensions of groundwater governance in India, assessing existing laws, institutional structures, and community-level challenges to propose more effective and inclusive governance models.

1.8 Research Methodology

This is the mixed research of doctrinal and non-doctrinal. The required research methods, tools techniques and others as connected are applied. Statutory provisions relating to the development and use of groundwater resources have been extensively examined. The research materials for this work have been based mainly on primary sources, viz. the bare Acts and statutes, as well as secondary sources, viz., various books, articles published in multiple research and law journals, and relevant reports of various Commissions and Committees on the subject.

The data derived from the courts' cases, laws passed by the legislature, and the research articles and books on water law and governance will be extensively used to arrive at appropriate conclusions. As the scope of the subject is vast and even expanding, a representative selection of cases to throw light on different aspects of the selected problem will be made by relying on All India Reporter, Supreme Court Cases, and Criminal Law Journal and for bare legislation acts and AIR Manual shall

be relied upon. Various governmental and non-governmental agencies will also be visited to collect the information and its systematic and scientific analysis to survey groundwater governance. Statements of international agencies and published articles in national dailies and magazines will also be consulted and suitably incorporated into the narrative at appropriate places.

To study the problem of law relating to Groundwater management in the country, a case study of Punjab will be taken up. One block from each of the 23 districts of Punjab, one village from each block and 20 respondents (farmers) from each village will be selected at random, using the multi stage sampling. An interview schedule will be designed and finalized in consultation with the teachers and by consulting relevant literature. The interview schedule will be pre-tested on a sample of farmers from the non- sampled area of Punjab and the interview schedule will be finalized. Data will be collected by visiting the study area and interviewing the farmers. The research methodology has been chosen to effectively coordinate the raw data derived from the different sources and is discussed in Chapter V under ‘Material and Methods.’

The theoretical framework is the “blueprint” for the entire dissertation inquiry. It serves as the guide on which to build and support the study, and provides the structure to define how to approach the dissertation philosophically, epistemologically, methodologically, and analytically. A theoretical framework is derived from an existing theory (or theories) in the literature that has already been tested and validated by others and is considered a generally acceptable theory in the scholarly literature. Selecting an appropriate theoretical framework for the dissertation research is an important and necessary process and it requires a deep and thoughtful understanding of the problem, purpose, significance, and research questions. It is imperative that all four constructs—the problem, purpose, significance, and research questions are tightly aligned and intricately interwoven so that the selected theoretical framework can serve as the foundation for the work and guide the choice of research design and data analysis.

In an empirical study, the farmers perceptions about the issues create their personal views of reality through receiving direct information from personal sensory impressions of the environment around them and interpreting it according to factors such as their own interest, the local socio-political background, knowledge, and

experiences. They use this reality to shape their understanding of the water use and translate it into behavioral responses. However, farmers of the same community may identify different changes depending on their production activity and perceived changes may not always reflect reality. So, the perceptions not only shape knowledge but knowledge also shapes perceptions. Perception is the end-product of the interaction between stimulus and internal hypotheses, expectations, and knowledge of the observer, while motivation and emotions play an important role in this process.

1.8.1. Research Objectives

1. To examine the historical background of Groundwater Governance.
2. To evaluate the law relating to Groundwater Governance in India.
3. To appraise the international perspectives of Groundwater Governance.
4. To research the role of Indian Judiciary in respect of Groundwater Governance.
5. To analyse the Groundwater Governance in Punjab, India and its implementation.
6. To explore the conclusion, findings and suggestions with respect to the Groundwater Governance in India.

1.8.2 Hypothesis

India is one of the largest users of groundwater globally, with millions relying on it for agriculture, drinking water, and industry. However, groundwater depletion has reached critical levels, exacerbated by weak legal mechanisms. The inadequacy of the legal framework manifests in several ways. Due to a fragmented and outdated legal framework, the groundwater is facing uncontrolled over-extraction, e.g., the Easement Act of 1882 gives landowners the right to extract groundwater beneath their land. Various state laws and policies exist, but there is no unified national groundwater law to ensure its sustainable use. There is a lack of effective regulation and enforcement because the institutions like the Central Ground Water Authority (CGWA) issue guidelines, but lack strong enforcement mechanisms. Many laws focus only on surface water regulation, neglecting the interconnectedness of surface and groundwater. The legal framework does not sufficiently empower local communities to manage groundwater sustainably. Successful models, like participatory groundwater management in certain regions, are not legally institutionalized

nationwide. Some States have implemented strict groundwater policies e.g., Jyotigram Scheme of Gujarat that regulate extraction, leading to better outcomes, but in contrast, some states with weak enforcement face severe groundwater depletion, e.g. Punjab. Research in legal and policy studies indicates that areas with stronger regulatory frameworks and active groundwater management committees perform better in sustainability indicators. Without well-defined legal rules and institutional mechanisms, common-pool resources like groundwater are generally over-exploited and thus, necessitate a strong legal framework for groundwater governance.

- i. **H₀ (Null Hypothesis):** There is no significant relationship between the existing legal framework and the effectiveness of groundwater governance in India.
- ii. **H₁ (Alternative Hypothesis):** The existing legal framework and its inadequacy significantly affects the effectiveness of groundwater governance in India.

This hypothesis suggests that the shortcomings in India's legal and regulatory framework directly impact the governance and sustainable management of groundwater resources. It implies that if the legal framework is inadequate-whether due to weak enforcement, regulatory gaps, or lack of community participation-it leads to ineffective groundwater governance, resulting in over-extraction, depletion, and inequitable access. The hypothesis is justified based on legal gaps, empirical evidence, and theoretical backing. The inadequacy of India's legal framework creates a governance vacuum, leading to poor groundwater management. Strengthening legal regulations, enforcement, and participatory governance mechanisms is necessary for effective groundwater governance.

1.8.3 Research Questions

What are the key laws and policies governing groundwater in India?

How effective is the existing legal framework in regulating groundwater extraction and conservation?

What are the major gaps and inconsistencies in India's groundwater governance laws?

How do judicial interventions influence groundwater governance in India?

What measures can be adopted to ensure sustainable groundwater management?

What are the key challenges in implementing and enforcing groundwater regulations at the local level?

How can governance structures be improved to enhance accountability and efficiency in groundwater management?

How can technology (such as remote sensing, GIS, and AI) improve groundwater monitoring and governance?

What are the best global practices in groundwater governance that India can adopt?

1.8.4 Limitations of Research

This research is limited to Groundwater Governance in Punjab, India and the may not be a representative for whole of the country. Still it may provide a direction or a way forward for improving the groundwater governance some states of India.

1.9. Chapterization

The proposed study has been divided into six chapters, each covering a distinct feature of the study area, as briefly explained below:

Chapter I, titled ‘**Introduction and Historical Background of Groundwater Governance**’ explains different concepts and trends of the emerging groundwater situation in India. It gives a brief review of literature regarding the development of groundwater legislation relating to the governance of Groundwater in India, along with the status and availability of water resources in the country and Punjab. It describes the objectives of the study and briefly discusses the study plan.

Chapter II, titled ‘**Law relating to Groundwater Governance in India,**’ describes various laws relating to groundwater governance in India, focussing on the historical development of the water laws, provisions under the Constitution of India, central legislations, policy initiatives, and different legal instruments about its management and governance.

Chapter III ‘**International Perspectives relating to the Groundwater Governance**’ focuses on various international treaties, conventions, declarations, etc., about water-related issues, considering their direct or indirect application in the

country. International law relating to the fundamental right to clean water, sanitation, marine pollution, and global efforts have been briefly discussed.

Chapter IV ‘Role of Indian Judiciary in respect of Groundwater Governance’, attempts to scan the significant decisions of various courts in India concerning water availability, use, management, and governance. It examines different principles laid down by the Supreme Court and other High Courts in India that contribute to framing environmental jurisprudence in the country.

Chapter V, titled ‘Groundwater Governance in Punjab, India and its Implementation,’ examines the different legal instruments related to water and its governance in Punjab. It focuses on the present scenario of the availability and use of groundwater resources for irrigation in the State. Further, an empirical study has been carried out to evaluate the level of awareness among grassroots users in the agricultural sector about the existing legal and institutional setup. This study has been conducted in the entire State, selecting one block in each of the 23 districts and one village in each block. From each sample village, 20 households were contacted to elicit information through a questionnaire designed for this purpose. The data has been analysed to determine different outcomes on the efficacy of the legal framework to govern groundwater.

Chapter VI, titled ‘Conclusion, Findings and Suggestions,’ summarises different outcomes of research work. Based on an empirical study about Punjab, it briefly provides an insight into problems faced by the State in efficient groundwater governance and contains a few suggestions for developing a better legal framework for the governance of water resources in India.

The 'National Water Policy 2012' also provides that "*there is a need to evolve a National Framework Law as an umbrella statement of general principles governing the exercise of legislative and/or executive (or devolved) powers by the Centre, the States, and the local governing bodies. It should lead the way for essential legislation on water governance in every State of the Union and devolution of necessary Authority to the lower tiers of Government to deal with the local water situation.*"⁸⁵ Thus, the formulation of the 'National Water Policy' as well as the National Water

⁸⁵ *Supra* 57 at 3.

Framework Bill (NWFB) 2016 draft by the Union Government has been an initiative to provide an overarching legal framework with principles for protection, conservation, regulation, and management of water as a vital and stressed natural resource. Despite the dire need for and significance of national water law, this Draft Bill has not initiated much debate among civil society and legal experts. The Bill emphasizes the right to a 'sufficient quantity of safe water for life' for all, without any indiscriminate based on caste, creed, religion, community, class, gender, age, disability, economic status, land ownership, and place of residence, there is no mention on the ways of dealing with the deep-rooted gender and caste biases and issues of water access in the country.

The success of the proposed legal framework for water, which is a state subject, largely depends on adoption and support from the states⁸⁶. Thus, formulating a national groundwater law is a significant challenge as it will not automatically ensure optimal use and sustainable management of the country's water resources. There are some aspects of Groundwater governance which vary from State to State (viz. the political will and legitimacy, need to integrate the institutional framework at all levels and stages, and the requirement to revisit the approach to handle the water, food, and electricity nexus), which are a prerequisite for finding a sustainable solution. The limited administrative, financial, technical, and human capacity is a significant bottleneck in GW governance reforms. Hence, there is a need for the present study, which stems from the worldwide emphasis on the sustainable development of water resources, mostly Groundwater. There is also a need for alterations and modifications in the legal framework for groundwater governance at the local and national levels. The present study is an effort to bridge this gap by analyzing the legal framework at the national and State level, and suggest measures for developing an effective legal framework for groundwater governance in the country.

⁸⁶ Government of India, Ministry of Water Resources, Report of Committee for Drafting of National Water Framework Law 2013, available at <https://ielrc.org/Content/e1316.pdf> (visited on 1.2.2021)

CHAPTER-II

LAW RELATING TO GROUNDWATER

GOVERNANCE IN INDIA

Good groundwater governance is managing the groundwater resources to achieve their sustainable use, ensure their protection, and manage the aquifer systems in the long-term for the benefit of people and ecosystems dependent on them. It is an overarching framework of customs, laws, and guiding principles for promoting the efficient use of groundwater. It is an emerging concept and requires a conducive legal and institutional framework to develop further. There is a need to engage civil society and the private and public sectors for responsible collective action to realise the goal of socially-sustainable groundwater use. A lack of awareness and understanding about issues related to groundwater development and its utilisation severely limits the commitment to groundwater governance to be effective. The sense of urgency about carrying forward the concepts of groundwater governance is absent due to the challenge of integration and coordination of multi-level issues of an increasing number of stakeholders.

Different legal frameworks and institutional arrangements exist in various countries, reflecting the region's historical and current political thought, hydrogeological situation, economic constraints, and cultural setting. The development of hydrogeology as a science to enhance understanding occurrence and movement of groundwater has resulted in the evolution of formal legislation, replacing the remnants of customary law governing groundwater use. Sound knowledge of the ground realities and related interdependences is a prerequisite to creating an enforceable legal framework for groundwater governance. Inadequate legal frameworks and prevalent meek implementation due to a lack of political will are serious impediments to groundwater management. A review of its evolution and its current status is a prerequisite to developing an appropriate legal framework for its governance¹.

2.1. Water in Ancient India

Water management in ancient India was based on different customs, religious texts, and written codes. But the western and northern parts of India along the river Indus,

¹ “Review of Legal and Policy Framework for Groundwater Governance in India”, available at: <http://indianecologicalsociety.com> (last visited on 23.3.24).

which flourished as the Indus Valley civilization around 2500 BC, are known for ‘well-planned water supply and storage, high standard sewage, and drainage.’²The *Mohenjo-Daro and Harrapan ruins* reveal that people in that era also gave adequate importance to household water supply, public baths, and irrigation.³

Ancient scriptures and secular literature, most of which are dated long after the disappearance of the Indus Valley Civilization, refer to the construction and improvement of water control works as activities beneficial to peoples’ welfare and deserve to be supported and promoted by kings.⁴

The Vedic period (or Vedic age, i.e., from 1500 to 500 BCE) was the period when the oldest scriptures of Hinduism, Vedas, were composed. It is well accepted that Dharma, which is universal, transcendent, and unchangeable, is fundamentally a law of interdependence, which was established on hierarchy following the nature of the things and is necessary for maintaining social order.⁵ In the Vedic system, the powers were exercised by the King. Dharma was maintained by the royal commands, which were backed by sanctions. Water regulation management, control, and exploitation were exercised by the royal Kings and by the community in some cases. During the regime of Chandragupta Maurya, Harshvardhan, and Guptas, there was a Hindu Vedic society and the country united with a centralised bureaucracy and brought under one rule.⁶

It is with the Vedas that Indian philosophy has its origin. The earliest period of the four Vedas, namely Rig-Veda, is from 500-1000 B.C. The Upanishads belong to 800-600 B.C. The importance given by Indians to water is evident from the references to water in these ancient literary works. The hydrologic cycle is highlighted in Rig Veda: the water evaporates due to the sun's heat, gets transported by wind, and becomes a cloud after coming together of vapours, condenses, and returns to earth as rain again and again.⁷

² Radha Krishnamurthy, “Water in Ancient India” 31(4) *Indian Journal of History of Science* 327 (1996), a at: <http://indiainscienceheritage.gov.in/pdf/Earth%20Sciences/Water%20in%20Ancient%20India.pdf> (last visited on 20 Dec. 2020).

³ Iqbal Ahmad Siddiqui, “History of Water in India” in Chhatrapati Singh (ed.), *Water Law in India* 290 (ILI, New Delhi, 1992).

⁴ A. Vaidyanathan, *Water Resources of India* 19 (Oxford University Press, New Delhi, 2013).

⁵ A.L. Basham, *The Wonder That Was India* 239 (Picarda, London, 2004).

⁶ Chhatrapati Singh (ed.), *Water Law in India* 293 (Indian Law Institute, New Delhi, 1992).

⁷ Terje Tvede and T. Oestigaard (eds.), *A History of Water: The World of Water*, Vol. III, 390 (I.B. Tauris, London, 2006).

With the advent of the Vedic social order, where Dharma became the litmus test for practically every activity, legal regulations concerning water use began to evolve. The Dharam Shastra or Code of Manu is another key source in the water use law, which opines that water is indivisible.⁸ According to Manu Smriti, the King should preserve public water and prohibit blocking waterways or diversions. The statutes established a penalty mechanism for individuals who contaminated, diverted, or stole water. Manu decreed that anybody who damages a tank's embankments shall be beheaded or drowned.⁹ Kautilya, the chief advisor to Chandragupta Maurya (321-297 BC) on politics and statecraft, provides in 'Arthashastra' that the King should construct water storage with the perennial water supply at the time of formation of new villages.¹⁰ 'Arthashastra' also indicates that users of water had to pay a tax for its use (Cullet and Koonan 2011) which was 1/5th of the produce for manually transported water, 1/4th of the produce for water carried by bullocks, and 1/3rd of the produce for water lifted by mechanism into channels. The water for irrigation from natural reservoirs was taxed at 1/4th of the produce.¹¹

The early Vedic text exhibited the philosophy of spiritualism concerning water, whereas the post-Vedic literature conceived its significance in ritualism. The earliest reference to GW irrigation, referring to well-style irrigation, is found in Rigveda. The dug wells, once excavated (*Kupa* and *avata*), are said to be always filled with water, which was pulled with a rope strap, wheel, and pails of water (*varatra* and *chakra*, *Kosa*). The water so drawn used to flow into broad channels (*surmisusira*) and then into fields through diverting channels (*khanitrima*).¹² According to the post-Vedic texts or *Smritis*, water was considered imperative for bodily and ritualistic purification. Ritualism was connected with the construction of *Dharma* or moral law. 'Dharma' persists steadfastly in Hindu society. No such substantial water shortage could be seen between 500 BCE and 300 BCE as there used to be excesses of food grains. The trade was promoted along water channels in that period.¹³

⁸ R.K. Sharma, *Carak Samhita with English Translation*, Vol. I, 198 (Chowkhamba Sanskrit Sansthan, Varanasi, 1972).

⁹ F. Max Muller(ed.), *Sacred Books of the East*, Vol. IX, 279 (Motilal Banarsidas, Delhi, 1965).

¹⁰ L.N. Rangarajan, *Kautilya, The Arthshastra* 202 (Penguin Books, Delhi, 1992).

¹¹ *Ibid.*

¹² R.C. Majumdar and H.C. Raychaudhuri, *et.al.* (eds.), *An Advanced History of India* 56 (MacMillan, Delhi, 1978).

¹³ *Ibid.*

Jainism and Buddhism grew up encouraging the preservation and protection of the environment and nature during this period. Mahavir Jain and Gautam Buddha encouraged right belief and rightful conduct and promoted reverence for other living beings. After the battle of Kalinga, Ashoka the Great converted to Buddhism and taught nonviolence to his subjects.¹⁴ Additionally, Ashoka ordered attention be paid to constructing water storage and growing trees. Around 600 CE, Jainism and Buddhism declined, and a reduction in agricultural production was observed, possibly due to water scarcity, deterioration in soil fertility, or an increase in population.¹⁵

During the rule of the Guptas and afterward, there was a renewed focus on preserving and protecting natural resources. This period witnessed the revering of specific animals and trees. Trade and urbanisation were at a low in this period. Ninth Century onwards, there was a growth of new technologies in South India, for construction tanks and better-quality canals and dams. The improved canal system and reservoirs contributed to the development of agriculture on a large scale.¹⁶ During the regime of Chandragupta Maurya, Harshvardhan, and Guptas, there was a Hindu Vedic society and the country united with a centralised bureaucracy. One example of a highly organised bureaucracy in charge of administration during the Mauryan period was *agronomists* having duties, among other things, to control irrigational practices. The authorised officer used to oversee rivers and check channels through which water was let out from several divisions to ensure maximum supply.

In this way, in the ancient period, one witnessed the existence of a legal water management regime. However, it was impracticable to compile various rules, regulations, and customary practices because, during that time, the socio-economic system was maintained through small republics with self-sufficient and autonomous villages. The task becomes even more difficult given the vastness of the country and its political and demographic divisions. The problem gets further complex because of the lack of efficient literature on agrological aspects, thus hindering the process of even a single sociological compilation of corpus juris of water for any social group in India for that period.¹⁷

¹⁴ A. Vaidyanathan, *Water Resources of India* 21–22 (Oxford University Press, New Delhi, 2013).

¹⁵ *Supra* note 12 at 67.

¹⁶ *Ibid.*

¹⁷ *Supra* note 12 at 294.

2.2 Medieval Water Laws

During the Gupta era, water resources development primarily took place. The Pallavas in the south expanded the irrigation system. Advanced irrigation systems were introduced during the Chola period. In Northern India, irrigation works were promoted by the Rajput dynasty. King Bhoja constructed a lake in Bhopal whose area was 647 km². Pal and Sen Kings built several big tanks and lakes in the eastern parts of the country. There were well-developed irrigation systems in the 12th Century in Kashmir.¹⁸ The Vijaynagar kingdom and the rulers of Deccan also extended surface irrigation through canals and tanks in the South. Several large and small storage tanks were constructed in the Vijaynagar Kingdom. These and subsequent periods witnessed greater interest among rulers in expanding and improving irrigation to increase agricultural production, which would benefit citizens and provide larger revenues for the exchequer.¹⁹

The Muslim rulers showed keen interest in constructing irrigation works, particularly canals, and declared that everybody had a right to unrestricted access to clean water.²⁰ Muslim rulers showed keen interest in constructing several irrigation works, particularly canals, across their boundaries. In the North, Firoz Shah Tughlaq constructed several canals to divert waters of the Sutlej River and Yamuna River in the 14th century A.D. for irrigation purposes. Mohammad Bin Tughlaq encouraged and supported the farmers to construct wells and rainwater harvesting systems. He advanced loans to the peasants for digging wells to extend cultivation.²¹

Akbar also took a keen interest in the construction of several canals. He rebuilt the abandoned Firoz Shah Canal in the 16th century. Firoz Shah Tughlaq constructed the Western Yamuna Canal in 1355 A.D. to make available an adequate supply of water for irrigation to the dry land regions of the present-day states of Haryana and Rajasthan. Emperor Shah Jahan constructed several canals. Two of them are Bari Doab and the Hasli Canal. The Eastern Yamuna Canal was constructed in the

¹⁸ Public Health Engineering Department, Govt. of Meghalaya, Rainwater Harvesting Manual, "Chapter II: Water Harvesting – Our Age-Old Tradition" available at: <http://megphed.gov.in/rainwater/Chap2.pdf> (last visited on 5 Dec. 2020).

¹⁹ A.Vaidyanathan, *Water Resources of India* 21-22 (Oxford University Press, New Delhi, 2013).

²⁰ M. Abdul Haleem, "Water in Quran", 33(1) *Islamic Quarterly* 34-50 (1989).

²¹ *Ibid*

eighteenth century to provide irrigation facilities in large areas of present-day Uttar Pradesh during the rule of Muhammad Shah.²²

The efforts to control water have not been conclusively shown during the Muslim rule in India. Perhaps, the relatively little attention paid to water control during this era also influenced the relatively abundant water supply available in India. Thus, historians rightly conclude that the Mughals preferred gardens to canals and their officers, tombs to wells.²³ Literature reveals that rulers paid less attention to water management during the medieval period.

2.3. Water Law in the Colonial Period

The development of water law in India is well documented in the colonial period. Colonization brought three significant impacts: "a shift in the economy from primarily a food-producing to a commodity-oriented; a departure in age-old social norms and customs; and a loss of social cohesiveness, and rising of the market economy and wealth." Once the East India Company took over the administration, a major emphasis was laid on increasing the land revenue.²⁴ British rule in India transformed water management in the country as local knowledge and institutions for managing it already existed. The British used irrigation to enhance the productivity of the land by providing it in regions with less rainfall or located away from rivers.²⁵

In the pre-colonial system, the local zamindars arranged to maintain the embankments, and peasants offered free labor to mend their major breaches.²⁶ *The colonial government passed the Bengal Embankment Act, of 1855, which gave more expansive powers to the concerned statutory authorities and the task of managing embankments and watercourses. Section 18 of the Act provided that a person desirous of using waters from created facilities was required to apply to the Collector, who may allow it only if it is advantageous.*²⁷ Specific acts interfering with the system of embankments were punishable offenses under section 76 of the Act.²⁸

²² *Ibid*

²³ M.P. Jain, *Outlines of Indian Legal History* 6 (Tripathi, Bombay, 1981).

²⁴ M. Gadgil and R. Guha, *The Use and Abuse of Nature* 116 (Oxford University Press, New Delhi, 1992).

²⁵ M.S. Vani, *Role of Panchayat Institutions in Irrigation Management: Law and Policy* 31 (The Indian Law Institute, New Delhi, 1992).

²⁶ Jayanta Bandyopadhyay, *Water, Ecosystems and Society* 8 (Sage Publications India Pvt Ltd., New Delhi, 2009).

²⁷ *Id.*, at.18.

²⁸ *Id.*, at .76.

The onset of British Colonial rule in the middle of the eighteenth century brought major structural changes in land and, in consequence, water management. With the East India Company taking over the administration of provinces, their immediate focus was on increasing land revenue.²⁹ East India Company and the British rule introduced new legislative thinking in India. The Colonial rulers also recognised the necessity to regulate and administer water resources. The permanent settlement system was introduced under British rule in 1793, which changed the nexus between government and land resources. The Britishers introduced the concept of private and individual ownership of resources. The State appropriated the land without personal ownership. A similar approach was adopted as regards water reservoirs. The *Bengal Regulation VI of 1819* was the first significant development in water resource management, which empowered the government to establish public ferries to appropriate private ferry rights. It marked a radical shift in treating water resources as common property for all as it introduced a new domain and sought to change earlier practices.³⁰

In the general context of the government's land revenue administration, the control, development, and management of irrigation, initially by the East India Company and after 1858 by the British Government, need to be viewed. During this period, the core objective of the law was its primary intent of generating more revenue.³¹ The water legislation was intended for the maximization of revenue and efficiency. The British colonial rule had the slightest concern for equity.

2.3.1. State Ownership over Water

The history of the development of irrigation in India is the history of the development of a State monopoly over water resources. The water resources are not owned by anyone belonging to the state.³² Statutory water law in the pre-independence or colonial period includes several legislations about drinking water supply, canal and drainage, irrigation, river water pollution, embankments, water conservation, fisheries, ferries, etc.

²⁹ M.P. Jain, *Outlines of Indian Legal History* 6 (Tripathi, Bombay, 1981).

³⁰ M. Gadgil and R. Guha, *The Use and Abuse of Nature* 116 (Oxford University Press, New Delhi, 1992).

³¹ Usha Ramanathan, "Legislation for Water: The Indian Context" 56 available at: <http://www.ielrc.org/content/WT201.pdf> (visited on 23 Dec. 2020)

³² *Id.*, at 77.

Indian Easement Act, of 1882 established the customary rights on or over an easement that the government, the public, or anyone possessed, no matter what other immovable property they owned. It included rights for water issuing from a well, spring spout, or flowing water in government or public places. The laws enacted after passing the Easement Act slowly shifted the focus from natural water rights to proprietary or individual water rights. The necessary connection between property rights on land and proprietary rights in water finds expression in “*The Transfer of Property Act, 1882*”, which stipulates the transfer of an immovable property only with the consent of from dominant heritage.^{33, 34} The dominant heritage that creates water rights is limited to rights in GW and certain riparian rights in naturally flowing water. However, no such rights accrue to the landowner when the government has provided the water through canals for irrigation purposes.³⁵ The Easement Act, of 1882 legalizes the rights acquired by customs and specifies two requirements for recognition of such rights, viz., due to prolonged use or prescription³⁶ or by local business.³⁷

2.3.3.1 Irrigation

The British focused on developing irrigation to foster agricultural productivity to increase revenue. The government directly asserted the ownership of the State over the water of rivers, lakes, and natural channels and empowered the administration to control the use of the water from such sources for public purposes. It was established through the enactment of the “*Bengal Canals Act, 1864*” and was expanded and strengthened through another colonial Act, viz. “*the Northern India Canal and Drainage Act, 1873 (Act VIII of 1873)*”. The successive framework for water resources development and administration was based on the rules laid down under these statutes. The preamble of *Act VIII of 1873* elucidates the necessity to interfere with the rights of people to abstract water from rivers, rivulets, watercourses, and streams; and to plan and construct watercourses and canals, a predominant practice

³³ Philippe Cullet, et.al., *Water Law for the Twenty-First Century: National and International Aspects of Water Law Reform in India* 126 (Routledge, London, 2010).

³⁴ Sujith Koonan, “Groundwater Legal Regime in India: Towards a Paradigm Shift” available at: <http://www.globalwaterforum.org/2016/12/12/groundwater-legal-regime-in-india-towards-a-paradigm-shift/> (visited on 18 Dec. 2021).

³⁵ Chhatrapati Singh, *Water Rights and Principles of Water Resources Management* 34 (Indian Law Institute, New Delhi, 1991).

³⁶ The Indian Easements Act (Act No. 5 of 1882), s. 15.

³⁷ *Id.*, s. 18.

throughout the country before British Rule, for the conveyance of water to field. This legislation granted the State the following powers:

- i. to impose tolls, rent, and charges for irrigation and drainage, power of redistribution of water supplies in the district, and power to notify water sources and bar the construction of any structure without official authorization;
- ii. to plan and implement irrigation works, to enter the land for construction and maintain the works, supervise the work, and inspect the government and private canals and other systems;
- iii. to regulate the water supply and its distribution in government and private canals and other systems;
- iv. to increase land rent, determine compensation, recover costs and rates from beneficiaries, and compel payment;
- v. to empower canal officers to settle disputes, record rights, assume management of private canals, determine the rates and amount of water charges, regulate the construction of water mills and their usage; and restrict or suspend these rights.”³⁸

The major criticism was the vesting of all control in the state to utilize and control all water resources such as rivers, natural streams, and lakes for public purposes.³⁹ Historically, the laws for irrigation development and regulation are the most settled part of water law in the statutory sense. The British government focused on large irrigation works to foster productivity and revenue.³⁴ The rules prescribed by the Board of Revenue of East India Company for Collectors of Districts related to the repair of tanks, water courses, and other sources of irrigation constituted the first regulation on the subject.

Under East India Company, various rules and regulations emphasized the management of works (repair, construction, etc.) more than the explicit declaration of the government’s authority. The act of territorial acquisition assumed the

³⁸ The Northern India Canal and Drainage Act, 1873 (Act No. 8 of 1873), available at: <http://www.punjabrevenue.nic.in/canal-drain-act1.html> (visited on 24 Nov. 2021).

³⁹ *Supra* note 104.

government's right of control.⁴⁰ The rules were generally to prescribe the forms of estimates and accounts and auditing of actual repairs of tanks, water courses, and other sources of irrigation. The regulations stipulated conditions of assessments required for new works or the restoration of old works; the daily wages to be paid to carpenters, brick layers smiths, coolies, and tank diggers, the rates of materials to be used etc. The Collectors were permitted to apply to the Superintendent, tank repairs, estimate forms, and superintendence. The Inspector of estimates of tank repairs was also required to assist the Collectors. Legislative declaration of government control over water resources evolved to tide over the complications connected with efficient and profitable administration of water resources.

In *Secretary of State v. Nageswara Iyer*⁴¹, the Madras High Court laid down the doctrine that it is the government's sovereign right to manage irrigation water supply and distribution. It is not just a proprietary right. The powers to regulate the usage of water were vested in the company.

The notion of the state's right of eminent domain and the absolute ownership of all rivers took root. It provided the legal basis for the government to assume the exclusive power and responsibility for developing surface water resources, as well as to improve restrictions on individuals, communities, and the private sector for accessing water flowing in rivers and streams without the explicit approval of the government. Pre-existing small local works were traditionally left to be managed by individuals and local institutions. The state also took over the power to construct and manage new projects of this kind.⁴¹ Till 1921, the Government of India had the authority over all public works in the provinces, including irrigation and hydroelectric power generation and all development activities related to the water resource. The power of supervision, control, issuing directions, and all technical or administrative activities of the Provincial Public Works Department was vested in the Central Government. However, the Provincial Governments were responsible for implementing and administering irrigation works.⁴²

⁴⁰ Ranjana Date, "Water Management in Ancient India" 68/69 *Bulletin of Deccan College Research Institute* 377 (2008), available at: <http://www.jstor.org/stable/4293122> (visited on 25 Dec. 2020).

⁴¹ *Secretary of State v. Nageswara Iyer*, AIR 1936 Mad 923.

⁴² Mahesh Chandra Chaturvedi, *Waters Environment, Economy and Development* 152 (CRC Press, London, 2012).

The firm control exercised by the Union Government ended after the first installment of statutory reforms was introduced in 1921. The governor in Council retained the sole authority to supervise the execution of irrigation works while delegating irrigation to provincial authorities as a reserved subject. According to the existing provisions, the State Government required a prior sanction from the Secretary of State in Council to take up the works. Before sanctioning any project with an outlay exceeding Rs. 5 million or a project that significantly affects two or more than two provinces' interests, such approval was required.⁴³

The British government focused on large irrigation projects to increase agricultural productivity and production, which in turn meant more revenue. But, with the promulgation of irrigation laws, traditional rights and privileges available to the native people for access and use of natural water sources were transferred to the state and its officers. The major criticism of these laws for the long term was vesting all control to utilise and control all water resources in the State.⁴⁴

2.3.3.2. Embankments

Till about the 1940s, the colonial government nearly neglected the traditional role of the previous governments in maintaining the embankments, on which the stability of the region's agriculture considerably depended.⁴⁵ The pre-colonial system of retaining the embankments had three significant features. Local zamindars arranged for their maintenance. Peasants offered free labour for mending the major breaches in the embankments.⁴⁶

Bengal Embankment Act, of 1855 was the earliest Act passed by the colonial government. After that, it was amended in 1866, 1873 and 1882. It was passed to amend the law concerning embankments and water courses. Section 3 of the Bengal Embankment Act 1855 defined the term embankment⁴⁷, and the embankments under the management of government servants are known as public embankments.

⁴³ *Ibid.*

⁴⁴ Philippe Cullet, "Water Law in India: Overview of Existing Framework and Proposed Reforms" available at: <http://www.ielrc.org/content/WO701.pdf> (visited on 21 Dec. 2020).

⁴⁵ D.P. Chattopadhyaya (ed.), *History of Science, Philosophy and Culture in Indian Civilisation*, Vol. VIII, Part 2, 224 (Centre for Studies in Civilisation, New Delhi, 2008)..

⁴⁶ *Ibid.*

⁴⁷ The Bengal Embankment Act, 1855 (Act 32 of 1855), s. 2 defines "Embankment" as "an embankment for the purpose of excluding or retaining water; and every embankment which is now

The jurisdiction of this Act extended to the areas of West Bengal and Bihar states and some parts of Odhisa.⁴⁸ These areas were governed by the Lieutenant Governor, who, on June 21, 1882, also administered the Bengal state. The interpretation clause of the Act affirms that the “collector” includes the revenue officer under the general charge of the district or some part thereof or who is exceptionally appointed by the West Bengal state government to work as a Collector and discharge its duties.

Under the terms of enactment, public embankments and entire water courses used by the public and the land, ground and terrain, pathway, etc. that were under or near the embankment and managed by concerned governments of the state, were to be administered and held by the such State government.⁴⁹ The concerned State Government acquired the lands for maintenance or other activities on public embankments without giving any damages and disposed of as it was deemed fit. The Collector is obliged to determine and demarcate the land as provided under the enactment. The Collector is also given some power under the Act, which includes taking the general administration of the embankment, carrying out the maintenance works of the embankment, exclusion of any embankment or any barrier caused to the embankment, altering the lines, any improvement to drainage, construction of roadways as well as watercourses.⁵⁰ The collector was not under obligation to pay any person, nor did anyone have a right to civil suit for recovery of money whose lands were acquired; rather, persons whose lands benefited from such schemes were bound to pay.

The Act of 1882 gave more expansive powers to the concerned statutory authorities, in addition to managing embankments and water courses, as stated above. A person desirous of using waters from the facilities so created shall apply to the Collector, who may allow to take up such activities in case these are advantageous to carry out.⁵¹ Certain acts interfering with the system of the embankment are punishable offenses.⁵²

kept up, or may hereafter be kept up, by the officers of the Crown at the expense either of the Crown or of any private person, is a public embankment within the meaning hereof.”

⁴⁸ *Ibid.*, The word “state” was substituted by the word “provinces” by para. 4(1) of the Adaptation of Laws Order, 1950.

⁴⁹ *Id.*, s 12.

⁵⁰ *Id.*, s 16 (2)

⁵¹ *Id.* s.18.

⁵² *Id.* s.76.

2.3.3.3. Some other Statutes

One of India's earliest laws on the conservation of rivers is the *Madras River Conservancy Act, 1884*, renamed *The Tamilnadu Rivers Conservancy Act, 1884*.⁵³ It seems to have been enacted not to control the river but the land use within the river banks. It appears to have been made to prevent land use within the river banks. Under the Act, the state may issue notifications from time to time, stating that conservancy of a river is required. After that, on the survey, the state is empowered to prohibit cultivation on land in the river bed. All these functions under the Act are to be discharged by the conservator.⁵⁴ It has been amended to provide powers to a Conservator of rivers to survey and prohibit certain activities like the cultivation of such land, which tend to obstruct or divert the river's course.⁵⁵

Earlier, fisheries were governed by local customs. However, after the codification of laws, the concern for fisheries became prominent. The need for the law on fishing was emphasized as long back as 1873 when the attention of the then government of India was drawn towards the extensive prevalent slaughter of fish, fry, and fingerlings and the urgency to adopt and implement effective measures to preserve the fishery resources. Consequently, *the Indian Fisheries Act 1897* was passed to include all private fisheries all over the nation. The Act defines the right to fishing in private waters as “*being a private property of a person, where for the time being, he has an exclusive right of the fishery as a lessee, owner, or in some other capacity*”.⁵⁶ It is further clarified that the water will be a private body of water private even if a person has a customary right to fish in it.

Further, this Act prohibited certain acts which cause pollution in water resources. Using destructive fishing methods such as explosions or dynamites in inland, coastal waters, and the marine league was forbidden. Poisoning of water with toxic materials was also banned.⁵⁷

⁵³ These words were substituted for the word “Madras” by the Tamil Nadu Adaptation of Laws Order, 1969, as amended by the Tamil Nadu Adaptation of Laws (Second Amendment) Order, 1969, which came into force on 14 Jan. 1969.

⁵⁴ The Madras River Conservancy Act, 1884 (Act 6 of 1884), s. 6. It provides: “For the purpose of carrying out this Act, the [State Government] may at any time appoint as many officers as may be deemed necessary...”.

⁵⁵ *Id.*, s. 3. It provides that “The State Government (earlier Province) may at any time direct that a survey be made.....”

⁵⁶ The Indian Fishery Act, 1897 (Act No.4 of 1897), s. 3.

⁵⁷ The Indian Penal Code, 1860 (Act 45 of 1860), available at: <https://legislative.gov.in/sites/default/files/A1860-45.pdf> (visited on 15 May 2022).

Subsequently, “*The Government of India Act, 1935*” divided the statutory powers amongst the State Legislative Assemblies and the Parliament. Sections 130 to 134 of the 1935 Act delegated authority of the province over drinking water and other infrastructure (such as canals, hydropower, reservoirs, and embankments). The Governor-General adjudicated the conflicts amongst provinces or princely states and was empowered to appoint a commission to investigate and examine a conflict if deemed appropriate.

2.3.3.4. Indian Penal Code, 1860

In addition to the easement and customary rights, some activities relating to water were designated as crimes punishable by law under “*the Indian Penal Code, 1860*” (*IPC*), a comprehensive code aiming to encompass all substantive issues of criminal law.⁵⁸ Twenty-three chapters under 511 sections list crimes, their definitions, and penalties. Relevant sections 268, 277, 290, 425, 430, 431, 432, and 441 of Chapter XIV provide for contamination of water to be a public nuisance, mischief by damage to irrigation works or diverting water wrongfully, and mischief causing damage to the river or other streams, an offense under the Code. These are general provisions for preserving, conserving, and protecting the limited supply of freshwater resources.

Section 268 of the IPC holds a person guilty of a public nuisance when his actions cause annoyance, danger, or common injury to the people who reside in the locality or create obstruction, hazard, or irritation to anyone utilising a public right. Similarly, Section 269 of the IPC punishes careless conduct likely to cause infection or a fatal disease.

Section 277 of the IPC provides for punishment for intentionally contaminating any publicly accessible reservoir or spring with trash or garbage, which reduces its fitness for ordinary use. This Section has a restricted scope as this rule does not cover involuntary conduct. Whatever the consequences of a spontaneous act may be, it does not lead to the liability of the doer.

A person causing a public nuisance that isn't otherwise penalized under Section 277 of the IPC can be punished for water contamination of sources other than reservoirs and

⁵⁸ The Constitution of India, art. 15(2). Available at https://www.indiacode.nic.in/bitstream/123456789/15240/1/constitution_of_india.pdf (visited on June 20, 2020)

public springs, as such activities are punishable under Section 290 of the IPC. Further, the provision dealing with mischief, which is causing damage to any property that decreases its worth, or utility, is also relevant to checking the water pollution under 426 of the IPC.

2.4 Water in the Constitutional Framework

The Constitution of India stipulates the legislative jurisdiction of the State and Union government and the local bodies under different provisions about water. The Seventh Schedule specifically provides 'water' as a '*state subject*', hence granting extensive legislative authority to the State over water-related matters (the union list contains only inter-state water disputes). As outlined in the Schedule (Part III and Part IV), the broad guidelines for natural resources management guarantee the citizens a fundamental right to "*free access and usage of water*" However, they are also obligated to fulfill specific primary duties under the Constitution.

Article 15(2) of the Constitution recognizes the need for equitable access to water. It expressly provides that no citizen should be subject to any condition, restriction, liability, or limitation for using, etc., solely based on caste, race, religion, place of birth, sex, or any of them.⁵⁹ "The use of bathing ghats, tanks, places of public resort, roads, and wells by the general public is provided in the Sub-clause 2b of Article 15, whether wholly or partly maintained by the funds provided by the state." This statement qualifies the provision of equal access to each of the facilities listed in sub-clause (b) but excludes private tanks and wells.

The Constitution provides for the right to life which requires the State to guarantee equitable sharing of resources and their ecological and environmental enhancement and protection.⁶⁰ Although the Indian Constitution does not clearly state that water is a human right, the courts have repeatedly pronounced in many cases⁶¹ that such a right exists. Due to the lack of a legislative framework, the judiciary has recognized the constitutional right but has not expounded on its core components.⁶² The Constitution

⁵⁹ *Ibid.*

⁶⁰ *Id.*, art. 21.

⁶¹ *Subhash Kumar v. State of Bihar, AIR 1991 SC 420; F.K. Hussain v. Union of India, AIR 1990 Ker 321.*

⁶² Philippe Cullet, "Right to Water in India: Plugging Conceptual and Practical Gaps" *International Journal of Human Rights* 61 (2013), available at: <http://www.ielrc.org/content/a1301.pdf> (last visited on 15 Dec. 2020).

of India under Article 21 provides for the right to life, which includes the right of access to potable water, basically due to profuse and advanced explanation or interpretation of this provision by several other courts and the Supreme Court.⁶³

The notion of equitable access to the community's material resources is also acknowledged by “*The Directive Principles of State Policy*.” As per Article 39(b), the State policies should be directed to ensure that control, distribution, and ownership of the community’s material resources serves the common good.⁶⁴ The Constitution of India under Article 47 mandates the State government to work to improve nutrition, living environment, and public health.⁶⁵ Indian citizens are also required under Article 51-A (g) to enhance and protect the water bodies, forests, and wildlife, i.e., the natural environment, and to demonstrate compassion for all living beings.⁶⁶ The State Legislative Assemblies and the Parliament have distinct legislative authority. The Constitution, recognising the varying conditions that prevail in different regions, has granted states the crucial responsibility of water management by including it in the State List. The decision to devolve water-related responsibilities to the States has been primarily influenced by “*The Government of India Act, 1935*”, where powers concerning the canals, irrigation, water storage and supply, hydro-power, embankments, and drainage were explicitly given to States.⁶⁷ Under the 1935 Act, the Governor General, if he deemed it appropriate and necessary, used to adjudicate the disputes between princely states by appointing a commission to examine and investigate a dispute.⁶⁸

However, the Central Government is still liable for the water and any related difficulties in the country under the Constitution. The Constitution of India (Article 245) empowers the Parliament to legislate for a part or whole of the country. The Seventh Schedule (List I) in the Union List lists the subjects under the exclusive domain of the Parliament for enacting the laws. This List includes the regulation and control of interstate rivers vide Entry 56, and Parliament is competent to legislate on

⁶³ *Assam Sillimanite Ltd. v. Union of India*, AIR 1992 SC 938.

⁶⁴ The Constitution of India, art. 39(b). available at https://www.indiacode.nic.in/bitstream/123456789/15240/1/constitution_of_india.pdf (visited on June 20, 2020)

⁶⁵ *Id.*, art. 47.

⁶⁶ *Id.*, art. 51-A.

⁶⁷ Philippe Cullet and Sujith Koonan, *Water Law in India 2* (Oxford University Press, New Delhi, 2011).

⁶⁸ The Government of India Act, 1935, ss. 130–134.

this subject to the extent that it is in the public interest to develop and regulate it. The Parliament passed the “*River Boards Act, of 1956*” to exercise these powers. The Act empowers the Union Government to provide “*a framework to set up river boards to advise the States in matters relating to the development or regulation of a river valley or an inter-state river.*”⁶⁹ However, this Act has remained mostly out of use.⁷⁰

The Constitution authorises the Union Government to constitute “*Tribunals*” to resolve interstate water disputes, under Article 262, concerning river water distribution. Accordingly, the Parliament passed the “*Inter-State Water Disputes Act, 1956*” to adjudicate inter-state river disputes by setting up tribunals to adjudicate the conflict.⁷¹ Many such tribunals have already been established to adjudicate water conflicts among states.⁷²

The Concurrent List, where the State governments and the Union government can legislate, does not contain the subject of ‘*water*’, despite its being included in the Union List along with the State List. However, under the topic of “*economic and social planning*”⁷³ [Concurrent List, Entry 20], the Union Government's approval is necessary to include in the national plan the medium and large irrigation and multipurpose projects as well as projects for flood control and hydropower.⁷⁴ Further, under Article 252, the Parliament is empowered to enact legislation on any subject in the State List (where it is an exclusive right of the state to pass legislation) with the prior consent of the States. The Parliament employed this provision to enact the “*Water (Prevention and Control of Pollution) Act, 1974*” to check pollution and rejuvenate the water resources.⁷⁵

The legislative competency concerned with ‘*water*’ is under Article 262 of the Constitution, Entry 56 of the Union List, and Entry 17 of the State List. The subjects included in Entry 17 include water storage, canals and irrigation, hydropower,

⁶⁹ The River Boards Act, 1956 (Act No. 49 of 1956), s 3, available at: <http://www.ielrc.org/content/e5602.pdf> (last visited on 28 Dec. 2020).

⁷⁰ Ramaswamy R. Iyer, “Towards a Re-ordering of Water Law in India” 1 *Indian Juridical Review* 18 (2004).

⁷¹ The River Boards Act, 1956 (Act No. 49 of 1956), s 5, available at: <http://www.ielrc.org/content/e5602.pdf> (last visited on 28 Dec. 2020)

⁷² *Id.*, s 51-A.

⁷³ *Id.*, s 9

⁷⁴ *Id.*, s.13.

⁷⁵ The Constitution of India, Entry 20, List III (Concurrent List): Economic and Social Planning, at https://www.indiacode.nic.in/bitstream/123456789/15240/1/constitution_of_india.pdf (visited on June 20, 2020)

embankments, drainage, and water supplies, but it can be used to an extent the Parliament determines is in the public's best interest, subject to conditions laid out in the Union List (Entry 56). Article 253 provides Union Government is empowered under Article 253 to legislate to implement international treaties with other countries and give effect to decisions taken in any international workshop, association, conference, etc. Such a law can be implemented in India or any part thereof."⁷⁶

2.5. Evolution of Legal Framework under the Constitution

The Constitution forms the basis of all post-constitutional legislations that the Union and States have passed regarding water and its management under constitutional powers. Since the surface and groundwater, broadly termed as water, fall in the state jurisdiction, the state legislatures have passed many laws in areas like drinking water supply, irrigation, groundwater management, mining, etc. The Union Government has been concerned with inter-state water distribution, economic development for the environment, territorial waters and inland transport, etc. In other areas like drinking water, sanitation, flood management, etc., its role has been advisory, i.e., policy-making, framing draft laws and schemes for helping and assisting state governments. The primary legal instruments governing the water, which are also relevant to groundwater, are discussed hereafter.

2.5.1. River Boards Act

Under Article 262 of the Constitution, the Parliament enacted "*The River Boards Act, 1956*", which empowers the Union Government to establish separate Boards for managing and regulating the development of inter-state rivers, as per the provisions of this Act or on state government's request.⁷⁷ Every Board shall be a body incorporated as per Section 4 of the Act, having a continuous succession and area of operation, i.e. its jurisdiction shall extend to the boundaries of the river or river valley.⁷⁸ The Board is responsible for preparing the schemes for developing the interstate river or river valley, regulating the water usage, and advising the governments to take up the measures as per schemes formulated by the Board for execution.⁷⁹ So far, the Union Govt. has constituted "*Brahmaputra Board, Betwa River Board, Tungabhadra Board,*

⁷⁶ *Id.*, art. 253.

⁷⁷ *Id.*, s 215

⁷⁸ *Id.*,s.4.

⁷⁹ *Id.*,s.13.

Bansagar Control Board, etc.” for the smooth implementation of various projects. The following are instances in which the board may be authorised to provide advice:

- i. Conservation, management, and optimal use of interstate river water resources.
- ii. Planning of water supply, irrigation, or drainage projects and their operation.
- iii. Promotion and administration of hydroelectric power development plans.
- iv. Promotion of flood and navigational control schemes and their operation.
- v. Promotion of reforestation and soil erosion management.
- vi. Prevention of contamination of interstate river flows.
- vii. Any other subject that may be required.

Other responsibilities include formulating plans to control or develop the interstate rivers and advising the State governments about how to implement the Board's programs.⁸⁰

2.5.2. *Inter-State Water Disputes Act 1956*

The riparian States had conflicts even at the time of independence regarding the distribution of river waters amongst themselves. The “Inter-State Water Disputes Act 1956” was enacted to resolve the disputes arising out of control and distribution of water of inter-state rivers.⁸¹Section 3 of the Act provides that when a State Government⁸² requests the Central Government about a water dispute and the Centre is of the view that a negotiated settlement of a dispute is not forthcoming, it shall constitute (under Section 4) a Water Disputes Tribunal, for adjudicating the dispute⁸³ within one year from the date of receiving the request from the state. After

⁸⁰ *Ibid.*

⁸¹ The Inter-State River Water Disputes Act, 1956 (Act No. 33 of 1956), available at <https://www.indiacode.nic.in/bitstream/123456789/1664/3/A1956-33.pdf> (visited on 23 Mar. 2021)

⁸² *Id.*, s. 3.

⁸³ *Id.*, s.4 (1). It provides as under:

“Constitution of Tribunal. (1) When any request under section 3 is received from any State Government in respect of any water dispute and the Central Government is of opinion that the water dispute cannot be settled by negotiations, the Central Government shall, within a period not exceeding one year from the date of receipt of such request, by notification in the Official Gazette, constitute a Water Disputes Tribunal for the adjudication of the water dispute”.

publication in the Official Gazette by the Central Government, the verdict of the Tribunal shall be enforced as a decree of the Apex Court.

Six Tribunals have been constituted for deciding the disputes since the enactment of this Act, viz., the Cauvery, Vasundhara, Krishna, Mahanadi, and Ravi-Beas rivers. An amendment in the 1956 Act was made through '*The Inter-State Water Disputes (Amendment) Act, 2002*'⁸⁴ to make it binding for the Indian Government to institute a Tribunal within one year of submission of the application by any disputant State. The Amendment also empowered the Union Government for *suo-moto* appointment of a Tribunal, if necessary. In addition, the Tribunal must submit its final report within three years, but the Government of India may extend this time further by two years.

2.5.3 Water Pollution Control Acts

When humanity became sedentary and started settling in villages and farming the land, water pollution induced or caused by human activities occurred for the first time about 10,000 years ago. Today several major rivers in India have become severely polluted. The expansion of agriculture and urbanization and their intensification contribute to serious GW pollution problems. The situation called for serious efforts on the national level to protect and preserve all the sources of water. Various legislative initiatives to control water pollution are as follows:

2.5.3.1. The Water Act, 1974

The first legislative measure to deal comprehensively with water pollution was the enactment of "*The Water (Prevention and Control of Pollution) Act, 1974*," hereinafter called the '*Water Act*', by the Parliament under Article 252(1).⁸⁵ As laid down in the Indian Constitution, the consent of all the state legislatures was obtained for enacting this Act. As stated in the preamble, the primary goal of '*the Water Act*' is to check, lessen, and avert water pollution, as well as preserve or reinstate water's naturalness. The Act was amended in 1978 and 1988 to bring it into closer agreement with the requirements of "*the Environment (Protection) Act, 1986*."⁸⁶ The Water Act mandates establishing Central, State, and joint Boards to prevent water pollution.

⁸⁴ *Id.*, s.4

⁸⁵ The Water (Prevention and Control of Pollution) Cess Act 1977(Act No. 36 of 1977), available at <https://pcb.nic.in/upload/home/water-pollution/A1977-36.pdf> (visited on 2 January 2021).

⁸⁶ Shyam Divan, et.al., *Environmental Law and Policy in India* 176 (Oxford University Press, New Delhi, 2014).

These Boards are empowered by the Act to draw water samples and get these analysed, take cognizance of offenses, establish water laboratories, lay standards for the discharge of sewage or trade effluents, and levy penalties for violations by companies and government departments to check pollution.

The CPCB, which is also an advisory body for the Union Govt. on various environmental issues, sponsors investigation and research about water pollution, coordinates the goings-on of 'State Boards', and works to develop an all-encompassing plan to avert and regulate the pollution of water. Ensuring the cleanliness of wells and streams in the States is the primary responsibility of CPCB. Section 17(1) of the Act authorises the State Boards “to lay the standards for the discharge of effluents or the quality of water received.”⁸⁷ The Act stipulates a permit or "consent" framework to check water pollution.⁸⁸ It is forbidden under the Act to discharge harmful materials above the limits set by CPCB or State Boards, in wells, natural channels, sewers, or over the land surface.⁸⁹ Furthermore, the Act mandates State Boards to promote, perform, and engage in water pollution investigations and research, check sewage and trade effluent treatment facilities, and create inexpensive and reliable means of treating the f sewage and other effluents.⁹⁰

A new section 33A was added in 1988, which empowered the State Boards to issue directives directing anybody to shut down any industry or control its activity, or process, as well as the delivery of utility services viz., water, electricity, etc.⁹¹ Boards were asked to ensure that untreated household or industrial effluents are not released into waterways or underground to protect the drinking water and usage in irrigation.

2.5.3.2. The Pollution Cess Act

To generate capital resources for efficient working of pollution boards in discharging their statutory functions, "*The Water (Prevention and Control of Pollution) Cess Act, 1977*" was passed. Its preamble provides that some enterprises and municipal bodies would be required to pay a cess on the water they use, which will be used for

⁸⁷ *Supra* 85, s.17(1).

⁸⁸ The Water (Prevention and Control of Pollution) Act, 1974 (Act No. 6 of 1974), s. 16. available at <https://cpcb.nic.in/water-pollution/> (visited on 12-10-2022)

⁸⁹ *Id.*, s.24.

⁹⁰ *Id.*, s.17.

⁹¹ *Id.*, s.33A.

augmenting the income of the CPCB and State Boards constituted to preserve water and control its pollution under *'the Water Act'*.⁹²

The Government of India has been empowered by the Act to levy a cess on the quantity of water used by various enterprises included in Schedule I. The Cess also applies to companies and municipalities that utilise water for one of the purposes listed in Schedule II. The Act's implementation was reviewed in 1991 and was amended to provide that when any person or local body establishes an effluent treatment plant, it should be eligible for a rebate@ of 25 percent on the payable Cess. In the cases challenging the imposition of the cess, it was primarily held that under "Entry 97, List I of Schedule VII of the Constitution", the Parliament is authorized to levy such a cess.⁹³ The Patna High Court concluded in the case of *"Tata Iron and Steel Company Ltd. v. The State of Bihar"* that the Parliament is legislatively competent to levy the cess under the Act.⁹⁴

2.5.3.3. The Environment Protection Act

"The Environment (Protection) Act, 1986" was passed to implement the recommendations of the 1972 UN Conference on Human Environments, with the primary aim of *"improving and protecting the environment and matters connected in addition to that."*⁹⁵ This umbrella legislation, passed under Article 253 of the Indian Constitution,⁹⁶ provides a framework to coordinate various authorities' activities under the *"Air Act and the Water Act"* already in force. Section 2 (a) of the legislation provides for water to be included in the environment along with the interrelations between land, water and air, humans, and other living beings such as microorganisms, and plants, among others.⁹⁷ Section 3 (2) empowers the Government of India to specify the standards for discharge/emission of contaminants in the environment from

⁹² *Id.*, Preamble,

⁹³ The Constitution of India, Sch. VII, List I, Entry 97: "Any other matter not enumerated in List II or List III including any tax not mentioned in either of those Lists."

⁹⁴ AIR 1991 Pat 75.

⁹⁵ *The Environment (Protection) Act, 1986*(Act No. 29 of 1986), Preamble, available at <https://cpcb.nic.in/env-protection-act/> (last visited on May 20,2021)

⁹⁶ The Constitution of India, art. 253, provides: "Legislation for giving effect to international agreements—Notwithstanding anything in the foregoing provisions of this Chapter, Parliament has power to make any law for the whole or any part of the territory of India..."

⁹⁷ *Supra* 95, s. 2(a). It provides: "environment includes water, air and land and the inter-relationship which exists among and between water, air and land, and human beings, other living creatures, plants, micro-organism and property."

any source.^{98, 99} The Government of India is empowered to delegate the powers and duties prescribed under The Act to any Authority or state government.¹⁰⁰ The Act bars the jurisdiction of courts to take notice of an offence under it except on a complaint filed by the Central Government or an authorized signatory.^{101,102} the responsible persons and incharge of the place are mandated to inform appropriate authorities about the inadvertent release of pollutants above prescribed limits.¹⁰³ The Act also defines stringent penalties in case of its violation.¹⁰⁴

The Act appears to have been enacted without considering the short- and long-term harmful impacts of pollutants on the environment. The Act, like all past environmental legislation, does not precisely specify the societal goal to be reached. The law is implemented via administrative machinery. But how may administrators understand their obligations and functions when the meaning and objective of the legislation are unclear?¹⁰⁵

2.5.4 73rd and 74th Amendment Acts

As mandated by these Amendment Acts, the State governments are required to implement a three-tier, i.e., the village, intermediate, and district levels system of Panchayats as well as at the city or town level in Municipal areas. These laws lay the foundation for the devolution of authority and control at grassroots levels. The 73rd amendment relating to Panchayats stipulates to transfer of some subjects in the Eighth Schedule (Part IX), viz., drinking water, maintenance of community assets, watershed development, water management, and minor irrigation.¹⁰⁶ Similarly, the 74th amendment regarding Municipalities also provided to transfer the subjects of

⁹⁸ *Supra* 95, s.2 (b).

⁹⁹ *Supra* 95, s.3 (2) (iii).

¹⁰⁰ *Supra* 95, s.23.

¹⁰¹ *Supra* 95, s.19(1).

¹⁰² *Supra* 95, s.22.

¹⁰³ *Supra* 95, s.15.

¹⁰⁴ C.M. Abraham, *Environmental Jurisprudence in India* 70 (Kluwer Law, The Hague, London, Boston, 1999).

¹⁰⁵ *Ibid.*

¹⁰⁶ This amendment added Part XI to the Constitution, consisting of 16 articles and the Eleventh Schedule. The Eleventh Schedule contains 29 subjects on which the Panchayats shall have administrative control. One of these subjects is minor irrigation, water management, and watershed development.

household and commercial water supply and supply for industrial purposes.¹⁰⁷ As a result of these amendments, it is up to the people's elected representatives to make choices about local activities having a direct bearing on their daily lives.

It empowered the State legislatures and governments to transfer these functions to local self-government. The Local Government institutions, i.e., in urban areas, municipal bodies, and the rural regions, the panchayats, have been given explicit powers and responsibilities regarding water and related issues. So far, these crucial changes have not been effectively transferred at the local level. These amendments Acts can effectively recast the distribution of powers and ensure stability, continuity, and autonomy to groundwater use and management functions, favouring democratically elected local bodies.¹⁰⁸

Sections 133-144 of CrPC, 1973 (Chapter X) provide for public nuisance as an offence. Section 133¹⁰⁹ deals with the removal of public nuisance through a conditional order. Any Executive Magistrate, the Sub-Divisional Magistrate, the District Magistrate, or any authorized person for this purpose has the power to take cognizance of certain acts, either based on a complaint by a citizen or a police report. It may conditionally order the person responsible for causing such nuisance, obstruction, or any acts to remove these within the fixed time limit or prevent or stop from carrying on such activity or fencing of such well, tank, or excavation. The preliminary order may be conditional, but the final may be passed only after providing the opposite party with a reasonable chance of being heard. In exigency, a speedy and summary solution is offered by Section 133, where any act leads to or is likely to damage the public interest or public health. In all proceedings started under CrPC, the Magistrate is considered virtuously working in the public interest.¹¹⁰

¹⁰⁷ The Twelfth Schedule (art. 243W), inserted by the Constitution (Seventy-Fourth Amendment) Act, 1992, includes: (1) Urban planning including town planning; (2) Water supply for domestic, industrial, and commercial purposes; and (3) Public health, sanitation, conservancy, and solid waste management.

¹⁰⁸ The Constitution of India, art. 243G and Sch. XI.

¹⁰⁹ The Code of Criminal Procedure, 1973 (Act No. 2 of 1974), s. 133(2).

¹¹⁰ *Farzand Ali v. Hakim Ali*, ILR (1915) 37 All 26, 28.

An order under Section 136 and Section 144 of the Code without prior notice under Section 133(1) is not good.¹¹¹ This Section bars the civil court's jurisdiction and provides that an order by a Magistrate is not questionable in civil court.¹¹² Supreme Court, in the landmark judgment in the case of *Ratlam Municipality*,¹¹³ did not consider the 'Water Act' effect on the availability of injunctive relief under the above-said Section. However, in the case of "*Tata Tea Ltd. v. the State of Kerala*," the High Court ruled that even if the state Board was negligent, the court could not accept a Section 133 action to wait for water pollution to occur.¹¹⁴

2.5.5 Common-Law

The British colonial rulers started imposing a general law system on India from the eighteenth century onwards to secure property rights and maintain law and order. Warren Hastings, in 1772 gave the judicial plan that laid the foundation of the Anglo-Indian judicial system on which superstructures were built by the later administrations.¹¹⁵ The British-introduced common law continues to apply in the country as per Article 372(1) of the Indian Constitution unless it has been modified or changed by legislation.¹¹⁶

The Law of Torts provides common law remedies for environmental damage, notably water pollution.¹¹⁷ While commenting on the nature of the wrong of pollution, the Apex Court remarked that it is a civic wrong to pollute. Because of its very nature, it is a crime perpetrated against the entire populace. Therefore, everybody who spoils must pay for rehabilitating the ecosystem and the environment they harm. If someone commits an offence, the "fine" that can be levied on them should be distinct and exemplary.¹¹⁸ As a result of Supreme Court decisions, tortious responsibility in environmental protection has been redefined. To minimise or manage pollution, the

¹¹¹ *Narayan Sahu v. Sub-Divisional Magistrate*, 1986 Cri LJ 102 (Ori).

¹¹² K. Ramajogarao, "Use of Criminal Law Machinery for Environment Protection" (2001) 7 SCC (J) 58, available at: <http://www.ebc-india.com/lawyer/articles/2001v7a7.html> (last visited on 2 Feb. 2021).

¹¹³ *Municipal Council, Ratlam v. Vardhi Chand*, AIR 1980 SC 1622.

¹¹⁴ 1984 Ker. L. T. 645.

¹¹⁵ M.P. Jain, *Outlines of Indian Legal History* 77 (LexisNexis Butterworths, Nagpur, 1972).

¹¹⁶ *Supra* note 105.

¹¹⁷ Manjula Batra, "Tortious Liability in Water Law" in Chhatrapati Singh (ed.), *Water Law in India* 170 (ILI, New Delhi, 1992).

¹¹⁸ AIR 2002 SC 1515.

law of Torts has long relied on the legal culpability of polluters. The significant liabilities for environmental or water pollution under the law of Torts are (a) Nuisance; (2) Trespass; (3) Negligence; and (4) Strict Liability.¹¹⁹ Using the doctrine of absolute liability, the Supreme Court inserted a new provision into the contract. In the case of *M.C. Mehta v. Union of India*, the Apex Court pronounced that the company is obligated to compensate for any damage caused by a company's hazardous activity. Such a provision guarantees that hazardous industries are held responsible, and these bear the cost of correcting any damage caused by dangerous chemicals that escape into the environment.¹²⁰

2.5.6. The Central Groundwater Authority (CGWA)

In January 1997, the CGWA was constituted by the Union Government to regulate groundwater development and management in those parts of the Country, i.e., Union Territories and States that have not established their Groundwater Authorities.¹²¹ The Authority issues the 'No Objection Certificate' (NOC) for GW extraction to industries or infrastructure projects, Mining Projects, etc., and frames guidelines in this connection from time to time. In April 2015, CGWA was directed by the National Green Tribunal (NGT) to ensure that every person shall obtain permission from it to operate a tubewell or any other means to extract GW. Both units in operation or ones yet to be established shall be subject to the law. NGT has also directed all industrial units linked to Common Effluent Treatment Plants to obtain an 'NOC' as per the law from CGWA through the State Pollution Control Board. NGT also directed CGWA in July 2017 that every industry should pay for the extraction of GW as per terms laid in the order permitting such extraction.

MoWR prepared the NWP, Government of India, in 1987 as a “*framework for planning, development, and optimal use of water resources*”. The policy was revised and modified in 2002 and then again in 2012.¹²² The goal of the NWP is to consider the implications of the present situation and provide a framework for creating an all-

¹¹⁹ *Supra*. note 120.

¹²⁰ Kailash Thakur, *Environmental Protection Law and Policy in India* 186 (Deep and Deep Publications, New Delhi, 2007).

¹²¹ Ministry of Water Resources, *Annual Report 1985*, available at: <http://mowr.gov.in> (last visited on 30 Dec. 2020).

¹²² *Ibid.*

encompassing structure of laws and institutions and an action plan for an integrated national perspective.¹²³ The main provisions under the policy may be summed up as (a) improvement in resource availability through planned use and recycling; (b) formulation of rules for dam safety and other storage infrastructure; (c) regulation of groundwater extraction; (d) prioritise the allocation of water for various uses viz., drinking, irrigation, navigation hydropower, and other uses; (e) rationalization of charges for surface and groundwater use, taking into consideration the interests of marginal and small farmers; (f) stakeholders, i.e., farmers and voluntary agencies participation; and (g) establishment of a uniform national information network of databases and data banks. The policy also deals with water demand, zoning, water conservation, water quality, erosion, drought and flood management, etc.¹²⁴

To suggest a roadmap for implementing the NWP, MoWR constituted a Committee in June 2013 under Former Member of the Planning Commission, Dr S.R Hashim, which submitted the report in September 2013. The report contained an Action Plan for implementation, including the enactment of the “*River Basin Management Bill and National Water Framework Bill.*”¹²⁵ Further, to estimate the water availability in the country and its augmentation, two additional documents, i.e. “*Reassessment of Water Availability in India using Space Inputs*”¹²⁶ and “*Master Plan for Artificial Recharge to Groundwater in India*”,¹²⁷ were prepared. The Water Resources Information System¹²⁸ is now available on the internet, and the uploading of primary data of CGWB and the CWC has been done. However, the NWP has not adequately prepared the nation for the emerging challenges of climate change and water scarcity in the coming years.¹²⁹

¹²³ Ministry of Jal Shakti, *National Water Policy*, 2012, Preamble, available at: <http://jalshakti-dowr.gov.in> (visited on 20 Apr. 2021).

¹²⁴ “National Water Policy, 2012 Silent on Priorities” available at: <http://www.downtoearth.org.in/news/national-water-policy-2012-silent-on-priorities--35952> (visited on 12 Dec. 2020).

¹²⁵ *Ibid.*

¹²⁶ Central Water Commission, *Reassessment of Water Availability in India Using Space Inputs* (2013), available at: <http://cwc.gov.in> (visited on 20 Apr. 2021).

¹²⁷ Central Ground Water Board, *Master Plan for Artificial Recharge to Ground Water in India* (2013), available at: <http://jalshakti-dowr.gov.in> (visited on 20 Apr. 2021).

¹²⁸ India Water Resources Information System, *India WRIS Portal* (1990), available at: <https://indiawris.gov.in> (visited on 20 Apr. 2021).

¹²⁹ Seth B.L., “National Water Policy, 2012 Silent on Priorities” *Down To Earth*, available at: <https://www.downtoearth.org.in/news/national-water-policy-2012-silent-on-priorities--35952> (visited on 12 Dec. 2020).

2.6. Some other Themes Relating to Water

2.6.1. Drinking Water Supply

Water supply is a core concern for every country, considering the importance of water to human existence. Drinking water is a central aspect of water law and policy to realise the fundamental right to water.¹³⁰ The Andhra Pradesh High Court held in the case *P.R. Subhash Chandran v. Government of A.P.*¹³¹ that the State's obligation to provide enough potable drinking water and its protection from contamination is not just a basic guiding concept but, as per Article 21, also a fundamental right. India is a vast and diverse country; many challenges exist in ensuring every household's reliable, sustainable, and safe drinking supply. There are two approaches, the first being statutes focusing on water supply, and sometimes governmental agencies driving sanitation and water supply; and the second is central government policy actions to assist and complement state activities to provide clean drinking water. The legal framework is meant to use water for drinking and other purposes. Water laws can be broadly classified as follows:

- i. Laws covering the whole state for the water supply;
- ii. Water supply legislation for the metropolitan cities;
- iii. Legislations enacted to provide water to specific industrial areas;
- iv. Rules setting up water boards for urban water supply;
- v. Legislation to regulate groundwater use, extraction, and transport.

The states of Karnataka¹³² and Maharashtra¹³³ have enacted legislation focused on groundwater as drinking water. Uttar Pradesh¹³⁴ has preferred a water supply law concentrating on establishing an institutional mechanism for supplying water. The water laws dealing with urban areas aim at constructing, developing, and maintaining facilities and co-exist with the other municipal laws in the concerned regions.¹³⁵

¹³⁰ P. Cullet, and Sujith Konnan, *Water Law in India* 69 (Oxford University Press, New Delhi, 2011).

¹³¹ AIR 2000 AP 272.

¹³² The Karnataka Groundwater (Regulation for Protection of Sources of Drinking Water) Act, 1999 (Act No : 44 of 2003) available at: www.ielrc.org/content/e9905.pdf (visited on 24 Mar. 2021).

¹³³ The Maharashtra Groundwater (Regulation for Drinking Water Purposes) Act, 1993, available at: www.ielrc.org/content/e9301.pdf (visited on 24 Mar. 2021).

¹³⁴ U.P. Water Supply & Sewerage Act, 1975 (U.P. Act 43 of 1975), Preamble.

¹³⁵ *Id.*, s 65, 67.

'*The Andhra Pradesh Municipalities Act, 1965*' provides that the 'Municipal Council' is responsible for providing adequate drinking water for the city's residents, as much as budgets allow.¹³⁶ It also gives the municipality the authority to deliver water to businesses, factories, and other commercial facilities. The municipalities bear the burden of ensuring that residents are provided with clean drinking water.

"*The Tamil Nadu Water Supply and Drainage Board Act, 1970*", and *the Punjab Water Supply Sewerage Board Act, 1976*" are a few of such legislations passed with the objectives of providing and regulating water supply, maintaining public health, and setting up boards or corporations for this purpose¹³⁷. The Karnataka Act provides for establishing a body, having powers to monitor various schemes and distributing monetary funds to the local bodies.

An examination of water supply regulations shows that most were adopted when the state was viewed as the dominating societal player.¹³⁸ So, the main limitations are that the water supply is confined to towns and cities, levies are imposed, state authorities are not held accountable if they fail to perform their tasks, etc.¹³⁹

2.6.2. Sanitation

There has been a significant change in how sanitation is perceived nowadays at local and national levels. Sanitation today must imperatively be conceived as encompassing various dimensions rather than as a question of access to toilets alone. Undoubtedly, there is an intrinsic link between water and sanitation, but sanitation also links to other sectors such as health and the environment. Further, sanitation in India can only be addressed in a meaningful manner if its social, religious, and labour dimensions are also considered an integral part of the sector.¹⁴⁰

The sanitation law in India includes constitutional provisions, legislations, judgments, administrative orders, and policy documents. The Indian Constitution does not specify sanitation as a fundamental right, but the higher judiciary has adjudicated that the

¹³⁶ The Andhra Pradesh Municipalities Act, 1965 (Act VI of 1965), s. 138.

¹³⁷ *Supra* note 134, Preamble.

¹³⁸ *Delhi Water Supply & Sewage Undertaking & Another. v. State of Haryana & Ors.*, (1996) 2 SCC 572.

¹³⁹ *Ibid.*

¹⁴⁰ Philippe Cullet and Lovleen Bhullar, *Sanitation Law and Policy in India* 8 (Oxford University Press, New Delhi, 2015).

right to sanitation is a basic tenet of the right to life.¹⁴¹ Further, the Constitution includes a fundamental right that does not mention the term ‘sanitation’ but constitutes an integral part of a broadly conceived right to sanitation. The eradication of untouchability has contributed to the abolition of the practice of manual scavenging.¹⁴²

The absence of comprehensive sanitation laws is a defining characteristic of the field of law that deals with different aspects of sanitation. What exists as sanitation law is found in laws that may or may not be linked to sanitation. Local laws for both rural and urban areas are the first category of law related to sanitation. None of the laws defines sanitation or provides a set of general principles applicable to sanitation, and they provide a framework within which the responsibilities of local bodies, which are enshrined in the Constitution, are to be performed. *National Urban Sanitation Policy* is the guiding framework for sanitation in urban areas.¹⁴³ The vision for urban sanitation in the country is that with a focus on providing sanitation services that are both accessible and affordable to the urban poor, all communities may achieve good human health and environmental sustainability for their residents. The following policy issues must be addressed to achieve this vision:

- i. Poor awareness among the citizens;
- ii. Occupational and social facets of sanitation;
- iii. Dispersed responsibilities and roles within the institution;
- iv. Lack of a city-wide strategy;
- v. Limited technology choices in this area;
- vi. Outreach to poor and marginalised populations; and
- vii. Lack of willingness to accept the demand.

The Prime Minister of India launched the “*Swachh Bharat Mission*” to focus on sanitation and to achieve sanitation coverage for all” on October 2, 2014, to

¹⁴¹ *Municipal Council, Ratlam v Vardhi Chand & Others.*, AIR 1980 SC 1622; *Virender Gaur & Ors. v. State of Haryana*, (1995) 2 SCC 577; *L.K. Koolwal, v. State of Rajasthan*, AIR 1988 Raj 2; *Dr K.C. Malhotra v. State of Madhya Pradesh & Others*, AIR 1994 MP 48.

¹⁴² The Constitution of India, art. 17. Available at https://www.indiacode.nic.in/bitstream/123456789/15240/1/constitution_of_india.pdf (visited on June 20, 2020)

¹⁴³ National Urban Sanitation Policy, 2008 available at <https://www.ielrc.org/content/e0811.pdf> (visited on 19 March 2021).

accelerate the range. The mission included sub-missions for rural as well as urban areas. Total Sanitation Campaign¹⁴⁴ stressed education and communication, capacity-building efforts to increase awareness, human resource development, and disseminating information in rural areas and generating, under a demand-driven strategy, demand for sanitary facilities.¹⁴⁵

2.6.3. Irrigation

The irrigation laws included the construction, regulation, and maintenance of canals, tanks, and other drainage works. Various acts on irrigation empower the state government to use water from a natural resource in the public interest. The right to use water out of irrigation works may be acquired by permission in writing or rational water distribution in some statutes.

The actual contents of most of the statutes passed by the state legislatures are as follows:

- i. Operation and maintenance of irrigation works and watercourses and their construction.
- ii. Levy of water rates and cess.
- iii. Provisions relating to the water supply.
- iv. Penalties for damaging irrigation works.

In India, there have been significant attempts in recent times to involve farmers in the operation and management of irrigation systems. In many statutes, including the States of Rajasthan, Odisha, Madhya Pradesh, Kerala, etc., the law enabling farmers' participation in irrigation management has come via the state enactments relating to irrigation.¹⁴⁶

¹⁴⁴ Total Sanitation Campaign Guidelines, 2007 (as amended in 2010), available at: <https://www.ielrc.org/content/e0716.pdf> (last visited on 19 Apr. 2021).

¹⁴⁵ Swachh Bharat Mission (Gramin) 2014 Guidelines, available at: www.mdws.gov.in/sites/default/files/swachbharatguidelines.pdf (last visited on 2 Dec. 2021).

¹⁴⁶ The Orissa Irrigation Act, 1959 (Orissa Act 14 of 1959), s. 21.

2.6.4. Flood Management

When it comes to controlling the floods, the States are primarily responsible because it doesn't find a mention in any of the lists of Schedule VII of the Constitution, although it does appear in the State list (Entry 17) as drainage and embankments.¹⁴⁷ Some States, viz. Assam, Uttar Pradesh, and Bihar have already passed Acts with provisions regarding 'Flood Management.' These statutes contain provisions relating to flood, diversion of flow, protection of property and life from flood damage, provision for boats, accommodation and compensation, removal of any obstruction, etc. The Government of India has only an advisory role in the matter. A two-tier flood control mechanism, one at the State level and another at the Centre, exists in India. *The Indian Government established the Brahmaputra Board* in 1980 under Brahmaputra Board Act, 1980 for all North Eastern states. The Board is responsible for conducting investigations and surveys in the Brahmaputra and Barak basin, preparing the master plan for controlling floods, improving the drainage system, checking bank erosion, and specifying standards for building dams and their operation and repairs.¹⁴⁸

In 1972, *The Ganga Flood Control Commission* was established to prepare an all-inclusive flood control plan for the Ganga Basin. It was assigned the responsibility to make a programme to implement the works in Ganga basin States related to schemes for flood management. The comprehensive plans prepared by it have been implemented in 23 sub-basins in the Ganga Basin.

To carry out river-bank protection and anti-erosion works in the vicinity of the Farakka Barrage and the river, the "*Farakka Barrage Project Authority*" was set up.¹⁴⁹

The "*National Disaster Management Authority (NDMA)*" was constituted in 2005 by the Union Government to prepare and approve National Disaster Management Plan, formulate the policy on disaster management, and consider and approve the plans prepared by various Govt. organisations under the National Plan. It helps to frame guidelines to integrate the measures for preventing the disaster or mitigating its effects

¹⁴⁷ Lin Crase and Vasant P. Gandhi (eds.), *Reforming Institutions in Water Resource Management* 139 (Earthscan, London, 1st edn., 2009).

¹⁴⁸ The Brahmaputra Board Act, 1980 (Act No. 46 of 1980), s 12, 13.

¹⁴⁹ Farakka Barrage Project, available at <https://fbp.gov.in/index.html> (visited on 3-1-2022)

in the development projects and plans drawn up by the State Authorities. On its basis, it recommends providing funds for the mitigation of the impact of disaster.¹⁵⁰ In January 2008, NDMA issued guidelines relating to flood management which specify the roles of State and Central agencies in preparing flood mitigation plans and implementing relief measures in the event of a disaster.

2.6.5. Water Conservation

Conservation of water resources is a complex process that requires careful attention, but there has not been enough legislative movement in this area to warrant further action. “*U.P. Bhoomi Evam Jal Sanrakshan Adhiniyam, 1963*” is a law for the conservation of water which is grossly neglected. “*The Andhra Pradesh Water, Land and Trees Act, 2002*” is all-inclusive legislation on green cover and conservation of water. Its preamble lays down its aim to promote the protection of tree cover and regulation of the usage and extraction of groundwater for protecting and conserving land, water, and the environment. The state government has constituted “*The State Water, Land and Trees Authority*” under the Act.¹⁵¹ The Government of India framed the “*Water Conservation Authority of India Bill, 2016*”, which provides to set up a Water Conservation Authority for conserving the rivers, rainwater, and groundwater. The bill is pending in parliament.¹⁵²

2.6.6. Mining

The extraction of natural resources has links with water use and conservation. Mining is such an activity whose impacts include water pollution, as a by-product of mining activities, and various effects on groundwater.¹⁵³ To incorporate mining's impact on the regulatory framework for water, “*the Mines and Minerals (Development and Regulation) Act, 1957*” provides the legislative context to regulate the mines and development of all minerals except natural gas and petroleum. However, it makes no specific space for integrating the impact of mining on the regulatory framework for water. This Act has been amended with “*The Mines and Minerals (Development and Regulation) Amendment Act, 2015*”, which acknowledges the relevance of water in

¹⁵⁰ National Disaster Management Authority, “Projects and Schemes”, available at: <http://www.ndma.gov.in/en/projects-and-scheme.html> (visited on 24 Dec. 2021).

¹⁵¹ The Andhra Pradesh Water, Land, and Trees Act 2002 (Act No. 10 of 2002), s. 3. (available at: <https://www.ap.gov.in>) (visited on 24 Dec. 2021).

¹⁵² The Water Conservation Authority of India Bill, 2016. (Bill No. XXXVII of 2016) Preamble.

¹⁵³ Mines And Minerals (Development And Regulation) Act, 1957 (Act No. 67 of 1957) Preamble.

several of its provisions. However, it does not integrate the principles of water law into mining law and, in the form proposed, would probably have little impact in practice.¹⁵⁴

*The National Mineral Policy*¹⁵⁵ recognises typically the impact of mining on water. It provides that the extraction process of minerals affects natural resources like air, water, forest, and land. Mining activities create complications in the mined area, viz., subsidence of land underground and degradation of land in open cast mines, pollution of streams and rivers, deforestation, etc., which are often related to ecological imbalance and affect the environment. It further provides that all mining be taken up only in an all-inclusive sustainable framework.

The Supreme Court, in an important judgment,¹⁵⁶ has asked the Government of India to review ‘the 2008 Policy’ and formulate a new, meaningful, more effective, and implementable policy. After these directions, a committee has been constituted by the Ministry of Mines to review the Mineral Policy, 2008.¹⁵⁷

2.6.7. Electricity

Electricity has a two-way link with water: first, it is generated as hydropower, and second, it is used for pumping groundwater and contributes to declining water tables due to over-extraction. However, the Electricity law fails to recognise the connection between access to groundwater and electricity (accessibility and affordability, its price). Further, the electricity law also does not account for the link between access to electricity and the realisation of the fundamental right to water.

Parliament and the state assemblies can legislate regarding electricity, as the subject appears in the concurrent List. The central Act relating to the matter is the Electricity Act, of 2003. It prohibits tariff differentiation linked to different uses of electricity,

¹⁵⁴ The Mines and Minerals (Development And Regulation) Amendment Act, 2015 (No. 10 Of 2015.) s 18.. It inserted Section 20 A (v) minimising and mitigating adverse environmental impacts particularly in respect of ground water,

¹⁵⁵ The National Mineral Policy (for Non-Fuel and Non-Coal Minerals), 2008, available at: [http://www.mines.nic.in/writereaddata/content/88753b05_NMP2008\(1\).pdf](http://www.mines.nic.in/writereaddata/content/88753b05_NMP2008(1).pdf) (visited on 22 Dec. 2021).

¹⁵⁶ *Common Cause v. Union of India & Others.*, Writ Petition (Civil) No. 194 of 2014, available at: <http://www.livelaw.in/sc-asks-uo-i-revisit-national-mineral-policy-read-judgment/> (last visited on 20 Dec. 2020)..

¹⁵⁷ “Centre Starts Reviewing National Mineral Policy Following Supreme Court Directions” available at: <http://www.downtoearth.org.in/news/centre-starts-reviewing-national-mineral-policy-following-supreme-court-directions-58644> (last visited on 20 Dec. 2020).

something that could be used to improve the accessibility to drinking water. The lack of a water dimension pervades electricity law.¹⁵⁸ The Rural Electrification Policy, 2006 only makes a single reference to water which does no more than the existence of a link. The Parliament and the state assemblies can legislate regarding electricity; the subject is a part of the Concurrent List. The central Act relating to the matter is the Electricity Act, of 2003. It prohibits tariff differentiation linked to different uses of electricity, something that could be used to improve the accessibility to drinking water. The lack of a water dimension pervades electricity law. The Rural Electrification Policy, 2006 only makes a single reference to water which does no more than the existence of a link.

The Central Government has introduced several policy measures in the last few years to revitalise the power sector through the participation of the private sector. The most significant move to reform is the Electricity Act of 2003, legislation that liberalises the power generation sector. The reforms have had mixed success, in part due to the vast size and complexity of the sector and the reluctance of the State Electricity Boards to adopt the new framework.¹⁵⁹

The Central Government is authorised to frame the “*National Electricity Policy*” in consultation with the “*Central Electricity Authority*” and State Governments. The Union Government is also empowered to review and modify the policy now and then.¹⁶⁰

2.6.8. Dam Projects

The dam projects are not covered under any specific law and the preparation of such projects, their approval and financing, and their construction, sharing of benefits, and operation and maintenance take place as stipulated in the Constitution and the legal framework created under it. The legislative competency of the states to plan and

¹⁵⁸ The Electricity Act, 2003, s. 62. It provides for “determination of tariff for (a) supply of electricity; (b) its transmission; (c) wheeling of electricity; and (d) its retail sale”

¹⁵⁹ “Water Sustainability and Power Generation in India” available at: http://www.unepfi.org/fileadmin/publications/water/chief_liquidity2-3India.pdf (last visited on 25 Nov. 2020).

¹⁶⁰ *Supra.* note 158, s. 3(1). It provides: “The Central Government shall, from time to time, prepare the National Electricity Policy and tariff policy...”.

implement dam projects is authorised by Entry 17¹⁶¹, whereas the Centre gets this power by Entry 20 of Concurrent and Entry 56 of List I, relating to “*economic and social planning*”¹⁶². The Central Government has not used the enabling provision of Entry 56 but it is utilising Entry 20 of the Concurrent List to mandate the States to get clearance for medium and large irrigation projects.

“*The Inter-State Water Disputes Act 1956*” is central legislation about the planning and construction of dams. The 'Tribunals' awards, 'established under the Act, must be considered while planning and approving such projects. The award of the Tribunal itself has catalysed the development or initiation of new projects. Another central legislation is “*the River Boards Act, of 1956*”, which stipulates the constitution of Boards. Other legislations enforcing clearance of dam projects by the Union Government are “*the Forest Conservation Act, 1980* and “*the Environmental Protection Act, 1986*”. Such clearances are a crucial element in the approval of irrigation projects. There are several State legislations relating to groundwater, irrigation, irrigation, drainage, etc., and all of them affect and regulate the day-to-day operation of projects.

2.6.9. Resettlement and Rehabilitation

Issues of displacement, resettlement, and rehabilitation of the outsee are often a part of large-scale irrigation projects. The *Land Acquisition Act of 1894*, a statute from the British Empire, has been repealed as it needed major changes and modifications. Because of the required changes, the new Act was passed. In the process of land acquisition, the right to adequate compensation and transparency in the acquisition are essential aspects of Central legislation relating to displacement, resettlement, and rehabilitation¹⁶³ (*LARR Act, 2013*). This Act lays down the procedure to be followed while acquiring land for a public purpose.

¹⁶¹ The Constitution of India, Sch. VII, List II, Entry 17: “Water, that is to say, water supplies, irrigation and canals, drainage and embankments, water storage and water power subject to the provisions of Entry 56 of List I.”

¹⁶² The Constitution of India, Sch. VII, List I, Entry 56: “Regulation and development of inter-State rivers and river valleys to the extent to which such regulation and development under the control of the Union is declared by Parliament by law to be expedient in the public interest.”

¹⁶³ The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 (Act No. 30 of 2013), available at: <https://dolr.gov.in> (visited on 11 May 2021).

Further, for all land acquisitions, its procedure, rights of those affected, compensation mechanisms, and concerns related to rehabilitation and resettlement have all undergone revision from the previous version of the rules. The government will utilise the acquired land for public purposes only. To entice India's large industrial sector to take up projects in a public-private partnership mode, the land purchase procedure has been defined by the Act. Additionally, the "public purpose" also includes, among others, the projects related to water, viz., the projects for its conservation, water harvesting, and sanitation.¹⁶⁴

This legislation prohibits the acquisition of multi-crop irrigated land. Suppose it is necessary to acquire such land under exceptional circumstances. In that case, the government should ensure that it is replaced by an equal quantity of uncultivable wasteland and transformed into fit for agriculture, or a deposit equal to the price of the acquired land is made with the relevant authorities for investment in agriculture to enhance food security.¹⁶⁵

Despite some legal amendments relating to displacement, the evidence shows that most relocated people end up in a worse situation than before. The leading causes of poverty resulting from forced relocation are homelessness, joblessness, landlessness, marginalisation, social disarticulation, increased illness, and loss of access to common property.

2.7 Legal Framework for Groundwater

Generally, groundwater is perceived as a part of landed property in legal parlance. So, its extraction by landowners where it existed is an unrestricted right. This rule originated in the 19th century in Britain, and the statutes¹⁶⁶ and court rulings in India have officially recognised it. The Indian Easement Act, of 1882 also followed the common law principle of absolute proprietorship regarding groundwater. This Act¹⁶⁷ recognised the right of the landowner to extract groundwater beneath his property that does not flow in a designated channel. It is believed to be inadequate and obsolete for addressing current issues and is likely to be rejected because of the present legal

¹⁶⁴ *Id.*, s.2(1)(b) iv.

¹⁶⁵ *Id.*, s.10.

¹⁶⁶ Ramaswamy R. Iyer, *Water and the Laws in India* 407 (Sage Publications Pvt. Ltd., New Delhi, 2012)

¹⁶⁷ The Indian Easement Act, 1882. available at <https://www.indiacode.nic.in/bitstream/123456789/2349/1/A1882-05.pdf>

scenario. The valid reason may be that land-based water rights were established when groundwater was not an important water source and pumping techniques did not encourage overexploitation and unsustainable use. As a result, groundwater has not been a major issue in water management historically.

The Central Government found it difficult to enact groundwater legislation owing to constitutional ineptitude. However, in an endeavour that has been ongoing for a long, it drafted the first Model Bill in 1970 for conserving, regulating, protecting, and managing groundwater and distributing it to States for adoption. It has since been redrafted in 1992, 1996, 2005, and 2011, and more recently in 2016. ‘*The Model Groundwater Bill*’ circulated to the States¹⁶⁸ to check the increasingly recognized problem of groundwater over-exploitation, but the states largely ignored it for a long. To correct certain defects in the Act, the Model Bill was redrafted in 1992 and further amended in 1996 and 2005. But, as the groundwater situation deteriorated, some States and Union territories started enacting groundwater legislation. The states/UTs have primarily adopted the basic framework of the Model Bill while enacting the groundwater statutes, and some of these are briefly discussed in the following section.

2.7.1. The Andhra Pradesh Act

The preamble of “*The Andhra Pradesh Water, Land, and Trees Act 2002*” provides for tree planting, regulation of usage of surface and over-extraction of groundwater, and water conservation to protect water, farmland, and environmental health. The Act provides for establishing Authority to govern the use of groundwater resources of the State, and every groundwater structure shall be required to register with the authority.¹⁶⁹ In consultation with the Authority, the designated officer can prohibit the pumping of water that is likely to damage the groundwater or environment in any area for six months.¹⁷⁰ None can dig a well within 25 meters of a water source used for public drinking water supply unless specifically authorised under Section 11(sub-

¹⁶⁸ Sujith Koonan, “Groundwater Legal Regime in India: Towards a Paradigm Shift”, available at: <http://www.globalwaterforum.org/2016/12/12/groundwater-legal-regime-in-india-towards-a-paradigm-shift/> (visited on 18 Feb. 2020).

¹⁶⁹ *Supra* note 151, s. 7(b), illus. (g). It provides as under: “The right of every owner of land to collect and dispose within his own limits of all water under the land which does not pass in a defined channel and all water on its surface which does not pass in a defined channel.”

¹⁷⁰ *Supra* note 151 s 16.

section 1) and Section 9.¹⁷¹ Only a public well for drinking water supply can be dug in an over-exploited area.¹⁷² Section 13 specifies the distance and depth to which a well must be sunk to prevent unnecessary interference for access to groundwater from deeper aquifers. Any person or organisation is prohibited from polluting the groundwater in any way, shape, or form.¹⁷³

The law also stipulates a realistic chance to be heard, the right to appeal, and penalties for those who violate it. Amongst other things, the powers of investigation, information gathering, inquiry, closure and sealing of unlawful wells, and equipment seizures¹⁷⁴ have also been granted to the Authority. The Act is unique and comprehensive as water management is planned in an integrated approach.

2.7.2. The Goa Groundwater Act

The Goa Ground Water Regulation Act, of 2002, authorises the Government to set up a groundwater cell. The State government may designate any area as a water-scarce area or ‘over-exploited’ in consultation with the Groundwater Cell.¹⁷⁵ Applicants seeking registration of an existing well must submit the request in the required form to the Groundwater Officer within 60 days of this Act's notification date.¹⁷⁶ Sinking a new well requires approval from the local Groundwater Officer.¹⁷⁷ Anybody violating this law or interfering with the work of a Groundwater Officer can be penalized with a jail term, fine, or both.¹⁷⁸

In the exercise of authority bestowed under the Act, the Government of Goa notified the Goa Ground Water Regulation Rules, 2003. These rules were further amended in the 2012 vide notification no. 4/1/EO-WRD/2012-13/25 to provide for the registration of drilling firms.¹⁷⁹

¹⁷¹ *Supra* note 151 s 9

¹⁷² *Supra* note 151 s 2(1)

¹⁷³ *Supra* note 151 s 8(2)

¹⁷⁴ *Supra* note 151 s 9 and 11

¹⁷⁵ The Goa Groundwater Regulation Act, 2002 (Goa Act 1 of 2002), s. 11(3), available at: <https://goawrd.gov.in/acts-rules/ground-water-act> (visited on 26 Dec. 2021).

¹⁷⁶ *Id.*, s 19

¹⁷⁷ *Id.*, s 3

¹⁷⁸ *Id.*, s 4

¹⁷⁹ *Id.*, s 5(1)

2.7.3. The Himachal Pradesh Groundwater Act

The “*Himachal Pradesh Ground Water (Regulation and Control of Development and Management) Act 2005*” is one of the ground-breaking legislations by a State to legalize and control the growth in groundwater use and its management. Under this law, a new authority, the “*Himachal Pradesh Ground Water Authority*,” would be established to regulate groundwater exploitation, and it will work under the government's overall control.¹⁸⁰ If the authority deems it essential to designate an area as “*a notified area*” in the public interest, the State Government will be advised accordingly, and all groundwater extraction activities will be regulated and managed appropriately.¹⁸¹ The State can also make such a declaration of a notified area *suo moto* by publishing it in the Official Gazette without the permission or knowledge of the authority. Those harmed or offended by such a declaration may register an objection within 30 days of such publication, and the authority may recommend the government denotify the same.¹⁸²

In addition, those who wish to extract groundwater from a notified area must apply, furnishing prescribed details, to the Authority for payment of a specified fee.¹⁸³ A permit can be granted within 60 days of receipt of an application if the authority is satisfied, and the drinking water shall be given priority over other needs.¹⁸⁴ The Authority must consider various considerations outlined in Section 7 (sub-section 5) while granting such permission. Further, it provides the applicant a chance to be heard before a decision is made, and the outcome must be conveyed to him within 30 days.¹⁸⁵

Existing groundwater users in notified areas have been mandated to register within 60 days with the Authority established after completing the necessary form and paying any fee that the authority may prescribe. This period can be extended if there are some valid grounds for its extension. The user will be eligible to continue to use

¹⁸⁰ The Himachal Pradesh Ground Water (Regulation and Control of Development and Management) Act 2005 (Act No 31 of 2005), s 3 (available at <https://www.indiacode.nic.in/>)

¹⁸¹ *Id.*, s 26

¹⁸² *Id.*, s 3

¹⁸³ *Id.*, s. 5(2).

¹⁸⁴ *Id.*, ss. 5(4) & 5(5).

¹⁸⁵ *Id.*, s. 7(1).

groundwater in the same quantity and manner that he was drawing before submitting the application for registration till his registration request is pending.¹⁸⁶

This Act also deals with harvesting rainwater for water conservation¹⁸⁷ and groundwater recharge, which is a landmark provision. To ameliorate the groundwater situation, the Authority may designate areas for groundwater recharge and ask for the implementation in such an area of its recommendations for rainwater harvesting for recharging groundwater. The Authority may involve the State Government's relevant agency to accomplish this work. Authority may direct the construction of structures for rainwater harvesting in urban areas, in housing, commercial, or other buildings having a plinth area of 100 m² or more. The Municipal Corporation or concerned local authority may also be instructed by the authority to enforce the establishment of rooftop rainwater collecting devices for groundwater recharge in construction plans of buildings with a plinth area of more than 100 square meters.

2.7.4. The Karnataka Groundwater Act

“*The Ground Water Regulation Act, 1999*” prioritised drinking water supply and its sources' preservation. To prevent uncontrolled groundwater exploitation in the notified regions of the State, a comprehensive “*The Karnataka Groundwater (Regulation and Control of Development and Management) Act, 2011*” legislation has been passed to regulate the usage of groundwater. The proposed bill also provides to establish the Karnataka Ground Water Authority,¹⁸⁸ prohibit and regulate groundwater extraction in the designated region, specify the minimum distance between irrigation bore wells, and notify any places affected by a drought.

The Groundwater Authority is provided to function under the overall supervision and control¹⁸⁹ of the Government. If, after deliberations with various experts,¹⁹⁰ the Authority considers controlling groundwater use, extraction, or both in any area in the public interest, it shall urge the State to pronounce that area as ‘*a notified area.*’ The authority may recommend the government to de-notify the area if it concludes in

¹⁸⁶ *Id.*, s. 7(2)

¹⁸⁷ *Id.*, s 15

¹⁸⁸ The Karnataka Groundwater (Regulation and Control of Development and Management) Act, 2011 (Karnataka Act No 25 of 2011), s. 3, available at: [https://dpal.karnataka.gov.in/storage/pdf-files/25%20of%202011%20\(E\).pdf](https://dpal.karnataka.gov.in/storage/pdf-files/25%20of%202011%20(E).pdf) (visited on 16 Dec. 2021).

¹⁸⁹ *Id.*, s. 5(3).

¹⁹⁰ *Id.*, s. 8(1)..

collaboration with other expert bodies that the groundwater situation in such an area has improved, which may be done by Govt. by following the stipulated process.

The authority should also ensure that groundwater extraction is not more than the aquifers' natural replenishment. The government may, on the authority's recommendation, take as many feasible initiatives as possible, in addition to regulatory measures, to improve the groundwater scenario.

Anyone intending to dig a well in a notified area to use groundwater for personal use or the community must apply for permission from the authorities.¹⁹¹ If the Authority decides to grant permission in the public interest, it may issue a permit enabling the drilling or excavation of a well to withdraw and use groundwater, subject to the terms and limits imposed in the permission. These terms will require the applicant to install, within the specified period, an artificial recharge structure of sufficient size. However, every individual shall be given a hearing before denying a permit. The applicant must be informed about the Authority's decision within sixty days of making the application. In addition, any existing user of groundwater in the notified area must submit an application to the authority in the prescribed form and manner, within 120 days of the date of such pronouncement, for a certificate of registration acknowledging its current use.

The Act also mandates drilling agencies to register their machinery with authority in six months. A person in the business of drilling for groundwater extraction must obtain a licence from the Authority per the terms and conditions laid out in the Act. The Authority may revise the terms of a registration certificate or a permit for technical reasons after providing the user of groundwater a chance to be heard. If the permission or certificate of registration is obtained by deception, or if the terms of issuing the permit or certificate are not complied with by the holder without sufficient cause, the Authority may revoke it.¹⁹² The Act renders a person in the notified area not holding a permit ineligible¹⁹³ to avail of any grant, subvention, or loan from the Government or financing institutions to dig a well and the power connection for the electricity supply to extract groundwater.

¹⁹¹ *Id.*, s. 10.

¹⁹² *Id.*, s. 4.

¹⁹³ *Id.*, s. 7.

The Authority will identify regions suitable for groundwater recharge and promote community involvement in watershed management to improve the groundwater condition.¹⁹⁴ The Authority is empowered to provide guidelines for rainwater harvesting in all approved development projects. The Authority may order all residential, commercial, and other buildings with a plot size of 100 square meters or greater in recognised metropolitan areas to create rainwater collecting systems within a specified period. To the extent that this Act empowers the Government or Authority to act, the Civil Courts have no authority to intervene.¹⁹⁵ And no injunction shall be issued for any activity performed under this Act.

2.7.1.5. The Kerala Groundwater Act

Groundwater extraction in some areas of the State has been allowed to continue unchecked, resulting in environmental issues in these areas. “*The Kerala Groundwater (Control and Regulation) Act 2002*” has been enacted to regulate and manage the use and extraction of groundwater in the state and to ensure its conservation. According to the legislation, a state Ground Water Authority would be established,¹⁹⁶ with the right to notify locations where groundwater development will be controlled and regulated.¹⁹⁷ Every groundwater user in a notified region must submit an application to the authority for a permit and register its well within 120 days of establishing the authority.¹⁹⁸ In addition, the authority has the jurisdiction to deny approval for any use within 30 meters of any water source used for public drinking water supply.¹⁹⁹

The Act treats any breach of the statutes as a criminal activity and penalizes it. It has several flaws as it relies on a top-down approach without allowing people to participate directly or through panchayats or other organisations. One of the Act's shortcomings is that it does not specify any role of the financial agencies and State Electricity Board in supplementing the authority's functions in controlling groundwater extraction. Water and sand mining, which negatively influence groundwater behaviour, have not been adequately addressed due to a lack of

¹⁹⁴ *Id.*, s. 15.

¹⁹⁵ *Id.*, s.16.

¹⁹⁶ The Kerala Groundwater (Control and Regulation) Act, 2002 (Act 19 Of 2002), s. 3, available at: <https://groundwater.kerala.gov.in/2018/06/02> (last visited on 15 May 2022).

¹⁹⁷ *Id.*, s.6.

¹⁹⁸ *Id.*, s.7(4).

¹⁹⁹ *Id.*, s.10.

innovative plans. Similarly, planning and execution of water harvesting programmes are also missing in Kerala Act.

2.7.1.6. Maharashtra Groundwater Act

Groundwater is a crucial resource, and it is essential and beneficial to provide for its conservation and regulate and control its use and withdrawal in the State through measures for the management of demand and supply and protect water sources for public drinking water supply with the community participation.

The “*Maharashtra Groundwater (Development and Management) Act, 2009*” was enacted as the tendency of indiscriminate extraction of groundwater in some areas of the State is continuing unchecked, resulting in undesired environmental problems in such areas. Maharashtra's State Groundwater Authority (SGA)²⁰⁰ and District Level Groundwater Authority (DLA) will be established for this purpose. The Act also defines the duties, functions, and powers of the “*Groundwater Surveys and Development Agency*” (GSDA).²⁰¹

“*The Maharashtra Water Resources Regulatory Authority,*” notified under Section 3 of “*the Maharashtra Water Resources Regulatory Authority Act, 2005 (Water Resources Act)*”, shall exercise the powers vested in and to perform assigned duties and roles, under this Act, in the prescribed manner and shall be the State Groundwater Authority (SGA). The SGA is empowered to notify areas for regulating, developing, and managing groundwater; to de-notify areas where such development can be restarted; to protect the quality of water; to register the owners of groundwater structures in the State, and to prohibit the installation of new and extraction of groundwater by the existing deep-wells.

The Act also provides for the levy of a cess. It stipulates that GSDA and the CGWB must work with the State Authority to determine which regions of the state are recharge-worthy and issue rainwater harvesting instructions to recharge groundwater.²⁰² To optimize groundwater use in notified areas, it provides for the preparation of a feasible crop plan based on the Groundwater Use Plan, keeping in

²⁰⁰ The Maharashtra Groundwater (Development and Management) Act, 2009 (Maharashtra Act No. XXVI of 2013), s 3 available at https://www.indiacode.nic.in/bitstream/123456789/15740/3/maharashtra_groundwate.pdf

²⁰¹ *Id.*, s.46.

²⁰² *Id.*, s.9.

view the recommendations of SGA and in conjunction with the Panchayat, the Watershed Water Resources Committee (WWRC), and DLA.²⁰³

In non-notified regions, the State Authority, in conjunction with the GSDA, should issue required directions to the authorities to implement the aquifer and watershed-based plan for groundwater use.²⁰⁴ Additionally, farmers in the non-notified regions will be encouraged to adopt a cropping pattern appropriate for their area's water supply and the Groundwater Use Plan of the watershed.

Registration of owners and operators of drilling rigs in the state with GSDA will be monitored by the State Authority as laid down in Section 12 following various regulations. To ensure the safety of wells, the State Authority will give directions to urban local authorities and Panchayats to oversee the work in the region.²⁰⁵ In writing, the State Authority may delegate duties or powers to any of its employees, the District Authority, the GSDA, or the WWRC. For this Act, the State Water Board created under the Water Resources Act is the Empowered Committee which should compile the “*Integrated Watershed Development and Management Plan*” for the State and get the council's approval.

The WWRC must establish an aquifer-based groundwater usage plan with the GSDA's technical help, and the District Authority must notify it as prescribed.²⁰⁶ Based on the annual rainfall and water level data, the WWRC must update the groundwater usage plan yearly and monitor groundwater withdrawals. The WWRC is empowered to recommend to DLA to regulate agrochemicals' use for crop production and the disposal or injection of wastewater to protect the groundwater quality.²⁰⁷ In conjunction with professional bodies and the GSDA, the WWRC must suggest to the DLA to control or ban sand mining in the notified area.²⁰⁸

2.7.7. The Tamil Nadu Groundwater Act

The “*Tamil Nadu Ground Water (Development and Management) Act 2003*” was passed to conserve the state's groundwater, prevent its over-extraction, and ensure a

²⁰³ *Id.*, s.29.

²⁰⁴ *Id.*, s. 34.

²⁰⁵ *Id.*, s.12.

²⁰⁶ *Id.*, s.28.

²⁰⁷ *Id.*, s.30.

²⁰⁸ *Id.*, s.35.

planned expansion in its use and effective management. It was repealed in 2013 for enacting a comprehensive law to suit the changed scenario, but no law has been enacted for the past 10 years.²⁰⁹

A Govt. Order has been issued by the Public Works Department on July 23, 2014, which contains detailed regulations for the management of groundwater and issuance of no-objection certificate or licence for extraction of groundwater in Tamil Nadu. It was issued to regulate the extraction and transportation of groundwater, and it has been challenged in various writ petitions. It has been a subject of legal challenges, with some writ petitions finding the G.O. to be valid and others seeking its quashing.

2.7.8. The West Bengal Groundwater Act

The main objective of “*The West Bengal Ground Water Resources (Management, Control and Regulation) Act 2005*” is that the extraction and usage of groundwater must be controlled and regulated, and heavy metals and pesticides must be prevented from contaminating the water supply²¹⁰. For this purpose, the State Government shall create an authority viz., “*the West Bengal State Level Ground Water Resources Development Authority*” w.e.f. a date indicated in the notification.²¹¹ This Authority's headquarters shall be located in ‘*State Water Investigation Directorate (SWID)*.’

The State Government may establish for every District other than Kolkata a “*District Level Ground Water Resources Development Authority*” bearing the district's name.²¹² It will help the State Authority perform its duties and functions and exercise its powers. The District Authority will have jurisdiction over every Municipality, Block, or Notified Area Authority within its district. A registration certificate or permit for groundwater use shall be granted as per provision in the Act by the State Level Authority to manage the groundwater resources in the State. It will prepare and implement a policy for groundwater conservation by replenishing, recharging, reusing, or recycling it in a coordinated manner. It will launch a public awareness

²⁰⁹ Jegadeeswari Pandian, “Draft bill on groundwater: Madurai Bench of Madras HC seeks Tamil Nadu's stand,” *The New Indian Express*, May 23, 2025, available at <https://www.newindianexpress.com/states/tamil-nadu/2023/Apr/08/draft-bill-on-groundwater--madurai-bench-of-madras-hc-seeks-tamil-nadus-stand-2563795.html>

²¹⁰ The West Bengal Ground Water Resources (Management, Control and Regulation) Act 2005 (West Bengal Act XVIII of 2005), Preamble, available at <https://www.indiacode.nic.in/bitstream/123456789/14460/1/2005-18.pdf>

²¹¹ *Id.*, s.3.

²¹² *Id.*, s.4.

programme and encourage adopting traditional practices and modern technology.²¹³ On and from the commencement of the Act, a person will be required to obtain a permit before sinking a well to draw groundwater from the appropriate state-level or local Level Authority, as applicable, in the form required.

Any User extracting or using groundwater before the commencement of the Act shall apply and obtain a certificate of registration to utilize groundwater from the competent Authority of such area.²¹⁴ The State Level Authority can authorize any individual or organization to enter any building or land at any reasonable time to investigate, measure groundwater structure, take water or soil samples, and inspect any existing well or one being sunk.²¹⁵ It may require any person to install a well to preserve samples of excavated material up to three months after completion of work or its abandonment.

If somebody installs, sinks, or uses a well without permission, violates the provisions of the Act or does not comply with these, or obstructs the authorised person from performing his duties, he shall be punished and may face fines up to Rs. 5,000 for the first, and Rs. 10,000 for the second or subsequent offence.²¹⁶ The Act bars the courts from interfering with the decisions despite anything conflicting with any other legislation in force or any instrument effective due to the order of any court or any other law.

2.7.9. The Other States

In **Delhi**, the country's capital, groundwater levels in more than 60% of the area are declining. The depth to the water table generally contours follows the area's topography.²¹⁷ The development and use of groundwater in the capital are regulated by “*Delhi Groundwater Regulation Direction, 2010.*”²¹⁸ These directions were

²¹³ The West Bengal Ground Water Resources (Management, Control and Regulation) Act, 2005, s. 3, available at: <https://www.indiawaterportal.org/sites/default/files/iwp2/> (last visited on 11 Dec. 2021).

²¹⁴ *Id.*, s.6.

²¹⁵ *Id.*, s.8.

²¹⁶ *Id.*, s.16 (b).

²¹⁷ At the central level, Central Ground Water Authority (CGWA) constituted in January 1997 under sub-section (3) of Section 3 of the Environment Protection Act, 1986 as per direction of Hon'ble Supreme Court of India, has been vested with responsibility for regulation and control of groundwater development and management.(available at https://cag.gov.in/uploads/download_audit_report/2021/7%20Chapter-3)

²¹⁸ The Environment (Protection) Act 1986 (Act No.29 of 1986), s 5

notified under “*Section 5 of The Environment (Protection) Act, 1986*”. No new tube well can be installed as per these stipulations without the permission of competent authority, i.e., Municipal Corporation or Delhi Jal Board, as applicable. Any violation of directions is punishable as per Section 15 of the Act. Any well drilled without permission of competent authority will be sealed, and the drilling company shall be prosecuted.

As far as **Punjab** is concerned, *The Punjab Tube Wells Act 1954* regulates the state's construction, operation, maintenance, and distribution of water pumped by State tubewells, but not individuals.²¹⁹ The Punjab Government took a new initiative for the conservation of irrigation water and to prevent the transplanting of paddy in the state before the notified date. It issued an ordinance in 2008 viz., '*Punjab Preservation of Subsoil Water Ordinance*', enacted as an Act of similar name in 2009.²²⁰ As 72 percent of cultivated area in the state is dependent on groundwater for irrigation, it helped reduce irrigation water demand and contributed to check the rate of groundwater table decline. It has been dealt with in detail in Chapter 5 about the case study of Punjab. Haryana also enacted a similar Act in 2009 for the conservation of groundwater.

2.7.10 An assessment of the emerging Framework

These groundwater statutes vary in their extent as some regulate its withdrawal and use in notified areas only, while some cover the whole of the state. Further, some of the former legislations laid emphasis, particularly on the utilization of groundwater for drinking water supply and its regulation. The Groundwater Acts primarily provide to set up a new institutional structure in the respective states to govern groundwater. Andhra Pradesh has enacted a groundwater law in the broader framework linking conjunctive management of groundwater with surface water in the context of environmental protection.²²¹ The West Bengal Act is the only State legislation that provides the Authority with a wider command area encompassing the prevention of groundwater contamination by heavy metals and pesticides, formulation of a policy to

²¹⁹ *The Punjab Tube Wells Act 1954* (Punjab Act 21 of 1954.) available at <https://pwrmdc.punjab.gov.in/acts> (visited on December 21, 2021)

²²⁰ The Punjab Preservation Of Subsoil Water Act, 2009 (Punjab Act No. 6 Of 2009) available at https://www.indiacode.nic.in/bitstream/123456789/14991/1/pb_preservation_of_subsoil_act2009_

²²¹ *Supra* note 153 s 6.

preserve it, and encouraging involvement and participation of people in the planning its use.²²²

The Maharashtra Act amalgamates its functions with the Water Resources Act to regulate and control surface and groundwater under a unified command. It provides optimal groundwater use and conservation through supply and demand management measures. It entrusts the work of monitoring and planning groundwater use by preparing different level plans through GSDA.

The Himachal Pradesh legislation has been the first comprehensive Act that casts a duty on the State to award priority to water use for drinking purposes, whereas Acts of most States lack this prioritization of the use of water for drinking.

There is a lack of implementation of these Acts for different reasons which can only be guessed in the absence of data. Other factors can be groundwater's increasingly politically sensitive nature, leading to a lack of state initiatives. The dependability of groundwater as a water source and the dependence of States on it for different uses have resulted in a state of affairs where it is almost impossible for the government to change the existing equilibrium, even if it is crooked. Moreover, these regulations do not address the issue adequately and are designed to make implementation difficult.

Based on the narrative set by the groundwater situation in the country, it can be safely assumed that State laws do not address water rights but ban the installation of tubewells and introduce licenses to govern water extraction and sale. Almost all statutes do not allow local representation in management authority to local groups. An all-inclusive review of these State laws reveals the absence of coordination in managing groundwater appropriation. Comprehensive legislation enacted by Parliament with an apparent groundwater conservation and management policy would be ideal. To deal with the groundwater situation effectively, we need an integrated approach that includes legislation, social action, economic incentives, and, of course, a firm resolve to ensure groundwater availability for future generations.

2.8 Recent Initiatives to Strengthen Legal Framework

The existing response of the Central Government to the deepening groundwater crisis reflects the intricacies of the emerging situation. A Committee constituted to suggest

²²² S. Koonan, "Groundwater—Legal Aspects of the Plachimada Dispute" in P. Cullet, A. Gualtieri, et.al. (eds.), *Water Governance in Motion* 159 (Cambridge University Press, New Delhi, 2010).

the reforms in two apex institutions, i.e., CGWB and CWC, has recommended the creation of a new entity by merging and restructuring existing organizations, i.e., a National Water Commission²²³. The new entity should be an autonomous and accountable Commission to facilitate the nation's water resources operation through expert advice and appropriate incentives. The Union Government has taken some initiatives during the last decade to reinforce the legislative framework for groundwater governance in the country, and some of these are briefly discussed hereunder.

2.8.1. The Water Conservation Authority Bill

Water conservation is one of the most important components of water management, but there is inadequate legislative support for this activity. *The Water Conservation Authority of India Bill, 2016* has been framed to set up a Water Conservation Authority of India²²⁴ to prepare and implement a comprehensive action plan to conserve rainwater (including river water) and groundwater throughout the country. After the enforcement of this Act, the Central Government, as soon as possible but within one year, shall establish for this Act a *Water Conservation Authority of India* by notification in the Official Gazette.²²⁵ The preamble of the proposed bill states that it intends to encourage the conservation of tree cover and surface water and control the withdrawal and usage of surface and groundwater to protect land, water, and the environment.²²⁶ The Authority shall perform any activities assigned by the Central Government and execute a country-wide comprehensive action plan for conserving river waters, rainwater, and groundwater.²²⁷ Other functions of the Authority²²⁸ shall be to:

- a. Build adequate storage in different parts of the country, particularly in desert and drought-prone areas;
- b. Revive all the dried rivers and make trenches in all the river basins;

²²³ Khandwalla P., "Comment on the Proposed National Water Commission," *The Economic and Political Weekly*, Vol. 51, Issue No. 52,87 (2016).

²²⁴ The Water Conservation Authority of India Bill, 2016, s. 3(1), available at: http://jalshakti-dowr.gov.in/sites/default/files/Model_Bill_Groundwater_May_2016_0.pdf (visited on 11 May 2022).

²²⁵ *Id.*, Preamble

²²⁶ *Id.*, s.3(1).

²²⁷ *Id.*, s.4(1).

²²⁸ *Id.*, s.4(2).

- c. Construct bunds and check dams on river beds;
- d. Take up works relating to deepening and widening canals and ponds;
- e. Build shafts and trenches for recharge at appropriate places;
- f. Create infrastructure for water conservation and recycling of wastewater;
- g. De-silt existing ponds, reservoirs, canals, and other such water bodies;
- h. Recharging shafts for dried-up bore wells, village ponds, and hollows;
- i. Revive the lost lakes and ponds;
- j. Advise the appropriate Government to diversify away from water-guzzling crops;
and
- k. Encourage people's participation, particularly school children, in water harvesting and conservation and create mass awareness about the importance and necessity of water conservation through radio, videos, pamphlets, booklets, hoardings, and print and electronic media.

2.8.2. The Interstate Water Disputes Bill

To reduce the delay in the adjudication process for resolving water disputes amongst the states, a Bill, "*The Interstate River Water Disputes (Amendment) Bill 2019*",²²⁹ has been drafted to amend the ISWD 1956. It seeks to constitute a permanent tribunal, so there will be benches, and one bar would look at more than one issue/dispute. The Bill is expected to define a new framework to resolve inter-state water disputes quickly. As per the Bill, one interstate river water tribunal will be established for the entire country, with separate benches for different rivers depending on the nature of the case. Retired judges, government officials, and specialists would serve on these panels, providing time-bound decisions within three years. This arrangement would facilitate state-to-state cooperation and better water management. The Lok Sabha has already approved it, and now it is under consideration in the Rajya Sabha.

²²⁹ The Interstate River Water Disputes (Amendment) Bill 2019 available at [https://prsindia.org/files/bills_acts/bills_parliament/2019/Inter-State%20River%20Water%20Disputes%20\(Amendment\)%20Bill,%202019.pdf](https://prsindia.org/files/bills_acts/bills_parliament/2019/Inter-State%20River%20Water%20Disputes%20(Amendment)%20Bill,%202019.pdf)

2.8.3 River Basin Management Bill

The draft “*River Basin Management Bill, 2018*” facilitates inter-state coordination by establishing 13 River Basin Authorities for optimum inter-state rivers. These Authorities will ensure scientific land use and water resources planning with a unified perspective (including surface, groundwater, and soil moisture), taking a sub-basin or basin of the command area as a unit to achieve comprehensive and balanced development. The proposed legislation is expected to result in optimal development management and regulation of waters of inter-State Rivers following the basin approach.²³⁰

2.8.4 New CGWA Guidelines for Groundwater Extraction

The CGWA has notified the following guidelines applicable since June 2020 to regulate groundwater extraction in the country.²³¹ The establishments of Armed Police and Armed Forces and individual consumers extracting water for drinking and other household usages in the rural and urban areas, groundwater withdrawals for agricultural purposes, and Micro and Small Enterprises withdrawing GW @ less than 10 m³/day are exempted from obtaining NOC for GW extraction. Government water supply and Group Housing agencies shall be granted NOC only for five years to install wells for domestic supply in those areas where the urban local bodies cannot supply water in the desired quantity. For groundwater requirements exceeding 20 m³/day, it will be mandatory to install Sewage Treatment Plants to recycle treated water for gardening, car washing, etc. The users will be liable to pay for the extracted GW at prescribed rates. The agriculture sector is exempted from obtaining 'NOC' for GW extraction. The States/UTs have been advised to substitute their free/subsidized electricity programme with a more appropriate pricing strategy and focus on agricultural diversification/other activities to lessen their reliance on groundwater. New major industries, except MSMEs, will not be granted 'NOC' in areas assessed as over-exploited. Compulsory water audits of more than 100 m³/day of industrial extractions will be carried out annually. Expansion of existing industries in over-exploited units that involve an increase in the quantity of GW extraction will not be

²³⁰ River Basin Management Bill, 2018, available at https://prsindia.org/files/bills_acts/bills_parliament/2019/Draft%20River%20Basin%20Management%20Bill,%202018.pdf

²³¹ Central Ground Water Authority, Ministry of Jal Shakti, Govt. of India, “Compendium of Guidelines, Notification etc. 2024” (August, 2024) available at <https://cgwa-noc.gov.in/landingpage/Guidelines/FINALCOMPENDIUM.pdf#ZOOM=100>

allowed. New MSME industries for packaged water will not be issued NOC in over-exploited areas.

2.8.5. Revised Policy Framework for Water

In September 2019, the Union Water Resources Minister announced that the government plans to update the NWP 2012 and make critical changes in the water governance structure and policy framework.²³² The government has asked a committee of independent experts to draft the policy which has received 124 submissions by state and central governments, academics, and practitioners over a period of one year. The NWP will be based on the striking consensus that emerged through these wide-ranging deliberations.

In a shift towards demand management, crop diversification is the single most important step in resolving India's water crisis as irrigation consumes 80-90 per cent of India's water, The policy suggests diversifying public procurement operations to include nutri-cereals, pulses, and oilseeds. Reduce-Recycle-Reuse has been proposed as the basic mantra of integrated urban water supply and wastewater management, with treatment of sewage and eco-restoration of urban river stretches, as far as possible through decentralised wastewater management. All non-potable use, such as flushing, fire protection, vehicle washing must mandatorily shift to treated wastewater.

2.8.6. Sustainable Groundwater Management Bill

MoWR has prepared a new framework, "*Groundwater (Sustainable Management) Bill 2017*", to address the fast-developing crisis of groundwater depletion being faced by many States. The GW (Sustainable Management) Bill 2017²³³ integrates legal developments having taking place since the 1970s, such as the decentralization reforms kick-started in the 1990s, the recognition of water as a fundamental right and its recognition as a public trust. In doing so, it provides new bases for regulating groundwater as a public resource and to take measures at aquifer level, something that

²³² Mihir Shah, "What India's new water policy seeks to deliver," *The Indian Express*, Oct 30, 2021, available at <https://indianexpress.com/article/opinion/columns/what-indias-new-water-policy-seeks-to-deliver-7595819/> (visited on 25 December,2021)

²³³ Groundwater (Sustainable Management) Bill 2017 available at <http://jalshakti-dowr.gov.in/> (last visited on 21 Apr. 2021)

is crucial to address ongoing overexploitation and falling water tables. However, this draft does not provide for regulating groundwater use at the local level and its conservation at the aquifer level.

2.8.7. National Water Framework Bill, 2016

The draft Bill provides an attempt to prepare an overall legislative framework at the national level, containing principles for preserving, conserving, regulating, and managing water as a scarce yet valuable natural resource. States would be able to share river water without infringing on the rights of others, according to the proposed legislation. Other topics covered by the Bill are water price and regulation, water as a right, water quality, flood control, drought management, and water conservation. Describing "water as part of life", the proposed Bill provides that every person of any caste, creed, or religious belief has the right to easily access a supply of safe drinking water near his home.²³⁴ It hopes to tackle conflicts over water. The Bill provides to adopt a national water quality standard for all uses. All water resource projects in a sub-basin or basin are expected to adhere to an integrated river basin development and management plan. The proposed legislation calls on the government to work to revitalize river systems by ensuring unpolluted and continuous flow with clean and attractive river banks.

A provision has been made for the metering and pricing of urban water supply on a volumetric basis. A participatory approach to irrigation management shall be encouraged, including establishing Water Users Associations. A statutory status shall be provided to such Associations, which will be empowered to collect a fee for irrigation services and retain a portion of it. Section 29 of the Bill provides a suitable agency to collect data about the river flows, rainfall, crop and source-wise area irrigated, and usage of both surface and groundwater for various purposes. As per the new law, it will be the responsibility of the water users, the State, and its citizens to protect and conserve the water.

²³⁴ Draft National Water Framework Bill available at: <https://www.ielrc.org/content/e1604.pdf> (visited on 20 Apr. 2021).

The measure proposes that states will share river water without violating others' rights. The law also includes water quality, water conservation, drought management, and water price regulation. Some key provisions of the draft Bill are as under:

i. Right to water for life

Describing water “as part of life” and essential for its sustenance, the proposed bill provides that everyone has the right to easy access to clean drinking water near his home, regardless of religion, caste, creed, class, gender, handicap, community, age, or socioeconomic situation.²³⁵

It defines “water as part of life” and includes drinking, bathing, cooking, personal hygiene, sanitation, and other household and personal usage. It includes water for requirements of women and water for livestock at home.²³⁶ Even when the water supply is entrusted to a commercial entity, the States are responsible for preserving right of everyone to clean water for life.²³⁷

ii. Binding national water quality standards

It is proposed to introduce a national water quality standard for all uses that will be legally obligatory.²³⁸

iii. Integrated river basin development and management plan

An integrated plan for the development of a river basin and its management should be prepared, and all projects in that basin relating to water resources must adhere to it.²³⁹

iv. Dispute Resolution

Aiming to prevent adjudication wherever feasible, Section 29 of the Draft Bill 2016 specifies that adequate institutional arrangements be made within the state and beyond to arrive at a negotiated settlement. Concerning water sharing and conflicts, it provides as follows:

²³⁵ *Id.* s 3

²³⁶ *Id.* s 3(1).

²³⁷ *Id.* s 3(3).

²³⁸ *Id.* s 10

²³⁹ *Id.* s 12

- a. *“Because each river basin's conditions are responsible for managing the region's water resources, they are all entitled to use the river as long as their actions do not jeopardise anyone's right to water for life;*
- b. *It means that there is no hierarchy of rights in a river system, which means that everyone in the basin has the same level of access to the river flow;*
- c. *It is the responsibility of the River Basin Authority to provide the best and most sustainable development of interstate rivers and river valleys for each inter-state basin or part thereof;*
- d. *Each river basin authority should develop a basin-wide strategy;*
- e. *The upper basin state should inform the lower basin states of the planned efforts, consult them on the likely implications at all stages, and take care to avoid substantial damage to them;*
- f. *The basin states should collaborate in good faith for a sensible, equitable, and comprehensive use of river resources for all partners;*
- g. *To avoid adjudication as much as possible, all levels of state and interstate river-basin governance should be developed with the right institutional frameworks in place;*
- h. *All existing disputes relating to water must be considered in light of this legislation, and appropriate action is taken;*
- i. *A National Informatics Centre for water-related hydrologic data gathering from around the country, its consolidation, and analysis will be set up; and*
- j. *An agency will regularly gather statistics on rainfall, river flows, irrigated agricultural area, and water usage for various purposes (surface and groundwater) for each river basin/sub-basin”.*²⁴⁰

v. Rejuvenation of the river system

The proposed legislation requests the government to ensure ‘Aviral Dhara’, ‘Nirmal Dhara’, and ‘Swachh Kinara’ (constant and unpolluted flow and clean and aesthetic river banks).²⁴¹

²⁴⁰ *Id.* s 29

vi. People-centered decentralized management

The proposed legislation calls for local watershed development, rainwater harvesting, and participatory irrigation management to be part of a people-centered, decentralized approach to surface and groundwater management. At the same time, local initiatives need to be recognized, encouraged, and empowered.²⁴²

vii. Appropriate use of waste water

The government must make efforts to treat wastewater and make its gainful reuse properly. To meet these objectives, the government must devise and implement economic models based on reducing, recycling, and reusing waste.²⁴³

viii. Flood mitigation and management

For flood forecasting and inundation of areas, a Decision Support System (DSS) shall be developed by the Union Government through the National Water Informatics Centre (NWIC)., as provided in Section 20 of the Draft Bill. To address the location-specific issues, the States will also be expected to develop their DSSs. The NWIC will ensure appropriate and effective federal and state DSS compatibility.

ix. Drought management and mitigation

Each State shall prepare a drought management and mitigation policy within six months of the notification of enforcement of this enactment and action plan.²⁴⁴

x. Sectoral use of water

To bring the desired change in sectoral water consumption, the Government is responsible for meeting Service Level Benchmarks for water, solid waste management, stormwater drainage, and sanitation. A provision has been made for the metering and pricing of urban water supply on a volumetric basis.²⁴⁵ The Government shall recognize and encourage irrigation management at all levels to

²⁴¹ *Id.*, s.5.

²⁴² *Id.*, s.7.

²⁴³ *Id.*, s.9.

²⁴⁴ *Id.*, s.20.

²⁴⁵ *Id.*, s.22 (d) (4).

be participatory. Water users' associations must be able to retain a share of charges collected by them as Irrigation Service Fees.²⁴⁶ Industrial facilities must reduce their water footprint²⁴⁷ over time. Industries will be required to declare their yearly water footprints, along with a strategy to reduce them gradually²⁴⁸. A regulation relating to industrial water consumption states that excessive use would be penalized by the denial of water supply services.

xi. Water resource information system

A web-based Water Resources Information System shall be developed and maintained by the Government of India on a publicly available Platform based on a Geographical Information System.²⁴⁹

xii. Water use prioritization

The priority of the Bill lies in meeting the drinking water needs as a right to life. It shall also include an allocation to achieve sustainable livelihoods, supporting sustainable agriculture, food security, and eco-system requirements.²⁵⁰ The new legislation requires all levels of government, people, and water users to safeguard, conserve, and preserve water resources for future generations.

2.9 The Bhartiya Nyaya Sanhita, 2023

Public nuisance A person is guilty of a public nuisance who does any act or is guilty of an illegal omission which causes any common injury, danger or annoyance to the public or to the people in general who dwell or occupy property in the vicinity, or which must necessarily cause injury, obstruction, danger or annoyance to persons who may have occasion to use any public right but a common nuisance is not excused on the ground that it causes some convenience or advantage.²⁵¹

²⁴⁶ *Id.*, s.24 (2).

²⁴⁷ *Id.*, s.25 (1).

²⁴⁸ *Id.*, s.25 (2).

²⁴⁹ *Id.*, s.27 (1).

²⁵⁰ *Id.*, s.11.

²⁵¹ Ministry of Law and Justice, Govt. of India, The Bhartiya Nyaya Sanhita, 2023. s.270 available at https://www.mha.gov.in/sites/default/files/250883_english_01042024.pdf (visited on March 25, 2025)

Fouling water of public spring or reservoir Whoever voluntarily corrupts or fouls the water of any public spring or reservoir, so as to render it less fit for the purpose for which it is ordinarily used, shall be punished with imprisonment of either description for a term which may extend to six months, or with fine which may extend to five thousand rupees, or with both.²⁵²

Mischief (1) Whoever with intent to cause, or knowing that he is likely to cause, wrongful loss or damage to the public or to any person, causes the destruction of any property, or any such change in any property or in the situation thereof as destroys or diminishes its value or utility, or affects it injuriously, commits mischief.

Explanation 1. It is not essential to the offence of mischief that the offender should intend to cause loss or damage to the owner of the property injured or destroyed. It is sufficient if he intends to cause, or knows that he is likely to cause, wrongful loss or damage to any person by injuring any property, whether it belongs to that person or not.

Explanation 2. Mischief may be committed by an act affecting property belonging to the person who commits the act, or to that person and others jointly.²⁵³

2.10 The Bhartiya Nagarik Suraksha Sanhita, 2023

As defined in this Act²⁵⁴, a “place” includes a house, building, tent, vehicle, and vessel and a “public place” includes also property belonging to the State, camping grounds and grounds left unoccupied for sanitary or recreative purposes. The Indian Penal Code (IPC) Section 268 defined public nuisance as an act or omission that causes common injury, danger, or annoyance to the public. The Bhartiya Nagarik Suraksha Sanhita, 2023 provides for removal of public nuisances as under:

A. Conditional order for removal of nuisance²⁵⁵:

(1) Whenever a District Magistrate or a Sub-divisional Magistrate or any other Executive Magistrate specially empowered in this behalf by the State

²⁵² *Id.*, s.279

²⁵³ *Id.*, s. 324

²⁵⁴ The Bhartiya Nagarik Suraksha Sanhita, 2023 (Act No. 46 of 2023) available at <https://www.indiacode.nic.in/bitstream/123456789/20099/3/aa2023-46.pdf>

²⁵⁵ *Id.*, s. 152

Government, on receiving the report of a police officer or other information and on taking such evidence (if any) as he thinks fit, considers

(a) that any unlawful obstruction or nuisance should be removed from any public place or from any way, river or channel which is or may be lawfully used by the public; or 61

(b) that the conduct of any trade or occupation, or the keeping of any goods or merchandise, is injurious to the health or physical comfort of the community, and that in consequence such trade or occupation should be prohibited or regulated or such goods or merchandise should be removed or the keeping thereof regulated; or

(c) that the construction of any building, or, the disposal of any substance, as is likely to occasion conflagration or explosion, should be prevented or stopped; or

(d) that any building, tent or structure, or any tree is in such a condition that it is likely to fall and thereby cause injury to persons living or carrying on business in the neighborhood or passing by, and that in consequence the removal, repair or support of such building, tent or structure, or the removal or support of such tree, is necessary; or

(e) that any tank, well or excavation adjacent to any such way or public place should be fenced in such manner as to prevent danger arising to the public; or

(f) that any dangerous animal should be destroyed, confined or otherwise disposed of,

such Magistrate may make a conditional order requiring the person causing such obstruction or nuisance, or carrying on such trade or occupation, or keeping any such goods or merchandise, or owning, possessing or controlling such building, tent, structure, substance, tank, well or excavation, or owning or possessing such animal or tree, within a time to be fixed in the order—

(i) to remove such obstruction or nuisance; or

(ii) to desist from carrying on, or to remove or regulate in such manner as may be directed, such trade or occupation, or to remove such goods or merchandise, or to regulate the keeping thereof in such manner as may be directed; or

(iii) to prevent or stop the construction of such building, or to alter the disposal of such substance; or

(iv) to remove, repair or support such building, tent or structure, or to remove or support such trees; or

(v) to fence such tank, well or excavation; or

(vi) to destroy, confine or dispose of such dangerous animal in the manner provided in the said order, or, if he objects so to do, to appear before himself or some other Executive Magistrate subordinate to him at a time and place to be fixed by the order, and show cause, in the manner hereinafter provided, why the order should not be made absolute.

(2) No order duly made by a Magistrate under this section shall be called in question in any Civil Court.

Explanation. A “public place” includes also property belonging to the State, camping grounds and grounds left unoccupied for sanitary or recreative purposes.

2.11. Conclusion

India is facing a dire water crisis which is likely to get worse. This chapter examines the development of a legal framework for India's water sector, from the customary laws created in ancient India through the developments during the British period to the additions and revisions made since independence. The enacted and proposed legislation's contents, shortcomings and omissions have been broadly discussed. Examining the legal and policy discourse reveals that the rights and obligations in the water law regime developed with civil society and were not created by the state. It analyses the proposed improvements of the current water laws and policies to address environmental, ecological, equitable, and development challenges. The review highlights that an alternative socio-legal discourse and set of practices must be devised, employing the organic and scientific knowledge of water resource management for better governance to pursue human rights.

Thus, there is an utmost need for using each drop of water more efficiently by making a coherent policy and legal framework, incorporating all major rulings by the Hon'ble Supreme Court regarding the recognition of water rights and the Public Trust Doctrine, for creating an effective water consumption culture, and considering the climatic advantages for the cultivation of crops.

CHAPTER III

INTERNATIONAL PERSPECTIVES RELATING TO THE GROUNDWATER GOVERNANCE

International water law includes several components. All of these may not be applicable explicitly in India but contribute significantly in several ways to the growth and development of laws relating to water at the domestic level.²⁵⁶ International law relating to water is as old as well as very advanced area of law. However, certain areas still need to be developed.²⁵⁷ Water regulation globally in the first phase focused mainly on navigational issues in international watercourses. Later, it has evolved progressively to cover issues comprising the sharing of international waters, environmental issues such as pollution, depletion of groundwater, drinking water, sanitation, and right and ownership perspectives of water. The existing water law at the international level covers only certain aspects of water and it lacks uniformity of international water treaties applicable globally.²⁵⁸

International water law is highly developed into a complex web of rules. These rules initially focus on issues related to the sharing of trans-boundary watercourses and address gradually an increasing number of issues relating to water globally.²⁵⁹ There are mainly three main reasons for the regulation of water under International law. First, the trans-national character of river basins, second, water management touches human rights aspects or other norms of international law and third reason is that the hydrological cycle within a country causes trans-boundary effects.²⁶⁰ International conventions can be applied globally or regionally depending upon the number of contracting parties. Various countries, inter-governmental organizations, and non-governmental organizations play a pivotal role in formulating water laws by gathering and exchanging information.

²⁵⁶ Philipp Cullet, Alix Gowland, *et.al.* (eds.), *Water Governance in Motion* 28, (Foundation Books, Delhi, 2010).

²⁵⁷ *Ibid.*

²⁵⁸ Philipp Cullet and Sujith Koonan, (eds), *Water Law in India: An Introduction to Legal Instruments* 15-20, (Oxford University Press, New Delhi 2017).

²⁵⁹ S.C. McCaffrey, *The Law of International Watercourses* 64 (Oxford University Press, 2007).

²⁶⁰ Antoinette Hildering, *International Law, Sustainable Development and Water Management* 48 (Eburon Academic Publishers, The Netherlands, 2006).

International water law has been witnessing deep changes in the last two decades. It seeks to embrace new important issues allied to water management. These are integrated water resource management, environment, human rights, trade, and economization in response to the current global water crisis. The international water courses owing to water scarcity and increasing environmental pollution will inevitably result in disputes in the future and extreme armed conflicts. Therefore, future arrangements and effective management of the international water courses through well-established international law are essential to prevent this.

This chapter examines various international instruments expressed in the form of conventions, treaties, declarations, etc. relating to water-related issues keeping in view its application in India directly or indirectly.

3.1. Evolution of International Water Law

Sustainable governance of resources is the biggest challenge of the twenty-first century. Earlier, the focus was on issues like finding water resources, exploitation, technological advancement, and financial arrangements. Currently, the primary concern is the reduced quantity of fresh and usable water. If effective and sustainable ways of management of this scarce and life-giving resource are not adopted urgently and immediately it will decrease and disappear.²⁶¹ International water law is well developed relating to trans-boundary issues and activities such as navigation on international water courses. In recent times, the significance of regulation on non-navigational aspects of international watercourses has developed speedily, and presently, it is broadly considered the central purpose of international Water law.²⁶² Global water law has developed at an accelerating pace over the last century, in parallel with growing competition between countries for this precious and increasingly scarce resource.

It is widely accepted that as the area and complications involved in the process of water management extend beyond national limits, so, it cannot be effectively addressed by national law and policies alone.²⁶³ One prime aspect of international law

²⁶¹ Joseph W. Dellapenna and Joyeeta Gupta (eds.), *The Evolution of the Law and Politics of Water* 3, (Springer Science + Business Media BV, Netherland, 2009)

²⁶² *Supra* note 1 at 30

²⁶³ Heather Cooley, Newsha Ajami, *et.al.*, “Global Water Governance in the Twenty-First Century” in *The World’s Water, Vol. 8* (2014), available at: <https://pacinst.org/wp-content/uploads/2013/07/ww8-ch1-us-water-Policy.pdf> (last visited on March 24, 2021).

on water is the navigational use of international watercourses. The use of water resources is also an important part of international law apart from the navigational use of international water courses. The UN Water Convention, 1997 provides a framework for the cooperation among nations on transnational watercourses concerning the use of their waters besides navigational matters.²⁶⁴ It is a multi-lateral treaty particularly focussing on shared water resources. The fundamental principle that underlines the use of transnational water courses is the ‘equitable and reasonable utilization’ of water and ‘the obligation not to cause significant harm’ to neighbours. To ensure that transboundary waters are used with the aim of ecologically sound and rational water management, conservation of water resources and environmental protection (article 2b).²⁶⁵ The Parties shall also take all appropriate measures to prevent, control and reduce pollution of waters causing or likely to cause transboundary impact (article 2a). It provides an international stage for the routine development and progression of trans-boundary cooperation. On 28 November 2003, the Meeting of the Parties to the Convention adopted decision III/1, amending articles 25 and 26 of the Convention to allow all United Nations Member States to accede to the Convention.²⁶⁶ India has not signed it yet. It may be due to the reason that she does not want to lose control over freshwater.²⁶⁷

Several international treaties are directly or indirectly connected to water. For instance, The UNECE Convention²⁶⁸ on impact assessment is applicable in the case of dams and other water-related infrastructure projects. The Parties shall, either individually or jointly, take all appropriate and effective measures to prevent, reduce and control significant adverse transboundary environmental impact from proposed activities (article 2.1) which means any activity or any major change to an activity subject to a decision of a competent authority in accordance with an applicable national procedure (article 1.v). This Convention imposes certain duties on the State parties²⁶⁹. It provides that “the States that have agreed to be bound by the Convention are under an obligation to carry out an environmental impact assessment of certain

²⁶⁴ UN General Assembly, *Convention on the Law of the Non-navigational use International Watercourses*, GA resolution 51/229, GA Official Records, UN Doc A/Res/Supplement No. A/51/49 (17 August 2014).

²⁶⁵ Convention on the Protection and Use of Transboundary Watercourses and International Lakes, 2013, art. 2(b)

²⁶⁶ *Id.*, art. 25 and 26

²⁶⁷ *Supra* note 1 at 29.

²⁶⁸ The Convention on Environmental Impact Assessment in a Trans-boundary Context ,1991, art.2(1).

²⁶⁹ *Id.*, art. 1(v)

activities at an early stage of planning. They may continue existing or enter into new bilateral or multilateral agreements or other arrangements in order to implement their obligations under this Convention”²⁷⁰ Under this Convention, the State parties are under general obligation to inform and consult each other on all major projects under consideration that may have a substantial negative environmental impact across territories. The Desertification Convention is another treaty that links water and desertification. promote cooperation among affected country Parties in the fields of environmental protection and the conservation of land and water resources, as they relate to desertification and drought²⁷¹ . It is the only legally binding international agreement linking environment and development to sustainable land management. National action programmes may include, inter alia, “strengthening of drought preparedness and management, including drought contingency plans at the local, national, or subregional levels, establishment and/or strengthening, as appropriate, of food security

systems, including storage and marketing facilities, particularly in rural areas; and development of sustainable irrigation programmes for both crops and livestock.”²⁷²

The Convention on wetlands of international importance (Ramsar Convention) is intrinsically concerned with water. It is an international convention that provides the framework for domestic action and international cooperation for the protection and effective use of wetlands and their resources. It exhorts the member countries to formulate and implement plans to promote the conservation of the wetlands and as far as possible, the wise use of wetlands in their territory.²⁷³ Indeed, the scope of the Ramsar Convention is not limited to trans-boundary wetlands but it is also applicable to wetlands that exist entirely within the boundaries of a Member State. There exist several non-binding instruments apart from treaties concerning water and related issues. The Dublin Statement, for instance,²⁷⁴ laid down principles for water sector reforms, in the early 1992. It called for fundamental new approaches to the assessment, development, and management of freshwater resources, which can only

²⁷⁰ *Id.*, art. 8.

²⁷¹ United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and / or Desertification, Particularly in Africa, 1994, art. 4 (2d).

²⁷² *Id.*, art. 10.3.

²⁷³ The Convention on Wetlands of International Importance Especially as Waterfowl Habitat, Ramsar, 1971, art. 3(1).

²⁷⁴ International Conference on Water and the Environment (ICWE), “The Dublin Statement on Water and Sustainable Development, 1992” 2. Available at <https://www.ielrc.org/content/e9209.pdf> (visited on Oct.2, 2021)

be brought about through political commitment and involvement from the highest levels of government to the smallest communities”²⁷⁵. According to this convention, prior information and the consent of Indigenous people are recognized as an essential element for any project affecting their water resources.

The history of international water treaties dates to 2500 BC when the two Sumerian city-states of Lagash and Umma agreed to settle a water dispute along the Tigris River. Subsequently, many water treaties have appeared. According to the Food and Agricultural Organization, there are more than 3,600 treaties concerning international water resources that appeared since 805 AD.²⁷⁶ Most of them deal with navigation and territorial delineation. In the last century, the focus has shifted from navigation towards the use, development, protection, and conservation of water resources in treaty-making. Cooperation is the way forward for several water-related interactions between nations and violence over water is not a strategically rational, effective, or economically viable option for countries. In the twentieth century, only seven minor skirmishes took place between nations over shared water resources, while over 300 treaties were signed during the same period.²⁷⁷

3.2 Theories and doctrines of international water law

The theoretic basis of the norms of international water law concerning trans-boundary water resources management emerges from different theories and doctrines. Several key principles of customary international water law overlap with each other or conflict with one another. Nations have conveniently chosen to rely on the specific customary principles that would support their claims to or actions over shared waters.²⁷⁸ A few of them are as follows:

3.2.1. Doctrine of Riparian Rights

Riparian is a Latin term. Etymologically the term “ripa” means the bank of the river or other body of water and as such “ripa proprietor” means a person who owns land

²⁷⁵ *Ibid.*

²⁷⁶ *Natural Resources and Infrastructure Division of the United Nations Economic Commission for Latin America and the Caribbean (ECLAC)*, “World Water Day 2009 calls attention to the waters that cross borders and link us together,” *International Rivers and Lakes*” Issue No. 47 (June 2009), p2. (available at <http://www.eclac.org/drii>)

²⁷⁷ *Ibid.*

²⁷⁸ Brahma Chellaney, *Water, Peace, and War: Confronting the Global Water Crisis* 249 (Oxford University Press, New Delhi, 2014).

on the bank of a natural water course or body of water.²⁷⁹ Thus the land to be riparian must have the stream flowing over it or along its borders, as the expression riparian means relating to, or situated or dwelling on the bank of a river or other body of water. In the same manner, riparian nations mean in international law, those who possess opposite banks or different parts of banks of the same river. Similarly, Riparian rights are those rights, which belong to land owners through whose property a natural water course runs, to the benefit of such stream for all purposes to which it can be applied.²⁸⁰

The concept of riparian rights or the doctrine of riparian rights originated from Roman law and moved into the common law structure in England. There it applied to the rights of individual riparian owners and as such took the form of a strict natural flow theory of riparian rights about private proprietary rights in water.²⁸¹ Recognition of equal rights to the use of water by all owners of and abutting a river is the essence of this doctrine as long as there is no resulting interference with the rights of other riparian owners. Each co-riparian has the right to have the water flow pass his lands undiminished in quantity and unimpaired in quality.²⁸² This doctrine of riparian rights about transboundary water law disputes has never been accepted as a basis for or found application in the settlement of such disputes despite its casual reference in the international arena.²⁸³

3.2.2 Theory of absolute territorial sovereignty

The theory of absolute territorial sovereignty provides that the upstream states are entitled to divert all the water from a shared watercourse without considering the need for downstream states. Regardless of the consequences in other countries, every country has the right to use the waters of an international river flowing in its boundaries, as it likes, without any obligation to notify or consult. This theory is also called the 'Harmon Doctrine'. It is named after the US Attorney General, Mr Judson

²⁷⁹ "Riparian," available at: <http://www.dictionary.com/browse/riparian> (last visited on March 27, 2023).

²⁸⁰ "Riparian Rights," available at: <http://legal-dictionary.thefreedictionary.com/Riparian+Rights> (last visited on March 28, 2023).

²⁸¹ B. R. Chauhan, *Settlement of International and inter-state water disputes in India* 24 (Indian law Institute New delhi, 1992)

²⁸² S. N. Jain, Alice Jacob, *et. al.*, *Inter-state Water Disputes in India* 151 (Indian Law Institute, New Delhi, 1971)

²⁸³ *Ibid.*

Harmon, who declared the absolute right of the USA to divert the Rio-Grande in 1895. He opined the fact that “the Rio Grande lacks sufficient water to permit its use by the inhabitants of both countries and does not entitle Mexico to impose restrictions on the USA which would hamper the development of the latter’s territory or deprive its inhabitants of an advantage with which nature had endowed it and which is situated entirely within its territory and USA exercises full sovereignty over its national territory”.²⁸⁴ This theory has little relevance in state practice and does not represent international law.

3.2.3 Theory of absolute territorial integrity

The theory of absolute territorial integrity is based on the concept that the lower riparian of an international river has the right to a full flow of water of natural quality and any interference with the natural flow by the upstream state requires the consent of the downstream riparian. Thus, the lower riparian is entitled to claim the continued and uninterrupted flow of water from the upper riparian territories, irrespective of any priority.²⁸⁵ That is why this theory is also called the ‘Natural water flow theory’. This theory is advocated by the downstream states as it entitles them to utilize the water of the international river unconditionally. Like, the ‘Harmon Doctrine’ this theory is also not supported much in state practice, jurisprudence, or the international water law related to trans-boundary water disputes.

3.2.4. Theory of limited territorial sovereignty

Another theory is the ‘theory of limited territorial sovereignty’ and is also called as ‘Equitable Apportionment’ Theory. This theory symbolizes the element of equitable apportionment to use the concerned trans-boundary waters. The equality of rights does not mean the right to equal division of water. It means the right of co-riparian states to share such water based on various factors. Such equitable apportionment depends upon, inter alia, the social and economic needs of the concerned states. It is concerned with the beneficial use of concerned waters only. To reserve the water for the future when present users are not satisfied would be unreasonable and contrary to the concept of equitable apportionment.²⁸⁶

²⁸⁴ M.M. Rahman, “Principles of International Water Law: Creating Effective Trans-boundary Water Resources Management” Vol. 1, No. 3, International Journal of Sustainable Society, 211 (2009).

²⁸⁵ *Supra* note 26 at 29.

²⁸⁶ *Supra* note 26 at 31

The basic principle of the theory is that every state has the right to utilize freely the water of shared rivers flowing on its territory without affecting the rights and interests of the co-riparian. In this case, sovereignty over shared water is conditional and not absolute. According to this theory, the co-riparians have reciprocal rights and duties about the use of waters of a shared watercourse and each has the right to an equitable share of its benefits. This theory is also known as the ‘theory of sovereign equality and territorial integrity’. The main benefit of this theory is that it recognizes the rights of both upstream and downstream countries simultaneously as it guarantees the right of reasonable use by the upstream country in the framework of equitable use by all interested parties. Limited territorial sovereignty includes the principles of equitable and reasonable utilization and obligation not to cause significant harm. This theory is also based upon the concept of treating a particular drainage basin or inter-state river as one unit irrespective of the contesting states or nations divided by political or administrative boundaries.²⁸⁷ This theory which forms the basis of modern international water law has gained wide acceptance.

3.2.5. Doctrine of Prior appropriation

‘Doctrine of Prior appropriation’ is based on the assumption that the first user always has a priority right over the use of river waters. Thus upper riparian state or any first appropriator of water also called as senior appropriator is eventually favoured. The downstream state can also have a priority right if it is the first user of the river waters. The senior appropriator has priority over the entitlement of a junior appropriator to draw resources from a waterway.²⁸⁸ The key point in prior appropriation is the diversion of water from a watercourse for beneficial usages, including irrigation, industrial or mining purposes, electric power generation, and municipal supply.²⁸⁹

3.2.6 The Colorado Doctrine

This principle observes the evolution of the doctrine of prior appropriation in the American West as a means of shaping the right to use scarce waters from rivers, streams, springs, lakes, and ponds. It was named after the U.S. Supreme Court case

²⁸⁷ *Ibid.*

²⁸⁸ *Supra* note 23 at 251.

²⁸⁹ *Supra* note 23 at 249.

Wyoming v. Colorado.²⁹⁰ The Colorado Doctrine unlike the broader doctrine of prior appropriation is based on the customary dictum “First in time, first in right.” The first user or appropriator of water obtains the priority for its future use, as against later users or appropriators. Water rights can also be lost due to non-use as said in the maxim “Use it or lose it.”²⁹¹

3.2.7. The doctrine of Reason

This emerging and evolving principle seeks to link modern water norms and rules with ecosystem values, rather than merely with human demand and competition.²⁹²

3.3. Principles governing International Law

There is no doubt that cooperation beyond state boundaries is essential because of the importance of freshwater to life on Earth and the uneven distribution of water resources across the globe. International law is one of several tools for establishing such cooperation and for shaping and implementing policy. From a global perspective, water governance faces two main challenges such as fair distribution and sustainability. These challenges have been addressed increasingly in recent years by international law.

This said, fundamentally communal interest (or as some would say, ‘a global public good’) such as water cannot be easily decoded in legal terms. International law - famously lacking a world constitution or a central legislator - is a system traditionally based on freely agreed commitments by territorially sovereign states. For a long time, waterways have been viewed as part of sovereign territory and groundwater (which accounts for 97% of the world’s available freshwater) is seen as a natural resource in the same legal category as oil and gas, over which the state exercises full control.²⁹³ The doctrine of ‘sovereignty over natural resources’ has gained additional importance as a legal principle because it was an outcome of a long struggle in the era of decolonization. A state has complete control over the water resources on its territory, limited only by the rights to water usage of co-riparian states in their respective territories.

²⁹⁰ *Supra* note 23 at 259 (*State of Wyoming v. State of Colorado*, 259 U.S. 419).

²⁹¹ *Supra* note 23 at 271.

²⁹² *Ibid.*

²⁹³ Catherine Brolmann, “International law as tool for global water governance” 1-2, available at <http://www.thebrokeronline.eu/Blogs/Prioritising-Water/International-law-as-tool-for-global-water-governance> (last visited on 30 March 2016).

The biggest obstacle in the creation of a framework for worldwide safe access to freshwater is the territorial basis of international law. Moreover, a legal concept such as the ‘global commons,’ which international law discourse has developed is a part of the agenda for protecting areas such as the high seas or the Arctic regions. This practice is not applicable to the world’s freshwater resources as these resources cannot, in the same way, be physically localized in one spot on the globe and placed outside the spheres of respective states’ sovereignty.²⁹⁴ Modern international conventions, agreements and treaties widely acknowledge the principle of equitable and reasonable utilization, an obligation not to cause significant harm, principles of cooperation, information exchange, notification, consultation and peaceful settlement of disputes. These principles could assist effective trans-boundary water resources management involving riparian countries of shared watercourses which would encourage sustainable development across the globe. Conflicts in international water courses are the cause of serious political, economic, environmental, and social instability regionally and internationally. Nile basin in Africa, the Tigris and Euphrates in the Middle East, the Aral Sea basin in Central Asia, the Parana basin in South America, and the Ganges basin in Asia are a few examples of trans-boundary water conflicts. Promoting and implementing integrated management through trans-boundary cooperation could reduce water conflicts among the nations and improve the condition of world water. Effective transboundary water resources management also enables the attainment of the three principle objects of integrated water resources management and sustainable development namely social equity, economic development, and environmental and ecological protection through good governance and community involvement.²⁹⁵

The lack of collective active and progressive management of trans-boundary water resources between two or more riparian countries is always the major threat to achieving integrated and sustainable development of the shared watercourses as well as that of the riparian nations. Further, the absence of adequate mechanisms and institutions to manage disputes over water resources results in issues related to the trans-boundary river basins, aquifers, and lakes. Few general and customary principles of international law related to water have become the basis of major

²⁹⁴ *Ibid.*

²⁹⁵ *Supra* note 29 at 215.

international conventions, treaties, and agreements for trans-boundary water resources management. However, the international community has yet to agree on a uniform mechanism/convention to manage trans-boundary water resources over the years.²⁹⁶

3.3.1. Principle of Equitable and Reasonable Utilisation

The basic principle of the theory of limited territorial sovereignty is use-oriented. Each basin state is entitled to a reasonable and equitable share of water resources for beneficial uses within its territory.²⁹⁷ Equitable and reasonable utilization does not necessarily mean an equal share of waters and rests on the foundation of shared sovereignty and equality of rights. Factors, such as the geography of the basin, hydrology of the basin, population dependent on the waters, economic and social needs, existing utilization of waters, potential needs in the future, climatic and ecological factors to a natural character and availability of other resources should be taken into account in determining equitable and reasonable share.²⁹⁸ As per this theory, every riparian or basin state or other concerned entity has a justified entitlement for a share of the water of the said basin or inter-state river, as the case may be. This theory is also based on the thesis of theoretically treating a particular drainage basin or inter-state basin as one unit irrespective of the political or administrative boundaries dividing the contesting states or federal units. A fair share of each respective state, federal unit, etc., in the concerned water, will depend on various factors and the circumstances of each case.²⁹⁹ It attempts to bring about an equilibrium of benefits that addresses the requirements and uses of each riparian nation. This doctrine has significant support in state practice, judicial verdicts, and codifications of global treaties.

3.3.2. Obligation not to cause significant harm

This doctrine is also a component of the theory of limited territorial sovereignty. It also states that no country in an international drainage basin is permitted to utilize the water of the International River in a way that would affect the rights or interests of other basin countries or the use of waters for beneficial purposes to their environment including harm to the well-being of humans or other living organisms. International

²⁹⁶ *Ibid.*

²⁹⁷ *Supra* note 10, art. 5, (and Helsinki Rules, 1966, art. IV).

²⁹⁸ *Supra* note 29 at 216.

²⁹⁹ *Supra* note 26 at 31.

water and environmental law also widely recognized this principle. However, there arises a question on the meaning and scope of the permitted use of such international watercourses. The permitted use may vary from the acceptance and elaboration of the riparian countries keeping in view their interests and benefits. Most of the modern global treaties and conventions recognize this doctrine and regard it as an important component of customary international law.³⁰⁰

3.3.3. Principles of notification, consultation and negotiation

According to the principles of notification, consultation, and negotiation, every riparian nation in a transnational watercourse has the right to prior notice, consultation, and negotiation in cases where serious harm is caused or likely to be caused to its rights or interest by another riparian who shares the same water course. These principles are usually accepted by international conventions, agreements, and treaties, while most upstream countries often oppose this principle. Notice is to be provided when a basin State proposes to undertake or permit the undertaking of a project that may substantially affect the interests of any co-basin State. This notice usually includes information, data, and specifications adequate for assessment of the effects of the project. Besides the obligation to notify and consult a comparatively new norm has emerged over the years whereby states are expected to monitor and assess specific environmental conditions domestically and disclose these conditions in a report to an international agency or international executive body constituted under an international agreement. The concerned parties to the agreement authorize the publication and collection of such information.³⁰¹

3.3.4. Principles of cooperation and information exchange

Under this principle, each riparian nation of an international watercourse is under obligation to cooperate and exchange data and information regarding the state of the watercourse including the existing and upcoming planned uses in such river basin. These principles are included in most modern international water conventions, treaties, and agreements, e.g. 1966 'Helsinki Rules, 1997 'UN Watercourses Convention', 1960 'Indus Waters Treaty', 1995 'SADC Protocol on Shared Water

³⁰⁰ *Supra* note 29 at 218.

³⁰¹ Shyam Diwan and Armin Rosencranz, *Environmental Law and Policy in India* 583 (Oxford University Press, New Delhi, 2014).

Course Systems’, 2002 ‘Sava River Basin Agreement’, 1996 ‘Mahakali River Treaty’, 1995 ‘Mekong Agreement’, 2004 ‘Berlin Rules’ and 1992 ‘UNECE Water Convention’. These principles are also approved by modern international environmental conventions and declarations, e.g. 1972 Stockholm Declaration of the UN Conference on Human Environment, the 1992 Rio Declaration on Environment and Development, and the 1992 Convention on Biological Diversity.³⁰²

3.3.5. Peaceful settlement of disputes

The doctrines ‘equitable and reasonable utilization’, ‘obligation not to cause significant harm’, ‘principles of cooperation’, ‘information exchange’, and ‘notification, consultation and peaceful settlement of disputes’ are broadly approved by modern international water conventions, agreements, and treaties. The 1966 ‘Helsinki Rules on the Uses of the Waters of International Rivers, the 1997 ‘UN Convention on Non-Navigational Uses of International Watercourses’ and the 2004 ‘Berlin Rules on Water Resources are based on these principles. These globally accepted principles could act as the guiding principles for the riparian States of common watercourses for ensuring effective trans-boundary water resources management.³⁰³

The lack of comprehensive legal and institutional framework including effective conflict resolution mechanisms and guidelines for cooperative management involving the riparian countries, has become a main hindrance to achieving effective management of trans-boundary water resources.

In the past ten years, this condition has been approved by a genuine paradigm shift: from water use as a state’s right to water access as a human right. This is nothing less than a full shift in perspective away from the state to the human individual as a starting point for international water norms.³⁰⁴ In 2002, in an authoritative ‘General Comment’, the ‘UN Committee for Economic Social and Cultural Rights’ initiated a process of interpreting and recognizing the human right to water. This is a complex process, operating mostly through instruments not legally binding in a formal sense (such as the well-known 2010 UN General Assembly Resolution), but it has made the

³⁰² *Supra* note 40.

³⁰³ *Ibid.*

³⁰⁴ *Supra* note 38.

human right to water a central normative factor in international affairs, decision-making, and economic cooperation. It is an undecided factor whether the human rights approach or the sovereign resources approach to water will prevail in international law – most likely they will co-exist, which for various reasons would not be a bad thing.³⁰⁵

International water law which is expressed in the form of conventions, covenants, protocols, declarations, agreements, treaties, and resolutions is a complex, fragmented landscape. For an effective governance of water, it must develop into an integrated legal framework to support the integrated approach towards water.³⁰⁶ The following are a few prime instruments concerning water and related issues.

3.4. United Nations Charter, 1945

Franklin D. Roosevelt, the 32nd President of the United States coined the term “United Nations”.³⁰⁷ It was first used during the Second World War in the Declaration by the United Nations on 1 January 1942, when representatives of 26 nations pledged their governments to continue fighting together against the Axis Powers. Representatives of 50 countries met in San Francisco in the year 1995 at the United Nations Conference on International Organization to draw up the United Nations Charter. The representatives of these 50 countries signed the Charter on 26 June 1945. Later, Poland which was not a member at the conference signed the UN Charter on 15 December 1945 and became one of the original Member States. Thus, there were 51 original members of the UN Charter.³⁰⁸

The United Nations Charter does not contain any specific content related to water. However, Article 55 of the United Nations Charter may be interpreted to lay stress on water as a right. This Article promotes:

- a. “full employment, higher standards of living, and conditions of economic and social progress and development;”

³⁰⁵ *Ibid.*

³⁰⁶ *Ibid.*

³⁰⁷ “Franklin D. Roosevelt: Presidential Term.” available at: <https://www.whitehouse.gov/1600/presidents/franklindroosevelt> (last visited on September 15, 2021).

³⁰⁸ “History of the United Nations”, available at: <http://www.un.org/en/sections/history/history-undated-nations/> (last visited on September 15, 2021).

- b. “Solution for problems related to international economic, social, health and related problems; and international cultural and educational cooperation;”
- c. “Universal respect for and observance of, human rights and fundamental freedoms for all irrespective of race, sex, language or religion.”³⁰⁹

To uphold the above-mentioned undertakings, it is necessary to make water a right due to the increase in population, climatic changes, and increasing water shortages.

3.5. Universal Declaration of Human Rights, 1948

Representatives from all regions of the world drafted the Universal Declaration of Human Rights a milestone document in the history of human rights. It was proclaimed by the United Nations General Assembly in Paris on 10 December 1948³¹⁰. The Universal Declaration of Human Rights sets out the fundamentals of human rights which are to be protected universally and have been translated into more than 500 languages.³¹¹

It recognizes the innate stateliness of every human being and acknowledges that disregard and contempt of human rights have resulted in barbarous acts which have outraged the conscience of mankind. It prioritizes the protection of human rights by the rule of law. The charter has reaffirmed the faith of the people of the United Nations in fundamental human rights, dignity, and worth of the human person and the equal rights of men and women. This declaration reminds the Member States of their vow to promote universal respect for human rights and fundamental freedoms and ensure their observance. Every member must promote respect for these rights and freedoms. It is essential to undertake such measures that will secure their universal recognition and observance among the people of Member States and among the peoples of territories within their jurisdiction.

Just like the United Nations Charter, the Universal Declaration of Human Rights does not express a specific mention of the right to water. Still, Article 25 of this

³⁰⁹ The United Nations Charter, 1945, art. 55.

³¹⁰ UN General Assembly, *Universal Declaration of Human Rights*, GA Resolution 217 (III), GOAR, UN Doc A/RES/3/217A (December 10, 1948)., available at: <http://www.un-documents.net/a3r217a.htm> (last visited on September 15, 2021).

³¹¹ *Ibid.*

Declaration is interpreted to include water as a matter of right. This Article declares that:

(1) *“Everyone has the right to a standard of living adequate for the health and well-being of himself and his family, including food, clothing, housing and medical care and necessary social services, and the right to security in the event of unemployment, sickness, disability, widowhood, old age or other lack of livelihood in circumstances beyond his control.”*³¹²

The term “including” shows that this list is not exhaustive and has a scope of extension to include some other components like water.

3.6. Geneva Conventions and Protocols

In 1859 Henry Dunant³¹³ was aghast to witness thousands of wounded soldiers lying helpless without any care. An unofficial international conference was organized in 1863 in which an agreement was reached to form a relief organization to assist the Army Medical Services in wartime. This paved the way for the formation of the Red Cross. Governments were asked to send representatives to a diplomatic conference in the year 1864. Twelve European nations signed a treaty in this diplomatic conference stating that in future wars they would care for all sick and wounded military personnel irrespective of their nationality. This treaty known as the Geneva Convention focussed only on the soldiers injured on the battlefield. However, its ambit of work has expanded immensely over the years. Currently, there are four Geneva Conventions which include armed forces on land and at sea, prisoners of war, and civilians. These are universally recognized and accepted. In addition to these two more new protocols were drawn up in 1977.³¹⁴

3.6.1. Geneva Convention III of 12 August 1949

The Prisoners of War Convention, 1929 was replaced by the Geneva Convention III, 1949 due to the changes in the conduct of warfare and its subsequent consequences. The new Convention was wide in its scope consisting of 143 articles. It expanded the

³¹² *Id.*, Art. 25.

³¹³ Henry Dunant: The founder of the Red Cross and first Nobel Peace Prize laureate.

³¹⁴ Geneva Convention (III) related to the Treatment of Prisoners of War. Geneva, 1949, available at https://www.un.org/en/genocideprevention/documents/atrocities-crimes/Doc.32_GC-III-EN.pdf (last visited on 18.9. 2021).

categories of persons who were entitled to the status of prisoners of war under Conventions I and II. The conditions and places of captivity, particularly regarding the labour of prisoners of war, the relief they receive, their financial resources, and the judicial proceedings instituted against them were more precisely defined. The Convention recognised the principle of releasing and repatriating the prisoners of war immediately after the cessation of active hostilities.³¹⁵ The conditions of evacuation are mentioned as follows: *“The evacuation of Prisoners of war shall always be effected humanely and in conditions similar to those for the forces of the Detaining Power in their changes of station. The Detaining Power shall supply prisoners of war who are being evacuated with sufficient food and potable water and with the necessary clothing and medical attention. The Detaining Power shall take all suitable precautions to ensure their safety during evacuation and shall establish as soon as possible a list of the prisoners of war who are evacuated. If prisoners of war during evacuation, pass through transit camps, their stay in such camps shall be as brief as possible”*³¹⁶

The absence of any express provision for conditions of evacuation in the Prisoners of War Convention, 1929, throughout the Second World War, resulted in the ill-treatment of the prisoners during evacuation. It clearly stated that the prisoners of war should be evacuated by stages of not more than twenty kilometres per day.³¹⁷ Therefore the Geneva Convention III provides an article specifically relating to the conditions in which prisoners should be evacuated.

Access to food and potable water is recognized as a right for the prisoners of war.³¹⁸ Reference may also be made to Article 26 which relates to Food. It states as under:

“The basic daily food rations shall be sufficient in quantity, quality, and variety to keep prisoners of war in good health and to prevent loss of weight or the development

³¹⁵ *Id.*, art. 118

³¹⁶ *Id.*, art. 20,

³¹⁷ Prisoners of War Convention, 1929, art. 7. It reads as under:

As soon as possible after their capture, prisoners of war shall be evacuated to depots sufficiently removed from the fighting zone for them to be out of danger. Only prisoners who, by reason of their wounds or maladies, would run greater risks by being evacuated than by remaining may be kept temporarily in a dangerous zone. Prisoners shall not be unnecessarily exposed to danger while awaiting evacuation from a fighting zone. The evacuation of prisoners on foot shall in normal circumstances be effected by stages of not more than 20 kilometres per day, unless the necessity for reaching water and food depots requires longer stages.

³¹⁸ *Supra* note 59, art. 20 Para 2.

*of nutritional deficiencies. Account shall also be taken of the habitual diet of the prisoners.*³¹⁹

*“The Detaining Power shall supply prisoners of war who work with such additional rations as are necessary for the labour on which they are employed. Sufficient drinking-water shall be supplied to prisoners of war. The use of tobacco shall be permitted. Prisoners of war shall, as far as possible, be associated with the preparation of their meals; they may be employed for that purpose in the kitchens. Furthermore, they shall be given the means of preparing, them-selves the additional food in their possession. Adequate premises shall be provided for messing. Collective disciplinary measures affecting food are prohibited.”*³²⁰

Para 3 of this Article lays an obligation on the Detaining Power to supply an adequate quantity of drinking water. However, there is no obligation to supply tobacco and it can be procured by the prisoners in the canteen.³²¹ The Convention makes specific provisions related to hygiene.³²² It reads as under:

*“The Detaining Power shall be bound to take all sanitary measures necessary to ensure the cleanliness and healthfulness of camps and to prevent epidemics. Prisoners of war shall have for their use, day and night, conveniences that conform to the rules of hygiene and are maintained in a constant state of cleanliness. In any camps in which women prisoners of war are accommodated, separate conveniences shall be provided for them.”*³²³

*“Also, apart from the baths and showers with which the camps shall be furnished, prisoners of war shall be provided with sufficient water and soap for their toilet and for washing their laundry; the necessary installations, facilities, and time shall be granted them for that purpose.”*³²⁴

Article 29 of this convention is based on Article 13 of the Prisoners of war Convention 1929.³²⁵ The Detaining Power must ensure the hygienic conditions of the

³¹⁹ *Supra* note 59, art. 26.

³²⁰ *Ibid.*

³²¹ *Id.*, art. 28,

³²² *Id.*, art. 29.

³²³ *Ibid.*

³²⁴ *Ibid.*

³²⁵ Art. 13, Prisoners of War Convention, 1929 read as under:

detention camps to prevent the spread of the epidemic. This Article provides that the camps must be equipped with baths and showers. Separate arrangements must be made for women prisoners, if any. Apart from baths and showers, prisoners of war must be provided with sufficient water and soap for their toilets and for washing their laundry. The following conditions for the transfer of prisoners of war after their arrival in camp³²⁶ are stated:

*“The Detaining Power, when deciding upon the transfer of prisoners of war, shall take into account the interests of the prisoners themselves, more especially so as not to increase the difficulty of their repatriation.”*³²⁷

*“The transfer of prisoners of war shall always be affected humanely and in conditions not less favourable than those under which the forces of the Detaining Power are transferred. Account shall always be taken of the climatic conditions to which the prisoners of war are accustomed and the conditions of transfer shall in no case be prejudicial to their health.”*³²⁸ *The Detaining Power shall supply prisoners of war during transfer with sufficient food and drinking-water to keep them in good health, likewise with the necessary clothing, shelter, and medical attention. The Detaining Power shall take adequate precautions, especially in case of transport by sea or by air, to ensure their safety during transfer, and shall draw up a complete list of all transferred prisoners before their departure.”*³²⁹

Further Para 3 of this article relates to maintenance and security. It provides that during transfer, the detaining power must provide an adequate amount of food and drinking water so that their health is not affected adversely. Thus, once again, the supply of drinking water has been made a right of the prisoners of war.

3.6.2. Geneva Convention IV, 1949

The Geneva Conventions adopted before 1949 were related to combatants and not to civilians. There were some provisions for the protection of civilians against the consequences of war in the Regulations annexed to the Hague Conventions of 1899

Belligerents shall be required to take all necessary hygienic measures to ensure the cleanliness and shall have facilities for engaging in physical exercises and obtaining the benefit of being out of doors.

³²⁶ Id., art. 46.

³²⁷ *Ibid.*

³²⁸ *Ibid.*

³²⁹ *Ibid.*

and 1907. The World War I revealed the ineffectiveness of the Hague provisions. The International Conferences of the Red Cross of the 1920s and the Diplomatic Conference of 1929 suggested the drafting of the convention on the protection of civilians in enemy-occupied territory or enemy territory. A draft convention popularly known as the "Tokyo Draft" containing 33 articles was approved by the International Conference of the Red Cross in Tokyo in 1934. The draft was to be present before a diplomatic conference scheduled to be held in 1940. However, due to the outbreak of World War, the diplomatic conference could not be held.

The draft was adopted in 1949. It includes provisions related to the general protection of populations against certain consequences of war. Many provisions were related to the status and treatment of protected persons. This Convention was supplementary to provisions of the Hague Regulations of 1907.³³⁰

The right to water is enshrined in Article 85 of the Geneva Convention IV, 1949 which relates to Accommodation and Hygiene. This Article states that:

“The Detaining Power is bound to take all necessary and possible measures to ensure that protected persons shall, from the outset of their internment, be accommodated in buildings or quarters which afford every possible safe guard as regards hygiene and health, and provide efficient protection against the rigours of the climate and the effects of the war. In no case shall permanent places of internment be situated in unhealthy areas or in districts the climate of which is injurious to the internees. In all cases where the district, in which a protected person is temporarily interned, is an unhealthy area or has a climate which is harmful to his health, he shall be removed to a more suitable place of internment as rapidly as circumstances permit.”³³¹

“The premises shall be fully protected from dampness, adequately heated and lighted, in particular between dusk and lights out. The sleeping quarters shall be sufficiently spacious and well ventilated, and the internees shall have suitable bedding and sufficient blankets, account being taken of the climate, and the age, sex, and state of health of the internees.”³³²

“Internees shall have for their use, day and night, sanitary conveniences which conform to the rules of hygiene, and are constantly maintained in a state of

³³⁰ Convention (IV) related to the Protection of Civilian Persons in Time of War available at <https://ihldatabases.icrc.org/ihl/INTRO/380> (Visited on 11 April 2015).

³³¹ *Id.*, art. 85.

³³² *Ibid.*

cleanliness. They shall be provided with sufficient water and soap for their daily personal toilet and for washing their laundry; installations and facilities for this purpose shall be granted to them. Showers or baths shall also be available. The necessary time shall be set aside for washing and cleaning.”³³³

“Whenever it is necessary, as an exceptional and temporary measure, to accommodate women internees who are not members of a family unit in the same place of internment as men, the provision of separate sleeping quarters and sanitary conveniences for the use of such women internees shall be obligatory.”³³⁴

The matter included in this Article is similar to those contained in Articles 22, 25, and 29 of the Prisoners of War Convention.³³⁵ Para 3 of Article 85 speaks about sanitary convenience. It provides the internees a right to use hygienic and clean sanitary conveniences during the day as well as at night. To maintain hygiene and cleanliness adequate supply of water must be provided for daily personal toilet and washing personal laundry. Besides this showers or baths should be made available.

The provision for drinking water has been made in Article 89 which runs as under: *“Internees shall also be given how they can prepare for themselves any additional food in their possession. Sufficient drinking water shall be supplied to internees.*”³³⁶

Para 3 of this Article³³⁷ states that drinking water must be provided to the internees by the Detaining authorities. Article 127 provides the conditions for the transfer of internees. Paragraph 2 of this Article states that:

³³³ *Ibid.*

³³⁴ *Ibid.*

³³⁵ Geneva Convention Relative to the Treatment of Prisoners of War, 1929, art. 22:

In order to ensure the service of officers' camps, soldier prisoners of war of the same armed forces, and as far as possible speaking the same language, shall be detached for service therein in sufficient number, having regard to the rank of the officers and persons of equivalent status. Officers and persons of equivalent status shall procure their food and clothing from the pay to be paid to them by the detaining Power. The management of a mess by officers themselves shall be facilitated in every way.

Art. 25, Prisoners of War Convention, 1929 reads as under:

Unless the course of military operations demands it, sick and wounded prisoners of war shall not be transferred if their recovery might be prejudiced by the journey.

Art. 29, Prisoners of War Convention, 1929 reads as under:

No prisoner of war may be employed on work for which he is physically unsuited.

³³⁶ *Id.*, art. 89.

³³⁷ This Article is based on Article 11 of Prisoners of War Convention, 1929 which reads as under:

The food ration of prisoners of war shall be equivalent in quantity and quality to that of the depot troops. Prisoners shall also be afforded the means of preparing for themselves such additional articles of food as they may possess. Sufficient drinking water shall be supplied to them. The use of tobacco shall be authorized. Prisoners may be employed in the kitchens. All collective disciplinary measures affecting food are prohibited.

*“The Detaining Power shall supply internees during transfer with drinking water and food sufficient in quantity, quality, and variety to maintain them in good health, and also with the necessary clothing, adequate shelter, and the necessary medical attention.”*³³⁸

This Article imposes a duty upon the Detaining Power to supply good quality drinking water in required quantity during transfer of the internees.

3.6.3. Additional Protocol I, 1977

The Additional Protocol to the Geneva Conventions of 12 August 1949, relating to the protection of victims of international armed conflicts was adopted at Geneva on 8 June 1977. This Protocol contains provisions related to the protection of objects inalienable to the survival of the civilian population.³³⁹ It, inter alia, prohibits the attack, destruction, and removal of the objects, that are indispensable to the survival of the civilians like food and drinking water. These prohibitions do not apply to those objects which are used by members of its armed forces of an adverse party or in direct support of military action. However, no action shall be taken against these objects if those objects are used only by the military forces of the adverse party or in direct support of military action if it is expected to leave an impact on the civilian population like inadequate food or water. In case of military necessity to defend any invasion of its territory, a party may not obey the prohibitions within a territory under its control.

Article 55 of Additional Protocol I emphasizes the protection of the natural environment. It states that care should be taken during war to protect the natural environment against widespread, long-term, and severe damage. This Article includes the protection of water bodies as well.

3.6.4. Additional Protocol II (1977)

Protocol Additional to the Geneva Conventions of 12 August was adopted on 8 June and it came into force on 7 December 1978, under Article 23.³⁴⁰ This Protocol

³³⁸ *Id.*, art127.

³³⁹ Additional Protocol I to the Geneva Conventions, 1977, art. 54.

³⁴⁰ Additional Protocol II to the Geneva Conventions, 1977, art. 5. (available at <http://www.ohchr.org/EN/ProfessionalInterest/Pages/ProtocolII.aspx>)

mentions that persons whose liberty has been restricted³⁴¹ due to the reasons related to armed conflict shall be provided with food and drinking water.

Protection is provided to the objects that are essential to the survival of the civilian population.³⁴² It prohibits the attack on, destruction, or removal of essential objects for the survival of the civilian population. It also prohibits rendering such objects useless. It, inter alia, includes drinking water installations and supplies and irrigation works.

3.7. International Covenant on Civil and Political Rights, 1966

The UN Commission on Human Rights drafted two treaties the International Covenant on Civil and Political Rights and its optional Protocol and the International

³⁴¹ Art. 5, Additional Protocol II, 1979 relates to Persons whose liberty has been restricted. It states as under:

1. In addition to the provisions of Art. 4, the following provisions shall be respected as a minimum about persons deprived of their liberty for reasons related to the armed conflict, whether they are interned or detained:
 - (a) The wounded and the sick shall be treated in accordance with Art. 7;
 - (b) The persons referred to in this paragraph shall, to the same extent as the local civilian population, be provided with food and drinking water and be afforded safeguards as regards health and hygiene and protection against the rigours of the climate and the dangers of the armed conflict;
 - (c) They shall be allowed to receive individual or collective relief;
 - (d) They shall be allowed to practice their religion and, if requested and appropriate, to receive spiritual assistance from persons, such as chaplains, performing religious functions;
 - (e) They shall, if made to work, have the benefit of working conditions and safeguards similar to those enjoyed by the local civilian population.
2. Those who are responsible for the internment or detention of the persons referred to in paragraph 1 shall also, within the limits of their capabilities, respect the following provisions relating to such persons:
 - (a) Except when men and women of a family are accommodated together, women shall be held in quarters separated from those of men and shall be under the immediate supervision of women;
 - (b) They shall be allowed to send and receive letters and cards, the number of which may be limited by the competent authority if it deems necessary;
 - (c) Places of internment and detention shall not be located close to the combat zone. The persons referred to in paragraph 1 shall be evacuated when the places where they are interned or detained become particularly exposed to danger arising out of the armed conflict, if their evacuation can be carried out under adequate conditions of safety;
 - (d) They shall have the benefit of medical examinations;
 - (e) Their physical or mental health and integrity shall not be endangered by an unjustified act or omission. Accordingly, it is prohibited to subject the persons described in this Article to any medical procedure which is not indicated by the state of health of the person concerned, and which is not consistent with the generally accepted medical standards applied to free persons under similar medical circumstances.
3. Persons who are not covered by paragraph 1 but whose liberty has been restricted in any way whatsoever for reasons related to the armed conflict shall be treated humanely in accordance with Article 4 and with paragraphs 1 (a), (c) and (d), and 2 (b) of this Article.
4. If it is decided to release persons deprived of their liberty, necessary measures to ensure their safety shall be taken by those so deciding.

³⁴² Additional Protocol II, 1977, art. 14.

Covenant on Economic, Social and Cultural Rights to establish mechanisms for enforcing the provisions of the Universal Declaration on Human Rights. The Universal Declaration along with these two treaties is referred to as the International Bill of Human Rights. The International Covenant on Civil and Political Rights emphasizes issues like the right to life, freedom of speech, etc. The International Covenant on Economic, Social, and Cultural Rights is related to issues like food, education, health, and shelter.³⁴³

International Covenant on Civil and Political Rights mentions that “*Every human being has the inherent right to life. This right shall be protected by law. No one shall be arbitrarily deprived of his life*”³⁴⁴. Right to life under this Article embraces all facets of life like air, water, etc.³⁴⁵

3.8. International Covenant on Economic, Social and Cultural Rights, 1966

The International Covenant on Economic, Social, and Cultural Rights was adopted vide the General Assembly resolution 2200A (XXI) of 16 December 1966. It entered into force on 3 January 1976.

The International Covenant on Economic, Social and Cultural Rights asserts that “*The States Parties to the present Covenant recognize the right of everyone to an adequate standard of living for himself and his family, including adequate food, clothing, and housing, and to the continuous improvement of living conditions. The States Parties will take appropriate steps to ensure the realization of this right, recognizing to this effect the essential importance of international co-operation based on free consent.*”³⁴⁶ This Article is similar to Article 47 of the Indian Constitution.³⁴⁷ Indian

³⁴³ Human Rights Resource Centre, “A Short History of Human Rights” (Human Rights Educators' Network Amnesty International USA, 1998) available at http://hrlibrary.umn.edu/edumat/hreduseries/her_eandnow/Part-1/short-history.htm (last visited on 21 May 2015).

³⁴⁴ U N General Assembly, *International Covenant on Civil and Political Rights*, GA Res 2200A (XXI), UN Doc A/Res/2200A, (16 December 1966), art. 6.

³⁴⁵ Supreme Court of India in *Subhash Kumar v. State of Bihar*, AIR 1991 SC 420 has observed: Right to live is a fundamental right under Art. 21 of the Constitution and it includes the right of enjoyment of pollution free water and air for full enjoyment of life. Similar views were expressed by the Apex Court in *Chameli Singh v. State of Uttar Pradesh* AIR 1996 SC 1051, *Narmada Bachao Andolan v. Union of India* (2000)10 SCC 664.

³⁴⁶ *Supra* note 89, art. 11(1).

³⁴⁷ Art. 47, Constitution of India provides that:

The State shall regard the raising of the level of nutrition and the standard of living of its people and the improvement of public health as among its primary duties and, in particular, the State shall endeavour to bring about prohibition of the consumption except for medicinal purposes of intoxicating drinks and of drugs which are injurious to health

courts have referred to this article to cast a primary responsibility on the State to improve the health of the public by providing unpolluted drinking water.³⁴⁸

The International Covenant on Economic, Social, and Cultural Rights also declares that “*The States Parties to the present Covenant recognize the right of everyone to the enjoyment of the highest attainable standard of physical and mental health.*”³⁴⁹

It is not feasible to attain the highest standards of health without having access to an adequate quantity of clean water. Thus, it may be rightly stated that above mentioned Articles of the International Covenant on Economic, Social, and Cultural Rights impliedly recognize the right to water.

3.9. United Nations Conferences on Environment

3.9.1. Stockholm Declaration, 1972

Sweden made a proposal suggesting the organization of an international conference in 1968, by the United Nations to examine environmental problems that could not be solved without international cooperation. United Nations Conference on the Human Environment also known as Stockholm Conference was organized at Stockholm in 1972, Sweden from June 5 to 16, 1972. This was the first conference of the United Nations in which the sole focus was on international environmental issues. The conference was a reflection of the growing interest of the world community to conserve the global environment by laying the foundation for global environmental governance. Representatives of 114 governments attended it. This Conference elucidated 26 environment-related principles. This UN conference is generally referred to as “the Magna Carta” on Human Environment. These principles are the guidelines for all nations for improving and protecting the present-day environment for the benefit and prosperity of all people. An action plan named “Framework for Environmental Action,” containing 109 specific recommendations was also framed. It also resulted in the creation of the

³⁴⁸ *Hamid Khan v. State of Madhya Pradesh*, AIR 1997 MP 191.

³⁴⁹ *Supra* note 89, art. 12(1).

United Nations Environment Programme in December 1972 to coordinate global efforts to promote sustainability and safeguard the natural environment.³⁵⁰

The Stockholm Declaration on Human Environment contains a warning as under:

“Man is both creator and moulder of his environment, which gives him physical sustenance and affords him the opportunity for intellectual, moral, social, and spiritual growth. In the evolution of humanity on this planet a stage has been reached when, through the rapid acceleration of science and technology, man has acquired the power to transform his environment in countless ways and on an unprecedented scale. Both aspects of man’s environment, natural and man-made, are essential to his well-being and to the enjoyment of basic human rights-even the right to life itself.”³⁵¹

The Stockholm Declaration affirms the fundamental right to “...an environment of a quality that permits a life of dignity and well-being³⁵²” and also that, “the natural resources of the earth including the air, water, land, flora and fauna and especially representative samples of natural ecosystem must be safeguarded for the benefit of present and future generations through careful planning or management, as appropriate”.³⁵³

These principles defend the right of an individual to water impliedly. Water is essential for good health and maintaining hygiene. It is also important to protect it against pollution. To implement the decisions taken at Stockholm in June 1972 and in the United Nations Conference on the Human Right to Water and Sanitation³⁵⁴ held in 2010, an action plan to protect water resources in nature like rivers, lakes, and groundwater resources for future generations was prepared.

3.9.2 United Nations Conference on Water, 1977

United Nations Conference on Water³⁵⁵ was organized in Mar del Plata, Argentina from 14-25 March 1977 to assess the status of water resources. This also ensured an

³⁵⁰ United Nations Conference on the Human Environment, 1972 , (available at <https://docs.un.org/en/A/CONF.48/14/Rev.1>), Chapter 2,

³⁵¹ Satish C. Shastri, *Environmental Law* 242(Eastern Book Company, Lucknow, 2012).

³⁵² *Supra* note 95, Principle 1.

³⁵³ *Supra* note 95, Principle 2.

³⁵⁴ UN General Assembly, "The Human Right to Water and Sanitation", GA Res 64/292, GAOR, UN Doc A/64/L.63/Rev.1 and Add.1, (3 August 2010).

³⁵⁵ The United Nations Water Conference, 1977, Mar del Plata Action Plan.

adequate and quality water supply, increased water use efficiency, and promoted international and national preparedness to avoid a global water crisis. There was an active participation of the developing world in the Conference which prepared the Mar del Plata Action Plan. This Action Plan was the first internationally coordinated attempt at Integrated Water Resource Management. It affirmed a holistic consideration of water management. The Conference recognized water as a “right” and stated that all people have the right to drinking water in quantities and quality suitable to their basic needs. The Action Plan from the United Nations Water Conference declared that “All people, whatever their stage of development and social and economic conditions, have the right to have access to drinking water in quantities and of a quality equal to their basic needs.” Broadly speaking, this conference was about the environment, with the human species prominent at its centre. The Secretary General of the United Nations made out that this conference was not an isolated event but it is a link in the chain of activities and efforts which the UN has been making for many years to heighten awareness and stimulate energies within the world communities³⁵⁶ in the face of great problems of our time.” The conference resolved³⁵⁷ the following:

- a. efforts should be made at the domestic level to augment adequate financial resources for performing activities connected to water resources assessment;
- b. training programs and facilities should be organized or strengthened for meteorologists, and hydrologists;
- c. national Scientific infrastructure for water assessment activities be strengthened or established; and
- d. international cooperation must be promoted aiming at the strengthening of water resources assessment.

3.9.3 United Nations Conference on Environment and Development, 1992

The United Nations Conference on Environment and Development (UNCED), is also called the ‘Rio de Janeiro Earth Summit’ or ‘Rio Summit’ or ‘Rio Conference’ or ‘Earth Summit.’ It was a United Nations Conference held in Rio de Janeiro from 3 to

³⁵⁶ *Id.* at 5

³⁵⁷ *Id.*, at 7-8

14 June 1992. This summit consists of three main objectives, that is, conservation of biological diversity, sustainable use of its components, and fair and equitable sharing of benefits arising from genetic resources.³⁵⁸ The issues addressed in the convention, inter alia, are ‘the growing usage’ and ‘limited supply of water.’ The UN sought to help Governments rethink economic development and find ways to prohibit the destruction of irreplaceable natural resources and pollution on the earth twenty years after the first international environment conference.³⁵⁹

Agenda 21 was one of the documents that came up in the meeting and was framed to deal with some of the fundamental problems of resource degradation and aid to developing nations. It deals with many issues relating to global sustainability and includes core chapters related to financing, the implementation of technology transfer, and institutional follow-up to UNCED. The Earth Summit had an impact on all subsequent UN conferences, which have examined the relationship between human rights, population, social development, women and human settlements, and the need for environmentally sustainable development.³⁶⁰ The main objective of Agenda 21 is to ensure that development proceeds in a sustainable manner. It affirmed that the system of incentives and penalties which motivate economic behaviour must be reoriented to promote sustainability. Agenda 21 also puts an effort to achieve the sustainable use of global and regional resources such as the atmosphere, oceans, seas freshwater, and marine organisms. The greater concern was on the awareness and the growing scarcity of water. Agenda 21 is an environmental action plan for the next century. It is not legally binding but provides a basis for new international cooperation and coordination for sustainable development and environmental protection worldwide.

3.9.4 The United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, particularly in Africa, 1994

Desertification affects around one-fourth of the landmass of the planet and is a major problem in the African continent. Over 100 countries and some 800 million people are

³⁵⁸ P.B. Sahasranaman, Handbook of Environmental Law in India 107 (Oxford University Press, New Delhi, 2012).

³⁵⁹ United Nations Conference on Environment and Development, 1992, Principal 8 (available at <http://www.un.org/geninfo/bp/enviro.html>).

³⁶⁰ *Id.*, agenda 21 at 12.

affected by it, with Australia and the United States of America heading the list of affected industrialized countries.³⁶¹ This convention was particularly related to countries in Africa. It may not be an essential component of International Water law that has direct relevance in the Indian context.

3.10. The Convention on the Elimination of All Forms of Discrimination against Women, 1979

The Charter of the United Nations reaffirmed the equal rights of men and women. Since then, the United Nations has worked actively to formulate policies, standards, programs, and goals at international levels to uplift the status of women globally.³⁶²

The main development is the adoption of 'The Convention on the Elimination of All Forms of Discrimination against Women' by the United Nations General Assembly in 1979. Mostly referred to as the international bill of rights for women, this Convention defines discrimination against women and sets legal obligations for state parties to put an end to all such discrimination.

On 10 December 1999, 'the Optional Protocol to the Convention on the Elimination of All Forms of Discrimination against Women' was opened for signature, ratification, and accession by States already party to the Convention.³⁶³ The Protocol enables the women whose rights have been violated and who have exhausted national remedies to seek redress from the Committee on the Elimination of Discrimination against Women an independent international body. This Committee is empowered to inquire into serious violations of the Convention's terms.

Article 14 of the Convention deals with the prohibition of discrimination against rural women. This article takes into consideration the peculiar problems faced by these women and the role played by them in the economic survival of their families. Their work in the non-monetized sectors of the economy is also given due regard. The Convention calls upon the States parties to ensure that rural women participate in rural development programs and benefit from the same. They are entitled to

³⁶¹ *United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, particularly in Africa*, 1994.art. 2

³⁶² *UN General Assembly, The Convention on the Elimination of All Forms of Discrimination against Women and its Optional Protocol: Handbook for Parliamentarians*, GA Res 34/180, GAOR, Un Doc A/Res/34/180 (18 December 1979)

³⁶³ *Id.*, art. 21.

participate in the development planning, have access to adequate, and obtain all types of training and education to organize self-help groups and cooperatives and to participate in community activities. Rural women have a right to equal access to agricultural loans, technology, land settlement schemes, etc. State Parties are under an obligation to take effective steps to eliminate discrimination against women in rural areas and to ensure the enjoyment of adequate living conditions by women, particularly, about, sanitation and water supply.³⁶⁴

3.11. Occupational Health Services Convention, 1985

The UN General Assembly noted that the protection of the workers against sickness, disease, and injury arising out of their employment has been assigned to the International Labour Organisation. The General Assembly referred to the relevant international labour conventions and recommendations like ‘The Protection of Workers’ Health Recommendation,’ 1953, ‘The Occupational Health Services Recommendation, 1959, the Workers’ Representatives Convention, 1971, and ‘the Occupational Safety and Health Convention and Recommendation’, 1981. The General Conference of the International Labour Organisation was convened in Geneva on 7 June 1985 (ILO 161) and ‘the Occupational Health Services Convention’ was adopted on 26 June 1985.³⁶⁵

Part II of the Occupational Health Services Convention, 1985 deals with the functions. Article 5 spells out the functions of occupational health services. These functions are in addition to the responsibility of each employer for the health and safety of the workers in his employment. The occupational health services shall, inter alia, include the following functions:

- i. “surveillance of the factors in the working environment and working practices which may affect workers’ health, including sanitary installations, canteens and housing where these facilities are provided by the employer,”³⁶⁶
- ii. “guidance on occupational health, safety, and hygiene and ergonomics and individual and collective protective equipment,”³⁶⁷

³⁶⁴ *Supra* note 104, art. 14(2)(h).

³⁶⁵ ILO Occupational Health Services Convention No. 161, 1985, Preamble (available at http://blue.lim.ilo.org/cariblex/pdfs/ILO_Convention_161.pdf)

³⁶⁶ *Id.*, Art. 5(b).

- iii. “surveillance of workers' health concerning work,”³⁶⁸
- iv. “association in providing information, training, and education in the fields of occupational health and hygiene and ergonomics,”³⁶⁹
- v. “conducting first aid and emergency treatment,”³⁷⁰

All these functions cannot be completed without an adequate supply of water and without having access to adequate water facilities and services.

3.12. Proclamation of International Water Supply and Sanitation Decade, 1989

The UN while showing deep concerns over the non-availability of drinking water and inadequate sanitation facilities to a large number of people across the globe and recognizing the fact that things will not improve until the national governments, as well as the international community, take immediate remedial steps, proclaimed the period between 1981-1990 as International Drinking Water Supply and Sanitation Decade.³⁷¹ All member states were entrusted with the task of bringing about substantial improvement in the drinking water supply and sanitation during the abovementioned period. The Governments that had not initiated the process to develop the policies and programs related to drinking water supply and sanitation were called upon to formulate such policies and programs on a priority basis and achieve the targets within the decade. The governments were requested to promote of the Decade, through development of national institutions; human resources development; information exchange and monitoring; and financial resource stimulation³⁷² and at the same time create awareness among the masses for the programs on drinking water and sanitation. The developed countries as well as the organs of the United Nations were urged to increase financial and technical assistance to the developing countries to help them achieve the targets that they had set for themselves. The Regional Commissions were requested to periodically review the

³⁶⁷ *Id.*, Art. 5(e).

³⁶⁸ *Id.*, Art. 5(f).

³⁶⁹ *Id.*, Art. 5(i).

³⁷⁰ *Id.*, Art. 5(j).

³⁷¹ The basis of this proclamation was the Resolution 25 entitled “International Drinking Water Supply and Sanitation Decade” adopted on 30 July 1980 by World Conference for United Nations Decade for Women: Equality, Development and Peace.

³⁷² World Health Organisation, *Proclamation of International Water Supply and Sanitation Decade*, 1980, Background p3.

progress made by the governments in their region in achieving the set targets. The General Assembly requested the Secretary-General to prepare an exhaustive analysis based on progress reports submitted by various state governments and international organizations.

3.13. The Convention on the Rights of the Child, 1989

‘The Convention on the Rights of the Child’ was adopted by the General Assembly on 20 November 1989. It was opened for signature, ratification, and accession on the same day. It entered into force on 2 September 1990. This legally binding international agreement sets out the rights-social, civil, political, economic, and cultural of every child throughout the globe without any regard to the race, religion, or abilities of the child. Recognizing that the United Nations has proclaimed and agreed that everyone is entitled to all the rights and freedoms stated therein. These rights and freedoms are without any discrimination based on race, colour, sex, language, religion, political or other opinions, national or social origin, property, birth, or another status. Recalling that, in the Universal Declaration of Human Rights, the United Nations has proclaimed that childhood needs special care and assistance. It accepted that the family is the fundamental group of society and the natural environment for the growth and well-being of all its members and especially children should be given the necessary protection and assistance so that they can fully pursue their responsibilities within the community.³⁷³

The state parties have acknowledged the rights of every child to the enjoyment of the highest attainable standards of health. This includes the right to medical facilities for the treatment of the disease. The member states are obliged to ensure that no child is deprived of access to health care services.³⁷⁴To achieve this right the state parties shall take appropriate measures to combat disease and malnutrition. This, *inter alia*, includes the use of technology and making provisions for adequate nutritious food and clean drinking water.³⁷⁵ The state parties are duty-bound to take effective steps to assist the parents and all others who are responsible for the child to implement this right. They all have to provide material assistance and support programs, especially

³⁷³ The United Nations Convention on the Rights of the Child, 1989. art. 18, 21, (<http://www.ohchr.org>).

³⁷⁴ *Id.*, art. 24(1).

³⁷⁵ *Id.*, art. 24(2).

concerning nutrition, clothing, and housing. This impliedly includes the supply of an adequate quantity of safe drinking water and usable water for other domestic purposes.

3.14. Convention on the protection and use of trans-boundary water courses and international lakes 1992

‘The Convention on the Protection and Use of Trans-boundary Watercourses and International Lakes’ (Water Convention) aims to protect and ensure the quantity, quality, and sustainable use of ‘trans-boundary waters’³⁷⁶ resources by facilitating cooperation. This convention also urges the countries to facilitate cooperation for the protection, development, and sustainable use of trans-boundary water resources. It provides an international stage for the routine development and progression of trans-boundary cooperation. It provides an intergovernmental platform for the day-to-day development and advancement of trans-boundary cooperation. Initially negotiated as a regional instrument, it turned into a universally available legal framework for trans-boundary water cooperation, following the entry into force of amendments in February 2013, opening it to all UN Member States. As of 1st March 2016, countries outside the ECE region can accede to the Convention.

The Convention focuses on the implementation of integrated water resources management, in particular basin approach. The Convention’s implementation contributes to achieve the Millennium Development Goals and to ensure that transboundary waters are used with the aim of ecologically sound and rational water management, conservation of water resources and environmental protection and sustainable development.³⁷⁷ The fundamental principles it underlines for the use of transnational water courses are ‘equitable and reasonable utilization’ of water and ‘the obligation not to cause significant harm’ to neighbours.

The state parties are entrusted to undertake appropriate measures for:³⁷⁸

³⁷⁶ Convention on the Protection and Use of Trans-boundary Watercourses and International Lakes, 1992, art. 1(1). It provides that "Transboundary waters" means any surface or ground waters which mark, cross or are located on boundaries between two or more States; wherever trans-boundary waters flow directly into the sea, these trans-boundary waters end at a straight line across their respective mouths between points on the low-water line of their banks"

³⁷⁷ *Id.*, art. 2.2(b).

³⁷⁸ *Id.*, art. 2(2).

- a) Prevention, control, and reduction of water pollution caused by or likely to be caused by trans-boundary impact.³⁷⁹
- b) Ensuring the trans-boundary waters in an ecologically sound manner. There must be rational water management, conservation of water resources, and environmental protection.
- c) Ensuring reasonable and equitable use of trans-boundary waters.
- d) Ensuring conservation and restoration of ecosystems. While undertaking the above-mentioned measures, the state parties shall be guided by the precautionary principle, sustainable development and the polluter pays principle.³⁸⁰

To prevent, control, and reduce ‘trans-boundary impact’ in the catchment areas, or parts thereof, the Riparian parties must cooperate based on equality and reciprocity. This can be achieved by concluding bilateral and multilateral agreements.³⁸¹ The prevention, control, and reduction of trans-boundary impact can be brought by state parties by developing, adopting, implementing, and making compatible with the relevant legal, administrative, economic, financial, and technical measures, to ensure, inter alia, that:³⁸²

- a) Emission of pollutants is prevented, controlled, and reduced at source.
- b) Protection of trans-boundary waters at a point source against pollution. This can be achieved through the prior licensing of waste water.
- c) Application of biological treatment to municipal waste water.
- d) Sustainable water resources management.
- e) Development of contingency planning.

³⁷⁹ *Id.*, art. 1(2). It defines “Trans-Boundary impact” means any significant adverse effect on the environment resulting from a change in the conditions of a trans-boundary waters caused by a human activity, the physical origin of which is situated wholly or in part within an area under the jurisdiction of a party, within an area under the jurisdiction of another party. Such effects on the environment includes effects on human health and safety, flora, fauna, soil, air, water, climate, landscape and historical monuments or other physical structures or the interaction among these factor, they also include effects on cultural heritage or socio-economic conditions resulting from alterations to those factors.

³⁸⁰ *Id.*, Art.2 (5).

³⁸¹ *Id.*, Art. 2 (6).

³⁸² *Id.*, Art. 3

- f) Taking additional specific measures to prevent groundwater pollution; and
- i) Minimising the risk of accidental pollution.³⁸³

The state parties have undertaken to cooperate in doing research and develop effective techniques for the prevention, control, and reduction of trans-boundary impact. For this, they shall either initiate or intensify specific research programs aimed at:³⁸⁴

- (a) Methods for the assessment of the toxicity of hazardous substances and the noxiousness of pollutants;
- (b) Improved knowledge of the occurrence, distribution, and environmental effects of pollutants and the processes involved;
- (c) The development and application of environmentally sound technologies, production and consumption patterns;
- (d) The phasing out and/or substitution of substances likely to have trans-boundary impact’; (e) Environmentally sound methods of disposal of hazardous substances;
- (f) Special methods for improving the conditions of trans-boundary waters;
- (g) The development of environmentally sound water-construction works and water-regulation techniques;
- (h) The physical and financial assessment of damage resulting from trans-boundary impact.³⁸⁵

The member states must exchange the results of these research programs among themselves as per the provisions of Article 6 of the convention. The Convention also provides for the exchange of information,³⁸⁶ responsibility, and liability among state parties³⁸⁷ and the protection of information.³⁸⁸

³⁸³ *Ibid.*

³⁸⁴ *Id.*, art. 5.

³⁸⁵ *Ibid.*

³⁸⁶ *Id.*, Art. 6. It provides that the Parties shall provide for the widest exchange of information, as early as possible, on issues covered by the provisions of this Convention.

³⁸⁷ *Id.*, art. 7. It provides that the Parties shall support appropriate international efforts to elaborate rules, criteria and procedures in the field of responsibility and liability

³⁸⁸ *Id.*, art. 8. It provides that the provisions of this Convention shall not affect the rights or the obligations of Parties in accordance with their national legal systems and applicable supranational

All bilateral and multilateral agreements on the relevant issues covered by the Convention and any other issue on which the riparian parties deem it necessary to cooperate must enter into the riparian parties on the basis of equality and reciprocity. These agreements shall provide the establishment of joint bodies to fulfill the following purposes:³⁸⁹(a) To collect, compile, and evaluate data to identify pollution sources likely to cause trans-boundary impact’;

- (b) To elaborate joint monitoring programs concerning water quality and quantity;
- (c) To draw up inventories and exchange information on the pollution sources mentioned in paragraph 2 (a) of this article;
- (d) To elaborate emission limits for waste water and evaluate the effectiveness of control programs;
- (e) To elaborate joint water-quality objectives and criteria having regard to the provisions of article 3, paragraph 3 of this Convention, and to propose relevant measures for maintaining and, where necessary, improving the existing water quality;
- (f) To develop concerted action programs for the reduction of pollution loads from both point sources (e.g. municipal and industrial sources) and diffuse sources (particularly from agriculture);
- (g) To establish warning and alarm procedures;
- (h) To serve as a forum for the exchange of information on existing and planned uses of water and related installations that are likely to cause trans-boundary impact;
- (i) To promote cooperation and exchange of information on the best available Technology.³⁹⁰

The Convention also provides for the joint monitoring and assessment for monitoring the conditions of trans-boundary waters. This includes floods and ice drifts, as well as trans-boundary impact. In the joint monitoring and assessment, the riparian

regulations to protect information related to industrial and commercial secrecy, including intellectual property, or national security.

³⁸⁹ *Id.*, art. 9.

³⁹⁰ *Ibid.*

parameters are also fixed. The riparian parties can carry out joint or coordinated assessments of the conditions of trans-boundary waters and find the efficacy of measures taken for the prevention, control, and reduction of trans-boundary impact.³⁹¹

According to the Convention, if a Riparian Party requests for some data from another Riparian Party and the requested data is unavailable with the later, the later shall try to provide the data but may ask the requesting party to make payment for collecting and processing such data or information. The Riparian parties shall ensure the exchange of the best available technology information experience and technical assistance among themselves.³⁹² The Convention also provides for mutual assistance among the riparian parties.³⁹³

It is provided under the convention that if there raises a dispute between two or more Parties regarding the elaboration or enforcement of any of the content of this Convention, they shall seek an answer by negotiation or by any other means of dispute settlement acceptable to the parties involved in the dispute. When signing, ratifying, accepting, approving, or acceding to this Convention, or at any time thereafter, a Party may declare in writing for the settlement of the dispute by

- (a) Submission of the dispute to the International Court of Justice;
- (b) Arbitration in accordance with the procedure set out in annexure IV.³⁹⁴

It is to be noted that the dispute may be submitted only to the International Court of Justice unless the parties agree otherwise.³⁹⁵

3.15. Declaration on the Right to Development (DRTD) 1986

In 1986, the United Nations General Assembly adopted the Declaration on the Right to Development³⁹⁶ in its resolution 41/128. The resolution was passed by one hundred

³⁹¹ *Id.*, art.11

³⁹² *Ibid.*

³⁹³ *Id.*, art.13.

³⁹⁴ *Id.*, Annex IV,

³⁹⁵ *Id.*, art. 22.

³⁹⁶ Declaration on the Right to Development, 1993, art. 1.1. It defines that the right to development is an inalienable human right by virtue of which every human person and all people are entitled to participate in, contribute to, and enjoy economic, social, cultural, and political development, in which all human rights and fundamental freedoms can be fully realized.

and forty-six votes in favour, one against, and eight abstentions.³⁹⁷ The Right to Development is an important but controversial third-generation human right. The Declaration proclaims that this right has international as well as national dimensions. The duty of cooperation is the main principle of a right to development. While the developing countries want to mainstream the right to development in the international economic rules and policies, the developed countries argue that they have no legal obligation to help the developing countries in economic development by assisting developing countries. Thus, this right is not acceptable to the developed countries.

In 1992, the General Assembly requested the Secretary-General of the United Nations by its resolution 47/181, to prepare the agenda for development. The report of the Secretary-General stated that the UN has started a 'process of re-examination and redefinition of development.' The 1990s saw major changes in the relationship of human rights and development. Between 1992 and 2001, all major international events held on environment, human rights, population, social development, women, the 50th anniversary of the Universal Declaration of Human Rights, and racism made references to the right to development. Some of the major international instruments recognizing and reaffirming the right to development are the African Charter on Human and Peoples' Rights, the Arab Charter on Human Rights, the Rio Declaration on Environment and Development, the Vienna Declaration and Programme of Action, the Millennium Declaration, Monterrey Consensus, the World Summit Outcome Document and the Declaration on the Rights of Indigenous Peoples.

The General Assembly recognized that development is a comprehensive process. This aims at the constant improvement of the well-being of the entire human population on the grounds of their participation in the development and fair distribution of benefits resulting from development. It also identified the human person to be the main subject of the development process. It, therefore, acknowledged the creation of favourable conditions for the development of people as the primary responsibility of the State.

Under Art.8 (1) of the Declaration on the Right to Development it is stated that "States should undertake, at the national level, all essential efforts for the realization of the right to development and shall ensure, inter alia, equal opportunity for all to

³⁹⁷ Khurshid Iqbal, "The Declaration on the Right to Development and Implementation" Vol 1 (1) *Political Perspectives* 18 (2007).

access basic resources such as housing food, education, health services, employment, and the fair distribution of income. To ensure that women have an active role in the development process effective measures should be undertaken. Appropriate economic and social reforms should be carried out to eradicate all social injustices.”

The General Assembly while interpreting this Article clarified in its Resolution 54/175 that “the rights to food and clean water and fundamental human rights and their promotion constitutes a moral imperative both for national governments and for the international community.”³⁹⁸

3.16. UN Millennium Declaration 2000

Various heads of State and Government gathered in New York for a three-day Millennium Summit from 6 to 8 September 2000 and adopted by the General Assembly Resolution 55/2, the United Nations Millennium Declaration on 8 September 2000. The largest-ever gathering of world leaders resulted in the Declaration as being the main document of the Summit. The Declaration reaffirmed Member States' faith in the United Nations and its Charter and fixed deadlines for several collective actions.³⁹⁹ In the Declaration, the world leaders determined, among other things, “to halve, by the year 2015, the proportion of people who are unable to reach or to afford safe drinking water,⁴⁰⁰ to develop water management strategies at all levels-local, regional and national and to stop unsustainable exploitation of water resources and promote both equitable access to water and adequate supplies of water.”⁴⁰¹

3.17. Johannesburg Declaration 2002

World Summit on Sustainable Development was convened by the United Nations from 26 August to 4 September 2002 in Johannesburg, South Africa to discuss sustainable development. The meet assessed the problems of environment deterioration and a broad plan was adopted to address the problems of the global environment which continues to suffer from the loss of biodiversity, depletion of fish change stocks, advancing desertification, worsening climate, and devastating natural

³⁹⁸ Anuj Kumar Nigam, “Right to Water in International and National Perspective”, Volume 19, Issue 4, Ver. VII, IOSR Journal Of Humanities And Social Science, (2014).

³⁹⁹ UN General Assembly, *United Nations Millennium Declaration*, GA Res 55/2, GAOR, Un Doc A/Res/55/2 (8 September 2000).

⁴⁰⁰ *Id.*, at Para 19.

⁴⁰¹ *Supra* note 103 at 109

disasters. The Plan of Implementation adopted by the Johannesburg World Summit on Sustainable Development in 2002 addresses issues such as access to clean drinking water and adequate sanitation and the development of integrated water resources management and water efficiency plans.⁴⁰²

While discussing the challenges that the world faces it was observed that despite development, the world environment continues to suffer and there is persistent loss of biodiversity, increase in desertification, growing adverse effects of climate change, more frequent and devastating natural disasters, and indiscriminate increase in air, water and marine pollution resulting in unhealthy life for millions across the globe.⁴⁰³

The Political Declaration of the World Summit on Sustainable Development included a strong commitment to the right to water by stating thus:

"To increase speedy access to basic amenities such as clean water, sanitation, health care, adequate shelter, energy, food security and the protection of bio-diversity."⁴⁰⁴

Recognizing poverty eradication as the greatest global challenge world leaders resolved to:

- i. 'Diminish the number of people without access to safe drinking water by 2015'.⁴⁰⁵
- ii. 'To develop national programs for sustainable development to increase access for sustainable development to increase access to productive resources, particularly land, water, etc.'⁴⁰⁶
- iii. 'Fight desertification, drought, and floods and reduce the degradation of land and water resources.'⁴⁰⁷
- iv. Increase access to sanitation.

It was observed that since the provision of clean drinking water and adequate sanitation is necessary to protect human health and the environment it was resolved to

⁴⁰² Report of the World Summit on Sustainable Development, 2002, p.3

⁴⁰³ *Id.*, Para 13,

⁴⁰⁴ *Id.*, Para 10

⁴⁰⁵ *Ibid.*

⁴⁰⁶ *Supra* note 147, para 11.

⁴⁰⁷ *Ibid.*

take actions at different levels for developing and implementing efficient household sanitation systems improving sanitation in public institutions and integrating sanitation into water resources management strategies.⁴⁰⁸

Sustainable development can be achieved by protecting and managing the natural resources. Sustainable development cannot be brought about unless there is an end to the degradation of natural resources. This can be achieved by undertaking actions at different levels “to mobilize financial resources, transfer technology, promote best practice and support capacity-building for water and sanitation infrastructure; expedite access to public information and participation promote the priority action by Governments for water management and capacity-building at the national as well as regional level increase prevention of water pollution adopt prevention and protection measures to promote sustainable water use and to address water shortages.”⁴⁰⁹

It was decided to evolve the plans for integrated water resources management by 2005 at all levels to:

- i. Make and implement plans, programs, and strategies at the national as well as regional levels for integrated river basins, watersheds, and groundwater management. The plans etc. were also to be evolved and implemented to improve the efficiency of water infrastructure and increase the recycling of water;
- ii. Prepare regulations, monitoring measures, market and information-based tools, land-use management, and cost recovery of water services and adopt an integrated water basin approach;
- iii. work for the efficient use of water resources and allocate them among competing uses giving priority to the basic human needs
- iv. Prepare programs for reducing the effects of extreme water-related events;
- v. Support the sharing of technology, capacity-building for non-conventional water resources, and conservation technologies among developed and developing countries.

⁴⁰⁸ *Supra* note 147, para 22.

⁴⁰⁹ *Ibid.*

- vi. Support programs for desalination of seawater, water recycling, and water harvesting from coastal fogs in developing countries.⁴¹⁰

It was resolved to protect and manage the natural resource base of economic and social development by:

- i. Supporting developing countries to monitor and assess the quantity and quality of water resources.⁴¹¹
- ii. Improving water resource management and encouraging knowledge-sharing particularly with the developing countries.⁴¹²
- iii. Effectively coordinating among the various international bodies as well as intergovernmental bodies on water-related issues.⁴¹³

It was resolved to publicize the integrated water resources development, the development and effective management of water resources, and the protection of water quality at all levels to:

- i. Give access to potable domestic water, improved sanitation, and waste management to encourage investment by public and private players in water supply and sanitation giving priority to the needs of the poor, monitor the performance of public institutions and private companies, and also improve their accountability
- ii. Develop critical water supply and build capacity to maintain and manage systems to deliver water and sanitation services in both rural and urban areas.
- iii. Formulate integrated river basin and watershed management strategies and plans and also implement them for all major water bodies.
- iv. Improve data collection and processing for water resource management
- v. Protect water resources, groundwater, and wetland ecosystems against pollution, including energy-efficiency, cost-effectiveness, and sustainable desalination of seawater, rainwater harvesting, and recycling of water.

⁴¹⁰ *Supra* note 147, para 22-23.

⁴¹¹ *Ibid.*

⁴¹² *Ibid.*

⁴¹³ *Ibid.*

3.18. The human right to water and sanitation 2010

The human right to water and the human right to sanitation are components of binding international human rights law. They are derived from Article 11 of the International Covenant on Economic, Social and Cultural Rights (ICESCR) i.e. the human right to an adequate standard of living. This is a treaty to which 163 United Nations (UN) Member States are party and which an additional six countries have signed. The rights to water and sanitation are also connected to other human rights such as the right to life, the right to health, and fundamental principles such as human dignity.

The rights to water and sanitation have also been recognized by independent experts elected or appointed by States. In 2002, the Committee for Economic, Social and Cultural Rights (CESCR), the treaty body responsible for monitoring State compliance with the International Covenant on Economic, Social and Cultural Rights, adopted General Comment No. 15 on the human right to water. General comments are authoritative interpretations of the ICESCR, clarifying the content of human rights. General Comment No. 15 affirmed that the human right to water is implicitly derived from the human right to an adequate standard of living.⁴¹⁴ It also emphasized that ensuring that everyone has access to adequate sanitation is not only fundamental for human dignity and privacy but is one of the principal mechanisms for protecting the quality of drinking water supplies and resources.⁴¹⁵

On 28 July 2010, through Resolution 64/292, the United Nations General Assembly explicitly recognized the human right to water and sanitation and acknowledged that clean drinking water and sanitation are essential to the realization of all human rights. The Resolution calls upon States and international organizations to provide financial resources to help capacity-building and technology transfer to help countries, particularly developing countries, to provide safe, clean, accessible, and affordable drinking water and sanitation for all.⁴¹⁶

3.19. UN Human Rights Council Resolution 15/9 (September 2010)

With this resolution, the Human Rights Council affirmed that the human rights to water and sanitation are legally binding by stating that the human right to safe

⁴¹⁴ United Nation Committee on Economic, Social and Cultural Rights, 2002, General Comment No. 15, (The Right to Water).

⁴¹⁵ *Ibid.*

⁴¹⁶ UN General Assembly, *The Human Right to Water and Sanitation*, GA Res 64/292, GAOR, UN Doc A/RES/64/292 (3 August 2010).

drinking water and sanitation is derived from the right to an adequate standard of living.⁴¹⁷ This HRC resolution effectively affirms that the rights to water and sanitation are implicitly contained in the right to an adequate standard of living, which is enshrined, among other instruments, in Article 11 of the International Covenant on Economic, Social, and Cultural Rights⁴¹⁸ and therefore are legally binding rights.

The General Assembly reaffirmed the recognition of the right in its resolution 68/157, The Human Right to Safe Drinking Water and Sanitation of 2013. The General Assembly recognizes, inter alia, the right to safe and clean drinking water and sanitation as a human right that is necessary for the enjoyment of life to the fullest and all human rights. It called upon States and international organizations particularly developing countries to speed up efforts through international assistance cooperation to provide safe, clean, accessible, and affordable drinking water and sanitation for all. To scale up efforts financial resources, capacity-building, and technology transfer must also be provided by such states or international bodies.⁴¹⁹

3.20. World Health Organisation Assembly Resolution 2011

A resolution was adopted by the World Health Organization's (WHO) apex decision-making body, the World Health Assembly (WHA), called 64/24. It insisted Member States ensure that national health strategies contribute to the realization of water- and sanitation-related Millennium Development Goals. It supported the realization that the human right to water and sanitation is entitled to everyone irrespective of discrimination, to water and sanitation that is sufficient, safe, acceptable, physically accessible, and affordable for personal and domestic uses.⁴²⁰

The WHO adopted a resolution to reinvigorate efforts in clean drinking water, sanitation, and health. Waterborne diseases continue to kill more than two million people per year. Member states called for WHO to strengthen its major normative functions on water and health, and expand its monitoring role of progress toward

⁴¹⁷ *Ibid.*

⁴¹⁸ International Covenant on Economic, Social and Cultural Rights, 1966, art. 11.

⁴¹⁹ Philippe Cullet and Lovleen Bhullar, *Sanitation Law and Policy in India* 26 (Oxford University Press, New Delhi, 2015).

⁴²⁰ World Health Organisation, *Drinking-Water, Sanitation and Health*, 2, (24 May 2011). (WHA Resolution 64/24 available at https://iris.who.int/bitstream/handle/10665/3587/A64_R24-en.pdf)

access to safe water and sanitation. The resolution also highlights the need for continued capacity development by strengthening health policy at all levels.⁴²¹

3.21. General Comment No.15: The Right to Water, 2002

The United Nations Committee on Economic, Social and Cultural Rights which monitors the implementation of the International Covenant on Economic, Social and Cultural Rights in 2002 adopted General Comment No.15.

The Committee on Economic, Social, and Cultural Rights has come across innumerable instances of denial of the right to water not only in developing countries but also in developed countries. It was observed by the Committee that the human right to water is a prerequisite for attaining other human rights. Further, the Committee was of the view that persistent contamination, continuous depletion, and rather unequal distribution of water are aggravating poverty. A general obligation was set on the States parties to undertake measures to realize the right to water.

While discussing the legal basis of the right to water, the General Comment affirms that "*The human right to water entitles everyone to sufficient, safe, acceptable, physically accessible and affordable water for personal and domestic uses. An adequate amount of safe water is necessary to prevent death from dehydration, to provide for consumption, cooking, personal and domestic hygienic requirements, and to reduce the risk of water-related diseases.*"⁴²²

The Committee observed that several international documents which include treaties, declarations, and other standards recognized the right to water.⁴²³ The Committee unanimously agreed that water must be given for personal and domestic uses. While allocating, the requirement of water for a wide range of activities must be considered. In

⁴²¹ *Id.*, at p1.

⁴²² International Covenant on Economic, Social and Cultural Rights, General Comment No. 15, 2002, art. 11 and 12. (available at <https://digitallibrary.un.org/record/486454?ln=en&v=pdf#files>).

⁴²³ The Committee referred to Convention on the Elimination of All Forms of Discrimination Against Women, Convention on the Rights of the Child; the Geneva Convention related to the Treatment of Prisoners of War, of 1949; the Geneva Convention related to the Treatment of Civilian Persons in Time of War, of 1949; Additional Protocol I the Geneva Convention of 1977; Additional Protocol II of the Geneva Convention of 1977; preamble, Mar Del Plata Action Plan of the United Nations Water Conference; Agenda 21, Report of the United Nations Conference on Environment and Development, The Dublin Statement on Water and Sustainable Development, International Conference on Water and the Environment , Programme of Action, Report of the United Nations International Conference on Population and Development, Recommendation (2001) 14 of the Committee of Ministers to Member States on the European Charter on Water Resources; resolution 2002/6 of the United Nations Sub-Commission on the Promotion and Protection of Human Rights on the promotion of the realization of the right to drinking water.

personal and domestic uses priority should also be given to prevent starvation and disease.

The General Comment 15 is not binding as a treaty but it serves as a notice to the state parties to the Economic, Social, And Cultural Rights Covenant that the Committee on Economic, Social and Cultural Rights will monitor their progress in as far as implementation of right to water is concerned.⁴²⁴

The Committee observed that sustainable access to water resources should be ensured to realize the right to adequate food. It was noted that priority must be given to those farmers who are disadvantaged and marginalized including women. Referring to the duty of the States under article 1, paragraph 2, of the Covenant on Economic, Social and Cultural Rights providing that people should not “be deprived of its means of subsistence”, it was laid that States parties should ensure proper access to water for subsistence farming which in turn will secure the livelihoods of indigenous peoples. Reference was also made to environmental hygiene, as a part of the right to health under article 12, paragraph 2 (b), of the Covenant on Economic, Social and Cultural Rights, to include taking preventive measures to remove threats to health from unsafe and toxic water conditions.⁴²⁵

Part-II of the General Comment focuses on the normative content of the right to water, state parties' obligations, violations, implementation at the national level, and obligations of factors other than State parties with the sole idea of assisting the State parties in the implementation of the Covenant on Economic, Social and Cultural Rights.⁴²⁶

While acknowledging that the right to water includes freedom and entitlement, the General Comment states that the freedom under the right to water includes the right to have access to the present water supplies and the right to enjoy them without any interference like arbitrary disconnections, or contamination of water supplies. The entitlements on the other hand include the right to a system of water supply and management. This system gives equal opportunity to people to enjoy the right to water.⁴²⁷

⁴²⁴ *Supra* note 167, art. 6.

⁴²⁵ *Supra* note 167, art. 8.

⁴²⁶ *Supra* note 167, art. 9.

⁴²⁷ *Supra* note 167, art. 10.

While stating that water should not be treated as a merely economic good but as a social and cultural good, it was observed that the elements of the right to water should be adequate for the subsistence of human life, dignity, and health. Warning against interpreting the water adequacy narrowly, the following factors were laid for judging the adequacy of water in all circumstances:⁴²⁸

- a) Availability
 - b) Quality
 - c) Accessibility
- a) Availability: There should be a continuous and sufficient supply of water corresponding to World Health Organization guidelines for every individual for his personal and domestic use which includes drinking, personal sanitation, washing clothes, cooking food, and personal and household hygiene. If an additional quantity of water is needed which exceeds WHO guidelines due to health, climate, and work conditions the same should be provided.
 - b) Quality: The water provided for personal or domestic use must be safe and should be of acceptable colour, odour, and taste.
 - c) Accessibility: The water, water facilities, and water services should be accessible to everyone without any discrimination. Accessibility has four different but overlapping dimensions:
 - (i) Physical accessibility: Water, water facilities, and services, should be within the physical reach of all individuals. Each household, educational institute, and workplace must have access to sufficient and safe water. The water facilities and services must be sufficient in quality and culturally appropriate.
 - (ii) Economic accessibility: Water, water facilities and water services should not be so priced that they are beyond the reach of a section of the population. They must be affordable for all. While judging the affordability of water, water facilities, and water services all direct and indirect costs and charges must be considered.

⁴²⁸ *Supra* note 167, art. 12.

(iii) Non-discrimination: There must be no discrimination on any unreasonable grounds for access to water, water facilities, and services. This means water, water facilities, and services must be available even to the most vulnerable or suppressed class of society.

(iv) Information accessibility: Everyone must have the right to seek, receive, and impart information relating to water issues.

Non-discrimination and equality are the focus of General Comment No. 15.⁴²⁹ It casts a duty on the State parties to ensure that the right to water is enjoyed by all individuals without discrimination based on race, sex, language, religion, etc.⁴³⁰ If in case discrimination exists on any ground the States parties should remove the grounds of discrimination for achieving the right to water. Noting that inappropriate allocation of resources can lead to discrimination, the State parties were to ensure that the investments in water and allocation of water resources should bring about access to water to every individual member of society.⁴³¹ The people who lack sufficient means must not be deprived of water and water services and facilities. They should be provided with the necessary water and water facilities by the State parties.⁴³²

It is provided under the General Comment that though, everyone has the right to water, special attention needs to be given to the individuals and groups that have traditionally faced difficulties in exercising this right like prisoners, minority groups, women, indigenous peoples, etc.⁴³³: The State parties are obliged to take steps to ensure the full realization of this right.

General Comment 15 lays down the states parties' obligations. The general legal obligations of state parties are as under:

- i. States parties should guarantee that the right to water will be exercised without discrimination of any kind. The state parties have to take deliberate and targeted steps for the full realization of Articles 11, and 12.⁴³⁴

⁴²⁹ *Supra* note 167, art. 13-16.

⁴³⁰ *Supra* note 167, art. 13.

⁴³¹ *Supra* note 167, art. 14.

⁴³² *Supra* note 167, art. 15.

⁴³³ *Supra* note 167, art. 16.

⁴³⁴ *Supra* note 167, art. 17.

- ii. States parties have to move as expeditiously and effectively as possible toward the full realization of the right to water in a manner that is feasible and practicable.⁴³⁵
- iii. The states should not take retrogressive measures concerning the right to water.⁴³⁶
- iv. In case of deliberate introduction of retrogressive measures, the onus of proof is on the State party to prove that such retrospective measures have been introduced after making a careful consideration of all alternatives. Such measures should be justified when seen as the totality of the rights provided for in the Covenant.
- v. The right to water imposes three types of obligations on States parties. These are obligations to respect, obligations to protect, and obligations to fulfil.⁴³⁷

a. Obligations to respect

This obligation conveys that the state parties must refrain from interfering with the enjoyment of the right to water- by any means. This involves non-indulgence of the state parties in any such activity or practice that either limits or denies equal access to adequate water, pollutes the water, and arbitrarily interferes with the traditional water allocation system.⁴³⁸ At the time of natural disasters, armed conflicts, and emergencies the right to water includes the obligations of the States parties to protect those essential objects for the survival of the civilian population. These include the protection of drinking water installations including the natural environment and ensuring adequate access to water to civilians, prisoners, and internees.⁴³⁹

(b) Obligations to protect

The obligation to *protect* casts an obligation on the State parties to refrain third parties including individuals, corporations, groups, or agents acting under the authority, etc.

⁴³⁵ *Supra* note 167, art. 18.

⁴³⁶ *Supra* note 167, art. 19.

⁴³⁷ *Supra* note 167, art. 20.

⁴³⁸ *Supra* note 167, art. 21.

⁴³⁹ *Supra* note 167, art.22.

from intruding into the right to water. This duty comprises of adopting the requisite and effective legislative and other measures to restrain from any such intrusion.⁴⁴⁰

Where the water services are managed or controlled by third parties they must not compromise on equal, affordable, and physical access to sufficient, safe, and acceptable water. The States parties must prevent them from doing so. An effective regulatory system having independent monitoring, genuine public participation, and the power to impose penalties for non-compliance is required to attain this.⁴⁴¹

(c) Obligations to fulfil

The obligation to *fulfil* consists of three obligations namely the obligation to facilitate, an obligation to promote, and the obligation to provide. The State is required to undertake effective positive measures for assisting individuals and communities to enjoy their right to water by the obligation to facilitate. The obligation to promote puts an obligation on the State party to take steps necessary to ensure imparting appropriate education related to the hygienic use of water, protection of water sources, and methods to minimize water wastage. If the individuals or groups are unable to realize the right to water due to some reasons beyond their control, the state parties are also obliged to fulfill or provide the right.⁴⁴²

This obligation requires States parties to adopt those measures which are necessary for the complete realization of the right to water like giving recognition of this right within the political and legal system of the state concerned by the framing of laws, national water strategy, and plan of action, ensuring affordability of water for everyone; and bringing about improved and sustainable access to water, with special focus on rural areas and deprived urban areas.⁴⁴³

The affordability of water could be ensured by adopting the following measures:⁴⁴⁴

(a) Using low-cost techniques and technologies;

⁴⁴⁰ *Supra* note 167, art. 23.

⁴⁴¹ *Supra* note 167, art. 24.

⁴⁴² *Supra* note 167, art. 25.

⁴⁴³ *Supra* note 167, art. 26.

⁴⁴⁴ *Supra* note 167, art. 27.

- (b) Appropriate policies for fixing water prices like supplying free water or low-cost water; and
- (c) Income supplements.

The payment for water services must be based on the principle of equity to ensure that the water services are affordable for all individuals and groups in society.

The sufficient and safe supply of water for the present and future generations can be ensured by the State Parties by adopting comprehensive and integrated strategies and programs for:⁴⁴⁵

- (a) Reducing depletion of water resources through unsustainable extraction, diversion, and damming and water wastage in its distribution;
- (b) Reducing and eliminating contamination of watersheds and water-related ecosystems by substances such as radiation, harmful chemicals and human excreta;
- (c) Monitoring water reserves;
- (d) Ensuring that proposed developments do not interfere with access to adequate water;
- (e) Assessing the impacts of actions that may impinge upon water availability and natural-ecosystems watersheds, such as climate changes, desertification and increased soil salinity, deforestation, and loss of biodiversity;
- (f) Increasing the efficient use of water by end-users; (g) Response mechanisms for emergencies;
- (h) Establishing competent institutions and appropriate institutional arrangements to carry out the strategies and programs.

The General Comment No. 15 also specifies the international obligations for the member countries to follow. Article 2, Article 11, and Article 23 of the Covenant on Economic, Social, and Cultural Rights Oblige the State parties to recognize the essential role of international cooperation and assistance to achieve the full realization

⁴⁴⁵ *Supra* note 167, art. 28.

of the right to water through joint as well as separate actions.⁴⁴⁶The international cooperation prohibits the States parties to refrain from all such actions that interfere—directly or indirectly, with the enjoyment of the right to water in other countries. No action within the State party’s jurisdiction should deprive another country of its ability to ensure the right to water for the people within its jurisdiction.⁴⁴⁷The embargoes etc. that prevent the supply of water and goods and services mandatory for securing the right to water must not be imposed by any of the State parties.

There is a prohibition on the use of water as an instrument of economic and political pressure.⁴⁴⁸It is the responsibility of the States parties to prevent their citizens and companies from violating the right of water to individuals and communities in other countries. Steps should also be taken by the State parties to influence the third parties to respect the right of water to other state parties.⁴⁴⁹The States should also facilitate the realization of the right to water in other countries. This can be done by providing financial and technical assistance when required. The economically developed State parties are responsible for assisting the developing States in realizing the right to water.⁴⁵⁰

The States parties are under an obligation to ensure that the right to water is further discussed at the international level and is incorporated in international agreements.

The development of further legal instruments should be considered. While implementing the international and regional agreements, the State Parties should ensure that these agreements do not harm the right to water.⁴⁵¹The States parties that are members of international financial institutions should take steps to ensure that the right to water is considered while deciding their lending policies, credit agreements, etc.⁴⁵²

The following Core obligations of the state parties are identified:

- (a) Ensuring access to a minimum adequate quantity of safe water for personal and domestic uses to prevent disease;

⁴⁴⁶ *Supra* note 167, art. 30.

⁴⁴⁷ *Supra* note 167, art. 31.

⁴⁴⁸ *Supra* note 167, art. 32.

⁴⁴⁹ *Supra* note 167, art. 33.

⁴⁵⁰ *Supra* note 167, art. 34.

⁴⁵¹ *Supra* note 167, art. 35.

⁴⁵² *Supra* note 167, art. 36.

- (b) Ensuring the right of access to water and water facilities and services for disadvantaged or marginalized groups;
- (c) ensuring physical access to water facilities or services that are at a reasonable distance from the household, have many water outlets, and provide sufficient, safe, and regular water;
- (d) Ensuring personal security of individuals when having physical access to water;
- (e) Ensuring equitable distribution of available water facilities and services;
- (f) Adopting and implementing national water strategy and plan of action that are reviewed from time to time based on a participatory and transparent process;
- (g) Monitoring the extent of the realization, or the non-realization, of the right to water;
- (h) Adopting low-cost water programs for the benefit of vulnerable and marginalized groups;
- (i) Taking measures to prevent threats and control diseases linked to water.⁴⁵³

When the normative content of the right to water is applied to the obligations of States parties, a process is set in motion, which facilitates the identification of violations of the right to water. The State parties are under an obligation to establish that they have taken necessary steps for the realization of the right to water following the provisions set out in general and core obligations. This would be beneficial to demonstrate compliance with their general and specific obligations. The failure to take such steps violates the right to water.⁴⁵⁴

Article 41 makes a distinction between the inability of a State to comply with the obligations about the right to water and the unwillingness of a State party to comply with its obligations about the right to water. A State reluctant to use its available resources to the fullest for the realization of the right to water violates its obligation under the Covenant. If the state is willing to fulfil its obligation but the unavailability of resources renders it impossible for a State party to comply with the obligations under the Covenant, the State must prove that all possible efforts had been made to

⁴⁵³ *Supra* note 167, art. 37.

⁴⁵⁴ *Supra* note 167, art. 40

use all available resources to meet the obligations. The right to water can be violated by the acts of state parties or other entities. This includes the adoption of incompatible legislation policies or measures with the core obligations or international legal obligations about the right to water. This also includes formal repeal or suspension of essential legislation for the continued enjoyment of the right to water.⁴⁵⁵

Violations of the right to water can also take place through omissions by the state parties. This includes the failure to enact relevant laws, non-formulation of national policy on water, and non-implementation of necessary steps for the realization of everyone's right to water by the State Parties.⁴⁵⁶

The General Comment 15 identifies some major violations. However, this list is not exhaustive. The violations identified are:

(a) Violation of the obligation to respect. Arbitrary disconnection or exclusion from water services or facilities, discriminatory or unaffordable hikes in water price, and pollution of water resources are included in this obligation.

(b) Violations of the obligation to protect. This comprises non-enactment or non-implementation of laws to regulate water services and prevent the pollution of water. It includes the protection of water distribution systems from interference, damage, and destruction. (c) Violations of the obligation include failure to adopt or implement a national water policy, and insufficient expenditure of public resources resulting in the non-enjoyment of the right to water by individuals or groups. It includes failure to take measures to reduce the inequitable distribution of water facilities and services, failure to monitor the realization of the right to water at the national level, failure to ensure that the minimum essential level of the right is enjoyed by everyone, failure to adopt mechanisms for emergency relief. Failure of a State to respect its international legal obligations regarding the right to water when entering into agreements with other States or with international organizations is part of this obligation.⁴⁵⁷

General Comment 15 provides for the implementation at the domestic level. The States parties are required under the Covenant to utilize all appropriate means to implement the obligations under this Covenant, including, inter alia, the adoption of

⁴⁵⁵ *Supra* note 167, art. 42.

⁴⁵⁶ *Supra* note 167, art. 43.

⁴⁵⁷ *Supra* note 167, art. 44.

legislative measures.⁴⁵⁸The Covenant casts an obligation on each State party to adopt necessary measures to ensure the enjoyment of the right to water by everyone. The national measures formed to realize the right to water should be such that they do not interfere with the enjoyment of other human rights.⁴⁵⁹

Each State Party should review its existing laws, strategies, and policies to ensure that they are compatible with obligations that arise from the right to water. Wherever they are inconsistent with such obligations, they should be repealed; amended, or changed.⁴⁶⁰The States parties should make use of the technical assistance and cooperation of the United Nations' specialized agencies at the time of formulating and implementing the strategy.⁴⁶¹

While formulating and implementing the national water strategies and plans of action the principles of non-discrimination and people's participation should be taken care of. Individuals and groups have a right to actively participate in the policy-making processes affecting their exercise of the right to water. Active Public participation must be an essential component of any policy, program, or strategy concerning water. Full and equal access to information held by public authorities or third parties concerning water, water services, and the environment, should be given to Individuals and groups affected by any policy, program, or strategy.⁴⁶²The principles of accountability, transparency, and independence of the judiciary should be the basis of the national water strategy and plan of action. To create a favourable climate for the realization of the right to water, state parties should take appropriate steps to create awareness among the private business sector and civil society.⁴⁶³

States parties may find it advantageous to adopt framework legislation which shall include: (a) Targets or goals to be attained and the time-frame for their achievement;⁴⁶⁴

(b) Mechanism to attain desired goals;

⁴⁵⁸ *Supra* note 167, art. 2, para 1.

⁴⁵⁹ *Supra* note 167, art. 45.

⁴⁶⁰ *Supra* note 167, art. 46.

⁴⁶¹ *Supra* note 167, art. 47.

⁴⁶² *Supra* note 167, art. 48.

⁴⁶³ *Supra* note 167, art. 49.

⁴⁶⁴ *Supra* note 167, art. 50.

- (c) Association with community, private actors, and global bodies; (d) Established accountability for the process;
- (e) Domestic means for National monitoring; and (f) Remedies and recourse procedures.⁴⁶⁵

To assist the monitoring process, right-to-water indicators need to be identified in the national water strategies or plans of action. These indicators should be capable of addressing the different components of adequate water, and be disaggregated by the prohibited grounds. Of discrimination, and cover all persons residing in the State party's territorial jurisdiction or the areas under their control. Guidance on these indicators may be taken from WHO, FAO, the United Nations Centre for Human Settlements (Habitat), ILO, UNICEF, UNEP, UNDP, and the United Nations Commission on Human Rights.⁴⁶⁶

An individual or group whose right to water has been violated should have access to judicial or other remedies at the national level as well as global level. All the victims of violations of the right to water should be entitled to adequate reparation, compensation, or guarantees of non-repetition. Apart from the judiciary the national ombudsmen, human rights commissions, and similar institutions should be permitted to address violations of the right.⁴⁶⁷

Before implementing any act of the State Party or any other third party that has the potential to interfere with an individual's right to water, the relevant authorities must ensure that such actions are performed following the provisions of the law.⁴⁶⁸ The incorporation of the provisions of international instruments related to the right to water in the domestic legal order of a state party should be encouraged as it enhances the scope and effectiveness of remedial measures. Incorporation enables the courts to adjudicate violations of the right to water.⁴⁶⁹ States parties should encourage the adjudicators, Judges, and members of the legal profession to be sensitive toward the cases of violations of the right to water.⁴⁷⁰ The States parties should facilitate and

⁴⁶⁵ *Ibid.*

⁴⁶⁶ Art. 53, General Comment No.15, 2002.

⁴⁶⁷ *Supra* note 167, art. 55.

⁴⁶⁸ *Supra* note 167, art. 56.

⁴⁶⁹ *Supra* note 167, art. 57.

⁴⁷⁰ *Supra* note 167, art. 58.

promote the activities of human rights advocates and civil society in the realization of the right to water.⁴⁷¹

General Comment 15 casts obligations of factors other than states. These non-state factors include the United Nations agencies and other international organizations concerned with water.⁴⁷² The international organizations which are concerned with trade like World Trade Organization should provide effective cooperation to the States parties for the implementation of the right to water at the national level. With an object to promote the right to water, international financial institutions like the International Monetary Fund and the World Bank should have due regard to this right in their lending policies, credit agreements, development programs, etc. International Committee and the International Federation of the Red Cross and Red Crescent Societies, the Office of the United Nations High Commissioner for Refugees, UNICEF, WHO, some non-governmental organizations and other associations can be instrumental in realizing the right to water particularly during times of disasters and emergencies.⁴⁷³

The Human Rights Council adopted a resolution in March 2008 that recognized human rights obligations concerning water and sanitation, and established an independent expert to examine these obligations and their realization problems in international action.

3.22. Human Rights Council Decision 2/104.

The Human Rights Council reaffirmed the right to water as provided in the Universal Declaration of Human Rights, the International Covenant on Civil and Political Rights, the International Covenant on Economic, Social and Cultural Rights, the Mar del Plata Action Plan, the International Convention on the Elimination of All Forms of Racial Discrimination, Discrimination against Women and the Convention on the Rights of the Child, General Comment No. 15 (2002) of the Committee on Economic, Social and Cultural Rights. It also referred to the guidelines contained in the report of the Special Reporter of the Sub-Commission on the Promotion and Protection of Human Rights for the realization of the right to drinking water and sanitation. Then it

⁴⁷¹ *Supra* note 167, art. 59.

⁴⁷² These agencies are mainly WHO, FAO, UNICEF, UNEP, UN-Habitat, ILO, UNDP, IFAD.

⁴⁷³ *Supra* note 167, art. 60.

requested the United Nations High Commissioner for Human Rights to undertake research and study the scope and content of the relevant human rights obligations concerning equitable access to safe drinking water and sanitation under international human rights instruments.⁴⁷⁴

3.23. The Convention on the Rights of Persons with Disabilities 2008

The Convention on the Rights of Persons with Disabilities and its Optional Protocol was adopted on 13 December 2006. It is the first comprehensive human rights treaty of the 21st century and is the first human rights convention to be open for signature by regional integration organizations. The Convention entered into force on 3 May 2008.

The Convention follows decades of work by the United Nations to change attitudes and approaches to persons with disabilities. This Convention attempted to change the perception of viewing persons with disabilities not as “objects” of charity, medical treatment, and social protection but as “subjects” with rights, who are capable of asserting those. The Convention viewed these persons as active members of society and also capable of making independent decisions for their lives based on their free, and informed consent.⁴⁷⁵

The Convention is considered a human rights instrument focusing on social development. It categorizes the person with disabilities broadly and reaffirms that all persons with all kinds of disabilities are entitled to all human rights and fundamental freedoms. It elaborates on the applicability of all categories of rights available to persons with disabilities and recognizes areas where changes must be made to effectively exercise their rights. It provides areas where their rights have been violated, and where protection of rights must be reinforced.

This Convention affirms that people with disabilities have the same rights as everyone else in all areas of life like access to justice, freedom of expression etc. The Convention aims “to promote, protect and ensure the full and equal enjoyment of all human rights and fundamental freedoms by all persons with disabilities, and to

⁴⁷⁴ UN Human Rights Council, *Human Rights and Access to Water, 2006*, HRC Decision 2/104, UN HRC, UN Doc A/HRC/DEC/2/104 (27 November 2006).

⁴⁷⁵ UN General Assembly, *Convention on the Rights of Persons with Disabilities*, GA Res 61/106, GAOR, UN Doc A/RES/61/106 (13 December 2006).(available at <https://www.un.org/development/desa/disabilities/convention-on-the-rights-of-persons-with-disabilities.html>)

promote respect for their inherent dignity.”⁴⁷⁶ The Convention makes provisions for ensuring an adequate standard of living and social protection for persons with disabilities.⁴⁷⁷ The State Parties also recognized the right to an adequate standard of living for the families of persons with disabilities. The right to an adequate standard of living includes the right to adequate food, clothing, and housing. The State Parties are bound to take necessary steps to safeguard and promote the realization of this right without discriminating based on disability.⁴⁷⁸

The States Parties considered social protection without discrimination as the right of persons with disabilities. Equal access to clean water services among other amenities by persons with disabilities is one of the essential measures to ensure the enjoyment of their rights.⁴⁷⁹

3.24. United Nations Conventions on the Law of the Sea

United Nations Convention on the Law of the Sea (UNCLOS) is also known as the Law of the Sea treaty. Regarding the development of the law of the sea, there were several global conventions signed in the latter half of the 20th century. The United Nations (UN) held its first Conference on the Law of the Sea (UNCLOS I) in 1956, which came into effect in a 1958 Convention. The final conference, held in Montego Bay, Jamaica, in 1982, resulted in the 1982 Law of the Sea Convention the latest UNCLOS is UNCLOS III which covers all the vital issues regarding the maritime boundaries. Several provisions were incorporated in this convention covering the most important issues such as navigation, setting limits, archipelagic status and transit regimes, and exclusive economic zones (EEZs). These also include continental shelf jurisdiction, deep seabed mining, the exploitation regime, protection of the marine environment, scientific research, and settlement of disputes. This convention includes rules, inter alia, to prevent, reduce, and control pollution of the marine environment. These rules are related to the reduction, prevention, and control of Pollution from land-based sources⁴⁸⁰, pollution from activities in the Area,⁴⁸¹ pollution by dumping,⁴⁸²

⁴⁷⁶ *Id.*, art. 18.

⁴⁷⁷ *Id.*, art. 28.

⁴⁷⁸ *Id.*, art. 28(1).

⁴⁷⁹ *Id.*, art. 28(2) (a).

⁴⁸⁰ United Nations Conventions on the Law of the Sea, 1982, art. 207.(available at https://www.un.org/ /depts /los /convention_agreements/texts/unclos/unclos_e.pdf)

⁴⁸¹ *Id.*, art. 209.

Pollution from seabed activities is subject to national jurisdiction,⁴⁸³ pollution from or through the atmosphere⁴⁸⁴ Pollution from vessels.⁴⁸⁵ This convention also includes provisions relating to the implementation and enforcement of laws and regulations to prevent, reduce, and control pollution of the marine environment.⁴⁸⁶

3.24.1. International Convention for the Prevention of Pollution of the Sea by Oil, 1954

This Convention was the first multidimensional instrument to be resolved with the main purpose of preserving the marine environment. It is concerned with the agreement between the States involved to prevent pollution of the sea by oil discharged from ships. The convention was held in London on 12 May 1954. It was intended to act by common agreement to prevent pollution of the sea by oil discharged from ships. Standards were prescribed for discharging oil into the sea. The principles were later amended in 1962, fixing zones of the Arabian Sea, Bay of Bengal, and Indian Ocean. In 1981, the conditions of the convention were made applicable to India.⁴⁸⁷

This Convention applies to all ships, except tankers under 150 tons gross tonnage and other ships of under 500 tons gross tonnage, registered in the territory of, or having the nationality of, a Party. Naval ships and ships engaged in whaling are also accepted.⁴⁸⁸ Discharges are permitted only, except when a ship is proceeding enroute or when the instantaneous rate of discharge does not exceed 60 liters per mile. The prohibition is not applicable when the following conditions are satisfied: “in the case of a ship - the oil content of the discharge is less than 100 parts per million parts of the mixture, or the discharge is made as far as practicable from land; in the case of a tanker - the total quantity of oil discharged on a ballast voyage does not exceed one fifteen-thousandth of the total cargo-carrying capacity, or the tanker is more than 50 miles from the nearest land.”⁴⁸⁹ However, this is subject to exception in cases of

⁴⁸² *Id.*, art. 210.

⁴⁸³ *Id.*, art. 208.

⁴⁸⁴ *Id.*, art. 212.

⁴⁸⁵ *Id.*, art. 211.

⁴⁸⁶ *Id.*, art. 213-220.

⁴⁸⁷ P. B. Sahasranaman, *Handbook of Environmental lawin India* 106 (Oxford University Press, New Delhi, 2012).

⁴⁸⁸ International Convention for the Prevention of Pollution of the Sea by Oil, 1954, art. 2.

⁴⁸⁹ *Id.*, art. 3.

necessity to secure the safety of ships, save life, or prevent damage to cargo, or where the leakage is unavoidable and alternate measures have been taken to minimize it.⁴⁹⁰ Ships are to be fitted within twelve months to prevent the escape of oil into the bilges.⁴⁹¹ Parties undertake to provide appropriate facilities at ports and oil-loading terminals.⁴⁹² All ships covered by the Convention are to carry an oil record book in a form specified in the annexure, to be completed whenever certain operations take place.⁴⁹³ Parties agree to send texts of laws, decrees, orders, and regulations giving effect to the Convention of the United Nations.

3.24.2. London Convention on the Dumping of Wastes at Sea, 1972

The Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 1972, commonly called the "London Convention" is an agreement to control pollution of the sea by dumping and to encourage regional agreements supplementary to the Convention. Its chief aim is to promote the effective control of all sources of marine pollution and to take all feasible measures to prevent sea pollution by dumping wastes and other materials. It covers the deliberate disposal at sea of wastes or other matter from vessels, aircraft, and platforms. It does not cover discharges from land-based sources such as pipes and outfalls, wastes generated incidental to normal operation of vessels, or placement of materials for purposes other than mere disposal. The convention has a global character and contributes to the international control and prevention of marine pollution. In 1996, the "London Protocol" was agreed to further modernize the Convention and, eventually, replace it.

All seas and all deliberate disposals of wastes other than that incidental to the normal operation of e.g. ships and aircraft recovered under this Convention. The London Convention aims to control all sources of marine pollution and prevent pollution of the sea through the regulation of dumping into the sea of waste materials. Wastes, which can be disposed of at sea according to the hazard they present to the environment come under the "black- and grey-list" approach is applied for. Dumping of certain hazardous materials including PCBs, mercury, DDT, oil, and persistent plastics is prohibited. Dumping of matter listed in annexure I is prohibited. Dumping

⁴⁹⁰ *Id.*, art. 4.

⁴⁹¹ *Id.*, art. e7.

⁴⁹² *Id.*, art. 8.

⁴⁹³ *Id.*, art. 9.

of matter listed in annexure II is allowed only by special permit while dumping of matter listed in annexure III is allowable only by general permit.⁴⁹⁴ Exceptions are permitted only in the case of force majeure or extreme emergency. Parties undertake to establish authorities to issue permits keep records and monitor the condition of the seas.⁴⁹⁵ They agree to enforce measures on all flag aircraft and ships, as well as ships and aircraft loading within their territories/territorial seas.⁴⁹⁶ Parties with particular interests in certain areas of the sea are to enter into regional agreements to prevent marine pollution.⁴⁹⁷ Moreover, Parties are to collaborate in training personnel, supplying equipment for research and monitoring, and disposing of and treating wastes.⁴⁹⁸ Procedures are to be developed for the assessment of liability and settlement of disputes.⁴⁹⁹ Ultimately, Parties take steps to prevent pollution by hydrocarbons, other matter transported other than for dumping, wastes generated during the operation of ships, etc., radioactive pollutants, and matter originating from exploration of the sea bed.⁵⁰⁰

3.24.3. International Convention for the Control and Management of Ships' Ballast Water and Sediments

Dangerous aquatic species are a major threat to the marine environments and shipping has been known as a major pathway for introducing such species to such environments. The effects of the introduction of such new species have in many areas of the world been devastating. The problem has amplified with the increase in trade and traffic volume over the last few years and with the introduction of steel hulls, allowing vessels to use water instead of solid materials as ballast. Ballast Water “means water with its suspended matter taken on board a ship to control trim, list, draught, stability or stresses of the ship.”⁵⁰¹ The existing data shows that the rate of bio-invasions is continuing to increase at an alarming rate. As the volumes of

⁴⁹⁴ The Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972, art. 4.

⁴⁹⁵ *Id.*, art. 6.

⁴⁹⁶ *Id.*, art. 7.

⁴⁹⁷ *Id.*, art. 8.

⁴⁹⁸ *Id.*, art. 9.

⁴⁹⁹ *Id.*, art. 10.

⁵⁰⁰ *Id.*, art. 12.

⁵⁰¹ International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004, art. 1.2

seaborne trade continue overall to increase, the problem may not yet have reached its peak.

The ballast water that is discharged from ships greatly affects the marine environment. A huge amount of ballast water is carried by large tankers, cruise ships, and bulk cargo carriers, which is often taken on in the coastal waters in one region after ships unload cargo, discharge wastewater, or discharge at the next port of call, whenever more cargo is loaded. A variety of biological materials, including plants, animals, viruses, and bacteria are present in ballast water. These substances cause serious human health issues including death and often include non-native, nuisance, exotic species that can cause extensive ecological and economic damage to aquatic ecosystems. The countries should promote and facilitate scientific and technical research on Ballast Water Management; and monitor the effects of Ballast Water Management in waters under their jurisdiction⁵⁰².

The Ballast Water Management Convention, adopted in 2004, established standards and procedures for the management and control of ships' ballast water and sediments intending to prevent the spread of harmful aquatic organisms from one region to another. The Ballast Water Management Convention which is subject to entry into force in September 2017 governs the discharge of ballast water and sediments by ships globally. It is also controlled through national regulations, which may be separate from the Convention, such as in the USA.

Under the Convention, “according to a ship-specific ballast water management plan, all ships in international traffic must manage their ballast water and sediments to a certain standard. Every ship should carry an international ballast water management certificate and a ballast water record book. The ballast water management standards will be phased in over some time. As an intermediate solution, ships should exchange ballast water mid-ocean. However, it is essential that all ships need to install an on-board ballast water treatment system.”⁵⁰³ Several guidelines have been formulated to facilitate the implementation of the Convention as follows:

“The Convention insists all ships implement a Ballast Water and Sediments Management Plan. All ships will have to carry a Ballast Water Record Book and will

⁵⁰² *Id.*, art. 6.1

⁵⁰³ *Id.*, regulation D-4

*be required to carry out ballast water management procedures to a given standard. Existing ships will be required to do the same but after a phase-in period. The Parties to the Convention are given the option to take additional measures which are subject to criteria set out in the Convention and to International Maritime Organisation (IMO) guidelines. Technical standards and requirements in the Regulations for the control and management of ships' ballast water and sediments are included in the Convention. Parties undertake to give complete effect to the provisions of the Convention and to prevent, minimize, and ultimately eliminate the transfer of harmful aquatic organisms and pathogens through the control and management of ships' ballast water and sediments.*⁵⁰⁴

Measures taken for ballast water management by the Parties should be ensured that it does not cause greater harm than they present to their environment, human health, property or resources, or those of other States. Under Article 5 “Sediment Reception Facilities Parties undertake to ensure that ports and terminals where cleaning or repair of ballast tanks occurs have adequate reception facilities for the reception of sediments”. Article 6 provides that “Scientific and Technical Research and Monitoring calls for Parties individually or jointly to promote and facilitate scientific and technical research on ballast water management, and monitor the effects of ballast water management in waters under their jurisdiction”.⁵⁰⁵

Ships are required to be surveyed and certified.⁵⁰⁶ This may be inspected by port State control officers⁵⁰⁷ who can verify that the ship has a valid certificate; inspect the Ballast Water Record Book; and/or sample the ballast water. If there are concerns, then a detailed inspection may be carried out, and "the Party carrying out the inspection shall take such steps as will ensure that the ship shall not discharge Ballast Water until it can do so without presenting a threat of harm to the environment, human health, property or resources."⁵⁰⁸

The Convention provides that “Technical Assistance, Co-operation, and Regional Co-operation, Parties undertake, directly or through the Organization and other international bodies, as appropriate, in respect of the control and management of

⁵⁰⁴ *Id.*, art. 2.

⁵⁰⁵ *Id.*, art. 2.

⁵⁰⁶ *Id.*, art. 7.

⁵⁰⁷ *Id.*, art. 9.

⁵⁰⁸ *Id.*, art. 9.

ships' ballast water and sediments, to provide support for those Parties which request technical assistance to train personnel; to ensure the availability of relevant technology, equipment, and facilities; to initiate joint research and development programs; and to undertake other action aimed at the effective implementation of this Convention and of guidance developed by the Organization related thereto.”⁵⁰⁹

Article 2 provides that "Except where expressly provided otherwise, the discharge of Ballast Water shall only be conducted through Ballast Water Management, in accordance with the provisions of this Annex. Ships are required to have on board and implement a Ballast Water Management Plan approved by the Administration. The Ballast Water Management Plan is specific to each ship and mentions all the actions to be taken to implement the Ballast Water Management requirements and supplemental Ballast Water Management practices.⁵¹⁰ To record when ballast water is circulated or treated for Ballast Water Management purposes; taken on board; and discharged into the sea, a Water Record Book should be carried by the ships. A record should be maintained of when Ballast Water is discharged to a reception facility and accidental or other exceptional discharges of Ballast Water. Regulation B-3 Ballast Water Management for Ships contains the specific requirements for ballast water management”.⁵¹¹

Other methods that ensure at least the same level of protection to the environment, human health, property, or resources, and are approved in principle by IMO's Marine Environment Protection Committee (MEPC) of ballast water management may also be accepted as alternatives to the ballast water exchange standard and ballast water performance standard.

3.25. Groundwater

Global law has, so far, rarely taken account of groundwater resources. The groundwater is either nominally included in the scope of these instruments, mainly if it is related to surface waters, or it is not mentioned at all. “Only a few legal instruments contain groundwater-specific provisions, and even fewer address groundwater exclusively As groundwater quickly emerges from the limelight and

⁵⁰⁹ *Id.*, art. 13.

⁵¹⁰ *Id.*, regulation B-1.

⁵¹¹ *Ibid.*

gains strategic importance as a source of often high-quality freshwater in the face of the impending water crisis world-wide, the need for rules of international law addressing groundwater management and protection becomes ever more compelling”.⁵¹²

There is no such direct reference to groundwater in any global convention except a few implied provisions. There are indirect references to groundwater in some of the provisions relating to environment protection. One such convention is the United Nations Convention to Combat Desertification in those Countries Experiencing Serious Drought and/or Desertification, particularly in Africa, 1994. The objective of this Convention is to combat desertification and mitigate the effects of drought in countries experiencing serious drought and/or desertification, particularly in Africa, through effective action at all levels, supported by international cooperation and partnership arrangements, in the framework of an integrated approach which is consistent with Agenda 21, to contribute to the achievement of sustainable development in affected areas.⁵¹³

Transboundary ground water gained attention in the United Nations Watercourse Convention, in 1997. The convention defines the watercourse to include both surface as well as groundwater.⁵¹⁴ However, this definition is incomplete as it leaves the groundwater that is not connected to surface water. Groundwater, which is in present times an important source of water must find its due place in international law for its protection and conservation globally.

3.26. World Water Forum

Over the last decade, there have been many global initiatives aimed at promoting the concept of sustainable development through implementing actions recommended by Agenda 21 (UN1992). In the case of water resources, this has largely been effected through the establishment and convening of international meetings known as the World Water Forums, which regularly debate and discuss issues relating to water and

⁵¹² Stefano Burchi and Kerstin Mechlem, “Groundwater in International law: Compilation of treaties and other legal Instruments” xi (UNESCO and FAO of the United Nations, Rome, 2005)

⁵¹³ United Nations Convention to Combat Desertification in those Countries Experiencing Serious Drought and/or Desertification, particularly in Africa, 1994, art, 2,

⁵¹⁴ United Nations Convention on the Law of the Non-navigational Uses of International Watercourse, 1997, art. 2 (a). According to it, the “Watercourse” means a system of surface waters and groundwaters constituting by virtue of their physical relationship a unitary whole and normally flowing into a common terminus.”

its management. An important feature of these World Water Forum meetings has been the agreements by participating countries to implement specific targets and objectives, which not only improve the status of water resources but also ensure that the resource is optimally utilized to the benefit of humankind (e.g. the Millennium Development Goals, 2000). Such international forums require that there is feedback from all countries on the achievement of agreed targets and objectives. Its overall objective is “to meet the growing requirements of UN Member States and the international community for a wider range of policy-relevant, timely and reliable information in various fields of water resources developments and management, through the production of the United Nations World Water Development Report.”⁵¹⁵

The World Water Council organizes the World Water Forum, an international platform relating to water, every three years. It is an international think tank founded in 1996 and has its headquarters in Marseille, France. It includes organizations from the UN and intergovernmental organizations, local governments, civil society groups, the private sector (construction, engineering, and manufacturing companies), governments and ministries, academic institutions, and international organizations. It constitutes over 250 organizations in more than 50 countries across 5 continents as members.⁵¹⁶

The stated mission of World Water Forum is “to promote awareness, build political commitment and trigger action on critical water issues at all levels, including the highest decision-making level, development, planning, management, to facilitate the efficient conservation, protection, and use of water in every aspect on an environmentally sustainable basis for the advantage of all life on earth.”⁵¹⁷ The other purposes of the forum are “to provide opportunities to develop visions on challenging water issues, to develop new partnerships and to pave the way for cooperation and action among a wide diversity of organizations and individuals and to encourage greater media attention for water issues and solutions.”⁵¹⁸

⁵¹⁵ World Water Assessment Programme, available at <https://www.unesco.org/en/wwap> (visited on 20-02-2025)

⁵¹⁶ World Water Council available at <http://www.worldwatercouncil.org/en> (last visited on 21 September 2021).

⁵¹⁷ World Water Forum available at <http://www.worldwatercouncil.org/en/world-water-forum> (last visited on 21 September 2021).

⁵¹⁸ *Ibid.*

3.26.1. 1st World Water Forum: The first World Water Forum, following the creation of the World Water Council, took place in Marrakech, Morocco, in 1997. It laid the basis for the development of a long-term “Vision for Water, Life and the Environment in the 21st Century.”⁵¹⁹ Sessions included in the forum were the following:

- i. Perspectives on world water.
- ii. On the road towards a long-term vision for world water.
- iii. The challenges of the 21st century.
- iv. Celebration of World Water Day.⁵²⁰

The 2nd World Water Forum. in Hague (2000) dealt with the state and ownership of water resources, management and financing models, their development potential, and their impact on poverty, social, cultural, and economic development, and the environment. There was much debate on the World Water Vision and the associated Framework for Action. The key challenges that were discussed in the forum include meeting basic water needs, sharing water resources, securing food supply, protecting the ecosystems, managing risks, and valuing and regulating water.⁵²¹

3.26.2. 3rd World Water Forum

In the context of new commitments were set forth by the United Nations in New York 2000⁵²², in Bonn 2001⁵²³, and then in Johannesburg 2002⁵²⁴ and the debate was furthered. The 3rd World Water Forum took place in Kyoto, Japan in March 2003.⁵²⁵ In the 3rd World Water Forum the "World Panel on Financing Water Infrastructure" presented its conclusions on what should be done to find adequate financing for water

⁵¹⁹ World Water Council, Marrakesh Forum available at <http://www.worldwatercouncil.org/forum/marrakesh-1997/> (last visited on 21 September 2021).

⁵²⁰ Marrakech Declaration available at [www.worldwatercouncil.org/.../wwc/.../ Marrakech_Declaration.pdf](http://www.worldwatercouncil.org/.../wwc/.../Marrakech_Declaration.pdf) (last visited on 21 September 2021).

⁵²¹ World Water Forum,2, Hague available at <http://faoswalim.org/so/content/world-water-forum-2-hague-Switzerland> (last visited on 21 September 2021).

⁵²² United Nations Millennium Declaration,2000

⁵²³ United Nations Framework Convention on Climate Change,2001

⁵²⁴ United Nations World Summit on Sustainable Development, 2002

⁵²⁵ 3rd World Water Forum Analysis available at http://www.worldwatercouncil.org/fileadmin/world_water_council/documents/world_water_forum_3/analysis.pdf (visited on 21 Sept. 2021).

infrastructure and offered specific proposals on how this can be achieved, and by whom.⁵²⁶

A new concept called Virtual Water Forum was introduced. Indigenous people were invited to participate in the 3rd World Water Forum thereby recognizing that indigenous land and water rights are vital to the discussion of water interests worldwide.⁵²⁷ This invitation recognized the rights of indigenous people to assist in creating water-related policy. Their involvement resulted in the signing of the Indigenous Peoples Kyoto Declaration focusing on the rights of indigenous people to self-determine usage of their water resources.

3.26.3. 4th World Water Forum

The 4th World Water Forum was held in 2006 in Mexico City. Participants included official representatives and delegates from 140 countries including mayors legislators, and ministers.⁵²⁸ The main events of the Forum were the presentation of the 2nd UN World Water Development Report, The establishment of the Asia-Pacific water forum, The launch of the Water Integrity Network, The Right to Water - From concept to implementation, Task Force on Financing Water for All - Report 1, Enhancing Access To Finance For Local Governments-Financing Water For Agriculture, Costing Target on Water Supply and Sanitation-Comparative Analysis, Obstacles and Recommendations and Official Development Assistance for Water from 1990 to 2004 - Figures and trends were the main features of this Forum.⁵²⁹

3.26.4. 5th World Water Forum

The 5th World Water Forum was organized in Istanbul, Turkey in 2009.⁵³⁰ The meeting of the state heads was conducted for the first time in the history of the World Water Forum. In addition, the ministerial statement and water guide were developed. Further exchanges with stakeholder representatives were organized through ministerial roundtable discussions.

⁵²⁶ *Ibid*

⁵²⁷ *Ibid.*

⁵²⁸ World Water Forum, Mexico 2006, available at <http://www.worldwatercouncil.org/forum/mexico-2006> (last visited on 21 September 2021).

⁵²⁹ *Ibid.*

⁵³⁰ 5th World Water Forum, Turkey 2009, available at <http://www.worldwaterforum5.org/> (last visited on 21 September 2021).

A new concept called the Istanbul Water Consensus (IWC) was framed with the involvement of the Local and regional authorities. Its concern was to adapt its water infrastructure and services to the emerging challenges they are facing. First time over 250 parliamentarians from around the world jointly participated in addressing water issues. Several high-level panels were organized on issues like sanitation, water-related disasters, the water-food-energy nexus, and financing.

The key decisions and major themes addressed at the Forum were water, food, and energy; climate change, disasters, MDGs, finance, public/private management, governance, transboundary issues, the right to water, and data availability.⁵³¹ Civil society protests were considerable, notably about the negative effects of dams. Blockades and marches were organized, and Turkey deported peaceful protesters.

There, were, again, extensive protests in the Sixth World Water Forum(2012) held in Marseille, France, against the green washing of water commodification by corporations and the effects of dams.⁵³²

3.26.5. 7th World Water Forum

The 7th World Water Forum on the theme of “Water for Our Future” took place from 12 to 17 April 2015 in Daegu and Gyeong Buk, Republic of Korea.⁵³³ All the participants engaged in dialogue and debated putting water at the heart of our future.⁵³⁴ The water community and decision-makers agreed that investing in water must be a top priority for the political agenda for all the policy makers in the next decade.⁵³⁵ Critics accuse the World Water Council of promoting the privatization of water supply; an indication of this is the large influence of financial institutions and global water corporations.

3.26.6. 10th World Water Forum

The 10th World Water Forum, held from May 18th to 25th, 2024, in Bali, Indonesia, provided a unique opportunity for the water community and key decision-makers to

⁵³¹ *Ibid.*

⁵³² 6th World Water Forum available at <http://www.worldwaterforum6.org/> (last visited on 21 September 2021).

⁵³³ 7th World Water Forum available at <http://www.oecd.org/cfe/regional-policy/world-water-forum-7.htm> (last visited on 21 September 2021).

⁵³⁴ World Water Council Home available at <http://www.worldwatercouncil.org/index.php?id=1> (last visited on 21 September 2021).

⁵³⁵ 8th World Water Forum, 2018 available at <https://www.dutchwatersector.com/news-events/events/125-8th-world-water-forum-2018.html> (last visited on 21 September 2021).

collaborate and bring innovative answers to global water challenges. The Forum allowed stakeholders to voice their political, thematic, and regional perspectives to turn water solutions into action.⁵³⁶ Water was described as the “next oil,” as it has become an important factor in maintaining economic sustainability and global ecology. Five goals were discussed, as follows: ‘water as a fundamental right, water resilience, water management funding, water for accelerating the SDGs, and creating synergies between the water agenda and global efforts.’⁵³⁷ The 10th World Water Forum in Bali confirmed the crucial importance of international cooperation in resolving water-related challenges.

3.27. International Water Law involving India and Neighbouring Countries

Today, many of the river systems traverse more than one country and different political geographies and the growing populations and increasing demand for water raises new issues of sharing, development, and management of water resources. In South Asia, too, the major northern river systems, the Indus and the Ganga–Brahmaputra, are trans-boundary in nature and flow through the territory of some neighbouring countries also in addition to their flow through the Indian territory. With nearly a quarter of the world’s population and less than 5 percent of the world’s annual renewable water resources, the South Asian region faces increasing water stress, stressing the significance of cooperative approaches and the urgency of policies for wise water management and development.

There are several arrangements for sharing and development of water resources that India has put in place with its neighbours over the years. Despite ups and downs in bilateral relations, these have provided predictable and transparent frameworks for water sharing. India had faced water disputes with Pakistan, Nepal, and Bangladesh. Efforts to resolve water-related disputes were made in the form of treaties or agreements with these nations. These treaties were The Indus Waters Treaty of 1960 (India-Pakistan), The Mahakali Treaty of 1996 (India-Nepal), and The Ganga Treaty of December 1996 (India-Bangladesh).

3.27.1. The Indus Water Treaty

The Indus River and its tributaries together make up one of the largest irrigation canals in the world crossing over 2880 km. The Indus River originates from the

⁵³⁶ 10th World Water Forum available at https://www.worldwatercouncil.org/sites/default/files/World_Water_Forum_10/Highlights_10th_World_Water_Forum.pdf (visited on 10 March,2025).

⁵³⁷ *Id.*, at 3.

Himalayan Mountains near Lake Manasarovar lake in Tibet. In the beginning flows 600 miles (960 km) northwest and then turns south, draining an area that includes the high mountains of India. It then flows through Pakistan before entering the Arabian Sea, in the southeast of Karachi.⁵³⁸

The Indus Water dispute is necessarily an outcome of the partition of India and the creation of Pakistan. In 1947, the line of partition of the Indian subcontinent cut across the Indus system. Notably, large irrigation developments in the undivided Punjab were based on the waters of the Indus system.⁵³⁹ This was interrupted by partition and the movement of people on a large scale. It became imperative for both countries to enter into a new water-sharing agreement. After prolonged talks, several rounds of meetings, and negotiations between the two governments, The Indus Treaty was signed in September 1960 at Karachi in Pakistan. This was made possible with the active involvement of the International Bank of Reconstruction and Development (World Bank) as an arbitrator. The Treaty divided the Indus River systems between two countries. It allocated the Eastern rivers namely the Sutlej, Beas, and Ravi to India and the use of the Western rivers namely the Indus, Jhelum, and Chenab to Pakistan. This roughly apportioned 80 percent of the water to Pakistan and 20 percent to India. Under this treaty, India got 33 MAF (Million Acre Feet) of annual flow of eastern rivers and Pakistan got 165 MAF from western rivers.

3.27.1.1. Germane provisions of the Indus Waters Treaty

The treaty contains 12 Articles covering 79 paragraphs and eight detailed Annexes.

a. Preamble:

“The Government of India and the Government of Pakistan, being equally desirous of attaining the most complete and satisfactory utilization of the waters of the Indus system of rivers and recognizing the need, therefore, of fixing and delineating, in a spirit of goodwill and friendship, the rights and obligations of each concerning the other concerning the use of these waters and of making provision for the settlement, in a cooperative spirit, of all such questions as may hereafter arise regarding the

⁵³⁸ Kishor Uprety and Salman M. A. Salman, “Legal aspects of sharing and management of transboundary waters in South Asia: preventing conflicts and promoting cooperation” Volume 56, Issue 4, *Hydrological Sciences Journal* 641-661 (2011).

⁵³⁹ Ramaswamy R. Iyer, *Water Perspectives, Issues, Concerns* 219 (Sage Publications, New Delhi, 2002).

interpretation or application of the provisions agreed upon herein, have resolved to conclude a Treaty in furtherance of these objectives.”⁵⁴⁰ The basic purpose of the treaty is to allocate the water resources of the Indus Basin equitably to India and Pakistan. It is indeed a comprehensive treaty, given its objectives.⁵⁴¹

b. Provisions Regarding Eastern Rivers

- (i) “All the waters of the Eastern Rivers shall be available for unrestricted use in India.
- (ii) Pakistan shall be under an obligation to let flow, and shall not permit any interference with the waters of the Sutlej main and Ravi main in the reaches where these rivers flow in Pakistan and have not yet finally crossed into Pakistan, except for domestic and non-consumptive uses.
- (iii) All the waters, while flowing in Pakistan, if any, tributary which, in its natural course, joins the Sutlej main or the Ravi main after these rivers have finally crossed into Pakistan shall be available for the unrestricted use of Pakistan.”⁵⁴²

c. Provisions Regarding Western Rivers

- (i) “Pakistan shall receive unrestricted use of all those waters of the Western Rivers.
- (ii) India shall be under an obligation to let flow all the waters of the Western Rivers, and shall not permit any interference with these waters, except for the following uses, restricted except as provided in Annexure c.⁵⁴³ item (c) (ii) of Paragraph 5 of Annexure (c) in the case of each of the rivers, The Indus, The Jhelum, and The Chenab, to the drainage basin thereof. (a) Domestic Use;
- (b) Non-Consumptive Use;
- (c) Agricultural Use, as set out in Annexure C; and
- (d) Generation of hydroelectric power, as set out in Annexure D.”⁵⁴⁴

⁵⁴⁰ ‘Indus Waters Treaty,’ 1960, Preamble, available at <http://mea.gov.in/bilateral-documents.htm?Dtl/6439/Indus> (last visited on 12 March, 2025).

⁵⁴¹ R. K. Arora, *The Indus Water Treaty Regime* 9 (Mohit Publications, New Delhi, 2007).

⁵⁴² *Supra* note 285, art. II.

⁵⁴³ *Supra* note 285, item (c) (ii) of Paragraph 5 of Annexure C.

⁵⁴⁴ *Supra* note 285, Art. III.

d. Provisions Regarding Eastern and Western Rivers

- (i) “Pakistan shall use its best endeavours to construct and bring into operation a system of works that will accomplish the replacement from the Western Rivers (and other sources of) the water supplies for irrigation canals in Pakistan, which on 15th August 1947, were dependent water supplies from the eastern rivers.
- (ii) The use of the natural channels of the rivers for the discharge of flood or other excess waters shall be free and not subject to limitation by either party or neither party shall have any claim against the other in respect of any damage caused by such use.
- (iii) Each Party declares its limitation to prevent, as far as practicable, undue pollution of the waters and agrees to ensure that, before any sewage or industrial waste, it will be treated, where necessary, in such manner as not materially to affect those uses.”⁵⁴⁵

e. Provisions for cooperation and collaboration

‘Indus Water Treaty’ while recognizing the interests of both countries in the utilization of waters of the rivers in the finest manner calls for cooperation and collaboration between the two countries. The treaty deals with the “exchange of data”⁵⁴⁶ and the clause of “future cooperation”.⁵⁴⁷ Further, “it anticipates future cooperation in the optimum development of the rivers. This treaty also calls for the cooperation in the arena of engineering works between both countries on the rivers.”⁵⁴⁸

The ‘principle of cooperation’ indicates that the nations in an international watercourse should seek dispute resolution by amicable means. ‘The Indus Water Treaty’ also provides a mechanism for dispute resolution.⁵⁴⁹ It provides that the “questions” are to be decided by the ‘Permanent Indus Commission’ (PIC), “differences” to be settled by ‘Neutral Experts’ (NE), and “disputes” to be settled by the ‘International Court of Arbitration’ (ICA). It is noteworthy, that the law which is

⁵⁴⁵ *Supra* note 285, art. IV.

⁵⁴⁶ *Supra* note 285, art. VI.

⁵⁴⁷ *Supra* note 285, art. VII.

⁵⁴⁸ *Supra* note 285, art. VII (2).

⁵⁴⁹ *Supra* note 285, Art. IX, Annexure F and Annexure G.

to be applied for settling a dispute in the ICA has to be well within the framework of the Treaty itself. At first, the matter is tried in the PIC, if it does not get settled there it is moved to the Neutral Expert and if it remains unsettled again, the 'International Court of Arbitration' tries the matter conclusively.⁵⁵⁰

The 'Indus Water Treaty' has established the institution of the 'Permanent Indus Commission' (PIC) under Article VIII. The primary function of this institution is to create and maintain cooperative arrangements for enforcing the provisions of the Treaty. A 'Permanent Indus Commission' consists of two commissioners, where one is appointed by each country. Such commissioners should usually be engineers of high rank who are experts in the field of hydrology and water use. The basic objectives of the Commission are "to promote cooperation between the parties in the development of the waters of the rivers, and to study matters referred to it for help, resolve questions concerning the interpretation or application of the treaty and to make tours of inspection. The commissioners must meet regularly once a year in India and Pakistan alternately and submit reports to respective governments before 1st June every year or shall also meet when requested by either commissioner."⁵⁵¹

f. Financial Provision and Indus Basin Development Fund

The treaty constituted the 'Indus Basin Development Fund' for future development in the Indus Basin. The chief purpose of this fund was, to construct head-works and canals from the Western Rivers and other sources of water for irrigation canals in Pakistan which were dependent on water supplies from the Eastern Rivers on 15th August 1947. The role of 'The World Bank' is significant in the creation of this fund as well as in carrying out these works.⁵⁵² Several countries agreed to support development programs in the Indus Basin, which was estimated at \$900 million and India was committed to providing \$174 million (£62 million) in ten instalments.⁵⁵³

The use of water in the Indus system has always been a key factor in conflicts between the two nations and has enlarged the trust gap. Over the recent years, the differences over the utilization of water became so serious that they raised

⁵⁵⁰ *Supra* note 285, Art. IX.

⁵⁵¹ *Supra* note 285, art. VIII.

⁵⁵² Salman M. A. Salman and Kishor Upreti, *Conflict and Cooperation on South Asia's International Rivers: A legal Perspective* 80 (Washington D.C: The World Bank, 2003).

⁵⁵³ N. D. Gulati, *Indus Water Treaty: An Exercise in International Mediation* 308 (Allied Publishers, Bombay, 1973).

controversies on the Indus Water Treaty especially because of the construction of certain projects. ‘Tulbul’, ‘Baglihar and Kishanganga’, ‘Dulhasti’, ‘Bursar’, and ‘Nemo-Bazgo’ projects have posed grave challenges to both the countries and to the Indus Water Treaty itself. These projects have also exaggerated the possibility of future conflicts at various levels.

3.27.2. The Mahakali Treaty

In the context of the relationship between India and Nepal, water sharing has not been a major issue. As such, there does not exist any water issues between these nations. The matters are only related to cooperation at both ends in deriving benefits from the water resources. Such cooperation is required in the fields of different water-related endeavours like power generation, enhancing irrigational facilities, and flood management. However, these attempts for cooperation at times have led to conflicts between the two nations. The affected rivers that pose problems of cooperation, development, and utilization of shared resources between India and Nepal are Gagra, Gandaki, Bagmati, Kamala, and Kosi.

An agreement between the Government of India and the Government of Nepal on the Kosi Project was signed in April 1954. India and Nepal signed the Kosi agreement in 1954 to regulate the flow of the river and ensure flood management. A dam spanning across the India-Nepal border was to be constructed for this purpose, and embankments were to be raised on either side of the river. At the same time, the project was also to be utilized for power generation and irrigation purposes. The estimated generation of power was 20,000 KW from the Eastern canal of which around fifty percent was to be sold to Nepal. The total estimated cost of the project was Rs.450 million, which was to be entirely borne by India.

The development of the Kosi project took place in three phases. The first phase was the period of the 1950s when the Kosi Agreement was signed. In the 1960s, the agreement was amended and new clauses were added. The third phase was in the 1980s when India came up with the idea of an alternative to the Kosi Barrage.⁵⁵⁴

⁵⁵⁴ Medha Bisht, “Revisiting the Kosi Agreement: Lessons for Indo-Nepal Water Diplomacy” *Manohar Parrikar Institute for Defence Studies and Analyses*, September 22, 2008, available at http://www.idsa.in/idsastrategiccomments/RevisitingtheKosiAgreement_Medha%20Bisht_220908 (last visited on 21 September 2021).

Another project concluded by both countries is ‘The Gandaki Irrigation and Power Project.’ It was concluded on December 4, 1959. Under the Agreement, both countries approved construction works concerning canal irrigation and power generation.⁵⁵⁵ The Revised Agreement made certain amendments to the Agreement of 1959. There were few agreements entered into by India and Nepal to meet new challenges of water management and cooperation. One of the important agreements is the ‘Mahakali Treaty.’

‘Mahakali’ River is situated on the India-Nepal border. It is one of the main tributaries of the Ganges. This river is also called Sarada in India. ‘The Mahakali Treaty’ was signed on 12 February 1996 and came into force on 5 June 1997 between Nepal and India. It was concerned with the integrated development of the ‘Mahakali River, including ‘The Sarada Barrage,’ ‘Tanakpur Barrage,’ and the ‘Pancheshwar multipurpose Project.’⁵⁵⁶ Of these, ‘Sarada Barrage’ and ‘Tanakpur Barrage’ were completed in 1920 and 1992 respectively. This Treaty absorbed the 1920 Sarada agreement⁵⁵⁷ and 1991 MOU and the 1992 Joint Commission for ‘Tanakpur Barrage’⁵⁵⁸. The idea of constructing ‘Pancheshwar Multipurpose Project’ (PMP) was endorsed in the Treaty.⁵⁵⁹ ‘The Mahakali Treaty’ combines three distinct treaties related to the water sharing of the Mahakali River, the Sarada agreement, the Tanakpur agreement, and the PMP. The Treaty contains twelve Articles and is valid for 75 years from the date it came into force.⁵⁶⁰

According to the treaty, India shall maintain a flow of not less than 10 m³/s (350 cusecs) downstream of the ‘Sarada Barrage’ in the ‘Mahakali’ River to protect and conserve the ecosystem of the river basin. Further, Nepal is entitled to have the supply of 1000 cusecs of water from the Sarada Barrage in the wet season i.e. from 15th May to 15th October, and 150 cusecs in the dry season i.e. from 16th October to 14th May.⁵⁶¹

⁵⁵⁵ B. R. Chauhan, *Settlement of International and Inter-State Water Disputes in India* 97 (Indian Law Institute, New Delhi, 1992).

⁵⁵⁶ Mahakali Treaty 1996 available at http://wrmin.nic.in/writereaddata/MAHAKALI_TREATY_1996.pdf (last visited on 21 September 2021).

⁵⁵⁷ *Id.*, art. 1.

⁵⁵⁸ *Id.*, art. 2

⁵⁵⁹ *Id.*, art. 3.

⁵⁶⁰ *Id.*, art. 12(2).

⁵⁶¹ *Id.*, art. 1 (1), (2).

‘The Mahakali Treaty’ endorsed the principles of “information exchange and cooperation.” Article 9 (1) forms the ‘Mahakali River Commission’ for information exchange, cooperation, and implementation of the Treaty. Article 9 of the Treaty set out clear guidelines for the formation of the Mahakali River Commission, as well as the jurisdiction of the Commission. According to Articles 9(2) and 9(4), “the Commission shall be composed of an equal number of the representatives from both Parties and its expenses shall be borne equally by both the Parties”. According to Article 9(3), “the functions of the Commission include information exchange and inspection of all structures included in the Treaty, make recommendations for the implementation of the Treaty provisions, expert evaluation of projects, monitor and coordinate a plan of actions, examine any differences arising between the Parties concerning the interpretation and application of the Treaty”.

The Treaty also approves the principles of “equitable and reasonable utilization,” the “equitable distribution of benefits,” and an “obligation not to cause significant harm.”⁵⁶² In defining the jurisdiction of the ‘Mahakali River Commission’, Article 9(1) states that “the Commission shall be guided by the principles of equality, mutual benefit and no harm to either Party”.

The provisions of the Treaty acknowledge an obligation not to cause harm⁵⁶³. The treaty acknowledges the right of both Parties to independently plan, survey, develop, and operate any work on the tributaries of the Mahakali River in case such use does not affect the rights of both Parties stipulated in Article 7.⁵⁶⁴ This means each Party should maintain the natural flow of the river. However, this obligation does not preclude the use of the waters by the local communities living on both sides of the Mahakali River, not exceeding 5% of the average annual flow at Pancheshwar.

⁵⁶² M. M. Rahaman, “Principles of Trans-boundary Water Resources Management and Ganges Treaties: An Analysis” Vol. 25, No. 1, *Water Resources Development*, 159–173, (2009).

⁵⁶³ *Supra* note 301, art. 7, The Article 7 of the Mahakali Treaty, 1996 provides that “to maintain the flow and level of the waters of the Mahakali River, each Party undertakes not to use or obstruct or divert the waters of the Mahakali River adversely affecting its natural flow and level except by an agreement between the Parties. Provided, however, this shall not preclude the use of the waters of the Mahakali River by the local communities living along both sides of the Mahakali River, not exceeding five percent of the average Annual flow at Pancheshwar.”

⁵⁶⁴ *Supra* note 301, art. 8.

Article 6 of the Treaty indirectly prohibits the construction of unilateral projects along the Mahakali River.⁵⁶⁵ Article 8 acknowledges “*the right of both Parties to independently plan, survey, develop and operate any work on the tributaries of the Mahakali River as long as such use does not affect the rights of both Parties stipulated in Article 7*”. Thus, each country is under an obligation to reach an agreement before initiating any project.⁵⁶⁶ The Mahakali Treaty, 1996 provides that “to maintain the flow and level of the waters of the Mahakali River, each Party undertakes not to obstruct, or divert the waters of the Mahakali River adversely affecting its natural flow and level except by an agreement between the Parties.”⁵⁶⁷ Provided, however, this shall not preclude the use of the waters of the Mahakali River by the local communities living along both sides of the Mahakali River, not exceeding five percent of the average annual flow at Pancheshwar. Its Article 6 states that “Any project, other than those mentioned herein, to be developed in the Mahakali River, where it is a boundary river, should be designed and implemented by an agreement between the Parties on the principles established by this Treaty.”

The treaty requires both parties to obey the principles of ‘the Mahakali Treaty.’ Article 11 of the Treaty provides a detailed dispute resolution and arbitration mechanism if the disputes are not resolved by the Mahakali Commission established under Article 9.⁵⁶⁸ There arose great difficulties in the successful enforcement of the treaty. It was opposed in Nepal and was untimely passed with specific conditions. Disputes still exist on the issues of defining the consumptive use of countries and fixing the selling price of Nepal’s excess share of electricity to India.

⁵⁶⁵ *Supra* note 301, art. 6.

⁵⁶⁶ *Supra* note 307 at 165.

⁵⁶⁷ *Supra* note 301, art. 7.

⁵⁶⁸ *Supra* note 301, art. 11. It reads as under:

1. If the Commission fails under Art. 9 of this Treaty, to recommend its opinion after examining the differences of the Parties within three months of such reference to the Commission or either Party disagrees with the recommendation of the Commission, then a dispute shall be deemed to have been arisen which shall then be submitted to arbitration for decision. In so doing either Party shall give three months prior notice to the other Party.
2. Arbitration shall be conducted by a tribunal composed of three arbitrators. One arbitrator shall be nominated by Nepal, one by India, with neither country to nominate its own national and the third arbitrator shall be appointed jointly, who, as a member of the tribunal, shall preside over such tribunal. If the Parties are unable to agree upon the third arbitrator within ninety days after receipt of a proposal, either Party may request the Secretary-General of the Permanent Court of Arbitration at The Hague to appoint such arbitrator who shall not be a national of either country.
3. The procedures of the arbitration shall be determined by the arbitration tribunal and the decision of Tribunal shall be treated as final, definitive, and binding.

Implementation of the ‘Pancheshwar Multipurpose Project’ is the centrepiece of ‘the Mahakali Treaty.’ Required field investigations for the ‘Pancheshwar Multipurpose Project’ were completed in 2002. Due to differences on certain contentious issues mutually acceptable ‘Detailed Project Report’ of ‘Pancheshwar Project’ could not be finalized.

It was decided to set up ‘Pancheshwar Development Authority’ (PDA) at the earliest for the development, execution, and operation of ‘Pancheshwar Multipurpose Project’ during the 3rd meeting of ‘The Joint Committee on Water Resources (JCWR) held on 29.09.08 to 01-10-08 at Kathmandu (Nepal). The constitution of PDA has been notified vide this Ministry’s Office Memorandum dated 7th August 2014. The ‘Detailed Project Report’ of the ‘Pancheshwar multipurpose Project’ was submitted in November 2016.⁵⁶⁹ Recently, the Government of India and the Government of Nepal signed an MoU regarding the ‘Pancheshwar Multipurpose Project’. India needs to have sound relations with Nepal and develop cooperation with it to meet its water requirements. Further, we have witnessed the devastation caused by the Kosi River in the past. Thus, a cordial relationship with Nepal is necessary focussing on balancing interests rather than hostile issues.

3.27.3. The Ganga Treaty

The Ganga River forms a boundary of 129 kilometers between India and Bangladesh and flows for 113 km in Bangladesh. The main branch of the Ganges is called the Padma River entering Bangladesh. Then, it is joined by the Jamuna River, the largest tributary of the Brahmaputra River, which descends from Assam and Northeast India. Further downstream, the Ganges is fed by the Meghna River, the second-largest tributary of the Brahmaputra, and takes on the Meghna's name as it enters the Meghna estuary. It spreads in an area of 350 km wide Ganges Delta and it finally empties into the Bay of Bengal. There are a total of 54 rivers that flow into Bangladesh from India. The Ganga Basin drainage area is about 861,400 sq. km. The delta of the river Ganga can be said to start from Farakka.

The Farakka Barrage is a dam on the Bhagirathi River located in the Indian state of West Bengal, roughly 10 km (6.2 miles) from the border with Bangladesh. India uses

⁵⁶⁹ Pancheshwar Multipurpose Project, Ministry of Water Resources, Govt. of India, available at <http://wrmin.nic.in/forms/list.aspx?lid=347> (last visited on 21 September 2021).

it to control the flow of the Ganga River. The dam was built to divert the Ganges River water into the Hooghly River during the dry season, from January to June, to flush out the accumulating silt which in the 1950s and 1960s was a problem at the Kolkata Port on the Hooghly River. Consequently, Bangladesh blamed India for an excess drawing of water that dried up from its rivers. A joint declaration was issued in May 1974 to resolve the water-sharing issue before the Farakka Barrage began operation. This was followed by an interim agreement in 1975 to allow India to operate feeder canals of the barrage for short periods.

The sharing of the waters of the Ganga between India and Bangladesh that flows from northern India into Bangladesh was an issue that remained a subject of conflict for almost 35 years, with several bilateral agreements and rounds of talks failing to produce results. After the commissioning of the Farakka Barrage along the mainstream of the Ganges in 1975 and subsequent conflict regarding the water shortage in downstream Bangladesh, Bangladesh and India signed two treaties (1977 and 1996) and two MOU (1983 and 1985) for sharing the Ganges waters at Farakka. A comprehensive bilateral treaty was entered on 12 December 1996 in New Delhi. The treaty formed water-sharing arrangements and recognized Bangladesh's rights as a lower riparian. On 12 December 1996, the two governments signed the most recent Treaty for sharing the Ganges waters at Farakka during the dry season (1 January to 31 May). This Treaty is valid for 30 years.⁵⁷⁰ Article II, Annexure I and II of the 1996 Ganges Treaty establishes “the formula for water sharing of the Ganges at Farakka during the dry season”.⁵⁷¹ Annexure II provides “an indicative schedule of the sharing arrangement based on 40 years (1949–88) 10-day average availability of water at Farakka”.

Articles IV to VII of the Treaty establish “the Joint Committee and its jurisdiction for monitoring the Treaty and exchanging data and information”. The Joint Committee, consisting of an equal number of representatives nominated by the Parties, is entrusted to observe and record at Farakka the daily flows below ‘Farakka Barrage’ as well as at ‘Hardinge Bridge’.⁵⁷² Article VI requires “the Joint Committee to submit all data collected by it and an annual report to both governments”. According to Article

⁵⁷⁰ The Ganges Treaty, 1996. art. IV,

⁵⁷¹ *Id.*, art. II, Annexure I and II.

⁵⁷² *Id.*, art. IV.

VII, “the Joint Committee is responsible for implementing the arrangement of the Treaty and examining any difficulty arising out of the implementation of the arrangements and the preamble operation of the ‘Farakka Barrage’.” The Treaty recognizes “the need to cooperate to find a solution to the long-term problem of augmenting the flow of Ganges during the dry season.”⁵⁷³

The conclusion of the treaty was generally welcomed by both the countries. This thirty-year-long treaty provided Bangladesh with an opportunity for environmental restoration of the Ganges-dependent area. ‘The Ganga Treaty’ did improve the flow of water into Bangladesh, but it was lower than the flow that was available during earlier agreement periods.⁵⁷⁴ India and Bangladesh share fifty-four rivers, ‘the Ganges treaty’ is the only water-sharing agreement that exists today between India and Bangladesh. On the issue of the distribution of Teesta waters between India and Bangladesh, efforts are being made from both sides but confusion prevails over the new deal on the Teesta over the agreed percentage of water to be shared between India and Bangladesh.

3.28. CONCLUSION

Sources of international water law include customary law, bi- or multilateral treaties, regional framework treaties and treaties with universal scope of application. International water law comprises agreements, manifested in rules, treaties, and principles, that have been created to foster cooperation among states sharing freshwater resources. The use of trans boundary water resources requires a legal framework which allows to prevent conflicts, maximises socio-economic benefits, and protects ecosystems. But this framework law is also relevant and produces impacts at the domestic level as the States need to comply with international norms and principles embodied in such conventions. So, the countries should consider new techniques to develop, design and strengthen their legal regimes regarding the inter-state and intra-state sharing of water resources based on principles established by customary law, the codified law, and prevailing international practices.

⁵⁷³ *Id.*, art. VIII.

⁵⁷⁴ Mashfiqus Salehin, and M. Shah Alam Khan, *et.al.* “Opportunities for Trans-boundary water Sharing in the Ganges, The Brahmaputra, and The Meghna Basins” 35 (India Infrastructure Report, Oxford University Press, New Delhi, 2011).

CHAPTER-IV

ROLE OF INDIAN JUDICIARY IN RESPECT OF GROUNDWATER GOVERNANCE

Three major reasons contributed to the increase of groundwater use, a) firstly the development of the turbine pump, which enabled the extraction of water from a large-diameter well with acceptable geology; b) secondly significant advancement in water well drilling techniques that occurred because of the advancement in oil well technology; and c) the advancement of subsurface hydrological science, or hydrogeology, which is now widely recognised as a sound science. An often-cited legal case concerns litigation from the late eighteenth century. The court concluded in its judgment that the issue of groundwater is so complicated that a causal link between groundwater abstraction and alleged adverse effects cannot be established. Interestingly, a century later, in the same court, in a similar case – though not with the same judge – the sentence commented on how hydrogeological research enabled the establishment of this causal link and therefore enabled the court to decide based on scientific evidence.

Even in India, the Courts have profoundly contributed to the growth of laws relating to water. This can be attributed to the governance of the issues relating to water under the rules of common law since colonial times.¹Comparatively poor evolution of formal water law has also contributed to the situation to some extent. The courts have addressed several issues pertaining to water and its management including control over water, groundwater, drinking water, irrigation, sanitation, and water pollution. The judiciary has developed a fundamental structure of water law despite the absence of a clear and exhaustive law. This chapter attempts to analyse the decisions of the courts in India concerning different issues relating to water and its management.

The Supreme Court of India and various other courts have played a commendable role in adjudicating disputes relating to water through an apt interpretation of the existing legal framework and also by evolving new principles suitable for the existing conditions. In certain judgments, the courts have also defined and demarcated a few

¹ Philippe Cullet, “Water Sector Reforms and Courts in India: Lessons from the Evolving Case Law,” Volume 19, Issue 3, *Review of European Community & International Environmental Law*, 332 (2011)

rights and principles relating to water in India. However, in certain cases, such as those related to displacement and rehabilitation, the basic right to water of individuals who have been evacuated has been suitably utilized to contest the fundamental right to water.²

4.1 Water Rights

In various cases, many aspects and issues relating to water rights such as natural rights, riparian rights, Easementary rights, fundamental rights, property rights, and prescriptive rights have arisen, evolved, and established. In *M.C. Mehta v Kamalnath* (1997)³ the Supreme Court categorically ruled that the State is not only bound to regulate water supply, but should also help realize the right to healthy water and prevent health hazards. “*Right to water is a right to life and thus a fundamental right.*” It may be noted that the basic right of every individual to water is different from a bunch of water rights admissible to users and stakeholders in a particular region.⁴

4.1.1 Water as a Fundamental Right

The judicial establishment of a basic right to water in India is briefly discussed in the next section. The Supreme Court State in a case of *Karnataka v. Andhra Pradesh*⁵ has remarked that "the law about water rights has undergone a major evolution throughout the world." It appears that no one has given adequate attention to the necessity of developing an all-inclusive set of water rights. A good legislative framework is therefore necessary for the development of effective water resources management.⁶

The present legislative framework concerning water is supplemented by a human rights perspective. The Indian Constitution does not explicitly provide for water as a fundamental right but the judicial pronouncements recognize it so as implied under the right to life given under Article 21 of the Constitution.⁷ Over the years, the courts

² *Ibid.*

³ (1997)1 SCC 388.

⁴ Vidheh Upadhyay, “Water Rights and the ‘New’ Water Laws in India: Emerging Issues and Concerns in a Rights Based Perspective” 60 ((India Infrastructure Report, Oxford University Press, New Delhi, 2011).

⁵ (2000) 9 SCC 572, 710.

⁶ *Ibid.*

⁷ P. Cullet et al. (eds.), *Water Governance in Motion* 35 (Cambridge University Press India Pvt. Ltd., New Delhi, 2010).

in India have considerably broadened the scope of this Article. The right to life now includes several other vital rights like the right to pollution-free air, the right to potable water, and the right to a healthy environment,⁸ etc. Public interest litigation (PIL) has played an important and commendable role in this process. Indian courts have interpreted that under Art.21, the right to water is an implied component of everyone's right to life.

A significant pronouncement in this regard is in the matter of *Subhash Kumar v. Bihar State and others*⁹. A PIL was filed by Subhash Kumar in the Supreme Court to check the pollution of Bokaro River waters by the discharge of sludge by Tata Iron & Steel Co. Ltd. which held that:

*“The Constitution states that the Right to live is a fundamental right under Art. 21 and it includes the right to enjoy pollution-free water and air for full enjoyment of life. Anything that endangers or harms that quality of life in derogation of laws, a citizen has the right to have recourse to Art. 32 of the Constitution for removing the pollution of water or air.”*¹⁰

Similarly, in *Chameli Singh v. State of Uttar Pradesh*¹¹ the court observed that the right to food, water, a healthy environment, education, medical care, and shelter are implicit in every civilized society that guarantees the right to life. In any civilized society, these are the fundamental rights and needs. These basic human rights are essential to practice the civil, political, social, and cultural rights guaranteed by the Universal Declaration of Human Rights¹².

Article 47 of the Constitution has also been associated by the courts with the right of existence. In *Hamid Khan v. State of Madhya Pradesh*,¹³ a PIL was filed by the Petitioner alleging a complete breach of duty on the state government's part. The litigation included the allegations that the State has not been taking appropriate steps, for supplying from the hand-pumps in Mandla district, the potable drinking water, which caused illness amongst the residents of the area. The water drawn from the hand-pumps contained fluoride more than the permissible limit which resulted in

⁸ *Bandhua Mukti Morcha v. Union of India & Ors.*, (1984) 3 SCC 161.

⁹ AIR 1991 SC 420.

¹⁰ *Id.*, at 424.

¹¹ (1996) 2 SCC 549, AIR 1996 SC 1051.

¹² *Ibid.*

¹³ AIR 1997 MP 191.

deformity among many of them. The State was held answerable for inappropriate precaution while providing potable water to its citizens. The court observed that as per Article 47 of the Indian Constitution, the state must enhance the nutritional status and standard of life of its citizens, as well as public health. It is the state's responsibility to protect the public's health by providing clean drinking water. The state has failed to fulfil its fundamental role in this matter. In *Hinch Lal Tiwari v. Kamla Devi and Others*,¹⁴ it was held that it is also covered under Article 21 of the Indian Constitution. It is the State's responsibility to give pure drinking water to every resident of India under their right to life.¹⁵ The Apex Court held that the “*material resources of the community like forest, ponds, lakes, hillocks, mountains, etc. are nature’s bounty. These need to be protected for a proper and healthy environment, which enables people to enjoy a quality of life which is the essence of the guaranteed rights under Article 21 of the Constitution of India.*”¹⁶

Another significant judgment was pronounced in the case of *Susetha v. State of Tamil Nadu*¹⁷ wherein it has been observed that retention of water bodies is essential. This criterion is contemplated not only because the right to water and the right to a good life are both enshrined in Article 21 of the Indian Constitution, but also because the right to water and the right to a good life are acknowledged in Articles 47 and 48A of the Indian Constitution. Additionally, Article 51 A of the Indian Constitution establishes a basic obligation for every person to maintain and develop the natural environment, which includes forests, lakes, rivers, and animals.¹⁸

While hearing a PIL filed by the people of West Kochi airing their grievances about the executive apathy of non-supply of clean drinking water for more than 30 years, the High Court opined that for any government, whether bourgeois or proletariat and any welfare state dedicated to the common man, it is obligatory to supply potable water to the people for drinking, which should be the priority of any government. When determining the government's objectives, ensuring access to safe and clean water should be paramount.¹⁹

¹⁴ (2001) 6 SCC 496

¹⁵ *Id.*, at 501;

¹⁶ *Id.*, At 501.

¹⁷ AIR 2006 SC 2893.

¹⁸ (2006)5 SCC 47.

¹⁹ *Vishala Kochi Kudivella Samarakshana Samiti v. State of Kerala*, AIR 2006 NOC 744.

The fundamental right to water includes only potable drinking water.²⁰ In *Narmada Bachao Andolan v. Union of India*²¹, the Supreme Court remarked that “Water is the basic need for the survival of human beings and is a part of the right to life and human rights as enshrined in Article 21 of the Constitution of India.”²²

In another case, *Dr K. C. Malhotra v. State of Madhya Pradesh*²³, the High Court explored a nexus between health, sanitation, and drinking water concerning fundamental rights wherein it was alleged that there was gross negligence on the part of the Public Health Department and Gwalior Municipal Corporation in preventing the spread of cholera epidemic of cholera, which resulted in the death of 30 children, 12 in 1991 and 18 in 1992. The court held that “all individuals, even from lower classes and weaker sections, benefit from the protection of Article 21. This put a duty on the government to ensure, for instance, that the sewer should be covered and regularly cleaned public toilets should be provided.”²⁴

“There is a duty on the State under Article 21 to provide clean drinking water to its citizens as the right to access to drinking water is fundamental to life.”²⁵ It is the responsibility of the State to provide adequate clean drinking water to every citizen as directed by the Constitution of India. The State is duty-bound to protect water from getting polluted. This is not only a fundamental Directive Principle in the governance of the State, but is also a penumbral right under Article 21 of the Constitution of India.”²⁶

The Indian judiciary's approach to the water rights regime demonstrates unequivocally the Supreme Court's and other Courts' commitment to protecting the right to water to offer the most basic of life amenities to the poorest of the poor. The courts in India have shown their grave concern over the provision of clean and safe drinking water to diverse segments of society on several occasions through many rulings. While the courts have unambiguously recognized a basic right to water, its implementation via policy and legislation has been less than satisfactory.

²⁰ *Venkatagiriyaappa v. Karnataka Electricity Board*, 1994 (4) Kar LJ 487.

²¹ (2000)10 SCC 664.

²² *Id.*, at 767.

²³ AIR 1994 MP 4.

²⁴ *Id.*, para.14.

²⁵ *A.P. Pollution Control Board II v. Prof. M.V. Nayudu And Ors*, (2001) 2 SCC 62 at 69.

²⁶ *P.R. Subas Chandra v. State of A.P. & Others*, 2001(6) ALT133.

4.1.2. Water as an Easementary Right

The provisions of the Easements Act 1882 have been invoked in several cases involving water law to protect the rights of persons, riparian owners, and others. Several rights discussed in such cases also help determine the scope and character of the dispute. Besides, the customary, juristic, and statutory rights of the people, there exist certain rights whose extent and nature are not clear or not settled. There are two reasons for it: a) contradictory interpretations of statutes; and b) innovative interpretations of the constitutional law.²⁷ The evolution of water laws has not only proclaimed sovereign rights of the state but also absolute water rights. Though by and large, the court judgments have tended to uphold the government's rights over water there have been odd cases that have either gone against the statutory provisions or interpreted them differently.

In 1932, the Privy Council itself held in the *Secretary of State v. Subharayudu*²⁸ that the government does not have an absolute right to curtail the material right of the riparian owners over the water of natural streams. The Privy Council held that government cannot arbitrarily control or regulate the supply of irrigation water. The Privy Council further observed that a riparian owner is someone who owns land next to a stream and so has a certain right to collect water from the stream. A riparian owner's primary right is to take water for various uses including domestic use, followed by other land-related activities, including irrigation of the areas that comprise the property.²⁹ The riparian right is a natural right, not an easement, and is not capable of being lost.³⁰

The question came up again in *Secretary of State v. PS Nageswara Iyer*³¹ and the court held that any prescriptive right that a person may obtain against the government could be the curtailment of the government's proprietary rights, but never that of its absolute sovereign rights. The Madras High Court observed that while a customary right may provide plaintiffs with everything they desire, it may not provide them with an exclusive right to all of the channel's waters to the extent that it precludes the

²⁷ Chhatrapati Singh, *Water Rights and Principles of Water Resources Management* 37 (N.M. Tripathi Pvt Ltd. Bombay, 1991).

²⁸ AIR 1932 PC 46.

²⁹ *Id.*, at 48.

³⁰ *Id.*, at 49.

³¹ AIR 1936 Mad 923.

government from using the channel's waters for other purposes.³² It was further remarked that "Additional rights by prescription may be gained against another's property right, but not against the sovereign power that the state holds under Indian law to manage the water supply in public streams to maximize its use."³³

Additionally, it also held that the national government has asserted an absolute right to alter the source of irrigation or the technique of irrigation used to provide the right, as well as to restrict the use of all public or natural streams in the public interest."³⁴

The Supreme Court in *Tekaba AO v. Sakumeren*³⁵ observed the following regarding the sovereign dominant ownership of the state.

*"The disputes of village community particularly relating to access to land having water source is not a traditional civil litigation as is handled by ordinary civil courts under the Code of Civil Procedure. These are disputes to be dealt with and handled only on the basis of the customs of the village communities and through a very informal procedure contained in the rules. So far as natural resources like land and water are concerned dispute of ownership is not very relevant because undoubtedly the state is the sovereign dominant owner."*³⁶

In *Het Singh's* case,³⁷ the court had to determine whether an Easementary right could be acquired on the water of the well situated in another's land by way of prescription. The Court recognized the socially prevailing custom of rich people allowing their poor neighbours to draw water from their wells. Additionally, it was also noted that such rights might be regarded as customary rights rather than Easementary rights. In this case, the plaintiffs were irrigating their land with the water drawn from a well situated in other's land for more than 20 years. The court observed that:

"A right to draw water from a well is surely a right to underground water and it is not the case that the plaintiffs' right to enjoy water from their well was interrupted by something done by the defendants to the source of water in the well which was through a defined channel, by doing something, such as drawing an excessive supply

³² *Id.*, at 926.

³³ *Ibid.*

³⁴ *Id.*, at 927.

³⁵ (2004) 5 SCC 672.

³⁶ *Ibid.*

³⁷ *Het Singh & Ors. v. Anar Singh & Ors.*, AIR 1982 All 468.

of water from their own well from the same underground source.”³⁸ It was held that the claim of the plaintiff was not an Easement right. It was rather a custom of society in India to help others in need.

In another case,³⁹ the court was called upon to determine whether there exists any Easementary right over the water flowing from an artificial channel into the land. The Court held that Easementary rights over water did exist where the water from such channel has been used for a sufficiently long period.

When the question arose before the court regarding the Easementary right of way or flow of water over that part of the land of the lessor which had not been leased to him, the court replied in negative.⁴⁰

4.2 Water supply, sanitation, and pollution

4.2.1. Drinking Water

Globally, among the various uses of water, the provision of drinking water has been recognized as the first and foremost priority. Indian judiciary in several cases of inter-sectoral distribution of water has duly recognised the priority of using water for drinking. Drinking water has also been often expressed as the fundamental right to water, as it forms a crucial component of the right to life.

In a PIL, filed regarding the impurity and scarcity of drinking water, the court observed that *“it is the duty of both the Municipality as well as the state government to provide clean drinking water as mandated under Article 21 of the constitution.”*⁴¹

While declining the submission of the municipality regarding the financial constraints, the court was of the view that the smaller schemes that needed lesser investment should have been executed. The court criticized the State government and Municipality for not revising water taxes and directed the State Government as well as the Municipality to prepare and place before it within three months cost-effective schemes.⁴² Similarly in another case, Central and State Pollution Control Boards were

³⁸ *Id.*, at 472.

³⁹ *Tharur Panchayat & Ors. v. Kunchayi & Anr.*, AIR 1978 Ker 50.

⁴⁰ *Madan Gopal Bhatnagar v. Smt. Jogya Devi & Ors.*, 1980 Supp (1) SCC 777.

⁴¹ *Gautam Uzir v. Gauhati Municipal Corpn.*, 1999 (3) GLT 110.

⁴² *Id.*, at 112.

directed by the court to jointly prepare a time-bound plan for checking the industrial pollution to reclaim the polluted water supply.⁴³

PIL was filed by a practicing Advocate alleging gross neglect by the State for not taking suitable steps before supplying high fluoride content water for drinking from hand-pumps, leading to skeletal and dental fluorosis amongst the people of that area.⁴⁴

The court observed that “*it is the duty of the State towards every citizen of India to provide pure drinking water. In the present case, it is the State which is responsible for not taking proper precaution to provide proper drinking water to the citizens.*”⁴⁵

The court ordered that the Government should provide free medical treatment to the people affected by drinking high fluoride content water. The medical treatment was to include surgery or callipers and shoes. In case surgery was to be done, all expenses were to be borne by the State and each of such people be paid Rs. 3000/- in addition to the free treatment. If artificial limbs or callipers were required by the people operated upon, the same was to be provided by the State. For those persons who did not need surgery, callipers and other artificial appliances were to be provided at State expenses. The State was further directed that the entire exercise of providing free medical treatment and compensation shall preferably be completed within one year.⁴⁶

In the case *Gautam Uzir & Anr. v. Gauhati Municipal Corp*,⁴⁷ involving the paucity and impurity of drinking water in Guwahati, it was argued that the municipal corporation is accountable for providing adequate and clean drinking water. In its counter affidavit, the municipal corporation submitted that while it is aware of its obligations regarding the provision of safe drinking water to inhabitants, it is unable to expand its existing plant owing to budgetary constraints. The court said unequivocally that “Water, and potable water, is so crucial for life and its supply is covered under Article 21 of the Constitution.”⁴⁸ The Supreme Court in *Chameli Singh v. State of UP*⁴⁹ held that the ‘right to live guaranteed in any civilized society implies the right to food, water, decent environment, education, medical care, and shelter’.⁵⁰

⁴³ *Indian Council for Enviro legal Action & Ors. v. Union of India & Others*, AIR 1999 SC 1502.

⁴⁴ *Hamid Khan v. State of M.P. & Ors.*, AIR 1997 MP 191.

⁴⁵ *Id.*, at 193.

⁴⁶ *Id.*, at 195.

⁴⁷ 1999 (3) GLT 110

⁴⁸ *Id.*, at 112

⁴⁹ *Chameli Singh v. State of U.P.*, (1996) 2 SCC 549: AIR 1996 SC 1051.

⁵⁰ *Id.*, at 1056. *The Apex Court held ‘That right to live guaranteed in any civilised society implies the right to food, water, decent environment, education, medical care and shelter. These are basic*

In another case, *Delhi Water Supply and Sewage Disposal Undertaking v. State of Haryana*,⁵¹ the Supreme Court observed that “*Water is a gift of nature. A human hand cannot be permitted to convert this bounty into a curse, or oppression. The primary use to which the water is put being drinking, it would be mocking the nature to force the people who live on the bank of a river to remain thirsty, whereas others incidentally placed in an advantageous position are allowed to use the water for non-drinking purposes.*”⁵² Additionally, it was also remarked that the right to use water for domestic purposes would have precedence over other needs, as drinking water forms the basis for life and this need cannot be subordinated to any other use of water, such as irrigation and so on.

In *P.R. Subhash Chandran v. Government of Andhra Pradesh*⁵³, the High court observed that as per Article 21 of the Indian constitution, it is a penumbral right and a key directive principle for the state government to provide sufficient and clean drinking water to every person and to safeguard water from pollution.⁵⁴

The Government formulated a scheme to enhance the drinking water supply by extracting the groundwater by pumps. It was challenged on the ground that it would disturb the freshwater equilibrium and result in the salinity of the water resources.

In *F.K. Hussain v. Union of India and Ors.*,⁵⁵ the court highlighted the importance of water by remarking that water and rivers have shaped man's fate and fortunes. Numerous rivers have benefited individuals who lived along their banks.⁵⁶ Expressing concern over the falling groundwater level, the court said “*Overexploitation of water resources has to be contained.*”⁵⁷ Suggesting a way forward to the looming crisis of water scarcity, the court opined: “*Perhaps water management will be one of the biggest challenges in the opening decade of the next century. Water resources have, therefore, to be conserved... Safeguards must be evolved to stop withdrawal of groundwater at a cut-off level to impose restrictions and introduce a system of*

human rights known to any civilised society. All civil, political, social and cultural rights enshrined in the Universal Declaration on Human Rights and Convention or under the Constitution of India cannot be exercised without these basic human rights’.

⁵¹ AIR 1996 SC 2992

⁵² *Ibid.*

⁵³ 2001 (6) ALT 133.

⁵⁴ *Ibid.*

⁵⁵ AIR 1990 Ker 321.

⁵⁶ *Id.*, at 323.

⁵⁷ *Ibid.*

effective monitoring at all levels.”⁵⁸ After studying the reports of the Central Ground Water Board, National Environmental Engineering Research Institute (NEERI), and CESS the court permitted the restricted extraction of the groundwater. However, the court left it to the Ministry of Environment and Ministry of Science and Technology to decide the method and extent of extraction. These Ministries were authorized by the state to set up a monitoring agency and issue statutory guidelines if the need so arose.⁵⁹

While hearing a PIL putting forth the grievance of residents of West Kochi, who were demanding supplies of potable drinking water, the court observed that the top priority of the government should be the supply of drinking water.⁶⁰ The court expressed distress at the attitude of the successive Governments as they did not pay attention to the long-standing demand of the residents of West Kochi for potable drinking water. While holding that failure of the government to provide adequate safe drinking water to its citizens amounts to a violation of the Constitution of India (Article 21), the court directed the State to undertake all steps needed for supplying an adequate quantity of water for drinking to the residents of the area within 6 months.

Instead of abiding by the directions of the court, the Government and the Kerala Water Authority filed appeals against the judgment⁶¹ challenging the Court’s competence to issue such dogmatic directions. The Apex court observed that finding a solution to the drinking water supply problems of the citizens should be a priority for any Government interested in their welfare. It further remarked that by establishing the Water Authority, the government cannot absolve itself of the duty to supply clean drinking water.

In a case where the people of two villages locked horns over the supply of water. Each claimed water supply to the exclusion of the other.⁶² The Court held that it is the responsibility of the State to arrange a continuous supply of water to both the villages and ordered the State to take appropriate measures in case anyone causes or attempts to obstruct the water flow. The Court was of the view that it is the constitutional mandate to ensure the supply of water to both villages. The State was directed to

⁵⁸ *Id.*, at 324

⁵⁹ *Ibid.*

⁶⁰ *Vishala Kochi Kudevella Sam. Samithi v. State of Kerala*, 2006 (1) KLT 919.

⁶¹ (2018) 4 SCC 1

⁶² *Diwan Singh & Anr. v. Sub-Divisional Magistrate, Almora & Ors.*, (2000) ALL. LJ 273.

supply water to both villages and avert steps to hinder the flow of water to either of the two villages.

The economic interests involved in the supply of drinking water have also been addressed in certain cases. Six petitions intensified a debate relating to the duties and obligations of local governing institutions to arrange assured drinking water supply to residents of their respective areas, for which these authorities were created as statutory bodies. While adjudicating the dispute over the levying of water charges in Lucknow, the court in the case of *Grih Swami Parishad v. State of Uttar Pradesh*,⁶³ observed that the situation is essentially the result of indifference on the part of authorities, who have usually failed to take timely corrective steps at the outset and have failed to appreciate the residents' plight. *"It is a matter of common experience that authorities do not care to look into the plethora of complaints by the consumers. Such is the matter of complaint in the present petitions."*

It was further observed that access to drinking water is a birth right. Water use and management are influenced by distinct distribution patterns that vary according to region, such as urban, rural, and suburban. Occasionally, it is governed by the people in charge or by needy, impoverished individuals, pavement dwellers, slum dwellers, and squatter colonies. Municipal and Notified Area Councils are accountable for delivering essential services such as drinkable water for consumption.

While concluding the case, the court remarked that problems are invariably addressed through temporary measures that rely on superfluous dressing rather than finding a permanent cure through a well-planned project that considers future requirements and accommodates maintenance of its infrastructure while remaining cost-effective on a 'no profit, no loss' basis.

In the case of *Bureau of Indian Standards v. Pepsico India Holdings Private Limited* it was held that the Bureau of Indian Standards (BIS) has sufficient authority over article labelling and can prohibit activities that mislead the public about the composition, origin, properties, and nature of anything being marketed under the BIS mark. While holding that packaged drinking water was no longer ordinary water, the court remarked that *"It is thus clear that all kinds of 'mineral water' or 'natural water'*

⁶³ *Lucknow Grih Swami Parishad v. State Of U.P. & Ors.*, 2000 (3) AWC 2139 available at <https://indiankanoon.org/doc/272751> (last visited on 11 June 2022).

*and 'packaged drinking water' which may derive from any source of potable water is subjected to treatments etc... It is added as an additional item as 'food' for the purposes of the Prevention of Food Adulteration Act 1954 in view of its nature and substance etc. The 'packaged drinking water' as defined hereinabove is comprehensive in its term, which takes into account the water that, is being manufactured and processed by the petitioners' companies. The impugned amendments, in our considered opinion, cannot be characterized as arbitrary, capricious, unreasonable, and unjust as complained by the petitioners."*⁶⁴

While the body of case law addressing drinking water concerns is vast, it has not led to the creation and expansion of any exclusive and consistent body of principles in this field. The drinking water which is the basic human need has not found its specific place in the legislative framework. The courts, on the other hand, have taken up the issue in several cases in various contexts, where the state has failed to take the initiative.

4.2.2. Sanitation

The judiciary has made a clear linkage between sanitation and other fundamental rights such as the right to water and the right to health. *Municipality Council, Ratlam v. Vardhi Chand and Others*⁶⁵ case did not specifically place sanitation in the context of a fundamental right but laid the ground for all subsequent decisions in this regard. The case related to the duties of municipal authorities to safeguard the rights of the residents related to public health. The issue for determination before the court was whether a court may compel a statutory body to execute its duty to the public by ordering the creation of sanitary facilities at a higher cost and in a time-bound manner.⁶⁶ The Municipality of Ratlam was being held liable by residents of informal settlements for not performing its duties. It was contended that the municipality had the obligation to protect the rights of the residents by checking and controlling the pollution caused by the discharge of a nearby alcohol plant. It was also contended that the Municipality is accountable for providing adequate sanitation facilities to reduce public health risks caused by the waste gathering in water in the residential areas.⁶⁷

⁶⁴ *Pepsico India Holdings Pvt Ltd. v. Union of India*, WP(C) No.6791/2008 available at <https://indiankanoon.org/doc/44242475>(last visited on 13.07.2022).

⁶⁵ AIR 1980 SC 1622.

⁶⁶ *Id.*, at 1625.

⁶⁷ *Id.* at 1626.

The residents of a neighbourhood filed a complaint against the Municipality of Ratlam to the Sub-Divisional Magistrate who found the facts to be true and ordered that the Municipality should provide sanitation facilities within two months. It was also included in the order that criminal prosecution shall be started in case of failure to comply with this order to check a public health nuisance.⁶⁸ It was contested by the Municipal Council on the basis that the owners of houses had preferred, on their own, to reside in that area besides being completely aware of the insanitary conditions existing there, and thus have no right to complain. The financial constraints in providing sanitation services and construction of drains were also pleaded by the Municipal Council.⁶⁹ Though the Sessions Court dismissed the order of the Magistrate, it was upheld by the High Court. The Supreme Court was approached by the Municipality against the High Court order but the Apex Court upheld the High Court decision of favouring the residents. It considered the case in the context of larger public interest and collective rights of the residents.

It also considered the prevailing inequality between the rich and poor residents of the municipal area and the duty on the part of municipal authorities to stop public nuisances. The Court appreciated the Magistrate's decision taken under the Code of Criminal Procedure to order the Municipality to take action as it forms a public duty of the Magistrate to the members of the public who are victims of the nuisance, and he has exercised it when the jurisdictional facts are present as here.⁷⁰

It was also held by the court that the financial constraints cannot be a justified ground for the non-performance of such mandatory obligations of the municipality.⁷¹ The Court further held that dignity and decency are non-negotiable facets of human rights and are a first charge on local self-governing bodies. Accordingly, providing a working drainage system that is adequate to meet the needs of residents is a must for the Municipality to justify its existence.⁷²

Subsequently, a vibrant change in the judicial approach to matters relating to the environment has also been visible in several cases that came before the Apex Court.

⁶⁸ *Id.*, at 1,2 and 7.

⁶⁹ AIR 1980 SC 1622, at para 7.

⁷⁰ *Id.*, at 9.

⁷¹ *Id.*, at 10.

⁷² *Ibid.*

Dissatisfied with the sanitation of Jaipur City, Mr. L. K. Koolwal⁷³ moved to the Supreme Court. It was observed by the court that bad conditions of sanitation in the city are harmfully affecting the lives of the residents and leading to the death of the citizens earlier than natural death.⁷⁴ The court reminded the municipality of its duty to remove all noxious or offensive matters irrespective of the availability of the funds or staff. The court interpreted Article 51A of the Constitution innovatively by observing that this Article is ordinarily the duty of the citizens, but truly it is their right as it gives them a right to move to the Court to ensure that the State faithfully performs its duties. Further, the law of the land is followed while performing these obligatory and primary duties. Thus, Article 51A gives a right to the citizens to bring omissions and/or commissions to the notice of the Court and to seek enforcement of the duty cast on the State, departments, agencies, local bodies, and other authorities created under the law of the State.

In *Virendra Gaur and Others v. State of Haryana and Others*,⁷⁵ the Supreme Court interpreted that Article 21 of the constitution guarantees the right to life as a fundamental right. The right to life with dignity includes the protection and maintenance of the environment, ecological balance free of air and water pollution, and sanitation, all of which are necessary for the enjoyment of life. Any other course of action would result in environmental pollution. Polluting the environment, ecology, air, and water, among other things, should be considered a violation of Article 21. Thus, a sanitary environment is a necessary component of the right to a healthy existence, and it would be impossible to live with human dignity in the absence of a humane and healthy environment.⁷⁶

In *Dr. B.L. Wadhwa's case*,⁷⁷ the court noted with anguish that Delhi, India's capital, is one of the most polluted cities on the planet. The agencies responsible for pollution management and environmental protection have been unable to give their inhabitants a clean and healthy environment. The surrounding air is so contaminated that breathing is difficult. Residents of Delhi are becoming more afflicted with respiratory ailments and throat infections. Untreated industrial sewage is being discharged freely

⁷³ *L.K. Koolwal v. State of Rajasthan & Ors.*, AIR 1988 Raj 2.

⁷⁴ *Ibid.*

⁷⁵ (1995) 2 SCC 577.

⁷⁶ *Id.*, at para 7.

⁷⁷ *Dr B.L. Wadhwa v. Union of India & Ors.*, (1996) 2 SCC 594.

into the Yamuna, the city's primary source of drinking water. Apart from air and water pollution, the city is essentially a rubbish dump and it is normal to see waste strewn across Delhi.⁷⁸ The court lambasted the local bodies i.e., Municipal Corporation of Delhi and New Delhi Municipal Council for total failure in discharging their obligations towards the citizens. Several directions were issued by the court, some of them are as under:

1. The experimental schemes proposed by these organizations were approved.
2. The Government of India was directed to install incinerators, preferably within nine months, in all the nursing homes and hospitals with a capacity of 50 beds and above,
3. All India Institute of Medical Sciences was directed to dispose of the hospital waste by installation of a sufficient number of incinerators, etc.
4. These bodies were directed to notify all nursing homes and private hospitals in the city to plan for the disposal of rubbish and hospital waste and build their incinerators.
5. The Central Pollution Control Board and the Delhi Pollution Control Committee have been directed to conduct frequent inspections of various sections of the city to verify that waste disposal, transportation, and collection are carried out properly.
6. Under Section 469 of the Delhi Act and 375 of the New Delhi Act, the Delhi Government was ordered to appoint Municipal Magistrates to prosecute offences under these Acts.
7. A duty was cast on the Doordarshan to educate the people about their civic duties through its programs.
8. Revive the Okhla compost plant.
9. Additional garbage collection centers were to be constructed.
10. The Delhi Administration and the Union of India were asked to take a sympathetic view of their requests for financial assistance.

⁷⁸ *Id.*, at 595

11. The Delhi Administration has been asked to collaborate with specialist bodies such as NEERI to determine alternative methods of solid waste and garbage disposal.

The Supreme Court, in *Environment and Consumer Protection Foundation vs. Delhi Administration and others*,⁷⁹ has interpreted that water and sanitation are basic components of the right to education. The Court ruled categorically that all schools must offer water and sanitary facilities only to ensure the right to education is realized.

In this case, a writ petition was filed by an NGO for seeking improvement in the existing water and sanitation conditions in all schools of the country. Earlier in this case, the Supreme Court of India has repeatedly ordered all states to provide basic infrastructure, including drinking water and toilet facilities in schools, to promote a clean and healthy learning environment for students. Several states refused to comply with these requests, while others presented information about school infrastructure. According to the data given, several schools lacked adequate restroom facilities for boys and girls, and some lacked safe drinking water entirely.

Consequently, the Court issued multiple interim directions throughout 2011 and 2012, noting, for example, "All schools must provide toilet facilities." Empirical studies unequivocally bring out that in the absence of bathroom facilities in schools, parents refrain from enrolling their children, particularly girls. This is a flagrant breach of children's constitutional right to compulsory and free education granted by Article 21-A⁸⁰.

The Court repeated its prior decisions in this matter and directed all states to comply with earlier judgments mandating the provision of toilet and water facilities in schools within six months.⁸¹ The Court stated that this holds for all schools, public and private, aided and unassisted, minority, and non-minority. The Court emphasized the importance of implementing these judgments, adding that "if the directives are not completely executed, disgruntled parties may petition this Court for appropriate measures."

⁷⁹ (2012) INSC 584.

⁸⁰ *Id.*, at para 7.

⁸¹ *Id.*, at para 10.

4.2.3. Water Pollution

The role of the judiciary in the control and prevention of water pollution and the conservation of resources can be acknowledged in many cases. It has played a critical role in environmental conservation and has advanced several ideas applicable to the current situation. The judiciary has tried to maintain a balance between environmental protection and sustainable development while deciding cases. The innovative and dynamic attitude of the judiciary, especially for the protection of environment, has generally been termed as 'Judicial Activism.'⁸²

It is also worth mentioning here that most environmental claims have been brought to the courts via PIL or 'Social Action Litigation'. In general, India's judicial approach to practically all environmental challenges is praiseworthy. The Indian judiciary has made substantial use of constitutional provisions in developing India's new 'environmental jurisprudence.' The courts efficiently execute the notion of, the polluter pays principle, sustainable development, the Doctrine of Public Trust, and the precautionary principle, as derived from many international publications and conventions.

On 29 January, 1998, the Apex court in *Bhavani River - Sakthi Sugars Ltd. vs Unknown*, took a serious note of the non-compliance of its directions to the industry regarding the stoppage of seepage from their unlined lagoons, resulting in the pollution of river water, and has directed the closure of the polluting industry.⁸³

In the case of *M.C. Mehta v. Union of India & Ors.*, regarding pollution by effluents from tanneries in Calcutta⁸⁴, the Supreme Court observed that it is clear that "the tanneries in Calcutta have operated in extremely unsanitary circumstances and have discharged highly hazardous effluents over the neighbourhood. Needless to add, the West Bengal Pollution Control Board and the State have failed miserably in their statutory responsibilities to control pollution and halt the degradation of the environment."

⁸² "Role of Judiciary" available at [http://shodhganga.inflibnet.ac.in/bitstream/10603/8107/13/13_chapter %208.pdf](http://shodhganga.inflibnet.ac.in/bitstream/10603/8107/13/13_chapter%208.pdf) (last visited on 18 Sept. 2021).

⁸³ AIR 1998 SC 2059

⁸⁴ (1997) 2 SCC 411

The court ordered the shifting of tanneries. None of the tanneries was allowed to function at the present site after September 30, 1997. The State was directed to assist in the relocation of the tanneries. The court gave comprehensive directions for the welfare of the workmen employed in Calcutta tanneries. The Supreme Court deputed the Calcutta High to oversee the effective implementation of its orders and directions.

Similarly, Vellore Citizens Welfare Forum filed a PIL concerning pollution caused by tanneries⁸⁵ that released untreated effluent into road-sides, agricultural fields, open lands, and waterways of the Tamil Nadu State. The PIL stated that this untreated effluent ultimately reaches River Palar which is the main source of the area's drinking water supply. It resulted in the non-availability of clean and safe drinking water to the people and caused environmental degradation. The toxic effluents percolated and contaminated the groundwater as well.

The court concluded that the discharge of effluents has polluted the total environment of the area. Though the tanneries create wealth for the country by earning foreign exchange and providing employment, these cannot be allowed to pose a health hazard, degrade the environment, and destroy the ecology of the area.⁸⁶ While trying to strike a balance between the two seemingly opposite concepts -development and ecology the court opined that there is no uncertainty in holding the notion of 'Sustainable Development' as a means of balancing environment and development, accepted as part of Customary International Law while its key aspects have not been finalized by international jurists. Several of the key concepts of 'Sustainable Development,' have been outlined in the Brundtland Report and other international documents, including optimal use, resource conservation, intergenerational equity, environmental protection, the need to assist and collaborate, the Polluter Pays principle, poverty alleviation, and financial support to developing and less developed nations. The court remarked that the most critical of these components of Sustainable Development are the ideas of 'The Polluter Pays' and 'The Precautionary Principle'.⁸⁷ The court elucidated the Precautionary Principle in the context of municipal law as under:

- (i) The causes of environmental deterioration must be predicted, avoided, and addressed by the action of the State Government and statutory authorities.

⁸⁵ *Vellore Citizens Welfare Forum v. Union of India & Ors.*, IR 1996 SC 2715

⁸⁶ *Id.*, at 2721.

⁸⁷ *Id.*, at 2722.

- (ii) Lack of scientific knowledge should not be used to justify the delay in taking steps to avoid environmental deterioration where substantial and irreparable harm has already occurred.
- (iii) The burden of evidence is on the developer/industrialist or the factor to show that his intervention is ecologically benign.⁸⁸

The Central Government was directed to establish an authority under the Environment (Protection) Act, 1986 [Section 3(3)] and to provide it with the requisite powers to deal with the situation generated in Tamil Nadu by tanneries and other polluting businesses. This authority was charged with the responsibility of enforcing the "polluter pays" and the "precautionary principle" principles. The authority was authorized to analyse the environmental damage in impacted regions, to identify persons who have suffered as a result of the pollution, and to determine the amount of compensation to be provided to affected individuals. Additionally, it was also made responsible for determining the amount of compensation to be collected from polluters to cover the expense of reversing the harm to the environment and for ordering the closure of the polluter's industry if he evades or refuses to pay the compensation imposed on him. This should be in addition to the land revenue arrears recovered from him. Suspending all closure orders, the court instead imposed a pollution charge of Rs.10,000 on each tannery and required them to install Individual Pollution Control Devices within a certain time frame. The Madras High Court was requested to establish a "Green Bench" to handle this issue and other environmental concerns.

Taking a *suo moto* notice of a news in Indian Express on February 25,1996, which alleged that the management of Span Resorts was trying to change the course of Beas River,⁸⁹ the Apex Court, while explaining the "Doctrine of the Public Trust", observed that the resources such as sea, forests, air, and water are vital to humanity. It would be unjustifiable to make these a private property. Given that the afore mentioned resources are a gift from nature, these should be made freely available to everyone, regardless of their socioeconomic condition. The idea asserts that the government's role is to safeguard resources for the public, rather than allowing private ownership or

⁸⁸ *Ibid.*

⁸⁹ *M.C. Mehta v. Kamal Nath & Ors.*, (1997) 1 SCC 388.

commercial use. The court stated that the state "serves as a trustee of all natural resources that are by their very nature intended for public enjoyment and use."

Looking into the struggle between the need for development and preservation of environment the court clearly stated that "*The resolution of this conflict in any given case is for the legislature and not the courts. If there is a law made by Parliament or the State Legislatures the courts can serve as an instrument of determining legislative intent in the exercise of its powers of judicial review under the Constitution. But in the absence of any legislation, the executive acting under the doctrine of public trust cannot abdicate the natural resources and convert them into private ownership, or for commercial use. The aesthetic use and the pristine glory of the natural resources, the environment, and the ecosystems of our country cannot be permitted to be eroded for private, commercial, or any other use unless the courts find it necessary, in good faith, for the public good, and in the public interest to encroach upon the said resources.*"⁹⁰ The leasing of the large area of the banks of River Beas to the motels only for commercial purposes by the Government of Himachal Pradesh amounts to a breach of public trust, the court observed.

The court held that "*The public trust doctrine is a part of the law of the land.*"⁹¹ The official approval by the Govt. of Himachal Pradesh and subsequent lease deed in favour of the Motel were cancelled. It was directed to take over and restore the land to its original state. The Motel was asked to bear the cost of the restoration of the environment of the affected area and forbidden from making any encroachment on any part of the river basin and discharging untreated effluents into the river.

The issue of pollution in the river Gomti mainly by Mohan Meakins was brought to the Supreme Court in *Vineet Kumar Mathur v. Union of India*.⁹² The Court seriously noted the misuse and pollution of water by the State government and businesses by releasing effluents and by failing to install common effluent treatment units. The court observed that the concerned officers acted in blatant contempt of court but accepted their apologies while adding the infraction to their service record. The Court has effectively separated important concepts of environmental law via its interpretation of

⁹⁰ *Id.*, at 398.

⁹¹ *Id.*, at 399.

⁹² (1996) 1 SCC 119.

statutes and the Constitution, while also providing a generous opinion for the sake of social justice and human rights protection.

The Court had earlier directed the Mohan Meakin industries to remove deficiencies in their effluent treatment plants by March 21, 1993, and obtain the consent of the Pollution Control Board by March 31, 1993. The Uttar Pradesh Pollution Control Board gave conditional consent on April 21, 1993, and allowed the industry to operate its plant and remove the deficiencies in the effluent treatment plants by December 31, 1993. The Supreme Court held that the order of the Uttar Pradesh Pollution Control Board to grant consent on April 21, 1993, was *ultra-virus* and the Member-Secretary of the Uttar Pradesh Pollution Control Board and its Chairman were guilty of contempt of court. Though an unconditional apology tendered by both was accepted by the court, a severe warning was given to both not to violate the orders of the court again. The Apex Court observed that “*Courts cannot afford to lightly deal with cases involving pollution of air and water. The message must go to all concerned. The courts will share the parliamentary concern on the escalating pollution level of our environment. Those who discharge noxious polluting effluents to streams may be unconcerned about the enormity of the injury which it inflicts on the public health at large, the irreparable impairment it causes on the aquatic organisms, the deleteriousness it imposes on the life and health of animals. So the courts should not deal with the prosecution for offences under the Act in a casual or routine manner. Parliamentary concern in the matter is adequately reflected in strengthening the measures prescribed by the statute. The court has no justification for ignoring the seriousness of the subject.*”⁹³

4.2.3.1. Cases related to river Pollution

A PIL was filed to restrain Kanpur Tanneries and the respondents other than the Union of India, Indian Standards Institute, Chairman Uttar Pradesh Pollution Control Board and Chairman, Central Board for Prevention and Control of Pollution from discharging the effluents into the Ganga River till they install effluent treatment plants. During the proceedings, it was informed that six tanneries had already installed the primary effluent treatment plants and fourteen were in the process of installing such plants for treatment before discharging it into the municipal sewerage and then into the Ganga River. A few tanneries sought some more time to set up treatment

⁹³ U.P. Pollution Control Board vs M/S Mohan Meakins Ltd. And Others, (2000) 3 SCC 745.

plants. However, all the tanneries expressed financial inability to set up a secondary system for treating wastewater. The court accepted this plea but insisted on setting up the primary treatment plants. It declared that every tannery should establish primary treatment plants irrespective of their financial capacity. As a strict measure, the court ordered the tanneries, who despite knowing the proceedings did not appear in the Court and gave their consent to establish the pre-treatment plants, to stop working.

The court observed that *“Millions of our people drink Ganga water out of an everlasting faith and belief to purify themselves and seek moksha, or liberation from the cycle of birth and death. It is unfortunate that the Ganga, which has cleaned humanity from time immemorial, has millions of our people drinking its water in an unwavering faith and conviction that they are purifying themselves and which supplies drinking water to one-third of India's population, is contaminated by urban sewage and industrial effluents discharged into the river. The pollution of the Ganga has a significant impact on the ecology, health, and lives of people residing in the Indo-Gangetic Plain. Disposal of garbage, animal carcasses, and discharge of effluents all impact the inhabitants of the area in numerous ways. Therefore, steps must be taken to safeguard the river Ganga's purity, which is critical for the survival of a vast portion of northern India. Both the Parliament and the Government have taken a variety of initiatives to curb water contamination, but nothing significant has been accomplished. Unless and until the public cooperates, no legislation or authority will succeed in eradicating pollution.”*⁹⁴

In *M.C. Mehta v. Union of India*,⁹⁵ the Kanpur Municipality received severe criticism for its failure to discharge its statutory duties. As such several directions were issued to the municipality for improving the sewerage system to check the pollution of Ganga River waters. Such directions were also issued to other municipalities and *mahapalikas* of the cities near the river-course areas.

Again in *M.C. Mehta v. Union of India*,⁹⁶ a petition was filed to check the flow of effluents from tanneries in West Bengal which caused pollution. The Supreme Court examined a proposal to setup Common Effluents Treatment Plants (CETPs) to check the pollution caused by operating units. Given the categorical findings of NEERI and

⁹⁴ *M.C. Mehta v. Union of India and Others*, AIR 1987 SC 1037.

⁹⁵ AIR 1988 SC 1115.

⁹⁶ (1997) 2 SCC 411.

several other reports by the pollution control board, it was found that there is no possibility of setting up CETPs at the existing locations. The tanneries would instead have to relocate. The tanneries declining to relocate were prohibited from operating from the present sites. A fine of Rs.10,000 was imposed on such tanneries and the matter was sent to the Green Bench for further monitoring. The state government was asked to frame schemes for the reversal of the ecological and environmental damage.

A PIL brought the adverse effect of the release of untreated effluents, chemicals, and sewage by industry in Bhagalpur on water resources, cattle, and crops to the attention of the Patna High Court.⁹⁷ Placing reliance on the decision of the Supreme Court given in *M.C. Mehta v. Union of India*,⁹⁸ wherein the Supreme Court had given six months to tanneries to establish primary treatment plants and failing to do so within the stipulated time, the said tanneries would not be allowed to operate and do their business, the High Court allowed the industry to start its manufacturing process with adequate safeguards. In case a situation arises where any person contracts any ailment, directly attributable to the effluent discharged by the industry, all expenses of treatment of such person shall be borne by the industry. Apart from this, the victim may also be awarded suitable compensation.

In a case, a petition was filed under Article 32 of the Constitution to prohibit Tata Iron & Steel Co. Ltd. from stopping the discharge of slurry or sludge into Bokaro river,⁹⁹ The court observed that according to Art. 21 of the Constitution, the right to life is a basic right that includes the right to pollution-free air and water for its full enjoyment. If something endangers or damages that quality of life in violation of the law, a person has the right to use Article 32 of the Constitution to have the pollution of water or air removed, if it is detrimental to the quality of life of the citizens.¹⁰⁰

In another case,¹⁰¹ a letter was written to the court alleging environmental pollution in a densely populated area had an adverse impact not only on the environment but also on the health of human beings, particularly children. The petitioner prayed to the court to issue directions to curb pollution. During the hearing of the matter, it was brought to the knowledge of the court that there was a long-standing hostility between

⁹⁷ *Rajiv Ranjan Singh alias Lallan Singh v. The State of Bihar & Others.*, AIR 1992 Pat 86.

⁹⁸ AIR 1988 SC 1037.

⁹⁹ *Subhash Kumar v. State of Bihar & Others.*, AIR 1991SC 420

¹⁰⁰ *Ibid.*

¹⁰¹ *Chhetriya Pardushan Mukti Sangharsh Samiti v. State of U.P. and others*, AIR 1990 SC 2060.

the petitioner and the owner of the industrial plant and refinery. There was a criminal proceeding against the petitioner. The petitioner had on an earlier occasion made a complaint to the Additional District Magistrate which was dismissed by him. Moreover, the industry in question had complied with the provisions of the Air (Prevention and Control of Pollution) Act, 1981, and the Water (Prevention & Control of Pollution) Act, 1974. No person, body, or authority ever had any complaint with the industry. The Apex Court once again voiced concern at the misuse of Article 32 and held that the Court must use extreme prudence and circumspection while utilizing and invoking this protection¹⁰². Where this looks to be a ruse to 'feed fact old grudges' and animosity, it should not only be declined, but severely discouraged. While it is the Court's responsibility to enforce fundamental rights, we also have to ensure that this weapon under Article 32 is not abused or permitted to be abused, thereby creating a bottleneck in the superior Court and precluding the Court from considering other genuine violations of fundamental rights. That would be an act or behaviour that would undermine the whole objective of basic rights protection.¹⁰³ While dismissing the petition, the court issued a warning against dishonest petitions and so-called 'protectors must not be allowed it hold the society to ransom'¹⁰⁴.

The Dhrangadhra Municipality alleged that Dhrangadhra Chemical Works Ltd. discharged large quantities of effluents polluting the drinking water in the nearby area wells, making it unfit for human consumption and at the same time affecting the fertility of the soil as well.¹⁰⁵ The Municipality issued a show-cause notice to Dhrangadhra Chemical Works Ltd. as to why it should not dispose of the effluent through a covered pucca drainage in the 'Ran' area of Kutch. The appellant in reply stated that it had already taken adequate measures to ensure that potable water from wells in nearby areas is not polluted. Further, it stated that the proposal given by the Municipality was not technically feasible and implementable despite being beyond the financial capacity of the appellant.

Thereafter the Municipality requested the Government to evaluate and appoint a Special Officer to decide whether the discharge of the effluent from Dhrangadhra Chemical Works Ltd is polluting water and adversely affecting the soil fertility. The

¹⁰² *Id.*, at 2061.

¹⁰³ *Id.*, at 2063.

¹⁰⁴ *Ibid.*

¹⁰⁵ *Dhrangadhra Chemical Works Ltd. v. The Dhrangadhra Municipality*, AIR 1959 SC 1271.

officer decided that whether the effluent discharge contaminated the water and harmed the soil fertility was a question of subjective determination for the respondent Municipality and was outside the scope of the inquiry before him. The court held that the Special Officer wrongly denied himself the jurisdiction that he should have exercised. It was also held that the Special Officer should decide whether the nuisance as alleged by the Municipality existed before imposing a heavy expenditure involving lakhs of rupees on the Dhrangadhra Chemical Works Ltd.

In another case,¹⁰⁶ the issue was whether the Air (Prevention and Control of Pollution) Act, 1981, and the Water (Prevention and Control of Pollution) Act, 1974 abrogated Section 133 of the Code of Criminal Procedure, 1973. The issue was initially heard by the High Court, which held that the provisions constitute an expansion of the powers provided by Section 133 of the Code of Criminal Procedure, 1973. The court remarked that air and water pollution were found to constitute nuisances or damage to the health or physical comfort of society. However, it ruled out the approach set out in Section 133 of the Code because it deals with unique types of nuisance.

In conclusion, it was remarked that the presence and operation of two parallel provisions would result in not just inconvenient but also illogical outcomes. It was decided that the provisions of the Air and Water Acts impliedly repealed Section 133 of the Code in so far as allegations of public nuisance caused by water and air pollution caused by people or companies covered by the two Acts are concerned.¹⁰⁷ However, the Supreme Court disagreed with the High Court's findings. Rather, it noted that "*...the provisions of Section 133 of the Code are preventive in character, and the provisions of the two Acts are not only curative but also preventive and punitive in nature.*" The clauses appear to be mutually incompatible, and the possibility of one supplanting the other is ruled out.¹⁰⁸

Water Act empowers the Pollution Control Board to issue directions to prohibit, close, or regulate any process, operation, industry, or storage. Directions can also be made to stop the supply of water, electricity, or any other service. Such orders issued by the Boards on certain occasions have been challenged before the courts. The Karnataka High Court in a similar case refused to interfere with the matter and stated that

¹⁰⁶ *State of M.P. v. Kedia Leather & Liquor Ltd. & Others.*, AIR 2003 SC 3236.

¹⁰⁷ *Id.*, at 3239.

¹⁰⁸ *Ibid.*

“Where various provisions of an Act are violated and conditions imposed for curtailing pollution are not complied with, the order for closure of the industry will be valid. An industry was polluting the environment by discharging water.”¹⁰⁹ However, an order regarding the closure of industry is to be passed with caution. Any order where principles of natural justice appear to be ignored needs to be quashed. The Karnataka High Court while interfering with one such order observed that it is important that all laws are enforced fairly, as this also generates respect for the law within the community and obeys the basic notions of justice available to mankind.¹¹⁰

In a similar case, an order was passed by the Andhra Pradesh Pollution Control Board to close the industry when the effluent treatment plant was found to be in-operative. It was challenged before the High Court, which called for the records of the case. It was found that it was not possible to hold the order directing the closure of industry and it was shockingly disproportionate, excessive, or severe.¹¹¹

A member of 'Nainital Bachao Samiti', Dr Ajay Singh Rawat, filed a petition in the Supreme Court averring that pollution and environmental degradation due to increasing pollution, lopping and hacking of oak forests, over-grazing, quarrying, landslides, and forest fires, etc., is going on unchecked in the hill city of Nainital.¹¹² The Supreme Court directed the District Judge, Nainital, to appoint a Commissioner, for physical inspection of the area and to submit a report. After going through the report and recommendations of the Commissioner, the court ordered the constitution of a monitoring committee consisting of government officials representing the concerned authorities or departments and leading members of the public having an interest in the matter. It also issued the following directives to be implemented immediately:

- (i) To prevent sewage water from flowing into the lake.
- (ii) Preventing the siltation of the lake by not allowing the building materials to be heaped on the.
- (iii) Preventing the horse dung from reaching the lake

¹⁰⁹ *Stella Silks Ltd. v. State of Karnataka*, AIR 2001 Kant 219.

¹¹⁰ *Mandu Distilleries Pvt Ltd. v. Madhya Pradesh Pradushan Niwaran Mandal*, AIR 1995 MP 57.

¹¹¹ *M/s. Ambuga Petrochemicals Ltd v. A.P. Pollution Control Board & Others.*, AIR 1997 AP 41

¹¹² *Dr Ajay Singh Rawat v. Union of India and Others.*, (1995) 3 SCC 266.

- (iv) Construction of multi-story group dwellings and commercial structures in town area be prohibited.
- (v) Making unauthorized tree felling a cognizable offence.
- (vi) Vehicle traffic on the Mall be minimized.
- (vii) Repairing the cracks of Ballia Ravine.

Intellectuals Forum's¹¹³ case related to the restoration and preservation of two water tanks viz., 'Peruru Tank' and 'Avilala Tank', situated around the world-famous Tirupathi Temple which was being converted to meet the requirement of shelter. These tanks were useful not only for irrigation but also useful for improving the ground water table. In the case, the court observed that the public trust establishes the state's authority to utilize public property for public interests. This is an articulation of the idea from the standpoint of the State's positive obligations towards public trust. From a nugatory standpoint, the doctrine does not explicitly forbid alienation of property held in public trust. However, the state allows for a high level of judicial examination of any action taken by the government that seeks to restrict public access to a resource that is freely available for public use, regardless of how compatible with current legislation it is. To properly analyze the government's activities, the courts must distinguish between the government's broad commitment to act in the public interest and the more exacting obligation that the government may have as a trustee of specific public resources. The tank is indeed a communal property, and the State authorities are trustees responsible for holding and managing such properties for the benefit of the community. However, they are prohibited from committing any act or omission that would violate the rights of the Community and alienate the property of any other individual or organization.¹¹⁴

The court rejected the arguments that heavy investments have already been made and the right to shelter will be violated if the construction is halted and observed that "*The right to shelter does not seem to be so pressing under the present circumstances to outweigh all environmental considerations.*"¹¹⁵ Given the peculiar circumstances of the case where a lot of development activities have taken place over a long time, the

¹¹³ *Intellectuals Forum, Tirupathi v. State of A.P. & Others.*, AIR 2006 SC1350.

¹¹⁴ *Id.*, at 1352.

¹¹⁵ *Ibid.*

Court expressed its inability to rectify the damage already done. The court issued directions prohibiting any further constructions on the tanks and harvesting the rain water among others.

4.3. Inter-State River water Disputes

Water disputes between states are different from other interstate problems. Article 262 of the Constitution of India precludes the Apex Court or other courts from adjudicating interstate water conflicts. The Interstate (River) Water Disputes Act, 1956 (herein after called ‘The Act’) establishes a mechanism for resolving such disputes. Under its terms, conflicts are to be decided by ad hoc, temporary, and exclusive tribunals. When states approach the Supreme Court in such circumstances, the court's limited jurisdiction restricts its involvement in offering explanations due to the prohibition on its jurisdiction.

Over the years, the Supreme Court has been presented with some interstate river water conflicts involving a variety of matters. These vary from the capability of the Tribunal to cope with a proposal for a provisional allocation and non-implementation of its order (Cauvery), failure on the rehabilitation, resettlement, and environmental fronts (Narmada), and the constitutional validity of a State Act aborting all previous water accords (Punjab), among others. It is noteworthy here that the Apex Court did not intervene in the matter of water sharing that had been resolved or was being considered by a tribunal. The issues that went before the Supreme Court were some others, connected legal or constitutional matters.

4.3.1. Cauvery Water Dispute

The river Cauvery originates in Karnataka and flows to the Bay of Bengal through Puducherry and Tamil Nadu. Cauvery basin is spread over 81,155 sq.km out of which 34,273 sq. km falls in Karnataka, about 44,016 sq. km in Puducherry and Tamil Nadu, and about 2,866 sq. km in Kerala.¹¹⁶ The dispute for sharing Cauvery River water, between Tamil Nadu and Karnataka has reached the Supreme Court more than once.

The water dispute primarily between these two states dates to the two agreements between the then Princely State of Mysore and Madras Presidency drawn in 1892 and

¹¹⁶ “Cauvery Water Dispute Award” available at <http://wrmin.nic.in/writereaddata/PR-CauveryAward.pdf> (last visited on 28 June 2022).

1924. These agreements put restrictions on Mysore to construct new irrigation projects. Karnataka alleged that the agreements were not fair and it did not get its due share of water. Tamil Nadu contends that it has developed a large area in the Cauvery basin because of which it is dependent on the existing pattern of usage. The agreement of 1924 expired after 50 years and opened a possibility for both to get things done in their favour.¹¹⁷The reorganization of States resulted in the creation of the present States of Tamil Nadu and Karnataka in 1956.

In 1970 Tamil Nadu requested the Government of India that a Tribunal be constituted under 'The Act' to solve the long-standing conflict with Karnataka on the sharing of Cauvery River waters. In 1971 a suit was filed in the Supreme Court by the state of Tamil Nadu alleging the infringement of its rights to Cauvery waters by Karnataka. Similar suits were also filed by the organizations of agriculturists. In 1975 Emergency was declared and the fundamental rights were suspended. The agriculturists had based their suits on violation of their fundamental rights. The suits filed by them were withdrawn. The state of Tamil Nadu anticipating a political settlement also withdrew the suit.¹¹⁸ Once the Emergency was lifted, Tamil Nadu cultivators once again filed a petition alleging the violation of their fundamental rights.¹¹⁹The state of Karnataka contended that the Tamil Nadu agriculturists could not file such a petition in the Apex Court as only a Tribunal constituted under 'The Act' was authorized to address and settle the inter-state river dispute. The Supreme Court rejected the plea and held that as the State of Tamil Nadu has now fully supported the petitioner and the matter has been before the Court for about 7 years, to dismiss the petition now by accepting the State of Karnataka's objection that a petition of such a society for the relief sought is not maintainable would be ignoring the actual state of affairs, would be too technical and would be a judicial overreach. In the lack of an explicit request, we treat this case as one filed by the State of Tamil Nadu.¹²⁰

'The Act' authorizes the Union Government to constitute a Tribunal to decide water disputes if such disputes cannot be settled through negotiations. The Supreme Court

¹¹⁷ Ramaswamy R Iyer (ed.), *Water and the Laws in India* 67 (Sage Publications, Delhi, 2nd Edition, 2002)

¹¹⁸ *Id.*, at 86.

¹¹⁹ *Tamil Nadu Cauvery Neerppasana Vilaiporulgal Vivasayigal Nala vs. Union of India and Others.*, AIR 1990 SC 1318

¹²⁰ *Id.*, at 1319

noted that attempts by this Court to accommodate these two States to negotiate the settlement within a period of four to five years and multiple adjournments were undoubtedly ample opportunity and time. Since these approaches failed, it is logical to conclude that negotiations cannot resolve the dispute.¹²¹

The court gave extra time to the Union executive to decide as provided in ‘The Act’. On 2 June 1990, The Cauvery Water Dispute Tribunal headed by Justice N.P. Singh was constituted by the Union Government with N.S. Rao and Sudhir Narain as members, to adjudicate the inter- state water dispute.¹²² The CWDT heard the application and on 25 June 1991 passed an Interim order directing Karnataka to release 205 thousand million cubic feet of water in twelve months starting from July 1991 till the final allocation to Tamil Nadu is decided.¹²³ Karnataka was directed to release to Tamil Nadu. The state of Karnataka was unhappy with the order. It wanted to protect the amount of Cauvery water that it had been using. Therefore, Karnataka invoked its jurisdiction over water as provided in the constitution, issued an emergency ordinance - *Karnataka Cauvery Basin Irrigation Protection Ordinance, 1991*, and thus nullified the interim order of CWDT. At the same time, the State of Tamil Nadu was requesting the Union Government repeatedly that interim order be published immediately in the Official Gazette. To resolve this stalemate, the President of India on 27th July 1991 sought the opinion of the Apex Court under Article 143 [clause 1] of the Indian Constitution. The court expressed its opinion on 22nd November 1991 and held that “*The Karnataka Cauvery Basin Irrigation Protection Ordinance was beyond the legislative competence of the State and is, therefore, ultra vires the Constitution. The Order of the Tribunal constitutes report and decision of the said Order is, therefore, required to be published by the Central Government in the official Gazette under Section 6 of the Act to make it effective.*”¹²⁴. The Union Government published the interim order in the Official Gazette dated December 10, 1991.¹²⁵

Once the interim award was notified by the Union Government, anti-Tamil riots broke out in Karnataka. A PIL on behalf of the riot victims was filed before the Apex

¹²¹ *Id.*, at 1320

¹²² *Ibid*

¹²³ Chandrasekaran Velayutham and I. Arul Aram, “Tracing the Life Cycle of Water Conflict News Coverage: A Case study of Cauvery River Tribunal Final Verdict” vol.2, International Journal of Communication Studies,3-4, (2010). (Available at <http://www.kurgu.anadolu.edu.tr>)

¹²⁴ AIR 1992 SC 522.

¹²⁵ *Supra* note 123, at 7-8.

Court.¹²⁶ The Cauvery Riots Relief Authority was setup by the Supreme Court and a scheme to provide relief to people affected by anti-Tamil riots was formulated. The government of Tamil Nadu filed a suit¹²⁷ in the Supreme Court praying to issue directions to the Government of India to frame the scheme in such a way that would be able to give effect to the CWDT decisions and notify the same in the official gazette., A constitution bench was constituted to hear the matter which subsequently directed the Union Government to formulate the desired scheme. The Union Government notified the Cauvery Water Scheme, in 1998 and the Cauvery River Authority and Monitoring Committee were constituted., The CWDT announced its verdict on 5 February 2007 and allotted 419 billion ft³ of water from the Cauvery River to Tamil Nadu, 192 billion ft³ to Karnataka, 7 billion ft³ to Puducherry, and 30 billion ft³ to Kerala.

The Union Government published the award of the CWDT, as ordered by the Supreme Court. However, Karnataka refused to comply with the award and release water to Tamil Nadu as per the order. The Supreme Court ruled on the decades-old controversy on February 16, 2018. It gave Karnataka additional water. The Supreme Court ordered Karnataka to give 177.25 tm ft³ of Cauvery water to Tamilnadu from Biligundu dam. This means that Karnataka will get an extra 14.75 tm ft³ of water per year, whereas Tamil Nadu will get 404.25 tm ft³ less than the Tribunal allocated in the original decision.

4.3.2. Narmada Water Dispute

Narmada largest west-flowing river and stands at number five among the rivers in India. It originates in Amarkantak in the Shahdol district of Madhya Pradesh. The basin area of Narmada is about 1 lakh km² and it flows for about 1,312 km into the Gulf of Cambay in the Arabian Sea. In Madhya Pradesh, it flows for 1,077 km, and then between Madhya Pradesh and Maharashtra for 35 km, between Maharashtra and Gujarat for 39 km, and a further 161 km in Gujarat. Even though the river had huge potential, most of its water was lost to the sea.

¹²⁶ T.S. Doabia, *Environmental Law and Pollutions in India* (Vol. 1) 1003 (Lexis Nexis, Nagpur, 2010).

¹²⁷ *Ranganathan and Another. v. Union of India & Others.*, AIR 1999 SC 1086.

In 1946, the Governments of Central Provinces and Berar and Bombay requested the Central Waterways, Irrigation and Navigation Commission to explore the possibility of developing of Narmada Basin to utilize its water for irrigation, better navigation, and power generation, etc. In 1948, the Union Govt. appointed an ad-hoc committee with two distinct tasks- first to examine the projects and second to suggest the priorities. The government of India sanctioned investigations of the Bargi, Broach, and Punasa projects in March 1949 based on the recommendations of this committee.

In 1955, the Central Water & Power Commission studied the hydroelectric potential of the Narmada basin. After consultations with the then-Bombay Government, it was decided to construct a dam at Nava gam. Initially project was to be implemented in two stages as recommended by the Central Water & Power Commission. In 1960, the panel recommended combining two stages into one and extending the irrigation towards the Rann of Kutch from the high-level canal. On 1 May 1960, the State of Gujarat was formed and the Narmada Project was transferred to it. In November 1963, the Chief Ministers of Madhya Pradesh and Gujarat held a meeting with the Union Minister of Irrigation and Power, and an Agreement was signed. But subsequently, Madhya Pradesh did not ratify it.

A committee headed by Dr A.N. Khosla and comprising eminent engineers was constituted by the Government of India on 5 September 1964 which recommended a Master Plan envisaging 13 major projects to be taken up, one in Gujarat and 12 in Madhya Pradesh. The recommendations of the Khosla Committee were not acceptable to the States and Gujarat complained on 6 July 1968 to the Government of India under Section 3 of 'The Act'. Narmada Waters Dispute Tribunal (NWDT) headed by Justice V Ramaswamy was constituted by the Government of India which decided that Gujarat should assist in giving compensation for rehabilitation of displaced persons of other States and share in beneficial use of the project. Rajasthan and Madhya Pradesh challenged this judgment of the Tribunal in the Supreme Court. The court granted a limited stay¹²⁸ of the proceedings before the Tribunal.

The Prime Minister of India tried to resolve the dispute and had a meeting of the Chief Ministers of concerned states viz. Maharashtra, Madhya Pradesh, Rajasthan, and Gujarat. Consequently, the Chief Ministers of Rajasthan, Maharashtra, Madhya

¹²⁸ All proceedings except discovery, inspection and other miscellaneous proceedings were stayed.

Pradesh, and the Advisor of the Governor of Gujarat entered into an agreement on 12 July 1974 on several issues that were otherwise to be decided by NWDT. The Narmada Control Authority, a Construction Advisory Committee, and a Review Committee were established as per the instructions of the NWDT. Narmada Control Authority was to ensure the execution of the decision of the NWDT. The Review Committee was to review the decisions of the Narmada Control Authority and the Construction Advisory Committee. Secretary, Ministry of Water Resources was asked to head the Sardar Sarovar Construction Advisory Committee which would ensure proper, cost-effective, and timely project execution. The construction of the dam began with the Planning Commission approving Rs 6,406 crores for the project.

In November 1990, the Commissioner of Scheduled Castes and Scheduled Tribes, Dr B. D. Sharma, wrote a letter to the Apex Court expressing concern over the rights of the Scheduled Castes and Scheduled Tribes who were displaced due to the construction of Sardar Sarovar Dam without adequate rehabilitation.¹²⁹ The letter stated that the Commission had made several reports to the central and state governments but these were ignored. The court, under Article 32 of the Constitution, treated the letter as a writ petition and took notice of the delays in rehabilitation. It suggested that rehabilitation should begin six months before the region is projected to be submerged. It should cover all aspects of homestead substitution, agricultural restoration, and other arrangements. Every month, the Secretary of Social Welfare shall report the progress to the court on the state of rehabilitation.¹³⁰

However, it was contended that different relief and rehabilitation packages existing in different states restrict the choice of the outsees. The court therefore observed that a dam serves many purposes viz. in storing water, generating electricity, and releasing water at times of scarcity and throughout the year. When two or more choices or viewpoints exist and the Government decides on one, it is not the Court's role to revisit the issue and, in a sense, review the policy decision.¹³¹

The court issued directions¹³² that the construction shall continue according to provisions of the NWDT Award. The Narmada Control Authority must devise a time-

¹²⁹ *B.D. Sharma v. Union of India*, 1992 Supp (3) 93.

¹³⁰ *Id.*, at 94.

¹³¹ *Id.*, at 38-39

¹³² *J.R. Parashar, Advocate & Others. v. Prashant Bhushan, Advocate & Others.*, AIR 2001 SC 3395.

bound strategy for future construction, relief, and rehabilitation. Each state must implement this action plan. The Review Committee will resolve any disagreements. Further, each state should implement the Narmada Control Authority's directives for land acquisition for relief and rehabilitation. Grievances The Redressal Authorities may direct the states to properly execute relief and rehabilitation programs. Non-compliance with its directives may result in recourse to the Review Committee.

The leaders of Narmada Bachao Andolan were unhappy with the decision of the court. They held a demonstration outside the Supreme Court. A contempt petition was filed against two Narmada Bachao Andolan activists namely Medha Patkar and Arundhati Roy and Prashant Bhushan, a senior counsel for the Narmada Bachao Andolan.¹⁴⁸ It was alleged in the petition that on 30th December 2000 leaders of Narmada Bachao Andolan gathered a huge crowd outside the Supreme Court and held a dharna. It was alleged that they shouted slogans against the Apex Court. These slogans were abusive and alleged that the court lacked integrity and dishonesty. It was alleged in the petition that respondents attacked the protesting petitioners. The three respondents were notified. All respondents filed separate affidavits in response to the notifications. The contempt motion was found to be flawed at the hearing. The court stated that as the respondent has shown no repentance, regret, or sorrow, no leniency should be shown. Because of this, we believe that the respondent should be sentenced to symbolic jail (for one day) and fined Rs. 2000.¹³³

Even after a lapse of so much time, many people did not get adequate relief and rehabilitation. They were left with no option but to knock at the door of the Supreme Court.¹³⁴ Is the case related to rehabilitation criteria and the number of people not rehabilitated? Although the grievance redressal Authority had been set up in Gujarat Madhya Pradesh and Maharashtra, the court observed that many people were not rehabilitated. It was also held that the eligibility criterion for rehabilitation was flawed.¹³⁵

¹³³ *In Re: Arundhati Roy*, AIR 2002 SC 1375 at 1396.

¹³⁴ *Narmada Bachao Andolan v. Union of India*, AIR 2005 SC 2994.

¹³⁵ Ramaswamy R. Iyer (ed.), *Water and the Laws in India* 87 (Sage Publications, New Delhi, 2012).

4.3.3. Ravi-Beas Waters Dispute

The seeds of the dispute on the sharing of waters of Ravi and Beas, two rivers of north India were sown at the time of partition of the country. After partition, the sharing of water of rivers Indus, Sutlej Beas, Ravi, Chenab, and Jhelum was a bone of contention between Pakistan and India. The Indus Water Treaty, signed in 1960, allowed unrestricted use of three western rivers to Pakistan and water of three eastern rivers – Beas, Sutlej, and Ravi to India. Their water was to be shared between Jammu and Kashmir, Delhi, and Punjab. The newly formed state of Haryana was deemed eligible to receive a portion of Punjab's river waters following its reorganization in 1966. The sharing of surplus Ravi-Beas River waters created a dispute between Punjab and Haryana.

In 1969, Haryana approached the Union Government to solve the dispute. The Central Government appointed a committee that recommended the distribution of surplus water. Punjab was allocated 3.26 million acre-feet (MAF), Haryana 3.78 MAF, and Delhi 0.20 MAF. Accordingly, a notification allocating the surplus Ravi- Beas waters was issued on 24 March 1976 which specified that 3.5 MAF had been allotted to the Haryana. Since Haryana is not a riparian State, it was proposed that the Sutlej Yamuna Link (SYL) Canal be constructed so that the water allocated to it could be utilized. The proposed canal was 214 km long; 122 km in Punjab and 92 km in Haryana.

On 23rd April 1976, the Chief Minister of Haryana wrote a letter requesting the Prime Minister of India that the construction of SYL be completed by June 1978. Notifications were issued by the State of Punjab for acquiring the land for the construction of the canal but its construction was delayed due to different reasons. Aggrieved by the dilatory tactics of the state of Punjab, Haryana filed a suit in 1979 in the Apex Court. Meanwhile, by June 1980, Haryana completed the construction of the canal in its territory.

Punjab also filed a suit challenging the validity of the 24th of March, 1976 Order of the Government of India. While the suits were pending in the Supreme Court, on 31st of December, 1981, the Chief Ministers of Punjab, Haryana, and Rajasthan in the presence of the Prime Minister of India agreed. This agreement allocated the net surplus of 17.17 MAF Ravi-Beas waters as follows: 3.50 MAF for Haryana, 4.22

MAF to Punjab, 0.20 MAF for Delhi Water Supply, 8.60 MAF Rajasthan, and 0.65 MAF for Jammu and Kashmir. The suits were withdrawn by both states in 1982 and Punjab released a white paper on the 23rd of April, 1982, appreciating the agreement of December 1981. Though Punjab started the construction of the canal, the pace of the work was rather slow.

On 24th of July, 1985, an agreement called the 'Rajiv-Longowal Accord' was arrived at between the then Prime Minister of India and the then President of Akali Dal. This agreement expressly provided for the continuance of the construction of the SYL Canal which was scheduled to be completed by the 15th of August, 1986. The agreement provided that all issues regarding the share, usage, and allocation of the Ravi- Beas waters would be adjudicated by a Tribunal. Accordingly, a water tribunal - The Eradi tribunal headed by Supreme Court, Justice V Balakrishna Eradi¹³⁶, was constituted vide Notification issued on 2nd April 1986, and the matter was referred to it. The Report of the Eradi Tribunal was submitted to the Central Government on the 30th of January, 1987. It was recommended to increase the share of Punjab to 5 MAF and the share of Haryana to 3.83 MAF. The tribunal opined that the remaining portion of the canal should be completed in Punjab as soon as possible. As Punjab was under the clouds of militancy and many Akali leaders were opposed to the decision of the Tribunal, it could not be notified.¹³⁷ By 1990, 90 percent of the canal work was completed amidst opposition and periodic incidents of violence. The killing of thirty labourers working at the project site and the subsequent killing of a Chief Engineer and his assistant by militants, who wanted to register their protest the construction of the canal, compelled the government of Punjab to stop work. Due to the non-completion of the canal in Punjab territory, the State of Haryana has not been able to utilize the water allocated to it.

This compelled the Haryana State to seek the intervention of the Union Government. A meeting was convened by the Prime Minister of India on 20 February 1991 wherein the Border Roads Organization was directed to takeover the work and construct the remaining portion of the canal at the earliest. In July 1995, the State of Punjab

¹³⁶ Navjeevan Gopal, "Simply Put: Decades on, why SYL canal remains a bridge too far for Punjab, Haryana" The Indian Express, March 14, 2016 available at <http://indianexpress.com/article/explained/decades-on-why-syl-canal-remains-a-bridge-too-far-for-punjab-haryana/> (last visited on 12 July 2022).

¹³⁷ *Ibid.*

expressed in unequivocal terms its intention not to complete the construction of the Canal and advised that water should be delivered through the Bhakra Canal System. Since this alternative measure was completely unworkable, the Haryana State filed a suit before the Supreme Court praying among other things for the grant of mandatory injunction compelling the State of Punjab to discharge its obligations and and complete the remaining portion of the SYL in its territory.¹³⁸

The Court observed that the State Governments, having reached an accord among themselves with the involvement of the Prime Minister of the country, resulting in the withdrawal of outstanding lawsuits before the Court, cannot be authorized to take a position counter to those accords. In our opinion, it was the solemn responsibility of the Central Government to ensure compliance with the conditions of the agreement. Apart from that, more than 700 billion rupees in public funds cannot be flushed down the drain, as the entire portion of the canal within the territory of Haryana has already been completed and most of the canal within the territory of Punjab has also been excavated and partially completed leaving only minor patches.¹³⁹

Rejecting the Punjab State's view that if the canal is completed, Haryana would draw water above what has been allocated to it, the court held that using a mandatory injunction, we thus order the defendant-State of Punjab to continue digging the segment of the SYL canal that has not yet been finished and to make it operational within one year of today. We also direct the Government of India to carry out its constitutional duty concerning the digging of the canal, and if within a year the SYL Canal is not dug by the defendant-State of Punjab, then the Union Government should get it dug through its agencies as quickly as possible so that the enormous amount of money that has already been spent and that would be spent in the future is not wasted.¹⁴⁰

The court gave a word of caution to the State of Haryana and observed that the direction to dig the SYL Canal should not interpreted as a licence to permit them to draw water more than the water that has already been allotted. If the tribunal, which is still considering the case of re-allotment of the water, grants the State of Haryana any

¹³⁸ *State of Haryana v. State of Punjab*, AIR 2002 SC 685.

¹³⁹ *Id.*, at 707.

¹⁴⁰ *Id.*, at 707-708.

excess water, it may also consider issuing appropriate directions as to how much of the water could be drawn through the SYL Canal.¹⁴¹

Punjab failed to comply with the decree of the Court and instead filed a review application on 8th January 2002. On 5th March 2002, the review petition was dismissed by the Supreme Court. A writ petition was filed on 22nd March 2002 by Bharatiya Kisan Union,¹⁴² an organization of agriculturists from Punjab alleging a violation of human rights but on 10th February 2004, it was also dismissed by the Court. The issue of surplus water availability in the Ravi and Beas Rivers for allocation to the States of Punjab and Haryana was also raised in this writ petition.

State of Haryana filed an application for implementation of the decree of 15th January 2002¹⁴³ in the Apex Court on 18th December 2002. The state of Punjab filed a suit 13th January 2003 praying the court among other things discharge it from the obligation to construct the SYL Canal and declare that the decree of 15.01.2002 was not binding, stating that only a Constitution Bench should have decided the issues raised in the earlier suit. This was followed by the Haryana filing a petition for rejection of the plaint and opposition by Punjab to this application.

Haryana sought to amend the application for enforcement of the decree. The State of Punjab filed a counter affidavit. Thereafter, Haryana filed a second appeal praying that the Central government may be directed to carry out its obligation of construction of the canal as the year fixed by the decree had expired. On 17 December 2003, this application of Haryana resulted in the dismissal of the earlier applications because they were infructuous. The court observed that the decreed deadline for Punjab to complete the canal had expired in January 2003. The Union of India stated that a contingency action plan was developed during this period. The contingency has happened, but we are unaware of whether the contingency plan has been implemented. Cabinet Committee on Project Appraisals had approved the proposal for the Border Roads Organisation (BRO) to complete the SYL canal and the then-Prime Minister had directed the BRO to complete the SYL Canal in the shortest time

¹⁴¹ *Id.*, at 708.

¹⁴² W.P. No.94 of 2004.

¹⁴³ *State of Haryana v. State of Punjab* (2004)12 SCC 673.

possible at a meeting held on 20 February 1991, the BRO is currently unavailable for the task.¹⁴⁴

The Government of India was directed to implement the proposed action plan in a specified time and manner:

- (1) Within one month following the judgment, the Union of India would send a central agency to take over the canal operations from Punjab.
- (2) The State of Punjab is required to hand over the works to the Central Agency within two weeks.
- (3) A committee comprising members from the states of Haryana and Punjab should be established within four weeks of the date of the order to coordinate prompt implementation.
- (4) This committee shall define the timeframe within which the Central Agency must execute the remaining work.
- (5) The Central and the State Governments have been ordered to provide appropriate protection for the Central Agency's personnel.

Punjab Legislative Assembly passed in July 2004 the Punjab Termination of Agreements Act which scrapped the water sharing accords with all other states¹⁴⁵. It jeopardized the construction of the SYL canal as well. However, a five-judge Constitution Bench of the Supreme Court led by Justice Anil R. Dave held that the said Act is *ultra vires* to the Constitution of India and under the provisions of the said Act, the State of Punjab cannot terminate the Agreement dated 31st December 1981 and nullify its earlier decisions. Accordingly, the Supreme Court under the President's Advice declared this Act unconstitutional in 2016.¹⁴⁶

In response, the Punjab Assembly passed another Act that provides for de-notification of the land acquired for the construction of the SYL Canal and returning the same to

¹⁴⁴ “State of Haryana v. State of Punjab – Judgment Text”, available at: <https://indiankanoon.org/doc/291736/> (last visited on 22 May 2022).

¹⁴⁵ “Sutlej-Yamuna Canal: Punjab Act Terminating Water Sharing With Other States Unconstitutional: SC” available at <http://www.livelaw.in/sutlej-yamuna-canal-punjab-act-terminating-water-sharing-with-other-states-unconstitutional-sc/> (last visited on 22 May 2022).

¹⁴⁶ The Constitution of India, art. 143.

its original owners.¹⁴⁷ The Act states that “no lawsuit can be filed against the state or any person for any act committed in good faith.”¹⁴⁸ The state government has also barred the civil courts from hearing any case related to this act.¹⁴⁹ The Act is kept outside of the jurisdiction of Civil Courts.¹⁵⁰ The Supreme Court has directed the States of Punjab and Haryana to maintain the status quo in the SYL canal dispute and in a recent hearing, the Government of India has offered to both Punjab and Haryana to act as a mediator.

4.3.4. Other Major River Water Disputes

4.3.4.1 Krishna Water Dispute

Krishna, an 870-mile-long river, originates in the Western Ghats near Mahabaleshwar and flows through Maharashtra, Karnataka, and Andhra Pradesh. It has a catchment area of about one lakh sq. miles. Disputes have been rising for many centuries regarding the sharing of its waters among the riparian states. Krishna Canal System was formed in 1855 to use its water for irrigation but after the reorganization of the states in 1956, its water was reallocated among the riparian states by the Central Water and Power Commission. This new scheme was not acceptable to the states and they could not reach an agreement at the Inter-State Conference held in 1960 for this purpose.

The first Krishna Water Disputes Tribunal (KWDT) also known as Bachawat Tribunal was setup under ‘The Act,’ on 10th April, 1969 to decide upon the water dispute that had arisen among the states sharing its water and its river valley. The Tribunal allocated water in favour of three riparian states Maharashtra, Karnataka, and Andhra Pradesh 560 TMC, 700TMC, and 800 TMC respectively. Andhra Pradesh, as the river's final riparian partner, was granted permission to utilize the river's leftover water, but it would acquire no legal claim to the additional quantity.

The first KWDT gave its Report with a decision in December 1973 and a further Report in May 1976. The decision of the first tribunal was published on 31 May 1976.

¹⁴⁷ Punjab Sutlej Yamuna Link Canal Land (Transfer of Property Rights) Act, 2016.

¹⁴⁸ *Id.*, s. 6.

¹⁴⁹ *Id.*, s. 7.

¹⁵⁰ *Ibid.*

It allocated water to the three riparian States, Andhra Pradesh, Maharashtra, and Karnataka with a rider to review it only after May 31, 2000.¹⁵¹

When Karnataka wished to raise the height of Almatti Dam which Andhra Pradesh protested. The Union Government tried to resolve the dispute by arbitration through a Committee of Chief Ministers from the States outside the basin. The state of Karnataka filed a suit making the Union of India, Andhra Pradesh, and the State of Maharashtra a party.¹⁵² The Supreme Court held that the decision of the Tribunal under section 5(2) of ‘The Act’ was final.¹⁵³ The petitioner had also challenged the proposal to raise the height of the dam at Almatti. Upholding the construction of a dam at Almatti, the court observed that the State of Karnataka should be permitted to construct the dam up to a height of 519.6 meters, and the KWDT should examine the possibility of extending its height to 524.256 meters. Though it may be advantageous for all states to be aware of the activities of other states, the law does not require that a state get the approval of other riparian states before utilizing its water resources in the event of an interstate river.¹⁵⁴

While examining the plaint, the court cited a lack of material that could form the basis for concluding that the construction of the Dam in Karnataka would have an adverse effect or was likely to harm Andhra Pradesh. The court thus observed the complaint and grievance of the plaintiff State are more speculative than genuine, and no evidence has been presented to enable the court to conclusively decide on the issue of the alleged harmful effect on Andhra Pradesh due to the construction of the Dam.¹⁵⁵

Refusing to grant permanent injunction as sought by the petitioner state, the court held that: *“The Court cannot grant the relief of permanent mandatory injunction, so far as construction of the Dam at Almatti is concerned ... we make it clear that there is no bar for raising the height of the Dam at Almatti upto 519.6 meters subject to getting clearance from the Appropriate Authority of the Central Government and any other Statutory Authority, required under law. The question of raising the height to 524.256*

¹⁵¹ “Krishna Water Dispute Tribunal” available at <http://wrmin.nic.in/forms/list.aspx?lid=371> (last visited on 22 May 2022)

¹⁵² *State of Andhra Pradesh v. State of Karnataka*, AIR 2000 SC1585.

¹⁵³ *Id.*, at 1599.

¹⁵⁴ *Id.*, at 1634.

¹⁵⁵ *Id.*, at 1632.

*meters at Almatti could be appropriately gone into by a Tribunal, to be appointed by the Central Government, on being approached by any of the three riparians.”*¹⁵⁶

Due to the passage of time and the availability of contemporary technologies, the tribunal was directed to examine the allocation of water in the Krishna River Basin when the need arose, without being affected by the opinions of the former tribunal.¹⁵⁷

The state of Karnataka wrote a letter to the Secretary, Government of India on September 25, 2002, complaining that the State of Andhra Pradesh had been not only using the surplus waters but was also refusing to share these surplus waters.¹⁵⁸

On November 27, 2002, the Government of Maharashtra complained to the Government of India stating that Andhra Pradesh had been drawing water over its share and Karnataka had constructed Hippargi Barrage and Bhima Barrage without its consent.¹⁵⁹

On the requests of the Governments of Andhra Pradesh, Karnataka, and Maharashtra, the Government of India set up a second KWDT on April 2, 2004, with Justice Brijesh Kumar as Chairman and Justice D.K. Seth and Justice S.P. Srivastava as members. The Tribunal noted that before addressing the questions posed for judgment in these proceedings, it would like to underline one of the key criteria in the settlement of such conflicts, i.e., the cooperation and good faith of the involved riparian States.¹⁶⁰

The second KWDT passed an order on June 9, 2006, turning down the request of partner States to give Interim Relief. After examining 29 issues the second KWDT gave its report on December 30, 2010. As Andhra Pradesh filed a suit before the Supreme Court and also submitted references along with Karnataka and Maharashtra and before the second KWDT, the publication of the decision was stayed till further directions.

¹⁵⁶ *Id.*, at 1634

¹⁵⁷ *Id.*, at 1655.

¹⁵⁸ Krishna Water Disputes Tribunal, “The Report of the Krishna Water Disputes Tribunal with the Decision”, vol. 1, 136, (December 2010), available at <http://wrmin.nic.in/writereaddata/Inter-tateWaterDisputes/KWDTReport9718468760.pdf> (last visited on 28 May 2022).

¹⁵⁹ *Id.*, at 138-139.

¹⁶⁰ *Id.*, at 160.

The second KWDT examined the references and submitted a report modifying its earlier award on November 29, 2013. The water share of Karnataka was reduced and the same was added to the share of Andhra Pradesh. Dissatisfied with the modified decision, Andhra Pradesh filed another special leave petition in the Supreme Court on January 16, 2014. Recently the State of Telangana has been carved out which becomes the Krishna River basin's fourth riparian state. The term of the second KWDT was extended for two years w.e.f. August 1, 2014, for making project-wise specific allocation as per terms of references stated in *Andhra Pradesh Reorganization Bill, 2014*.

As Telangana was not a party to the earlier two KWDT, it wants the tribunal proceedings to start afresh. This demand is being opposed by the States of Karnataka and Maharashtra on the ground that the Term of KWDT has been extended only for adjudicating the dispute between Telangana and Andhra Pradesh. In the meantime, the Supreme Court in 2011 has stayed the publication of the KWDT decisions pronounced in December 2010 and thus, it cannot be implemented. Karnataka has approached the Supreme Court to vacate the stay orders on publication of KDWT decision.¹⁶¹

4.3.4.2. Godavari Water Dispute

River Godavari originates in the Sahayadri hill in Nasik District of Maharashtra and is about 1465 Km long river of Peninsular India. It flows through the States of Maharashtra, Chhattisgarh, Odisha, Madhya Pradesh, Karnataka, Andhra Pradesh, and Telangana before emptying into the Bay of Bengal. On April 10, 1969, the Government of India constituted the Godavari Water Disputes Tribunal (GWDT) to adjudicate the issues related to the use of Godavari River waters. The GWDT was headed by Shri RS Bachawat as its chairman and Sri DM Sen and Shri DM Bhandari were its members. As the irrigation projects were at stake, the states of the Krishna River basin pressed for a quicker verdict. This caused a delay in the proceedings of the Godavari Water Disputes Tribunal which could be started only after the Krishna Water Dispute Tribunal delivered a final verdict on 27 May 1976.

¹⁶¹ Krishna Water Disputes Tribunal, "The Further Report of The Krishna Water Disputes Tribunal in the matter of Water Disputes regarding the Inter- State River Krishna and The River Valley Thereof," 458, (2012) available at <https://irrigationap.cgg.gov.in/img/tribunaryDisputes/KWDT-II%20Further%20Report.pdf> (last visited on 22 May 2022).

While the proceedings in GWDT were being carried on in 1975, several Inter-State water-sharing accords were signed between the partner States. Several bilateral and tripartite agreements relating to the number of irrigation projects were also signed during 1978-79. Taking cognizance of such agreements, GWDT included these agreements in its final award at the request of the parties. The main features of the award are as under:

1. Krishna water that will be diverted will be shared. Andhra Pradesh will divert 45 TMC of water, while Karnataka and Maharashtra will divert 35 TMC.
2. The states of Andhra Pradesh, Maharashtra, and Madhya Pradesh shall jointly implement the Inchampalli Multipurpose Project. These states will split the storage, energy, and benefits costs. This project will be executed under the directions of the Inter-State Control Board, comprising representatives from the three partner states.
3. The award may be modified, revised, or amended by understanding between the partners or by parliamentary legislation.¹⁶²

The award was given by the GWDT on November 11, 1979. After clarification on a few aspects sought by Govt. of India, the further award was delivered by the Tribunal on July 7, 1980. Andhra Pradesh filed a suit in the Supreme Court claiming that Maharashtra is constructing an illegal Babhali barrage contrary to the award within the reservoir bridge of Pochampad dam. It was also alleged that Maharashtra plans to utilize the Pochampad dam water by invading the reservoir, thus depriving Andhra Pradesh of water for drinking and irrigation.¹⁶³ Maharashtra stated that an agreement between the states of Maharashtra and Andhra Pradesh, entered on 06.10.1975, allowed it to utilize 60 TMC waters not for new projects. Maharashtra further contended that there is no restriction on any projects or their sites in its territory. After going through the Award of the GWDT and agreements between the states, the Supreme Court concluded that the use of 60 TMCs of water by Maharashtra for the new projects on the Godavari is not limited to the waters flowing exclusively inside the state of Maharashtra. So, the court constituted a Supervisory Committee, with a

¹⁶² Ministry of Water Resources, "List of Inter-State Water Disputes," available at: <http://wrmin.nic.in/forms/list.aspx?lid=385> (last visited on 22 May 2022).

¹⁶³ *State of Andhra Pradesh v. State of Maharashtra & Others.*, Original Suit No. 1 of 2006, available at <http://judis.nic.in/supremecourt/imgs1.aspx?filename=40106> (last visited on 22 May 2022).

representative from the Central Water Commission as Chairman, and one representative each from the states of Andhra Pradesh and Maharashtra as members, and stipulated the powers and functions of this committee.¹⁶⁴

Recently the Chief Ministers of Telangana and Maharashtra have signed a memorandum of understanding on setting up an Inter-state Water Board on Godavari projects which will help the two States to amicably utilize the waters of the Godavari River and its tributaries.¹⁶⁵

4.3.4.3. Tungbhadra River Dispute

Tungbhadra is a tributary of the river Krishna, formed by the merger of the Tunga and Bhadra rivers in the Western Ghats¹⁶⁶. Tungabhadra joins Krishna beyond Kurnool. Flowing through Andhra Pradesh and Karnataka, it has a drainage area of 27,574 sq. miles. The governments of the then states of Hyderabad and Madras signed an agreement on November 7, 1938, for the sharing of the waters of the Tungbhadra River. Another agreement which superseded the agreement of 1938, was signed in June 1944.¹⁶⁷ To supplement the agreement of 1944, another agreement was signed between the Governments of Hyderabad, Madras, Mysore, and the Government of India in December 1945. The sharing of water went on smoothly until 1956 when the trouble started because of the following two reasons:

1. Since Tungbhadra was a tributary of River Krishna, it should be treated as a 'unit' for inter-state dispute;
2. The boundaries of the states have drastically changed after the reorganization of states.

The validity of the agreements signed on the sharing of the waters of Tungbhadra before Independence and the impact of the Indian Independence Act, of 1947 on these agreements were raised before the Krishna Waters Dispute Tribunal. The states of Andhra Pradesh and Mysore requested the Tribunal to decide on the utilization and

¹⁶⁴ *Ibid.*

¹⁶⁵ B. Chandrashekhar, "Telangana, Maharashtra CMs Ink Pact on Godavari Water Projects", *The Hindu*, (March 08, 2016) available at: www.thehindu.com/news/national/telangana-maharashtra-cms-ink-pact-on-godavari-water-projects/article8327039.ece (last visited on 28 May 2021).

¹⁶⁶ S.N. Jain, Alice Jacob, et. al., *Inter-State Water Disputes in India*, 49 (N.M. Tripathi Pvt Ltd, under the auspices of The Indian Law Institute, New Delhi, 1971),

¹⁶⁷ B.R. Chauhan, *Settlement of International and Inter-State Water Disputes in India* 310 (Indian Law Institute, N.M. Tripathi, Bombay, 1992).

distribution of the entire Krishna River including its tributary- Tungbhadra. The Tribunal acceded to this request and the case became a part of the issue before KWDT.

4.4.4.4 Palar River Water Dispute

Palar River, originating in the Kolar district of Karnataka, falls into the Bay of Bengal after flowing through Andhra Pradesh. An agreement was signed between the states of Madras and Mysore on February 18, 1892, stating that a new irrigation reservoir that would result in the diversion of water from any river could be constructed by Mysore only with the prior consent of Madras. In 1902, Mysore sought the consent of Madras to increase the capacity of the Bethamangalam tank on the assurance that the water of the tank would be used for domestic purposes and the manufacture of Kolar goldfields. It also undertook not to increase the yearly draw-off without reference to Madras. The waters of the Palar River fell drastically in 1927 in Madras. The latter suspected that Mysore had constructed an additional irrigation reservoir. The refusal by Mysore to provide any data increased the mistrust. The state of Madras approached the Central Government and requested to constitute a council under Article 263 of the Constitution. Joint Investigations were conducted and it was concluded that Mysore had not breached any agreement.¹⁶⁸

4.3.4.5. Musakhand Dam Project

Karamanasa River rises in Bihar and runs through Uttar Pradesh. The basin area of this river is 1474 sq. km. out of which about 1050 sq. km. is in Uttar Pradesh. When the state of Uttar Pradesh expressed intent to construct the Musakhand dam, the Government of Uttar Pradesh was asked by the Central Water and Power Commission to obtain consent from Bihar. Disagreement arose on the sharing of water and the cost of construction of the dam. Since the states were unable to solve the dispute, the Union Ministry of Irrigation and Power was approached in 1965.¹⁶⁹ This resulted in an agreement acceptable to both the states.

4.3.4.6. Bajaj Sagar Dam Project

Mahi River rises in Madhya Pradesh, passes through Rajasthan and Gujarat, and falls into the Gulf of Cambay. Three projects were planned on this river. However, there was disagreement between the parties regarding the sharing of cost and water. The

¹⁶⁸ *Supra* note 166, at 52.

¹⁶⁹ *Supra* note 166, at 54.

Ministry of Irrigation and Power, Govt. of India negotiated with the states and an agreement was reached between Gujarat and Rajasthan on January 10, 1966. Later, a supplemental Agreement was also concluded between these states on 29 May 1975 for the smooth acquisition of land, rehabilitation of the displaced person, and awarding proper compensation.¹⁷⁰

4.4. Groundwater

The intensification of groundwater use was driven by the concurrence of three factors: the first was the invention of the turbine pump, which allowed the extraction of water from a well of half a meter in diameter if the geology was suitable. The second factor was the substantial advance in water well drilling technology as a by-product of oil well technology. The third factor was increased underground hydrological science, or hydrogeology, now considered a solid science respected by almost everyone. A legal case frequently quoted refers to a lawsuit in the late nineteenth century. The judge in his ruling stated that the subject of groundwater is so complex that a cause-and-effect relationship between groundwater abstraction and its alleged impacts could not be established. Interestingly, a century later, in the same court, in a similar case – although not with the same judge – the sentence commented how hydrogeological science had allowed to establish a relationship between cause and effect and therefore to give a court ruling based on scientific evidence.

Three major reasons contributed to the increase in groundwater use, a) firstly the development of the turbine/submersible pumps, which enabled groundwater extraction from a large-diameter well with acceptable geology; b) secondly significant advancement in water well drilling techniques that occurred as a result of the advancement in oil well technology; and c) the advancement of subsurface hydrological science, or hydrogeology, which is now widely recognised as a sound science. An often-cited legal case concerns litigation from the late eighteenth century. The court concluded in its judgment that the issue of groundwater is so complicated that a causal link between groundwater extraction and its alleged adverse effects cannot be established. But fortunately, a century later, in a similar case, in the same court, though not with the same judge, the adjudication stated that hydrogeological research has enabled the establishment of this causal link and therefore, enabled the

¹⁷⁰ *Supra* note 166, at 110-112.

court to decide on the basis of scientific evidence. The Constitution has very clearly demarcated the spheres of legislation by the state legislatures and the parliament. But these lists are not exhaustive in the entries relating to water. Many aspects like groundwater have been left out. So, the Courts have applied the principles of common law while deciding many cases.

In Karathigundi Keshava Bhatta v. Sunnanguli Krishna Bhatta,¹⁷¹ the Court held that the general rule is that the owner of land has a natural right to all the water that percolates or flows in undefined channels within his land. Even if his object in digging a well or a pond is to cause damage to his neighbour by abstracting water from his field or land, it does not in the least matter because it is the act and not the motive which must be regarded. No action lies for the obstruction or diversion of percolating water even if the result of such abstraction is to diminish or take away the water from a neighbouring well in an adjoining land.¹⁷²

In the Groundwater case¹⁷³ *M.C. Mehta*, Advocate brought to the notice of the Court news item that appeared in the March 20, 1996 edition of Indian Express, titled “*Falling Groundwater Level Threatens City*”. It was argued that the Central Government did not wish to assume responsibility for controlling the groundwater extraction due to the Board's weak organizational presence throughout the country and groundwater being the responsibility of the State Government. However, the court was of the view that it was unnecessary to discuss this issue as the Environment (Protection) Act is an Act made by Parliament under Entry 13 List I read with Article 253 of the Constitution of India and has an overriding effect.¹⁷⁴ This observation of the court did not solve the long-standing issue of whether groundwater is covered under List I or List II of the Constitution. After hearing the parties, the court concluded that the primary reason for groundwater depletion in the country was increased and unregulated pumping of water. Taking a serious note of the falling groundwater levels in certain areas of Delhi, the court directed the Union Government to constitute the ‘*Central Groundwater Board as an Authority*’ under Section 3(3) of the Environment (Protection) Act having the power to resort to penal sanctions as per Sections 15 to 21 of the said Act, if the need so arose. The major objective of the

¹⁷¹ AIR 1946 Mad 334

¹⁷² *Id.*, at 335

¹⁷³ *M.C. Mehta v. Union of India*, (1997)11 SCC 312.

¹⁷⁴ *Id.*, at 326

constitution of the Central Ground Water Authority was to regulate the indiscriminate boring and groundwater extraction in the country.¹⁷⁵ Groundwater is a shared resource and it is, thus, necessary to include it in the resources like surface water that are already protected under the Public Trust Doctrine.¹⁷⁶

It was also held that the State has to protect it against undue over-exploitation.¹⁷⁷ The Andhra High Court was also of the opinion that under the Public Trust Doctrine, the deep underground water is the property of the State. The holder of the land has an easement right to draw water by tubewells. His action cannot harm his neighbours and if it does so, it would violate Article 21 of the Constitution.¹⁷⁸

The need to bring groundwater under the scope of public trust has been impressed in the *State of West Bengal v. Kesoram Industries*¹⁷⁹ wherein the court observed that some rights can be granted by holders of same or higher rights and some only by the State. Even the State, having regard to the doctrine of 'public trust', may not have any power to grant any right about certain matters, e.g., groundwater. Groundwater belongs to the State in the logic that the public trust doctrine is applicable there as well.¹⁸⁰

In a contradictory approach, the court affirmed the primacy of control of landowners over groundwater.¹⁸¹ In *Venkatagiriappa v. Karnataka Electricity Board, Bangalore, and Others*¹⁸² one of the issues raised was whether a citizen has a right to draw groundwater for drinking, business, or irrigation purposes as a part of the right to life as guaranteed under Article 21 of the Constitution. The Court opined that Article 21 may be construed as conferring the exclusive right to water for drinking only. In India, which is a developing country, no individual can assert absolute ownership over the natural resources by ignoring the demands of other residents. Due to the scarcity of water, its usage must be regulated for the good of society. The court clarified that the right to use groundwater for irrigation and commercial purposes may be a right

¹⁷⁵ *Id.*, at 327.

¹⁷⁶ *M.C.Mehta v. Kamal Nath*, (1997)1 SCC 388.

¹⁷⁷ *Perumatty Gram Panchayat v. State of Kerala*, 2004 (1) KLT 554.

¹⁷⁸ *M.P. Rambabu v. District Forest Officer*, AIR 2002 A.P.

¹⁷⁹ AIR 1946 Mad 334

¹⁸⁰ (2004)10 SCC 207.

¹⁸¹ *Hindustan Coca-Cola Beverages v. Perumatty Gram Panchayat*, 2005(2) KLT 554.

¹⁸² (1994) 4 Kar LJ 482.

granted by Article 300-A or a statutory right provided by the provisions of any law now in effect.

In an amply deliberated case, *Perumatty Gram Panchayat v. State of Kerala*,¹⁸³ the village Panchayat had granted the Coca-Cola Company a license to extract groundwater. It refused the renewal of the license as there was a decline in the groundwater table and degradation of water quality in the region. The Panchayat, citing the emerging severe scarcity of drinking water due to over-exploitation of groundwater by the Company, also ordered the closure of its plant. The company approached the Kerala High Court against the order of the Panchayat. The court was to adjudicate whether a landowner has the right to extract groundwater from his land and if the Panchayat is competent to restrict private people from usage of groundwater. The Single Judge observed that “*even without groundwater regulation, the existing legal position was that groundwater is a public trust and the state must protect it against excessive exploitation.*”¹⁸⁴ The judge also drew a connection between the right to life and the public trust, recognizing that a system that leaves groundwater extraction to the discretion of landowners might have adverse environmental effects. However, a division bench of the same high court overruled this verdict and ordered the *gram* Panchayat to reinstate the permission granted to the company to utilize the groundwater in the region.¹⁸⁵ In the absence of a particular statute forbidding extraction, the Division Bench affirmed landowners' authority over groundwater as paramount. The judgment of the Division Bench stated that “*The industry has the right to receive water ‘without inconveniencing others. The court held that ordinarily, a person has the right to draw water within reasonable limits. There is a need to do balancing of ecological rhythm with the aspirations of the people in the locality and finally, the findings of the single judge might not be practical.*”¹⁸⁶ The ruling of the division Bench overlooked the importance of local self-governing authorities in conserving natural resources. In doing so, the Court infringed the public trust doctrine. Simultaneously, it reduced the obligation of large business houses to be penalized for environmental degradation generated by their commercial activities.

¹⁸³ 2004 (1) KLT 731.

¹⁸⁴ *Ibid.*

¹⁸⁵ *Hindustan Coca-Cola Beverages (P) Ltd v. Perumatty Gram Panchayat*, 2005 (2) KLT 554.

¹⁸⁶ *Ibid.*

Several civil appeals were filed in the Supreme Court challenging this decision of the High Court's division. In the meanwhile, Coca-Cola informed the Supreme Court that it has no plans to reopen and resume operations at its Plachimada facility in Kerala, putting an end to the 12-year-long dispute between the Panchayat and the company. In its final ruling, the Supreme Court did not address the numerous pertinent concerns, thus leaving the legal questions unanswered.

The Plachimada case is one instance of how large companies while carrying out their business activities have shown great laxity over the damage to the environment and local communities.¹⁸⁷ The Kerala state legislature adopted the *Plachimada Coca-Cola Victims' Relief and Compensation Claims Special Tribunal Bill* to adjudicate disputes over compensation to be paid by *Hindustan Coca-Cola Beverages Limited* for damages it caused. However, it was returned without presidential approval and was even deemed unlawful by the central administration based on legislative ineptitude.¹⁸⁸

4.5. Concluding Remarks

For efficient water management, there are several types of regulations, ranging from informal local arrangements to administrative rights established by statute. Modern criteria for evaluating water regulations include whether generated processes are responsible, transparent, and inclusive, and if they deal with water resources in an integrated manner and enable sustainable management of renewable water resources. The conjunctive use of surface and groundwater has played a significant role in addressing national demands for potable water, food security, and reduction of poverty. In certain regions of India, the remarkable development of groundwater over the past three to four decades has precipitated a precipitous decline in groundwater levels. This has created a very challenging situation for the nation, as the regions that provide the majority of national agricultural production and especially marketable surplus are experiencing increasing groundwater stress as withdrawals exceed recharge. Given the limited potential of supply-side interventions in these over-exploited but crucial regions, there is an urgent need to implement demand-side measures to manage groundwater extraction in these areas. Such a requirement has

¹⁸⁷ Gayatri Raghunandan, "Look at the Legal Issues Plachimada's Struggle for Water Against Coca-Cola Has Brought Up" available at <https://thewire.in/> (last visited on 9 Sept. 2022).

¹⁸⁸ *Ibid.*

been recognized for quite some time, notably since 1970, when the Government of India circulated a Model Bill to state governments for this purpose. Though there has been little effect, the process has begun.

The evolution of water laws and jurisprudence have been significantly shaped by the courts in India. The judgments pronounced during the past several years should be seen in the context of the transformation of the water sector and the substantial policy shifts in the country.¹⁸⁹ A basic right to potable drinking water has been established as a result of the court decisions under Article 21 of the Indian Constitution and on pollution of water under the Water Act. To check the menace caused by groundwater pollution, some of the basic principles evolved by the courts for the protection and improvement of the environment, in general, may be of great help. The major initiatives generated by the Courts can be summarised as follows:

- (i) The Principle of Precaution
- (ii) Polluter-Pays principle
- (iii) The Principle of Inter-generational Equity
- (iv) Public Trust Principle
- (v) Absolute Liability Principle

The Apex Court as well as various other Courts have defined and demarcated the contours of the water rights further under different settings. While adjudicating different matters, the historic ‘public trust doctrine’ as well as remarkable principles such as ‘Sustainable Development’ enshrined in environmental law have also been relied upon by the judiciary. The extensive scope of various rulings about water availability and its pollution control, environmental protection, access for all, and determination of the rights of different users, as well as the resolution of inter-state disputes, suggests an awareness about appropriate development paradigms while forming a judicial posture in particular situations.

¹⁸⁹ Philippe Cullet, “Water Sector Reforms and Courts in India: Lessons from the Evolving Case Law” available at <http://www.ielrc.org/content/a1006.pdf> (last visited on 13 May 2021).

CHAPTER-V

GROUNDWATER GOVERNANCE IN PUNJAB, INDIA AND ITS IMPLEMENTATION

5.1. INTRODUCTION

Punjab, the land of five rivers, now has three perennial rivers, namely Ravi, Beas, and Sutlej, the tributaries of the Indus⁸⁵⁰. Another river, Ghaggar, which is a non-perennial river, forms the boundary with Haryana. The State is a flat alluvial plain with a thin belt of mountains along the northeastern border called the *Kandi* belt. These alluvial deposits comprise alternate layers of clays, silt, and sand of varying grades, often mixed with *kankar*. Such sandy zones, which have abundant storage for GW, constitute suitable aquifers. Historically, dug wells fitted with Persian wheels were used for GW extraction just after independence in 1947, and their depths were generally less than ten mbgl⁸⁵¹. The choice of crops was made to balance the demand and supply of irrigation water except during years of deficient rainfall, and thus, the water use was generally sustainable.

Punjab agriculture experienced a significant turning point with the introduction of green revolution technology during the mid-1960s. The critical change was the introduction of input-responsive dwarf varieties of Wheat and rice, along with other initiatives such as the development of rural infrastructure, viz. rural electrification, agricultural markets, link roads, etc., and establishment of institutions for credit, input supply, agricultural research, and extension, etc. The hard-working peasantry, displaced due to partition and eager to rebuild their lives, also played a critical role in the transformation of State Agriculture.

Considerable public investments in surface water irrigation accompanied the expansion of the State's irrigation area. However, the institutionally complex and poorly managed canal system contributed to a rapid expansion of GI at the cost of canal irrigation (Figure 5.1), with more and more farmers realizing that GW could be applied as per crop requirement, something unthinkable in the *warabandi* system. It

⁸⁵⁰ Singh, Inderjeet and Bhangoo, Kesar Singh, 'Irrigation systems in Indian Punjab' Punjabi University, Patiala, September 2013) available at <https://mpr.ub.uni-invenchen.de> visited on 22 December, 2021.

⁸⁵¹ Central Ground Water Board, Govt. of India, "National Compilation on Dynamic Ground Water Resources of India 2024" (December, 2024)

led to a significant increase in dug-cum-bore wells during 1970. These were pumped with low-cost centrifugal pumps⁸⁵² coupled with slow-speed diesel engines and were 20 to 30 m deep. The mechanized pumping enabled the farmers to increase the area under irrigation and to grow crops requiring frequent irrigation.

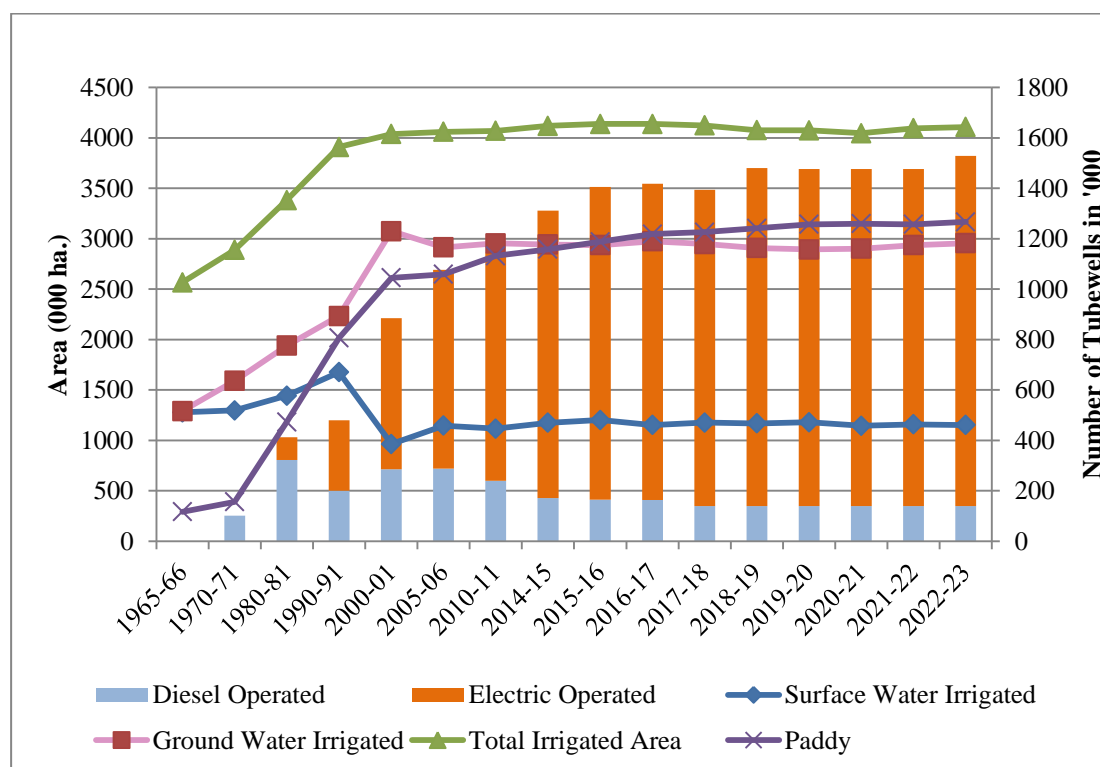


Figure 5.1: Growth of GW use and Area under Paddy in Punjab

Source: Developed from various issues of Statistical Abstract of Punjab

The embracing of rice and wheat crop rotation necessitated the farmers to adopt submersible pumps for GW extraction during the mid-1980s. The availability of institutional credit at low interest facilitated the shift, and the depth of tubewells increased beyond 125 mbgl in many areas. Also, the vertical drainage by pumping helped to tackle the issue of waterlogging and salinity in canal-irrigated and flood-prone areas. The growth of the irrigated area due to the contribution of GW is depicted in Figure 1, which increased from 2.88 million hectares in 1970–71 to 4.11 million hectares during 2022–23 (Table 5.1), mainly due to the increase in GW use for irrigation. The subsidy bill for the free power supply increased to Rs. 9000 crores during 2022-23.

⁸⁵² Inder Jeet, *Groundwater Resources of India: Occurrence, Utilization and Management*, 67-68 (Mittal Publications, New Delhi, 2005)

Table 5.1: Basic Irrigation and Other Statistics for Punjab

| Sr. No | Year | Area Irrigated (000 ha) | | | Cropped Area (000 ha.) | | No. of Tubwells (lakh) | | | Power Subsidy (CroreRs) |
|--------|---------|-------------------------|------|-------|------------------------|-------|------------------------|-------|-------|-------------------------|
| | | SW | GW | Total | Paddy | Wheat | DO. | EO. | Total | |
| 1 | 1965-66 | 1277 | 1290 | 2567 | 293 | 1550 | NA | NA | 0.26 | - |
| 2 | 1970-71 | 1297 | 1591 | 2888 | 390 | 2299 | 1.01 | 0.91 | 1.92 | - |
| 3 | 1980-81 | 1443 | 1939 | 3382 | 1183 | 2812 | 3.22 | 2.8 | 6.02 | - |
| 4 | 1990-91 | 1676 | 2233 | 3909 | 2015 | 3273 | 2.00 | 6.00 | 8.00 | 385.0 |
| 5 | 2000-01 | 964 | 3074 | 4038 | 2612 | 3408 | 2.85 | 7.88 | 10.7 | 1659.0 |
| 6 | 2005-06 | 1146 | 2914 | 4060 | 2647 | 3469 | 2.88 | 9.05 | 11.9 | 1386.0 |
| 7 | 2010-11 | 1116 | 2954 | 4070 | 2830 | 3510 | 2.4 | 11.4 | 13.8 | 2737.0 |
| 8 | 2014-15 | 1175 | 2943 | 4118 | 2895 | 3505 | 1.71 | 12.4 | 14.1 | 4454.0 |
| 9 | 2015-16 | 1201 | 2936 | 4137 | 2970 | 3508 | 1.65 | 12.54 | 14.19 | 4709.9 |
| 10 | 2016-17 | 1152 | 2975 | 4137 | 3046 | 3495 | 1.64 | 12.54 | 14.19 | 5196.7 |
| 11 | 2017-18 | 1176 | 2948 | 4124 | 3065 | 3512 | 1.4 | 13.40 | 14.80 | 5976.8 |
| 12 | 2018-19 | 1169 | 2907 | 4076 | 3103 | 3520 | 1.4 | 13.36 | 14.76 | 6256.0 |
| 13 | 2019-20 | 1180 | 2894 | 4074 | 3142 | 3521 | 1.4 | 13.36 | 14.76 | 6061.0 |
| 14 | 2020-21 | 1144 | 2902 | 4046 | 3149 | 3530 | 1.4 | 13.36 | 14.76 | 7589.0 |
| 15 | 2021-22 | 1159 | 2936 | 4095 | 3143 | 3526 | 1.4 | 13.89 | 15.29 | 6745.0 |
| 16 | 2022-23 | 1153 | 2955 | 4108 | 3167 | 3517 | 1.4 | 13.89 | 15.29 | 9063.8 |

Source: Statistical Abstracts of Punjab's various issues

5.1.1. Factors for the Growth of GI

The GW use has inter-sectoral links and is highly contextual. The main driver of the growth of GW irrigation⁸⁵³ in the private sector development of GI is the inadequacy and unreliability of water supply through the public canal systems to meet the intensifying irrigation needs of new hybrid crop varieties. The low cost of pumping and easy availability of electricity rendered the GW pumping economical. Further, GI offered better control to the farmers over the timing and amount of water supply. The policy support in terms of supply of subsidized and subsequently free power for tubewells, availability of cheap credit, input subsidies on seeds and chemical fertilizers, and open-ended procurement of Wheat and paddy at minimum support price (MSP) encouraged the GI. The establishment of monoculture of rice-wheat

⁸⁵³ Pandey, Rita, "Groundwater Irrigation in Punjab: Some Issues and Way Forward," Working Papers 14/140, (National Institute of Public Finance and Policy. 2014) available at <https://www.nipfp.org.in> visited on 22 December,2022

rotation (Table 5.1) contributed to unregulated GW use and a shift in irrigated areas from maize, cotton, pulses, and oilseed crops to rice cultivation.

5.1.2 Impact of Growth of GI

A favourable policy framework of open-ended procurement and free power for tubewells is leading to the increasing over-extraction of GW and a decline in the water table in the State. The assessment of the GW situation by CGWB during 2024⁸⁵⁴ indicates that the stage of groundwater extraction in the State is **156.87** percent in aggregate (Table 5.2). However, a review of the district-wise situation shows that the level of GW extraction for GI in Zone 2 and adjoining parts of the State, which have GW quality fit for irrigation, is more than 200 percent.

Table 5.2: District-wise Ground Water Scenario (2024)

| S. No. | Name of District | Annual Extractable Groundwater Resource (HaM) | Current Annual Groundwater Extraction (HaM) | Stage of GW Extraction (%) |
|-------------------|------------------|---|---|----------------------------|
| 1 | Sangrur | 63685 | 199485 | 313 |
| 2 | Jalandhar | 74701 | 190146 | 255 |
| 3 | Moga | 76337 | 174545 | 229 |
| 4 | Patiala | 83374 | 178825 | 214 |
| 5 | Kapurthala | 71177 | 151281 | 213 |
| 6 | Barnala | 50959 | 111521 | 219 |
| 7 | Ludhiana | 141104 | 313194 | 222 |
| 8 | Fatehgarh Sahib | 34886 | 72237 | 207 |
| 9 | Tarn Taran | 68586 | 131448 | 192 |
| 10 | Amritsar | 133930 | 237200 | 177 |
| 11 | Mansa | 61812 | 63740 | 103 |
| 12 | Faridkot | 57247 | 70001 | 122 |
| 13 | Ferozpur | 152981 | 169471 | 111 |
| 14 | Gurdaspur | 152577 | 208114 | 136 |
| 15 | Nawanshahar | 49880 | 60771 | 122 |
| 16 | Bathinda | 109006 | 118393 | 109 |
| 17 | S.A.S Nagar | 21790 | 27720 | 127 |
| 18 | Hoshiarpur | 81547 | 94793 | 116 |
| 19 | Ropar | 39540 | 37991 | 96 |
| 20 | Fazilka | 86444 | 53765 | 62 |
| 21 | Pathankot | 43941 | 22584 | 51 |
| 22 | Muktsar | 88448 | 20137 | 23 |
| 23 | Malerkotla | 19426 | 58791 | 303 |
| Total State (BCM) | | 17.63 | 27.66 | 156.87 |

Source: Dynamic Groundwater Resources of India, 2024, available at <https://cgwb.gon.in>

⁸⁵⁴ Central Ground Water Board, Govt. of India, “National Compilation on Dynamic Ground Water Resources of India 2024” (December, 2024)

The depletion of the GW table has increased the farmers' private investment in continuous upgrades of irrigation infrastructure and public investment in power infrastructure to manage its supply to tubewells, and there has been an increase in the State's Power subsidy bill. The power subsidy has increased from Rs. 385 crores in 1990-91 to 9603 crores in 2022-23 (Table 5.1). GI, coupled with a supply of free power for tubewells and an assured and open-ended procurement of paddy at MSP, has contributed to the marginalization of traditional crops, viz. maize, cotton, pulses, oilseeds, etc., and has favoured the emergence of the current rice-wheat cropping pattern, and thus, loss of biodiversity. The area under the rice and wheat cropping system rose from less than 40% of the total cropped area during the late-1960s to more than 84% in 2022-23 (Table 5.1).

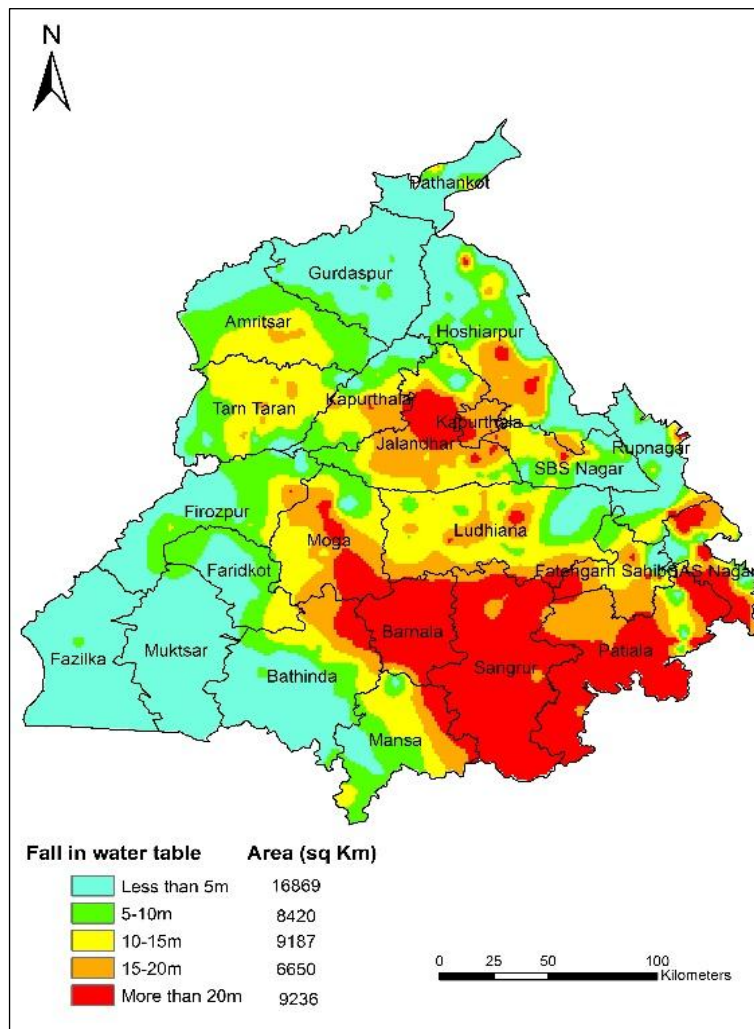


Figure 5.2: The Fall in Pre-Monsoon Water Table in Punjab between 1990 and 2019⁸⁵⁵

⁸⁵⁵ Personal communication from Balwinder Singh Sidhu and based on "Spatio-temporal assessment of groundwater depletion in Punjab, India", *Groundwater for Sustainable Development*, Vol 12, February 2021 <https://doi.org/10.1016/j.gsd.2020.100498>

The development of GI has also negatively affected social equity issues and has benefitted large farmers due to a compulsory shift to capital-intensive modern well-drilling techniques and the adoption of submersible pumping technology. The large farmers have been early GW users because it is a common property resource and is now being used disproportionately due to ownership of deep tubewells with larger pumping capacity. The GI also becomes costlier with the use of tubewells operated by diesel engines/ generators for pumping and farmers with no tubewells entering the water markets. A comparative analysis of the Block-wise GW situation as assessed by CGWB over the years indicates that the percentage of over-exploited (Dark) blocks has been increasing and has touched 75 percent in 2024 from 45 percent in 1984 (Table 5.3).

Table 5.3: Categorization of Blocks based on Ground Water Extraction

| Year | 1984 | | 1999 | | 2011 | | 2020 | | 2024 | |
|-----------------------|------|-------|------|-------|------|-------|------|-------|------|-------|
| | No. | % | No. | % | No. | % | No. | % | No. | % |
| Over Exploited (Dark) | 53 | 44.92 | 73 | 52.90 | 110 | 79.71 | 117 | 78.00 | 115 | 75.16 |
| Critical (Dark) | 07 | 05.93 | 11 | 07.97 | 4 | 2.90 | 06 | 4.00 | 4 | 2.61 |
| Semi-Critical (Grey) | 22 | 18.64 | 16 | 11.59 | 2 | 1.45 | 10 | 6.67 | 12 | 7.84 |
| Safe (White) | 36 | 30.51 | 38 | 27.54 | 22 | 15.94 | 17 | 11.33 | 22 | 14.38 |
| Total | 118 | | 138 | | 138 | | 150 | | 153 | |

Source: Compiled from Dynamic GW resources of India's various issues

5.2 Recent Legislative and Policy Developments

In practically every country of the world, the implementation of GW legislation is still insufficient due to fragmented legislative approaches and weak institutional frameworks. The legal system in India also lacks an explicit provision for water rights. As per the earliest provisions of some of the Acts, the landowner is entitled to GW beneath his property under the "Indian Easement Act 1882"⁸⁵⁶ and the "The Transfer of the Property Act 1882"⁸⁵⁷, and ownership of GW is changed with the change of ownership of land. The British had enacted the "Northern India Canal and

⁸⁵⁶ The Indian Easements Act, 1882 (Act 5 of 1882)

⁸⁵⁷ The Transfer of the Property Act of 1882 (Act 4 of 1882)

Drainage Act, 1873”⁸⁵⁸ to regulate the use of surface water for irrigation, of course, with the sole agenda to increase their revenue collection. After independence, the Punjab government enacted the "The Punjab State Tubewell Act, 1954”⁸⁵⁹ to provide for the construction, improvement, and maintenance of State Tubewell Irrigation Works in the State". The "State Tubewell" means a tubewell controlled by the Government for GW abstraction. The Act provides that the “provisions of the Northern India Canal and Drainage Act, 1873” shall apply to any State Tubewell, except as otherwise provided, as if such State Tubewells were canals within the meaning of the said Act.

Presently, the GW, which is one of the essential natural resources for the State, is being over-exploited by different sectors of the economy. Agriculture is the primary user of GW, so several progressive legal and policy measures have been tried for its management in the State. The State has recently taken the following legal initiatives to check the over-extraction of GW and strengthen its governance.

5.2.2 Change in Crop Calendar

An Ordinance to prohibit the early sowing and transplanting of paddy was issued by the State Government in 2008, and the same was notified as an Act on April 28, 2009, as the "The Punjab Preservation of Sub-soil Water Act 2009". The preamble of the Act⁸⁶⁰ provides "for the prohibition of sowing nursery of paddy and transplanting paddy before the notified dates." It is an attempt to modify the crop calendar for paddy crop, which has a higher water consumption and leads to colossal evapotranspiration losses if sown during the high-temperature period of May and June. The sowing of the nursery and its transplanting⁸⁶¹ before May 10 and before

⁸⁵⁸ Northern India Canal and Drainage Act, 1873 (Act 8 of 1873)

⁸⁵⁹ The Punjab State Tubewell Act, 1954 (Act 21 of 1954) ss 2(c), 4

⁸⁶⁰ The Punjab Preservation of Sub-soil Water Act 2009 (Act No. 6 of 2009), the preamble

⁸⁶¹ *Supra* note 11 s 3

3. (1) No farmer shall sow nursery of paddy before 10th Day of May of the agricultural year or such other date as may be notified by the State Government by notification in the Official Gazette for any local area.

Explanation – For the purpose of this section, “agricultural year” means the year commencing on the 16th day of June or on such other date, as may be appointed by the State Government by notification in the Official Gazette for any local area.

(2) No farmer shall transplant paddy before such date, as may be notified in this regard by the State Government by notification in the Official Gazette.

(3) Notwithstanding anything contained in sub-sections (1) and (2), the provisions of this section, shall not be applicable to-

(a) any research project of the Punjab Agricultural University, Ludhiana;

June 10, respectively, was prohibited by a notification in 2008. It was shifted to June 15 in 2014. However, it is also argued that delayed transplanting has shortened the window of time between rice harvesting and wheat sowing, and the incidents of farmers burning its residue have increased. The particulate matter (PM) generated due to its burning contributes to an increase in respiratory and cardiovascular problems in North India as its dispersal becomes difficult from October onwards due to a fall in temperature and changes in wind direction.

5.2.2 Levy of water cess for Canal Water Use

The Punjab Government promulgated an Ordinance, viz. "The Northern India Canal and Drainage (Amendment) Ordinance, 2014", on November 11, 2014, which empowered the State to levy a cess to develop and maintain irrigation infrastructure. It was later enacted as an Act of a similar name, and it enables the State to impose a water cess on the occupiers of land, who use canal water for irrigation, maintenance, and development of irrigation infrastructure at the rate to be determined by it from time to time and such occupiers, as accept the water, shall pay for water cess accordingly.

5.2.3 Conveyance of irrigation water

The State enacted "The Punjab Land Improvement Schemes (Amendment) Act 2017,"⁸⁶² which incorporates a new Section 14-A in Chapter III of "The Punjab Land Improvement Schemes Act 1963". The latest amendment enables the farmers or the Department of Soil and Water Conservation to lay underground pipelines for the

(b) any other Research Institute, as may be declared by the State Government by notification in the Official Gazette;

(c) any water-logged area, as may be declared by the State Government by notification in the Official Gazette;

⁸⁶² "The Punjab Land Improvement Schemes (Amendment) Act 2017 (Punjab Act No. 25 of 2017) s 14

14-A (1) Where –

(a) the Department intends to lay underground pipeline or repair or renovation, as the case may be, of existing underground pipeline through holding of any other land holders for the purpose of irrigation; or (b) a farmer or a group of farmers intend to lay an underground pipeline or repair or renovation, as the case may be, of existing pipeline through the holding of any other land owner for the purpose of irrigation on his holding or as the case may be, their holdings; and the matter is not settled by mutual agreement, then the District Level Committee may, by order, allow the Department or the farmer or the group of farmers, as the case may be, to lay pipeline or repair or renovation, as the case may be, of existing pipeline, atleast three feet beneath the surface of the land along the demarcated line on payment of such compensation arising out of crop damage or damage to any structure to the land owner. The District Level Committee shall determine the amount of compensation to be paid as per prevalent market prices to the land holder through whose land the pipeline is to be laid or repaired or renovated and its decision shall be binding upon all the parties.

conveyance of irrigation water at a depth of three feet below the surface of other holders by providing the 'Right of Way' for this purpose. The pipeline may be laid as per the approved alignment by paying compensation for damage to crops or any structure. As per section 14 B (1)⁸⁶³, a Committee constituted under the chairmanship of the District's Deputy Commissioner shall decide the amount of compensation based on prevailing market rates.

5.2.4 Law for Management of Water Resources

After decades of ignoring the problem of groundwater overexploitation, Punjab, in 2020, enacted a legislation to regulate the use of its water resources. These are to be managed and controlled under "*the Punjab Water Resources Management and Regulation Act (Punjab Water Act),2020*", which seeks to ensure their sustainable, equitable, and judicious management⁸⁶⁴. It provides for establishing the Punjab Water Resources Authority for water conservation, regulation, and management. Thus, the legislation seems to have adopted an integrated approach by focusing on the totality of water resources and not on groundwater alone.

The Authority can issue directives⁸⁶⁵ and advise the Government⁸⁶⁶ regarding the use of water, as well as its conservation and development. The directions may be regarding:

- i. "fixing the limits on groundwater use;
- ii. groundwater recharge; water conservation, rainwater harvesting and recycling and reuse of water;⁸⁶⁷
- iii. optimum use of water in the household, agriculture, and irrigation sector,⁸⁶⁸

⁸⁶³ 14- B. (1) In every district, there shall be constituted a Committee to be called the District Level Committee for granting compensation, to the Department or the farmer or the group of farmers, as the case may be, consisting of the following, namely:-

- (i) Deputy Commissioner - Chairman
- (ii) Divisional Soil Conservation Officer- Convener
- (iii) District Revenue Officer - Member
- (iv) Executive Engineer, Public Works Department (B&R) - Member
- (v) Divisional Forest Officer - Member

⁸⁶⁴ Punjab Water Resources (Management and Regulation) Act 2020 (Punjab Act No. 2 of 2020) preamble.

⁸⁶⁵ *Supra* note 15 s 15(2).

⁸⁶⁶ *Supra* note 15 s15(7).

⁸⁶⁷ *Supra* note 15 s15(2)(viii) and13(6)(i).

- iv. the installation and maintenance of volumetric measurement instruments for groundwater extraction;
- v. criteria for the operation of existing water extraction units and their registration;
- vi. the demarcation of areas where GW can be used subject to safeguards and conditions;
- vii. the improvement of agricultural water use efficiency and
- viii. the publication of reports to raise public awareness about managing water."

The Authority can issue advisories to the Government regarding the management of water resources, which may mainly be regarding:

- i. "sustainable operation and maintenance of water infrastructure and water delivery systems;
- ii. prevention of the pollution of water resources to check their degradation;
- iii. maximization of the utilization of irrigation potential created;
- iv. propagation, promotion, and the adoption of new water-saving technologies; and
- v. creation of public awareness of water conservation".⁸⁶⁹

The Authority's primary responsibilities are to determine the costs and fixing the water supply and management tariffs. The Authority issues tariff orders for GW usage and surface water supplies. It also has the power to set the fees that water providers can charge for commercial or industrial use.⁸⁷⁰ However, the appropriate government policy must be considered while determining drinking, household, and agricultural water supply rates.⁸⁷¹

The Authority should consider the principles of equity, efficiency, economy, and sustainability as much as possible while deciding the tariff.⁸⁷² The tax should be based on volumetric measurement of water use to ensure its economical and efficient use.

⁸⁶⁸ *Supra* note 15 s15(2)(viii) emphasises for surface water as well: "optimal use of surface water for irrigation, industrial or domestic use"

⁸⁶⁹ *Supra* note 15 s 15(7)(i), 15(7)(iii),15(7)(v),15(7)(vi).

⁸⁷⁰ *Supra* note 15 s 17(1).

⁸⁷¹ *Supra* note 15 s 3(2).

⁸⁷² *Supra* note 15 s 17(4).

Punjab Water Act explicitly states that the socio-economic interests of poorer and disadvantaged sections of society must be considered while fixing tariffs.⁸⁷³

The Punjab Water Authority has been empowered by the Punjab Act to collect groundwater usage charges, which has far-reaching legal repercussions. The Authority can fix groundwater extraction charges for any person with the state government's consent. On the other hand, households that use non-energized methods or pump up to 2 horsepower from a single tubewell in their home for drinking and residential uses are exempt from water tariffs.⁸⁷⁴

As the Act provides, the Punjab authority comprises a chairperson and two other members.⁸⁷⁵ The Government makes the appointments to these posts at the suggestion of the Selection Committee, headed by the State's Chief Secretary.⁸⁷⁶ Suitable supporting staff⁸⁷⁷ is provided to them because of the nature of their duties, and it has a separate fund to support its functioning. Further, some other bodies can also be established under the Punjab Act. A Water Resources Advisory Committee can be constituted, comprising the chairman of the Punjab authority as head and up to five experts as members. This advisory Council must be consulted while making policy decisions and issuing regulatory directions in Punjab.⁸⁷⁸ Even yet, the recommendations of the advisory Committee are not legally binding.⁸⁷⁹ The Advisory Committee also informs the relevant authorities about government programs and initiatives related to water, conservation, development, and management.⁸⁸⁰

The Punjab Act provides for establishing the "Punjab State Council for Water Management and Development" to achieve its goals and objectives. The Chief Minister heads this powerful Council, which includes ministers from all line departments. This Council oversees state policies and programmes to ensure everyone has access to high-quality water at an affordable price.⁸⁸¹ The Council has to ensure

⁸⁷³ *Supra* note 15 s 17(6).

⁸⁷⁴ *Supra* note 15 s 17(5).

⁸⁷⁵ *Supra* note 15 s (2).

⁸⁷⁶ *Supra* note 15 s 5.

⁸⁷⁷ *Supra* note 15 s 8.

⁸⁷⁸ *Supra* note 15 s 12(2).

⁸⁷⁹ *Supra* note 15 s 12(2) proviso.

⁸⁸⁰ *Supra* note 15 s 12(4).

⁸⁸¹ *Supra* note 15 s 13(5).

the judicious and optimal use of water resources⁸⁸², review or refine the Integrated State Water Plan (ISWP) and the Punjab State Water Policy, and compensate consumers for government decisions that may affect them.⁸⁸³

An exclusive feature of the Act is the provision to develop an ISWP and its periodic revision.⁸⁸⁴ The Department of Water Resources is the nodal agency that prepares the ISWP,⁸⁸⁵ and the Authority has to follow this plan for developing, managing, and conserving the water resources of the State.⁸⁸⁶

The Act includes many penalties and sanctions to curb non-compliance, including fines. Inquiry Officers can be appointed to undertake investigations.⁸⁸⁷ In addition, the statute empowers the state government to frame rules and regulations on various topics.⁸⁸⁸

5.2.5 Other Policy Measures

a) Coordinated Groundwater Management

The division of responsibility for GW development for various purposes among many agencies was considered a significant hindrance in its collaborative development and management. A new Directorate of Groundwater Management was created in October 2017, focusing on designing policies, programs, and strategies for the utilization, conservation, and management of GW resources in an equitable, judicious, and sustainable manner.

b) Technical Interventions for Water Conservation

Rice grown during the summer in puddled transplanted conditions is the main culprit for GW depletion, and diversification from rice to less water-exhaustive crops is urgently required. However, such a shift has not been possible due to economic and prevailing policy reasons. As such, the State is implementing multiple agronomic and technical measures to conserve irrigation water. Some of these are (a) promotion of

⁸⁸² *Supra* note 15 s 13(5).

⁸⁸³ *Supra* note 15 s 13(6)(iii).

⁸⁸⁴ *Supra* note 15 s 14(4).

⁸⁸⁵ *Supra* note 15 s 14(1).

⁸⁸⁶ *Supra* note 15 s 15(1).

⁸⁸⁷ *Supra* note 15 s 20 and 21.

⁸⁸⁸ *Supra* note 15 s 35.

Precision Land Levelling, (b) propagation of Short Duration Varieties of Rice, (c) Direct Seeding of Rice, (d) segregation of Power Supply Feeders, and (e) Direct Benefit Transfer of Electricity subsidy. Further, the State Government is also implementing some programs for water conservation by subsidizing the initial capital cost (Table 5). A capital subsidy @ 90% for community underground pipelines and @ 50% to individual farmers is being provided in the canal and tubewell command areas to improve the on-farm water conveyance efficiency. Micro-sprinklers and drip irrigation are being propagated by providing a capital subsidy@ 80% of the cost, particularly for vegetables, orchards, sugarcane, cotton, etc.

During the last ten years (2013-14 to 2023-24), a length of about 3090 km. of underground pipeline systems, benefitting an area of 206621 ha, have been laid, installation of Micro Irrigation Systems for Precision Irrigation in 22052 ha has been completed, 9356 Rainwater Harvesting-cum- Recharge Structures have been constructed in Kandi Area, and 45 projects have been completed for conjunctive use of treated sullage water of Sewage Treatment Plants for irrigation, covering an area of 7202 ha⁸⁸⁹.

5.2.6 Guidelines for Extraction and Conservation of GW

Groundwater is a vital natural resource for Punjab and is extensively used for domestic supplies, industry, commercial enterprises, and sustaining agriculture. The State enacted the "Punjab Water Resources (Regulation and Management) Act, 2020" to manage and regulate its water resources to ensure their judicious, equitable, and sustainable utilization and management. The "Punjab Water Regulation and Development Authority" was established under Section 3 (1) of the above Act to achieve the objectives of the Act. The Authority has prepared the draft "Punjab Guidelines for Groundwater Extraction and Conservation, 2020. These Guidelines aim to promote and ensure water conservation by all persons extracting GW for commercial and industrial use, including institutions, construction, and infrastructure projects other than agriculture, drinking, and domestic use.

⁸⁸⁹ Available at <https://dswcpunjab.gov.in>. (visited on 20-12-2024)

The guidelines aim to achieve sustainable water use by levying GW extraction charges⁸⁹⁰ on a volumetric basis for GW use for commercial and industrial purposes. The objective would be achieved through water conservation measures undertaken by the entity utilizing the groundwater as per permission from the Authority⁸⁹¹. There will be charges for the conveyance of water⁸⁹². Various units shall implement the water conservation measures, which the Authority shall monitor.⁸⁹³ The permission is

⁸⁹⁰ Charges for Groundwater Extraction

For the proposes of the Guidelines, the criterion for Categorisation of the blocks is the same as in the 2017 Assessment Report, but the nomenclature of the category of the blocks has been modified for better management and conservation of groundwater resources as follows:

| Stage of Ground Water Extraction | Category | No. of Blocks |
|----------------------------------|----------|---------------|
| 0-99% | Green | 29 |
| 100-199% | Yellow | 65 |
| 200%andabove | Orange | 44 |

Each Water User shall be permitted to extract groundwater upon payment of the following charges and upon fulfilment of conditions imposed in the permission granted by the Authority, including commitments and liabilities to conserve groundwater.

Groundwater Extraction Charges (Gross)

| | Category of Area* | Quantity Used | | |
|----------------------------------|-------------------|------------------------|---------------------------|-------------------------|
| | | <10m ³ /day | 10-100m ³ /day | >100m ³ /day |
| Charges in Rupees/m ³ | | | | |
| 1 | Orange | 8 | 18 | 22 |
| 2 | Yellow | 6 | 14 | 18 |
| 3 | Green | 4 | 10 | 14 |

⁸⁹¹ Groundwater charges shall be volumetric and shall be based on actual consumption. The initial quantity (up to 10 cubic meters per day) shall be charged at the lowest applicable rate in the Schedule of Charges. Additional quantities extracted during the billing period (month) shall be charged at higher rates. All volumetric charges shall be billed and paid monthly. If the water user extracts a quantity greater than the permitted for two or more consecutive billing periods, then the quantity permitted shall be revised to the highest level of consumption recorded in any of those months. These charges are per and above any charge applicable by any other Government/Local body in the area where the unit is located.

⁸⁹² Groundwater Conveyance Charges -Water Tanker

The Groundwater Conveyance Charges shall be paid by a water tanker conveying, supplying or delivering groundwater for any purpose. These charges shall be irrespective of the groundwater charges, if any, payable by the owner or operator of the water extraction structure. However, a water tanker shall pay no groundwater conveyance charge for drinking water supply in pockets with brackish or saline groundwater at all depths.

Groundwater Conveyance Charges

| S.no | Area | Charges (Rs. /cum) |
|------|-------------|--------------------|
| 1 | Orange Area | 22 |
| 2 | Yellow Area | 18 |
| 3 | Green Area | 14 |

⁸⁹³ WATER CONSERVATION BY UNITS: Each Water User shall be expected to meet their target for water conservation as specified in these Draft Guidelines. If a Water User cannot achieve his target, in part or in its entirety, then the Groundwater Charges paid by him shall be utilised in part to defray the expenses of implementing such Schemes by a Public Agency. The water conservation schemes shall be implemented on priority in the Orange and Yellow category areas. Conservation Credits will be available only on the schemes approved by the Authority.

All Units shall be expected to implement water conservation measures inside their premises as required by any other Statutory Body or Agency. No credit shall be provided in the Groundwater Charges for such activities. If the Unit implements water conservation within its premises in addition to its statutory obligations, it will be provided credit for the same. Units that undertake any water conservation measures outside their premises in pursuance of these Guidelines, shall be provided a credit that shall be deducted from the amount of Groundwater Charges as per these

valid for three years and must be renewed before expiration. If the entity cannot carry out the conservation measures, the Authority will implement the measures through designated agencies. The Authority would permit due consideration of permissions/NoC already taken by the Units from the Central Ground Water Authority or any other body. The Authority would provide permission to extract the groundwater in the State. Extraction of groundwater for a) drinking and domestic usage; b) agricultural usage (activities defined by the Government as Agriculture and related activities) shall be exempted from seeking permission.⁸⁹⁴ The water users, a) Drinking-Water, Housing and Urban Development Authorities, and Places of Worship shall also be exempted from seeking permission for groundwater extraction and conservation. Supply schemes of Government; b) Establishments of the Military and Central Paramilitary Forces; c) Urban Local Bodies and Panchayati Raj Institutions, and Improvement Trusts shall also be exempted. The units over-extracting GW shall be penalized at the rates fixed by the Authority.⁸⁹⁵

Guidelines. The monitoring of Water Conservation by units shall be done by an Agency to be specified by the Authority.

Monitoring: Each Unit shall measure the groundwater extracted from each tubewell located on its premises daily and maintain a Log Book in electronic or physical format for each tubewell. The log books are to be submitted as per the permission. Units extracting more than 100 m³/day of water must install a digital water meter with telemetry, while those extracting 10-100 m³/day must install only a digital water meter. The units that have been granted permission to draw more than 100 m³/day of groundwater shall be required to undertake an annual Water Audit through auditors to be empaneled by the Authority. The first Water Audit Report must be submitted within six months of completion of one year from the date of grant of permission.

All units extracting groundwater exceeding 1000 m³/day are required to monitor the groundwater levels through a piezometer

⁸⁹⁵ Penalties

A) Groundwater Compensation Charges

Extraction of groundwater without valid permit from the Authority shall attract penalties termed Groundwater Compensation Charges (GCC), which shall be calculated as per the following equation: GCC=Groundwater extraction per day x Groundwater Compensation Rate (GCR) x No. of days that Unit operates without valid permission of the Authority;

Groundwater Compensation Rates for Unauthorised extraction in (Rs per metre³) are as follows.

| S No | Category of area | 3<10m/day | 3 10-100m/day | 3 >100m/day |
|------|------------------|-----------|---------------|-------------|
| 1 | Orange | 16 | 36 | 44 |
| 2 | Yellow | 12 | 28 | 36 |
| 3 | Green | 8 | 20 | 28 |

B) Non-Compliance Charges

All machinery, equipment and instruments installed or used by the water user for any purpose connected with groundwater extraction or conservation, including measurement and monitoring thereof, shall be as specified by the Authority. If the water user does not comply with such specifications, requirements or directions, he shall be liable to pay Non-compliance Charges fixed by the Authority. In case an act or omission by a Water User amounts to a violation of more than one of the conditions of permission or directions of the Authority, then each of the Non-compliance charges applicable shall be levied, and the Water User shall be liable to pay the total amount so fall such charges.

However, despite all these legal and technical initiatives in the last 15 years, the GW table has been declining (Table 5.4), and the area under the deeper water table is increasing. The "Punjab Preservation of Sub-soil Water Act 2009" positively impacted the State by arresting the decline in groundwater. However, the variations in annual average rainfall, the increase in area under water-guzzling paddy, and the number of tubewells have again aggravated the problem, and the water table is declining faster (Table 5.4).

Table 5.4: Water table decline in Punjab and associated factors

| Period | Average water table decline (cm/year) | Average rainfall (cm) | The area under paddy in the last year of the period (lakh/ha) | Number of tubewells in the last year of the period (lakh) |
|-----------------------|---------------------------------------|-----------------------|---|---|
| June 1990- June2000 | 25 | 64 | 22.5 | 9.2 |
| June 2000- June 2008* | 84 | 39 | 26.1 | 11.5 |
| June2008- June2014** | 50 | 53 | 27.3 | 13.3 |
| June 2014- Present | 60 | 50 | 29.7 | 15.3 |

a) *Ordinance on the preservation of sub-soil water stipulating rice transplanting from June 10

b) **Change of transplanting date to June 15 in 2014. This date was shifted to June 20 for one year but has now been changed to June 13 again.

5.3 The Case Study of Punjab

Given the above changes in the legal policy discourse in Punjab, which aim to ensure judicious, equitable, and sustainable GW use, an attempt has been made to study the farmers' awareness of such legal policy instruments. Legal literacy, which is used interchangeably with legal awareness, is often viewed as knowing the primary level of law that affects people's lives. The study examines the socio-economic profile of the farmers, the situation of groundwater resources, and farmers' awareness of climate change and groundwater depletion. Finally, it relates groundwater depletion with their legal awareness of groundwater governance in Punjab. As there are considerable differences in the characteristics of the small, medium, and large farmers, as well as their irrigation water use and legal literacy, this study has been taken up based on various landholding size categories to draw meaningful conclusions. The material and methods of any research largely depend on the procedures followed in conducting the investigation. Considering this, a thorough review of the relevant literature was made to develop the research methodology for the present study.

5.3.1 The Study Area

Punjab is a small state (Figure 5.2) situated in the north of India ($29^{\circ} 30' N$ to $32^{\circ} 32' N$ latitude and $73^{\circ} 55' E$ to $76^{\circ} 50' E$ longitude). It is located between 230 m to 700 m above mean sea level. It forms about 1.54 percent of the country. The variation in average seasonal temperature is from $34^{\circ}C$ in June to $13^{\circ}C$ in January, with the maximum temperature rising to $45^{\circ}C$ in the summer and the minimum temperature dipping to near freezing in the winter. More than 70 percent of the average Annual rainfall occurs during the monsoon season, i.e., from July to September,¹³ but varies from 350 mm in the southwest to 1250 mm in the north. Most of the land in the State is under cultivation, and the net sown area is about 41250 km^2 out of a geographical area of 50362 km^2 . The primary land use details of Punjab are given in Table 5.5.



Figure 5.3 The Location and Zoning Map of the Study Area, Punjab

Table 5.5: Basic Land Use Statistics of Punjab

| | |
|--------------------------------------|-------|
| Geographical Area (000ha) | 5033 |
| Area under forest | 253 |
| Barren and Uncultivable land | 42 |
| Land put to non-agricultural use | 501 |
| Cultivable waste land | 12 |
| Permanent pastures | 4 |
| Land under miscellaneous tree crops | 10 |
| Current fallow land | 85 |
| Net sown area | 4118 |
| Total cropped area | 7839 |
| Cropping intensity (percent) | 190 |
| Divisions (No.) | 5 |
| Districts (No.) | 23 |
| Sub-Divisions (No.) | 91 |
| Blocks (No.) | 150 |
| Inhabited villages (No.) | 12581 |
| Population in lakhs (projected-2021) | 314 |

Source: Statistical Abstracts of Punjab: various issues

It can be divided into three distinct physiographic regions, i.e., the Sub-Mountain Zone (Zone 1), Central Plain Zone (Zone 2), and Southwestern Zone (Zone 3), and their salient features are briefly enumerated in Table 5.6. The zone-wise socio-economic and irrigation Situation is given in Table 5.7. As per the 2015-16 Agricultural Census, there are about 10.93 lakh operational land holdings covering an area of 39.58 lakh hectares, and their distribution over various regions is given in Table 5.8.

The 'Green Revolution' contributed to doubling the wheat production in the State from 1966-67 to 1968-69. The development of short-duration varieties created a space for cultivating two crops in a year, and rice, a non-traditional crop of the area, became a major crop of the *Kharif* season. The rice-wheat crop rotation became the state's dominant crop rotation, enabling it to play a crucial long-term role in the country's food security. The area under paddy increased to about 3.1 million hectares in 2018-19, and its productivity (6.2 tons per hectare) and production (191 lakh tons) also

increased, and the contribution of the State to the central pool of foodgrains has also touched 11.83 million tons. Since rice is grown chiefly under puddled transplanted conditions as a summer crop, its water requirement is high. The number of tubewells has increased over the years to provide assured irrigation to an additional area, and the diesel-engine operated pump sets, which were costly in operation but efficient in terms of water use, have also been replaced with those operated with electric motors. There is a positive correlation between the number of tubewells and the area under the paddy (Figure 1). The Fertilizer Consumption in Punjab has increased to 1080 thousand tons during 2022-23 (Table 5.9). The contribution of agriculture sector in the GSDP/GSVA has been about 23 percent in 2018-19 and it has reduced from 57 percent in 1970-71 (Table 5.10). Punjab has been the grain basket of the country has contributed about 122 LMT of rice and 96.45 LMT of wheat to the Central pool of foodgrains during 2022-23 (Table 5.11).

Table 5.6: Characteristics of different physiographic regions

| Regions | ACRP Region | Districts | Rainfall | Climate | Soil Type |
|---------|-----------------|--|----------|-----------------|-----------------|
| Zone 1 | Northern Punjab | Gurdaspur, Pathankot, Ropar, Mohali, Hoshiarpur | 1150 | Sub-humid | Clay, clay loam |
| Zone 2 | Central Punjab | Amritsar, Taran Tarn, Jalandhar, S.B.S Nagar, Ludhiana, Moga, Patiala, Fatehgarh Sahib, Kapurthala | 650 | Semi-arid | Loamy |
| Zone 3 | Southern Punjab | Bathinda, Mansa, Ferozepur, Mukatsar, Faridkot, Sangrur, Malerkotla, Fazilka, Barnala | 375 | Arid loamy sand | Sandy loam |

Source: Sidhu Balwinder Singh and others ¹⁴

Table 5.7 Zone-wise Socio-economic and Irrigation Situation

| Region | Population (million) (2011) | Population Density (Persons/sq. km) | Urban Popn. (%) | SC (%) | Female Literacy (%) | Net Sown Area (%) | Irrigation by canals (%) | Irrigation by Tubewells (%) |
|--------|-----------------------------|-------------------------------------|-----------------|--------|---------------------|-------------------|--------------------------|-----------------------------|
| Zone 1 | 5.55 | 591 | 31 | 28 | 69 | 65.05 | 8 | 92 |
| Zone 2 | 14.22 | 677 | 44 | 32 | 65 | 83.99 | 2 | 98 |
| Zone 3 | 7.96 | 399 | 30 | 36 | 54 | 87.59 | 63 | 37 |
| State | 27.74 | 551 | 37 | 32 | 63 | 82 | 28.96 | 71.03 |

Source: Statistical Abstracts of Punjab's various issues

Groundwater irrigation (GI), used in nearly 72 percent of irrigated area in the State, has also been primarily accountable for making Punjab the 'food bowl' of the country. However, this widespread adoption of tubewells prompted economist Robert Repetto to assert that 'the Green Revolution is more [a] tubewell revolution than [a] wheat revolution.¹⁵ Dependence on GI has been steadily increasing in Punjab since the 1990s when the policy of subsidized power supply to agriculture was introduced in the State. Then, the introduction of free power for agriculture in 1997¹⁶ gave it a further fillip. Consequently, the water table in Punjab has been continuously depleted due to its over-extraction. CGWB has warned that "at the current rate of GW extraction, all available groundwater resources in the State till the depth of 300 meters will dry up in next 20 to 25 years"¹⁷. Thus, Punjab is a high-priority area for GW management as it is an area with intense competition for water and water-driven degradation of ecosystems. Thus, developing an appropriate legal framework for improving GW governance is one of the most desired components of such an Action Plan. An adequate legal framework with well-defined responsibilities and rights can significantly contribute to turning policy decisions into rights and obligations, thereby improving the efficiency of GW governance.

Table 5.8: Operational Land Holdings in Punjab (2015-16)

| Category | Region 1 | | Region 2 | | Region 3 | | Punjab | |
|------------|--------------------|--------------------|--------------------|---------------------|--------------------|---------------------|---------------------|---------------------|
| | Number (000) | Area (000 ha) | Number (000) | Area (000 ha) | Number (000) | Area (000 ha) | Number (000) | Area (000 ha) |
| <1 ha | 53.94 (25.00) | 29.94 (5.51) | 55.42 (12.63) | 34.57 (2.17) | 45.05 (10.28) | 28.85 (1.59) | 154.57 (14.13) | 93.45 (2.36) |
| 1 to 2 ha | 54.74 (25.37) | 74.93 (13.79) | 83.78 (19.09) | 117.21 (7.37) | 68.91 (15.73) | 97.58 (5.36) | 207.64 (18.98) | 290.02 (7.33) |
| 2 to 4 ha | 65.37 (30.29) | 170.10 (31.30) | 151.52 (34.53) | 403.6 (25.37) | 151.04 (34.48) | 409.86 (22.53) | 368.31 (33.67) | 984.55 (24.88) |
| 4 to 10 ha | 37.16 (17.22) | 204.11 (37.56) | 126.16 (28.75) | 714.21 (44.90) | 141.9 (32.39) | 811.52 (44.60) | 305.53 (27.93) | 1731.79 (43.76) |
| >10 ha | 4.57 (2.12) | 64.38 (11.85) | 21.95 (5.00) | 321.22 (20.19) | 31.18 (7.12) | 471.63 (25.92) | 57.76 (5.28) | 858.09 (21.68) |
| ALL | 215.79 (100.00) | 543.47 (100.00) | 438.84 (100.00) | 1590.82 (100.00) | 438.09 (100.00) | 1819.44 (100.00) | 1093.81 (100.00) | 3957.69 (100.00) |

Figures in parentheses are %age share in total.

Source: Statistical Abstracts of Punjab's various issues

Table 5.9: Fertilizer Consumption in Punjab (2022-23)

(Nutrient 000' tonnes)

| Region | Nitrogen (N) | Phosphorus (P) | Potash (K) | Total (N+P+K) | Consumption (Kg/ha) | Cropping Intensity |
|--------|-----------------|-------------------|---------------|------------------|------------------------|-----------------------|
| 1 | 87 | 32 | 9 | 128 | - | - |
| 2 | 336 | 129 | 25 | 490 | - | - |
| 3 | 343 | 108 | 11 | 462 | - | - |
| Punjab | 766 | 269 | 45 | 1080 | 245 | 189.1 |

Source: Statistical Abstracts of Punjab: various issues

**Table 5.10: GSDP/GSVA from Agriculture at Factor Cost
(At current prices) in Punjab**

(Rs. Crore)

| Year | Total | From Agriculture | |
|--------------------------------------|----------|------------------|-------------------|
| | | Crops | Crops & livestock |
| Gross State Domestic Products (GSDP) | | | |
| 1960-61 | 491 | 219 (44.6) | 261 (53.2) |
| 1970-71 | 1509 | 649 (43.0) | 863 (57.2) |
| 1980-81 | 5025 | 1696 (33.8) | 2422 (48.2) |
| 1990-91 | 18928 | 6116 (32.4) | 8231 (43.6) |
| 2000-01 | 65954 | 17950 (27.2) | 26639 (40.4) |
| 2010-11 | 226204 | 44573 (19.7) | 63289 (28.0) |
| Gross State Value Added (GSVA) | | | |
| 2011-12 | 26662 | 50079 (18.8) | 70425 (26.4) |
| 2015-16 | 390087 | 59364 (15.2) | 91476 (23.5) |
| 2019-20 | 53703104 | 7820362 (14.5) | 5151677(9.6) |
| 2020-21(R) | 54085261 | 8237008(15.2) | 5358617(9.9) |
| 2021-22(P) | 61719169 | 8155080(13.2) | 5837610(9.5) |
| 2022-23(Q) | 67616428 | 8733194(12.9) | 6213652(9.2) |

*P-Provisional, Q-Quick Estimates, Figures in parentheses are %age share in total GSDP/GSVA.

Source: Statistical Abstracts of Punjab's various issues

Table 5.11: Contribution of Punjab to Central Pool of Foodgrains

| Crop year | Contribution (percent) | | | Quantity Contributed (Lakh tonnes) | | |
|------------|------------------------|-------|-------|------------------------------------|--------|-------|
| | Rice | Wheat | Total | Rice | Wheat | Total |
| 1966-67 | 5.2 | 63.8 | 20.8 | 1.3 | 5.7 | 7 |
| 1970-71 | 19.9 | 57.6 | 43.1 | 6.4 | 29.4 | 35.8 |
| 1980-81 | 45.3 | 43.0 | 43.9 | 25.2 | 37.7 | 62.9 |
| 1990-91 | 41.0 | 71.5 | 53.1 | 48.2 | 55.4 | 103.6 |
| 2005-06 | 32.0 | 75.3 | 42.9 | 88.6 | 69.5 | 158.1 |
| 2010-11 | 25.3 | 38.7 | 31.3 | 86.4 | 109.6 | 196 |
| 2015-16 | 27.3 | 46.4 | 35.0 | 93.5 | 106.5 | 200 |
| 2020-21 | 20.6 | 32.6 | 25.05 | 135.89 | 127.1 | 263 |
| 2021-22(R) | 21.2 | 31.0 | 25.30 | 125.48 | 132.22 | 257.7 |
| 2022-23(P) | 21.4 | 51.3 | 28.88 | 122.01 | 96.45 | 218.5 |

Source: Statistical Abstracts of Punjab's various issues

5.3.2 Materials and Methods

The material and methods of any research are largely dependent upon the procedures followed in conducting the investigation. Keeping this in view, a thorough study of the available relevant literature was made to develop the research methodology to be followed for conducting the present study. The preceding section about 'The Study Area' briefly discusses the prevailing situation regarding groundwater use in the production agriculture, the existing groundwater laws and institutions to govern its use. The research methodology adopted in conducting this study has been given under the following heads:

(a). Selection of the respondents: Using the multi stage sampling method, a total of 23 villages were selected, one from each district of the state. From each village, 20 respondents were selected at random. Thus, a total of 460 households were selected.

(b). Construction of research instrument: A questionnaire was designed and finalized in consultation with the Department of Economics and Sociology, Punjab Agricultural University, Ludhiana, members of the advisory committee and by consulting relevant literature. The questionnaire consisted of three parts (Annexure I) and a fairly large variety of data required for the present study was obtained from primary sources.

Part A: It dealt with socio-economic description of households. It included age, educational level, family type, family size, details about occupation and income, etc.

Part B: It consisted of information related to land holdings and farm assets information. It includes information about own land, leased in land, leased out land, information about ownership of tubewells, prime movers etc.

Part C: It relates to awareness and perceptions of households about groundwater laws and their implementation. It includes farmers' awareness about new agriculture techniques and their adoption, awareness about government policies and regulations regarding water conservation and farmers' perception about climate change and factors effecting groundwater sustainability.

(c). Pretesting of questionnaire: the questionnaire was pre tested on a sample of 60 farmers from the non-sampled villages of Punjab. Based on information so obtained, necessary modifications were made in the final schedule.

(d). Collection of data: the data was collected through the officials of Department of Economics and Sociology, PAU, Ludhiana and some of the villages were personally visited and farmers were interviewed. Proper precautions were taken to ensure unbiased response of the respondents by providing them necessary information after explaining the objectives of the study.

(e). Statistical Analysis of data : after the data collection the data was tabulated on a master sheet for further processing. The tables were prepared according to the objectives of the study. The data was analysed with the help of range, frequency and percentage.

A) frequency distribution of respondents: Frequency was worked out by calculating the number of respondents belonging to a particular response category.

B) Percentage: the percentage is a way of expressing a number as a fraction of 100 (per cent meaning per 100)

$$Percentage = \frac{frequency}{total\ number\ of\ respondents} \times 100$$

This study is based on the primary data collected from the farmers of Punjab by using a multistage random sampling procedure (Table 5.12). The primary survey was collected with the help of the Department of Economics and Sociology, Punjab Agricultural University, Ludhiana, and field data was compiled. For this purpose, one block from each of the 22 districts of Punjab was randomly selected at the first stage of sampling. One medium-sized village was randomly selected from each designated block in the second stage. Then, a complete list of the farming households was prepared for each selected village. Then, 20 farmers were selected randomly for this study. Overall, the total sample of this study pertained to 23 blocks, 23 villages, and 460 farmers. The details of the districts, blocks, villages, and sample size are given in Table 5.13.

Table 5.12: Sampling framework of the study

| Particular | Number | Remarks |
|------------------------|--------|---------------------------------------|
| Selection of districts | 23 | All the districts were selected |
| Selection of blocks | 23 | One block, chosen from each district |
| Selection of villages | 23 | One village, selected from each block |
| Selection of farmers | 460 | Selected 20 farmers from each village |

Source: Primary Survey

Further, the state was classified into three distinct zones based on elevation, rainfall, climate, and soil types. The three regions/zone are Northern Punjab (Gurdaspur, Roopnagar, Hoshiarpur, Pathankot, SAS Nagar, and SBS Nagar), denoted as Zone 1, and Central Punjab (Amritsar, Jalandhar, Ludhiana, Patiala, Kapurthala, Tarn Taran, Fatehgarh Sahib and Moga) denoted as Zone 2, and Southern Punjab (Bhatinda, Ferozepur, Faridkot, Sangrur, Malerkotla, Mansa, Fazilka, Shri Muktsar Sahib and Barnala) denoted as Zone 3.

The total sample size is 460, out of which 120 (26.09%) are in Northern Punjab (Zone 1), 160 (34.78%) are in Central Punjab (Zone2), and 190 (41.30%) are in southern Punjab (Zone 3). The study sample comprises about 45% small farmers (below 5 acres), 37% medium (5-15 acres), and 18% large farmers (15 acres and above) (Figure 4).

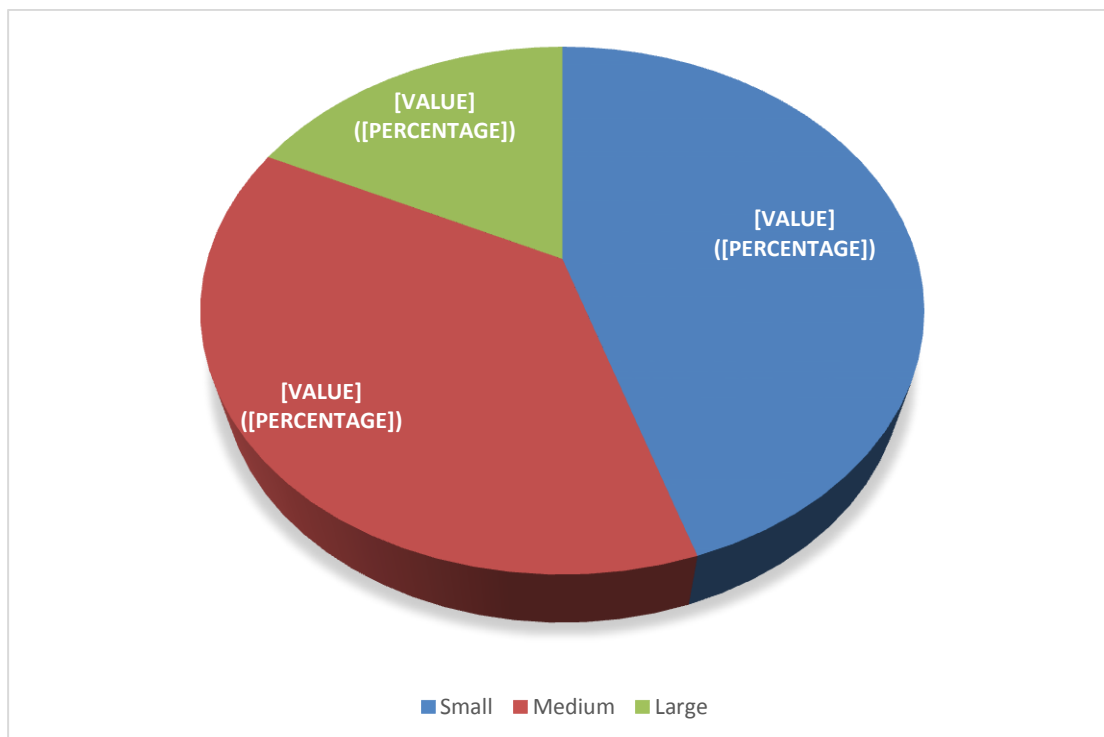


Figure 5.4: Distribution of sample size across various farm size categories

Detailed information as per questionnaire (Annexure II) was obtained about the farmers' landholdings, income sources, electric motors, groundwater depletion, groundwater table, and the adoption of various water conservation practices. Farmers' perceptions of climate change impacts and legal policy changes were also obtained to draw valuable lessons for the long-term sustainability of groundwater resources.

Table 5.13: The details of districts, blocks, villages, and sample size for the study

| Zones | Districts | Block | Village | Sample Size |
|-------|----------------|---------------|------------------|-------------------------------|
| Zone1 | Gurdaspur | Kahnuwan | Tugalwal | Total 120 households (26.09%) |
| | Hoshiarpur | Bhunga | Daffar | |
| | Mohali | Dera Bassi | Janetpur | |
| | Nawanshehar | NawanSehar | BarnalaKalan | |
| | Pathankot | Sujanpur | Baroi | |
| | Roopnagar | AnandpurSahib | Surewal | |
| Zone2 | Amritsar | Ajnala | Kamalpura | Total 160 households (34.78%) |
| | Fatehgarhsahib | BassiPathana | Nandpur | |
| | Jalandhar | Bhogpur | Buttaran | |
| | Kapurthala | Dhilwan | Bhandal Bhet | |
| | Ludhiana | Jagraon | Chimna | |
| | Moga | MogaII | Sadda Singh Wala | |
| | Patiala | Bhunerheri | Ghuram | |
| | Tarntaran | Chola Sahib | Marhana | |
| Zone3 | Barnala | Sehna | Nainewala | Total 180 households (41.30%) |
| | Bhatinda | Rampura | Ramniwas | |
| | Faridkot | Kotakpura | Dal Singh Wala | |
| | Fazilka | Fazilka | Abhun | |
| | Ferozepur | Gurharsai | Jandwala | |
| | Mansa | Budhlada | Lakhmerr Wal | |
| | Muktsar | Kot Bhai | Surewala | |
| | Sangrur | Sangrur | Turi | |
| | Malerkotla | Malerkotla | Mannki | |

Source: Primary Survey

5.4 Results and Discussion

5.4.1 Socio-economic status of the farming households

The socio-economic condition of the selected households has been tabulated and given in Annexure-II. It reveals as under:

(a) The age-wise distribution of the sample households (Table A1) brings out that 22.30 % of them (583) are less than 18 years of age and 79.21 % of them are studying. 25.33% are in 18-30 age group (662) and their 59.69% of them are engaged in farming and household work. 38.64% of them are in the age group of 30-60 years of age (1010) and 97.71% are engaged in farming and household work and remaining 2.29% have permanent government jobs. Respondents above 60 years of age are 13.73% (359) and about 35% of them are still engaged in farming and household work while 42.33% are old and 21.33% are old age pensioners.

(b)) Gender-wise average age of males and females (Table A2) was about the same, being 35.21 years for males and 35.63 years for females. The Age group-wise major principal status of sample farming households is given in Table A3 (Annexures II) and an analysis of principal status of females indicates that majority of them are looking after household work (57.96%) and one-fifth of them (20.42%) are studying. In case of males, 42.13% of them are engaged in farming and 23.30% of them are studying.

(c) Gender-wise educational status of the farming households study is given in table A4. It reveals that while 12.13% of males have an education level of less than primary (<5th class), number of females in this category is more (27.48%). About 39% males and 31% females were under matric. The education level of matriculation or above (10th class or higher) was observed to be slightly more in males (48.93%) than in females (41.83%). This indicates that the education level of females is improving but they are still primarily involved in household work and are not proportionately employed.

(d) The overall size of the operational holding of sampled farmers (Table A6) was 8.9 acres, which is close to the average size of operational holding in the State. It confirms the representativeness of the study sample.

The observations regarding details of operational holdings across various zones and farm-size categories are given in Table A6 and it indicates that on average, the farmers were leasing in more than 1/3rd of their operational land. The proportion of leased-in land increased substantially with an increase in the land-size category as only about 5% of the land was being leased in by the small farmers, and it increased to 24.26 % by the medium and almost 46% by the large farmers. In zonal analysis, it was evident that in zone2 (Central Punjab), the practice of leasing in was the highest (42.7 %), and it was lowest (26.7 %) in zone3 (Southern Punjab). Moreover, the highest percentage of small farmers in central Punjab (9.9 %) have leased-in land for cultivation. Overall highest average owned land was observed for central Punjab (6.99 acres), followed by southern Punjab (5.96 acres). Central Punjab has the highest land ownership across all the zones and across all farm categories.

5.4.2 Income distribution of farming households

The average yearly income of a farm household was observed to be the highest in the case of the Central Zone (Zone 2), with a value of Rs 590829 (Table A7). The

respective income of small, medium and large farm households was Rs 210436, Rs 3389863, and Rs 1427782. The household income was more diversified for small farm households, and its diversity declined with an increase in holding size (Table 9). Similar findings were observed for all the selected Zones of Punjab state. Most of the small farmers (53 per cent) in case of Zone 1, 30 per cent in case of Zone 2 and 38 per cent in case of Zone 3 are dependent upon the income from wages, while the share of income from the crop sector was 8 %, 21 % and 28 per cent respectively. The dependence of medium and large farms was mainly on crops and livestock, which reflected that the diversification to non-farm sources was less remunerative and distress-driven. In the case of Zone-wise comparison, the proportion of income from crop husbandry was 9 % for Zone 1, 28 % for Zone 2, and 10 % for Zone 3, respectively. The small farm households derived more than 40% of their income from wages, salaries, and other non-farm income sources. They had even much higher dependence on transfer income such as pensions, which was less a case for medium and large farm households.

5.4.3 Source of irrigation and occupational income distribution

A perusal of **Table 5.15** brings out that in all the zones in Punjab, groundwater has been the primary source of irrigation, with 86.11 percent of farms in Zone I, 88.07 percent in Zone II and 82.89 percent of farms in Zone III depending on tubewell irrigation. Canal irrigation was observed to cover the highest area (15.38 %) in Zone III (Southern Punjab), followed by Central Punjab (7.34 %) and Northern Punjab (2.78 %). This is also true as the hydrogeology of the area (the bouldery underground strata and higher depth to water) and the undulating topography of the region make the Zone I unsuitable for flow irrigation.

An analysis of the income of farmers across different sources of irrigation (**Table 5.22**) indicated that the crop income was highest for farmers using both sources of irrigation in Zone I (Rs.7,46,555) and Zone II (Rs. 33,86,976), while for Zone III farmers using only canal irrigation were having highest average crop income (Rs. 4,18,125). Across all the zones, central Punjab has the highest crop income (Rs. 5,76,534) and canal irrigation (Rs. 10,39,500) due to good quality of groundwater and fertile soils and well-developed canal irrigation system.

Table 5.14: Percentage of farmers by irrigation source

| Source of Irrigation | Zone 1 | Zone 2 | Zone 3 |
|----------------------|--------|--------|--------|
| Tube well | 86.11 | 88.07 | 82.89 |
| Canal | 2.78 | 7.34 | 13.16 |
| Both | 5.56 | 3.67 | 2.63 |
| Others | 5.56 | 0.92 | 1.32 |

Source: Primary Survey

Table 5.15: Effect of irrigation source on occupational diversity of Households

| Zone | Irrigation Source | Source of income and Amount (Rs.) | | | | | |
|--------|-------------------|-----------------------------------|-----------|---------|----------|----------|-----------|
| | | Crop | Livestock | Rental | Pension | Wage | Total |
| Zone 1 | Tube well | 430298.8 | 72080.6 | 0.0 | 38380.6 | 67871.0 | 616082.6 |
| | Canal Only | 268408.9 | 81500.0 | 0.0 | 0.0 | 0.0 | 349908.9 |
| | Both | 746555.0 | 53000.0 | 0.0 | 0.0 | 0.0 | 799555.0 |
| | Others | 197091.5 | 26750.0 | 0.0 | 4500.0 | 199500.0 | 457841.5 |
| Zone 2 | Tube well | 576534.8 | 466812.5 | 1729.2 | 3250.0 | 26208.3 | 1090909.8 |
| | Canal Only | 1039500.1 | 633250.0 | 0.0 | 91125.0 | 135000.0 | 1898875.1 |
| | Both | 3386976.0 | 266000.0 | 0.0 | 0.0 | 0.0 | 3652976.0 |
| | Others | 164054.0 | 17000.0 | 0.0 | 0.0 | 0.0 | 181054.0 |
| Zone 3 | Tube well | 364035.6 | 53561.9 | 952.381 | 21485.71 | 33079.37 | 481051.5 |
| | Canal Only | 418124.8 | 54950.0 | 0.0 | 3600.0 | 34400.0 | 511074.8 |
| | Both | 208756.5 | 37000.0 | 0.0 | 0.0 | 0.0 | 245756.5 |
| | Others | 111407.0 | 37500.0 | 0.0 | 3600.0 | 72000.0 | 224507.0 |

Source: Primary Survey

5.4.4 Variation of groundwater structures with farm-size across different zones

An analysis of ownership of tubewells is represented in Table 5.14, which shows that the Central Zone accounts for 43.22 percent of tubewells, followed by the Southern Zone (34.85 percent) and Northern Zone (22.08 percent). These results match the ground situation as the water quality in the Central Zone is fit for irrigation. The Northern Zone has fewer tubewells because it is tricky and costly to install a tubewell due to a hydrogeology comprising hard rock and boulders. Further, apart from

regional disparities, there is also a variation in the number of tubewells owned based on farm size. The large farmers own more than one tubewell in Central and Southern Zones, whereas most of the small farmers do not have access to groundwater irrigation.

The distribution of pumps used for extracting groundwater different zones of Punjab state has been depicted in Table 5.16. As far as the use of submersible motors is concerned, it was observed to be highest (more than 50 %) in the case of Zone II (177), followed by Zone III (104) and Zone I (66). The motors per farmer were observed to be the highest in the case of large farmers of all the selected zones of the State except for the Southern Zone (Zone 3).

Table 5.16: Variation in No. of Tubewells with farm-size across different regions

| Zone | Farm Category | Total Number of Motors | Number of Farmers | Motors per farmer | %age of the total |
|-----------------|---------------|------------------------|-------------------|-------------------|-------------------|
| Northern Punjab | Large | 20 | 13 | 1.54 | 19.61 |
| | Medium | 68 | 66 | 1.03 | 66.67 |
| | Small | 14 | 41 | 0.34 | 13.73 |
| | Overall | 102 | 120 | 0.85 | 22.08 |
| Central Punjab | Large | 74 | 35 | 2.11 | 37.19 |
| | Medium | 86 | 87 | 0.99 | 43.22 |
| | Small | 39 | 38 | 1.03 | 19.60 |
| | Overall | 199 | 160 | 1.24 | 43.07 |
| Southern Punjab | Large | 39 | 22 | 1.77 | 24.22 |
| | Medium | 105 | 117 | 0.90 | 65.22 |
| | Small | 17 | 41 | 0.41 | 10.56 |
| | Overall | 161 | 180 | 0.89 | 34.85 |

Source: Primary Survey

In the case of large farmers, the number of motors per farmer was 1.97 in the Central Punjab Zone, followed by the Northern Zone (1.46) and Southern Zone (1.05) which clearly shows that the majority of the large farmers have installed almost more than two motors per farm. The lower value of motors per farmer in the case of southern

Punjab demonstrates that large farmers mainly depend upon irrigation from the canals.

As far as the district-wise number of submersible pumps (Table 5.17) is concerned, it was observed that the highest percentage of pumps were owned in the Ludhiana district (9.22%), followed by Jalandhar district (8.93%), while the lowest pump ownership was observed in Roopnagar (0.86%), followed by Kapurthala (1.73%), and Muktsar (1.73%) district.

Table 5.17: Distribution of Submersible pumps across different zones

| Zone | Farm Category | Number of Submersible pumps | Number of Farmers | Submersible pumps per farmer |
|-----------------|----------------------|------------------------------------|--------------------------|-------------------------------------|
| Northern Punjab | Large | 19 (28.79) | 13 | 1.46 |
| | Medium | 36 (54.55) | 66 | 0.55 |
| | Small | 11 (16.67) | 41 | 0.27 |
| | Overall | 66 (19.08) | 120 | 0.55 |
| Central Punjab | Large | 71 (40.11) | 35 | 2.03 |
| | Medium | 70 (39.55) | 87 | 0.80 |
| | Small | 36 (20.34) | 38 | 0.95 |
| | Overall | 177 (51.01) | 160 | 1.11 |
| Southern Punjab | Large | 23(22.12) | 22 | 1.05 |
| | Medium | 66(63.46) | 117 | 0.56 |
| | Small | 15(14.42) | 41 | 0.37 |
| | Overall | 104 (29.97) | 180 | 0.58 |

Note: Figures in parentheses denote the percentage of the total.

Source: Primary Survey

The central region, which accounts for 34.78 percent of the sample, possesses 51.01 percent of the submersible motors, the southwestern region, with 39.13 percent of the sample, owns 29.97 percent of submersible motors, and the sub-mountainous region with 26.09 percent sample accounts for 29.97 percent submersible motors. Thus, the central region has the highest concentration (1.11) of submersible motors, while sub-mountainous (0.55) and southwestern (0.58) have a lower concentration.

Table 5.18: Distribution of submersible pumps by the district

| District | Number of Submersible pumps | Percentage | Submersible pumps per Farmer |
|-----------------|-----------------------------|------------|------------------------------|
| Amritsar | 25 | 7.20 | 1.25 |
| Barnala | 21 | 5.48 | 1.05 |
| Bathinda | 20 | 5.76 | 1.00 |
| Faridkot | 22 | 6.34 | 1.22 |
| Fatehgarh Sahib | 25 | 7.20 | 1.25 |
| Gurdaspur | 9 | 2.59 | 0.45 |
| Hoshiarpur | 28 | 8.07 | 1.4 |
| Jalandhar | 31 | 8.93 | 1.55 |
| Kapurthala | 6 | 1.73 | 0.30 |
| Ludhiana | 32 | 9.22 | 1.60 |
| Malerkotla | 21 | 6.05 | 1.05 |
| Mansa | 4 | 1.15 | 0.20 |
| Moga | 23 | 6.63 | 1.15 |
| Mohali | 16 | 4.61 | 0.80 |
| Muktsar | 4 | 1.73 | 0.20 |
| NawanSehar | 10 | 2.88 | 0.5 |
| Patiala | 20 | 5.76 | 1.00 |
| Roopnagar | 3 | 0.86 | 0.15 |
| Sangrur | 16 | 4.61 | 0.8 |
| TarnTaran | 11 | 3.17 | 0.55 |
| Total | 347 | 100 | |

Source: Primary Survey

5.4.5 Farm-size wise ownership of electricity operated tubewells

On an average, each farmer owns one tubewell operated with an electric motor for irrigating crops (Table 5.19). The number of electric motors per acre is 0.19 i.e. the command area of one tubewell is about 5 acres. While 78.4% of farmers own electric tubewells, almost 53.3% own more than one electricity operated tubewell, with an average 10 horsepower electric connection per tubewell.

Although a relatively lesser proportion of small farmers own electric motor-operated tubewells for irrigation (56.2%), the average number of motors per unit area is relatively high at 0.34 compared to 0.15 on medium farms and 0.08 on large farms. The proportion of farmers with electric motors increased with the increase in farm size. About 75% of the large farmers owned more than one electric motor for irrigation.

Table 5.19: Farm-size wise ownership of electricity operated tubewells

| Particular | Small | Medium | Large | Overall |
|---|-------|--------|-------|---------|
| The average number of electric tubewells per farmer | 0.72 | 1.14 | 1.67 | 1.17 |
| Number of electric tubewells per acre | 0.34 | 0.15 | 0.08 | 0.19 |
| %age of farmers owning electric tubewells | 56.2 | 86.7 | 92.3 | 78.4 |
| %age of farmers owning >1 electricity operated tubewell | 48.6 | 37.3 | 74.2 | 53.3 |
| Average horsepower per electric connection | 8.71 | 9.46 | 9.74 | 9.3 |

Source: Primary Survey

The average horsepower of motors increased with an increase in farm size from 8.71 hp on small farms, 9.46 hp on medium farms, and 9.74 hp on large farms. Medium and large farmers own the majority of the electric motors for irrigation. Hence, their share in total water usage in agriculture and extraction of groundwater resources is relatively much higher than that of small farmers. Figure 5.5 shows that most of the electric motors (about 74%) were up to 12.5 HP. While the proportion of 12.5 to 17.5 HP motors was 18.0%, more than 8% of the electric motors had a horsepower of more than 17.5HP. The analysis also shows that the horsepower of electric motors varied across districts.

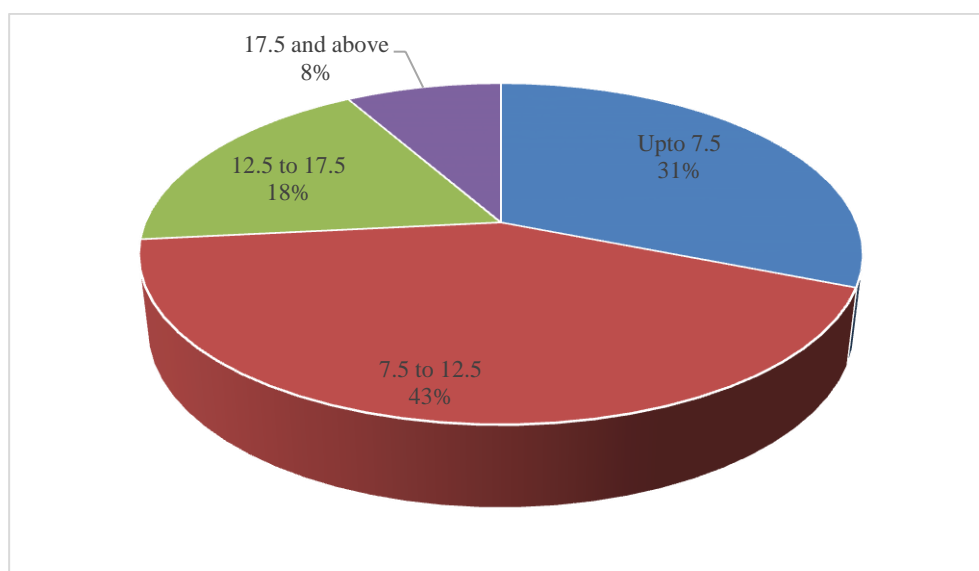


Figure 5.5: Distribution of electric motors in Punjab

5.4.6 Distribution of Centrifugal pump across different zones

Table 5.20 shows the distribution of centrifugal pumps by different farm-size categories as well as different zones of the State. The sample households had higher

possession of electric submersible pumps than the diesel centrifugal pumps. The distribution of centrifugal pumps among different zones of the State was 36 in the case of Northern Punjab, 22 in the case of Central Punjab, and 57 in the case of Southern Punjab, clearly indicating the predominance of centrifugal pumps in Southern Punjab. The concentration of submersible pumps in the central zone also supplements the conclusion that number of centrifugal pumps should be lower due to higher depth of water table. Mostly, farmers in the districts with shallow water tables (Fazilka, Ferozepur, and Pathankot) use centrifugal pumps to extract groundwater.

Table 5.20: Distribution of Centrifugal pump across different zones of Punjab

| Zone | Farm Size Category | Number of Centrifugal Pumps | Number of Farmers | Centrifugal Pumps per farmer |
|-----------------|--------------------|-----------------------------|-------------------|------------------------------|
| Northern Punjab | Large | 1(2.78) | 13 | 0.08 |
| | Medium | 32(88.89) | 66 | 0.48 |
| | Small | 3(8.33) | 41 | 0.07 |
| | Overall | 36 | 120 | 0.30 |
| Central Punjab | Large | 3(13.64) | 35 | 0.09 |
| | Medium | 16(72.73) | 87 | 0.18 |
| | Small | 3(13.64) | 38 | 0.08 |
| | Overall | 22 | 160 | 0.14 |
| Southern Punjab | Large | 16(28.07) | 22 | 0.73 |
| | Medium | 39(68.42) | 117 | 0.33 |
| | Small | 2(3.51) | 41 | 0.05 |
| | Overall | 57 | 180 | 0.32 |

Notes: Figures in the parentheses denotes the percentage of total

Source: Primary Survey

Table 5.21: Variation in depth of water table and use of submersible motors (%)

| Depth in feet | Zone1 | Zone2 | Zone3 |
|---------------|-------|-------|-------|
| 0-50 | 3.03 | - | - |
| 50-100 | 6.06 | 4.62 | 3.85 |
| 100-150 | 9.09 | 1.16 | 7.69 |
| 150-200 | 10.61 | 35.26 | 8.65 |
| 200 + | 71.21 | 58.96 | 79.81 |

Source: Primary Survey

Table 5.21 shows the distribution of water table depth where farmers use submersible motors. The water depth has been divided into five subcategories: 0-50, 50-100, 100-

150, 150-200, and more than 200 feet, and the study area is divided into three zones: Zone I, Zone II, and Zone III. The Table shows that in the area where depth of water table is more than 200 feet the farmers use submersible motors for extraction of ground water. Zone III has the highest proportion of farmers (**79.81** %) having submersible pumps where water table depth is more than 200 feet, followed by Zone I (71.21 %) and Zone II (**58.96**%). Six districts (Barnala, Moga, Mohali, Patiala, Malerkotla and Sangrur) had an average water table depth of over 100 feet. The regional analysis illustrates that the sub-mountainous region has a deeper water table (99 feet), followed by the central (85 feet) and southwestern part (35 feet).

Table 5.22: Zone-wise depletion of water table per year

| Zone | Farm Category | Rate of groundwater depletion per year (feet/year) |
|-----------------|----------------------|---|
| Northern Punjab | Large | 1.18 |
| | Medium | 2.06 |
| | Small | 2.35 |
| | Overall | 1.37 |
| Central Punjab | Large | 2.13 |
| | Medium | 2.49 |
| | Small | 2.82 |
| | Overall | 2.46 |
| Southern Punjab | Large | 1.65 |
| | Medium | 2.62 |
| | Small | 2.15 |
| | Overall | 2.14 |

Source: Primary Survey

Table 5.22 shows the zone-wise annual depletion of the water table in the study area. The average rate of groundwater depletion in Northern Punjab was found to be 1.37 feet/year, while in Central Punjab it is about 2.46 feet/year and in Southern Punjab it is about 14.2 feet/year. This observation by the farmers is in consonance with the scientific data that water table in the State is declining at an average rate of 50-70 cms per year.

5.4.7 Farmers awareness about climate change and its affects

The perceptions about climate change and its affects on factors relating to groundwater sustainability are given in Table 5.23. Most farmers agree that rainy days in the Kharif season have decreased with a decrease in average annual rainfall, untimely rain events have also increased, the temperature is rising, and incidences of

heavy rains have decreased with time. Similar findings were observed during the rabi season when most farmers agreed that rainy days decreased as average rainfall decreased, untimely rain events increased, the temperature rose, and the incidence of heavy rains decreased.

Table 5.23: Farmers response about climate changes and its affects on groundwater sustainability (%)

| Problem | Zone 1 | Zone 2 | Zone 3 | Overall |
|---|---------------|--------|--------|---------|
| | <i>Kharif</i> | | | |
| A reduction in the rainy days | 87.20 | 88.82 | 89.89 | 88.64 |
| A decline in average rainfall | 92.80 | 93.42 | 90.53 | 92.25 |
| Increase in untimely rain events | 98.40 | 99.34 | 95.70 | 97.81 |
| Rise in temperature | 100.00 | 98.03 | 95.71 | 97.91 |
| A decline in the incidence of heavy rains | 96.00 | 98.68 | 95.71 | 96.80 |
| <i>Rabi</i> | | | | |
| Decrease in the number of rainy days | 90.20 | 90.82 | 95.17 | 91.11 |
| A decline in average rainfall | 90.10 | 89.82 | 90.43 | 89.21 |
| Increase in untimely rain events | 95.80 | 96.04 | 94.76 | 94.59 |
| Rise in temperature | 97.40 | 95.73 | 95.77 | 95.34 |
| A decline in the incidence of heavy rains | 94.10 | 96.28 | 95.87 | 94.46 |

Source: Primary Survey

Table 5.24: Farmers' awareness and perceptions about GW depletion and its conservation (% response)

| Particulars | Zone1 | Zone2 | Zone3 |
|---|--------|--------|--------|
| Awareness of the adverse effect of groundwater depletion on groundwater stock | 88.80 | 86.84 | 85.61 |
| Groundwater depletion adversely affects agriculture | 82.40 | 80.26 | 82.27 |
| Groundwater depletion is due to increased area under paddy | 37.60 | 44.74 | 47.49 |
| Groundwater depletion due to wasteful use of water | 95.20 | 95.39 | 97.13 |
| Farmers' cooperatives can help reduce the wastage of groundwater | 80.00 | 77.63 | 75.68 |
| Farmers favouring the role of cooperatives in groundwater sustainability | 100.00 | 100.00 | 100.20 |
| Awareness of laws/rules to regulate groundwater use | 24.00 | 31.58 | 32.45 |
| Do the villagers follow them? | 8.80 | 9.21 | 10.77 |

Source: Primary Survey

More than 85% of the farmers are aware of the adverse effects of groundwater depletion on groundwater stock in all three zones of Punjab, which is a good sign. The proportion of awareness was the highest in Zone I (Table 5.24). Most of the farmers (> 80%) agreed to the adverse effects of groundwater depletion in the study area on State agriculture. Further, less than half of the farmers were of the view that an increase in the paddy area is a critical reason for the over-exploitation of groundwater and depletion of the groundwater table in all the zones of Punjab. However, in Zone I, the percentage of the farmers who agreed that the increasing area under paddy crop was contributing to a decline in water table depth was comparatively lower (37.60 %) than in Zone II and Zone III. About 75 to 80 % of farmers in all three zones agreed that farmers' cooperatives could play a constructive role in reducing the wastage of groundwater, and almost all the farmers of the study area favoured that the cooperatives should play a favourable role in improving groundwater sustainability. Although about 25-30% farmers agreed that they are aware about the laws to regulate the groundwater use but very few of them (about 9 %) reported that these are being followed by the villagers.

Table 5.25: Legal literacy about water across various regions (% response)

| The observation | Zone I | Zone II | Zone III |
|--|---------------|----------------|-----------------|
| Do you know about the Sub Soil Water Act? | 67.5 | 67.6 | 60.8 |
| If so, is it viable to cultivate the paddy fields after June 15? | 67.9 | 70 | 76.0 |
| Do you think the area under paddy cultivation decreased after implementing this Act? | 12.9 | 8.1 | 22.9 |
| Do you observe that the groundwater depth fall has been checked after the Act? | 71.6 | 75.7 | 62.8 |
| Does this policy increase the density of electric tube wells? | 43.3 | 47.3 | 52.3 |
| Does this strategy of restricting paddy cultivation before June 15 help in recharging the groundwater? | 62.4 | 58.1 | 56.9 |
| Is there a monsoon shift? | 74.7 | 79.7 | 70.0 |
| Does this Act need any refinement? Please specify. | 43.3 | 47.3 | 52.3 |
| Do you know about the Groundwater Authority Act? | 19.1 | 8.1 | 30.8 |
| Do you know about the Canal and Drainage Act? | 12.9 | 8.1 | 22.9 |
| Is the State Govt. appropriately maintaining the drainage work? | 6.2 | 5.4 | 11.8 |
| Do you observe the efficient delivery of canal water in your fields? | 23.5 | 17.6 | 20.3 |
| Do you receive timely compensation for crop damage due to floods? | 20.9 | 19.1 | 19.1 |
| Have you faced the problem of soil erosion due to canal water in your field? | 12.9 | 8.1 | 22.9 |

Source: Primary Survey

5.4.8 An assessment about legal literacy across different regions:

An analysis of the extent of legal literacy in terms of various Acts and regulations, as explained at the beginning of this paper, across different farm size categories is given in Table 5.25. In Punjab, around 68% of farmers in Zones I and II and **60.8%** of farmers in Zone III claimed awareness of the Sub Soil Water Act, while 67, 70, and **76** percent of the farmers in Zone I, II, and III agreed that paddy production is viable after June 15. After the Act's adoption, almost **23%** of the farmers in zone III reported a decrease in the cultivated area under paddy, compared to just 13% and 8% of farmers in zones 1 and 2. Farmers may hesitate to move the area away from paddy due to its relatively higher profitability than the alternative, less water-intensive crops. However, most of them concurred that the Act had successfully slowed the rate at which groundwater levels fell in the State, and the proportion agreeing to that was 71.6%, 75.7%, and **62.8** % in zones I II, and III, respectively. About 62%, 58%, and 57% of the farmers in the three zones agreed that Punjab's groundwater has been recharged due to this technique of transplanting paddy after June 15. Many farmers also reported that the delayed transplantation of paddy, as stipulated by the Act, positively affects the monsoons in Punjab, as early transplantation caused a delay in its onset. However, almost half of the farmers stressed the need to prepone the transplanting date and notify it as June 10. The percentage of farmers expressing such an opinion was 43.3%, 47.3%, and **52.3%** in the three zones, respectively.

The Groundwater Authority Act and the Canal and Drainage Act are relatively incomprehensible, in contrast to the Sub Soil Water Act, a more contemporary law often better recognized. In each of the three zones, less than 30% of individuals are aware of these laws. Awareness of the farmers about the two acts was the lowest (8%) in Zone II, while those in Zone III had a better understanding of the two acts. About 19% and 13% of the farmers in Zone I and 30% and 22% in Zone III are aware of the Groundwater Authority and the Canal and Drainage Act. It is striking to note that the awareness is notably less amongst the farmers of Zone II. They use a large share of groundwater for irrigation and, thus, can jeopardize the long-term sustainability of groundwater in Punjab.

Additionally, most farmers don't think the State is appropriately managing the drainage network. Only 6.2 percent, 5.4 percent, and **11.8** percent of farmers in the

three zones agree that the Government is appropriately maintaining the drainage work. Similarly, a smaller proportion of farmers had access to canal water for irrigation, and only a tiny proportion reported soil erosion. The farmers also said they are promptly compensated when floods harm their crops. The legal awareness of farmers about groundwater issues, i.e., legal literacy about water, may decide the future path of groundwater sustainability as it may significantly affect their actions and attitude towards adopting water conservation practices.

5.4.9 Adoption of different water-conserving methods Adopting innovative water-saving technologies, practices, and water-efficient crops can pave the way for sustainable agriculture in Punjab (Perveen et al., 2008; Sidhu et al., 2010; Green et al., 2021; Bhogal and Vatta, 2021). The information related to adopting such practices is given in Table 5.26. There is very little adoption of drip irrigation in the state and about 5% of the farmers have adopted drip irrigation in Zone I. these observations of the farmers match with the ground reality as almost 80-85% area of the State is under paddy and wheat crops which have a close row to row distance and the cost of irrigating these crops with drip irrigation becomes prohibitive. Further, the policy of supply of free power to the armed also acts as a dampener in adoption of micro irrigation technologies. The adoption of lase land leveller is less in Zone I due to its undulating topograhphy an and poorly developed irrigation facilities.

Table 5.26: Adoption of different water-conserving methods by the farmers (%)

| Water conserving Methods | Zone1 | Zone2 | Zone3 |
|---------------------------------|--------------|--------------|--------------|
| Drip irrigation | 5.13 | 0.99 | - |
| Land Laser Levelling | 45.08 | 83.11 | 88.62 |
| Sprinkler irrigation | 1.08 | 1.85 | 1.03 |
| Direct seeding of rice | - | 2.96 | 2.63 |
| Rainwater harvesting | 4.69 | 2.13 | 9.76 |

Source: Primary Survey

The adoption of sprinkler irrigation (Table 5.27) in Punjab is also poor, being 1.08, 1.85, and **1.03%** in Zone I, Zone II, and Zone III, respectively. While none of the farmers in Zone I opted for direct seeding of rice, 2.96 % of farmers in Zone II and **2.63 %** in Zone III adopted this technique as the farmers are used to puddled transplanting of rice wherein they use standing water as a herbicide to control

germination of weeds. Only 2 to 9 % of farmers in all three zones of the states adopted rainwater harvesting. Increasing awareness about the legal framework and water conservation technologies along with a change in the policy of supply of free power of agriculture can enhance the adoption levels of water conservation technologies and can contribute to the long-term sustainable use of groundwater resources.

5.5 Conclusions

Due to intensive agriculture practices and the dominance of the paddy-wheat system, Punjab is facing a faster depletion of its groundwater resources. The annual groundwater extraction at 33.85 BCM far exceeds the yearly groundwater recharge of 22.80 bcm. Hence, most areas (development blocks) in Punjab face over-exploitation of their groundwater resources and consequent water table depletion. Several Acts have been introduced in Punjab that aim to resolve this situation and ensure the long-term sustainability of groundwater. The present study examined the awareness of groundwater resources and legal policy amongst Punjab farmers. Based on the primary data collected from 427 farmers selected from 22 villages spread across 22 districts of Punjab, the study revealed that, on average, the medium and large farmer owns one to two electricity-operated tubewells in all the respective zones of Punjab and thus have better access to higher use of groundwater for crop production.

On the other hand, small farmers own more electric motors per Unit of cultivated area, which indicates a higher investment in irrigation infrastructure and poor utilization of resources. The level of awareness about groundwater availability, its depletion, factors affecting it, the role of community organizations, and legal literacy was lower among the farmers, especially among the farmers in Zone 3, which can jeopardize the long-term sustainability of groundwater in the State. Awareness about groundwater issues and legal literacy may decide the future path of groundwater sustainability as they also significantly affect farmers' attitudes towards adopting water conservation practices. Adopting such technologies is also limited in all three zones of Punjab. There is a need for a well-oiled extension program coupled with appropriate financial incentives to encourage farmers to adopt these technologies. Further, a campaign to make all farmers aware of the emerging legal policy framework in the state needs to be launched to bring a behavioural change in their rights and obligations in managing groundwater resources optimally.

CHAPTER-6

CONCLUSION, FINDINGS AND SUGGESTIONS

Currently, the planet Earth is facing a significant water crisis that affects its diverse life forms, including more than eight billion humans. This crisis primarily pertains to water governance, resulting from the mismanagement of water resources. India is also experiencing a significant water crisis, similar to many countries worldwide. Water crises encompass issues related to the availability and accessibility of clean and safe drinking water, contamination of freshwater sources, equitable distribution of water among users, over-exploitation and pollution of groundwater, and the occurrence of flooding and famines in specific regions of the country. It necessitates the implementation of some area-specific and effective measures immediately, failing which the situation is likely to deteriorate further. Freshwater scarcity is unwarranted in inhabited areas; however, the country as a whole is also facing a significant water crisis that threatens the inclusive and sustainable development of the country. Since water is a 'state' subject, the State governments are responsible for enacting water laws, specific to their jurisdiction for its efficient governance.

Groundwater is among India's most valuable resources, and a thorough understanding of its governance perspective is essential to explore its scientific, sociological, and economic stance. As an unseen resource, the depletion of the groundwater table has raised significant concerns regarding its management and governance across the country. Groundwater governance has been defined by UNDP¹ as “*a set of social, political, administrative, and economic institutions that impact water resource use, development, and management and assure equity and efficiency in water services and distribution*”. The theory of GW governance outlines the necessity of legal frameworks for effective governance, converting policy decisions into rights and obligations while establishing accountability and authority in resource management. Groundwater is intricately connected to the management of environmental and various land and water resources, e.g. alterations in land use can influence both recharge rates and quality, highlighting the necessity of incorporating land use regulations into discussions surrounding groundwater governance.

¹ UN World Water Assessment Programme 2003, Water for People, Water for Life. Paris: UNESCO available at http://www.un.org/esa/sustdev/publications/WWDR_english_129556e.pdf (Visited on 20 October 2022).

6.1 Findings and Conclusions

The concept of 'Water Resource Management' encompasses the comprehensive preservation, development, and utilization of all water bodies, both surface and subsurface, constituting a unified hydrologic system. Traditionally, it has been understood as the management of water for specific purposes which has resulted in distinct legal frameworks and the development of targeted water initiatives. Thus, the diverse applications of water by various users as well as different sectors of the economy complicate the task of water governance. After examining various issues, apprehensions, and perceptions related to its governance in the preceding Chapters, the conclusions and suggestions derived from this study have been discussed in the following paras.

6.1.1 Existing Legal Framework for Groundwater Governance

The discussion about the “Constitutional and Legal Framework for Governance of Groundwater in India”² brings out that numerous Acts enacted during the British era comprised two primary elements. The first aspect pertains to control over water, and the second aspect involves the regulation of water rights through common law principles, emphasizing landowners' entitlements to access water, especially groundwater.

- (i) The Constitution of India, in express terms, provides water as a state subject while the Union government has legislative authority only in case of inter-state river waters. The relevant provisions of water under the constitution relating to legislative competency are Entry 17 in the State List, Entry 56 in the Union List, and Article 262 of the Constitution. The concern of the Union concerning water resources is mainly in specific areas like interstate water concerns, economic development of the environment, territorial waters, and inland transport. Moreover, in other aspects such as drinking water, sanitation, flood management, etc. the central Government's role is advisory, policy making, and schemes for helping and assisting state governments.

In certain situations, this gives rise to tension between the Centre and any state about the implementation of a scheme or the order of a tribunal. The power of

² Chapter 2

lawmaking of the Centre concerning interstate rivers and river valleys is theoretically an important one and this is reinforced by the use of the provisions of Entry 20 in the Concurrent List, namely “Economic and Social planning”. By virtue of this entry, clearance from the Centre is required for the inclusion of major and medium irrigation, hydropower, flood control, and multipurpose projects in the national plan.³ Local bodies of governance at the village and city level constitute the third tier in the constitutional structure created by the 73rd and 74th Amendments, namely; the village panchayats and the city *nagarpalikas* (municipalities/ corporations). The Eleventh and the Twelfth Schedule to the Constitution lay down lists of subjects entrusted to the Panchayats and Nagarpalikas. Similarly, municipalities have been given powers over water supply for domestic, industrial, and commercial purposes. These amendments constitute some of the most significant changes brought to the Constitution because they can effectively recast the distribution of power in favour of democratically elected local bodies. However, these significant changes are yet to be executed at the local level. Accordingly, it comes out that our legal system has a limited understanding of the water and the provisions relating to fundamental rights or directive principles in the constitution have no specific mention of water.

It is, therefore, suggested that water must find an expression in the directive principles of state Policy and the fundamental Duties sections of the Constitution. Though, under the constitution, the right to a life well entrenches the human right to water, the real challenge in this regard is the determination of its real constituents and active realization. So, a significant gap concerning water⁴ exists in the legal framework and there is a need to define and determine this right and its sphere under different settings. Hence, it is suggested that water must be included in the concurrent list to enable the Union Government to legislate on any subject related to water and its management in the country. Further, the provisions conferring powers and functions to the local bodies and Panchayati Raj Institutions must be implemented in letter and spirit.

³ Ramaswamy R Iyer , *Water Perspectives , Issues , Concerns 22* (Sage Publications, New Delhi, 2003).

⁴ Philippe Cullet, “Right to Water in India Plugging Conceptual and Practical Gaps”, *International Journal of Human Rights* 61 (2013) available at <http://www.ielrc.org/content/a1301.pdf> (Visited on 15 July 2021).

6.1.2 Settlement of Inter-State River Water Disputes

The Parliament of India passed two Central Acts namely ‘The River Boards Act, 1956’⁵ and ‘The Inter-State River Water Disputes Act, 1956’ to resolve water disputes and control and develop river waters in the country. Though ‘The River Boards Act, of 1956’ was enacted to establish River Boards to regulate and develop interstate rivers and river valleys, no board has been constituted so far under this Act to date. Different boards have been constituted under other laws, e.g. Betwa River Board was set up under ‘the Betwa River Board Act, 1976,’⁶ Tungabhadra Board under the Tungabhadra Board Act, 1953, and Brahmaputra Board under the Brahmaputra Boards Act, 1980. Normally, various River Boards, whenever the need arose to fulfil the different requirements, were set up under different Acts of Parliament as per the then-existing settings.

It is, therefore, suggested to enact suitable Central legislation replacing Act 49 of 1956 under Entry 56 of List I. The proposed legislation should specify the structure of the River Boards and their authority to develop, regulate, and control all inter-state rivers without affecting the previously accepted rights of the riparian states. Further, new legislation may be enacted by the Parliament by considering the inter-State rivers as ‘national assets’ and at large, the material resources of the community, and after holding meaningful discussions and effective public consultation with all the stakeholders.⁷

The adjudication of disputes of inter-state rivers is also provided in ‘The Inter-State River Water Disputes Act, 1956’. These disputes may comprise conflicts on account of the levy of water rates, and/ or the interpretation of water-sharing agreements and treaties of inter-state rivers⁸. The most significant issue in the effective implementation of this Act has been the ‘minimalist’ attitude of the Union Government to act authoritatively. The other is inordinate delays in the establishment of the tribunals as well as during the proceedings and time taken in pronouncing interim, and final awards. Though the awards of the tribunals are conclusive and said to be final and barred from review by the courts, the States continue to challenge these

⁵ Act No. 49 of 1956.

⁶ <http://wrmin.nic.in/forms/list.aspx?lid=254> (Visited on 21 March 2023).

⁷ “Water Related Issues” available at http://arc.gov.in/arc_7th_report/ARC_7thReport_Ch5.pdf (Visited on 25th November, 2023).

⁸ For details, *see* Chapter 2

awards on frivolous grounds and problems arise in their execution due to the absence of enforcing mechanism. On the recommendations of ‘the Sarkaria Commission’, the ‘Inter-State River Water Disputes Act, 1956’ was amended in 2002 for timely disposal of the matters referred to the tribunal. It was provided that the Tribunal shall forward a report to the Central Government setting out the facts as found by it. The tribunal was asked to pronounce the verdict within three years, provided that if the decision cannot be given within the stipulated period for unavoidable reasons, the Central Government may extend the limit for a further period but not exceeding two years. The Tribunal is a fact-finding and advisory body whose term comes to an end through a formal resolution of Parliament after the submission of its report to the satisfaction of the Government.

Accordingly, it is suggested that the Union Government, through the Department of Water Resources, River Development and Ganga Rejuvenation (DoWR, RD & GR), should be made a party to proceedings before the Tribunals and be asked to submit its affidavit regarding allocation of water resources. The Union Government should play a decisive role in the settlement of the water-sharing disputes between states as the inter-state rivers are common property and a national asset. Further, an effective enforcement mechanism should be evolved to execute the Tribunal awards. The Supreme Court is already barred under Article 262 (1) of the Indian Constitution to review the decision of the tribunal, however, the states not satisfied with the award, take up the matters relating to constitutional, jurisdictional, legal, and environmental issues.

6.1.3 Water Sharing by the States

Further, the Union Government has not framed any guidelines for the sharing of waters of inter-state rivers at the national level to guide the tribunals in the adjudication of matters presented before them. The tribunals refer to various case laws in India, Helsinki Rules, awards of other tribunals, and so on. The doctrine of ‘equitable apportionment’ sharing between contesting parties is acknowledged as the most apposite principle in the present scenario for the allocation of waters. However, appropriate legislation must elaborate, define, and demarcate the essential factors of this general statement.

The 'National Commission constituted to review the working of the Constitution' as well as Fali S. Nariman suggested repealing the Inter-State Water Disputes Act, 1956 to bring the conflicts regarding inter-state rivers within the original jurisdiction of the Supreme Court.⁹ However, the question about the ability of the Supreme Court to cope with the mammoth burden due to such conflicts remained unanswered. There was also a doubt about the speed of the Supreme Court vis-a-vis the tribunals to dispose of these cases. Former Secretary (Water Resources), Govt. of India, Mr Ramaswamy Iyer termed this measure an extreme step and suggested that "the most important deficiency in our system is that the tribunal's decision is a single, non-appealable verdict. If one or more parties are left with a sense of grievance or injustice, the aggrieved party has no remedy apart from a reference to the tribunal again within three months."¹⁰ He suggested that the Act may be amended to provide for an appeal against the Tribunal's award in the Supreme Court but that would have also led to overburdening the Apex Court. So, it is suggested that the tribunals adopt an interactive, consultative, and fact-finding committee-style procedure for exploring the solution while adopting the eventual obligation of delivering a judicial decision. Further, the institutional measures for collecting the required data and the requisite information may be set up to enable these tribunals to provide speedier justice.

It is also suggested to consult the farmers and the interested parties and stakeholders in the river basin who are likely to be affected by the projects on these rivers. The root cause of such conflicts is a competitive and unsustainable demand for water resources. If the people of a state lack water even for drinking, the people of adjoining states should not be permitted to use it for other purposes. The federal structure of the states should be used for the national needs of welfare and betterment of the people instead of dividing them. Thus, there is a need for a National Law relating to water, integrating these values and guiding statements for thoughtful initiatives and optimal use of inter-state water resources.

6.1.4 Ownership rights of Water

Ownership of water has been a contentious issue that requires meaningful and perceptible attention. The judiciary has advocated a most fitting and appropriate

⁹ Fali Nariman's suggestion to repeal the IWSD Act as mentioned in Ramaswamy Iyer, *Water and The Laws in India* 576 (Sage Publications, New Delhi, 2012).

¹⁰ Ramaswamy Iyer, *Water and The Laws in India* 576 (Sage Publications, New Delhi, 2012).

doctrine regarding ownership called the Public trust doctrine which means that the sovereign holds shared water resources in trust for the public's use and enjoyment. Though, the courts have invoked this Doctrine to confine government activities for the common good- equitable access to and fair distribution of natural resources, protection of the environment, and concerns for intergenerational equity, in the absence of the law, the enforcement and interpretation of the doctrine remains doubtful.¹¹ The development of case laws over time, even after the acknowledgment of this doctrine, indicates that the courts have not found it easy to move beyond the conventional norms central to the water law.¹² So, there is a need to recognize the doctrine in the Water Policy, it is incumbent to have legal recognition of such a doctrine through the effective and binding 'National Water law', for planning, execution, and management of the various activities relating to water and its nature. Water as a part of history, religion, culture, and ecology, is unknown to the Constitution. An eminent legal expert, Mr M.S. Vani, has also referred to the non-recognition of our ecological characteristics by our legal system.¹³ Similarly, a renowned geologist Mr T. N. Narsimhan, who specialized in Water Resources and Hydrology, desired that our law and water policy should be based on a scientific understanding of the role of water on planet earth and its ecological system.¹⁴ Thus, a central legislation considering all perspectives of water is required encompassing all the state laws concerning water management under its fundamental and universal principles.

6.1 5 Groundwater Governance Issues

Most of the irrigation laws of today are based on the laws enacted and developed during the British era. Irrigation laws vest control and ownership over water resources in the State government. However, there is a substantial difference in different state laws relating to irrigation. Few of them are comprehensive while others address definite issues. Several issues like imprudent canal irrigation without considering soil conditions over-exploitation of water or non-consideration of the groundwater table are not appropriately addressed. Further, insufficient consideration of drainage in

¹¹ Paromita Goswami "Public Trust Doctrine: Implications For Democratisation of Water Governance 9 *NUJS L. Rev.* 67 (2016).

¹² Philippe Cullet "Water Sector Reforms And Courts In India" available at <http://www.ielrc.org/content/a1006.pdf> (Visited on 11 October, 2023).

¹³ Ramaswamy Iyer, *Water and the Laws in India* 568 (Sage Publications, New Delhi, 2012)..

¹⁴ *Ibid*

most parts of the nation has led to water logging and pollution. The reforms in irrigation law seek to lessen the control of the government and emphasize the participation and involvement of stakeholders in the planning and management of the water resources for irrigation. This reflects the concept of 'Participatory Irrigation Management' (PIM), which envisions greater participation and involvement of farmers in the management of irrigation systems. One of the major drawbacks of this model is that the associations that are set up have no direct link with Panchayati Raj institutions. The different Acts regarding WUA passed by several states do not take into account the diversity of conditions in those states as there exists a high level of uniformity between these Acts.

It is suggested that there is a need to update most of the irrigation laws in the country which are generally based on the laws passed and developed in the colonial times. We can have a model irrigation law at the central level that addresses the various issues concerning irrigation comprehensively. Such law must reflect the principles that are applicable uniformly and to meet the challenges posed in the present times for instance regulating the over-exploitation of groundwater by the farmers for irrigation. The laws relating to public participation or WUA must ensure the involvement of 'Panchayati Raj Institutions' which are the backbone of rural administration in the country.

6.1.6 Conservation of Water Resources

Rainwater harvesting has received, these days, much attention from the policy framers keeping in view the decline in groundwater tables across the nation. 'The National Water Policy 2012' as well as many state policies like 'The Karnataka State Water Policy 2002' recognize the role of traditional water conservation practices like rainwater harvesting, including rooftop rainwater harvesting to further increase the utilizable water resources.²² 'The Model Groundwater Bill, 2016', also recognizes the adoption of rainwater harvesting as a method to improve the groundwater situation in critical areas.

It is submitted that there is absence of a comprehensive legal framework for rainwater harvesting, and legal provisions addressing rainwater harvesting are scattered in different water-related laws. There is a need to have specific and stringent laws making this practice or alternative water conservation practices mandatory to

participate in and contribute to effective water management. The conjunctive use of surface and groundwater resources should be a policy initiative to achieve their planned and efficient use.

6.1.7 Pricing of Surface and Groundwater

Water sector reforms are generally based on the perception that water is a tradable economic good. Treating water as an economic good may lead to several problems. One of the outcomes of this perception is the involvement of the private sector and the introduction of concepts such as water rights and privileges and charges on stakeholders for cost recovery. As a result, there may be denial of access and availability to those who lack the financial capacity to pay for water or the marginalized sections of society. Certain Act empowers the authorities to disconnect private water supply on non-payment of water bills. Few Acts contain such provisions namely ‘The Uttar Pradesh Water Supply and Sewerage Act, 1975’ (section 72), ‘the New Delhi Municipal Council Act, 1994’ (section 169), and ‘the Mumbai Municipal Corporation Act, 1988’ (section 279). No doubt, this may help generate revenue and ensure the financial sustainability of operations. But, the possibility of disconnection may also unfavorably affect the realization of the human right to water. Further, treating water as an economic good may lead to increased use of water as private because private service providers or actors may encourage water users to use more water particularly where the capital costs of investments are to be recovered through imposing charges on users. Moreover, there is no specific legislation to regulate and control the activities and functions of the private sector. Moreover, the public-private partnerships have, so far, not been successful in providing improved water services in the country. Experience across the world and even in India like Nagpur city reveals that the privatisation of drinking water services is a total failure model. The condition was such that the tariff of water has augmented to four times and the losses to NMC after privatization is 180 crores annually.

It is submitted that privatization should mean here only the privatization of services and not the privatization or commercialization of water itself. No doubt, Water has been said to be a social and economic good in the National Water Policy, but in the absence of a stringent law at the central level it remains a mere declaration. The corresponding state Acts must also conform to this statement by incorporating

appropriate provisions. It is, therefore, suggested that an enactment, containing the guidelines and norms within which the private bodies rendering water services, is needed to regulate the functions of such bodies effectively. Ultimately, it is the responsibility of the state to provide drinking water even to the poorest. The privatization of the services needs to be the proper control of the state and probably effective legislation and there must be transparency in all the affairs and functioning of the private bodies providing services related to water.

6.2 Recent Initiatives to Strengthen Legal Framework

For groundwater governance in India, comprehensive legislation to regulate the development of groundwater is lacking. In colonial times, the Indian Easement Act, of 1882, followed the common law principle of absolute proprietorship regarding groundwater as it recognized the right of the landowner to extract groundwater beneath his property. After independence, the legislative competence to enact laws on water rested primarily with the states under the State List. Though the Central Government found it difficult to enact legislation to regulate groundwater use due to its inability under the constitutional scheme, its first attempt dated back to 1970 when the first Model Groundwater Bill was circulated to the States which provided to regulate control, conserve, protect and manage the groundwater. Since then, it has been revised in 1992, 1996, 2005, and 2011, and more recently in 2016. The Union Government, through the Ministry of Water Resources, has been encouraging state governments to adopt groundwater laws by regularly modifying the draft Model Bill and circulating it to the States to regulate control, and manage the groundwater.¹⁵ It recognizes the application of the public trust doctrine and provides groundwater in its natural state as a common pool resource and private property rights in groundwater are inappropriate.

Most of the states in India have passed groundwater Acts, and with the odd exception, the adopted Acts and pending Bills follow the conventional command and control approach to regulate Central Ground Water Authority (CGWA)-notified areas on a well-by-well basis and as per assessment unit only. Blanket prohibitions of new structures for private groundwater abstraction are combined with an obligation to

¹⁵ P. Cullet, Sujith Koonan (ed.) *Water Law in India* 121 (Oxford University Press, New Delhi, 2011).

register existing ones and drilling companies. Regulation of the depth of wells and zoning arrangements around wells used as public drinking sources are common features, whereas provisions to control the present levels of groundwater development are absent just like protection of groundwater quality. No ‘integrated’ approach links groundwater to other (water) sectors or polluting activities. There is also a lack of safeguarding the nature protection areas, demarcation of drinking water protection zones besides around individual wells, regulation of emission of listed pollutants and substances (or quantities thereof), and regulation of certain listed activities and point/ diffuse sources. The basis for monitoring and control is mostly not the watershed (or sub-river) but an administrative assessment unit such as a District or Block. There is no provision for the active participation of users or community groups at the village level or elsewhere. Most of the state Acts do not give preference of use to drinking water, though certain Acts give attention to it, e.g. the Himachal Pradesh legislation requires the groundwater authority to give priority of use to drinking water.¹⁶

The lack of effective implementation of the existing Acts due to its politically sensitive nature is also one of the reasons for the mismanagement of groundwater resources. The dependence on groundwater for all uses of water in a state has led to a situation where no government wants to disturb the existing poise. Moreover, these regulations do not address the issue adequately and are designed in a manner that makes implementation difficult. Unfortunately, the Central Government has not so far been able to play a significant role despite the existence of the ‘Central Groundwater Authority’. An explicit legal or constitutional recognition seems necessary to bring about the requisite changes in the presumption of land-related private property in groundwater. The existing regulatory framework in India does not ensure equity or the sustainability of the use of groundwater. Therefore, effective reforms in groundwater laws will require an entirely new set of principles, approaches, and institutional mechanisms. It would seem necessary to reform both the law and the conditions surrounding the very implementation process and accordingly, the legal reforms concerning groundwater legislation in India are given below.

¹⁶ Section 7(3), Himachal Pradesh Ground Water (Regulation and Control of Development and Management) Act, 2005. Also *See* Chapter 2 for details.

- The same control system based on licensing for new wells in a few notified areas and the approach of upholding existing rules for right-holders and application of stricter rules to new users need to be reviewed.
- The intrinsic link between land rights and the use of groundwater should be cut off in the interest of sustainability and landlessness. A new approach based on a system of water allocations to farmers and industries could be adopted.
- Improved institutional arrangements, supported by better execution capacity and enforcement be put in place. For the collection of data and appropriate information relating to groundwater, an institutional setup backed by a legal framework is necessary.
- Legislation to regulate the usage of groundwater and prevent its pollution should be enacted by all states for uniformity in the principles concerning groundwater governance.
- The groundwater regulation framework must provide for the preservation of aquifers and the groundwater itself.
- ‘Panchayati Raj Institutions’ must be adequately empowered to involve themselves in the efficient management of groundwater in respective areas. The legislation should provide for public participation, local management, or community engagement.
- For required reforms in groundwater governance, a national legal framework for the Management of Water Resources (including groundwater) is deemed necessary.

The recent initiatives for improving GW governance are a half-hearted attempt as the passing of proposed legislations such as ‘The Water Conservation Authority Bill’, ‘The Inter-State Water Disputes Bill’, ‘River Basin Management Bill’, ‘Sustainable Groundwater Management Bill’, and ‘National Water Framework Bill’ etc. will further complicate the existing legal situation whereas the need of the hour is to manage the available surface and ground water resources conjunctively. Water being a State subject, some of the States are already harping about dilution of ‘federal structure’ and Union Govt. rendering the States governments as municipalities. Tamil

Nadu Chief Minister on April 15, 2025 announced the formation of a three-member high-level committee to review the provisions of the Constitution, laws and policies with respect to Centre-State relations and recommend appropriate steps to strengthen the States' autonomy and federalism

6.2.1 Role of Judiciary in developing a governance Framework

Based on scientific evidence, the judicial approach to water management¹⁷ has also profoundly contributed to the growth of laws relating to water. The Indian Constitution fails to recognize the human right to water. Yet the judiciary has time and again confirmed its existence.¹⁸ The courts have addressed several issues about water and its management including control over water, irrigation, groundwater, water pollution, drinking water, and sanitation. In the absence of a clear and exhaustive law, the judiciary has developed the fundamental structure of water law. The courts have given completely different responses to the issues they were asked to address in different contexts and there is thus no single trend that can be identified. The judicial pronouncements recognize the right to water as implied under the right to life given under Article 21 of the Constitution of India and have time and again proclaimed the existence of a fundamental right to water.¹⁹ The contribution of the judiciary in shaping this right to water as a fundamental right is commendable. Yet, there have been certain decisions that raised controversies concerning the right to water. This includes the Supreme Court's Sardar Sarovar Project judgment²⁰ in which the court justified the construction of the dam on the basis that it would meet the water needs of people residing in the command area. The adverse impacts of the judgment on the realization of the right to water of the persons evacuated were not stated. This decision reveals that the right to water is full of complications and there is a need to redefine the existing right to water.

¹⁷ See Chapter 3

¹⁸ *Subhash Kumar v. State of Bihar*, AIR 1991 SC 420, *FK Hussain v. Union of India*, AIR 1990 Ker 321. For details see Chapter 3

¹⁹ See, for instance, *Subhash Kumar v. State of Bihar*, AIR 1991 SC 420, *Chameli Singh v. State of Uttar Pradesh*, AIR 1996 SC 1051, *Hinch Lal Tiwari v. Kamla Devi and Others*, (2001)6 SCC 496. For details also see Chapter 3.

²⁰ *Narmada Bachao Andolan v. Union of India*, AIR 2000 SC 3751. Also see Chapter 3.

The inadequate progress of the case law concerning water is shown in the Plachimada Case²¹. It is noteworthy that at the first instance where this case appeared, the court observed that principles of common law are irrelevant in the existing situations and the doctrine of public trust should apply to groundwater as well. However, a subsequent judgment of the High Court reversed this and suggested that traditional norms conferring owners and occupiers of land the powers to extract unlimited groundwater should be maintained.²² The observation made by the judge where the matter was first filed appeared to be correct as in the same year the Supreme Court verdict stated that groundwater is covered by the public trust.²³ Resultantly, one cannot expect substantial changes in this area shortly. However, these issues can be better handled by passing sound legislation. Indian courts have devoted significant attention to environmental issues over the past few years with mixed outcomes from a social and environmental perspective. Several cases that appear to be addressing issues from an environmental perspective end up neither increasing environmental sustainability nor benefitting the poor and weaker section of society.

It can be safely inferred that undoubtedly the Indian judiciary has played a significant role in shaping the water law by evolving different principles and applying the existing laws to prevailing conditions aptly. However, it is the absence of Central legislation containing fundamental principles that gives rise to a lack of uniformity and difficulties in establishing a single trend in the various judgments. A comprehensive water law is also needed to define 'the right to water' under different settings and to provide its scope. Hence, National law is the need of the hour to address vivid issues and bring uniformity in the legal context of water management.

6.2.2 Contribution of International Organisations in delineating essentials of Water Governance

Development of International water law, which is expressed in the form of conventions, covenants, protocols, declarations, agreements, treaties, and resolutions is a complex, fragmented landscape. Various international conventions and covenants

21 Perumatty Grama Panchayat v. State of Kerala, 2004 (1) KLT 731 (High Court of Kerala) (16 December 2003). *Also see* Chapter 3.

22 Hindustan Coca-Cola Beverages v. Perumatty Grama Panchayat, 2005 (2) KLT 554 (High Court of Kerala) (7 April 2005). *Also see* Chapter 3 for details.

23 *Ibid*

relating to water management have been discussed in Chapter 4. These rules initially focus on issues related to the sharing of transboundary watercourses and address gradually an increasing number of issues relating to water globally. This point out that international law no doubt plays an important role in formulating water law at the domestic level but it is based on and looks for ideal situations at different levels which is very difficult to achieve at local levels. There is still a lack of uniformity in adopting varied principles or doctrines of international law by various countries.

It is, therefore, suggested that there is a need to frame a fundamental universal law containing basic principles addressing the different issues. Further, for an effective governance of water, it must develop into an integrated legal framework to support the integrated approach towards water. It is noteworthy that International law speaks about the ideal conditions which are hard to achieve at all local levels, so to attain the goals and objectives of international law, the domestic laws are to be framed and implemented in tune with them.

(ii) The theoretical basis of the several doctrines of international water law related to transboundary water resources management develops from diverse theories and doctrines. Several key principles of customary international water law overlap with each other or conflict with one another. Nations have conveniently chosen to rely on the specific customary principles that would support their claims to or actions over shared waters. Despite the wide extent of shared water resources, there does not exist any global treaty in force to govern the resources of transnational watercourses. ‘The United Nations Convention on the Law of the Non-Navigational Uses of International Watercourses, 1997’ was designed to serve as the global water law. This convention entails the contribution of the watercourse states to take part in the use, development, and preservation of a transnational watercourse in a just and sensible manner.²⁴ Despite this UN Convention, riparian countries raise and support their respective claims and counterclaims based on their interests and interpretations. This raises a question mark on the attainment of long-lasting peaceful sharing of river waters, especially in regions of political hostility. Further, the lack of a comprehensive legal and institutional framework for cooperative management involving riparian

²⁴ Article 5, The United Nations Convention on the Law of the Non-Navigational Uses of International Watercourses, 1997.

countries has become a major hindrance to ensuring effective management of transboundary water resources. It is thereby suggested that there is a need to have a detailed legal and institutional framework along with an effective dispute-resolution mechanism. The international law must also include the guidelines for cooperative management involving riparian rights.

- (iii) Other areas of concern concerning international water law are the lack of recognition and expressed mention of groundwater in the treaties and conventions. International law concerning groundwater is hardly found explicitly in any Convention or treaty. This is ironic that such a useful source of water is ignored in the international arena. So far only the United Nations Convention on the Law of the Non-navigational Uses of International Watercourses, 1997 recognizes groundwater, as the convention defines the watercourse to include both surface as well as groundwater.²⁵ However, this definition is also incomplete as it leaves the groundwater which is not connected to surface water.

Hence, there is a need to address all the relevant and important contents of the international law like groundwater which is an important component of water resource management.

- (iv) The settlement of international issues is primarily a foreign policy matter of a country and outside the ambit of national law. It falls under the domain of international law, and many of the principles and norms have already been discussed in chapter 4 related to international law. Water issues with Pakistan and China are of an added political and strategic nature as the political risks are greater. Issues related to water with Pakistan and China have the latent effect of becoming the reason for conflict that may lead to war.

6.2.3 Managing Trans-boundary Waters

It is suggested that a few fundamental considerations given below may be kept in view while dealing with and settling international transboundary disputes with neighbouring countries.

- The 'Indus Water Treaty' contains some rigorous provisions that affect India's Plans for developing projects on the western rivers. There is a need to make

²⁵ See Chapter 4.

amendments to the existing provisions of the treaty. It can be done through renegotiations or through establishing an Indus II Treaty. Under the draft provisions of the International Law Commission 'Responsibility of States for Internationally Wrongful Acts, 2001', India can contemplate the annulment of the treaty so long as it is proportional to a breach by the other side. It is well-known that Pakistan supports and abets terrorism on its soil. So the country can seek this abrogation as a first step towards suitable compensation. If Pakistan does not conform, India can probably threaten to walk out of several bilateral agreements including the IWT. But this action of India can harm its relationship with Pakistan's ally China and China can also adopt such measures against India.

- China's plans for the diversion of water from south to north on the rivers originating from the Tibet region, particularly on the 'Yarlung-Tsangpo' (Brahmaputra), is likely to affect the Indo-China relationship. China's proposed dams on the 'Yarlung-Tsangpo' are a substantial matter of concern for India. India needs to create global awareness about the exploitation of water resources in Tibet and build regional pressure.
- The significance of politics cannot be overlooked in India's water relations with Nepal and Bangladesh, But there exists more scope for creating and maintaining good relations with these countries through workable water-sharing measures. India should enhance its support for Nepal's proposed projects and should significantly invest in its water infrastructural projects. Small run-of-river projects should be initiated to create political confidence. With Bhutan, hydro-relations have been equally important. Sharing the advantages of river water cooperation will give impetus to a sound relationship between the two countries.
- India's approach with Bangladesh should be to have arrangements concerning the sharing of water and other related issues in the complete political and security context. The Ganges Treaty is now well established but the issues related to the sharing of Teesta and the construction of the Tipaimukh dam by India are likely to affect the relationship of the countries. It is in the interest of the country to carry on dialogues with Bangladesh on water sharing and cooperation. It is also required for India to consider its interest while making arrangements. Bangladesh also

needs to be sensitized to China's long-distance transfer of waters of the Brahmaputra.

6.2.4 Meeting the Water Demand for Agriculture

The Green Revolution began in the 1960s and was a period of technological innovation and agricultural transformation that significantly increased food production in many developing countries, including India. It introduced high-yielding varieties (HYVs) of crops, mainly wheat and rice, along with the extensive use of chemical fertilizers, pesticides, and irrigation. The Green Revolution was pivotal in transforming India from a food-deficient country to a self-sufficient one, particularly in staple crops. The outcomes of the study are discussed below in brief.

- Due to intensive agriculture practices and the dominance of the paddy-wheat system, Punjab is facing a faster depletion of its groundwater resources. The annual groundwater extraction at 33.85 BCM far exceeds the yearly groundwater recharge of 22.80 bcm. Hence, most areas (development blocks) in Punjab face over-exploitation of their groundwater resources and consequent water table depletion.
- Several Acts have been introduced in Punjab that aim to resolve this situation and ensure the long-term sustainability of groundwater. The present study examined the awareness of groundwater resources and legal policy amongst Punjab farmers and observed that, on average, the medium and large farmer owns one to two electricity-operated tubewells in all the respective zones of Punjab and thus have better access to higher use of groundwater for crop production.
- On the other hand, small farmers own more electric motors per Unit of cultivated area, which indicates a higher investment in irrigation infrastructure and poor utilization of resources. The level of awareness about groundwater availability, its depletion, factors affecting it, the role of community organizations, and legal literacy was lower among the farmers, especially among the farmers in the Southern Zone, comprising the districts of Bathinda, Mansa, Ferozepur, Mukatsar, Faridkot, Sangrur, Fazilka, and Barnala, which can jeopardize the long-term sustainability of groundwater in the State. Awareness about groundwater issues and legal literacy may decide the future path of groundwater

sustainability as they also significantly affect farmers' attitudes towards adopting water conservation practices.

- Adopting such technologies is also limited in all parts of Punjab. There is a need for a well-oiled extension program coupled with appropriate financial incentives to encourage farmers to adopt these technologies. Further, a campaign to make all farmers aware of the emerging legal policy framework in the state needs to be launched to bring a behavioural change in their rights and obligations in managing groundwater resources optimally.

6.3 Towards a National Ground Water Law

The water sector in India faces several challenges most of which are interrelated. The absence of a comprehensive legal framework has contributed to the overall mismanagement of water resources, especially groundwater resources as the present-day framework is complex, inadequate, and multifaceted. The current water law in India is composed of several rules, instruments, and judicial verdicts which are essentially not adequately compatible with one another. Hence, there is a need for the National Ground Water Law (NGWL) to bring consistency in principles governing water usage and ensure their justiciability.

India requires a new and integrated legal framework to guide water governance amongst the states and also within the states while recognizing the traditional and existing practices of water use and aiming at achieving some uniformity in rules and principles to ensure fairness and equity in the distribution of water and associated rights amongst users including states. An initiative like the preparation of the 'National Water Policy' is a good indicator of reforms in the water sector, and the current policy document is only a unifying factor of numerous principles linking to water management. This Policy also suffered from some drawbacks, one being its non-association with energy, food, and health policies of the republic. Further, The law of riparian states and the effect of climate change have also not been included while formulating the policy.

6.3.1 A new National Framework for water

According to 'the National Water Policy 2012,' *“There is a need to evolve a National Framework Law as an umbrella statement of general principles governing the*

*exercise of legislative and/or executive (or devolved) powers by the Centre, the States, and the local governing bodies. This should lead the way for essential legislation on water governance in every State of the Union and devolution of necessary authority to the lower tiers of government to deal with the local water situation.”*²⁶ A Draft National Water Framework Bill (NWFB) 2016 was also circulated by the Central Government to provide an all-encompassing legal framework with principles for regulation, conservation, protection, and management of water as a stressed but vital natural resource. This Bill has not been debated much by legal experts and civil society members despite its inordinate significance and dire need. The current Bill proposes major improvements in many aspects, one being the expansion of the definition of ‘water for life’²⁷, a positive step toward realizing the right to water. The Bill recognizes water as a common heritage and emphasizes community participation in water management. However, the Bills lack adequate elucidation on the mechanism for the implementation and development of institutions while laws and institutions have overlapping purposes and may result in a delay in execution. However, the Bill lays stress on the development of river basins and provides to set up the river basin and water regulatory authorities, but is ambiguous about the controlling or governing power over the state agencies or governments. The majority of politics is increasingly driving Water regulation in the country and is largely detached from scientific knowledge, practices, and international trends.²⁸ The outcome of the proposed Bill depends upon the support and adoption by the states.

Because of the above, the formulation of an NGWL for India must begin with a statutory order for developing the corpus juris i.e. body of law. Given the statutory mandate, the water resources of the country have to be managed equitably and wisely for all citizens. Formulation and the success of such a legal framework is not only a challenge in itself but also a challenge relating to human attitudes and science. Accordingly, the following few provisions can be included in NGWL for a clear recognition of the multiple dimensions of water.

²⁶ Para 2.1, National Water Policy, 2012. For details, *see* Chapter 2.

²⁷ For details *see* Chapter 2.

²⁸ Sarada Prasanna Das and Ashwini K. Swain, “*India Has Legislative Solutions to Its Water Management Problems, But Will They Work?*” available at <https://thewire.in/71388/india-water-management-problem/> (Visited on 24 October 20 2023).

- Water is essential for life. The NGWL will provide an explicit legal basis for primacy to this aspect of water, along with recognition of the right of other species, like wildlife or livestock to water.
- The NGWL should bring together various current laws and case laws related to water under a unifying and overarching framework. However, the basic right to drinking water must be given clear priority over other kinds of water rights.
- The NGWL must determine the role of the state because of its control over the resources and the doctrine of trust regarding water management. It should be a legal base for public participation and the role of the community, including Participatory Irrigation Management in the governance of water and its sources.
- The law must provide an integrated framework for large Water-related projects. It has to make a certain and strong resolve for privatization in the context of water.
- NGWL should have an all-inclusive section for resolving water-related disputes between countries, states, areas, sectors, users, and. usage.
- The NGWL should also have the provision to deal with the protection of varied water sources (lakes, rivers, other surface water bodies, mountains, springs, forests, aquifers, water harvesting structures, wetlands, etc.) from degradation, or contamination or pollution as well as over-exploitation.
- It must encompass the important concerns, viz. promotion of awareness about scarcity, conservation of the resource, need to enforce economy in every type of water use, the evading the misuse and waste, and so on.
- Regarding industrial use, the law will include the requirement of reuse, and recycling, prescribe norms for effluent treatment and standards for final discharge, and so on, and will have to provide a system of approvals per norms, and rules.
- The NGWL must take note of the pollution of water by agricultural residues. It should also provide for legal backing in Water resources and activities such as fisheries, navigation, boat-plying, the requirement of aquatic life, run-of-the-river schemes, wildlife, and so on.

- Rainwater harvesting and Watershed development may be given a legal basis under such law. Keeping in view a governing philosophy, the various themes and elements mentioned above need to be suitably integrated into a structured whole.

The proposed NGWL must be construed as a tool to change the statutory position on the water in any way, to bring any modification in the Centre-State relationship, or to centralize water governance. The proposed Act is not a Union Govt. legislation for Ground Water Governance, but a framework stating the overall principles regarding groundwater management, governing the usage of legislative and/or executive authority by governing bodies like local self-government, the States, and the Centre. It is brought out that NGWL is not a panacea for the resolution of water crises comprising several challenges and encompassing many dimensions, but a significant stride for unifying the diverse and contrary principles and approaches relating to the governance of water resources in the country.

Considering the strategic importance of India's groundwater resources, its use is badly in need of reform for regulation. The development of the resource occurs largely in the private sector and without control of effective authority. At the policy level, there is no dearth of research studies and expert reports and there is a high level of awareness in the country about the current situation; under a business-as-usual paradigm, large parts of the country are already severely water-stressed, with a bleak future. Yet, improved water use efficiency can only be achieved with systematic efforts and a combination of incentives, instruments, and institutions- legislation being one. In the field of groundwater, the expected resistance from landowners – especially farmers – against restrictions to their right to abstract unlimited volumes of water from tubewells contributes to an unwillingness among lawmakers to even suggest changes to the prevailing order. Because of the hundreds of millions of direct and indirect groundwater users in the country, and the majority of well owners assumed to be more or less reluctant to change, it is easy to concede to the challenge at hand. Limited human, administrative, technical, and financial capacity remains a major stumbling block at all levels. To check the prevailing culture of non-compliance stands in the way of law as an enforceable instrument, it would be necessary to reform both the law and the conditions surrounding the very implementation process.

Reformed legislation must be coupled with improved institutional arrangements and strengthened capacity for implementation and enforcement. It also suggests that to confront problems shaped by low legitimacy, groundwater users (including local politicians) need to better understand the basic hydrogeology of their surrounding environment. A scientifically informed, decentralized, contextualized, and integrated yet wide approach to groundwater governance can be viable given that it incorporates strong accountability and powerful means of enforcement. Nonetheless, it is probably the participatory trajectory that will receive the most spotlight shortly, along with voluntary self-restraint and reallocation in communities under severe groundwater stress. Behavioural change should, among other things, be based on a 'leading by example' approach where high-ranking officials and politicians showcase how they comply with the applicable provisions. Only when the need for reform is internalized and translated into altered conduct at the top, the law can become a viable tool for change towards a society that takes its groundwater resources seriously.

6.4 Upgrading in current Governance Structure

Water crisis entails the availability and accessibility of clean and safe drinking water, the contamination of freshwater, overexploitation, and pollution of groundwater, the distribution of water amongst different stakeholders, and so on. It is felt that this legal framework for groundwater governance will essentially be an important step towards unifying the different and contradictory principles and approaches relating to groundwater management in the country. However, it will not be a panacea for resolving the water crises composed of various issues and challenges and encompassing Groundwater governance dimensions. The case study of Punjab reveals that the reforms in the regulation of Groundwater resources in the country are urgently required, given the looming crisis. Sustainability can only be achieved by improved water use efficiency and a combination of incentives and instruments, including legal measures. The case study indicates that the resistance from farmers to check the unlimited extraction of groundwater for irrigation, lack of political will on the part of politicians restraining them even from suggesting changes in the present policies, incentives, and legal framework, and a culture of non-compliance of law would stand in the way to reforms. We need not only to create an appropriate legal framework but also an enabling environment for efficient groundwater governance.

The reforms in the legislative framework must be supported even with an improved institutional framework to facilitate effective enforcement and efficient implementation. To render the prevailing culture of non-enforcement ineffective, a process of adapting to the emerging needs of society and a continuous review is urgently required. The issue of groundwater scarcity at the local, regional, and national levels needs the immediate attention of the Government and interventions to manage and control the development of Groundwater resources. The time is ripe for the country to have a comprehensive legal framework to efficiently govern the usage of Groundwater resources.

- A. Over-Exploitation and Depletion:** Punjab has one of the highest rates of groundwater extraction in India, with nearly 80% of groundwater blocks categorized as over-exploited. The over-reliance on groundwater for agriculture, particularly for water-intensive crops like paddy, has led to a rapid decline in water tables and need to be checked.
- B. Ineffectiveness of Legal Framework:** The existing laws, such as the Easement Act of 1882, provide landowners unrestricted rights to extract groundwater, leading to overuse. The Punjab Preservation of Subsoil Water Act (2009) has had limited success in curbing excessive extraction, as farmers continue to rely on groundwater due to lack of alternative irrigation sources. Regulatory bodies such as the Punjab Water Regulation and Development Authority require strong enforcement mechanisms for good governance.
- C. Lack of Policy Coordination:** Multiple institutions (state and central) are involved in groundwater governance, leading to fragmented decision-making and poor implementation. Absence of a comprehensive groundwater management policy tailored to Punjab's specific socio-economic and environmental conditions.
- D. Social and Economic Challenges:** Farmers depend on free or subsidized electricity, encouraging excessive groundwater pumping. Lack of awareness and incentives for sustainable water practices among farming communities. Small and marginal farmers face challenges in adopting water-efficient technologies due to high costs and lack of institutional support.

- E. Environmental and Health Impacts:** Depleting groundwater levels have led to increased arsenic and fluoride contamination, affecting public health. Lowering water tables has resulted in drying up of traditional wells and reduced base flows in rivers, affecting aquatic ecosystems.
- F. Regulating Agricultural Water Use:** Promote crop diversification away from water-intensive crops (e.g., paddy) to less water-consuming alternatives like maize, pulses, and horticulture. Implement metered electricity supply for agricultural pumps to control excessive extraction.
- G. Conjunctive use of available resources:** Introduce a Punjab Groundwater Management Act that clearly defines water rights extraction limits, and penalties for violations. Enforce mandatory groundwater recharge mechanisms for industries and bring large-scale agricultural users under the legal ambit. There is a need to promote recycling and reuse of waste water.
- H. Enhancing Institutional Coordination:** Establish a single regulatory body to oversee groundwater governance, ensuring synergy between state and central agencies. Strengthen community-based water management programs, encouraging farmers to adopt sustainable practices.
- I. Technological and Infrastructure Interventions:** Promote drip and sprinkler irrigation to reduce groundwater wastage. Invest in rainwater harvesting and artificial recharge structures to replenish groundwater. Start a mass awareness campaign for adoption of efficient water use technologies and capacity building of users on sustainable water management. Introduce water conservation incentives and subsidies for farmers adopting efficient irrigation practices.

The legal frameworks for groundwater governance must be custom-made to suit the financial, technological, and institutional capacities of the States as well as their geography, environment, customs, cultures, political systems, and prevalent practices, failing which, these are likely to face the problems in acceptance and implementation. Groundwater is increasingly being seen as a private resource rather than that is tied to property rights and issues of its regulation and the environmental concerns require an increasing attention. As climate variability increases, the suitable mechanisms to balance consequential uncertainties in its availability and quality will become

increasingly crucial to ensure water rights. To effectively and sustainably improve groundwater governance and check the trend of declining and degrading groundwater, positive developments in legal framework for its governance must be bolstered with supportive policies, coupled with appropriate institutional and administrative reforms. Legal frameworks that are well tailored to the specific local contexts are indispensable for good groundwater governance.

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ANNEXURE I
QUESTIONNAIRE

| | |
|----------|--|
| HHID | |
| District | |
| Block | |
| Village | |
| Date | |

Section A: Socio-economic information of the households

Section A1: Socio-economic descriptive of the household

| Code | Question | Response |
|------|--|----------|
| A1 | Name of the respondent | |
| A2 | Mobile number of the respondent | |
| A3 | Relationship of respondent to head of the household (Code: 1= Head himself, 2= Father/Mother, 3= Wife/Husband, 4= Son/Daughter, 5= Grandfather/mother, 6= Son/Daughter in law, 7= Uncle/Aunt, 8= Nephew/Niece, 9= Grandchild, 10= employee, 99 = others (specify)) | |
| A4 | Name of the household head | |
| A5 | Name of household head's father | |
| A6 | Religion of the household [codes: 1= Sikh, 2= Hindu, 3= Muslim, 99= Others (specify)] | |
| A7 | Caste of the household [Codes: 1= General, 2= OBC, 3= SC, 4= ST, 99= Others (specify)] | |
| A8 | Do you hold membership in any of the societies? [1= Cooperative Society, 2= Self Help Group, 3= Farmer's Club, 4= Farmer producer organisation, 5= religious organisations(specify), 99= others specify] | |
| A9 | What is the size of your family? | |

Section A2: Socio-economic description of the household

| No. | Name | Rel to HH (Code: A) | Gender (1= Male, 2= Female) | Age (years) | Education (Years) | If graduate or above, please name the degree as well | Type of school/college last attended (Code: B) | Location (Code: C) |
|-----|------|------------------------|--------------------------------|----------------|----------------------|---|---|-----------------------|
| 1 | | | | | | | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |

Code A: 1= Head himself, 2= Father/Mother, 3= Wife/Husband, 4= Son/Daughter, 5= Grandfather/mother, 6= Son/Daughter in law, 7= Uncle/Aunt, 8= Nephew/Niece, 9= Grandchild, 10= employee, 99 = others (specify)

Code B: 1= Government, 2= Private, 3= Semi-Government, 99= Others specify

Code C: 1= with in Village, 2= another village, 3= within city, 4= another city in Punjab, 5= another city outside Punjab, 6= Abroad

Section A3: Socio-economic description of the household occupation

| No. | Name | Primary Occupation (Code: A) | Annual Income (Rs) | Occupied (current job) | First Job (specify) | Year started (first job) | Secondary Occupation (Code: A) | Annual Income (Rs) |
|-----|------|---------------------------------|-----------------------|---------------------------|------------------------|-----------------------------|-----------------------------------|-----------------------|
| 1 | | | | | | | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |

Section B: Land holdings and farm asset information

B1. Information of land assets in the household

| Particulars | Details | |
|---|---------|--|
| 1. Owned land (in acres) | | |
| 2. No. of plots of owned land | | |
| 3. Area owned plot wise (in acres) | a. | |
| 4. No. of motors owned plot wise (with hp) | a. | |
| 5. Source of irrigation (1=Tube well, 2=Canal, 3=Both Canal and Tube well, 99=Other sources[specify]) | a. | |

B2. Leased-in Land Details

| Particular | Plot-1 | Plot-2 | Plot-3 | Plot-4 |
|---|--------|--------|--------|--------|
| 1. Area of the land leased-in (acres) | | | | |
| 2. Source of irrigation in the leased-in land [1=Canal Water, 2=Electric Motor of the lessee (give hp of motor), 3=Own electric motor from adjoining field (give hp of motor), 99=others (specify)] | | | | |
| 3. Terms of lease [1=Rent, 2=Shared cropping, 99=other (specify)] | | | | |
| 4. Rent paid for the leased in land (Rs/acre) | | | | |
| 5. Source of irrigation in the leased-in land [1=Canal Water, 2=Electric Motor of the lessee (give hp of motor), 3=Own electric motor from adjoining field (give hp of motor), 99=others (specify)] | | | | |
| 6. Is there sufficient water on Leased-in land? (1=Yes, 0=No) | | | | |
| 7. Is the leased-in plot adjoining your own land? (1=Yes, 0=No) | | | | |
| 8. Give details of the leased-in land. (1=Village land (VL), 2=Other land, specify) | | | | |
| 9. When did you first start leasing in? (year) | | | | |

B3. Leased-out Land Details

| Particular | Plot-1 | Plot-2 | Plot-3 | Plot-4 |
|--|--------|--------|--------|--------|
| 1. Area of the land leased-out (acres) | | | | |
| 2. Terms of lease [1=Rent, 2=Shared cropping, 99=other (specify)] | | | | |
| 3. Source of irrigation in the leased-out land [1=Canal Water, 2=Electric Motor of the lessee (give hp of motor), 3=Own electric motor from adjoining field (give hp of motor), 99=others (specify)] | | | | |
| 4. Rent received for the leased out land (Rs) | | | | |
| 5. Major reason for leasing out land by the farmer in the household | | | | |
| 6. Is there sufficient water on Leased-out land? (1=Yes, 0=No) | | | | |
| 7. Is the leased-out plot near roadside? (1=Yes, 0=No) | | | | |
| 8. Is the leased-out plot adjoining your own land? (1=Yes, 0=No) | | | | |
| 9. Is the leased-out plot adjoining leasing-out farmer's own land? | | | | |

B4. Information about irrigation (Tubewells)

| Particulars | Response |
|--|----------|
| 1. Number of motors | |
| 2. Type of motor (1=Submersible, 2=Centrifugal) | |
| 3. Horse power of the motor | |
| 4. Ownership details (1=Fully owned, 2=shared) | |
| 5. If shared with whom? | |
| 6. Percentage share | |
| 7. Depth of well in case of centrifugal pump (Ft) | |
| 8. Depth of water table (Ft) | |
| 9. Depth of bore well (Ft) | |
| 10. Depth of delivery pipe now (Ft) | |
| 11. Depth of delivery pipe when installed (Ft) | |
| 12. Year of installation | |
| 13. Cost of installation (Rs) | |
| 14. How was the cost incurred (talk about your share only) [Codes:1=own savings, 2=borrowings, 99=others(specify)] | |
| 15. If motor has replaced the centrifugal pump then depth of well before the shift (Ft) | |
| 16. Last time motor seen on the surface | |
| 17. Number of times well deepened | |
| 18. Length of pipe each time of deepening (Ft) | |

Section C: Awareness and perceptions of the households

C1: Farmer's awareness and adoption of improved agricultural practices

| Technology | Awareness (0=No, 1=Yes) | Adoption (0=No, 1=Yes) | If No, then reason for non-adoption/dis adoption (Code A) | If Yes, then year | Crop / Area |
|---------------------------|----------------------------|---------------------------|--|-------------------|-------------|
| 1. Laser land levelling | | | | | |
| 2. Direct seeding of rice | | | | | |
| 3. Sprinkler irrigation | | | | | |
| 4. Drip irrigation | | | | | |
| 5. Rain water harvesting | | | | | |

Code A: 1=Lack of technical guidance, 2= Technology did not work, 3=Increase in cost, 4= decline in yield, 99= others (specify)

C2: Farmer's awareness about government policies/ regulations regarding water conservation

| Particulars | Awareness (0=No, 1=Yes) |
|--|-------------------------|
| Do you know about the Sub Soil Water Act? | |
| If so, is it viable to cultivate the paddy fields after June 15? | |
| Do you think the area under paddy cultivation decreased after implementing this Act? | |
| Do you observe that the groundwater depth fall has been checked after the Act? | |
| Does this policy increase the density of electric tube wells? | |
| Does this strategy of restricting paddy cultivation before June 15 help in recharging the groundwater? | |
| Is there a monsoon shift? | |
| Does this Act need any refinement? Please specify. | |
| Do you know about the Groundwater Authority Act? | |
| Do you know about the Canal and Drainage Act? | |
| Is the State Govt. appropriately maintaining the drainage work? | |
| Do you observe the efficient delivery of canal water in your fields? | |
| Do you receive timely compensation for crop damage due to floods? | |
| Have you faced the problem of soil erosion due to canal water in your field? | |

C3: Farmer's perceptions about climate changes and related factors affecting groundwater sustainability

| Particulars | Awareness (0=No, 1=Yes) |
|---|-------------------------|
| A reduction in the rainy days | |
| A decline in average rainfall | |
| Increase in untimely rain events | |
| Rise in temperature | |
| A decline in the incidence of heavy rains | |
| Decrease in the number of rainy days | |
| A decline in average rainfall | |
| Increase in untimely rain events | |
| Rise in temperature | |
| A decline in the incidence of heavy rains | |

C4: Farmers' awareness and perceptions about GW depletion and its conservation

| Particulars | Awareness (0=No, 1=Yes) |
|---|-------------------------|
| Awareness of the adverse effect of groundwater depletion on groundwater stock | |
| Groundwater depletion adversely affects agriculture | |
| Groundwater depletion is due to increased area under paddy | |
| Groundwater depletion due to wasteful use of water | |
| Farmers' cooperatives can help reduce the wastage of groundwater | |
| Farmers favouring the role of cooperatives in groundwater sustainability | |
| Awareness of laws/rules to regulate groundwater use | |
| Do the villagers follow them? | |
| Awareness of the adverse effect of groundwater depletion on groundwater stock | |

ANNEXURE II

Socio-economic status of the farming households

Table A1: The age-wise distribution of the sample households

| Zone | Age group | Frequency | Share (%) |
|----------------|------------------|------------------|------------------|
| Zone 1 | 0-18 | 157 | 22.18 |
| | 18-30 | 163 | 23.02 |
| | 30-60 | 292 | 41.24 |
| | 60+ | 96 | 13.56 |
| Zone 2 | 0-18 | 205 | 22.23 |
| | 18-30 | 230 | 24.95 |
| | 30-60 | 360 | 39.05 |
| | 60+ | 127 | 13.77 |
| Zone 3 | 0-18 | 221 | 22.46 |
| | 18-30 | 269 | 27.34 |
| | 30-60 | 358 | 36.38 |
| | 60+ | 136 | 13.82 |
| Overall Punjab | 0-18 | 583 | 22.30 |
| | 18-30 | 662 | 25.33 |
| | 30-60 | 1010 | 38.64 |
| | 60+ | 359 | 13.73 |

Source: Primary Survey

Table A2: Gender-wise average age of males and females (years)

| Zone | Gender | Average Age |
|----------------|---------------|--------------------|
| Zone1 | Male | 36.28 |
| | Female | 35.88 |
| Zone2 | Male | 34.98 |
| | Female | 36.34 |
| Zone3 | Male | 34.36 |
| | Female | 34.68 |
| Overall Punjab | Male | 35.21 |
| | Female | 35.63 |

Source: Primary Survey

Table A3: Age group-wise major principal status of sample farming households

| Zone | Age Group | Principal Status | Share, % |
|-------------------|-----------|-----------------------------|----------|
| Zone 1 | 0-18 | Child | 15.29 |
| | | Study | 80.89 |
| | 18-30 | NRI | 5.52 |
| | | Private and Contractual Job | 9.20 |
| | | Farming | 20.25 |
| | | Study | 25.15 |
| | | Household Work | 26.38 |
| | 30-60 | Permanent Govt. Job | 6.85 |
| | | Farming | 32.88 |
| | | Household Work | 45.21 |
| | 60+ | Household Work | 8.33 |
| | | Farming | 18.75 |
| Old age Pensioner | | 23.96 | |
| Old | | 45.83 | |
| Zone 2 | 0-18 | Child | 17.07 |
| | | Study | 78.05 |
| | 18-30 | NRI | 5.65 |
| | | Private and Contractual Job | 9.57 |
| | | Study | 21.30 |
| | | Farming | 25.65 |
| | 30-60 | Household Work | 29.13 |
| | | Farming | 42.78 |
| | 60+ | Household Work | 43.06 |
| | | Household Work | 13.39 |
| | | Old Age Pensioner | 20.47 |
| | | Farming | 22.05 |
| Zone 3 | 0-18 | Child | 25.81 |
| | | Study | 70.05 |
| | 18-30 | Agricultural Labourers | 6.67 |
| | | Private and Contractual Job | 8.15 |
| | | Unemployed | 8.52 |
| | | Study | 15.93 |
| | | Farming | 20.00 |
| | 30-60 | Household Work | 32.96 |
| | | Farming | 43.30 |
| | 60+ | Household Work | 45.30 |
| | | Household Work | 19.18 |
| | | Old Age Pensioner | 19.86 |
| Farming | | 21.92 | |
| Overall Punjab | 0-18 | Child | 20.79 |
| | | Study | 79.21 |
| | 18-30 | Agricultural Labourers | 3.11 |
| | | Private and Contractual Job | 10.21 |
| | | Unemployed | 3.98 |
| | | Study | 23.01 |
| | | Farming | 25.26 |
| | 30-60 | Household Work | 34.43 |
| | | Farming | 46.34 |
| | 60+ | Household Work | 51.37 |
| | | Permanent Govt. Job | 2.29 |
| | | Household Work | 14.49 |
| Old Age Pensioner | | 21.59 | |
| | | Farming | 21.59 |
| | | Old | 42.33 |

Source: Primary Survey

Table A4: Gender-wise educational status of the farming households study

| Education Level | Zone1 | | Zone2 | | Zone3 | | Overall Punjab | |
|-----------------|-------|--------|-------|--------|-------|--------|----------------|--------|
| | Male | Female | Male | Female | Male | Female | Male | Female |
| | 7.49 | 12.87 | 12.52 | 13.63 | 21.61 | 23.62 | 14.85 | 17.37 |
| 1 | 2.14 | 2.10 | 3.72 | 2.19 | 4.21 | 1.83 | 3.53 | 2.02 |
| 2 | 1.60 | 0.60 | 2.54 | 3.65 | 1.28 | 2.06 | 1.82 | 2.24 |
| 3 | 2.14 | 2.10 | 1.96 | 4.62 | 3.11 | 4.36 | 2.45 | 3.87 |
| 4 | 1.34 | 1.20 | 2.35 | 1.95 | 3.30 | 2.52 | 2.48 | 1.98 |
| 5 | 6.95 | 12.28 | 9.39 | 16.30 | 10.62 | 12.84 | 9.28 | 13.90 |
| 6 | 4.81 | 3.29 | 1.96 | 2.19 | 1.47 | 1.61 | 2.46 | 2.24 |
| 7 | 1.60 | 1.80 | 3.13 | 2.68 | 2.56 | 4.36 | 2.54 | 3.12 |
| 8 | 8.02 | 9.88 | 9.98 | 5.60 | 6.96 | 8.94 | 8.32 | 8.02 |
| 9 | 4.81 | 3.59 | 2.54 | 2.92 | 3.11 | 3.67 | 3.31 | 3.39 |
| 10 | 22.46 | 20.06 | 20.55 | 20.44 | 16.12 | 15.37 | 19.28 | 18.34 |
| 11 | 1.87 | 0.90 | 1.96 | 1.22 | 1.28 | 0.92 | 1.67 | 1.02 |
| 12 | 20.59 | 11.68 | 18.20 | 12.90 | 14.47 | 9.63 | 17.32 | 11.30 |
| 12+ | 14.17 | 17.66 | 9.17 | 9.73 | 9.89 | 8.26 | 10.66 | 11.19 |

Source: Primary Survey

A5: Gender-wise principal status of the sampled farming households

| Zone | Gender | Principal Status | Share, % [@] |
|----------------|--------|---------------------|-----------------------|
| Zone 1 | Male | Farming | 36.90 |
| | | Study | 24.87 |
| | | Old | 6.15 |
| | Female | Permanent Govt. Job | 5.88 |
| | | Household work | 53.29 |
| | | Study | 22.46 |
| Zone 2 | Male | Old | 7.78 |
| | | Farming | 45.99 |
| | | Study | 23.48 |
| | Female | Old | 5.87 |
| | | Household work | 56.20 |
| | | Study | 22.14 |
| Zone 3 | Male | Old | 6.57 |
| | | Old age pensioner | 5.11 |
| | | Farming | 41.76 |
| | Female | Study | 22.16 |
| | | Old | 7.14 |
| | | Child | 6.96 |
| Overall Punjab | Male | Household work | 62.56 |
| | | Study | 17.58 |
| | | Child | 6.16 |
| | Female | Farming | 42.13 |
| | | Study | 23.30 |
| | | Old | 6.43 |
| Overall Punjab | Male | Child | 2.72 |
| | | Household work | 57.96 |
| | | Study | 20.42 |
| | Female | Child | 2.43 |
| | | Old | 4.29 |

@: The percentages are for major principal status, thus do not add upto 100.

Source: Primary Survey

Table A6: Details of operational holdings across various zones and farm-size categories

| Zone | Farm Category | Owned Land | Leased-in Land | Leased-out Land | Operational Land |
|-----------------------|---------------|-------------|----------------|-----------------|------------------|
| Zone 1 | Large | 14.04 | 10.73 | 0.00 | 24.77 |
| | Medium | 5.56 | 1.38 | 0.00 | 6.94 |
| | Small | 1.87 | 0.03 | 0.63 | 1.27 |
| | Overall | 5.08 | 1.86 | 0.23 | 6.70 |
| Zone 2 | Large | 15.67 | 16.77 | 0.00 | 32.44 |
| | Medium | 5.13 | 1.88 | 0.00 | 6.94 |
| | Small | 2.42 | 0.16 | 0.91 | 1.61 |
| | Overall | 6.99 | 4.97 | 0.23 | 11.65 |
| Zone 3 | Large | 17.28 | 8.26 | 0.00 | 25.55 |
| | Medium | 5.68 | 1.84 | 0.09 | 7.43 |
| | Small | 1.37 | 0.05 | 0.03 | 1.36 |
| | Overall | 5.96 | 2.13 | 0.06 | 7.99 |
| Overall 1 | Large | 15.76 | 13.39 | 0.00 | 29.15 |
| | Medium | 5.47 | 1.73 | 0.04 | 7.13 |
| | Small | 1.89 | 0.08 | 0.53 | 1.41 |
| Overall Punjab | | 6.07 | 3.06 | 0.17 | 8.91 |

Table A7: Income distribution (Rs.) of farming households

| Zone | Farm Category | Crop Income | Livestock Income | Rental Income | Pension | Wage Income | Total Income |
|-----------------|----------------|-----------------|------------------|---------------|----------------|-----------------|------------------|
| Northern Punjab | Large | 863758.5 | 93076.9 | 0.0 | 1569.2 | 0.0 | 996866.2 |
| | Medium | 197880.7 | 37757.6 | 0.0 | 30150.0 | 158151.5 | 447194.4 |
| | Small | 20325.0 | 24978.3 | 20250.0 | 33652.2 | 130434.8 | 244727.1 |
| | Overall | 201791.5 | 38808.0 | 7452.0 | 28466.4 | 131504.0 | 429852.3 |
| Central Punjab | Large | 971851.0 | 420652.8 | 0.0 | 10500.0 | 13000.0 | 1427781.6 |
| | Medium | 206677.1 | 102641.0 | 1743.6 | 7115.4 | 48250.0 | 389863.0 |
| | Small | 44654.1 | 41223.7 | 28184.2 | 2368.4 | 63952.6 | 210435.7 |
| | Overall | 347396.7 | 162605.3 | 7940.8 | 6730.3 | 43827.0 | 590829.0 |
| Southern Punjab | Large | 875069.9 | 95863.6 | 0.0 | 545.5 | 25363.6 | 1037751.7 |
| | Medium | 259995.4 | 39667.3 | 3415.8 | 5002.0 | 54396.0 | 366694.4 |
| | Small | 42903.0 | 32142.9 | 952.4 | 5785.7 | 63642.9 | 156569.7 |
| | Overall | 286745.5 | 45244.9 | 2333.3 | 4607.3 | 52878.8 | 402682.4 |

Source: Primary Survey