This book is a compilation of articles published by the Centre for Research in Water Resource Management and Law, a research wing of Karnataka State Law University, Hubballi. Dedicated to the study of water management and regulation, the Centre has produced this broad-ranging and interdisciplinary articles encompassing integrated approaches in water law, constitutional dimensions to water resources, implications of Mahadayi award, groundwater conservation, interlinking river projects of Karnataka, traditional irrigation systems such as Katta and state water policy. The book is earnestly hoped to make a meaningful contribution to the literature on water studies.

Emerging Trends in Water Law and Management

- P. Ishwara Bhat
- Akhila Basalalli

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Karnataka State
Law University, Hubballi

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A PUBLICATION FROM THE CENTRE FOR RESEARCH IN WATER RESOURCE MANAGEMENT AND LAW, KARNATAKA STATE LAW UNIVERSITY, HUBBALLI

Emerging Trends in Water Law and Management

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Preface

The book *Emerging Trends in Water Law and Management* is the first publication of the Centre for Research in Water Resource Management and Law, a research wing of Karnataka State Law University, Hubballi dedicated to the study of water laws, water crisis and management, groundwater conservation and management, traditional irrigational systems, water disputes (national and international), dams, interlinking of rivers, management of drinking water and sanitation to name a few. The book is a varied and rich compilation of articles the Centre has produced by studying and researching about water as a resource, its management and regulation. These wide-ranged articles are an outcome of both empirical and doctrinal research the Centre's team has undertaken to understand and study the nuances concerning water.

The opening article of the book 'Emerging Jurisprudence of Integrated Approach on Sharing, Quality Management and Conservation of Water' by P. Ishwara Bhat, illuminates the importance of an integrated approach for judicious management of water resources. In the paper, he argues that the integrationist model must be an underlying block for the investigation and adjudication of water disputes; that collaboration among the pollution control boards and other agencies to combat the problem of pollution becomes indispensable; and for addressing the discrepancies arising out of federal structures, a concerted approach becomes essential. He points out that development with a wholesome environment calls for avoidance of spillage of water, cooperation among regulatory agencies or multiple departments and that a holistic development of the catchment area and basin augments water resources.

The article 'Regulating and Managing Groundwater in Karnataka' authored by P. Ishwara Bhat, Akhila Basalalli and Nayashree Bhosge, elucidates the plight of groundwater in Karnataka. The alarming overdraft of groundwater has resulted in deficit and growing chemical infiltration. It further critically examines the two governing groundwater regulations of Karnataka-Karnataka Ground Water (Regulation for Protection of Sources of Drinking Water) Act, 1999 and

the Karnataka Ground Water (Regulation and Control of Development and Management) Act, 2011 in the light of the Model Bill. Looking towards a suitable solution, the paper proposes an integrationist model drawing inspiration from Andhra Pradesh which has assimilated land, forest and water management.

The following article on 'Water Constitutionalism: A Study' by Akhila Basalalli, encapsulates the constitutional dimensions concerning water by referring to a body of precedents. It explains the channels through which the Constitution provides a framework for efficient water management explicitly and through interpretation. The different segments of the paper such as clean water as a fundamental right and integral part of sustainable development, development of distributive justice with socio-economic equity, responsibility of local bodies in water governance, international commitments and water dispute resolution have been discussed in great detail.

The riveting article on 'Kattas of Dakshina Kannada, Udupi of Karnataka and Kasargod of Kerala: A Study of their Revival, Regulation and Management' authored by P. Ishwara Bhat, Akhila Basalalli and Nayashree Bhosge, emphasizes on the need for reviving the traditional irrigation systems. Kattas which are a classic irrigation system of coastal Karnataka and partly Kerala, constructed against the rivulets and streams with the local material are studied for their multi-faceted benefits. The need for their regulation is felt as they are greatly desired by the local communities. The paper tests the structures against the Vented Dams that have slowly gained popularity.

P. Ishwara Bhat in his enthralling article 'The Elements of Ecology, Equity and Development with Justice in the Mahadayi Tribunal's Decision on Inter-State Water Disputes: A Critical Study' initiates the discourse on the overriding importance attached to ecological and environment over development by the Tribunal. He argues that the non-integration of human environment with that of the environment could be the possible reason for such a decision. The article further contends that the quantity of water that was agreed upon in 1996 is maintained as it is (with negligible increase) by the Tribunal even after twenty-two years depicting very little importance given to the idea of sustainable development.

Akhila Basalalli in the following article 'Interlinking River Projects in Karnataka: An Overview', provides an overview of the interlinking projects in Karnataka. The paper debates the desirability of these projects in the light of socio-economic rights and ecological concerns. The links such as Bedthi-Varada, Netravathi- Hemavathi, Krishna (Almatti)- Pennar and Mahadayi- Malaprabha are studied to understand their contemporary position and impact.

In the last article comments on the Draft State Water Policy 2021, Akhila Basalalli studies the initiative of the Water Resource Department, Government of Karnataka in addressing the water challenges through Integrated Water Resource Management (IWRM). She opines that the Policy might have been more holistic with the inclusion of a few aspects such as pollution, needs for restoring traditional irrigation system along with modernising the existing ones, integration among the different departments that concerns with water to strengthen the supply side along with the demand and accommodating interlinking projects and inter-basin transfers.

We hope that this book will be a meaningful addition to the existing corpus of literature on water laws. The seriousness of the Centre regarding the water challenges has been reflected through the study and research it has conducted and insights it has provided through papers. We take this opportunity to acknowledge our sincere gratitude to Shri J C Madhuswamy, Honourable Minister for Law, Parliamentary Affairs and Minor Irrigation, Government of Karnataka and Chancellor of KSLU for his encouraging words and interactions about minor irrigation in Karnataka. We also thank Shree Padre and Chandrashekar Yettadka for their valuable guidance in our project on Kattas and for their help in collecting data and conducting interviews. We are highly thankful to Ms. Nayashree Bhosge, for her active involvement in the Centre's activities, consistent efforts in data collection through frequent field visits and contribution towards the completion of this book. We are grateful to the library staff and administrative staff of KSLU for their constant support to our Centre.

P. Ishwara Bhat
Akhila Basalalli

1

EMERGING JURISPRUDENCE OF INTEGRATED APPROACH ON SHARING, QUALITY MANAGEMENT AND CONSERVATION OF WATER*

P. Ishwara Bhat

1. Introduction

We live in an era of convergence. The values of human rights, environmentalism, development, federalism and participative democracy converge. They stimulate us to go beyond the conflicting and overlapping multiplicity of jurisdictions and the mind-boggling procedural rigmaroles, and to use the instrumentalities of power, both public and private, to uphold and effectuate these values.

The co-existence of federalism, local self-government system, innumerable public undertakings, autonomous institutions and voluntary organizations produces plurality of jurisdiction and engenders the problems regarding coordinated efforts. Added to this are the inter-state water disputes amidst riparian states on various issues like the quantum of their share in the water flowing in inter-state rivers, construction or heightening of dams, pollution of water and rehabilitation of the evictees from the submerged areas. Failure to regard inter-state river basin as one single unit for the purpose of environmental protection either by obligating a select riparian state only to maintain flow of water or by ignoring to persuade for most economic use of both surface water and groundwater appears to have deviated from public trust doctrine in the

* This is a revised version of a paper published in an e-journal 2 *International Journal of Law and Policy Review* (1e-IJLPR 2012) pp.122-145.

course of resolving inter-state river water dispute in some circumstances.[1] Introduction of the policy of privatization in water works through contracts- by lease, sale or other arrangements- has also raised fears of alarming consequences because of focus on commercialization of water sources and setting wrong priorities that disturb the rights of traditional users. Activities of unsafe mining, inefficient handling of solid waste management and loss of forest coverage have been sometimes looked at in practice as problems unconnected with water management. Further, some statutory attempts have looked at the problem of groundwater management separately from that of surface water. However, there are also positive developments in case law and statutes like Andhra Pradesh Act, 2002 that abandon fragmentary approach and attempt holistic effort.

Owing to the above factors, in a wide area ranging from policy making function to redressing of grievances, jurisdictional diversity, difficulty of location of duty and legal disputes have posed tall challenges. A traditional tunnel vision on 'legal competence' is obstructive to the mission of environmental protection. Our mindset needs to be reset from 'division of power' to 'division of labour', and from self-centered autonomy towards sincere and collective performance of duties. From the angle of human rights and environmental protection, there should be a community-based approach with greater focus on conservation and respect for intergenerational equity. It is essential to know why such a bottom-up approach is inevitable in both theory and practice and how the legal system is to be fine-tuned towards this end for greater efficacy and success. With reference to the Indian experience in the sphere of water quality management, sharing and conservation, a discussion is made from this perspective in this paper.

1.1 Implications of integrated approach

Integrated approach in the present context implies several factors. Firstly, groundwater and surface water shall be managed together for better quality,

[1] As will be discussed in this paper the final award of Cauvery Water Dispute Tribunal was problematic from this perspective, which was set right in the final judgment of the Supreme Court in *State of Karnataka* v. *State of Tamil Nadu* , (2018) 4 SCC 204; AIR 2018 SC (Supp) 2621.

equitable distribution and conservation.[2] According to the National Water Policy 1987, "Integrated and coordinated development of surface water and groundwater and their conjunctive use, should be envisaged right from the project planning stage and should form an essential part of the project." The National Water Policy 2002 reiterates the same position as the 1987 Policy. The National Water Policy 2012, not only emphasizes on the conjunctive use of ground and surface water, but goes ahead to advocate the recycling of canal seepage water through conjunctive groundwater water use in order to save water in irrigation.[3] The Policy 2012 further mentions the conjunctive use of groundwater with the rainwater to meet the demands of the urban and rural regions.[4] The requirement of equitable distribution is in continuance of the policy of development with justice supported by positive rights of life like right to drinking water and right to livelihood. The rights of traditional users of rivers and of small farmers, which would be driven to helpless situations of deprivation of water source because of unreasonable extraction of surface and groundwater, ought to be taken into consideration as a part of integrated approach. Community's integration should be the natural outcome of application of equitable distribution principle in waterfront. Secondly, the policies relating to most economic use, prevention of pollution, revival of traditional tanks, purification of wastewater, recycling, recharge of groundwater, and rainwater harvesting shall be applied in a concerted and collective manner. Thirdly, approaches relating to afforestation, soil conservation and regulation of mining shall be integrated to the efforts of water conservation. Fourthly, integration of water-use and land-use policies shall be done along with appropriate irrigation planning and use of cost effective irrigation options. Finally, agencies that participate in these activities – central and state governments and their respective departments, panchayats, municipalities, public undertakings, private organizations vested with the responsibilities of water works, water users and the NGOs- shall act with perfect coordination and unity of purpose.

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2 Sanjay Upadhyay and Videh Upadhyay, II *Water Laws, Air Laws and the Environment* 51 (New Delhi: Lexis Nexis, Butterworths, 2002)

3 Demand Management and Water Use Efficiency, National Water Policy 2012 available at Microsoft Word - NWP,2012(Eng).docx (mowr.gov.in) (last visited on 04/05/2022).

4 Water Supply and Sanitation, National Water Policy 2012 available at Microsoft Word - NWP, 2012(Eng).docx (mowr.gov.in) (last visited on 04/05/2022).

1.2 Need for coordinated efforts

Integrating the plurality of public bodies with environmentalism for an effective protection of right to environment has become a constitutional necessity for the following reasons:

Firstly, the nature and importance of the right to environment beckon for such an approach. In the Indian context, right to wholesome environment was evolved by the judiciary by creative application of a Directive Principle of State Policy under Art- 48-A and Fundamental Duty under Art- 51-A (g) into the domain of right to dignified life under Article 21. Both these clauses reflect duties, either of the state or of the citizens. The moral visions underlying the concepts of intergenerational equity and public trust inform us the soundness of the duty approach towards protection of the environment. Since the very survival of the ecosystem is at stake, environmental right as a human right partakes the character of duty based right in a more emphatic way. This is because while human- to -human relation is open to rectification by self- defence or assertion, human- to- nature relation is not open to the mechanism of auto adjustment. Hence, towards nature, society has primarily obligations, and its entitlement shall be based on performance of duties. According to Sir John Laws, "A society whose values are defined by reference to individual rights is by that very fact already impoverished. Its culture says nothing of individual duty and certainly nothing of moral aspiration, and therefore nothing of community."[5] Since right to the environment is a right of the community as a whole, a participative approach of duty performance by all the duty holders is a suitable approach concerning protection of environment.[6] In the context of right to environment, applying the Hohfeldian matrix of jural relations as well as analyzing from the perspective of duty (rather than power or any other concept) is both meaningful and rewarding.

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[5] Sir John Laws, "The Constitution: Morals and Rights" *Public Law* (Winter) 622 at 624 (1996).

[6] About the advantages and imperatives of self regulation in environmental protection, see Bridget M.Hutter, "Socio-legal Perspectives of Environmental Law: An Overview" in Bridget M.Hutter, *A Reader in Environmental Law* p.3 at 26-7 (Oxford: Oxford University Press, 1999); *Also See* , V.R.Krishna Iyer, *Environmental Protection and Legal Development* 56, 80 (New Delhi: Sterling Publishers, 1992).

The above theoretical imperative is practically responded to by evolution of public trust doctrine, precautionary principle, 'polluter pays' concept and intergenerational equity. Laid down in landmark cases like *Ganga Pollution* cases[7], *Vellore Citizens Welfare Forum*[8] and *Indian Council for Enviro-Legal Action*,[9] these principles are interconnected; they require integrated application; but emphasis shall be on precautionary principle. The National Commission to Review the Working of the Constitution has, while recommending for incorporation of right to safe drinking water and wholesome environment as fundamental rights, suggested incorporating these principles for promotion of conservation of natural resources and sustainable development.[10] It also favoured adding to the Directive Principles a plan of action for generation of rural employment opportunities by afforestation and wasteland development; for soil and water conservation to support afforestation; for water conservation and tank rehabilitation; and for integrated programme of aquaculture by using village ponds and lakes.

Secondly, failure to view the environment as a whole has far reaching adverse consequences. Ecology believes in the interrelated existence of living beings and natural resources. "The world system is web-like; to pluck one strand is to cause all to vibrate; whatever happens to one part has ramification to all the rest", views A. Fritsch.[11] As Simon Ball and Stuart Bell opine about the British experience, "The environment as a concept is a series of interdependent sectors. When individual bodies controlled separate sectors there was often a reluctance to deal with a problem on a unified basis. Administratively, the idea of two separate bodies with overlapping responsibilities created tremendous logistical difficulties, misunderstandings arose, inter-departmental communication

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7 *M.C.Mehta* v . *Union of India*, 1992 Supp. (2) SCC 633 and 607.

8 *Vellore Citizens' Welfare Forum* v. *Union of India*, AIR 1996 SC 2715

9 *Indian Council for Enviro-Legal Action* v. *Union of India*, AIR 1996 SC 1446.

10 Report of the National Commission to Review the Working of the Constitution, 3.22.3 and 3.27.3

11 A. Fritsch, *Environmental Ethics* cited in *Common Cause* v. *Union of India*, 1999 SC 2 GJX 0473 SC.

had its own problems, which led to inefficient control."[12] The interdependence amidst water (*jal*), soil (*jameen*) and forest (*jungle*) calls for a long term plan of developing forest, stoppage of expansion of desert, conservation of fertility of soil and nurturing groundwater by rain water harvesting to meet the challenges of drought. Lack of integrated approach and definitive standards in this sphere allows different statutory bodies to adopt different criteria and policies, apply overlapping controls with communication gaps and to escape from public accountability through mutual accusations. Nature as a harmoniously unified entity cannot tolerate a proverbial situation of 'too many cooks spoiling the broth.'[13] Co-operation and coordination at the international, national and local level in the matter of environmental protection have been greatly emphasized by the international declarations.[14] It has been categorically stated by the U.N. Survey, "The rational uses of water resources require an integrated approach in which water quality and quantity, environment, physical quality of life are all associated…. Water development programmes should take into consideration the environmental and the ecological aspects so as to guarantee the quality and quantity of water required to satisfy the human needs for the present and future generations."

The above requirement is responded to in decisional law relating to mining, deforestation and industrial/urban waste management. In *Rural Litigation and Entitlement Kendra*[15], facts involved dangerous and haphazard quarrying of limestone in Dehradun valley resulting in deforestation, landslides and disturbance of the hydrological system resulting in dried up springs and severe water shortage. The remedy of stoppage of mines and effective reforestation through the concerted act of state government and Monitoring Committee could bring the valley nearer to normalcy. Another case on mining and deforestation

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[12] Simon Ball and Stuart Bell, *Environmental Law* 254 (New Delhi: Universal Book Traders, 2nd edn. 1994).

[13] Id. at 251

[14] Principles 23 and 24 of Stockholm Declaration , 1972 in UN Conference on Human Development; Ramsar Convention on Wetlands, 1971; Principles 7, 15 and 27 of the Rio Declaration on Environment and Development.

[15] *Rural Litigation and Entitlement Kendra* v. *Union of India*, AIR 1985 SC 652.

having implication on water sources is *Tarun Bharat Sangh, Alwar*.[16] In water scarce Rajasthan, Aravalli range of forest was a significant source of groundwater. Widespread mining for limestone and marble in the region deeply disturbed the groundwater position. Deforestation threatened the existence of wildlife. Finding non-compliance with the central and state legislations in the course of issuance of mining lease, the apex Court directed for immediate stoppage of mining activity. In *M.C.Mehta* (Surajkund case) also, the adverse impact of mining on water sources was considered by the Court when it observed in support of the order for stoppage of mining, "The Badkal lake and Surajkund are monsoon-fed water bodies. The natural drainage pattern of the surrounding hill areas feed these water bodies during the rainy season. The mining activities in the vicinity of these tourist resorts may disturb the rainwater drains, which in turn may badly affect the water level as well as the water quality of these water bodies. The mining may also cause fractures and cracks in the subsurface rock layer causing disturbances to the aquifers, which are the source of groundwater. This may disturb the hydrology of the area."[17]

Thirdly, diversity of public bodies born out of federalism, local self-government and public undertakings, should be understood as sub serving the cause of human rights values and development with justice because of the implications of Articles 12 and 36 and other related provisions. The duty discourse on federalism can be gathered from Thomas Jefferson's observation, "In government, as well as in every other business of life, it is by division and subdivision of duties alone that all matters, great and small, can be managed to perfection…. (1) the general federal republic for all concerns, foreign and federal; (2) that of the state for what relates to its own citizens exclusively; (3) the country republics for the duties and concerns of the country; (4) the ward republic for the small and yet numerous interesting concern of the neighborhood."[18] The division of the labour or duty involved in this proposition or

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[16] *Tarun Bharat Sangh Alwar* v. *Union of India,* (Sariska case) 1992 Supp. (2) SCC 750, 1993 Supp. (3) SCC 115.

[17] *M.C.Mehta* v. *Union of India,* (Badkal and Suraj Kund Lakes) 1997 (3) SCC 715.

[18] Cited by Dennis C. Mueller, *Constitutional Democracy* 77 (New York: Oxford University Press, 1996).

that can be contemplated in the context of the Indian scenario should not be understood as water tight compartmentalization once we look to the purpose underlying the whole mechanism that brings coordination. Concerning the right to reasonable use of water, the outcome of the totality of actions or omissions of all the public bodies put together matters a lot, transcending the internal divisions. If a sense of helplessness is unjustifiably raised by an approach that the gap or lack of coordination is a peculiar consequence of federalism, it makes a big derogation into the system of equal rights. In fact, federalism's links with human rights and development with justice offer first-order public law principles for equitable and efficient use of natural resources. As Prof. Upendra Baxi puts it, "The federal idea, and ideal, subsuming these aspects, is above all about equitable development and the most just uses, humanly possible, of available resources for that kind of development which disproportionately benefits the impoverished. In India, we have yet to begin to grasp the fold on the surface of federal ideas and ideals and to mistake it for depth."[19]

Creative use of division of power approach can be found in *Ambica Quarry Works*[20], where the Supreme Court held that state governments may renew the preexisting mining leases only with the renewal and approval of the Centre as required by the Forest (Conservation) Act, 1980. In *Tarun Bharat Sangh*[21] also, absence of Central Government's prior permission for mining in tiger reserve area and lack of clearance of mining lease by the Central Government, although conducted with state license, amounted to illegality and the Court ordered for stoppage of mining. In *M.C.Mehta* v. *Union of India*[22], a case relating to extensive mining, which affected ecology, the Supreme Court prohibited mining activity within two km radius of the tourist resorts of Badkhal and Surajkund. The Court directed the Forest Department of the State of Haryana to undertake to develop the green belts as recommended by NEERI with immediate effect. It also directed the Director, Mining and Geology,

[19] Upendra Baxi, Foreword to B.R.Chauhan, *Settlement of International and Inter-State Water Disputes in India* i (Bombay: N.M.Tripathi, 1992).

[20] *Ambika Quarry Works* v. *State of Gujarat*, AIR 1987 SC1037.

[21] *Tarun Bharat Sangh Alwar* v. *Union of India*, (Sariska case) 1992 Supp. (2) SCC 750, 1993 Supp. (3) SCC 115.

[22] *M.C.Mehta* v. *Union of India*, (Badkal and Suraj Kund Lakes) 1997 (3) SCC 715.

Haryana, and the Haryana Pollution Control Board to enforce all the recommendations of NEERI in so far as the mining operations in the State of Haryana are concerned. The Court upheld the restrictions imposed by the Central Government Authority on construction of buildings in the area as the area came under the jurisdiction of the Authority on National Capital Region constituted under the Environment Protection Act, 1986. The creative application of the division of power approach contributed towards enhancing the carrying capacity of the ecosystem and better conservation of groundwater resources.

Fourthly, one of the predominant purposes of decentralization of power through Panchayat Raj and Nagarpalika institutions is to bring the function of providing amenities and access to natural resources to the level of people by involving them in formulating and implementing appropriate plans. Since the rural development programs like minor irrigation, preservation of tanks, waste land development, groundwater promotion, rain harvesting, drainage and sanitation are interconnected with each other, and all the three levels of Panchayat Raj Institutions are vested with these powers, an integrated approach alone is pragmatic. Concerning avoidance of wastage, prevention of pollution, purification and recycling of water in urban areas also, the need for an integrated approach is to be realized. A bottom up approach, which is most essential for environmental protection, is feasible with systematic functioning of the Local Self Governments. As laid down in Principle 10 of the Rio Declaration, "Environmental issues are best handled with the participation of all concerned citizens at the relevant level." Concerning overlapping and conflicting jurisdictions of governmental departments and public undertakings upon water related subjects also, it is possible to find solutions through the application of duties correlated with rights to environment and purposive character and function of these bodies.

Fifthly, the diversity of reasons for water pollution calls for a comprehensive strategy rather than fragmented approach. Water pollution occurs primarily due to discharge of industrial effluents, mining activities, release of domestic sewage, run-offs from unsustainable agricultural practices like use of pesticides, fungicides and chemical manures, and soil erosion due to extensive deforestation. Prevention and control of pollution at all points, and measures for

purification and recycling at appropriate situations are required for this purpose. Since solid wastes and hazardous air pollutants also ultimately pollute water either through seepage or acid rain, overall protection of the natural environment shall be aimed as the method of water quality management.

Finally, the cultural ethos of India has a philanthropic approach about facilitating access to water. Amidst *purtta* type of charities, construction of water reservoirs and excavation of tanks and wells were given prominent place in *shastrik* writings.[23] According to *Mahabharata*, "All the progenitors of a man obtain salvation who excavated a reservoir in which cows and good men always drink water. The man in whose tank cows, other quadrupeds, birds and human beings are relieved of thirst by drinking obtain the reward of *Ashwamedha*."[24] As there could be no sustaining of life in both the worlds without water, wise men were advised to always construct reservoirs of water. The formal dedication of water body for the benefit of all the living beings without discrimination used to state, "This water has been dedicated by me for the welfare of all beings so that it be an instrument for realizing *Dharma, Artha, Kama* and *Moksha* every day and night."[25] History is replete with instances of royal patronage to step wells, tanks, small dams and bathing *ghats*.[26] Local community's involvement in their construction, maintenance and management reflected a high degree of popular participation. However, the dichotomy between theoretic adherence to welfare of all beings and the practice of untouchability that excluded the lowest social strata of Indian society from having access to water is a heresy to social values. The socio-cultural aspects of reverence to water bodies need to be looked at from the communitarian perspective of environmental protection in an integrated manner. During the colonial period, the Famine Relief policy of the British included extensive irrigation works such as excavation or repair of ponds and tanks and raising of embankments by using the local manpower and assisting their sustenance.

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[23] Vishnu Dharmottara cited in Hemadri's *Danakanda*; see B.K.Mukherjea, *Hindu Law of Religious and Charitable Trusts* 82-3 (Calcutta: Eastern Law House, 5th edn. 1983) .

[24] Id. at 82.

[25] Rajadharmakaustubha 179 cited in B.K.Mukherjea, *Supra* note 23 at 52.

[26] Romila Thapar, I *A History of India* 77-8 (New Delhi: Penguin Books, 1966).

Funding by the Central Government, supervision by Provincial Government and execution by local panchayat called for coordinated efforts.[27]

Thus, cogent and convincing reasons can be found for preferring integrated approach in contrast to fragmented one.

Does Indian federalism satisfy the requirements of equitable sharing, quality management and conservation of water?

As discussed above, the relevance of federalism as a mechanism for division of labour between two levels of governments should be properly appreciated. Water sharing, quality management and conservation constitute a subject extensively involving human rights dimension and fundamental aspects of the environment. Although there could be some arguments for centralized control for the sake of uniform and stringent norms and for avoidance of cross border pollution and depletion of natural resources, in the background of actual experience and diversity of geographic and climatic factors, better coordination rather than centralization is required of the system. Many of the environmental problems are local specific ones affecting the local community and asking for a fitting response by the local environmental activists and local administration towards solving the problem. The possibility of using modern communication technology to have rapport between the Centre and the local community cannot be overstated. In the United States also public choice analysis of environmental regulation favors decentralized policy determination in view of the importance of regional environmental groups.[28] Stephen Breyer raises an interesting question, 'does federalism make a difference', and answers after analyzing environmental and other legal development, "Federalism does matter to the ordinary citizen seeking to maintain a degree of local control, a sense of community, in an increasingly interrelated and complex world. For that reason federalism must make a difference to the appellate judge whose interpretation

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[27] R.C.Mujumdar *et al*, *An Advanced History of India* 932 (Delhi: Macmillan, 4th edn. 1978).

[28] See Richard L. Revesz, "Federalism and Environmental Regulation: A Public Choice Analysis" 115 *Harv. L.Rev*. 553 (2001).

of the laws will help determine how well federalism will serve that important human need."[29]

The issue stated in the subheading needs to be discussed in the light of constitutional experiences about inter-state rivers, working of the Water Act, National Water Policy, and ground water conservation, implementation of international treaties and handling of natural calamities. While the Union has exclusive powers with regard to inter-state rivers and river valleys (List I Entry 56), States have powers on water, that is to say water supplies, irrigation and canals, drainage and embankments, water storage and waterpower subject to entry 56 of List I' (List II Entry 17). The reason behind the latter position is that there is diversity amidst states in the matters of climatic and geographic conditions, rainfall, topography, crop pattern, extent of groundwater resource and irrigation methods which require regional policy making and implementation. This is to mean that a state may take all necessary action (both legislative and administrative) over the interstate watercourse to an extent that it flows within the state territory. This action however is limited by the Supreme Court in the decision *State of Karnataka v. State of Tamil Nadu*,[30] where the Court has reiterated the principle of the Re: Presidential Reference (Cauvery Water Dispute Tribunal) that the waters of an inter-state river passing through corridors of the riparian states constitute a national asset and no single state can claim exclusive ownership of its water.[31] But discomfort arises with states' inactions and retrograde actions.[32] Finding a solution within the constitutional framework of cooperative federalism in such situations is very much required.

2. Inter-State Rivers

Seventy two years of constitutional development in India witnessed more conflicts, litigations and agitations amidst federating units in the matter of quantity

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29 Stephen Breyer, "Does Federalism Make a Difference?" *Public Law* (Winter) 1999 p.651 at 662.

30 (2018) 4 SCC.

31 Id. 460

32 Shyam Divan and Armin Rosencranz, *Environmental Law and Policy in India* 48-9 (New Delhi: Oxford University Press, 2nd edn. 2001).

of utilization of water, and less of systematic co-operation and integrated development. The River Board Act, which aimed to treat the whole geographic and of the river basin as a single system irrespective of state boundaries and also to coordinate the functions of irrigation, inland fisheries, hydroelectric project and navigation became a dead letter. The delay involved in settlement of inter-state water disputes and problems of enforcement are products of mislaid emphasis on the aspects of allocation of water without focusing on best, economic and equitable use. The lower riparian States' undue reliance on flood irrigation system, which is linked to the culture of big dams, has resulted in large tracks of water logging lands, which could have been avoided by reasonable utilization of groundwater. While the Supreme Court's opinion in *Re Cauvery*[33] did not focus on the integrated use of surface and groundwater as a method to face water scarcity, *Narmada Bachao Andolan* [34] looked at the aspect of the augmentation of groundwater owing to the reservoir. The trend towards integrated approach is clear in this development. It was highly desirable at that point of time that the profuse source of groundwater in the lower basin of Cauvery was properly taken into account in determining the extent of its dependence on surface water flowing from the upper riparian state, which has been facing continuous water shortage. In the decision of *State of Karnataka v. State of Tamil Nadu*,[35] CJI Deepak Misra, observing that the groundwater quantity in Tamil Nadu is eminently safe, held that the groundwater availability should be considered in calculating the water resources of an inter-state river basin.

The substantive principle relating to water allocation amidst riparian states in India is equitable apportionment theory as evident from the awards given by Krishna, Godavari and Narmada Tribunals.[36] Ever since the Indus Commission

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[33] Re *Cauvery*, 1993 Supp.1 SCC 96.

[34] *Narmada Bachao Andolan* v. *Union of India*, AIR 2000 SC 3751.

[35] (2018) 4 SCC 204-206 and 433

[36] Report of the Krishna Water Disputes Tribunal with Decisions, Vol. I, 1973, p.93; Report of the Narmada Water Disputes Tribunal, Vol. I, 1978, p.109; Report of the Godavari Water Dispute Tribunal, Vol. I, 1979, p.19; *Also See* B.R.Chauhan, *Settlement of International and Inter-State Water Disputes in India* 31 to 34 (Bombay: N.M.Tripathi Pvt. Ltd., 1972).

of the pre-independence period, this principle has been used to allocate a fair share of the common river amidst the riparian states.[37] This theory postulates that a drainage basin or inter-state river is one single unit irrespective of the political or administrative boundaries dividing the concerned federal units. Emerged as the guiding principle in resolving inter-state water disputes in America, its major focus has been on equality of rights amidst riparian states on the basis of various factors including social and economic needs consistent with the corresponding rights of co-basin states. It believes in distribution of the waters among the contending parties in such a manner to satisfy their rational needs to the greatest possible extent and achieving maximum benefit for each co-riparian state with minimum detriment to all. Protecting the legitimate expectations based on prior use is also within its domain.[38] According to Narmada Water Disputes Tribunal, in addition to looking to the previous agreements or judicial decisions, other matters that need scrutiny are: volume of the stream, existing uses, areas of land yet to be watered, the physical and climatic conditions of each state, the relative productivity of land in the state, the state-wise drainage, the population dependent on the water supply and degree of their dependence, alternative needs to satisfy their demands, and avoidance of unnecessary waste in the utilization of the water by the concerned state.[39] The Helsinki Rules, which were evolved by International Law Association and often referred to and applied by the Indian tribunals in the name of equitable apportionment, reflect particular principles for equitable utilization on similar lines and emphasized on the determination of fair share by taking into consideration all the relevant factors and by giving weight to each factor on the basis of its comparative importance. It is interesting that the Mahadayi Tribunal Award is not based on equal apportionment and the Tribunal reasons that "all the requisite data and information required for evaluation of the demands of the three States for equitable apportionment in the light of various criteria, particularly those mentioned in either Helsinki Rules or the Water Resource Law of International Law Association, Berlin Conference, 2004, are not

[37] B.R.Chauhan, S*upra* note 36, p.31.

[38] Ibid

[39] Report of the Narmada Water Disputes Tribunal, Vol. I, 1978, p.113.

provided by the respective States in their claims."[40] The Tribunal further justifies the distribution of water in the absence of apportionment to uphold the human rights and benefit of the people by allowing the activities related to water resource development.[41] Although these two approaches are interchangeably used, equitable apportionment is distribution-oriented whereas equitable utilization is development-oriented and they vary in the matter of giving due importance to various factors.[42] The Helsinki rules also obligated the riparian states to abate existing water pollution by taking all reasonable measures and prevent any new form of water pollution or increase in the degree of existing pollution. The post-Helsinki legal development incorporates the state's duty to refrain from and prevent acts or omissions within its territory that will cause substantial injury to any co-basin state.[43] Application of the above principles, as contrasted to the traditional theories like riparian right doctrine, prior appropriation theory, territorial sovereignty theory and natural water-flow theory, look for a high degree of integrated approach and co-operation on the part of participating states. As Fali Nariman points out, "The principle of 'equitable apportionment' – 'without quibbling over formulas' – could have been incorporated as the guiding factor for distribution and allocation of waters of every major inter-State river in the country…."[44]

The way in which the Tribunals and the Supreme Court dealt with the inter-state water disputes in India at various stages of investigation, adjudication and implementation clearly shows that a concerted approach based on cooperative federalism alone is appropriate. The Court in *Re Cauvery* nullified an effort of legislative assertion of Karnataka to obstruct implementation of Tribunal's interim order to release water to a co-riparian state, and observed, "Though the waters of an inter-State river pass through the territories of the riparian States such waters cannot be said to be located in any one State. They are in a state of

40 Report-Cum-Decision of the Mahadayi Water Dispute Tribunal, Vol. XII, p. 2696.

41 Ibid.

42 P.Ishwara Bhat, "Inter-State Water Disputes and the Legal Response" 1 *SBRRM Journal of Law* 11 at 18 (1994).

43 B.R.Chauhan, *Supra* note 36, p. 40.

44 Fali S Nariman, "Inter-State Water Disputes: A Nightmare!", in Ramaswamy R Iyer (Ed), *Water and the Laws in India* 32 at 47 (Sage Publications, New Delhi, 2009) .

flow and no State can claim exclusive ownership of such water so as to deprive the other States of their equitable share. Hence in respect of such waters, no state can effectively legislate for the use of such waters since its legislative power does not extend beyond its territories. It is further an acknowledged principle of distribution and allocation of waters between the riparian States that the same has to be done on the basis of the equitable share of each State."[45] The Court also held that the River Boards Act, 1956 which is admittedly enacted under Entry 56 for the regulation and development of inter-State rivers and river valleys did cover the field of the use, distribution and allocation of the waters of the inter-State rivers and river valleys and that State's power under Entry 17 of List II to enact laws relating to water supplies, irrigation and canals, drainage and embankments, water storage and water power was subject to Entry 56. Since the Act was not put into service so far, it has become almost a dead letter and an instrument of missed opportunity.[46]

Planned development of the river valley as a whole with multi-purpose use of the reservoir for domestic use, irrigation, hydroelectric power, fisheries and transportation is contemplated in the River Board Act. Although it is not yet put into action, its prototype like Narmada Control Authority has shown encouraging result as can be gathered from the Court's judgment in *Narmada Bachao Andolan* [47] case.

In *Narmada* the Supreme Court was convinced about the environmental plans of the concerned states on phased catchments area treatment, compensatory afforestation, command area development, conservation of flora and fauna, health aspects and fisheries development. Narmada Control Authority (NCA), which was established by the Government of India in concurrence with the state governments of Madhya Pradesh, Gujarat and Maharashtra in 1987, has been a high level authority formed for the purpose of integrated development. Since geographical area relating to the above functions is spread over four states, *viz.*, Madhya Pradesh, Maharashtra, Gujarat and Rajasthan,

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45 Re *Cauvery* 1993 Supp.1 SCC 96 para 72.

46 Fali Nariman, *Supra* note 44, p. 47.

47 *Narmada Bachao Andolan v. Union of India*, AIR 2000 SC 3751.

co-operative efforts of all the states have become an imperative. The Supreme Court asked NCA to proceed with heightening of the dam only after completion of satisfactory works about resettlement and rehabilitation of evictees and a clearance report by the Resettlement and Rehabilitation Sub-group constituted under NCA to that effect, and after a clearance by the Environment Sub-group about catchment area development, impact assessment on flora and fauna, effect on public health and ensuring of water quality. The Court found that there was no adverse impact upon fishing activity threatened by salinity downstream. A serious attempt of cooperative federalism that underlies NCA is a substitute for the River Board. It vindicates what was averred in Krishna Tribunal Award, "Nature's laws treat the river and tributaries as the arteries of a single circulatory system". Surely, human laws and approaches cannot afford to be different.

However, the experience about the approaches of riparian states of inter-state river Krishna is not evincing such an integrated approach. The Krishna Tribunal recommended for constituting Krishna Valley Authority by the Central Government on the basis of consent of the riparian states for giving appropriate directions regarding the transfer of water, determination of shares of respective states, adjustment of utilization, ensuring availability of water in proportion to their share in case of distress. The KVA was envisioned as a body composed of high-ranking engineers and representatives of the States and the Central Government. It was expected to be the very soul of Scheme B. In the *Alamatti dam* case[48] the Supreme Court considered Scheme B only as recommendatory as it did not form part of the decision of the Tribunal, and hence declined to issue directions for constituting the KVA at the behest of one State. The Court set aside the objections of the State of Andhra Pradesh to the heightening of the dam at Almatti to 519.6 meters by Karnataka as the water storage dam did not obstruct the flow of water within the entitlement of Andhra Pradesh under the Tribunal's award. The argument of Andhra Pradesh that it was not consulted by the Central Government before permission to heighten the dam was rejected by the Supreme Court by a reasoning that there was no legal obligation to consult

[48] *State of Andhra Pradesh v. State of Karnataka*, JT 2000 (6)SC 1

the State by the Union in such matters. The Union has enormous power and authority and without the approval of the Central Water Commission, Planning Commission and other authorities, no State could construct any project when it has adverse effect on other riparian States. Karnataka's claim for raising the dam height to 524.56 meters was rejected by the Court as the matter was to be decided by the Tribunal afresh and the Central Government had also not sanctioned the project. The Supreme Court also considered the concern of the State of Maharashtra about submergence of its land in case of raising of the dam's height to the level of 524.56 meters. Sethi J., while concurring with the majority view, referred to the unreasonable attitudes of the riparian states motivated by local pressures and political compulsions and called for an approach that befits the position of responsible constituents of the federation. Looking to the human dimension involved, he observed, "Water is an important factor in the economic development of the countries which ultimately affects the social and human relations between the inhabitants. Planned development and proper utilization of water resources can serve both as a cause as well as an effect of the prosperity of a nation."[49]

The overall experience is that the Central Government played its role with caution and self-restraint in the context of inter-state water sharing problems. But when the States enthused their co-operative spirit, it extended its supporting hand. Failures to seriously try for negotiation, conciliation and settlement, vagueness of law, procedural complexities and delay in adjudication have reflected the failure to effectuate cooperative federalism.[50] Another big lacuna is failure to effectuate River Board Act, and the failure can be traced to the lack of cooperation on the part of riparian states and the Centre's policy of passive neutrality. Prime Minister A.B.Vajpayee in his speech on water security suggested constituting River Basin Organizations (both intra state and inter-state) for adopting a holistic and integrated approach to the water resource management by discussing and implementing plans for conservation, pollution control and basin development.[51]

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[49] *Id*. 116 para 138, per R.P.Sethi J.

[50] P Ishwara Bhat, *Supra* note 42.

[51] Address to National Water Resources Council, 1st April, 2002.

The approach of the riparian states of Karnataka, Goa and Maharashtra towards the Mahadayi river also did not evidence an integrated management of the resource. When Goa sought for the constitution of the tribunal, it pursued adjudication of the dispute on two major grounds. Firstly, that the right to wholesome environment of its people was jeopardized because of the water diversion and hydroelectric projects Karnataka had initiated, and secondly, premising the EIA of Karnataka as faulty, Goa argued that its ecology, biodiversity, wildlife, salinity in the estuaries and freshwater would have an impact due to such activities. Karnataka retaliated that Goa had lacked a comprehensive scientific study to back their claims and it would not halt the water resource development project when there is lack of evidence of its impact. The Tribunal acknowledged that there is a lack of scientific data and informational evidence from all the State parties. Since apportionment was not possible due to inadequacy of data, the Tribunal allocated to (a) Karnataka, 1.5 TMC of water for in-basin consumptive use, 3.9 TMC water consumptive use by diverting through the Kalasa- Banduri projects and 8.02 TMC for the Mahadayi Hydro-electric Project which is a non-consumption use; (b) Maharashtra, to use 1.33 TMC of water for consumptive purpose. Total of which 0.56 TMC is to be used for Virdi Large MI project and 0.77 TMC for the other four proposed projects of Morachi, Virdi, Dhangarwadi and Ambadgaon; and (c) Goa was identified with 59 projects sites and 24 TMC water was allocated without any restriction to its non-consumptive usage.[52] The States have filed petitions in the Supreme Court raising concerns regarding the award depicting a classic federal character in interstate water disputes. The constitution of Joint Commissions or Boards under the River Boards Act, 1956 is an interesting development in the water law. The Commission/ Boards that are set up pursuant to the award constitute members of the state parties.[53] The sectorial (agricultural, hydrology, engineering etc.) representation in the commissions and boards is to enhance the expertise, democratizes the process and integrate all the perspectives which is much needed in expediting the dispute settlement process.

[52] Report-Cum-Decision of the Mahadayi Water Dispute Tribunal, Vol. XII, p. 2697-2704

[53] Id., p.2689

It is however interesting that the Tribunal in its decision highlighted the lacunae in the provisions of the Inter-State River Water Disputes Act 1956 that the Tribunal can only give an award, but cannot enforce its implementation. For effective implementation of the award, the power for punishment for contempt or non-compliance of Award must be conferred upon the Tribunal. The Tribunal further explains that the water disputes are seen merely as political issues and for solving the disputes the meeting of political representatives, bureaucrats and water management engineers take place where legal aspects get pushed into the background.[54] The inherent inconsistencies in the legal framework and tribunals working has been best described by Puthucherril as 'conflictual federalism' and 'band-aid fix approaches' making the dispute resolution tardy and incomplete.[55]

The Inter-State Water Dispute (Amendment) Bill, 2019 has been introduced in Lok Sabha and is yet to be placed before Rajya Sabha and it provides for the adjudication of disputes relating to waters of inter-state rivers and river valleys.[56] One of the salient features of the Bill is the setting up of Dispute Resolution Committee (DRC) by the Central Government for amicable settlement of dispute within a period of one year and extendable up to six months. If the dispute doesn't get settled by the DRC only then the Central Government may refer it to the tribunal. To avoid the multiplicity of tribunals, the Bill provides for creation of a single Inter-state Water Tribunal with multiple benches. Nonetheless, it remains to be seen if such superficial restructuring of the Bill will remove the defects inherent in the dispute resolution mechanism.

2.1 *Pollution of inter-state rivers*

Concerning pollution of inter-state rivers, no inter-state legal dispute of serious nature has arisen so far. But this does not mean that there is no problem as such. Along with the increase in pollution of river water, legal disputes on this

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[54] Id., p.2686

[55] Tony George Puthucherril, "Water Federalism, Tribunalization of Water Justice and Hydro-Politics: India's Inter-State River Water Disputes Act at 65 Years" Vol. 35, No. 1 *Columbia Journal of Asian Law* 46 (Spring 2022).

[56] Inter-State Water Dispute (Amendment) Bill, 2019 available at The Inter-State River Water Disputes (Amendment) Bill, 2019 (prsindia.org) (last visited on 26/05/2022).

ground may also figure. It is to be noted that riparian states or their inhabitants have no right to divert pollutants to the river, but have the duty to prevent such acts. Prevention principle, public trust theory and inter-generation equity operate to the effect that the river bed including that of tributaries ought not to be dumped with any pollutant and river water at the threshold of another riparian state shall be pure. Under section 16(2) (b) and (h) of Water (Prevention and Control of Pollution) Act, 1974, the Central Board has the power of coordinating the activities of State Boards and resolving disputes among them. It has also the power to plan a nation-wide programme for the prevention, control and abatement of water pollution, and cause it to be executed. It also has the main function of promoting cleanliness of streams and wells in various areas of the State (Sec. 16 (1)).

A strategy of cooperative federalism was set into service in the context of cleansing river Ganga. A centrally sponsored scheme, Ganga Action Plan, was launched in 1986. Ganga Authority, a high-powered body headed by the Prime Minister, took up the pollution abatement works in major cities on the banks of river Ganga in the states of Uttar Pradesh, Bihar and West Bengal. The Union Environment Ministry initiated the National River Conservation Plan in 1995 on the basis of the Ganga experience to cover 18 rivers in 10 states. Subsequently creation of the 'National Ganga River Basin Authority', by the Center pursuant to the Environment Protection Act by inclusion of the state ministries is yet another significant step that challenges the federal structure of the Constitution.[57] The judicial approach also favored integrated efforts. In *M.C.Mehta*[58], the Supreme Court passed comprehensive directions to the Central Government, the Uttar Pradesh Pollution Control Board, District administration and to the tanning industries that were polluting the river. Concerning other inter-state and intra-state rivers also, a similar approach has been adopted.

However, the expanded mandate of Union's Ministry of Jalshakthi in integrating the Ministry of Water Resources, River Development and Ganga

[57] National Ganga River Basin Authority, Available at https://nmcg.nic.in/ngrbaread.aspx (last visited on 21/05/2022).

[58] *M.C.Mehta* v. *Union of India* (Ganga Pollution case) AIR 1987 SC 1086;, (1987) Supp. SCC 131.

Rejuvenation and the Ministry of Drinking Water and Sanitation challenges the very nature of cooperative federal structure by legislating, facilitating , managing and regulating the water pollution, groundwater development, drinking water supplies and infrastructure, participatory irrigation management, command area development, river basin management, environment and forest development and implementation of tribunal awards which essentially are state-centered subjects.[59]

The Central Pollution Control Board (CPCB) in its study on the 'Water Quality of Rivers at Interstate Borders' observed that pollution of the rivers by the riparian states is also a prominent contributing factor for the interstate disputes along with other reasons. It identifies a few disputes such as (a) Markanda river dispute between Himachal Pradesh and Haryana is regarding the wastewater discharge from Kala Amb industrial area in H.P. and entering into Haryana; (b) Sahibi river dispute between Haryana and Rajasthan where the wastewater discharge from Bhiwadi in Rajasthan is entering into the territory of Dharuhera of Haryana; (c) Dhela, Bahela, Kosi and Ramganga between Uttarakhand and Uttar Pradesh regarding the Magh Mela and Kumbh Mela where the waste water is discharged from Uttarakhand into Uttar Pradesh; (d) Yamuna river dispute among Haryana, Delhi and Uttar Pradesh regarding ammonia issue raised frequently for supply of drinking water in Delhi and Agra.[60] The report recommends an integrated water management system that includes the installation of sewage treatment plants to treat sewage, installation of effluents treatment plants (ETP) to treat industrial effluents, regulating religious practices that pollute water such as idol immersion, creation of treatment capacity to handle sewage, enhancing systems and procedures that measure quantity and quality of sewage, promoting community participation, organizing awareness programs and improving the flow patterns of the rivers with proper garbage collection on the banks of the river.[61]

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[59] *Supra* note 55, p 48-49

[60] Central Pollution Control Board, "Water Quality rivers at Interstate Borders, Interstate River Boundary Monitoring Programme," Series: IRBM/01/2015, available at Water Quality of Rivers at Interstate Borders (indiawaterportal.org) (last visited on 05/05/2022).

[61] Id. at p.133

The extent of pollution of the rivers Ganga and Yamuna changed the jurisprudential character of the rivers with the decisions of *Mohd. Salim v. State of Uttarakhand and Others*[62] *and Lalit Miglani v. State of Uttarakhand*[63]*,* where the High Court of Uttarakhand not only declared the rivers as living entities to attain legal personality but also the glaciers, including Gangotri and Yamnuotri, rivers, streams, rivulets, lakes, air, meadows, dales, jungles, forests wetlands, grasslands, springs and waterfalls in the State of Uttarakhand. The Court identified the Chief Secretary, State of Uttarakhand, Director NAMAMI Gange Project, Legal Advisor, NAMAMI Gange Project, Advocate General. State of Uttarakhand and a Senior Advocate of Supreme Court as loco parentis of the rivers in Uttarakhand. However, the Supreme Court in 2017 staying the decision[64], expressed its concerns with the legal personality such as liabilities pursuant to legal personality to be sued and the possibility of loco parentis in the light of federal principles when the rivers are interstate watercourses.

3. Water Act, Cooperative Federalism and horizontal coordination

The very passing of Water (Prevention and Control of Pollution) Act, 1974, involved a purposive exercise in cooperative federalism. The Parliament enacted this statute under Art.252 (1) with the consent of few state legislatures, and subsequently all the remaining states adopted it. The amendment made in 1988 is yet to be adopted by some states. There are various spheres in which coordinated works of Central and State Pollution Control Boards and Union and State Governments are contemplated.

The framework of the statute has explicit features and schemes requiring the central and state governments or authorities to act in a concerted manner. In the very composition of Central Pollution Control Board, which consists of about 15 members, not exceeding five members shall be appointed from amidst the members of State Pollution Control Boards. The Act also contemplates the constitution of Joint Boards based on agreement by two or more Governments of contiguous states or by the Central Government (in respect of one or more

62 WP No. 126/2014.

63 WP No. 140/2015.

64 *Union of India* v. *Lalit Miglani*, SPL (Civil) No. 34250/2017, accessed on 05/05/2022

Union Territories) and one or more Government of state/s contiguous to such Union Territory. Sharing of expenditure and functions shall be in accordance with the agreement. The Joint Board shall have a full time Chairman nominated by the Central Government and an equal number of members (official and non-official) from the participating states.

Coordination between Central Board and State Boards is expressly envisaged in the course of their functioning. The main function of the Central Board shall be to promote cleanliness of streams and wells in different areas of the States. The Central Board shall coordinate the activities of the State Boards and resolve disputes among them (Sec.16 (2)(c)). It shall provide technical assistance and guidance to the State Boards. It shall lay down, modify or annul the standards of a stream or well in consultation with the concerned state government. The State Boards shall collaborate with the Central Board in organizing the training of persons engaged or to be engaged in programmes relating to prevention, control or abatement of water pollution and to organize mass education programmes relating thereto. Every State Board shall be bound by the directions given by the Central Board or by the State Government. In case of inconsistency between such directions, the matter shall be referred to the Central Government for its decision. Where the Central Government is of the opinion that any State Board has defaulted in complying with any directions given by the Central Board and as a result of which a grave emergency has arisen and it is necessary or expedient in public interest, it may perform any of the functions of State Board in relation to such area, period or purpose as specified in the order. Further, many of the functions of Central and State Boards are mutually interdependent. For example, the Central Board's function of investigation and research relating to problems of water pollution and sewage/ waste disposal; and collection, compilation, and publication of statistical and technical data should go hand in hand with the State Board's function of encouraging, conducting and participating in investigation and research on the subject. Central Board shall plan and cause to be executed a nation-wide programme for the prevention, control or abatement of water pollution. It has also the responsibility of organizing through mass media a comprehensive programme regarding the prevention and control of water pollution. It is

submitted, meaningful performance of these functions requires cooperation by the states also. Under section 33A of the Act the State Board's power of giving directions to any person, officer or authority for administering the Act shall be subject to the statute and the directions given by the Central Government. In brief, the Central Government is envisaged to act as master of the orchestra and give a good leadership in the task of preventing, abating and controlling water pollution. While State boards are better situated to evaluate the local water problems, the central authority is better insulated from local pressure. The dichotomy involved in the competence to control is sometimes resolved by resorting to strict compliance with principles of natural justice, as done by Madhya Pradesh High Court in *Madhu Distilleries* case.[65]

A case study conducted by Samaja Parivartana Samudaya, an NGO, about water pollution in Tunga Bhadra River points out the inefficacy of federal schemes contemplated under the Water Act.[66] There were two interconnected factories in the same locality discharging two different types of pollutants into adjacent rivers after some treatment. The Karnataka State Pollution Control Board circumvented the Central Board's letter of clarification, which said that evaluation of permissible release of effluent should be done separately and not by mixing both, by resorting to dilatory means. Ultimately, the Karnataka High Court ruled on the basis of an expert committee report that percentage of effluents in total quantity of polluted water need be taken into consideration.[67] Effective application of federal mechanisms could have avoided the uncomfortable situation.

Lack of coordination between Central Board and State Board in mitigating the problem of water pollution came to surface in *Travancore Cochin Chemicals Ltd.* case[68]. While the State Board ordered the chemical factory to

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[65] *Madhu Distilleries Pvt. Ltd* v. *Madhya Pradesh Pradushan Niwaran Mandal*, AIR 1995 MP 57 at 63

[66] A Case Study on Tungabhadra River Pollution and related critical aspects, February 2002- Report submitted to CEERA, National Law School of India University, Bangalore.

[67] Judgment dated 15. 9. 1997in W.P.19483/1985.

[68] *Travancore Cochin Chemicals Ltd.* v. *Kerala Pollution Control Board*, Crim. Misc. Pet. No. 556/84, Kerala High Court dated 12 April 1985.

install a treatment plant, the Central Board had advised it to wait for two months for testing of new technology before installing a plant. The Kerala High Court criticized the discrepant approaches.

Case law development under the Water Act has shown the need for avoiding excessive formalism and consolidating horizontal coordination. Sample taking, inquiry, notice, appreciation of evidence, issuing of appropriate orders, prosecution and enforcement of orders of closures are various links of the same legal process. Every stage of action should be informed and sensitized by the policy of public welfare underlying the legislation. Unfortunately, this did not occur in some cases. In *Delhi Bottling Company* case[69] the evidence collected through sample taking without strict compliance with the statutory requirements of notice and party's presence was held by the Delhi High Court to be inadmissible, although the company had not challenged the integrity of the sampling method or of the method of analysis. In *Executive Apparel Processors*[70] the Karnataka High Court held that the State Board had no power to get its order of closure executed through the Deputy Commissioner, but only could initiate penalty proceedings. *Travancore Cochin Chemicals Ltd.* case involved a lenient approach of the State Board in giving consent to discharge effluents to Periyar River, its failure to ensure compliance with the conditions of consent for eight years and inaction to respond to the new application of the company. The Kerala High Court adopted a formalist reasoning that since the four-month's waiting period was not interfered by the Board, the company had an unconditional right to discharge into the river. Another example of formalist reasoning is a session court's order of quashing prosecution of the officials of a company on the ground that there was error in description of the company's name. It is only after a lapse of 16 years that the prosecution was revived after the Supreme Court's decision.[71]

In contrast, there are pro-environment judgments that emphasize strict enforcement of the Water Act. The doctrines of absolute liability and public trust

[69] *Delhi Bottling Co. Pvt. Ltd.v. Central Board for the Prevention and Control of Pollution*, AIR 1986 Del. 152.

[70] *Executive Apparel Processors v. Taluka Executive Magistrate,* 1997 (4) Kar.L.J. 181.

[71] *U.P.Pollution Control Board v. Mohan Meakins Ltd*. 2000 (2) SCALE 532

laid down in *Ganga Pollution* cases, *Bichhri* case and *Vellore Citizens Forum* case have gone a long way towards sternly dealing with water pollution problem.[72] In *Pondicherry Papers Ltd.*[73] the Madras High Court upheld the Magistrate's power of issuing injunction restraining a paper company from discharging effluent until the company constructed a water treatment plant. The Allahabad High Court in *Shadilal Enterprises*[74] adopted a similar approach. In *Kohinoor Dyeing and Printing Works*[75] the Magistrate's order on the company to desist from causing pollution until the hearing of the criminal case was upheld by the Gujarat High Court. In *Narula Dyeing and Printing Works*[76] Gujarat High Court upheld the state government's closure order on a factory that defied for more than a decade the condition imposed under the consent order to establish a treatment plant within six months from the date of the consent order. Regarding penal liability of managers of companies, which committed offences under the Water Act, a rigid approach avoiding escape from liability, is adopted in a number of cases.[77]

In *Delhi Jal Board v. State of Haryana*,[78] the increased ammonia levels in Yamuna due to discharge of pollutants into the river was addressed by the Supreme Court where it directed the registration of a *suo moto* writ petition with regard to 'remediation of polluted rivers.' Highlighting the duty of the Municipalities and local authorities under Article 243W and Item 6 of the Twelfth Schedule, the Court observed that the "onus to operate the existing common

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[72] *M.C.Mehta v. Union of India*, 1992 Supp. (2) SCC 633 and 607; *Indian Council for Enviro-Legal Action v. Union of India*, AIR 1996 SC 1446; *Vellore Citizens' Welfare Forum v. Union of India*, AIR 1996 SC 2715.

[73] *Pondicherry Papers Ltd. v. Central Board for Prevention and Control of Water Pollution*, Madras H.C., Crim.Misc.P.No. 4662 and 4663 of 1978 dated March 21, 1980.

[74] *Sir Shadilal Enterprises Ltd. v. Chief Judicial Magistrate, Saharanpur*, 1990 Cri.L.J. 522.

[75] *Gujarat Water Pollution Control Board v. Kohinoor Dyeing and Printing Works,* 1993(2) Guj.L.R. 1368.

[76] *Narula Dyeing and Printing Works v. Union of India*, AIR 1995 Guj 185.

[77] *UP Pollution Control Board v. Mohan Meakins Ltd.* 2000(2) SCALE 532; *K.K.Nandi v, Amitabha Bannerjee*, 1983 Cri. L.J. 1479; *Mohamud Ali* v. *State of Bihar*, AIR 1986 Pat 133; *J.S.Huja* v. *State of UP*, 1989 Cri. L.J.1334.

[78] Dated 13/01/2021 available at river-pollution-SC-order-Jan-2021.pdf (indiaenvironmentportal.org.in) (last visited on 05/05/2021).

effluent treatment plants rests on the municipalities and they are not permitted to shy away from discharging this onerous duty."[79] It further observed that in cases of financial constraints the remedy lies in Article 243X and 243Y of the Constitution. The Court went on to direct the CPCB to identify municipalities along the river Yamuna that have not installed STP, to highlight other sources of prominent contamination and make a priority-wise list of Municipalities, river stretches which have been polluted the most.[80]

It can be distinctly seen that success in prevention and control of water pollution has largely depended on concerted application of various facets of the Act and co-ordination amidst various agencies performing functions assigned under the Act.

4. Enforcement of international conventions through national laws

Article 253 of the Constitution authorizes the Parliament to enact laws for the enforcement of international treaties and conventions signed by India. The Environment Protection Act, 1986 has been a product of such an effort to give effect to the decisions taken in the UN Conference in Stockholm in 1972. In the famous shrimp culture case, *S. Jagannath* v. *Union of India*, [81] the principle in Stockholm Declaration, 1972 to the effect that non-renewable resources of earth shall be guarded against the danger of exhaustion was relied upon for upholding an action under Coastal Zone Regulation to prevent use of groundwater for shrimp farming and avoid salinization of land. According to Principle 13 of the Declaration, "In order to achieve a more rational management of resources and thus to improve the environment, states should adopt an integrated and coordinated approach to their development and planning so as to ensure that development is compatible with the need to protect and improve the human environment for the benefit of their population." This calls for avoidance of fragmented approaches amidst power holders within the federal system.

The Indian government has been an active participant of the multilateral climate change negotiations including United Nations Framework Convention for

[79] Id. para 11

[80] Id. para 18

[81] *S. Jagannath v. Union of India* AIR 1997 SC 811.

Climate Change (UNFCC), Kyoto Protocol, Paris, and COPs. India has undertaken to develop the National Action Plan on Climate Change (NAPCC) attempting to integrate the sectorial regimes and collaborate at the institutional governance. One of the eight missions in the NAPCC is the National Water Mission that aims at integrated water resource management to help conserve water, minimize wastage and equitable distribution both across and within states.[82] The international commitments and obligation indicates the turn towards the integrated and coordinated efforts in managing the natural resources.

5. National Water Policy and federalism

The formulation and implementation of national water policy involves a wide-spread cooperative effort of big dimension. Fundamental Rights, Directive Principles of State Policy and Fundamental Duties provide valuable input and direction in framing national water policy. According to Upendra Baxi, "The so-called Indian national water policy regimes thrive fully on the practices ordaining human rightlessness as a governing virtue. These create an illusionary appearance of change masking the deep Human Right to Water Indian backwardness. The situation has not been further ameliorated by the new 'wisdom' that speaks to us in terms of privatization, public-private partnerships and some newly instituted regulatory cultures."[83] The rich environmental jurisprudence developed by the judiciary, the complex experience of the country and the thrusts of relevant international conventions are also the relevant factors in its formulation. The modus operandi of evolving it through various levels of discussions involving all the States and the concerned Departments of Union Government like Irrigation, Environment, Agriculture, Urban and Rural Development, Drinking Water etc point out the practical application of cooperative federalism. In prioritization of purposes in use of water and monitoring its implementation, the national policy is expected to evolve an approach of integrated efforts.

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[82] National Water Mission, National Action Plan for Climate Change, available at Inner 01-54-C 7.6.08 (moef.gov.in)(last visited on 04/05/2022).

[83] Upendra Baxi, "The Human Right to Water: Policies and Rights", in Ramaswamy R Iyer, *Supra* note 44, p.149 at 165.

However, the National Water Policy 2012 recognizes the need for a holistic and interdisciplinary approach to water related problems.[84] The Policy stresses on the need for the public policies on water resources to be governed by basic principles of equity and social justice in the aspects of use and allocation of water. [85] The Policy is criticized for allowing the competitive use of water which makes way to prioritize industrial/ commercial use over agriculture.[86]

6. Groundwater law and federalism

As groundwater is a subject coming under State List, the role of the central government is confined to draft and circulate Model Groundwater Bills amidst states for their guidance. In the centrally administered areas the rules enacted under the Environment Protection Act provide for some regulation. Still an effort is going on to refine the rules so that rain harvesting will be made compulsory for building owners and constructors.

Since the situations regarding groundwater in various states are diverse owing to differences in the extent of recharge, availability of water and extent of use, there has not been a uniform approach. There has been a view that in Gangetic plain there is underutilization of groundwater[87] whereas in Deccan plateau, there is over utilization. States have often hesitated to enact laws in view of the practical difficulties and propriety of the policy of extensive regulation. In the Model Groundwater Bill and some of the state measures, the essential legislative policy involved: fixation of interspaces of wells and borewells, requirement of licensing and other extensive regulations.[88] But scarce attention is paid to rainwater harvesting methods and invigorating traditional methods of water conservation. Cooperative federalism in this sphere has not proceeded towards a satisfactory position. Although the state laws may improve upon the

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[84] National Water Policy 2012, available at Microsoft Word - NWP,2012(Eng).docx (mowr.gov.in) (last visited on 04/-5/2022).

[85] Id, p 3

[86] National Water Policy, 2012 silent on priorities (downtoearth.org.in) visited on 04/05/2022

[87] B.D.Dhawan, "Underutilization of Groundwater Resources: A case study of East Uttar Pradesh" *Economic aAnd Political Weekly*, A-113 (September 1980).

[88] For elaborate discussion, see infra P.Ishwara Bhat, *Legal Management of Groundwater for Rational use, Conservation and Development with Justice* ILI Seminar Paper 1994

Model Bill, the expertise of the central water agency on the matter could have been better used. Further, the task of water quality management and conservation spills over various departments of government because of its multiple dimensions. The Departments of Irrigation, Agriculture, Industry, Drinking Water System, Geology, Mining, Forest, Environment, Soil Conservation, Dry land development, Local Self Government and Electricity come into picture in the course of performing this task. Unless coordination in their activities is ensured, it is difficult to realize the objective. While Kerala has enacted a groundwater statute in 2002 on lines of Model Bill, Karnataka has enacted a statute in 2003 confining its policy to protection of groundwater for the supply of drinking water.[89] The Model Bill for the Conservation, Protection, Regulation and Management of Groundwater, 2016, recognizes the integrated approach as one of the basic principles where the protection, conservation, regulation and management of groundwater shall be undertaken in such a manner that it is integrated with the protection, conservation, regulation and management of surface water.[90] This means that the groundwater is to be treated on par with that of surface water for all purposes, but with the private rights over the groundwater, it remains to be seen how the integration can be achieved.

It is pleasing to note that the Andhra Pradesh Water Act, 2002, strikes a different path because of its highly imaginative and comprehensive approach. As the preamble states, it is an Act to promote water conservation and tree cover and regulate the exploitation and use of ground and surface water for protection and conservation of water sources, land and environment matters, connected therewith or incidental thereto. The Act has following features:

First, it sets up the Water, Land and Tree Authority, composed of the Minister for Panchayat and Rural Development as its chairperson, and Secretaries of relevant departments, three Professors of life science, engineering and technology and five experts in soil conservation, economics and natural

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89 P Ishwara Bhat, "A Comparative Study of Groundwater Law in South India" 1 *Indian Juridical Review* 25 (2004).

90 Model_Bill_Groundwater_May_2016_0.pdf (mowr.gov.in) (last visited on 03/05/2022).

resource management as its members. It is vested with the responsibility to promote water conservation and enhancement of tree cover in the State; to regulate the exploitation of ground and surface water in the State; and to advise the Government on the legislative, administrative, and economic measures to be taken from time to time for the conservation of natural resources. Working at the levels of panchayats and planning for and ensuring public participation in conservation efforts are also its functions. The statute largely relies on a participative model of resource management on the part of stakeholders.

Second, it provides that the authority shall regulate all the groundwater resources in the state. Registration of all the existing wells, requirement of license for new wells/ bore wells, prescription of minimum interspaces of 250 meters with public drinking water source and subjection to take over of the water source by the state for the purpose of supply of drinking water to the public are prescribed. Any commercial exploitation of private water sources adversely affecting levels of groundwater or environment may be stopped by state's order for a period of six months or the water source may be taken over by the state. Declaration of any groundwater area as an overexploited area and prevention of extraction of groundwater in such areas are also contemplated. The role of the Electricity Transmission Company for regulating extraction of groundwater is specifically mentioned. The authority may, by prescribing license conditions, compel the groundwater user to follow the methods of enhancing the groundwater by recharge or rainwater harvesting. The authority through appropriate directions may also deal with unhealthy competitions and overcrowding of bore wells. Owners of buildings, whether residential, industrial, commercial or educational are required to adopt rainwater harvesting methods. There is also prohibition of groundwater pollution by chemical, industrial or other uses.

Thirdly, the Authority or any designated officer may direct the occupier of any land for modification of land use or cropping pattern to suit the availability of water. To ensure that land and water use in the watersheds shall be conducive for efficient utilization of these resources as well as groundwater recharge, the watershed committees shall adopt the measures as suggested by the officer concerned. The members of watershed committees shall be trained

by the officer concerned and the members so trained shall in turn train the other farmers prior to signing of the Memorandum of Understanding. The cost will be recovered from the landowner as if it were arrears of land revenue from the party. The Act contemplates Water Users Associations, which shall ensure optimum use of surface and groundwater and for this purpose the Water Users Associations shall adopt the measures suggested by the designated officer. The authority may notify water bodies like lakes, village ponds and minor irrigation tanks along with *nalas* (watercourse or drainage course) as heritage bodies and conservation areas to prevent conversion of their intended use and shall take appropriate actions.

Fourthly, the Authority may direct the municipal and local bodies to insist for compulsory plantation with such number of trees and their maintenance as may be prescribed while according approval of building plans. Tree plantation and landscaping shall be adopted in all public and private premises including educational institutions. No felling of the trees or branches is permitted without the prior permission of the designated officer, and if done shall be compensated by planting not less than two seedlings. The authority may formulate guidelines for tree plantations along with the road margins, canal banks, tank-foreshores and water bodies. All agricultural land owners except small and marginal farmers and wetland owners as determined by the Government shall plant trees in their land holding as prescribed by the Authority upto 5% of their total land holding and felling permission for trees shall be given only when the landowner plants trees in equal extent of land.

The Andhra experiment is to be closely watched before wholesale adoption or implementation in other states. Given the theoretic frame and approach of popular participation with a happy combination of disciplining, hopes for its success are justified. Indian federalism does not obstruct creativity in regional law. The Karnataka Groundwater Act 2011 has relied more on the command and control model rather than the Andhra model.

The central groundwater scheme i.e., the Atal Bhujal Yojna (Atal Jal), is a project of INR 6000 crores initiated by the Central Government for facilitating sustainable groundwater management in the water stressed regions of Gujrat,

Haryana, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan and Uttar Pradesh.[91] The scheme has been well knit to justify the significance attached to groundwater as a local matter by promoting the panchayath led groundwater management and community participation in its management. The focus of the scheme is to drive the demand side into sustainable groundwater use.

7. Proposed project of Interlinking of Rivers

Federal system has great responsibility in carefully dealing with the proposed planning, implementation and working of mega projects for linking Ganga, Cauvery and other major rivers. Initiated in the suggestion made by Sir Arthur Cotton during British rule, the idea of linking the rivers to resolve the problems of drought and flood was given repeated attention by the Central Government in 1972 (owing to the initiative by K. L. Rao, Union Minister for Irrigation), 1974 (Captain Dastur's proposal of Garland Canal) and in 1990s (being opposed by an expert committee consisting of M. S. Reddy and Ramaswamy Iyer) only to be rejected on account of non-feasibility. The political resolution of the BJP National Council meeting at Nagpur in August 27-28, 2000 also stated: "We also urge the Government to consider a time bound programme to link Ganga and Cauvery waters. The Sethu Samudram canal project also needs to be considered for early action." The 9th Five Year Plan also states positively about this project.

The idea was brought about in the case of *In Re Networking of Rivers* before the Supreme Court in September 2002.[92] The petitioner had sought the Apex Court's intervention to direct authorities to initiate the implementation of this project in a phased manner and with a time frame; to publicize the feasibility reports prepared by the National Water Development Agency under Ministry of Water Resources; and to furnish details of the total funds presently spent by Central and all State Governments on flood and drought relief; and to disclose reasons for delay. The Court ordered the task of interlinking major rivers of the country.[93] The National Water Development Agency (NWDA) has, after

[91] Atal Bhujal Yojana(Atal Jal) (mowr.gov.in) (last visited on 03/05/2022).

[92] *Networking of Rivers*, re, September 16, 2002 (2002) 4 SCC 78

[93] *Networking of Rivers*, re, May 5, 2003, (2002) 4 SCC 77

carrying out detailed studies, identified 30 links for the preparation of feasibility reports under the National Perspective Plan, 1980 and has prepared feasibility reports of 6 such links. With a view to bring about a consensus among the states and provide guidance on norms of appraisal of individual projects and modalities for project funding etc. the central government set up a Task Force on 13th December, 2002. Completion of a detailed project feasibility report with the participation of the concerned states and the Union Government has been scheduled at the end of the year 2006 and completion of the project by the end of 2016. None of the ILR projects have been completed yet but of the 30 links from the two components, 14 of the Himalayan links Manas-Sankosh-Tista-Ganga (M-S-T-G) link, Rajasthan-Sabarmati link, Subernarekha-Mahanadi link have completed the stage of feasibility report (FR), Gandak-Ganga link, Ghaghra-Yamuna link, Sarda-Yamuna link, Ganga(Farakka)-Damodar-Subernarekha link, Ganga (Farakka)-Sunderbans link have completed feasibility report (Indian Component), Yamuna-Rajasthan link, Chunar-Sone Barrage link are in the stage of draft feasibility report, Kosi-Ghaghra link, Sone Dam – Southern Tributaries of Ganga link, Kosi-Mechi link are still in pre-feasibility report (PFR) stage. The only link dropped is the Jogighopa-Tista-Farakka link.[94] A few links involve Nepal as they are transboundary. The 16 links of the Peninsular region Ken-Betwa link has completed the feasibility report, detailed project report and two phases of Comprehensive study, Par-Tapi-Narmada link, Damanganga - Pinjal link have completed feasibility and detailed project report, while Mahanadi (Manibhadra)- Godavari (Dowlaiswaram) link, Godavari (Inchampalli) – Krishna (Pulichintala) link, Godavari (Inchampalli)- Krishna (Nagarjunasagar) link, Godavari (Polavaram) - Krishna (Vijayawada) link, Krishna (Almatti) – Pennar link, Krishna (Srisailam) – Pennar link, Krishna (Nagarjunasagar) - Pennar (Somasila) link, Pennar (Somasila) - Cauvery (Grand Anicut) link, Cauvery (Kattalai) - Vaigai -Gundar link, Parbati -Kalisindh-Chambal link, Pamba - Achankovil - Vaippar link have completed the feasibility report and Bedti-Varada link and Netravati-Hemavati link have completed the pre-feasible report.[95]

[94] https://pib.gov.in/PressReleasePage.aspx?PRID=1779792 (Last visited on 25-05-2022)

[95] Ibid

The expected benefits of interlinking of rivers are: Surface water irrigation: 25 million Ha; Groundwater irrigation: 10 million Ha; Hydropower generation: 34 million KW; improved agriculture ensuring food security; flood and drought control; alternative means of transport which is a cheap and non-polluting; higher GDP growth by creation of more employment opportunities approximately leading to a 4% growth in the GDP; promotion of national unity and national security.

The disadvantages of this networking project have been the following: non-inclusion of people's participation; lack of consensus among citizens; crisscross construction of dams and canal systems, which will cause displacement of people; submergence of land, forests and reserves; negative impact on flora and fauna; acquisition of large tracts of land; centralized political decision making and marginalisation of states. Huge expense involved in the project (5.6 lakh crores), acquisition of vast area (8000 square k.m.), displacement and rehabilitation of millions of people, increased pollution due to less water in donor area rivers, problem of deposit of silt and problem of security are some of the major hassles feared.

From the angle of integrated development, it is submitted, the overall impact of the project upon the ecology shall be foreseen before venturing for it. Some of the fears expressed by the experts and environmentalists[96] should be perused with serious attention. The decline in the extent of ice cover of Himalayan Mountains and Nepal's new irrigation plans are likely to lower the extent of flow of water in Ganga (Vandana Shiva). The project's impact upon neighbouring countries like Nepal, Bhutan and BanglaDesh in the form of submergence of land, eviction of people or drastic fall in the flow rate shall be taken into account (Shankara Iyer). Thousands of big and small dams for carrying on the project are likely to result in loss of vast tracts of forestland, resultant climate change, eviction and rehabilitation of millions of people and serious disturbance of the hydro geological cycle (Medha Patkar). Because of unabated pollution of rivers

[96] N.Murari Ballal, "Jeevantha nadigala nirjeeva jodane (Lifeless linking of living rivers: Unscientific and irrelevant) ' and N.A.Madhyastha, ' Nadi thirugisuva modalu yochisi (Think before you twist the rivers)" *Taranga*, Kannada Weekly, (October 9. 2003).

the project may further add to the water pollution problem. The project may dislocate and fragment the river basins, each of which have their own organic unity, and thus cause big malady to the environment (Bittu Sehgal). Enormous hydroelectric power required for pumping water to the high Deccan plateau would deepen the power crisis. The experiences of countries like Australia and the United States of America regarding joining the rivers by network of dams have been largely negative. The adverse impact upon flora and fauna, deposit of silt, drying of riverbed and such other consequences have compelled the respective governments to go back for restoration and rejuvenation of rivers. Integrated approach does not mean mechanical joining of the rivers without bothering about the overall impact upon ecology. Environment's bearing capacity regarding the project shall be properly assessed and hasty decision shall be avoided. The huge financial resource required for the project can be better utilized for long standing development and rejuvenation of tanks and extensive use of traditional and refined techniques of rainwater harvesting.

There are also proposals for altering the directions of river flow especially the rivers originating in western ghat and flowing towards the west in Karnataka. Such proposals bank on the thinking that the west flowing rivers are not properly harnessed because of lesser availability of cultivable land and that dry lands in the plains could be benefited by change of flow direction. Again, questions of ecological impact do arise. Soil erosion, loss of forestland, drying of streams and rivers and deprivation of groundwater recharge are some of the major and convincing reasons for opposition by the environmentalists. Immediate availability of water because of such projects shall not be the sole basis for adopting decisions in these matters.

Without a constitutional amendment providing for transfer of legislative power on water from State List to Concurrent List it is not possible to go ahead with the project since land acquisition, rehabilitation and various other burdens upon the states in the course of implementation are likely to strain federal structure.

Presently, regarding flood control also, a number of state legislations are in effect with definite policies and methods suitable to the local conditions. Although

the central government has been extending its assistance through financial grants, deployment of paramilitary forces for rescue and supply of infrastructural facilities, it has not invoked the provisions of the River Board Act. It has also not resorted to Art. 249 or 252 for enacting any central legislation on the subject. But it has competence to apply the mechanism of administrative directions under Arts. 256 and 257. The state legislations provide for restricting the human activities in flood plain zoning, prohibit obstruction to rivers, compulsory evacuation of people and property from areas threatened or affected by flood, requisition of labour, boats or vehicles and requisition of land for executing flood control schemes.[97] But long-term solutions like afforestation and rain water harvesting have not been contemplated under state legislation. Inter-state cooperation in situations of flood is prevalent in ad hoc manner.

The Government constituted a Task Force, and was involved in preparatory works.[98] In 2012, the Supreme Court found broad consensus amidst Central and State Governments on the issue and directed the Union Government to constitute a task force and produce feasibility reports, detailed project reports and financial implications.[99] The Court got dissatisfied with the extent of progress in preparatory work for networking of rivers, and directed the Union Government to constitute a Special Committee; to have its meeting at least once in two months; to have biannual scrutiny by the Cabinet followed by expeditious action; to take up the 'Ken-Betwa' project for implementation because of sufficient preparatory work and consensus of states; and Special Committee to fix definite time-frame for completion of preparatory works and implementation of the projects.

The Court referred to the report of the National Council for Applied Economic Research and observed, "The report clearly opines that interlinking

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97 *See* the Assam Embankment and Drainage Act, 1954; Andhra Pradesh Irrigation Act, 1955; Bengal Embankment Act, 1882; Bihar Public Irrigation and Flood Protection Act, 1947; Bombay Irrigation Act,1879; Madras Irrigation Act, 1955; Mysore Irrigation Act, 1965;Orissa Hydro-electric Projects and Flood Control Works Act, 1961;Uttar Pradesh Flood Emergency Powers Evacuation and Requisition Act, 1951; *Also See*, Alice Jacob and K.C.Joshi, "Law relating to Flood Control in India" *Indian Law Institute* (1971).

98 *Networking of Rivers*, re, May 5, 2003 (2012) 4 SCC 77.

99 *Networking of Rivers,* re, (2012) 4 SCC 51.

of river projects will prove fruitful for the nation as a whole and would serve a greater purpose by allowing higher returns from the agricultural sector for the benefit of the entire economy. This would also result in providing varied benefits like control of floods, providing water to drought-prone States, providing water to a larger part of agricultural land and even power generation." Integrated approach requires more systematic cooperation in this sphere.

8. Local Self Government and the Integrated Approach

In the devolution of powers conferred under the 73rd Amendment in relation to minor irrigation, water management, watershed development and drinking water, the state legislations have necessitated coordinated efforts of Zilla Panchayat, Taluka Panchayat and Grama Panchayat. Since Grama Sabha is given a crucial role of influencing the plan and developmental activities, participative approach in the matter of water quality management and conservation has been very much required. Grama Sabha is a forum that unifies various activities. The norms and practices for integrated efforts amidst Panchayat bodies are not very well settled. On the other hand confusions and divided responsibilities obstruct planned conservation activities on rain harvesting.

Under the Eleventh Schedule to the Constitution, the powers relating to minor irrigation, water management and water development; agriculture, land development and soil conservation; drinking water; fisheries; social forestry and small scale industries have been enumerated, which have bearing on water quality management and conservation. Art.243 *G* of the Constitution provides that state legislation shall make provisions for devolution of power at the appropriate level with respect to economic development and social justice. The Karnataka Panchayat Raj Act, 1993, which can be taken as a sample, distributes these powers amidst three levels of Panchayat in an overlapping manner.[100] Drinking water is a common subject to all the three layers of Panchayat. But primary responsibility of construction, repairs and maintenance of drinking water wells, tanks and ponds and prevention and control of water pollution is vested with the Grama Panchayat. Establishment, repairs and maintenance of rural

[100] See Schedules I, II and III of Karnataka Panchayat Act, 1993.

water supply schemes and prevention and control of water supply schemes is within Taluka Panchayat's jurisdiction. Promotion of drinking water and rural sanitation programmes is the power of Zilla Panchayat. Difficulty arises in delineating the jurisdictions. Regarding minor irrigation, water management and watershed development, the primary responsibility vests with the Zilla Panchayat. This includes: construction, renovation and maintenance of minor irrigation works; providing for the timely and equitable distribution and full use of water under irrigation schemes; watershed development programmes; development of groundwater resources. Taluka Panchayats have the power of assisting Zilla Panchayat's irrigation works. The power vested with the Gram Panchayat concerning irrigation is relatively limited. Hence, it is problematic for them to undertake activities on promotion and development of agriculture; development of wastelands; and development and maintenance of grazing lands, concerning which they have powers. While Grama Panchayat has extensive powers on planting of trees and promotion of social forestry, regarding watershed management, which is key to the success of afforestation, the power is with the Zilla Panchayat. It is not at all possible to have a rigid watertight compartment approach. Proper coordination amidst all the bodies is very much required. In fact, the state government is contemplating to play a significant role by prescribing the conditions within which each layer of panchayat is to exercise powers mentioned in the respective schedules.

Some noteworthy provisions in the Act empowering the Grama Panchayats in the matter of water supply and water quality management can be looked at. No place in the Grama Panchayat can be used for installing industries, for hotels or shops or for any offensive trade without the licence of the Panchayat.[101] For providing sufficient and pure water supply for private or public purpose, it has the power of constructing, repairing and maintaining tanks or wells; or acquiring any water source for the purpose; or utilize water with the consent of the owner.[102] Prohibiting pollution of drinking water, making bye laws to prevent injury to water source, obligating owners of drinking water sources to maintain

[101] Sections 66-69 of Karnataka Panchayat Act, 1993.
[102] Section 77 of Karnataka Panchayat Act, 1993.

cleanliness, setting apart of public springs for specific purposes, abatement of nuisance from foul water, construction of drainages, obligating the occupiers to arrange for drainages and making provisions for privies are some of the powers in the hands of Grama Panchayat.[103] Comprehensive powers to deal with village level water requirements in both quality and quantity considerations have been entrusted upon Grama Panchayat for an integrated application. Most of the policies and schemes emphasize on the community participation and involvement of the panchayats to encourage water management from below. For instance, the Atal Jal scheme or Krishi Bhagya scheme (Karnataka)[104] are the community empowering programs.

The Guidelines for Watershed development of the Ministry of Rural Development, Government of India 1994 contemplate a key role for panchayats in watershed development projects. Although at present, the extent of people's participation is inadequate, the participatory approach is regarded as the single most important factor for fulfilling the targets. In view of the emphasis laid in Rio Earth Summit's Agenda 21 towards local people's involvement and participation in the conservation and rational use of natural resources, this is appropriate.

9. Public Undertakings and the Integrated Approach

Cutting across the distinctions amidst the sectors of economic activities, all the enterprises whether public or private, have immense responsibilities towards water conservation and quality management. Whether involved in mining, industrial, agricultural, infrastructural (electricity), urban, or other activities, their responsibility in this sphere is big because of the extensive impact of their activities on the environment. As owners of land, of water bodies and buildings, in cooperation with neighboring persons and authorities, they have to discharge their responsibilities. Petty conflicts about jurisdiction or dissensions about cost sharing in circumstances of joint work are highly obstructive to the objective of water quality management and conservation. The role of the Power

[103] Sections 82 to 87 and 100 to 106 of Karnataka Panchayat Act, 1993.

[104] The farmers obtain grants for constructing farm ponds (Krishi Honda) to conserve rainwater and for buying lift pumps, diesel motors to draw water during deficit rainfall.

Transmission body in regulating supply of electricity for pumps by limiting hours of pumping is likely to assist the cause of conservation of groundwater. Coordination amidst municipalities, water supply bodies and sewage disposal authorities is a must for success in water conservation and quality management. The decision in *Ratlam Municipality* [105] case points out the need for a holistic approach towards sanitation and purity of water. The task of water quality management and conservation spills over various departments of government because of its multiple dimensions. The Departments of Irrigation, Agriculture, Industry, Drinking Water System, Geology, Mining, Forest, Environment, Soil Conservation, Dry land development, Local Self Government and Electricity come into picture in the course of performing this task. Unless coordination in their activities is ensured, it is difficult to realize the objective.

10. Privatization as a threat to integrated approach

Privatization of water service and water work, which is an alarming phenomenon of recent times, has been found to be problematic. The National Water Policy 2002 made space for the idea of privatizing water. According to one source, almost all the cities have privatization projects of river water at various stages of implementation starting from Sheonath River at Chhattisgarh to Periyar of Kerala, whereas the unofficial figure is about 40. This is in addition to numerous mineral water and soft drinks companies spread over various parts of India. Finer principles of water conservation, maintenance of purity and its equitable use by all get obstructed because of privatization. Being more concerned with profiteering, their concern for enduring environmental balance is suspected. However, legally they are subject to application of public trust theory, intergenerational equity, precautionary principle and polluter pays concepts. Some of the disturbing facts about privatization can be noted vis-à-vis integrated approach.

In 1998, being unable to launch a scheme for infrastructure facilitation for growing industries and succumbing to pressure from the bulk consumers/ industries, the government of Chhattisgarh decided to involve the private sector

[105] *Muncipal Council, Ratlam v. Vardhichand*, AIR 1980 SC 1622.

in the water supply scheme.[106] It signed a 22-year lease with Radius Water Limited, giving it the right to 23.6 km of the Sheonath and supply the Borai Industrial Centre water from July till September through the nodal agency. The project was commissioned in April 2001. The Company now supplies 40 million kilolitres of water at Rs.12.60 a kilolitre to industries, the railway station and a railway colony through the nodal agency, which would pay Radius irrespective of whether it collects the money from the industries using the water. As a consequence of the contract, farmers situated in the area depending on the river for their agricultural activities and for drinking water from time immemorial are denied access to it. There were agitations by NGOs and farmers against the deprivation because of privatization.

In Kerala, the ramification of two government sponsored privatization schemes and of two private enterprises can be highlighted.[107] First one is Periyar. According to a revised scheme presented by Kerala State Industrial Development Corporation Ltd., the Rs.330-crore Cochin Industrial Water Supply Scheme (CIWSS) is meant to allow the private investor to pump out 200 million litres a day (MLD) from the Periyar river at Mahilalayam in Aluva, purify it at a 20-acre (eight hectare) treatment plant near Kalamassery, and distribute potable water to major industrial and commercial units in and around Kochi at a rate of Rs.14 a kilolitre (out of which Rs.2 a kl is to be paid to the government as water cess). It was meant to be a build-own-operate-transfer (BOOT) scheme, to be operated fully by the investor for the lease period of 20 years. The private company that would run the scheme is also expected to implement "long-term steps to improve the flow rate in the river", such as constructing check dams in the upstream points and regulators to check salinity intrusion from the sea (the Kochi area being at the mouth of the river) and dredging reservoirs to improve their storage capacities. The major beneficiaries of the project include large scale and small-scale industries, hospitals and educational institutions. There is a view that the river is already polluted because several industrial units are situated

[106] Asha Krishna Kumar, "Natural Resources: Peoples' Battle for a River" *The Hindu, Nov.* 07, 2002.

[107] "Kerala Government's move to sell water comes in for flak" *Deccan Herald*, Thiruvananthapuram, Dec.4, 2002.

on its banks, who depend on it for water supply. Added to it are the problems of indiscriminate sand mining (according to one estimate, about 50,000 tonnes a day) and saltwater intrusion into the river during summer. Reduced flow of the river because of privatization is likely to further aggravate the problem.

Second one is the Rs.1, 351-crore Kanjikode Industrial Water Supply Scheme (KIWSS), which is to meet the "present and ultimate water demand" of the new industries being established in the industrial belts and the proposed industrial townships at the Kanjikode Industrial Development Area (IDA) and the Pudussary Industrial Development Area in Palakkad district. The main source of water is the Malampuzha irrigation dam. Moreover, the investor will also be allowed to "rely on groundwater sources'' and "rainwater harvesting" during the monsoon season. Withdrawal of 75 MLD of water from the Malampuzha irrigation system, to be supplied by the private investor to the industrial units at Kanjikode and Pudussary is causing fears about originally meant utility of Malampuzha dam to irrigate paddy crops on 20,000 ha in the district, and to serve as the source of drinking water supply to Palakkad town and six panchayats in the district. The dam is never full and is unable to supply water for more than 60 days for the two crops of paddy. The already existing arrangement for Pepsi bottling plant which draws 1.75 lakh litres of water a day from the Malampuzha dam has raised much concern amidst farmers. The new scheme would mean an assured supply of water for the private investor, irrespective of the water shortage in the region, and is likely to deteriorate the situation.

Another instance of private enterprise's water use causing alarming consequences is that of the Coca-Cola bottling unit at Plachimada on the Kerala-Tamil Nadu border in Palakkad district. Within two years of inauguration, several places in Chittoor taluk, including 10 colonies of tribal people, began to experience severe drinking water shortage. Estimates by people's committees suggest the company is drawing 10 lakh litres of groundwater from the region, and scientific studies are being quoted to prove that the factory is the major reason for the drought and drinking water scarcity in Chittoor taluk. There is an agitation for its closure.

The recent instance is of cleaning up of the river Ganga. Cleaning of a river includes different stages like cleaning of the polluted areas, cleaning of the debris, setting up treatment plants etc. The Clean Ganga program was launched with the financial aid of the World Bank. The initial scheme was to build the infrastructure where the government would pay 40% of the project costs to private developers on the completion of the project and subsequently remaining costs would be paid in annuities over a period of 15 years to private developers along with the operational and maintenance cost.[108] There were neither bids nor enthusiasm among the private developers. The Government then allowed the private developers not just to benefit from the construction alone but to sell the wastewater from the sewage treatment plant to the refineries for the cooling purposes and generate power from the biogas. This is how Haridwar attracted six bids while Varanasi had eight.[109] When thousands of crores are invested in the Clean Ganga program, the expectation from such public-private partnership is high. It is needless to say that the project is incomplete despite the frequently promised deadlines. The private sector is simply reaping benefits jeopardizing the people's right to clean water.

Instances of privatization of water service in African countries like Ghana, Tanzania, and Mozambique by involving multinational companies have raised the problem of deviation from pro-poor approach regarding water.[110] Lack of commitment to overall conservation and equitable distribution/use of water sources on the part of multinational corporations, lack of public accountability and marginalization of the poor have been complained of by these countries. These lessons are quite relevant for India too.

11. NGOs, People's Participation and the Integrated Approach

The developments during the last two decades have shown that the mission of water quality management and conservation can effectively work only with strong NGO activity and widespread people's participation. Most of the

[108] India: Cleaning up the Ganga with private sector support (worldbank.org) (last visited on 05/05/2022).

[109] Ibid.

[110] http:// Brettonwoodsproject.org.

Environment NGOs like Rural Litigation and Entitlement Kendra, Narmada Bachao Andolan, Vellore Citizens Welfare Forum, Banawasi Sewa Ashram, Nagarahole Budakattu Hakkusthapana Samithi are local organizations agitating for the cause of environment at local level. Local community in the Indian scenario is better suited to act locally although forced to think globally. The Union Government published its policy statement relating to environmental protection in 1992, which has categorically recognized the role of NGOs. It said, "Affected citizens and non-governmental organizations play a role in environmental monitoring and therefore in allowing them to supplement the regulatory system and recognizing their expertise where such exists and their commitment and vigilance, will also be cost effective. Access to information to enable public monitoring of environmental concerns will be provided for. Public interest litigation has successfully demonstrated that responsible non-governmental organizations and public-spirited individuals can bring about significant pressure on polluting units for adopting abatement measures. This commitment and expertise will be encouraged and their practical work supported."[111] Conceding that environmental issues have delicate zones and that the man-nature relationship is to be handled in a coordinated manner, the enhanced role and responsibility of NGOs is within the fitness of things. As can be gathered from the works and methods employed by Rural Ltigation Kendra and Tarun Bharat Sangh, -avoidance of mining, extensive planting of trees and rainwater harvesting- in resolving the problem of water depletion, integrated approach alone is effective.

Law provides for the participatory role of NGOs and people in the matter of water quality management and conservation. Under the Water (Prevention and Control of Pollution) Act, 1974 the composition of Central, State and Joint Pollution Control Board is such that it includes not more than three non-official members representing the interest of fishery, agriculture, or industry or trade or any other interest which the appropriate government considers as ought to be represented (Sections 34 and 14). Usually, office bearers of NGOs find a place

[111] Ministry of Environment and Forests, Government of India, Policy Statement for Abatement of Pollution (26 February 1992) cited in Shyam Divan and Armin Rosencranz, *Supra* note 32.

for such nominations. In exercising functions under the Act relating to promotion of research, training the officials, organizing the programmes for dissemination of information under Sections 16 and 17 of the Act, the Central Board and State Boards involve NGOs in the activities.

Opportunity to participate in the determination of environmental impact assessment and in the public hearing for clearances of projects call for meaningful involvement of NGOs in the enforcement of environment protection laws. According to Schedule III of Environmental Impact Assessment Regulations framed under Environment Protection Act, 1986 the expert committee for EIA shall consist, amongst others, a representative of NGOs or persons concerned with environmental issues. Schedule IV provides that in addition to local residents and affected persons, environmental groups (associations whether incorporated or not, but functioning in the field of Environment) also have the right to participate in public hearing. The Andhra Pradesh Water Land and Trees Act, 2002 has not only provided for participation of 5 non-official members from the class of people interested in conservation of natural resources, but also has contemplated an active role of Water Users Association in the optimum use of water in irrigation in command areas and of other organizations in planting and protection of trees and involving in rainwater harvesting (Sections 3 and 22).

12. Conclusion

Integrated approach to water quality management and conservation has both theoretical and practical justifications, and has been increasingly adopted in the legal regime. Contrasted to the fragmented and isolated approaches, it has great merits. It avoids conflict of policy, jurisdiction and actions amidst various bodies shouldering the responsibility of water quality management and conservation. It is suitable to holistic perception about nature; is fit to the unity of duty towards it; and conducive to the approach of people's participation towards the laudable cause. The dimensions of human rights, development and environmental protection are integral parts of it. The existing constitutional framework ordains to attain coordination by a focus on duty on the part of various levels of government, public and private organizations and people at large.

Cooperative federalism is a key concept instrumental for the integrated approach. Regarding inter-state rivers, one of the positive experiences is that there is a definite tendency towards equitable apportionment principle in water sharing and use, which requires inter-state cooperation and joint operation through river specific inter-state authorities supervised by the Central Government. In dealing with water pollution, whether in inter-state rivers or in intra state water bodies, cooperation and coordination of states and of different departments have been the imperatives in the background of both negative and positive experiences. Indian federalism has necessitated flexibility in the matter of groundwater law and consultation of constituents in framing national water policy. Federalism has greater responsibility in tackling the issue of joining the rivers, which is feared to be environmentally problematic.

The system of local self-government, which is spread wide over the country, has shown great potential in dealing with the problem of water pollution and water conservation by employing the holistic approach. People's involvement and participation through NGOs and self-help groups put forward the creative impact of social capital engendered from group power. Privatization of water supply service and lack of adequate qualitative and quantitative control over soft drink /mineral water producers pose problems of compliance with the constitutional objective of equitable access to drinking water.

While law has predominantly tuned to the integrated approach, in practice, adherence to its spirit has not been made in the sphere of inter-state river disputes. Lack of coordination between various bodies and levels of government has also been witnessed during the functioning of pollution control boards. Participation of people and the civil society, which should fill life to the whole enterprise, is yet to be developed with missionary zeal.

On the whole, although there is a definite trend towards cooperative federalism and integrated approach, in view of the mammoth dimension of the problem, its network shall be widened and its full potentiality shall be tapped. Mustering the entire energies of the society and utilizing them fully is required for a comfortable result.

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2

REGULATING AND MANAGING GROUNDWATER IN KARNATAKA*

P. Ishwara Bhat, Akhila Basalalli and Nayashree Bhogse**

Groundwater is a highly crucial natural resource and is a primary source of water.[1] Since the 1970s, India has relied upon groundwater in a big way to increase areas under irrigation and to provide water for drinking and other purposes. The reliance has brought about far-reaching economic development in various parts of the country. Private entrepreneurship dominates groundwater development, and financing bodies and power suppliers support it. However, its availability for safe use depends upon the extent of annual recharge by rain. The extent of recharge depends on the extent and duration of water spread those feeds into the aquifer and its geological structure. Excessive extraction of groundwater lowers the water table drastically and leads to a host of geological problems like landslide, tremor, and leads to deterioration of the quality by altering its chemical composition which potentially ruins health and rendering it

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1 A Vaidyanathan, *Water Resources of India* 38-50 (Oxford University Press, New Delhi, 2013); PS Vijay Shankar, Himanshu Kulkarni and Sunderrajan Krishnan, "India's Groundwater Challenge and the Way Forward" 46/2 *Economic & Political Weekly* 37 (2011); Aditi Mukherji, Stuti Rawat and Tushaar Shah, "Major Insights from India's Minor Irrigation Censuses: 1986-87 to 2006-07" 48/26–27 *Economic & Political Weekly* 115(2013).

unusable.[2] The water level can be enhanced by increasing the extent of recharge through rainwater harvesting by the creation of artificial storage mechanisms, construction of bunds and pits, afforestation, and artificial recharging. Since all these factors operate at the local level, groundwater is a 'local matter'[3]. However, given its importance to the State and to the country, groundwater management has implications beyond local confines. Such a proposition assumes significance due to the Supreme Court's decision in the final Cauvery judgment wherein it was held that groundwater availability should be considered in calculating the water resources of an inter-State River basin.[4] It suggests conjunctive use of surface and groundwater. Legal regulation of overdrawing of groundwater, management of its use, avoidance of wastage, prioritization of purpose of use becomes inevitable as unreasonable extraction of groundwater is calamitous. Such regulation stands in contrast to the common law approach that the landowner has an absolute right to extract any amount of groundwater from his/her land even if such actions lead to the drying up of a neighbouring owner's groundwater resource. The latter legal position can obstruct prioritization of water for drinking over other uses, equitable access to water by other landowners in that locality, and efforts to maintain geological health. Further, it is an archaic legal position prevalent in an era where modern means of extracting groundwater by high-speed pumps and drilling technology was not prevalent. Moreover, it is inimical to the principle of equality, economic justice, and ecological protection. To balance between development and distributive justice and establish inter-generation equity, which is a constitutional imperative

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2 P. Ishwara Bhat, "Legal Management of Groundwater to ensure Rational Use and Development with Justice" in ILI, *International Conference on Shaping the Future by Law: Children, Environment and Human Health, Indian Law Institute's Conference Proceedings*, pp. 139-153 (1994).

3 Water Education Foundation, "Groundwater Law" https://www.watereducation.org/aquapedia-background/groundwater-law, (last visited 03/06/2020).

4 *State of Karnataka v. State of Tamil Nadu*, (2018) 4 SCC 204-206 paragraphs 426-430 (India). While the groundwater quantified for Tamil Nadu is 'eminently safe quantity to be accounted for', over-extraction of groundwater in coastal zones is to be avoided as per Dipak Misra CJI paragraph 428.

and a human rights requirement,[5] a general law with full-fledged policies of conservation, regulation, development, and appropriate mechanisms for their enforcement is required. However, such a law should be flexible and accommodate the diversity of topographical and climate conditions in a State.

The legislative power regarding groundwater management falls with the States under the State List. The Central Groundwater Authority established by the Union Government under the Environment Protection Act, 1986, has the power to regulate and control the management and development of groundwater in the country and to issue necessary regulatory directions for this purpose all over India.[6] The Ministry of Water Resources, Government of India, has formulated and circulated Model Groundwater Bill to the States since the 1970s. Karnataka has enacted two legislations, one for protecting drinking water supply systems and the other for regulation and control of development and management. These laws were enacted in 1999 and in 2011, respectively. Further, there is a prohibition upon extracting groundwater in ayacut areas where the State provides canal irrigation. This paper aims to critically review these statutes after a brief literature survey and depiction of Karnataka's groundwater profile.

Literature and Policy Review

The groundwater is closely connected with surface water especially tanks and bunds which are fed by rain water, a brief discussion of the rich and old tradition of tanks in Karnataka is regarded as relevant as it provides a historical narrative of keeping the groundwater table at a comfortable level. A fascinating and scholarly work on the historical survey of tank irrigation in Karnataka based

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5 Right to life under Article 21 of the Constitution envisages right to live with human dignity, and access to drinking water is part of it, as held in *Subhash Kumar v. State of Bihar*, AIR 1991 SC 420 (India); *K M. Hiriyannappa v. State of Karnataka*, WP15080/2007 judgment dated 5 the June 2013 https://indiankanoon.org/doc/176249711 (last visited 05/08/2020); *F.K. Hussain v. Union of India*, A.I.R 1990 Ker.321

6 Notification Constituting the Central Groundwater Authority, 1997 under section 3 (3) of the Environment Protection Act, 1986, extracted in Philippe Culllet and Sujith Koonan (Eds), *Water Law in India: An Introduction to Legal Instruments* 271-2 (Oxford University Press, New Delhi, 2011). Also see *M C Mehta v. Union of India*, (1997) 1 SCC 312.

on archaeological research and empirical study by G S Dixit, G R Kuppuswamy and S K Mohan has greatly helped in knowing the best practices about tanks and open wells that have implication on groundwater.[7] It sheds useful light on the importance of community participation in water management.

In the collection of 20 interesting articles in the book *Waternama* edited by Sandhya Iyengar one can find discussion on indigenous methods of conservation of water, collective action of people for better water management, water use efficiency, rainwater harvesting, interlinking of ponds, compulsion to cooperate for water management, role of tank water distributor in equitable allocation of water, temporary arrangements for obstructing flow of water in stream in order to ensure that the water spread during the summer will recharge the aquifer and feed the birds and animals.[8] They emphasise less dependence on groundwater.

G B Ramesh, Lokesh, and Kashinatha trace the exponential growth of groundwater exploitation in Karnataka, especially in the 1990s. They refer to disturbing statistical data regarding the drastic fall in groundwater.[9] In response to the increased demand for water due to urbanization, expansion of agriculture, industries, and mining, a drastic increase in groundwater extraction occurred, causing a mismatch between the quantum of groundwater exploited and the rate for replenishment. Groundwater availability in Karnataka fell from 16.3 lakh hectare metres in 1994 to 15.3 lakh hectare metres in 2004, and to 14.8 lakh hectare metres in 2015 corresponding to the increase in the quantity of groundwater extracted. Referring to Karnataka Government records on over-exploitation, they estimate that in 30 talukas of 12 districts the situation is alarming: groundwater usage is excess. It stands at the range of 100 to 125 percent in 6 talukas, 126-150 percent in 11 talukas, 151-175 percent in 7 talukas, and 176-200 percent in 6 talukas. They suggest coordinated efforts to implement

7 G S Dixit, G R Kuppuswamy and S K Mohan, *Tank Irrigation in Karnataka : A Historical Survey* (Gandhi Sahitya Sangha, Bangalore, 1993)

8 Sandhya Iyengar, *Waternama: A Collection of Traditional Practices on Water Conservation and Management in Karnataka* (Communication for Development and Learning, Bangalore, 2007)

9 G B Ramesh, G B Lokesh and Kashinatha Dandoti, "Groundwater Regulation and Management Practices in Karnataka – Status and Challenges" Special Issue 7 *International Journal of Current Microbiology and Applied Sciences,* 807-815 (2018)

the KGW Act, synchronisation between the CGWA and KGWA, and appropriate management at both the demand and supply side of groundwater.

This article is pioneering on the legal management of groundwater discusses the dwindling groundwater situation in India in general and in Karnataka, in particular. In the problematic areas of this State, the fall in the water table has been 4.5 feet per year.[10] It theorizes the imperatives of rational use and development with the constitutional requirement of social justice. It throws light on the comparative position of groundwater laws – common law system (traditional English law), partial regulation in problematic areas (statutory law in the UK), prior appropriation principle (in some States of the US), and wholesale nationalisation of entire water resources including groundwater as in Israel. This comparative analysis posits an argument for an integrated approach for conjunctive use of surface and groundwater, coordinated efforts of electric power suppliers, financial institutions, local bodies, department of geology, joint farming practice, and augmentation of groundwater resource by water spread method. Law's role should appropriately address all these issues along with the need for greater center-state cooperation. In another article, there is a survey and comparison of the groundwater law in the States of South India and their diversified approaches.[11] The primary recommendation in this paper is that the integrated approach of augmenting natural resources – tree, soil, and water – as envisaged by the Andhra Pradesh water law is a more superior approach that is geared towards sustainable water development.

Philippe Cullet traces the groundwater law's development, finds fault with the overwhelming control over groundwater by landowners, and extensively discusses the elaborate measures under the central Groundwater Bill 2011 in the background of earlier Bills of 1970 and 2005.[12] He analyses the Kerala High Court judgment on permitting extensive extraction of groundwater by Coca Cola

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10 Bhat, *Supra* note 2.

11 P. Ishwara Bhat, "A Comparative Study of Groundwater law and Policy in South India" (2004)1 *Journal of Juridical Science Kolkata.*

12 Phillippe Cullet, "Groundwater in India: Towards a Framework Ensuring Equitable Access and Aquifer Protection" 26 *Journal of Environmental Law* 55-81 (2014).

Company in Plachimada basin.[13] He argues that the aquifer protection approach is the best method to address ecological considerations.

In another article, Philippe Cullet surveys the Central Government's continuing effort to inspire the State Governments to adopt the Model Groundwater Bill. It also examines the responses of the State governments, their distinct features of the State groundwater laws, and related judicial approaches.[14] He highlights the unique character of the West Bengal model law, which creatively utilises the roles of local self-governing bodies and the striking features of the Andhra Pradesh law, which provides for an integrated approach.

M. S. Vani discusses the growth of groundwater law in India by focussing on adverse effects of over-extraction of groundwater, nature of groundwater rights, the problematic aspects of the easement law, the central bill, state enactments, the need to integrate land use policy, the question of equitable rights and the trends of development.[15] She holds that the present state legislations on groundwater have been unable to free themselves from the common law's grip. They have been unable to articulate a comprehensive approach and are ineffective in strategizing decentralised governance.

Water Governance Facility's Report on groundwater governance in India is based on doctrinal and empirical study and is highly critical about the lapses in the enforcement of groundwater law.[16]

The Report states, "Groundwater governance entails the political, social, economic and administrative systems which affect the use, development, and

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13 *Hindustan Coca-Cola Beverages v. Perumatty Grama Panchayat* 2005(2) KLT 554 (High Court of Kerala 2005 para 35. The only concession made was to set an upper limit of 500,000 litres per day (para 53).

14 Philipple Cullet and Sujith Koonan (eds) *Water Law in India: An Introduction to Legal Instruments* 258-95 (Oxford University Press, 2011).

15 M S Vani, "Groundwater Law in India: A New Approach" in Ramaswamy R Iyer (Ed), *Water and the Laws in India* 435-473 (SAGE Publications, New Delhi, 2009).

16 Water Governance Facility, "Groundwater Governance in India: Stumbling Blocks for Law andCompliance" WGF Report 3, Stockholm(2013)

management of the resources and equity and efficiency of water services and allocation."[17] Some of the stumbling blocks that prevent reform include the sheer number of groundwater users, the lack of scientific principles and related personnel, the high economic stakes involved, and the lack of political will to strictly implement the law.

The Ground Water Year Book of Karnataka 2016-17 and other Year Books brought out by the Central Ground Water Board give elaborate quantitative data about the groundwater position in Karnataka.[18] Based on data collected from 1494 aquifers spread over all the districts of Karnataka by Ground Water Monitoring stations, rainfall records, and chemical quality reports, the Year Book provides valuable information. One can note it's finding that during the decade, 2006-2015, 70 to 76 percent of the wells have shown an alarming fall in water level.

The National Water Policy 2012 emphasizes the application of public trust doctrine in the domain of groundwater, the principle of equitable access, conjunctive use of surface and groundwater, and the need for private-public partnership in its conservation and development. The Jal Shakti Abhiyan launched in 2019 emphasizes on rainwater harvesting, renovation of the traditional methods to rejuvenate water bodies, watershed development, and intensive afforestation by involving civil society and local bodies.[19]The Atal Bhujal Yojana 2019 is a five years scheme to improve groundwater management through community participation. It promotes panchayat-led groundwater management, improves water use efficiency on a mass scale, emphasises on fair use and behavioural change by the community.[20] It aims at (i) improving monitoring network, capacity building and strengthening Water Users Association; and (ii) incentivising the states to improve the groundwater management practices by gathering data, preparing water security plans and it

17 *Id.* at 5

18 Central Ground Water Board, "Ground Water Year Book of Karnataka, 2016-17" (October 2017)

19 https://pib.gov.in/PressReleasePage.aspx?PRID=1594012 (last visited 04/06/2020).

20 https://timesofindia.indiatimes.com/india/what-is-atal-bhujal-yojana-atal-jal/articleshow/72964373.cms (last visited 04/06/2020).

seeks its effective implementation. The scheme is implemented in 7 water-starved States, including Karnataka and benefits 78 districts.

The above review of writings, reports, and policies provides a picture regarding trends in groundwater law and policy development at the national level in general and in Karnataka in particular. The emerging commitment to secure rational use and equitable access is evident.

Historical background

In assessing the present legal arrangement, the socio-economic and ecological practices prevalent for centuries as a part of the cultural tradition greatly helps. The success or failure of community participation in water conservation, use and management provides input. Unlike North India, where a perennial source of water is the system of major rivers, in the Deccan plateau, rivers were not major sources of irrigation until the dawn of modern dam technology. Tank irrigation gained great importance and attracted the attention and support of royal dynasties, administration, people's village organisation in the form of panchayats and philanthropists. G S Dixit et al refer to inscriptions and literary sources pointing out construction of tanks, wells and bunds by rulers belonging to Satavahana, Kadamba, Rashtrakuta, Pallava, Chalukya, Hoysala, Ganga and Chola dynasties in the ancient period, Vijayanagara, Maratha and Muslim rulers of Bahmani kingdoms in medieval period, and Mysore rulers including Tipu Sultan in the modern period.[21] Local chieftains, members of royal family, officers, philanthropists and village organizations made similar contributions. As a result, there came into existence 45,000 tanks, big and small, by the end of 19th century in Karnataka. Economic incentives were provided to the persons constructing or maintaining tanks. The Village headman, a Patel, enjoyed complete authority over the village and also took care of repair of tanks[22]. The maintenance of tank was the responsibility of the builder who was the recipient of bittuvata (land granted for construction and maintenance of

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21 G S Dixit et al S*upra* note 7; Also see Vatsala Iyengar, "Tanks of Karnataka: A Historical Perspective", in *Waternama* (Sandhya Iyengar, 2004).

22 G S Dixit et al S*upra* note 7.

tanks), dasavanda (one tenth of land revenue granted for repair or building tanks), or Kattukodige (grant of land for service rendered in connection with restoration or construction of tank) from the community. In his absence another individual would undertake repair or restoration as an act of merit, for which he was granted fresh kattukodige. There was also a practice of designating Neeraganti for managing water distribution. With scientific knowledge about topography, suitability of site for tanks, rain water feeding from catchment area through long supply canals, maximum advantage and less loss of land and forest, viable technology of construction with the help of experts and skilled workers, and perception about extent of land brought under cultivation, the tank irrigation was done keeping in mind the objective of maintaining good water table. Present water scarce districts like Bijapur and Chitradurga never had scarcity of water during 16th and 17th centuries due to well-planned rainwater harvesting systems. The arrangements included-rainwater harvesting, channelizing storm water to other tanks and large reservoirs outside the city which supplied water using earthen pipes.[23] The income from fisheries, gardening of fruit bearing trees, contributions from users and temples supported the economy of tank irrigation. Thus, tanks became part of the people's life and culture, a rich resource for smiling crops and lush green groves. During the colonial period, this system was replaced by State management of tanks which put an end to the practice of voluntarism. With very high water cess, inadequate spending for proper maintenance, no new constructions of tanks and alienation of people from management of tanks, tank irrigation suffered a sharp decline during the colonial period. By 1901, in Mysore princely State. There were 22,000 tanks with atchcut of 8.05 lakh acres and 7,000 breached tanks. The position further deteriorated and by 1951 the atchcut area was reduced to 5. 38 lakh acres. In 1956-57 this figure declined to 3.21 lakh acres and it plummeted to 1.8 lakh acres in 2002-2003 although the registered command area is quite high. This is alarming as the fall is by 43 percent.[24]

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23 Id. at 271.

24. P. Thippaiah, 'Encroachment of Waterspread Area of Tanks in Karnataka: Magnitude, Causes and Consequences' 19 *Agricultural Economics Research Review* 11-38 (January-June 2006)

It being a difficult task for the State to regulate the tanks throughout the State, the book suggests creation of societies for maintenance and management of catchment and command areas, formation of bunds along with afforestation in the catchment area, development of fisheries in the tank bed and soil conservation in an integrated way[25]. Dixit et al. suggest – a) revival of Village community system and the community spirit in construction and management of watershed in the domain of local village community; b) restoration of old tanks which will improve both water table, irrigation and fisheries; c) improving watershed development with an integrated approach to conserve soil and water and d) Revival of administrative system (referred to nadus in ancient South India) to include each watershed as an unit of administration; construction and reconstruction of tanks to be entrusted to local entrepreneur; management and maintenance to be the responsibility of the tank panchayat. On similar lines, another study on groundwater in Karnataka[26] argues towards having aquifer-based management committees and suggests aquifer to be a unit of management.

The contemporary developments during the last four decades have posed two serious anthropocentric problems: first, the wide scale introduction of technology of sinking bore wells and extracting groundwater in huge quantity in shortest time from whatever depth; and second, illegal encroachment of tank beds and conversion of unused tanks for commercial purposes of urban habitation. The first one is a technological development substituting tank irrigation or making the whole tradition of water management irrelevant. The apparent ease with which water is made available through bore wells has made the people to discard the traditional methods of water storage like temporary bunds across the streams. This is a deep injury to the aquifers' competence for rejuvenated service on the basis of recharging. Further, tanks become dry due to over extraction of groundwater, and extend invitation for unscrupulous encroachment.

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25 G S Dixit et al. *Supra note* 7, p. 184

26 Frédéric Landy, Laurent Ruiz, Julie Jacquet, Audrey Richard-Ferroudji, et al. 'Commons as Demanding Social Constructions: The Case of Aquifers in Rural Karnataka', (2020), International Journal of Rural Management, SAGE Publications, 1-28.

The second problem is more serious as it brings permanent change, and makes it difficult to restore the original position. According to Thippaiah, 6.69 percent of water spread area of tanks has been encroached by 290 persons in relation to 47 tanks. While 36, 672 tanks are registered, 2595 tanks have been abandoned. The reasons attributed for encroachment are: shift of management from people to government, lack of coordination between village community and irrigation department, indiscriminate sinking of bore-wells, non-filling of tanks due to inadequate rain, governmental policy of regularization of irregularities inducing violation, lack of desilting, etc. The consequences of encroachment include impediment to water facility, obstruction to de-silting and restoration process and social conflicts.

Karnataka's Groundwater Profile

Karnataka has four physiographic regions: the narrow Coastal plain along the west coast stretching over 300 kilometres with a maximum width of 40 km (elevation of 0-200 m msl); the Malnad region with steep western ghats mountain ranges eastwards to the coastal plain with a width varying between 50 and 100 km (elevation of 200-300 m msl); the Northern part comprising a table-land (elevation of 300-350 m msl); and the Eastern districts towards south from the plateau with a rolling topography of sporadic hills (elevation of 600-1000 m msl).[27] Agro-climatic distribution is such that coastal area constitutes 6 percent, hilly area 13 percent, transitional area 18 percent, and dry area 63 percent.[28] The river systems that drain Karnataka include the east-flowing Krishna, the Cauvery and the Godavari and the west-flowing Kalinadi, Sharavati, Netravati, Sita, and Swarna and their innumerable major and minor tributaries. Geologically, except the area of alluvium in the coastal belt and along the stream courses, the State is primarily littered with crystalline rocks and consolidated sedimentary. These do not possess primary porosity that can help

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27 "Groundwater Yearbook of Karnataka 2016-17" (Central Groundwater Board, SW Region, Bangalore) 1.

28 Id. at 4

water to percolate easily to form aquifers.[29] The total rainfall in the year 2016 varied from about 112 mm (at Kollegal of Chamarajanagar district) to over 4582 mm (Kumta of Uttarakannada district).[30] Between 2007 and 2017, in all the four seasons in almost all the districts (in 70 percent of wells) there has been a fall in the water levels of less than 2 m and 2 to 4m.[31] A fall of more than 4 m is seen in small patches in almost all the districts. Chemical components noticed in excess in the water samples are: 20 percent of samples with high pH content; 3 percent with high electrical conductivity; 1 percent chloride; 20 percent nitrate; and 13 percent fluoride. The decadal fall of the water level is alarming and shows the need for substantially augmenting the extent of recharge and controlling over-extraction of groundwater. The extent of diversity in climatic and topographical conditions defies a 'one cap for all' solution. The fluctuating figure of rainfall shows the need to increase forest coverage and decrease deforestation.

The following section discusses the deterioration of the quality of groundwater resources in Karnataka due to chemical infiltration and contamination. This is studied under two heads Urban and Rural Karnataka as the sources of contamination and the purpose of water use are different. The management strategies adopted by the users in urban and rural context are discussed to provide a few solutions. The paper however strongly recommends the integrated approach in management and governance of groundwater as an appropriate model to increase the quality and quantity of groundwater.

Groundwater resources in Karnataka

Groundwater is the most important source for water supply in Karnataka. Assessment made by Central Water Commission measures Karnataka's availability of ground water resources as- Total Annual Replenishable Ground

29 Id. at 9. "Karnataka is drought-prone and underlain by the Peninsular Gneissic Complex, where aquifers consist of weathered zones and generally low-yielding fractures at greater depths. It is one of the most urbanised States in India with almost 40 per cent of the people living in towns and cities." Water Governance Facility (2013) Groundwater Governance in India: Stumbling Blocks for Law and Compliance WGF Report 3 Stockholm p. 19

30 Id. at 12

31 Id at 30-32 and 36

Water Resource (In Billion Cubic Meter- BCM) equivalent to 17.3 BCM, and percentage with respect to Total Annual Replenishable Ground Water Resource is calculated as 3.9 BCM.[32] However, the ground water available is not entirely fresh water. Quality of groundwater is affected due to anthropogenic factors and naturally occurring contaminants. A few causes of groundwater pollution include: ill-maintained septic tanks; lack of sewage treatment, agricultural run-off carrying pesticides, micro plastic contamination etc. This has caused diminution of human and non- human health.

Chemical infiltration and contamination of groundwater in Karnataka

Infiltration can be defined as "the process of absorption of water by earth."[33] Infiltration depends on the nature of soil and organic substances found inside the soil and gaps in the land to be absorbed into the groundwater. Hence, the soil quality affected by pesticide residues, pollutants, pathogens, minerals etc. determines soaking of these substances into the soil and later into the sub surface thereby reacting with the groundwater. Chemical quality of groundwater depends on the nature and extent of rock-water interaction in addition to various sources which are not related to nature.[34] Spring water may contain enterovirus, reovirus, and adenovirus. These viruses can be isolated from raw water. Moreover, absence of enterovirus ensures that the water is safe to drink.[35]

Decreasing quality of fresh groundwater is due to over extraction of groundwater. Increased dependency upon groundwater during the drought periods affects the quality of the ground water. Where adequate surface water is available, utilization of ground water resources is less.[36] Anthropocentric factors affecting groundwater processes are: (1) farmers' preferences to bore-well irrigation because of the less cumbersome method of sinking it, availability

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32 State wise Ground Water Resources (Availability) (wwfenvis.nic.in) (last visited 20 September 2021).

33 R. K. Gurjar And B.C. Jat, *Geography of Water Resources,* 104 (Rawat Publications, 2008).

34 *Geogenic Final.pdf (cgwb.gov.in) (last visited 22/12/2021).

35 *IS 10500 (2012): Drinking water (cgwb.gov.in) pg. 5 (last visited 22/12/2021).

36 Vasant Kumar, *Groundwater Exploitation in Karnataka*

of bank loan and absence of legal restraints; (2) rapid urbanisation resulting in increased pollution whose percolation into aquifer causes groundwater pollution; (3) industrialisation resulting in chemical pollution threatening ground water quality;[37] and (4) Mining operations namely, blasting/ drilling, mineral processing, pumping of mine pit water (especially in Bellary) and solid waste disposal – are found to be mainly responsible for groundwater quality deterioration[38].

The water quality reports throw light on the status of groundwater in Karnataka. The type of groundwater available for consumption consists of- Calcium Bicarbonate, Sodium-Chloride water, and Mixed type.[39] Ground water quality problems include salinity in water, presence of Fluoride, Iron, Nitrate, Arsenic contaminants in Karnataka.[40] Study also reports that Uranium elements are found in parts of the Eastern half of Karnataka due to fall in groundwater levels.[41] Presence of Radon has also been reported in parts of Karnataka.[42] A study by Central Ground Water Board in 2012 reports that 15 out of 30 districts in Karnataka show Fluoride in groundwater (>1.5 mg/ litre)[43]; Nitrate (> 45 mg/ litre) has been found in 24 districts of Karnataka[44]; ground water vulnerable areas include- Bengaluru, Mangalore, Raichur and Shimoga for pollution from industry[45]; Raichur and Yadgir districts have showed presence of Arsenic (between 0.01 to 0.05 mg/litre)[46] in groundwater. Groundwater quality is also affected due to cement industries and limestone quarrying as has been found in the districts of Bagalkot.[47] The extent of fluoride content ranged from 0 to

37 Karnataka State Pollution Control Board, Annual Report 2017-18, 106 Bengaluru.

38 Hombal K, Spatio Temporal Analysis of Environmental Impact of Iron-Ore Mining in Bellary, (2016)(unpublished Ph.D.thesis, Department of Geography, Karnataka University Dharwad) (on file with the KUD library).

39 Central Ground Water Board, Ministry of Water Re/sources, RD &GR Government of India (cgwb.gov.in) (last visited 22/12/2021).

40 Karnataka.pdf (cgwb.gov.in) (last visited 22/12/2021).

41 298.pdf (currentscience.ac.in) (last visited 22/12/2021).

42 *Geogenic Final.pdf (cgwb.gov.in) p. 10 (last visited 22/12/2021).

43 *Karnataka.pdf (cgwb.gov.in) pg. 43 (last visited 22/12/2021).

44 Id. at p 45.

45 Id. at p 72.

46 Arsenic.pdf (cgwb.gov.in) p. 2 (last visited 22/12/2021).

47 Microsoft Word - BAGALKOTE_BROCHURE_2012.doc (cgwb.gov.in) p. 18 (last visited 22/12/2021)..

4.9mg/l, maximum in Bagewadi taluk of Bijapur district followed by 4mg/l in talukas of North Karnataka and 1.5 mg/l in 15 talukas of middle Karnataka belt in 2009.[48] In 2016-17, the fluoride content of more than 1.5mg/l was found in 14 districts which provided samples of 16 percent, and in the remaining 84 percent samples the fluoride content was less than 1.5 mg/l.[49] The maximum acceptable limit of fluoride content is 1.5 mg/l. Excessive fluoride content in drinking water brings hazards ranging from crippling of the skeletal system to milder dental problems.[50]

The undesirable effects on health due to groundwater contamination include- ulcers, dermatitis, gastrointestinal irritation, fluorosis, and carcinogenic diseases.[51] High salinity in groundwater can damage crops, affect plant growth, degrade drinking water quality and damage industrial equipment.[52]

The above-mentioned data on contamination of groundwater in Karnataka can be further detailed by looking at the Urban and Rural context of groundwater contamination.

I. Urban and Rural context of groundwater contamination

Rapid urbanization exerts enormous stress on natural resources and groundwater quality in particular is compromised.[53] 50 % of the urban water and 80% of the rural water supply for domestic use is provided by groundwater

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48 https://www.indiawaterportal.org/sites/indiawaterportal.org/files/Dynamic_groundwater_resources_of_Karnataka_as_of_March_2009_DMG_GoK_CGWBSWR_2010_0.pdf (last visited 21/09/2021).

49 http://cgwb.gov.in/Regions/SWR/Reports/GW%20%20year%20book%202017-18_PDF_karnataka.pdf

50 https://news.un.org/en/story/2006/11/200362-fluoride-drinking-water-causing-serious-health-problems-warns-un-report 21/09/2020 accessed. Also see Ashwas-Process-Handbook-pdf-version.pdf (arghyam.org) (last visited 22/12/2021).

51 Id. p. 15 (last visited 22/12/2021).

52 *Geogenic Final.pdf (cgwb.gov.in) p. 43. (last visited 22/12/2021).

53 K. W. F. Howard, "Urban Groundwater Issues- An Introduction", in: Howard K.W.F., Israfilov R.G. (eds) (Series IV: Earth and Environmental Sciences) vol 8 *Current Problems of Hydrogeology in Urban Areas, Urban Agglomerates and Industrial Centres. Nato Science Series* Springer, Dordrecht.

usage.[54] Various users of groundwater include agriculturists, industrialists, and users for domestic purposes. Competition between these users is a major factor for drastic decrease in groundwater table.

a. Urban context

The presence of competitive over pumping of groundwater has drastically increased over the past decades. Increased depth has impacted drinking water quality due to hardness.[55] 41 out of 208 Urban Local Bodies coming under the Karnataka Urban Water Supply and Drainage Board depend on groundwater.[56] A metropolitan area, Bengaluru has rapidly expanded and reached the tip point of groundwater exploitation. The Karnataka State Pollution Control Board has issued guidelines/ directions to curb industrial pollution in Industrial areas such as Peenya[57], whereby groundwater contamination due to heavy metals caused by electroplating industries was mitigated by reconsidering the issuance of Consent for Establishment or Consent for Operation to new electroplating industries in these areas.

In the Urban context, examples from Bengaluru and Belgaum are worth replicating in other rapidly urbanizing cities. This set of informal understanding of 'regulating' or responses for groundwater crises has been developed by the users/ stakeholders. Some of them are-

1. Participatory Aquifer Mapping is a program led by Biome, ACWADAM, and Wipro Technologies Ltd. This is a techno- social experiment driving participation of citizens in mapping aquifers, and groundwater management and governance.[58]
2. Resident Welfare Associations (RWA) have initiated steps such as- calling for annual meetings with the tanker operators to negotiate a common price

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54 K.V. Raju et al., "Increasing Ground water Dependency and Declining Water Quality in Urban Water Supply" ISEC, 2007.

55 K.V.Raju et. al., "Emerging Ground Water Crisis in Urban Areas- A Case Study of Ward No. 39, Bangalore City" ISEC 2008, p. 19

56 K.V. Rajuet et al., "Increasing Ground water Dependency and Declining Water Quality in Urban Water Supply" ISEC, p. 3 (2007).

57 circular.pdf (karnataka.gov.in) (last visited 20/09/2021).

58 Avinash Krishnamurthy et. al., "Competition and Conflict for Groundwater: The Urban Context and the potential for Cooperation" Biome Environmental Trust, p.4

for all the buyers.[59] Residents have implemented RWH and use the monsoon waters during these months. Residents voluntary efforts for revival of lakes which in-turn recharges groundwater is an initiative taken by citizen groups in Bangalore. RWA manages withdrawal and distribution of water instead of competing interests. Communities, Institutions and Businesses also invest in artificial groundwater recharge. In response to increasing ground water competition, communities are beginning to recover & control costs and discourage wastage of water.[60]

3. The Open Well Project initiated by the Belgaum City Corporation has revived wells by Innovation methods of mapping and tapping underground resources; relocating and decentralizing the site of filtration. This involved designing Participatory tools-

a. Integrating the Citizens, Civil Society Organizations and Professionals in revival efforts- involvement of senior citizens for identification of wells and alternate sources of water; Hydro-geological Survey, and testing of yield and quality of water. The team successfully completed 19 open well projects with filters and dozing systems and revival of 13 open wells without filters and dozing systems[61]; Biome's Million Wells Campaign[62] has mapped wells, documented well stories and works with the local community of traditional well diggers (Mannu Vaddars) providing livelihoods and increasing the groundwater table in Bengaluru.

b. Rural context

Major sources of drinking water and irrigation in Karnataka include- Wells, including dug well, tube well, and bore well. In the coastal districts of Karnataka Suranga and horizontal bore well water are used for drinking water and irrigation.

59 Id at p. 7

60 R.S.Nayak, "Augmentation of Surface Water by Ground Water From Unconfined Aquifers (Open Wells) And Fixing Mini Filter Plants & Dozing Systems for the Supply of Potable Water to Belgaum City" p. 9, accessed Name of Project Utilisation of ground water by revival of open wells and fixing mini filter units with dozing system and supply of water in Belgaum City (indiawaterportal.org) (last visited 16/09/2021).

61 Ibid.

62 Million Wells | Urban Waters, Bengaluru (last visited 5/1202021).

Springs also act as a source of drinking water. However, unregulated use of wells resulted in lack of quality drinking water, which included- high amount of arsenic[63], chloride, fluoride, calcium etc. beyond permitted standards. Presence of coliforms has decreased the biochemical quality of drinking water in Gulbarga.[64] Increased concentration of fluoride has caused dental fluorosis in Kolar.[65]

Government of Karnataka launched Krishi Bhagya Scheme[66] with the objective of conservation of rainwater and using the same for irrigation. Under this scheme, provision for construction of farm ponds with polythene tarpal lining along with lift pumps and diesel motors to draw water during deficit rainfall is provided to farmers. Other methods of irrigation include- wells and tanks. However, excessive pumping of groundwater is the common practice among farmers in Karnataka. To overcome excess water requirement, bore wells have been drilled. At times, farmers are unable to identify the aquifer for drilling and fail to get the right source of groundwater. In order to maximize commercial crop yields by drawing waters from aquifers without recharging has placed the farmers in a vicious cycle of debts. Intensive irrigation activities and use of fertilizers has led to fall in the water quality in Bellary district[67], nitrogenous chemical fertilizers use in parts of Chamarajanagar district has led to excess nitrate and chloride contents[68], excess nitrate was found in parts of Chikmagluru district[69]. Fluoride, nitrate and pesticide constituents were found in Chitradurga district[70]. Extensive use of fertilizers in parts of eastern regions of Dharwad district has infiltrated the groundwater.[71] Samples collected from regions of

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63 Paper- Bhujal Manthan (arsenicnetwork.in) (last visited 21/12/2021).

64 Shashikanth Majagi et. al., "Chemistry of groundwater in Gulbarga district, Karnakata, India', Environmental Monitoring and Assessment" (Feb 2008).

65 Biome Trust: Testing for Fluoride in Groundwater in Mulbagal Taluk - a report by Ashwin (Intern with BIOME Trust) (last visited 21/12/2021).

66 Microsoft Word - KBY NEW NOTE.docx (karnataka.gov.in) (last visited 21/12/2021).

67 Microsoft Word - BELLARY_BROCHURE 2012.doc (cgwb.gov.in) (last visited 21/12/2021).

68 Microsoft Word - C R Nagar_BROCHURE 2012.doc (cgwb.gov.in) (last visited 21/12/2021).

69 CHIKMAGALUR-2012.pdf (cgwb.gov.in) (last visited 21/12/2021).

70 CHITRADURGA-2012.pdf (cgwb.gov.in) (last visited 21/12/2021).

71 DHARWAD-2012.pdf (cgwb.gov.in) (last visited 21/12/2021).

Gulbarga[72],Haveri[73],Koppal[74], Mandya[75], Raichur[76], Tumkur[77], Uttar Kannada[78], Yadgir[79] districts found the occurrence of nitrate and fluoride contents. A high concentration of Nitrate is found in Ramanagara District.[80] The problem of salinity was reported in parts of the Tungabhadra command area in Shimoga.[81] In Belgaum district, 53 incidents of farmers' suicide between 2003-2006 were reported[82], which has also witnessed a declining groundwater table.

However, instances of farmers' innovations which are water efficient for sugarcane farming to reduce irrigation dependency and integrating the practice with pest management is a sustainable method for sugarcane farming.[83] Gadag district is facing the major problem of unscientific development of groundwater and brackishness and salinity of groundwater[84]. A need for implementation of a program for recharging of dug wells in hard rock areas of Gadag and Haveri is felt.[85] Converting tanks to percolation tanks to minimize the digging of additional wells has also been suggested.[86] The Karnataka State Rural Sanitation Strategy provides for management of Liquid waste generated by domestic consumption treatment measures saving contamination of soil surface, groundwater or surface water.[87]

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72 Gulbarga-2012.pdf (cgwb.gov.in) (last visited 21/12/2021).
73 Microsoft Word - Haveri_brochure 2012.doc (cgwb.gov.in) (last visited 21/12/2021).
74 KOPPA-2012L.pdf (cgwb.gov.in) (last visited 21/12/2021).
75 Microsoft Word - Mandya_Brouchere 2012.doc (cgwb.gov.in) (last visited 21/12/2021).
76 Raichur Brochure (cgwb.gov.in) (last visited 21/12/2021).
77 Microsoft Word - Tumkur brouchure 2012.doc (cgwb.gov.in) (last visited 21/12/2021).
78 Microsoft Word - Uttara Kannada brochure-2012.doc (cgwb.gov.in) (last visited 21/12/2021).
79 Yadgir-2012.pdf (cgwb.gov.in) (last visited 21/12/2021).
80 Ramanagaram-2012.pdf (cgwb.gov.in) (last visited 21/12/2021).
81 Microsoft Word - SHIMOGA-BROCHURE 2012.doc (cgwb.gov.in) (last visited 21/12/2021).
82 Microsoft Word - Belgaum_brochure 2012.doc (cgwb.gov.in) (last visited 21/12/2021).
83 Claude Alvares, "Water Efficient Sugarcane Farming', Organic Farmers Club" Other India Press accessed Water_efficient_sugarcane.pdf (indiawaterportal.org) (last visited 21/12/2021).
84 GAGDAG-2012.pdf (cgwb.gov.in) (last visited 21/12/2021).
85 Sunderrajan Krishnan et. al., "Is it Possible to Revive Dug Wells in Hard- Rock India through Recharge? Discussion from Studies in Ten Districts of the Country", IWMI accessed NRLP - Series 5 for Print 11-02-2010.pdf (iwmi.org) (last visited 21/09/2021).
86 http://re.indiaenvironmentportal.org.in/files/strategic%20issues%20in%20indian%20irrigation.pdf p. 340 pdf
87 5.2 English_bye-laws book layout-1.cdr (swachhamevajayate.org) (last visited 21/12/2021).

However, the challenges need to be addressed holistically. Hence, the following section presents some illustrations from Karnataka where this approach has been taken up to improve groundwater taking into account social, economic and environmental factors, along with recognizing the importance of water quality issues.

II. Enhancing groundwater quality

The most natural means of enhancing groundwater quality is to prevent and control pollution and contamination of water sources including- recycling and reuse of water, minimizing the generation of waste in all water uses, reducing non-point source of pollution, recovering water for some use from waste, and ensuring that bad quality water is not allowed to enter the water sources.[88]

In-situ and Ex-situ technology to treat excess quantities of Arsenic, Fluoride, Iron, Manganese, Chromium, Strontium, Silica, Iron, Selenium, Nitrate in the groundwater have been suggested by the CGWB.[89] A few natural methods of treatment include- natural adsorbents such as- red mud, mud pot, seeds of drumstick tree, roots of vetiver grass and tamarind seeds.[90] To reduce saline water, methods such as distillation, membrane technologies have been suggested in addition to chemical processing.[91]

Mitigation efforts by the institutions through partnerships and collaborations such as Arsenic Knowledge & Action Network[92], Fluoride Knowledge and Action Network[93] etc. through community based efforts in bringing relief to the people affected by Fluorosis is an effort in addressing groundwater quality improvement. Children suffering from fluorosis can be detected at an early stage and recovery from skeletal deformities through safe and good nutrition is a successful community-based approach being practiced in parts of India affected by Fluoride. Preventive measures for the problem of fluoride and

88 19. Draft Water Framework, 2019.
89 *Geogenic Final.pdf (cgwb.gov.in) (last visited 21/12/2021).
90 *Geogenic Final.pdf (cgwb.gov.in) pp. 35 & 36. (last visited 21/12/2021).
91 *Geogenic Final.pdf (cgwb.gov.in) p. 45 (last visited 21/12/2021).
92 Arsenic Network (last visited 21/12/2021).
93 Fluoride Action Network | Broadening Public Awareness on Fluoride. (fluoridealert.org); www.fluorideindia.org (last visited 21/12/2021).

arsenic contamination in water can be carried through the process of rainwater harvesting.[94] Use of wells, groundwater recharge, water recycling, river bed filtration, sub-surface dam, piped water supply scheme etc. are alternate sources of arsenic free water.[95] However, a good solid waste management and waste-water management is important to maintain the quality of water in shallow aquifers.[96]

Capacity building programmes include dissemination of information about-different waste streams and waste water, importance of containment and treatment of blackwater, use of tools and equipment for conducting quality tests, capturing waste data through MIS system, urban-rural linkages for waste management, linkages to allied sectors such as health, nutrition, education, drinking water, environment and agriculture, horticulture and watershed- among stakeholders including sanitation workers, swachhagrahis, PDO and members of Village Health, Sanitation and Nutrition Committee, or Village Water and Sanitation Committee. Engineers and SWM consultants at district and state levels, CEOs at District Level Commissioners and Secretaries at State Levels.[97]

To ensure safe drinking water, a few programs have been initiated by the Government of Karnataka with the objective of improving access to supply of drinking water.

a. Under the National Water Quality Sub-Mission, 1,038 fluoride affected habitations have been identified and 863 habitations have been covered in Karnataka.[98]

b. The Jal Jeevan Mission, the National Rural Drinking Water Programme aims to provide safe drinking water including rural areas affected by Arsenic/ Fluoride consisting of water purification plants.[99]

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94 Biosand Filter | Arsenic Network (last visited 21/12/2021).

95 A-Note-on-Arsenic-Removal-Technologies.pdf (arsenicnetwork.in) pp. 1-3. (last visited 21/12/2021).

96 Biome Environment Trust & ACWADAM, "Participatory Aquifer Mapping: Catalysing a Social Response to Manage groundwater" p.11 (2017).

97 7. Capacity Building and Research and Development English_bye-laws book layout-1.cdr (swachhamevajayate.org) (last visited 21/12/2021).

98 Microsoft Word - 730.docx (last visited 21/12/2021).

99 Drinking Water – RDWSD Karnataka (swachhamevajayate.org) (last visited 21/12/2021).

The menace of degrading quality and quantity can only be addressed by adopting integrated approaches in their management and regulating the resource effectively. The Section below looks at the legislative framework in Karnataka.

The Karnataka Ground Water (Regulation for Protection of Sources of Drinking Water) Act, 1999

The Statement of Objects and Reasons refers to the Central Government's repeated insistence on enacting a groundwater law for safeguarding sources for drinking water. The existing administrative order requiring inter-spacing of bore wells by providing for a minimum distance of 250 meters was to ensure power supply and financial support. These measures were ineffective in securing sustainable groundwater development. To secure access to the fundamental human right to drinking water, the state governments and local authorities were increasingly involved in establishing public water supply systems in rural and urban areas. The need to protect them against private activities competing for groundwater extraction was considered essential and required legislative support.

The central policy of the Act, section 3 (1) states, "No person shall without obtaining permission from the appropriate authority ... (3), sink any well[100] for purpose of extracting or drawing water within five hundred metres of public source of drinking water[101]; Provided that nothing in this sub-section shall apply to sinking of a well on behalf of the Government or a local authority for being

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100 "Well"; means a well sunk for the search or extraction of ground water by a person or persons except by the authorised officials of the State or Central Governments for carrying out scientific investigations, exploration, development, augmentation, conservation, protection, or management works and shall include open well, dug well, bore well, dug-cum- -bore well, tube well, filter points, collector well and infiltration gallery or any of their combinations or variations (Section 2[14]) "Ground water" means water existing in an aquifer below the surface of the ground at any particular location regardless of the geological structure in which it is stationary or moving and includes all ground water reservoirs (s 2[4]).

101 Section 2 (7) "Public source of drinking water "means a well from which the Government or a local authority or such authority as the Government may, by notification specify, provides water to the public and includes such point or any other drinking water sources as may be notified by appropriate Authority.

used as a public drinking water source." The appropriate authority,[102] on the advice of the Technical Officer (geologist), and having regard to the interest of the general public, may grant or reject permission for the sinking or well overcoming the prohibition. The grant of permission is subject to prescribed conditions. Section 3 has the effect of protecting public drinking water sources and avoiding the overcrowding of bore wells, which are detrimental to the objective of supplying drinking water.

In circumstances of scanty rainfall in any year, on the technical officer's advice, the appropriate authority may notify any area as a water scarcity area for one year (Section 4). In such areas, the extraction of water within 500 metres of public drinking water sources may be regulated by complying with the procedure and giving 15 days for compliance (Section 5). This operates against existing users, again prioritising the claim and protecting public sources of drinking water. Under section 6, the appropriate authority, based on the advice of the Technical Officer, can declare any area as an overexploited watershed. Law prohibits sinking of wells in the watershed area unless there is permission from an appropriate authority who has to duly consider the public interest in protecting the drinking water source (section 7). The existing users in the overexploited watershed may be asked, after duly complying with the procedure, to abstain from drawing water from their wells during the summer months (section 8). The appropriate authority has the power to close any well in the overexploited watershed. There are provisions for appeal, for entry into private premises and action, the penalty for non-compliance, and the power to make rules.

The Act has a limited purpose of safeguarding the public drinking water supply system. It allows the sinking of wells in justified circumstances by balancing competing interests and following the prescribed procedure.

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[102] Section 2 (1) "appropriate authority" means the Deputy Commissioner and includes any officer, not below the rank of an Assistant Commissioner as the Government may by notification appoint for the purposes of this Act, and different officers may be appointed for different local areas of the State.

The Karnataka Ground Water (Regulation and Control of Development and Management) Act, 2011

The statement of objects and reasons of this enactment states that it is necessary to bring general legislation to control indiscriminate exploitation of groundwater, especially in the notified areas in the State. For this purpose, the law constitutes the Karnataka Ground Water Authority (KGWA). It specifies the minimum distance between the bore wells dug for irrigation and empowers the concerned authority to declare drought-hit areas. It envisages coordination with funding and power distribution agencies for effective implementation of the law. It also provides for rainwater harvesting.

The Act 2011 responds to the diversity of groundwater profile in Karnataka and confines the regulatory regime through 'permit system' only to the notified area. To effectuate this policy, it relies on the institution KGWA, which has vast powers and responsibilities, especially concerning the notified areas. It employs a KGWA-monitored registration system governing groundwater users and drilling agencies. KGWA handles rainwater harvesting measures in recharge-worthy areas identified by it.

The Essential Policy underlying the KGW Act 2011

Regulation of extraction and use of groundwater in the public interest, whenever found necessary and expedient, is the principal policy underlying the Act. Vast regulatory powers are conferred on the KGWA. It can identify and declare any area as a notified area after due consultation and compliance with the procedure. The KGWA also operates the permit system for sinking any new well in the notified area. As well, it regulates the existing wells through the system of registration in the notified area; it can alter amend or vary terms of the permits; can cancel permit or registration; regulate the activities of drilling agencies through registration; can exercise the power of entry, investigation, inquiry, supervision, seek Report etc., to enforce the Act; and initiate criminal and other proceedings against defaulters. 'Command and control' is the core feature of this regulatory scheme. However, the biggest shortcoming of this scheme and more broadly, the Act is that the regulatory powers are confined

only to notified areas, which, when translated into practice, extends only to a few talukas (30) in twelve districts out of a total of 237 talukas in 30 districts in the State.[103] Empirical research points out that the experience concerning this regulatory policy is not one of strict compliance.

There are detailed provisions in the Act concerning the establishment, composition, meeting procedures of the KGWA; funding of KGWA; rulemaking power; provisions on offenses, penalties, and prosecution. The following sections will discuss these provisions and their underlying policies, which will assess the importance, weakness, and efficacy of the legal measure.

Notified area: The Prerequisite for the Application of KGW Act, 2011

The concept of 'Notified area' arises from section 10 (2) which states, "If the authority, after consultations with various expert bodies is of the opinion that it is necessary or expedient in the public interest to regulate the extraction or the use or both of groundwater[104] in any form in any area, it shall advise the Government to declare any such area to be a notified area ...." Consultation with the Central Groundwater Board is crucial as it provides an empirical

[103] As notified by the Central Ground Water Board as on 27-11-2012, there were 22 talukas in 8 districts which have serious problems of overexploitation of groundwater. http://cgwb.gov.in/CGWA/List-Notified-Areas.html (last visited 1/6/2020). As per Karnataka Water Resources Department, 2015 there are 30 talukas in 12 districts. (i) Bagalkote district
– Badami and Bakalkote (p) talukas; (ii) Bengaluru rural
– Devanahalli, Doddaballapura, Hoskote and Nelamangala; (iii) Bengaluru Urban
– Anekal, Bengaluru East, Bengaluru South and Bengaluru West; (iv) Belagavi
– Ramadurga; (v) Bellari
– Hagaribommanahalli; (vi) Chikkamagalur
– Kadur; (vii) Chikballapura -Chikballapur, Chintamani, Gauribidanur, Gudibanda and Sidlaghatta; (viii) Chitradurga
– Chitradurga and Holalkere; (ix) Davanagere
– Jagalur; (x) Kolar
– Bangarpet, Malur, Mulbagal, Shrinivaspura, Kolar; (xi) Ramnagar
– Ramnagara; (xii) Tumkur
– Chikkanayakanahalli, Koratagere and Mahugiri. Rayabaug of Belagavi, Gadag of Gadag district which were in CGWA list are not included in the 2015 Karnataka list.

[104] Section 2 (i): "Groundwater" means the water, which exists below the ground surface in the zone of saturation and can be extracted through wells or any other means or emerges as springs and base flows in streams and rivers; section 2 (r) "Zone of saturation" means a subsurface zone in which all the pores or the material are filled with ground water under phreatic condition.

research-based Report regarding the annual groundwater position in Karnataka. However, perusal of the annual reports and the extent of notified area, it is clear that the KGWA does not act entirely on the Report. The inclination is to confine notified area only to those zones that are highly problematic and overexploited. The limitation on the economic process arising from a more extensive list, difficulties of extensive regulation, and lack of public opinion in support of bureaucratic and meticulous regulation could be possible reasons behind such a restrictive approach.

The notification shall be in the Official Gazette, and the date of commencement should be at least three months after the notification (section 10[3]). It shall also be published in at least one daily regional language newspaper having wide circulation in the area (section 10[4]). If groundwater availability has improved in the area as per experts, it may be de-notified (section 10[5]). The Authority shall also take steps to ensure that the exploitation of groundwater resources does not exceed the natural replenishment of the aquifers (section 10 [6]). The Government also has the responsibility to augment the groundwater resource in the notified area on the advice of KGWA.

Permit system in the notified area

Section 11 (1) states, "Subject to the provisions of any law relating to protection of public sources of drinking water, any user of groundwater desiring to drill or dig a well in the notified area for any purpose either on personal or community basis shall apply to the authority for grant of permit for this purpose and shall not proceed with any activity connected with such drilling or digging unless [the authority has granted a permit]." Clearly, the KGWA 1999 is supplemented by the KGWA 2011.

The words "User of groundwater" is used in a generic sense. It includes any person or group of persons or an institution including a company or an establishment, whether the Government or not who or which extracts or uses or sells groundwater for any purpose including domestic use. "Well" means a structure constructed for the search or extraction of groundwater by a person or persons for drinking, domestic, industrial, commercial or agricultural purposes. It includes open well, bore well, dug cum bore well, tube well, filter point,

collection well, infiltration gallery, recharge well, disposal well or any of their combinations or variations. Because of these two broad definitions, the scope of the permit system is broad.

The application for a permit should state the purpose - industrial, commercial entertainment, agricultural and domestic use, etc. (section 11[2]). If the Authority is satisfied that it is not against public interest, it may grant subject to such conditions and restrictions as may be specified therein, a permit authorizing drilling or digging of a well for the extraction and use of groundwater. The conditions shall include the mandatory provision of artificial recharge structures of appropriate size to be constructed by the applicant within a period as specified by the Authority (section 11[3]). Hearing opportunity and disposal of the application within 60 days are the obligations of the KGWA (section 11[4]).

In granting or refusing the permit the KGWA shall consider the purpose intended by the applicant - domestic, agriculture, industry, commercial, establishments entertainment,- sale/own use or both. Other factors include avoidance of water intensive crops such as paddy, sugar cane etc. in the notified area; existence of other competitive users; the availability and the quantity to be drawn; groundwater quality; spacing of groundwater structures; long term groundwater level behaviour; its likelihood of adversely affecting any drinking water sources in its vicinity; and priority to water saving device users who adopt sprinkler and drip irrigation system (section 11 [5]).

Not having a permit in the notified area disentitles a person to receive any subsidy, grant or loan provided by the Government or any other agency to dig wells and to access power for groundwater extraction (section 16). These are severe and deterrent factors that dissuade users from not complying. However, this rule's efficacy depends upon the vigilance exhibited by the authorities. Empirical findings do not show substantial compliance, but rather it points to gross violation.[105]

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[105] Water Governance Facility (2013) *Groundwater Governance in India: Stumbling Blocks for Law and Compliance* WGF Report 3 Stockholm p. 19

Composition and meetings of KGWA

Under section 3, the Government may establish KGWA, which shall have the trappings of a corporate personality and attendant rights and powers. It is the primary agency tasked with the duty to administer the legal policy on groundwater management (section 3[1] and [2]). It functions under the overall control and supervision of the Government (section 10[1]). Its composition is mainly bureaucratic except that the Government may nominate four representatives of farmers and two members who have specialized knowledge or practical experience in matters relating to groundwater for three years as non-official members (section 3[3] and 5).

The official members include (a) Secretary to Government in charge of the Department of Water resources, Minor Irrigation, Government of Karnataka who is the chairperson; (b) The Commissioner or Director of Mines and Geology, who is the Member Secretary; (c) A representative of the Finance Department, Government of Karnataka; (d) The Regional Director, Central Groundwater Board, Government of India; (e) One representative from the Electrical Supply Company having jurisdiction over the area, not below the rank of a Chief engineer; (f) The Chief Engineer, RDED, Rural Development and Panchayat Raj Department; (g) The Engineer-in-Chief, Water Resources Development Organization of Water Resources Department; (h) The Chief Engineer, Minor Irrigation, nominated by the Government; (i) The Chairman of the Karnataka State Pollution Control Board; (j) The Commissioner/Director of Agriculture, Department of Agriculture; (k) The Chief General Manager, National Bank for Agriculture and Rural Development, Bangalore; (m) The Chief Engineer, the KUWS&DB; (n) The Chief Engineer, the BWSSB (Section 3[3]).

The Authority (KGWA) shall ordinarily meet at least once in three months. The chairperson or any member chosen by other members in his absence presides over the meeting. Decisions are based on the majority principle, and in case of equal division, the chairperson has a casting vote. Seven members constitute a quorum. The KGWA is supported by administrative staff recruited

by the Government as per prescribed rules. The administrative expenses and salary is paid out of the fund of the Authority. Regarding sources, use of funds, budget, account and audit and annual report, there are detailed provisions in chapter III (sections 18 to 21).

Powers of KGWA

The KGWA has the following powers under section 17 in addition to the ones already discussed:

(a) to enter on any property at any reasonable time and to investigate and take any measurement concerning land or water located on the surface or underground; **(b)** to inspect a well, the soils and other materials excavated from there; **(c)** to take specimens; **(d)** to order the person drilling or digging a well to keep and preserve in the prescribed manner specimen extracted soil or any material; **(e)** to inspect and to take copies of the relevant record or documents and to ask any question for obtaining any relevant information; **(f)** to serve notice requiring any groundwater user or agency to furnish information in such form, at such intervals as may be prescribed; **(g)** to require the user of groundwater to install water measuring, devices if necessary; **(h)** to seize any mechanical equipment or device utilized for illegal drilling or digging of well and to demolish the work if executed fully or partly; and **(i)** to direct any user of groundwater who does not comply with the Act and its rules to close down the extraction of ground water, disconnect power supply or confiscate any hydraulic work

The list of powers is comprehensive and supports the execution of the 'command and control' model. However, the UNDP and journalistic reports do not point to a successful implementation of the law. In a matter like groundwater conservation and avoidance of over-exploitation, active participation, and full-fledged cooperation of the community is required if the objectives underlying the Act has to be secured. However, this aspect is conspicuously absent in the law.

Registration of existing users

To ensure compliance in the notified area, existing users should register their wells. Registration application should be filed within 120 days from the date

of notification. Delay can be condoned if sufficient cause is shown (section 12 [1]).

The application shall contain details such as the description of the source of groundwater, its exact location; the lifting device used; the quantity of ground water withdrawal and hours of operation every day; the total period of use in each year; the purpose or purposes for which groundwater is being extracted; if groundwater is for drinking, the approximate population to be served; if an irrigation well, the location and extent of area irrigated and the crops grown; etc. (section 12 [2]).

After being satisfied on conclusion of an appropriate enquiry, the KGWA shall grant a registration certificate subject to conditions as may be prescribed (section 12 [3&4]). The following matters shall be duly considered in granting or refusing registration: the purpose for which the groundwater is to be used; where applicants are growing water-intensive crops like paddy and sugarcane, an undertaking that they will change to light-duty crops should be obtained from them and this matter should be incorporated into the certificate of registration; the existence of other competitive users; groundwater availability and the need to conserve it; the quantity of groundwater to be drawn; groundwater quality with reference to use; spacing of groundwater structures, etc. (section 12 [5]).

Power to alter or cancel the permits and registration certificates

After giving due opportunity of hearing to the groundwater user, and for technical reasons, the KGWA may alter, amend or vary the terms of permit or registration certificate. However, standing crops shall not suffer loss (section 14). In case the permit or registration certificate is obtained by fraud or misrepresentation, or the holder has failed to comply with the conditions without justification, or a situation has arisen warranting limits on the extraction of groundwater, the Authority may cancel the permit or registration (section 15).

Control over Drilling Agencies

As per section 2 (e) ,"Drilling Agency" means a person or an agency or an organization or an institution engaged in drilling or digging wells for

exploration or extraction of water. Since it is illegal to continue the business of digging or extraction of groundwater without obtaining a certificate of registration from the KGWA, all in this business should register his/her machinery with the KGWA. Granting registration entails applying with adequate details and the KGWA's satisfaction with the applicant's skill and knowledge (section 13). Rejection of application for registration on account of irrelevant consideration like cancellation of the contract between the bore well agency and the KGWA is arbitrary and remediable through a writ of certiorari.[106]

The KGWA has the power to order the person drilling or digging a well to preserve specimens of soil or any material excavated from that place in the prescribed manner for such a period not exceeding three months (section 17 [d]). It may obtain any information including, diameter or depth of the well, the level at which the water was obtained, types of strata encountered while drilling or digging, and quality of the water (section 17 [e]). The drilling agency should provide all information sought by the KGWA periodically (section 17 [f]).

Rainwater harvesting

Given the geological profile and the extent of plummeting groundwater levels in Karnataka, rainwater harvesting is the essential measure to be assiduously and consistently practiced. Rainwater harvesting emerges as a long-time sustainable strategy that can be implemented in almost all parts of Karnataka, except in areas prone to landslides. "Rainwater harvesting" is the technique of collecting and using water at the surface or sub-surface aquifer. In contrast, "artificial recharge to groundwater" is the process by which groundwater reservoir is augmented at a rate that exceeds natural conditions of replenishment. There is one section devoted to this purpose that too made precarious on KGWA's identification of 'recharge worthy' areas.

According to section 22 (1) "To improve the groundwater situation, the Authority shall identify the recharge worthy areas in the State. The Authority in rural areas shall encourage through community participation the watershed

[106] *Shweta Borewells* v. *State Government of Karnataka*, judgment dated 18, November, 2014

management to facilitate ground water recharge." There is no definition or criteria on identification of 'recharge worthy' areas. Considering the purpose of the legislation, the most extensive ambit should be attributed to this concept. A pan-Karnataka approach is required rather than focusing only on endangered areas. As per Rule 19 of the KGW Rules 2012, the KGWA shall provide for rainwater harvesting structures by issuing appropriate directions to the local authorities.

According to section 22 (2), "The Authority shall give appropriate directions to the concerned departments of the Government to include rainwater harvesting in all developmental schemes falling under notified areas." Here, the focus of attention is the notified area, which is a small segment. There is no reason why such a measure should not apply to other parts of the State. There are useful lessons from the Andhra Pradesh model that integrates rainwater harvesting with water, forest, and soil management (jal, jungle, jameen). The concerted efforts of departments for soil conservation, agriculture, forestry, and minor irrigation should help build healthy groundwater ecology.

Rainwater harvesting in urban areas requires strict compliance and enthusiastic participation by stakeholders. According to section 22(3), "In urban areas, falling in notified areas, the Authority shall issue directives for constructing appropriate rain water harvesting structures in all residential, commercial and other premises having an area of 100 square meters or more in manner prescribed within the stipulated period." Categorically, the focus again is on such measures in the notified areas. Section 22 (4) states, "Notwithstanding anything contained in the relevant laws, the Municipal Corporation or any other local Authority as the case may be, may impose stipulated conditions for providing roof top rain water harvesting structures in the building plan in an area of 100 Square meters or more, while according approval for construction, and permanent water and electricity connections shall be extended only after compliance of the directions given in this regard." Even though there is nothing to suggest that this clause applies only to notified areas except the fact it is juxtaposed with clause (3). It is debatable whether the 'noscitur soci' rule or

'expressio unius est exclusio ulterius' is to be applied.[107]Common factor in both is the building area of 100 square meters and the requirement of roof top rainwater harvesting. Looking at the purpose behind rainwater harvesting and the Act's overall objective, omission of the words 'notified area' should be understood as not confining the requirement to 'notified area' only.

Section 22(5) mandates the Authority to take steps for promotion of mass awareness and training programmes on rainwater harvesting and artificial recharge to groundwater through Government Agencies/Non-Government Organizations (NGOs) Voluntary Organizations (VOs) /Educational Institutions/ Industries/ Individuals. This policy of linking law and people through NGOs is a commendable task that should be implemented with systematic planning and networking with civil society bodies throughout the State.

Section 22(6) reflects the policy of incentive as a method of enforcement. It states, "The Authority shall take steps to extend incentives/subsidies to the farmers who are following water conservation and rainwater harvesting/ recharge schemes."

Offences, punishments, and enforcement methods

The 'Command and control' method employs a punitive dimension of the law to sternly deal with the persons who obstruct the law's implementation or fail to perform the duties under the Act.[108] It is an offence to obstruct the Authority or any other persons authorised by it to exercise any power under the Act. Similarly, it is an offence to wilfully refuse or neglect or furnish false information. Drilling without permit from the authority is also an offence. The offenders are punished with a fine which may extend to five thousand rupees and/or imprisonment for a term which may extend to six months or both. Drilling and extracting water from any well in a notified area without a permit or continuing to extract water in a notified area without a certificate of registration is punishable with a fine which may extend to two thousand rupees or imprisonment to three months. Contravention of conditions of certificate of

[107] For analysis of the maxims see, Justice G P Singh, *Principles of Statutory Interpretation*, Justice A K Patnaik pp. 98, 90, 555-560 (14th ed. 2016).

[108] See Chapter V viz., 'Miscellaneous' sections 23 to 41 of the KGW Act 2011

registration attracts a fine of rupees ten thousand or imprisonment for a term which may extend to one year. The quantum of fine in these clauses is hardly deterrent because of the fall in money value.

Public may give information about the contravention of the Act. The prior sanction of the Authority is required to initiate court's cognizance. Such a court shall not be inferior to the Metropolitan Magistrate. Compounding of offences by collecting the prescribed sum is permissible. In the case of offenses by companies, persons in charge or who are responsible to the company can be held liable. Fines recovered under the Act are credited to the fund of the Authority. The jurisdiction of civil courts is barred. Compensation cannot be claimed for the acts done or actions taken under the Act in good faith. The information given by the users of groundwater is confidential.

Empirical comments

The practical aspects of implementing the two enactments have come to the surface with time. Comparatively, the 1999 Act, because of its focus on prioritization of drinking water, has more significant governmental support, active involvement of the local bodies, and broader acceptance by the community. Further, the Act has lesser technicalities and least complaints.[109] However, the Act of 2011 had severe issues. Out of 697 rig owners, only 307 got themselves registered in the BBMP area. Nearly 145 unregistered rig owners were penalized and rupees 7.5 lakh was collected as fines.[110] The expert survey had estimated the number of private bore well owners in the BBMP area as four to five lakhs, whereas less than one lakh had registered, that too by getting forms filled up by water meter readers. A second chance to register was provided.[111] According to the WCF, failure of awareness-raising campaigns to

[109] Madhusudhan, N., "Decade-old Water Act Yet to Evolve", *The New Indian Express* (July 9, 2009) cited by Water Governance Facility, (2013) 21.

[110] https://www.deccanherald.com/content/391629/groundwater-authority-yet-gain-ground.html (last visited on 05/06/2020).

[111] Ashwini YS, "Owners to get second chance to register bore wells with groundwater authority" *Deccan Herald* available at https://www.deccanherald.com/content/634983/owners-get-second-chance-register.html; https://www.deccanherald.com/content/391629/groundwater-authority-yet-gain-ground.html (last visited 05/06/2020); *Also See* Water Governance Facility, Groundwater Governance in India: Stumbling Blocks for Law and Compliance WGF Report 3 Stockholm at p 20 (2013).

communicate the wider objectives of the law resulted in disobedience to the law.[112] It attributes the gap between availability and demand as a governance problem, commonly interpreted as misguided policies, unenforceable legislation, inefficient bureaucracy, institutional fragmentation, low capacity, dated knowledge, poor accountability, corruption, 'vote-bank' politics, and lack of stakeholder involvement.[113] The WCF finds fault in the very design and policy of the Act of 2011. The delegation of powers to District Deputy Commissioners denied scope for technical skill operation and made the scheme of permit or registration more bureaucratic in its functioning.[114]

Judicial process, Groundwater Management and Human Rights

The judicial approach in reviewing governmental policy, both administrative and legal, and conserving the groundwater resource in its purity needs to be assessed as the ultimate outcome of regulatory action of the government depends upon judicial stance based on constitutional principles and ideals whenever any regulatory action is challenged. Further, the concept of equal rights of all in the matter of access to drinking water needs to be discussed in relation to an atmosphere infested by caste discrimination. A brief discussion with a focus on Karnataka experience is ventured here.

Before the commencement of both the enactments, a regulatory measure by an administrative direction insisting on inter-spacing of bore wells in order to obtain electric connection to the newly sunk bore well was challenged before the Karnataka High Court in *Puttappa Honnappa Talawar* as violating right to life which included right to drinking water.[115] The Court held that such administrative regulation without the support of law violated right under Article 21. Although the judgment did not help the cause of groundwater protection, it necessitated the expedient enactment of groundwater law in Karnataka. There

[112] Water Governance Facility, 21 (2013)
[113] Id at p. 6.
[114] Grönwall, J, "Water Access Strategies and the Importance of Groundwater for Poor Urban Households in Bangalore, India" Institute of Water Policy. (Singapore, 2013, unpublished), Cited by Water Governance Facility, 21 (2013).
[115] *Puttappa Honnappa Talawar v. Deputy Commissioner*, *Dharwad*, AIR 1998 Kar 10

are numerous Supreme Court judgments on protection of groundwater as a part of ecology.[116]

After the commencement of the 1999 Act, an issue about its application came before the Karnataka High Court. In *K M Hiriyannappa* v. *State of Karnataka*,[117] the Karnataka High Court held that denial of permission to a landowner by the Deputy Commissioner to sink a bore well in his/her land within 500 meters of a public source of drinking water was valid in law. Justice L Narayanaswamy for the Court referred to the constitutional development of the right to drinking water as an aspect of the right to life,[118] and the State's responsibility under Article 39 to arrange for distribution of resources to subserve the common good.

A question arose before the Supreme Court in *State of Karnataka v. State of Tamil Nadu*[119] whether the quantum of groundwater available in an inter-state river basin should be taken into account in the course of determining the shares of states in the water of such a river. This question was negatively answered by the Cauvery Inter-State Water Dispute Tribunal on account of uncertainty and lack of means of assessment. Overruling this proposition, the Court held that the ground water availability shall be taken into consideration as the quantum of groundwater is determinable.

About the care that shall be taken in the course of mining so that groundwater and forest cover shall not be depleted, the Supreme Court expressed its affirmation in *Samaj Parivartan Samudaya* case.[120] On the basis of the doctrine of sustainable development the Court ordered for suspension of

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[116] *M C Mehta v. Union of India*, AIR Online 2018 SC 160; *M C Mehta v. Union of India*, 2018 AIR SCW 4033 (India); *Deepak Kumar v. State of Haryana* , 2012 AIR SCW 1954 (India); *S Jagannath v. Union of India,* 1997 AIR SCW 635 (India); *M K Balakrishnan v. Union of India* , 2009 AIR SCW 2371(India).

[117] WP 15080/2007 judgment dated 5th June 2013 https://indiankanoon.org/doc/176249711

[118] *Subhash Kumar v. State of Bihar*, AIR 1991 SC 420 (India); *Venkatagiriyappa v. Karnataka Electricity Board*, (1999) 4 Kar LJ 482 (DB) (India) ; *Puttappa Honnappa Talavar v. D C, Dharwad*, AIR 1998 Kant 10 (India)

[119] AIR Online 2018 SC 626

[120] *Samaj Parivartan Samudaya v. State of Karnataka*, MANU/SC/0397/2013MANU/SC/0397/2013

mining in three districts in Karnataka until adequate measures are adopted for protection of water resources.

Article 15 (2) (b) of the constitution immunises every citizen from any discrimination on account of race, religion, caste, sex or place of birth with regard to the use of wells, tanks, bathing ghats, roads wholly or partly maintained out of state funds or dedicated to the use of the general public. Abolition of the practice of untouchability in any form under Article 17 and penalising provisions under the Protection of Civil Rights Act condemn any act of denial of access to water to the untouchables. Application of this legal position took place in the *Appa Balu Ingale* case.[121] The facts of the case involved exclusion of Harijans by upper caste people from having access to a bore well sunk by the government nearer Harijan colony in Belagavi of Karnataka for supplying drinking water to the people of the locality. The Court set aside the acquittal, after elaborating on the caste based discriminations impinging human dignity. The case points out the need for expanding human right to water cutting across caste or other discriminations. The incident of spray of Endosulfan on cashew plantation in Karnataka and Kerala resulting in serious pollution of open wells and groundwater was a matter before the Supreme Court in a writ petition.[122] The Court prohibited such spray and compensated the victims.[123]

Managing Groundwater

The issues relating to groundwater management, quality, utilization, and recharge need to be addressed holistically. To address Groundwater Management issue, the CGWB[124] puts forth a sustainable and integrated approach, to be applied effectively along with understanding of scientific and governance aspects.

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[121] *State of Karnataka v. Appa Balu Ingale*, MANU/SC/0151/1993; also see Dr. Babasaheb Ambedkar : Writings and Speeches Vol. 17 (Part-1), p. 6 (First Edition by Education Department, Govt. of Maharashtra : 4 October, 2003 Re-printed by Dr. Ambedkar Foundation : January, 2014).

[122] WP (C) 213/ 2011

[123] Ibid; Also See *Remya P v. Abraham*, AIR Online 2019 SC 426.

[124] "Aquifer Systems of Karnataka", Central Ground Water Board, MoWR, GoI, SW Region, Bengaluru, (September 2012).

The following integration in the planning and implementation of groundwater management will enhance the groundwater table and quality -

1. Demand side of water has to be addressed by creating awareness on groundwater resources, judicious use of groundwater and application of modern irrigation methods along with selection of less water intensive crops in water stressed areas has to be incentivized. Demand side has to be encouraged to limit the groundwater use to domestic purposes. Surface water sources such as canals, ponds and treated waste water can be used for irrigation. Potential of the wetland ecosystem to eliminate and transform pollutants has to be implemented by the agricultural and industrial sector.[125]

   Atal Bhujal Yojana with an objective of improving management of groundwater resources in the seven water stressed states has designed the schemes to bring behavioral changes at the community level through awareness programmes and capacity building for fostering sustainable groundwater management.[126]

2. *Aquifer Mapping* through community participation as a strategy for groundwater management and for climate change adaptation. Community participation will also evoke a sense of ownership of Common Pool Resources like groundwater. Aquifer mapping can also help integrate groundwater availability with groundwater accessibility and quality regulations.

3. *Conjunctive Use* of surface and groundwater resources. Understanding surface and groundwater interactions. Katta and Springs help in supplementing water during critical periods when surface water is deficit. Katta/ vented dams and stream restoration recharges groundwater.[127]

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[125] Alexandros I. Stefanakis, "Introduction to Constructed Wetland Technology", in Constructed Wetlands for Industrial Wastewater Treatment, (Wiley, 2018)

[126] About ATAL JAL (mowr.gov.in) (last visited 20/02/2022).

[127] P. Ishwara Bhat et. al., "A Study of Kattas as Traditional Irrigation Systems in the Districts of Dakshin Kannada, Udupi and Kasaragod", M.K. Ramesh and Sairam Bhat (eds). *Agricultural Water Governance: Sustainable Practices and Strategies* (2021).

Haphazard construction and agricultural activities around the springs of Shridhar Ashram, Shivamogga; between Netravati- Varada stream; Anthargange, Kolar have resulted in drying of springs.[128] To ensure sustainable use of groundwater resources in mountainous regions, it is necessary to revive or regenerate springs and underground flows.[129] Efforts at rejuvenation of springs include- identifying the recharge area of the aquifers feeding the springs and artificially recharging through trenches and ponds to enhance the infiltration. NABARD, has been promoting innovative and integrated concept of spring-shed based participatory watershed development program[130]. Spring rejuvenation calls for mapping of the spring-shed, identification of recharge areas, pinpointing sites for appropriate recharge structures, construction of recharge structures through convergence of activities under MGNREGA Scheme, PMKSY-WDC and related Schemes of State Governments.

The Drought Proofing Program is an initiative to address these issues. In 100 drought hit and low groundwater level taluks of Karnataka, Watershed activities have been proposed under the Watershed Development Programmes with the Saturation approach and convergence of MGNREGA and PMKSY for the period of 2019 to 2024. One of the objectives is to increase the groundwater table and strengthen local community participation.[131]

4. Stakeholder Participation in mapping and management of groundwater resources. Strategies proposed for mitigating arsenic spread is to identify arsenic aquifers along with filtration. To sustain this process, a need for convergence and collaborative approach is suggested.[132] Alternate water supply

[128] V. Lingaraju, "Springs Sustainability and its implementation for rural water supply schemes", *National Webinar on Spring Water Supply and its Sustainability in parts of Western Ghat Region*, National Institute of Hydrology.

[129] "Spring Rejuvenation A Framework Document", National Hydrology Project, Ministry of Jal Shakti, Dept. of WR, RD, GR, accessed booklet-format.cdr (mowr.gov.in) (last visited 20 Sept. 2021).

[130] Developmental and Promotional Interventions of NABARD under Farm Sector, NABARD, p.8, accessed Booklet C17 New1.cdr (nrsc.gov.in) (last visited 20 Sept. 2021).

[131] Watershed Development for Drought Proofing (WDDP) - Watershed Development Department (karnataka.gov.in) (last visited 20 Sept. 2021).

[132] Paper- Bhujal Manthan (arsenicnetwork.in) (last visited 20 Sept. 2021).

efforts through employment schemes whereby activities of cleaning up and recharging local surface ponds and creating local simple water filtration,[133] involving community in water testing,[134] are being taken up.

Strategy for Sewage Treatment is to Invest in waste-water reuse – by communities, institutions and businesses in retrofitting reuse of waste-water. For example, a business that claims to be running around 10 MLD of Private Sewage treatment capacity in Bengaluru revolves around a model that takes over a dysfunctional sewage treatment plant, refurbishes it and promises to sell back the treated waste water at much lower than tanker water rates to the community for lower value end-uses. These kinds of businesses are effectively displacing use of fresh groundwater and developing a market not only in the context of the increasing competition and cost for groundwater, but also in the context of growing consciousness of some urban elite to be environmentally sensitive.[135]

5. Convergence is addressing Public Health Issue - Intersectoral coordination among the government institutions and non-government institutions for mitigation of groundwater contamination. KSPCB, Gram Panchayats, ASHA Workers, Anganwadi workers, Water User Associations, etc. play a significant role in addressing water quality issues. For Prevention, Detection and Management of groundwater contamination, sustained efforts by the stakeholder's participation will help in maintaining the groundwater quality for consumption of users.

III. Conclusion

Compared to the centuries old tradition of eco-friendly tank systems, the unregulated extraction of groundwater is an anomaly of modern economic

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[133] Paper- Bhujal Manthan (arsenicnetwork.in) (last visited 20 Sept. 2021).

[134] National Rural Drinking Water Policy (NRDWP) Guidelines

[135] R.S.Nayak, "Augmentation of Surface Water by Ground Water From Unconfined Aquifers (Open Wells) And Fixing Mini Filter Plants & Dozing Systems for the Supply of Potable Water to Belgaum City", p. 9, accessed Name of Project Utilisation of ground water by revival of open wells and fixing mini filter units with dozing system and supply of water in Belgaum City (indiawaterportal.org) (last visited on 16/09/2021).

development. Given the laudable constitutional objectives that emphasize human rights, equitable access, and sustainable development in the sphere of natural resources like groundwater, the current legal framework for the regulation and management of groundwater in Karnataka is inadequate. However, the legal measure for protecting the public drinking water schemes provides better compliance with these purposes. Practically, the legal development has only responded to the problems of over exploited areas as its operation is confined to notified area, which constitutes ten percent of Karnataka's total geographical area, that too with little effect in practice. Other areas where exploitation of groundwater is more than 70 percent is left unregulated awaiting calamity. The idea of disaster prevention has no place in such an approach. The inherent limitation of provisions on rainwater harvesting and lack of groundwater literacy have blocked conservation efforts. Without linking groundwater regulation to soil conservation, revival of tanks system and afforestation, the law remains incomprehensive. Over-reliance on the 'command and control' model, non-involvement of local self-governing bodies, non-inclusion of human rights and economic justice approaches, and failure in partnering with civil society bodies or NGOs are other weaknesses. An overhaul of this law to set right the defects in its design is long overdue.

However, policies and schemes have acknowledged the deteriorating groundwater table and quality due to over extraction and infiltration of pollutants. To address these issues a step towards participatory groundwater management to improve access to groundwater data and quality has been shaping through aquifer mapping. Integrating the protection and management of groundwater and surface water, and linking of groundwater to land and vegetation and its intricate relationship with rainwater has been recognised in the Model Groundwater (Sustainable Management) Bill, 2017. Karnataka's groundwater reform can be framed on the lines of Model Groundwater Bill, 2017 and Andhra Pradesh's integrated model of groundwater management.

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3

WATER CONSTITUTIONALISM : A STUDY

Akhila Basalalli

Water is an essential resource for sustenance of life forms. India has about 17%of the world population but does not proportionately possess the natural resources. Only 4% of the water form is available in India as potable water. Despite the scanty availability, the conservation of water is seen as at it's minimal in India. The over extraction of groundwater and pollution of both ground and surface water have rendered the substantial amount of it inutile. The legislative enactments and the constant interventions by the judiciary have compelled the compliance towards conservation. The scarcity of water has further led to the conflict regarding the sharing of the river water by the riparian states' particularity concerning alteration of water course, inadequacy of flow and construction of dams. The Indian Constitution, explicitly and through interpretation has provided a framework for efficient water management. This paper is titled as 'Water Constitutionalism' and constitutionalism is understood as "a mindset, a deliberate vision, an approach of determined commitment and action on the part of power holders and power addresses to abide by the supreme value postulates that are essential for a nation's planned agenda for welfare of all".[1] The study thus has expanded its dimension by not limiting its scope to provisions of the constitution in relation to water, but to emphasize on its social dimensions; manifestations of the individual rights towards water as a

[1] P. Ishwara Bhat, "Constitutionalism's Challenges and Responses in the Domain of Inter-State Water Dispute Law: An Analysis Towards Enhancement of Social Acceptability", in P. Ishwara Bhat (ed) *Inter- State and International Water Dispute* 27 (Eastern Book Company Lucknow 2013).

resource; and exploring the policies, administrative actions and adjudication of disputes for its better management. Water is understood and perceived through various paradigms for instance, (a) through the human rights regime; (b) as a distinct legal person, (c) as resource possessing intrinsic value to be conserved marking the shift from anthropo-centric approach towards eco-centric perspective[2]; (d) through social dimensions and distributive justice; (e) as a subject matter of privatization; (f) as resource highlighting the principles of equitable appropriation especially the riparian rights, to name a few. Some of these mentioned issues will be examined in the following segments, venturing into the constitutional provisions and their interpretation to highlight the importance of constitutionalism in the water management.

1. Water and Fundamental Rights

Water as a right in the Indian Constitution finds its place only in the Article 261 as riparian right.[3] But water as a public and collective right finds its place in the jurisprudential doctrines and interpretation of Article 21. Running water along with other natural resources is associated with the legal concept of public trust. The common properties were to be held by the government for the perpetual use dedicated to the public. Joseph Sax's formulations on the public trust doctrine introduces the three restrictions on the government namely; first, the property subject to the trust must not only be used for a public purpose, but it must be held available for use by the general public; second, the property may not be sold, even for a fair cash equivalent; and third, the property must be maintained for particular types of uses.[4] The public trust is adopted by Indian judiciary in *Kamal Nath*[5] decision, where the Court relying heavily on Sax's writing held that,

> Our legal system - based on English Common Law - includes the public trust doctrine as part of its jurisprudence. The State is the trustee of all

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2 S.C. Shastri, Anthropocentric approach towards Ecocentrism, *Environmental Law* (Eastern book Company, 2018)

3 Rose Mary, "Right to Water: Theoretical Concerns and Practical Issues", Vol 67. No 4 *Indian Journal of Political Science* 762 (2006).

4 Joseph L. Sax, "The Public Trust Doctrine in Natural Resources Law: Effective Judicial Intervention", Vol. 68:471 *Michigan Law Review* 477.

5 (1997) 1 SCC 388

> natural resources which are by nature meant for public use and enjoyment. Public at large is the beneficiary of the sea- shore, running waters, airs, forests and ecologically fragile lands. The State as a trustee is under a legal duty to protect the natural resources. These resources meant for public use cannot be converted into private ownership.

Public trust also enforces the concept of public right or collective right over the natural resources. This has two-fold implications, firstly, realization of the right to water, and secondly, refraining the rest from interfering with such right. This is further endorsed by the Supreme Court in Re: Cauvery Water Dispute Tribunal.[6]

> The right to the use of the flowing water is *public juris*, and common to all the riparian proprietors; it is not an absolute and exclusive right to all the water flowing past their land so that any obstruction would give a cause of action; but it is a right to the flow and enjoyment of the water subject to a similar right in all the proprietors to the reasonable enjoyment of the same gift of providence. It is therefore only for an abstraction and deprivation of this common benefit or for an unreasonable and unauthorized use of it that an action will lie.

On the other hand, the right to water has a different connotation from the right to clean water. The right to water conflicting with the private entrepreneurship that is vested by the common law, sets out a limitation for its fulfillment. For instance, the groundwater within the property is considered as the property of the land owner and he is entitled to its benefits and preclusion of others from interference. The right to clean and drinking water, however, is regarded as fundamental to quality existence.

Water right, to mean right to clean drinking water as a fundamental right originated from the expansive interpretation of Article 21 of the Constitution. The need for water as a fundamental right over riparian rights was more intensely felt with the growing pollution and scarcity. Article 21 has been expanded to

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[6] AIR1992 SC 522.

include right to health[7] and the right to a clean environment.[8] It is also asserted that every person is entitled to life as enjoined in Article 21 of the Constitution that he has also the right under Article 21 to his life and that right under Article 21 embraces not only physical existence of life, but also the quality of life.[9] The right to drinking water is regarded as one of basic tenets associated with adequate living and quality of life, which is to mean that access to safe and pure drinking water is of fundamental importance to live a healthy and hygienic life. Explaining the importance of pollution free water for quality life, the Supreme Court in *Subhash Kumar v. State of Bihar*[10], held that " right to life is a fundamental right under Article 21 of the Constitution and it includes the right of enjoyment of pollution free water and air for full enjoyment of life and if anything endangers or impairs that quality of life in derogation of laws, a citizen has right to have recourse to Article 32 of the Constitution for removing the pollution of water or air which may be detrimental to the quality of life". The Court in *Narmada Bachao Andolan v Union of India*,[11] referred to the United Nations Conference in 1977 and that India as party to the Resolution of UNO is bound by the principle that under "all people, whatever their stage of development and their social and economic conditions have the right to have access to drinking water in quantum and equal to their basic needs." It further held the right to access to drinking water as fundamental to life and it is a duty of the State under Article 21 to provide clean drinking water to its citizens. The environmental rights being collective in nature form the third-generation rights in the human rights jurisprudence.

The development or progress has often negatively impacted nature and as Marx explains it as 'capital induces man to destroy nature piece by piece for the sake of money… A healthy development based on pragmatic considerations and circumstances does not violate the norms of nature but the concept of

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7 *CESC Ltd. V. Subash Chandra*, AIR 1992 SC 573; *Consumer Education and Research Centre v. UOI* AIR 1995 SC 636; *Paschim Banga Khet Mazdoor Samiti v. State of WB* (1996) 4 SCC 37

8 *Bandhua Mukti Morcha vs. Union of India* 1984 SCC 161

9 *State of Himachal Pradesh v Umed Ram Sharma* (1986) 2 SCC 68

10 AIR 1991 SC 420

11 2000 (7) SC 34

capitalizing nature for enormous and immediate progress acts as a serious menace to the health of the environment'.[12] Thus the sustainable use of the environment for developmental purposes was identified as suitable to balance both the essentials. The right to sustainable development has gained normative attention as one of the important facets of human development after having found its place in the United National Declaration on the Right to Development 1986. Considering the connection of sustainable development with human rights, the Court in *A. P. Pollution Control Board (II) v. Prof. M. V. Nayudu*[13] held that 'there is therefore a need to take into account the right to a healthy environment along with the right to sustainable development and balance them…there is building up, in various countries, a concept that right to healthy environment and sustainable development are fundamental human rights implicit in the right to life". Further explaining the importance of sustainable development and the need for socio-economic development and environment considerations to go hand in hand, the Supreme Court in *Essar Oil v Halar Utkarsh Samiti,*[14] observed,

> It is the sole aim, namely, to balance economic and social needs on the one hand with environmental considerations on the other. But in a sense all development is an environmental threat. Indeed, the very existence of humanity and the rapid increase in population together with the consequential demands to sustain the population has resulted in the concreting of open lands, cutting down of forests, filling up of lakes and the pollution of water resources and the very air we breathe. However, there need not necessarily be a deadlock between development on the one hand and the environment on the other. The objectives of all laws on the

[12] Cited in P. Ishwara Bhat, *Natural Resources Law – Concepts & Approaches* 44 (EBC, 2016)

[13] (2001) 2 SCC 62. The reiteration of the principle laid down in *Narmada Bachao Andolan v Union of India* by J. Kirpal.

[14] 2004 (2) SCC 392; See *Enviro-Legal Action v Union of India* 1996 (5) SCC 281, The Court held that "While economic development should not be allowed to take place at the cost of ecology or by causing widespread environmental destruction and violation; at the same time the necessity to preserve ecology and environment should not hamper economic and other developments. Both, development and environment should go hand in hand, in other words, there should not be development at the cost of the environment and vice versa, but there should be development while taking due care and ensuring the protection of the environment."

environment should be to create harmony between the two since neither one can be sacrificed at the altar of the other.

The concept of sustainable development has been interpreted as an integral part of the right to life under Article 21. The Court in *N.D. Jayal v Union of India*,[15] stressed on maintaining symbiotic relationship between development projects like construction of dams and human right towards environment held that "the right to environment is fundamental right. On the other hand, the right to development is also one. Here the right to 'sustainable development' cannot be singled out. Therefore, the concept of sustainable development is to be treated as an integral part of life under Article 21."

Subsequently, the decision of *Atma Linga Reddy v. Union of India,*[16]extended the scope of right to drinking water to include the right to use water for domestic purposes, that water is the most essential natural resource upon which the life of all living beings depends. It further held that the human need of drinking water is paramount, perennial and eternal. Of all human needs, the need for drinking and domestic use of water is inevitable and equally important is the role of water in irrigation which is the only source that enables production of food-grains, another essential component for survival of human life. Right to water, therefore, the Court held, is to be considered as part and parcel of the right to life within the meaning of Article 21 of the Constitution. In multiple uses of water, drinking purpose must have the top most priority and second preference should be given to irrigation.

Further the recent decision of *suo-moto* petition *'Remediation of Polluted Rivers'* and subsequent *Delhi Jal Board v State of Haryana*[17], related to increased ammonia levels in Yamuna due to discharge of pollutants. The Supreme Court, while maintaining that the right to clean environment as fundamental, went on to hold that pollution free water has been protected under the broad rubric of the right to life guaranteed under Article 21. It also

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15 AIR 2004 SC 867

16 AIR 2009 SC 436 : 2008 (7) JT 601 : 2008 (7) JT 610 : 2008 (7) Scale 45 : 2008 (9) Scale 745: 2008 (7) SCC 788 : 2008 (10) SCR 741 : 2008 (5) Supreme 353

17 W.P.(C) No. 8/2021

emphasized on the duty of the government under Article 47, 48A and 243W in order to ensure pollution free, hygienic and natural environment.

The judicial interpretation of Article 21 to include right to wholesome environment and right to drinking water is of paramount significance. This elucidates the development of human rights towards leading a meaningful life with dignity. The right to live in a healthy and hygienic environment, right to unpolluted air, right to drinking water are the manifestations of the right to live with dignity. The development of these rights are milestones in Indian human rights jurisprudence as they essentially highlight the social and distributive justice.

Another very pertinent dimension of social justice is concerning water use and access to water bodies without caste discriminations. In India, it is estimated that 20% of the Dalits do not have access to safe drinking water while 48.4% are denied access to water sources.[18] Access to the water is particularly difficult for the Dalit women as they suffer triple disadvantage as they are poor Dalit women, leading to inhumane segregations, human right violations and discriminations.[19] Article 15(2)(b) of the Constitution eliminates discriminations based on race, religion, caste and sex regarding the use of wells, tanks, bathing ghats, wholly or partly maintained out of state fund or dedicated to public use. Further, Article 17 abolishes the practice of untouchability in any form. These two provisions ensure the accessibility to water to all the people without discrimination of any kind. In the case, *State of Karnataka v. Appa Balu Ingale*[20], existence of a practice of caste discrimination where the Harijan were excluded by the upper caste from having access to a bore-well sunk by the Government. The Court set aside the accused acquittal awarded by the trial court with the reason that caste discrimination affects human dignity. The provision and the decision must serve as beacons of upholding human rights and social justice, especially in the light of existing discriminations to accessing the water bodies that are evidently seen in the rural areas.

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18 Hannah Johns, "Stigmatization of Dalits in Access to Water and Sanitation in India" available at https://www.ohchr.org/documents/issues/water/contributionsstigma/csociety/stimatizationofdalitsinacesstowatersanitation.docx

19 Swarup Dutta, Sukanta Behera and Ahok Bharti, "Access to Drinking Water by Scheduled Castes in Rural India: Some Key Issues and Challenges" Vol 9, No. 1 *Indian Journal of Human Development* (2015).

20 AIR 1993 SC 1126

2. Water and Directive Principles of State Policy

The provisions 39(b) and 48A under Directive Principles of State Policy (DPSP) have bearing upon water resources. The Part IV, The Directive Principles being supplementary in nature nevertheless lays down the objectives to be pursued by the state organs. The DPSP being non- justiciable in the court of law may not be challenged for their non-observance. However, B. R. Ambedkar in the Constituent Assembly argued that the legislative and executive must not pay lip service to the Directive Principles, but should make them the basis for their action. The Supreme Court further highlighting the importance of the DPSPs in the Constitution in *State of Kerala v Thomas*[21] held that "the Directive Principles in the view of the Supreme Court, forms the fundamental feature and the social conscience of the Constitution and the Constitution enjoins upon the State to implement these principles. The directives thus provide the policy, the guidelines and the end of socio-economic freedom." The directive principles are social and economic policies that are to guide the governments. These are the aspects which could not be guaranteed during the early years of independence but could be accommodated eventually in the future. The directive principles are frequently cited with the fundamental rights and have been considered complementary to them. The Supreme Court in *Som Prakash Rekhi v Union of India*,[22] held that India is a welfare state and a socialist republic, under the Constitution with profound concern for the weaker classes.

Article 39(b) enumerates 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 sub serve the common good." Initially this provision as per Article 31(ii) stated that

> the ownership, control and management of the natural resources of the country in the shape of mines and mineral wealth, forests, rivers and flowing waters as well as in the shape of the seas along the coast of the country shall be vested in and belong to the country collectively and shall

[21] (1976) 1 SCR 906
[22] 1981 AIR 212

be exploited and developed on behalf of the community by the state as represented by the Central or Provincial Governments or local governing authority or statutory corporation as may be provided for in each case by the Parliament.

Prof. K. T. Shah in the Constituent Assembly Debate, proposed the substitution of the above clause with the current provision by calling the mines, mineral wealth, forests, rivers, flowing waters and sea coast cumulatively as 'material resources'.[23] He further advances the argument that the natural resources have to be monopolized for economic and efficient utilization and such ownership, management has to be worked by the state.[24] Since these resources are gifts of nature, they should belong to all the people collectively and must equally be distributed among all. In the light of the above argument, it is evident that the term 'material resource' was initially constructed to include water and such resource should be held and redistributed for common good.

The Madras High Court in *K.A. Kannappa Chetti v State of Tamil Nadu,*[25]referring to the CAD, explained 'material resource' as the resources that belonged to the community but owned by others whose control has become necessary to sub-serve the common good and therefore, such resources have to be acquired and distributed amongst the community. The judiciary has expanded the scope of material resources by defining it in the context of wealth to include natural resources, raw materials, human resources and total non-human resources in the country.[26] It further has included the palace, the land appertain and the movables of archaeological value to material resources.[27] With such expansive meaning to the material resources, there is no hesitation in holding that all the water bodies, irrespective of naturally occurring or man-made, are necessary for the common good must be made available for the community utilization.

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[23] Constituent Assembly of India Debates (Proceedings)- Volume VII Monday, the 22nd November 1948available at http://164.100.47.194/loksabha/writereaddata/cadebatefiles/C22111948.pdf

[24] Ibid

[25] (1973) 2 MLJ 212

[26] *Assam Sillimanite Ltd. v. Union of India* AIR *1977 Del 193.*

[27] *Chamundi Hotels Ltd. v. State* ILR 1997 Kar 1573

Supporting the above argument is the decision of *Palapati Ravichandra Reddy v Government of AP*[28] which referred to Article 39(b) and viewed the state is the custodian to maintain water bodies and ecological balance. It also called it an obligation of the State to protect the water from pollution and protect the lakes, rivers, tank beds etc., in view of Articles 48A and 51A(g). Similarly, in the case of *T. Siva Prasad v State of AP,*[29] the vacant lands, lakes, rivers etc., were considered under the direct control of the State and the State has to maintain those rivers, lakes, and tanks by applying public trust doctrine and right to life.

The precedents necessitate clean and structured maintenance of the water bodies by the State, as they are the resources for common good and ensure the equitable distribution by providing them access to the water resources. This shall essentially imply that the State is also under the obligation of supplying water to all. The supply of water and sanitation are state subjects requiring the state to regulate and provide these services. The Ministry of Drinking Water and Sanitation which is currently, is Department of Drinking Water and Sanitation under Ministry of Jal Shakthi is primarily responsible for policy, planning, funding and co-ordination of programmes for safe drinking water and sanitation in the rural areas. It initially launched two key schemes, Swachh Bharat Mission-Gramin (SBM-G) and National Rural Drinking Water Programme (NRDWP).[30] The NRDWP is restructured and subsumed into Jal Jeevan Mission (JJM) to provide Functional Household Tap Connection (FHTC) to every rural household i.e., Har Ghar Jal by 2024.[31] Despite the overwhelming policies and financial viability, materialization of the schemes are under enormous pressure due to scarcity of water, location of the water source, opacity and unaccountability among the authorities.

Protection and improvement of the environment was first time incorporated into the Constitution by the 42nd Amendment in 1976. Article 48A, situated in Part IV, declares that 'the state shall endeavor to protect and improve the

28 PIL No. 337 of 2012
29 W.P. No. 18349 of 2017
30 https://www.prsindia.org/theprsblog/status-drinking-water-and-sanitation-rural-india
31 https://jalshakti-ddws.gov.in/

environment and to safeguard the forest and wildlife of the country'. There was considerable debate in Parliament over the structure and words of draft Article 48A, for instance one of them required the state to conserve and develop the water, soil and other natural resources, while another, to ensure that state's efforts to protect and improve the environment would not harm tribal forest dwellers.[32] These amendments were not accepted by the government and it took the position that the broad terms of a directive principle need not contain details.[33]

Article 48A has been cited by the judiciary alongside Article 21 in many environmental decisions. The Court, emphasizing the importance of Article 48A in *Sachidanand Pandey v State of West Bengal*,[34] held that,

> Whenever a problem of ecology is brought before the Court, the Court is bound to bear in mind Article 48A of the Constitution. When the Court is called upon to give effect to the Directive Principles and the fundamental duty, the Court is not to shrug its shoulders and say that priorities are a matter of policy and so it is a matter for the policy-making authority. The least that the Court may do is to examine whether appropriate considerations are borne in mind and irrelevances excluded.

An instance of massive pollution occurred in Bichhri village of Rajasthan where the toxic effluents, particularly the iron-based and gypsy based sludge contaminated everything that was in contact with it. The groundwater, surface water and land had been polluted. The social action litigation was initiated requesting for appropriate remedy in *Indian Council for Enviro-legal Action v. Union of India and Others,*[35] in which the Court referred to Article 48A, along with Article 21 and provisions of Water Act. The precedents are evident that the status of Article 48A is elevated as the co-substantial norm to Article 21 as it is the only provision in the Constitution that directs protection of the environment.

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[32] Shyam Divan and Armin Rosencranz, *Environmental Law and Policy in India* 48-9 (New Delhi: Oxford University Press, 2nd edn. 2001).

[33] Ibid.

[34] AIR1987 SC 1109

[35] 1996 AIR 1446

3. Water and Fundamental Duties

The Part IVA, Article 51A was added by the 42nd Amendment in 1976 to the Constitution upon the recommendations of the Swaran Singh Committee. The fundamental duties were inspired by the Constitution of the USSR. There were originally ten fundamental duties; the eleventh duty was added by the 86th Amendment in 2002. Article 51-A(g) requires the citizens to protect and improve the natural environment including forests, lakes, rivers, wildlife and to have compassion for living creatures. The language of Article 51-A that 'it shall be the duty of every citizen of India' makes the provision non-obligatory. The provision requires the citizens to observe the duties, but the failure does not entail any legal sanction. However, similar to the status of Article 48 A, Article 51- A (g) is co-cited along with Article 21 thereby being complementary in nature. The Court in *Virendra Gaur v State of Haryana,* [36]citing Article 51A-(g) observed that, "the word 'environment' is of broad spectrum which brings within its ambit 'hygienic atmosphere and ecological balance'. It is therefore, not only the duty of the State but also the duty of every citizen to maintain a hygienic environment." Further in *Abhilash Textile v Rajkot Municipal Corporation*,[37] the Court questioned if there was any right to carry on business or trade in an unregulated manner and cause nuisance to the public and also become a health hazard to the society at large. The petition was regarding the notice issued by the Municipal Commissioner after finding that the petitioners were discharging dirty water from the factory on public roads, and public drainage without treating them thereby causing damage to the public health. The Court referring to Article 51A-(g) held that,

> By no stretch of imagination it can be said that the petitioners would be protecting the natural environment by discharging the effluents from the factory on public road and or in public drainage systems… the petitioners cannot assert their right, much less fundamental right, to carry on business without any regard to the fundamental duty. In a complex society, in which we live today, no one can claim absolute freedom without incurring any obligation whatsoever for the general well-being.

[36] 1995 (2) SCC 571
[37] AIR 1988 Guj 57

The fundamental duties being co substantial in nature to Article 21 and Article 48A have taken the shape of legal obligations imposing the duty on the citizen (a) to protect the environment and (b) to restrain from activities that pollute the environment or interfere with anybody's peaceful enjoyment of the wholesome environment.

4. Water and Local Self Government

The Article 40 of the Indian Constitution lays down a direction that the 'state shall take steps to organize village panchayats and endow them with such powers and authority as may be necessary to enable them to function as units of self- government'. The 73rd and 74th Amendment 1992 have been added as a new Part IX to the Indian Constitution pursuant to the above directive. The creation of these units within the Part IX has made them justiciable part of the Constitution. The 73rd Amendment covers the provisions from Article 243-243(O) and a new 11th Schedule covering 29 subjects to fall within the functions of the Panchayats. The 73rd Amendment made constitutionally mandatory for all the state governments to enact appropriate Panchayath Raj legislations detailing meaningful democratic devolution of functions, functionaries and funds.[38] Article 243G gives such power to the state to make legislation to empower the Panchayath with the powers, authority and responsibilities in order to enable them to function as the institutions of self-government and discharge functions necessary for economic development and social justice. The Eleventh Schedule lists the matters that may be entrusted to the Panchayats of which the matters relating to water are listed under Entry 3 that covers minor irrigation, water management and watershed development, Entry 11 covers drinking water and Entry 23 deals with the health and sanitation.[39] The Entry 29 requiring the Panchayats to maintain community assets is an interesting area as the participation of the local communities in preserving their assets becomes extremely relevant. Apart from these entries that directly deal with water, some other entries are expected to have insinuations on water conservation and its

[38] Videh Upadhyay, "Water Rights and the New Water Laws in India: Emerging Issues and Concerns in a Rights based Perspective" available at https://www.idfc.com/pdf/report/2011/Chp-5-Water-Rights-And-The-New-Water-Laws-In-India.pdf (last visited on 15/10/2021).

[39] Article 243G, 11th Schedule of the Indian Constitution.

management, for instance the subjects such as fisheries, agriculture, land development, soil conservation and social forestry. The best means of water conservation is through integrated water management and the articulation of this approach emphasizes on the cumulative conservation of *Jal, Jungle and Jameen.*[40]

Decentralization has been identified as a foundational principle of the National Environmental Policy 2006,[41] as this effectuates the active participation of the local communities. The National Water Policy 2002 encourages the gram panchayats and municipalities along with the Water Users Associations to be involved in the operation, maintenance and management of water infrastructures/ facilities at the appropriate levels so that there is an eventual transfer of the management to the user groups and local bodies.[42] Further, the National Water Policy 2012, highlights the role of the local bodies like the other governance institutions of the Center and the states in ensuring the access to a minimum quantity of potable water for essential health and hygiene to all citizens, available within easy reach of the household.[43] The locals often associate the natural resources as a part of their lives, their culture. Such culture of the community is very appropriately explained by Edward Taylor to be inclusive of customs, beliefs, knowledge, art, law and any other capabilities and habits acquired by man as a member of the society.[44] For the purpose of efficient functioning, the Panchayats are authorized to collect appropriate taxes, duties, fees etc. and the Panchayats may also be assigned a certain state level taxes subject to a few conditions.[45]

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40 Ishwara Bhat, Akhila Basalalli and Nayashree Bhosge, "Karnataka", in Sarfaraz Ahmed Khan, Tony George and Sanu Paul (eds.) *Groundwater Law And Management In India* 203-220 (Springer, 2021).

41 National Environment Policy, 2006

42 National Water Policy 2002 at http://cwc.gov.in/sites/default/files/nwauser/nwp-lectnote6.pdf

43 National Water Policy 2012 at http://cwc.gov.in/sites/default/files/nwauser/nwp-lectnote6.pdf

44 *Supra* note 12,p. 41.

45 Sairam Bhat, *Natural Resources Conservation Law* 445 (Sage Law, 2010).

Similar nature of power is vested in the Municipalities by the Constitution, as per Article 243Q, where the Article constitutes three types of municipalities in the urban areas.[46] The Article 243W provides for the devolution of powers, authority and responsibilities of the municipalities with respect to (i) the preparation of plans for economic development and social justice; (ii) the performance of functions and the implementation of schemes as may be entrusted to them including those in relation to the matters listed in the Twelfth Schedule. Some of the subject matters in the Schedule that concerns water are Entry 5 dealing with the water supply for domestic, industrial and commercial purposes, Entry 7 concerning the public health, sanitation, conservancy and solid waste management and Entry 15 for creation of cattle ponds.[47]

The Article 243W mandates the creation of Municipalities but does not explicitly determine the power that is to be devolved upon the municipalities. However, the scope of the provision is not to be interpreted textually limiting its scope but in the spirit of 74th Amendment which intended to empower the municipalities in local governance.

5. Water and International Obligations

The international treaty obligations get channelized into the Indian legal system after being transformed into domestic legislation by the act of Parliament. The Article 253 of the Indian Constitution states that "Notwithstanding anything in the foregoing provisions in this chapter, Parliament has power to make any law for the whole or any part of the territory of India for implementing any treaty, agreement or conventions with any other country or countries or any decisions made at any international conferences, associations or other bodies." The Parliamentary prerogative to give effect to the international instrument is broad to include not just the treaties and conventions but also the decisions made at any international conferences, associations or other bodies. Further, the Entry 13 of the Union List in 7th Schedule includes the 'Participation in international conferences, association and other bodies and implementing of decisions made thereat.' The Article 253 essentially removes the limitations

[46] Article 243-Q The Constitution of India.
[47] Twelfth Schedule of the Indian Constitution.

imposed by Article 245[48] and Article 246[49] by opening the entire field of legislation by Parliament which means that Article 253 is in the form of an exception to the rule contained in Article 246.[50] In other words, Article 253 when read with Entry 13, empowers the Parliament to legislate on any entry irrespective of it being in state list. The Court in *Maganbhai Ishwarabhai Patel v. Union of India,*[51]endorsed this view by holding that "the effect of Article 253 is that if a treaty, agreement or convention with foreign state deals with a subject within the competence of the State legislature, the Parliament alone has notwithstanding Article 246(3), the power to make laws to implement the treaty, agreement or convention or any decision made at any international conference, association or other body. In terms, the Article deals with legislative power thereby power is conferred upon the Parliament which it may not otherwise possess." The Court further elucidating the scope of Article 253 read with Entry 13 in *S. Jagannath v. Union of India,* held that, "the Environment Protection Act 1986 has enacted by the Parliament under Entry 13 of List 1 Schedule VII read with Article 253 of the Constitution, the CRZ Notification having been issued under the Act shall have overriding effect and shall prevail over the law made by the legislatures of the States.

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48 Article 245-Extent of laws made by Parliament and by the Legislatures of States (1) Subject to the provisions of this Constitution, Parliament may make laws for the whole or any part of the territory of India, and the Legislature of a State may make laws for the whole or any part of the State. (2) No law made by Parliament shall be deemed to be invalid on the ground that it would have extra-territorial operation.

49 Article 246 Constitution of India: Subject-matter of laws made by Parliament and by the Legislatures of States (1) Notwithstanding anything in clauses (2) and (3), Parliament has exclusive power to make laws with respect to any of the matters enumerated in List I in the Seventh Schedule (in this Constitution referred to as the "Union List"). (2) Notwithstanding anything in clause (3), Parliament, and, subject to clause (1), the Legislature of any State also, have power to make laws with respect to any of the matters enumerated in List III in the Seventh Schedule (in this Constitution referred to as the "Concurrent List"). (3) Subject to clauses (1) and (2), the Legislature of any State has exclusive power to make laws for such State or any part thereof with respect to any of the matters enumerated in List II in the Seventh Schedule (in this Constitution referred to as the "State List"). (4) Parliament has power to make laws with respect to any matter for any part of the territory of India not included notwithstanding that such matter is a matter enumerated in the State List.

50 Varma, Prem "Position Relating to Treaties Under the Constitution of India", 17(1): 113-130 *Journal of the Indian Law Institute*, p. 119 (1975).

51 1969 AIR 783

Pursuant to Article 253 read with Entry 13, the Parliament enacted the Air Act of 1981 and the Environment Protection Act 1986 as the preambles to both laws state that these Acts were passed to implement the decisions reached at United Nations Conference on the Human Environment held at Stockholm in 1972.[52] Most of the environment legislations or the amendments brought to the existing legislation are the consequences of the international obligations entailed upon India to bring its domestic law in conformity with the international norms. For instance, the enactment of Biodiversity Act 2002 to give effect to United Nations Convention on Biodiversity 1992; the inclusion brought to the Wildlife (Protection) Act 1972 after being party to Convention on International Trade in Endangered Species of Wild fauna and Flora 1975. Article 253 has paramount significance in channelizing the international environmental norm into the Indian legal system.

The Water (Prevention and Control of Pollution) Act 1974, however was not enacted as a matter of compliance as per the Article 253, but pursuant to Article 252(1)[53]. Though water is a state subject requiring the state to legislate upon this subject, there were more than two state legislatures consenting to a central law, resulting in the enactment of the Water Act. The scope of its application at first instance extended to the States of Assam, Bihar, Gujarat, Haryana, Himachal Pradesh, Jammu and Kashmir, Karnataka, Kerala, Madhya Pradesh, Rajasthan, Tripura and West Bengal and the Union Territories and it is also applicable to such other states that adopt this Act by passing resolution.

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[52] *Supra* note 32, p 47

[53] Article 252 deals with the power of Parliament to legislate for two or more States by consent and adoption of such legislation by any other State (1) If it appears to the Legislatures of two or more States to be desirable that any of the matters with respect to which Parliament has no power to make laws for the States except as provided in Articles 249 and 250 should be regulated in such States by Parliament by law, and if resolutions to that effect are passed by all the House of the Legislatures of those States, it shall be lawful for Parliament to pass an Act for regulating that matter accordingly, and any Act so passed shall apply to such States and to any other State by which it is adopted afterwards by resolution passed in that behalf by the House or, where there are two Houses, by each of the Houses of the Legislature of that State (2) Any Act so passed by Parliament may be amended or repealed by an Act of Parliament passed or adopted in like manner but shall not, as respects any State to which it applies, be amended or repealed by an Act of the Legislature of that State

Though the Water Act 1974 has limited applicability, it is an enabling legislation that has created and empowered the Central and State Pollution Control Boards in furtherance of the objective to control and prevent water pollution.

6. Water Disputes and Article 262

The demand for water has increased with the growth of population, migration, rapid industrialization and changed patterns of agriculture. The demand has necessitated an efficient water management and distribution regime. The water disputes between the riparian states have also witnessed a surge as a consequence of growing demand and scarcity. Water disputes are described as a volatile mixture of politics, law and livelihood issues.[54]

Singh traces the Parliament's enactment of States Reorganization Act 1956 with restructuring of boundaries and consolidation of population on the basis of language[55] as one of the causes for intensification of water disputes.[56] He observes that the management of the rivers became fragmented and the consensus was difficult to reach with new states having rivers within their territory.

Article 262 of the Indian Constitution reads that in cases of disputes relating to waters, 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. Parliament may also through law limit the jurisdiction of the Supreme Court or any other court with respect to any such dispute or complaint relating to use, distribution or control of waters in any interstate river or river valley. Further the entry 56 of the Union List read with Article 246 provide the Parliament to make laws regarding 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

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54 *Supra* note 1, M.P. Singh, "Inter-State Rivers and the Constitution: Issues and Solutions".

55 The 7th Amendment of the Indian Constitution introduced the reorganization of the states on the linguistic basis after the recommendation of the State Reorganization Committee composed of Fazl Ali, K.M. Pannikar and H.N. Kunzru.

56 *Supra* note 54 p 18

Parliament by law to be expedient in the public interest[57]. Similarly, the Parliament's prerogative is evidenced from Entry 17 of the State List where a state may only legislate with respect to water supplies, irrigation and canals, drainages and embankments, water storage and water power subject to provision of Entry 56 of List I.[58]

This centralization of water dispute resolution has an interesting history from the time of Government of India Act 1919, when dyarchy was introduced in the provinces, the subject of irrigation though treated as provincial, still became reserved requiring the prior approval of the Secretary of State mandatory before any Provincial Government could take up project involving the interest of more than one province.[59] Subsequently, the Government of India Act 1935 marked irrigation as a provincial subject as per Entry 19.[60] The Entry 17 of List II of Seventh Schedule however is a *verbatim* replica of the Entry 19 of Provincial List of Government of India Act 1935. When faced with the inter-provincial disputes, the GOI Act of 1935 through provisions of 130-133 nevertheless, required the interference of the Governor General who in turn was to appoint a Commission to investigate and report to him about the disputes.[61] Based on the report the Governor General was to give decisions as he deemed proper which was to be binding upon the parties, unless before the decision, Governor of any state or the ruler of a Princely State affected by the order

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[57] Entry 56 of the List I, Seventh Schedule Read with Article 246. Article 246 reads Subject matter of laws made by Parliament and by the Legislatures of States (1) Notwithstanding anything in clauses (2) and (3), Parliament has exclusive power to make laws with respect to any of the matters enumerated in List I in the Seventh Schedule (in this Constitution referred to as the Union List) (2) Notwithstanding anything in clause (3), Parliament, and, subject to clause (1), the Legislature of any State also, have power to make laws with respect to any of the matters enumerated in List III in the Seventh Schedule (in this Constitution referred to as the Concurrent List) (4) Parliament has power to make laws with respect to any matter for any part of the territory of India not included (in a State) notwithstanding that such matter is a matter enumerated in the State List

[58] Entry 17 of the List II, Seventh Schedule, Constitution of India.

[59] A Background Paper on Article 262 and Inter-State Disputes relating to Water. The Paper was prepared for the Commission by P.M. Bakshi in 1985.

[60] Provincial List, Entry 19: Water, that is to say, water supplies, irrigation and canals, drainage and embankments, water storage and water power.

[61] *Supra* note 59.

require the Governor General to refer the matter to His Majesty in Council, which could give such decision.[62] Similar to the Article 262, Federal Court or any other court was barred from exercising the jurisdiction if action to lodge a complaint had been taken by the Governor of a province. The reiteration of the above provisions from 130-133 was seen in the draft Constitution through Articles 239-242 simply by substituting the Governor General with President, however Dr. Ambedkar replaced the plethora of provisions by just adding 242A which currently is Article 262.[63]

Pursuant to Constitutional provisions such as Article 262 read with Article 246 Entry 56 of Union List, Seventh Schedule, the Parliament has enacted the Inter- State Water Dispute Act, 1956 and the River Boards Act 1956. The River Boards Act, 1956 provided for the establishment of River Boards for the regulation and development of inter-state river and river valleys. The statute empowers the Central Government to establish a river board on the request of the state government to advise them concerning the regulation or development of an inter-state river or valley.[64] The Board may advise the state governments on the conservation, utilization of water, irrigation, water supply, drainage, development of hydro-electric power, flood control, navigation, afforestation, soil erosion, pollution and prepare schemes. [65]

The Inter- State Water Dispute Act, 1956 provides for the constitution of the tribunal, empowering it to decide the water disputes, simultaneously barring the jurisdiction of the Supreme Court or other courts in the matters referred to the tribunal. This however doesn't limit the jurisdiction of the Supreme Court under Article 136.[66] There have been instances where the decisions have been before the Supreme Court for the review. Any interstate water dispute[67] may

62 Ibid.

63 Ibid.

64 Section 4 of the River Board Act, 1956.

65 Section 13 of the River Board Act, 1956.

66 The Article vests the Supreme Court with the special power to grant leave to appeal against any judgment or order or decree in any matter or cause, passed or made by any Court/tribunal in the territory of India.

67 Water dispute in the Act is defined under Sec 2 (c) to mean any dispute or difference between two or more states with respect to the use distribution or control of the waters of, or in, any interstate river or river valley or interpretation of the terms of any agreement relating to the use, distribution or control of such waters or the implementation of such agreement.

be taken by the Tribunal with the request of the state government and the Central Government is of the opinion that the water dispute cannot be settled by negotiation.[68] The tribunal shall consist of a Chairman and two other members who are the sitting judges of the Supreme Court or High Court and these members are nominated on behalf by the Chief Justice of India.[69] The decision of the tribunal is final upon the parties and the tribunal is supposed to give its decision within three years with an extension of two more years.[70]

There have been attempts to improvise the Inter-State Water Dispute Act, 1956 at several instances. The Sarkaria Committee, later on taken up by the Inter- State Council for one, recommended further empowering the Central Government to constitute, refer and provide an extension to the tribunal.[71] It further proposed the strengthening of the data bank and information system at the national level so that the data may be provided as and when the tribunal requires.[72] The Punchhi Commission on the other hand, focused on the long delays, uncertain time frame, finality of the tribunal's awards, linking of tribunal with the River Boards, and making the tribunal a multi-disciplinary body with the more participatory and conciliatory role.[73] The National Commission to Review the Working of the Constitution, 2002, unlike the other two commissions was not conformational to the Act, but proposed to shift the jurisdiction of the water disputes from the tribunal to the Supreme Court under Article 131 of the Indian Constitution retaining Article 262 however.[74] Further attempt to alter the interstate water dispute mechanism was made with the introduction of the Inter-State Water Dispute (Amendment) Bill, 2019, where the water disputes are encouraged to be settled amicably by creating a Dispute Resolution Committee (DRC)[75]. The Center proposes a speedy dispute resolution within a period of one year and only if settlement is not reached through DRC, the matter is

68 Sec 3 of the River Board Act, 1956
69 Sec 4 of the River Board Act, 1956
70 Sec 6 of the River Board Act, 1956
71 Report of Sarkaria Commission available at http://interstatecouncil.nic.in/report-of-the-sarkaria-commission/
72 Ibid.
73 *Supra* note 54, pp. 23-25
74 Id. at 21
75 Section 4A of the Bill 2019

referred to the Tribunal. The Bill also proposes the constitution of a Tribunal and multiple benches[76] to streamline the dispute resolution in a speedy and effective manner and build a unified institutional mechanism. However, the superficial changes to the 1956 Act by the way of amendment does not solve the innate difficulties of the water dispute resolution system.[77]

Despite the limitation of Article 262 on the Supreme Courts' inference in the matters of tribunal, there nevertheless have been many instances where intervention of the Supreme Court is sought either through the Special Leave Petitions *vide* Article 136, judicial review or by making it a subject matter under Article 32.. In the decision of *Atma Linga Reddy v. Union of India*,[78] the writ petition is filed in the nature of Public Interest Litigation pursuant to Article 32 restraining the respondents which are State of Karnataka and Sree Swarna Energy Ltd. from construction of a Mini Hydro Power Project at Rajolibanda Diversion Scheme, Raichur District, Karnataka. The Court stating that the dispute is subject to the jurisdiction under Article 262 held that,

> In the light of the scheme as envisaged by the Makers of the Constitution as also by Parliament under the Act XXXIII of 1956 in connection with water disputes between inter-States, it is clear to us that such disputes cannot be made subject matter of petition either in a High Court under Article 226 or in this Court under Article 32 of the Constitution. Probably, Article 262 is the only provision which enables Parliament to oust and exclude jurisdiction of all Courts including the Supreme Court (this Court). It is also pertinent to note that Clause (2) of Article 262 contains non-obstante clause ("Notwithstanding anything in this Constitution"). It is no doubt true that Article 262 of the Constitution is not self- executory inasmuch as it does not, by itself, take away the jurisdiction of this Court in respect of disputes relating to waters of inter-State rivers or river-valleys. It is an enabling provision and empowers Parliament to enact a law

[76] Section 4B and 4E of the Bill 2019

[77] See *Supra* note; Tony George Puthucherril, "Water Federalism, Tribunalization of Water Justice and Hydro- Politics: India's International State River Water Dispute Act at 65 Years" Vol.35, No. 1 *Columbia Journal of Asian Law* 46(Spring 2022).

[78] AIR 2009 SC 436.

> providing for adjudication of such disputes or complaints, excluding the jurisdiction of all Courts including this Court (Supreme Court).[79]

However, there have been several instances where the disputes have been brought before the Supreme Court at various stages seeking judicial review. Bhat vividly explains this phenomenon as,

> Litigation before the Supreme Court may now centers around several issues at different stages: starting with a direction or mandamus to constitute a tribunal, interpretation of terms of reference, justification for interim relief and propriety of its procedure, review of substantive principles or merits of interim relief and implementation thereof, constitutionality of State law distributing the interim relief or obstructing the implementation of tribunal's award or court's order or judgment, finally propriety of substantive principles for final award and ending with implementation of the decision.[80]

The above arguments reflect the dual stance of the Indian Judiciary swinging between barring the jurisdiction and allowing the dispute before them. This inconsistency has further added to the uncertainty and politicization of the water dispute resolution.

7. Conclusion

This paper on water constitutionalism doesn't limit the constitutional dimensions to water as a resource but explores its social dimensions; manifestations of the individual rights towards water, jurisdictional limitations, internationalism and many more. The Judiciary by articulating Article 21 in its precedents has exponentially developed the public and collective rights over water. The concept of sustainable development has been treated as an integral part of Article 21. Further, the scope of Article 21 has been extended to the right to clean water in association with life with dignity, emphasizing on the duty of the government to ensure pollution free, hygienic and natural condition of water. The Directives also encourage the resources such as water to be

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[79] Id.

[80] *Supra* note 1.

distributed among all the people ensuring the principles of social justice. The 73rd and 74th amendments to the Indian Constitution have provided legal support to the role of local government towards management of water as a resource. Water justice has been further strengthened with the support of international legal instruments. They have been read into the decisions of courts and awards of tribunals further legitimizing and channelizing water principles into domestic law. The Article 262 provided for the establishment of tribunals and enactment of laws for the development of the river and river valleys.

The rights concerning water in India have greatly evolved in furtherance of social and distributive justice. The dispute resolution however has been complicated with the politicization of the issues. The fragmented approach has deteriorated the situation for which solutions through integrated perspectives are offered in the other chapters.

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4

KATTAS IN THE DISTRICTS OF DAKSHINA KANNADA AND UDUPI IN KARNATAKA AND KASARGOD IN KERALA: A STUDY OF THEIR REVIVAL, REGULATION AND MANAGEMENT*

P. Ishwara Bhat, Akhila Basalalli Nayashree Bhosge**

The emphasis on traditional and alternative forms of irrigation and their revival is of great importance given the rampant water crisis in the country. The need for the revival of traditional forms of irrigation is strongly felt across Karnataka as it appears to be the viable solution to the alarming crisis. The Ground Water Year Book of Karnataka has recorded a fall in water levels in 70 percentage of wells the decade 2006- 2015[1] and agricultural use of the groundwater largely attributes to such depletion. There have been persistent efforts at all levels to conserve water for instance, the Ministry of Jal Shakti has stressed on the importance of rainwater harvesting, renovation of traditional water bodies and tanks, reuse and recharge structures and afforestation;[2] Prime Minister in the recent Mann Ki

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* A few portions of this article were published in P. Ishwar Bhat et al., "A Study of Kattas as Trational Irrigation Systems in the Districts of Dakshina Kannada, Udupi and Kasargod", in M. K. Ramesh and Sairam Bhat, *Agricultural Water Governance : Sustainable Practices and Strategies* 93 (CEERA - NLSIU, 2021).

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1 Sri H.P. Jayaprakash et. al., "Ground Water Year Book of Karnataka" GoI, Ministry of Water Resources, River Development & Ganga Rejuvenation, Central Ground Water Board, Bangalore, October 2017.

2 http://164.100.68.78/gwh/GWH_Home.aspx (last visited on 8/3/2021).

Baat has initiated a new 100 days campaign 'catch the rain'.[3] The National Water Policies,[4] and Karnataka State Water Policy, 2019[5] further encourage the revival of traditional water harvesting systems to solve the problem of water crisis. Such water conservation drives have provided impetus for the reversion to traditional forms of irrigation as the viable and alternative models. The paper explores the Kattas as reliable traditional irrigation model of Coastal Karnataka and vouches for their efficacy. These are classical irrigation structure predominantly found in the districts of Dakshina Kannada, Udupi and Uttara Kannada of Karnataka and Kasaragod of Kerala. This paper is an outcome of doctrinal and empirical study undertaken in (i) Kasaragod District (villages of Yethadka, Badiyadka, Perla and Swarga) covering 15 Kattas; (ii) Dakshina Kannada District (Talukas of Puttur, Sullia (villages Bellare, Kumra, Kavu), Belthangady (Venoor, Mundaje) and Bantwal (Vitla) covering 15 Kattas/ VD; (iii) Udupi District (Talukas of Karkala [Ajekar, Kervashe, Shirla], Kapu [Palimar], Kundapura and Byndoor- covering 15 Kattas/ VD.

Traditional Kattas

Kattas are the temporary structures in the form of bunds constructed across the rivers, tributaries of the rivers and streams. The Kattas/ seasonal bunds or barricades are designed to store running water from the streams or rivers for community irrigation during Rabi and summer season. They are significant means of water conservation as they hold back the flowing water and letting the excess water flow. Traditional Kattas are mostly community irrigation system where their construction, maintenance and repair are managed by the community.

The construction of these structures requires enormous amounts of traditional skill and knowledge as the task of building a Katta begins from identification of a suitable location, processing the raw material into construction materials and ends

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3 https://www.pmindia.gov.in/en/news_updates/pms-address-in-the-21st-episode-of-mann-ki-baat-2-0/ (last visited on 8/3/2021) ; *Also See* Concept_Note-CTR21.pdf (mowr.gov.in) (last visited 10/06/2021).

4 3.2 National Water Policy, 2002, 4.2 National Water Policy, 2012 & Section 7 Draft National Water Framework Bill, 2016.

5 KJA Task Group, Government of Karnataka, Karnataka State Water Policy, 2019, p. 187

with building barricades without breaches or leakages. Generally the site selected for construction of Katta would be in the bottle-neck shape landform.[6] The traditional Kattas are mostly constructed with the locally available materials like stone, mud, wild creepers, wooden poles and soil. The materials that are chosen and the manner of construction of the Kattas facilitate the percolation of water into the soil effectively rejuvenating the groundwater. The foundation is first constructed using the locally available soil or if the granite rock exists then it serves as the foundation. The barricade/bund to obstruct the water flow is constructed using the stones and sticky mud. A small outlet called 'Maadu'[7](diversion channel) is left open in the barricade/bund to allow the water to flow until the construction of Katta is complete. After the construction is complete 'Maadu' is closed for the water to collect. One of the remarkable features of construction is the preparation of the sticky mud to bind the stones in the barricade. The preparation of the sticky mud takes about a week's time as it involves kneading of the muddy mixture by feet until it gets sticky and letting it ferment for about 3-4 days so that it acts as an adhesive to the stones while constructing the barricade/bund. To protect the slimy texture of the mud from getting evaporated, banana or areca dried leaves are used as coating agents.[8] The process of applying such mixture to the stones is a skill where while continuously kneading mud by feet, the gaps between the stones are filled up. Hence, the construction of a Katta requires enormous skill, indigenous knowledge and physical labour.

The Kattas have multiple benefits not just for the farmers but they are the most effective means of rain water conservation in Coastal Karnataka. The water from the Kattas is used for the purpose of irrigating the agricultural lands, it also provides water for the cattle and other domestic needs. The Kattas recharge water-bodies like tanks (hondas) and open wells in the surrounding areas. Another remarkable benefit of Kattas is that it recharges the water source that is located in the elevated place. Water flows from the downwards Katta to the water sources

6 Chandrashekhar Yethadka, "Sarani Katta Ulisikonda Yethadka", in Shree Padre & Dr. Varanashi Krishnamurthy, *Kattagalu Anushodhane Mattu Varanashi Madari,* pp.44-50 (Varanashi Research Foundation & Arghyam Trust, May 2008).

7 Id. at p. 45

8 Id. at p. 46

at higher altitude due to 'capillary action.'[9] The unique construction of Kattas facilitates the percolation of water sideways and surface thereby enhancing the retention of moisture in the surrounding areas. The birds, animals and aquatic species also benefit from Kattas adding to their ecological significance. Since these structures are of great importance for their multiple and varied benefits, the emphasis for their revival becomes all the more relevant.

Despite Kattas being remarkable structures, they are not without challenges. The desirability of Kattas has reduced over the years due to some of the problems that grapple them. Firstly, the breach in the walls or embankments poses threat to the stability of the Katta. The very purpose of constructing Kattas gets compromised if there is any leakage because of breach. The construction has to be re-started if the problem has to be addressed.[10] The second challenge arises in the event of multiple beneficiaries of Katta when a few of them are reluctant to share the cost arising out of its construction and maintenance. The empirical data collected after interviewing one of the beneficiaries of Nereppady stream Katta reveals the reluctance of few among the seven beneficiaries to share the cost of the expenses.[11] It is a basic tenet that the law doesn't support unjust enrichment of one at the cost of another or a free ride. Hence, the beneficiaries using Katta water are obligated to share the cost of the expenses arising out of construction and maintenance. Thirdly, the Kattas are often under the threat of crab attack, i.e. the crabs gnaw mud from the barricades/bunds thereby loosening the structures. In order to prevent such attacks from the crabs Copper Sulphate is mixed with the mud while constructing Kattas.[12] Fourthly, the construction of Kattas requires skilled labour and there has been a decrease in the availability of the skilled labour over the years.[13] There have been instances where only with the intention of providing employment, a few of the women laborers were assigned for the construction of Kattas under the MGNREGA. This proved to be futile since the

[9] Shree Padre, *Rain Water Harvesting* 34 & 35 (Alter Media).
[10] Ravishankar Doddamani *Supra* note *6* pp. 91-99.
[11] *Also see* Shree Padre, "Kattas and Madakas: Decline of Traditional Water Conservation Methods", *Down To Earth* 27 Feb 2020.
[12] *Also see* Jagadeeshchandra K., "Katta Katti Nodi" *Adike Patrike* 36 & 37 (November 2019).
[13] Anitha Pailoor, "Water Conservation: Kattas in the coast" *Deccan Herald*, 28 Nov. 2020.

women laborers had neither any training to construct Kattas nor did they have any knowledge of the same.[14] Fifthly, the other set of problems faced during the construction of Kattas is the insufficiency of local construction material. The local material is to be transported from different places making the construction process far more tedious than it already is. Finally, there is excess reliance on groundwater as an alternative to the Kattas appears to the local communities as an easier means of irrigation. With the insufficiency of material, skilled labour and construction material and the reduced community participation, the shift from the use of water from traditional Kattas towards groundwater is evident. Further, bore wells sunk on the banks of the stream near Kattas suck the groundwater, soon drying up the surface water in the Katta. This risk dissuades the people from going for Kattas in case of competition between Kattas and bore well pumps.

Innovations in Kattas

A few innovations to the traditional design have been brought about to increase the longevity of the structures and reduce the manual labour. Innovations in Katta have been shaped by- technological advancement in the use of materials for construction, in the leadership roles taken by the women[15], gram panchayats, youths and the entrepreneurs[16], and through facilitation of interactions between the people, technology and media leading to the movement for conservation of water through revival of traditional irrigation systems. Community-conscious strength working through entrepreneur stewardship is helping in restoring the streams affected by the droughts. This has been made possible by revival of Katta/ Bandhara in the coastal regions. The schemes for water conservation under MGNREGA, initiatives taken by entrepreneurs under the scheme of social responsibility, and educators through the National Service Scheme, have demonstrated their commitment towards sustainable development. The innovative materials like construction using concrete planks, fibre plastic planks, sandbags,[17]

[14] Interview with farmers at Yethadka.

[15] https://nrega.nic.in/netnrega/Data/JSA_sucessstory/Jal_Sangraha_Volume_1.pdf (last visited 15/02/2022).

[16] Mumbai Magic: Bandhara at Aptale Village, Jawhar region, Maharashtra (mumbai-magic.blogspot.com) (last visited on12/11/2021).

[17] Apa Balaga, "Hosa Aase Chigurisida Sudharita Katta" *Adike Patrike* 15 & 16 (June 2019).

lining plastic sheet to the tank, micro ring to check dam[18] in place of stones and mud to prevent washing away of barrages.[19] There have been innovations by farmers to the traditional Kattas with the use of HDPE sheet, iron sheet[20], Silpaulin sheet,[21] concwood, bison-sheet, convex sheets, and micro-ring check dams.

Riparian farmers over several years of trials and experiments conducted under existing soil and climatic conditions along with availability of a large number of streams/ brooks have developed a system of water management, which are very effective under the existing condition of topography and terrain. Kattas in South Coast or Bhandaras in Maharashtra, or Pat system in MP or Phad irrigation etc. have been devised based on peculiarities of terrain to divert water flowing from hills into irrigation channels. Most of the farmers have shifted to sandbag Kattas which is cost effective as compared to traditional Kattas. The HDPE Sheet lasts for 7-8 years and sandbags can be re-used yearly. Other innovations include- In the place of bamboo, drums are erected for blocking the flowing waters. Kolyur drum Katta also known as Modern Gurji Katta benefits 30-40 acre areca plantations. This has been in use for six years. Flexible Check dam or Rubber dam is an inflatable structure built across a stream that has been scaled by ICAR. [22]

Decline of Kattas

The study about the location of the VDs reveals that they have been constructed in the place where Kattas existed. It is empirically evident that it has resulted in the gradual decline of Kattas, for instance, in Udupi especially the talukas of Karkala, Byndoor, Kundapur and Kapu have marked decline of traditional Kattas. The chart below furthers the argument.

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[18] Raviprasad Kamila, "Old 'Kattas' make a comeback as Mini Check Dam" *The Hindu*, Mar. 20, 2017 available at https://www.thehindu.com/news/cities/Mangalore/old-kattas-make-a-comeback-as-mini-check-dams/article17533135.ece.

[19] Karant, "Neer Nemmadige Katta Kattona" *Adike Patrike* 18 & 19 (August 2017).

[20] Karant, "Marike Tagadina Katta" *Adike Patrike*, 18-20 (January 2018).

[21] *Supra* note 6, p. 46

[22] Dr. Susanta Kumar Jena and Dr. P. S. Brahmanand, "ICAR Flexi-Check Dam (Rubber Dam) Technology for Water Conservation and Efficient Use for Agriculture", in M.K. Ramesh and Sairam Bhat, *Agricultural Water Governance: Sustainable Practices and Strategies* 93 (CEERA-NLSIU, 2021).

Decline in Traditional Kattas

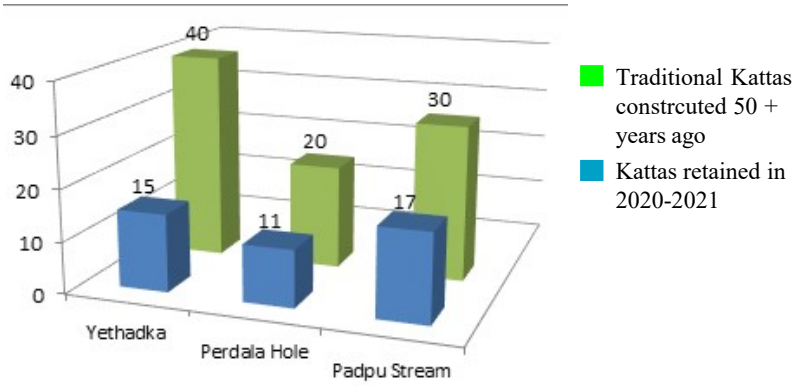

Figure 1 Katta/ VD in Kasaragod

x - axis indicates name of streams;
y - axis indicates no. of Kattas constructed in 2020-2021, and no. of traditional Kattas constructed 50 + years ago.

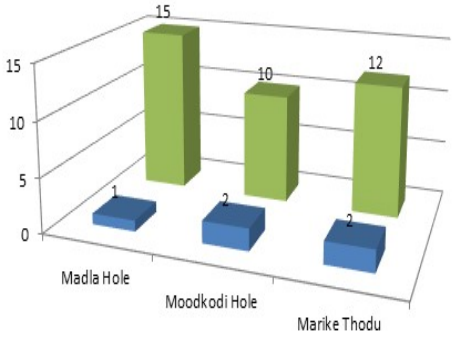

Figure 2 Kattas/ VD in DK Dist.

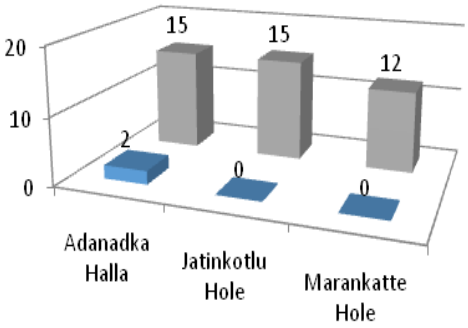

Figure 3 Kattas/ VD in Udupi District

1. Yethadka has retained 35-40% of Kattas.
2. Dakshina Kannada District has seen increased number of farmer innovated Kattas [23] as compared to Kasargod and Udupi.

[23] For ex. Two Kattas retained in Marike thodu (stream), both are farmer innovated Katta i.e., one micro-ring check dam & another steel sheets Kattas, which are far more sustainable than traditional Kattas, sandbag Kattas and VDs. *See* https://www.civilsocietyonline.com/rural-reporter/the-new-check-dams-of-puttur/

3. With increase in VDs, there has been a decrease in Traditional kattas in Udupi& DK Districts.
4. VD are not constructed in small streams, farmers irrigating from these streams construct ede Katta[24] which are tiny check dams across the drainage channel. These are inexpensive and can be constructed in a day using areca trunks, soil and plastic sheets.

While exploring the ways to meet the challenges, the interviews from the framers suggested that the intervention by the governments and their departments in terms of financial and technical assistance would be the way forward. Since the study is focused on the districts of Dakshina Kannada and Udupi of Karnataka and Kasargod of Kerala, the response from the two State Governments are evaluated and a comparative assessment is made on the basis of incentives provided in support of traditional Kattas.

Responses from Governments of Kerala and Karnataka

Kerala

The Kerala government has launched several schemes for the retention of traditional Kattas and construction of new Vented Dams (VDs). The VDs are the modernized concrete structures with similar function and roles as Katta. Few of efforts by Kerala government are as follows:

1. Minor Irrigation (MI), Kasaragod

The MI department has constructed 263 Vented Cross Bars (VCBs) in 6 divisions of Kasaragod. under the Haritha Keralam Mission.[25] VCBs are generally designed in discharge areas where direct irrigation is not feasible from the streams. Vented Cross Bars are constructed across the streams with reinforced cement concrete on an average height of 2.5 m above bed level, a minimum of 2 vents and provision of wooden shutters to discharge the flood water and silt load carried during the monsoon seasons.[26] The Haritha Keralam Mission has also ensured

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[24] Shree Padre, "Put in the Water, Take out the Guarantee" *India Together*, 02 Dec. 2008 available at http://www.indiatogether.org/photo/2002/rwhpadre.htm.

[25] As per data available till 2014, collected from MI Department, Kerala

[26] http://www.irrigation.kerala.gov.in/index.php/infrastructure/other-mi-structures (last visited 15/03/2021).

cleanliness of streams/ rivers to curb water pollution. Cleanliness drives have been initiated with the help of the local self-government institutions. [27] The Irrigation Department has undertaken construction of seven check dams from 2010-2020.[28]

2. Kasargod Development Package (KDP).

The government launched a special developmental programme for the district known as 'Kasaragod Development Package' which was started in the year 2013-14[29]. About five rubber check dams (RCD) have been sanctioned by Kasaragod Development Package in 2019-20 and Rupees 2.43 crores has been granted for the same.[30] Rubber check dam or flexible check dam is an inflatable structure built across a stream used for water conservation, flood control and regulating flow of water in the stream. When RCD is inflated, it serves as a check dam/ weir. When RCD is deflated, it functions as a flood mitigation device and sediment flushing. The head or height of RCD is variable. According to the requirement its height can be increased or decreased[31]. The components of a rubber dam include a concrete base and side walls. Its dimension varies from a width of 1 meter to 100 m, and height of 0.5 m to 5m. KDP's water conservation project has launched construction of 900 micro ring check dams.[32] It has also initiated projects for construction of 16 check dams, 72 VCBs and renovation of 18 VCBs since 2014-2021 costing Rs. 11247.21 lakhs.[33]

3. Local Bodies

Kerala Government has also initiated schemes to promote construction of traditional Kattas, for example, a few gram panchayats had sanctioned 50% of construction costs for ten years between 2005- 2015[34]; Rs. 8000/- was sanctioned

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27 http://haritham.kerala.gov.in/ininjan-ozhukatte/ (last visited 15/03/2021).
28 Data collected from Irrigation Department
29 http://www.kasaragodpackage.com/index.php#about (last visited 15/03/2021).
30 http://www.kasaragodpackage.com/projects.php (last visited 15/03/2021).
31 Jena, "Design and Development of Rubber Dams for Watersheds"
32 Shree Padre, "Kasaragodina Ananya Ring Thadegottu" *Adike Patrike*, 26 & 27, July 2020.
33 Data collected from Kasargod Development Package, Kasargod, *Also see* Shree Padre, *Rubber Anekattua,* Adike Patrike, March 2020, pp 5 -10
34 Field interview with farmers at Perdala Kattas

under 9th Five Year Plan;[35] Rs. 4000/- was sanctioned to Karimbila panchayat from 2008 to 2016; 120 NREGA women laborers were assisting in construction of Kattas. MGNREGA scheme for construction of Kattas was discontinued three years ago as the scheme was implemented for construction work which was permanent in nature, construction of Kattas being of temporary in nature, NREGA scheme was discontinued[36].

The P. Prabhakaran Commission[37] was appointed to study the scope for developmental needs of Kasargod especially in the light of its overall backwardness. The Commission was set up 25 years after the formation of Kasargod. Addressing the over-extraction of groundwater, the Commission made the following observation as "problems faced due to over exploitation of groundwater can be resolved by striking a balance between drawal of ground water and its recharge. Water requirements for drinking, irrigation, etc. can be met to a large extent by adopting new approaches for optimum conservation of surface water. Over-utilization of ground water and under-utilization of surface water potential are problems that call for immediate attention. Surface water which wastefully drains into the sea is enough to take care of our drinking water and irrigation needs. Check dams should be constructed in major rivers at regular intervals to facilitate recharging of groundwater."[38] The approach of Kerala Government is inclined towards revival of Kattas and construction of new VDs. Several incentives have been provided for construction of Kattas and Gram Panchayats have played an active role in disbursing the sanctioned amount. Kerala has also experimented with different designs and structures of VCB's.[39] However, when the cost- benefit analysis,

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35 Five Year Plan from 1997 to 2002, Field interview with farmers at Perdala Kattas

36 Field interview with farmers at Yethadka, Kasaragod

37 P. Prabhakarn Commission Report available at http://www.kasaragodpackage.com/index.php https://cdn.s3waas.gov.in/s38dd48d6a2e2cad213179a3992c0be53c/uploads/2018/05/2018050942.pdf

38 Id. at 297

39 The Government bodies have also recognized the efforts of local farmers. For instance, Mini ring check dams was innovated by farmer from Dakshina Kannada District., this has been studied & is being scaled by KDP, Raviprasad Kamila, "Old 'Kattas' makes comeback as mini check dam" *The Hindu*, Mar. 20, 2017 available at https://www.thehindu.com/news/cities/Mangalore/old-kattas-make-a-comeback-as-mini-check-dams/article17533135.ece .

monitoring, maintenance, repair and renovation of VCBs were accessed during field study at Kasaragod, it was observed that despite a large number of schemes they were not implemented in letter and spirit.[40] The Report adduces reasons such as: (i) a lack of coordination in the functioning of Agriculture and Irrigation Departments, which reduces the effectiveness of the irrigation schemes; (2) low level of participation of farmers in the implementation of schemes for the development of irrigation facilities, and; (3) lack of arrangements to involve local people in the maintenance of the assets created as part of irrigation development on a sustainable basis also results in poor efficiency.[41]

Karnataka

The Government of Karnataka has mostly constructed Vented Dams (VDs) in the districts of Dakshina Kannada and Udupi. The Dakshina Kannada district has seven major rivers[42] while Udupi has six.[43] Several departments and ministries, such as Minor Irrigation Department, Panchayat Raj Engineering Department and Agriculture Department have launched schemes such as Paschim Vahini[44], PMKSY-WD,[45] PMKSY-OI,[46] WDDP[47] and MGNREGA[48] for the construction of VDs. Some of the department wise figures are as follows:

1. Minor Irrigation Department

Under Paschimvahini Scheme, 212 VDs have been completed by Minor Irrigation Department in DK District during the period from 2010-2020. The total funds allocated during the period of 2009-2021 to Dashina Kannada is Rs. 54,035.31 lakhs of which A&P NABARD has funded Rs. 2659.5 lakhs, A&P has allocated

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40 Field interview with farmers at Yethadka

41 Dr. P. Prabhkaran Commission Report, "Report on the development of Kasargod District '' 51 (October 2012).

42 Major Rivers are- Netravathi, Gurupura, Nandini, Shambhavi, Phalguni, Kumardhara and Gowri. As per Data collected from Minor Irrigation Department, Dakshina Kannada District.

43 Major Rivers are- Seetanadi, Swarnanadi, Shambhavi, Chakra, Varahi & Gangolli *See* PMKSY, Udupi District, District Irrigation Plan, 22 (2016).

44 Data collected from Minor Irrigation Department, Dakshina Kannada District

45 Data collected from Agriculture Department, Dakshina Kannada District.

46 Id.

47 Id.

48 Data collected from Zilla Panchayat Office, Dakshina Kannada District.

Rs. 29905.75 lakhs and Pashimvahini has allocated Rs. 18811.06 lakhs.[49] The expenditure incurred for the construction of VD varies from Rs. 15 lakhs to Rs. 4670 lakhs depending on the size.[50] Minor Irrigation Department also provides storage sheds to store planks and looks after regular maintenance of the Vented Dam[51].

2. Agriculture Department

The PMKSY and Watershed Development (PMKSY-WD) is a Central Government Scheme which is implemented at State Level. Under this scheme, 60% funds were sanctioned by the Central Government and 40% funds from the State Government. Integrated Watershed Management Programme (IWMP) is another such scheme for soil and water conservation, implemented by the Department of Land Resources. In the year 2009-2010, VI batches of projects were sanctioned by the Central Government. In the year 2017-18, Watershed Development for Drought Proofing (WDDP) consisting of a ridge-to-valley scheme was introduced by the Agriculture Department, DK District. Important components of these programmes are: construction of Vented Dams, nala bunds, gowkatte, and krishi Honda. About 806 VDs have been completed by Agriculture Dept., DK Dist. and the amount allocated for construction of VD is Rs. 39062 lakhs. [52] The capacity building training programmes are conducted where the user group, self- help groups and watershed committee members led by Assistant Agricultural Officer and President of Gram Panchayat are trained. About 638 VDs have been constructed by the Agriculture Department, Udupi District under PMKSY-WD, PMKSY-IO and WDDP Schemes and Rs. 1,969.81 lakhs was sanctioned for the same.[53]

3. Zilla Panchayat

The DK Dist. under MGNREGA has constructed 125 VD in the past three years and Rs. 3.53 Crores has been expended. The VDs constructed under this scheme have width between 2m to 5m, and store water between 1200m^3 to 2900m^3.

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[49] Data collected from Minor Irrigation Department, Dakshina Kannada District
[50] Data collected from Zilla Panchayat Office, Dakshina Kannada District.
[51] Data collected from MI Department, Dakshina Kannada District
[52] Data collected from Agriculture Department, Dakshina Kannada District.
[53] Data collected from Agriculture Department, Udupi District.

The Panchayat Raj Engineering Department (PRED), Udupi Dist. has constructed 548 VD.[54]

From the evaluation of the data, it may be evidently observed that the response by the Karnataka Government has been construction of VDs through several schemes and enormous funds whereas, the Kerala Government though has launched many projects for the construction of VDs, it has nevertheless taken efforts to sustain traditional Kattas and has experimented with new innovation to Kattas.

Evaluation of the Vented Dams

The VDs are seen more as a solution to the problem that traditional Kattas face. The concrete based checked dam/ vented cross bars are projected as the way out for the traditional Kattas. This proposition can be tested by evaluating the VDs in the matter of water conservation and retention, channelization of stored water, longevity of the structures, cost efficacy and desirability among the users. The following inferences were drawn after examining the data gathered from the government authorities and interviews of the users.

1. Vented dams are constructed using concrete structures. The retaining walls and the vents are permanent structures which obstruct the flow of water permanently unlike traditional Kattas that are dismantled post-monsoon. The semi- permanent concrete structures block 30% natural flow over the year.[55] The general norm is that the obstruction has to be reasonable and must not hinder the natural flow.
2. VDs lacked structures/channels that facilitate the flow of excess water, thereby resulting in the artificial floods. A few instances of which are during August 2019 floods, the embankments of 87 vented dams were damaged causing a loss of Rs 35.77 crore.[56] There had been blockage due to fallen tree branches

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[54] Data collected from Zilla Panchayat Office, Dakshina Kannada District.

[55] Shivanand Kalave, *Supra* note 6, p. 24

[56] https://www.deccanchronicle.com/nation/current-affairs/260819/mangaluru-vented-dams-gone-farmers-worried.html (last visited on 10/11/2020).

and garbage.[57] During September- October 2020 floods, at Kukkuje Village, Karkala Taluk, a VD was damaged as a result of which the surrounding agricultural plantations were damaged because of artificial flooding.[58] Many bridges in Udupi and DK Districts also were damaged during the 2020 floods. A VD constructed at Palimar, KaupTaluk, Udupi District has created huge agricultural loss upto 100 acres due to standing waters stored in this VD, and lack of channels to drain excess water.[59] The work of this VD was completed on 17/06/2020 with the budget of Rs. 650.00 lakhs and consists of 30 Vents. There is another VD located just 50 m ahead that was built earlier and is defunct now. Also there is another bridge 50 m ahead of these two VDs making three concrete structures in a row. An Inter-Ministerial Central Team was appointed to assess the damages caused by the flood.[60] However, repair work is in progress and the emergency support came from the local people. The Udupi District Disaster Management Plan 2019-2020 provides for- Inspection of damage prone roads, bridges, check dams, causeways,[61] preparedness by alerting officers on the dam site,[62] forewarning settlements in the downstream, evacuation, coordination with other dam authorities.[63] However, Disaster Management Plans with respect to VDs specifically require detailed guidelines and better planning for the dam safety keeping in view the havoc caused by the artificial floods.

3. Flawed site selection is a significant cause for the breach in the structures and leakages. Leakages in the foundation of the structure or vents or VDs have become defunct due to other reasons, such structures are being simply abandoned and not used for anything. Shree Padre strongly opines that the Authorities have to repair such abandoned structures and make them useful

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57 Id.

58 Data Collected from Disaster Management Department, Udupi

59 Field Visit to Palimar VD and farmers interview

60 https://timesofindia.indiatimes.com/city/mangaluru/karnataka-3-member-central-team-visits-flood-hit-udupi-dakshina-kannada/articleshow/65786996.cms (last visited on 10/03/2021).

61 8.1.12 Udupi District Disaster Management Plan 2019-2020

62 8.2.6 Udupi District Disaster Management Plan 2019-2020

63 8.2.6 Udupi District Disaster Management Plan 2019-2020

rather than constructing the new ones.[64] The interviews of the local farmers at Moodkodi village,[65] suggested that VD was constructed in that location simply because it was easy to approach and transport the construction materials. However, that VD had failed to store water due to leakage in foundation and the site selection was based on ease of transportation. The farmer had to incur expenses and repair VD and had to use iron shutters to prevent leakages[66]. Bengav Bandhara, Sirsi, which was constructed in 1993 is another example for failed VD due to selection of site based on transportation of stones and cement trucks[67].

4. There has been heavy reliance on the government's expert knowledge base resulting in reduced community participation and disregard to the traditional knowledge. The government sponsored projects lack local farmer's participation. For instance, initially, watershed programmes had no component of Kattas.[68] Shivanand Kalave argues that lack of building trust during site selection, construction and execution of these concrete structures has alienated VDs from the people.[69] He further draws attention to water bodies such as bunds, tanks, wells built by farmers are flourishing because of elders' wisdom in terms of water conservation and culture of societal co-operation. The villages in Bhatkal are cited as examples for where water conservation in agriculture is achieved only after understanding the nature of water.[70] Shree Padre proposes that the watershed projects should take into confidence all the stakeholders since the local farmers have wisdom and experience in water conservation practices and their knowledge and expertise has to be utilized from the initial stages of the project.[71]

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64 Interview conducted during field visit
65 Venooru Gram Panchayath, Belthangady Taluk, DK District
66 Id.
67 Shivanand Kalave, *Supra* note 6, p. 35
68 Interview with Shree Padre
69 *Supra* note 6, pp.20 & 21
70 *Supra* note 6, p.29
71 Interview with Shree Padre

5. There have been noted procedural delays in laying and removing barricades since the tenders have to be floated for laying and removing the planks. The data gathered from the farmers at the Udupi District expressed that they cannot lay/remove the planks themselves because one FRP sheet weighs around 50 kg and have to be laid/removed using the earth movers. They have also revealed the delay in laying planks has defeated the purpose of VD altogether and at times the planks are not laid at all.[72] Additionally, the insufficiency of planks has also posed a problem to the farmers of Udupi District. Due to less number of planks, there is a marked decrease in storage of flowing water. In one of the VDs of Palimar Village, Kapu Taluka, Udupi District planks have not been laid for ten years. Wooden planks last only for two years whereas FRP sheets have a long span but they are not affordable by local farmers making them dependent on the MI Department for shuttering materials.
6. Difficulties persist while attempting to address these challenges because of scattered jurisdiction. The authorities claim that the VDs not falling within their jurisdiction for the repair and maintenance has left most of the VDs futile. The jurisdiction is often disputed regarding undertaking the obligations of the VDs by the Gram Panchayats, Public Works Department, Minor Irrigation Department and Agriculture Department. Scattered jurisdiction, fragmented responsibilities and lack of co-ordination between concerned agencies poses a serious problem that remains unaddressed.
7. Questioning the cost effectiveness of VDs, the paper compares the VD with Katta and farmer innovative micro-ring check dams.[73] Although Kattas and farmers' micro dams have less cost, the conservation capacity and output of VDs to irrigate the extent of land is more. The observation is tabulated as follows:

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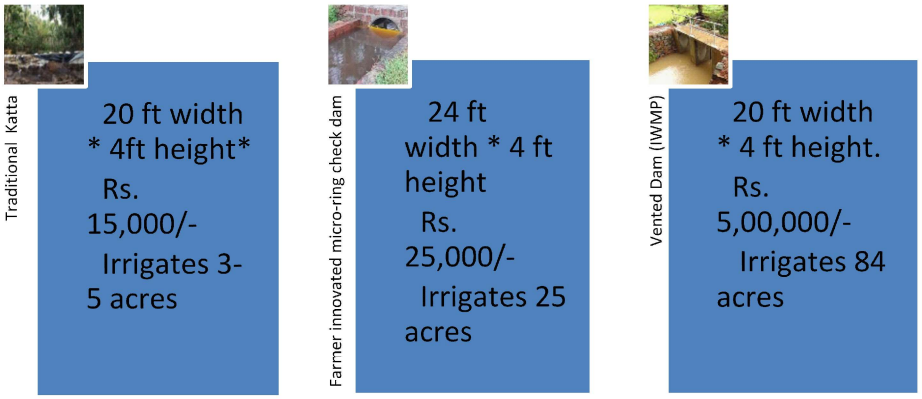
[72] Interview with farmers at Kervashe, Karkala Taluk, Udupi

[73] Four beneficiaries at Kodungai river, DK Dist., voluntarily joined together to design concrete VD with galvanized iron sheets as shutters on an abandoned bridge. Shuttering is carried out through Cranes. KDP Special Officer has remarked that this model is very effective and that the difference in government estimates & the costs incurred by locals for the same structure is huge. *See* Shree Padre, "With Dream Dam farmers show what is possible" *Civil Society*, Feb 28, 2020 available at https://www.civilsocietyonline.com/rural-reporter/with-dream-dam-farmers-show-what-is-possible.

The interviews with the farmers and local communities have shown that with Kattas, the communities feel the sense of responsibility and control and the inclination towards these structures has carried through generations. Whereas



with the VDs, the responsibility of structuring and maintenance is completely handed over to the government. The paper strongly advocates that the local communities have to be given a great role and partnership role in the managing and structuring these entities.

Comparison with management of 'Beaver Dams' in America

Beaver, a species found in America build natural dams using ecosystem engineering skills.[74] It is a natural instinct of beavers to build dams. The Beaver Restoration Guidebook[75] defines the Beaver Dam Analogues (BDAs) as "channel-spanning structures that mimic or reinforce natural beaver dams". The BDAs are biodegradable, temporary features on the landscape with functions that change in response to the effects of flowing water, sediment, beaver activity."[76]

Some benefits of these dams are as follows: they increase biodiversity; they

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74 *Beavers of NYS- Conservationist Centerfold accessed on 27/11/2021; *Also See* Beaver - NYS Dept. of Environmental Conservation (last visited on 27/11/2021).

75 Janine Castro et. al., "The Beaver Restoration Guidebook", Version 2.01, U.S. Fish & Wildlife Service, April 10, 2018 available at www.fws.gov/oregonfwo/promo.cfm?id=177175812 .

76 Id. Chapter 6, at 85

are resilient and help in flood and drought mitigation and wildfire prevention.[77] These structures carry important implications for nature-based solutions to climate change.[78] Learning from beavers and trying to emulate their skills will bring development in the eco-friendly dams that are now being built by riparian farmers i.e., human facilitated analogues. The restoration of BDAs is being carried through scientific studies along with law and policy interventions.

BDAs are comparable to *Katta* irrigation system in following ways namely,

a) Both BDAs and Kattas are temporary features and may breach during high flow events;

b) Materials used in both the structures are local material, for instance, BDAs use- cobbles, gravel, sand, silt and clay, vegetation such as stalks of emergent vegetation, the branches and stems of (deciduous trees and shrubs and wood posts) and for Kattas material like arecanut splints, fermented soil, granite boulders, wild creepers etc. are used

c) Method of construction of both the structures are similar. BDAs are constructed firstly by installing of posts using a hydraulic or pneumatic post pounder; followed by weaving branches in between the posts. Further, continue to construct layers using vegetation and finer grained material till reaching the level of flow permeability and upstream pool depth. Similarly, construction of Katta begins with identification of a suitable location, laying the foundation and placing stones or sandbags, supporting these with branches.

d) Maintenance requirements of the structures include ongoing maintenance and repair such as replacing damaged structures, monitoring leakages in the structure etc. In case, BDA/ Katta breaches, monitoring flooding of the breached structure is essential.

e) Benefits of these both similar such as, elevation of water table, groundwater

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[77] Episode 07: Beaver hydrology and management — Water Talk (watertalkpodcast.com) (last visited on 27/11/202).

[78] Beaver dams: How structure, flow state, and landscape setting regulate water storage and release - *Science Direct*, (last visited on 21/11/2021). *Also See* An Illustrated Guide to Bay Area Nature, Summer 2021 - Bay Nature (last visited on 21/11/2021).

recharge, increased aquatic and avian habitat diversity, increased wetland area among other benefits.

An important aspect of BDAs is that the U.S. legal framework covers the regulatory and management regime of BDAs especially concerning the jurisdictional assessment, permit assessment; policy matters such as dam insurance policy; and directions relating to breaching of dam[79] and disaster management[80]. Permit application process for restoration involving beaver, beaver dams and beaver dam analogues are regulated by authorities working in the Departments of Fish & Wildlife; Oceanic & Atmospheric Administration; Forest Service; Land Management; and U.S. Army Corps of Engineers.[81] The rules and regulations governing water rights during the construction of Beaver Dam Analogues focuses on the aspects of stream restoration, increasing habitation, flood management and prevention of wildfires. Stream alteration permit is approved by the Division of Water Rights, for instance, the jurisdiction of Utah on BDAs in that region.[82] The office of the State Engineer is the Chief Water Rights Administrative Officer, who is tasked to oversee the State's water rights. Further, water rights conveyances would usually include natural streams.[83] Each specific state stream alteration permit has to be renewed/ updated approximately every 5 years and includes any exclusions, limitations, and conditions for permit. The application will be submitted to the Corps and several other agencies for comments. After verification, an authorization "approval letter" is sent with conditions after evaluating the merits

[79] General Permit - Beaver Dam, breaching/removal (ny.gov) (last visited on 27/11/2021).

[80] Flow Devices 7.1.03 (wildlifehelp.org) (last visited on 27/11/2021).

[81] The Beaver Restoration Guidebook 2.0 pp. 60-62; Also see www.fws.gov/oregonfwo/promo.cfm?id=177175812 (last visited on 27/11/2021).

[82] Utah Water Law and Water Rights: New Policy on Beaver Dam Analogue Construction (utahwaterrights.blogspot.com) (last visited on 30/11/2021).

[83] An application to relocate any natural stream channel or alter the beds and banks of any natural stream should contain the complete detailed statement of the location, nature, and type of relocation or alterations; the method of construction; the purposes of the application; plans and specifications for the construction works. Along with location map with sites clearly marked, photos, plan and cross section views with surrounding features, pre/ post construction changes, mitigation plans, and channel dimensions. The application must also include justification for the project and how impacts are minimized. These projects are intended to be projects with minimal impacts.

of the project. Applications can also be rejected or withdrawn.[84] Community engagement organization such as Sageland Collaborative is an example for science-based policy formulation, whereby data- driven strategies are provided for effective conservation of habitats including the BDAs.[85]

The legal regime of regulation and management of the BDAs suggests some good practices such as insurance, disaster management, use of dams for fishery and prevention of wildfire, and regulation of artificial alteration of stream's direction. But it employs an extensive command and control system of permits and license, and intervention by various governmental departments. In India, Kattas enjoy freedom from a high regulatory regime. Introduction of regulatory regime to their sphere will bring unnecessary bureaucratization and concomitant delay and procedural difficulties. Since Kattas provide for temporary reservoirs, fishery activity may not be viable. But governmental support in the form of subsidy, technical guidance, disaster management and gradual conversion into VDs subject to modifications may help the farming community.

Regulatory Framework

(a) Traditional customary practice

In India, streams, in addition to the ecosystem services, are also an important source for irrigating the fields. The streams in the coastal region have evolved the Katta system of traditional irrigation (also known as *Bandhara* in Marathi) into an indigenous method by introducing entrepreneurial stewardship, customs and norms in allocation of water shares, and revived these structures in the governance and management of these irrigation systems. This study proposes to look at a) Customs and norms in governance and allocation of water shares; and b) Managerial aspects of Kattas. These factors may be considered for formulating regulatory norms.

Traditionally, the customs and norms practiced have been documented in the texts, shlokas and account book records maintained for centuries by the farmers. Kerala is known for its rich cultural heritage, traditional knowledge of Ayurveda,

[84] www.waterrights.utah.gov (last visited on 27/11/2021).
[85] About Us — Sageland Collaborative (last visited on 30/11/2021).

and knowledge of ecosystem and water conservation. Parāśara's *Kriciparāśara* is an introductory text addressed to farmers. He stressed soil management, seed health, and overall farm management that included water harvesting and conservation, animal management and maintenance of implements. The verses- 'What hope of harvest can that foolish farmer have who has not made arrangements for preserving water for the crop during Aśvin (October) and Kārttika (November)'[86] sums up the planning arrangements required by the farmers to be made for the post monsoon cultivations. Traditional water management techniques emphasized on a holistic approach to water management wherein people, animals, plants, water, land, and the environment were considered as an integrated whole.

In arranging for proper distribution of the common water resource of Katta among its various beneficiaries the ancestors have evolved norms through verses. An interesting archive belonging to Mundaje village[87] throws light on creativity in formulation of norms through a verse. The verse gives a schedule for the rotation of irrigation to the lands held by farmers.[88] Written by one farmer Sadashiv Shastri probably around 1870, it guides farmers about distribution of water in Mundaje village. It is said that the verse for water distribution was ingrained in the memories of the users and that if this 'Ready Reckoner' is learnt by heart, it would be easier to identify whose fields are being irrigated at that moment. The ancestors were masters not only in storing and diverting water through Kattas, but also provided for systematic and fair distribution among the stakeholders.

(b) Contemporary Practice

Since ancient times, culture associated with construction of Kattas is a practice of respecting the resources, for instance, during construction of Katta, the laborers and participants involved in its construction walk barefooted. On the day of closing of *Maadu,* the beneficiaries offer prayers to the deity to preserve the Katta structure.[89] In Kasaragod, Katta day is celebrated around the second week of November to mark the beginning of construction of Katta. Farmers and officials

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86 Sadhale, Nalini (tr.). "Krishi-Parashara (Agriculture by Parashara)" *Agri-History Bulletin* No.2. (Asian Agri-History Foundation, Secunderabad 1999).

87 Interview with farmers at Mundaje

88 There is mention of the order and duration of distribution of water from the Katta to the lands of farmers, who are living in places mentioned in the verse such as Onimane, Hebbaaraakhyey, Bathrebailu, Gudoli, Udupa etc.

89 Interview with farmers at Yethadka

from the irrigation department come together to celebrate this day. These ceremonies bring together communities in order to undertake important cultural activities that help to maintain internal community ties, as well as ties between communities. Additionally, these ceremonies maintain ties between people, their ancestors, the land and the water. The distribution and managerial practices are as follows:

(i) Distribution of roles and responsibilities

The norm is that every beneficiary has been using Katta water for irrigation during the time allotted to them and thereafter the next beneficiary gets his turn to irrigate according to the time allotted to them. This has been followed over several years by every beneficiary. Repairs and any construction of water storage (gundi) is taken up by respective water users groups that require them. For example, repairing of drainage channels is undertaken by respective farmers where the drainage channel is damaged. Expenses for it are contributed by these farmers. This expenditure is not included in the main accounts of Katta construction.[90]

(ii) Accounting and contribution

During the third week of December, there is 'accounts meeting' every year. Advance amount is contributed by the villagers prior to construction of Katta in November. After completion of construction of Katta and irrigation to the field, a meeting to settle the accounts is immediately called for. Meeting takes place in a home and next year's meeting is conducted in the neighbor's home serially from upstream to downstream. This way everybody's participation is ensured. An example accounts management of a Katta of Mundaje can be seen where account management desilting and construction has all been done by one community.[91] From the beginning till 3-4 decades ago, Kattas were constructed by the members

[90] Gajanan Vaje, "Shatak Mirida Valyashaktiya Katta", *Adike Patrike* 8 (Feb 2017).

[91] For over 35 years, Govind Marathe has been taking responsibility for accounting. Examples of a few account details written in book of accounts of Mundaje Katta's are- In the year 1917-18, total expenses for construction of Katta was Rs. 27 and 15 Anna; in the year 1926-27, there was dynamite blasting of rocks and retaining wall was constructed in addition to Katta, hence the total expenses for that year was 274 Rupees 13 Anna and 6 paise. In 1955-56, expenses were Rs. 49/-. In 1999-2000, expenses were Rs. 11,943 and 85 paise. And in 2014-15, a drainage channel had to be constructed, hence the total expenses were Rs. 45,498/-. Desilting work has been monitored by D. Mahadeva Patwardhan for over 40 years and Govind Marathe has been supervising construction of Katta works.

of the community themselves. But thereafter the system of hiring laborers for construction of Kattas came into existence. On the day of accounting all the beneficiaries gather at a decided place. All the calculations are made in-front of them and if the expenses are more, an extra amount is paid, if the expenses are less, the amount is returned.[92]

(iii) Water Usage

The water stored in Katta is not properly regulated by the beneficiaries. Unregulated uses were reported, whereby the beneficiaries kept the motors on for the entire night. The interviews with the farmers regarding their concerns about the water crisis revealed their preparedness in planning and management for irrigation. They expressed that- "earlier, due to good rainfalls, Katta water storage was until April. Those days, water was not pumped from the river. Nowadays, water is lifted by placing pumps connecting rivers to their respective fields. Forest Department pumps water from upwards the Katta area. Due to over exploitation of water, Katta water's storage has reduced. Perhaps, Katta water is stored till February or sometimes stream gets dried in January itself. The problem being that each house has access to pumping of water from the river and when Katta water supply halts, they turn to small ponds in their fields."[93]

Generally, each beneficiary uses the sprinkler for about 1.5 hours.[94] Nereppady Katta[95] water is also used to supply drinking water to 150 families through the public tank. However, the farmers reported that the concerned departments do not contribute in construction of Katta. Water storage varies from small Katta which holds water up to 700 meters benefiting 15-20 acres irrigation lands to large Katta which has carrying capacity of up to 2 km and benefits 50 acres. Vanticharu Katta[96] farmers reported that they have constituted a beneficiary committee to self-regulate the usage of Katta water resource. The purpose of these committees is also to discuss and get approval of the accounts for the present

[92] *Supra* note 90, p.9.
[93] Interview with farmers at Yethadka
[94] Interview with farmers at Padyadka, Nereppady and Berkadayu.
[95] Interview with farmers at Nereppady
[96] Interview with farmers at Vanticharu Katta

and the following years. A few Kattas (e.g., Balegadde) stopped functioning, but was revived after the beneficiaries started sharing costs.[97] There is awareness that when the flow/storage in the stream stops, there will be no water in the well also. Hence there is a pressing need to judiciously use the water.

(iv) Labour

Katta construction is a highly skilled art which requires- preparation of fermented soil, placing stones/ sandbags, silpaulin sheet and wrapping the sides with sheets. Dismantling work involves removal of planks during stormy rains, which requires the employment of skilled laborers as the flow rushes at faster pace. It is difficult and dangerous to remove HDPE sheet. The timeframe for workers is to remove wooden planks, placing planks inside the Shed safely, diesel coating of wooden planks and repair works of the dam by the end of May. A Katta of 50 ft- 75 ft width requires 350- 625 man days.[98] The costs for soil preparation and laborers costs together for the year 2021 on an average was INR 1,10,000 to 1,50,000.[99] Since the labour costs are increasing yearly, the farmers feel that permanent vented dam will save the yearly construction costs.

(v) Irrigation Methods

In coastal areas, agriculture is confined to paddy, areca nut, coconut, banana, cocoa, rubber plantation, black pepper. Agro-forestry is also widely prevalent. Two respondents from Dakshina Kannada believed that – (i) forest land helps in water cycle and (ii) there is a need for recognizing these private forests.

Earlier, these regions only cultivated paddy. The irrigation requirement was limited which was met through rainwater conservation and rivers. With expansion of agriculture, demand for irrigation water increased. The agrarian societies started developing innovative lifting devices. 'Yetha' irrigation is one such traditional device whereby water from river/stream is scooped, lifted and carried into the water channels.[100] These devices used manual labour and were off-grid. The principles

[97] Interview with farmers at Balegadde Katta
[98] Interview with farmers at Yethadka
[99] Interview with farmers at Yethadka

of gravity applied in applying irrigation water. With the invention of diesel engines, pumping water to the higher areas by use of GI pipes came as a revolution. Modern method of field irrigation is through sprinklers. Later, drip irrigation came into practice which is subsidized by the Irrigation Department to some extent.

Other factors that have influenced the selection of modern irrigation method include less availability of labour/ high cost of labour, free electricity for pumping, and subsidies for small farmers for equipment. These factors may also be attributed to decline in the use of traditional irrigation system. As a result, young farmers have parted away from their ancestors traditional knowledge, as shared by one of the respondents. However, the costs of repair of equipment (which are to be borne by the farmers themselves) are high.

Most of the farmers in Kasaragod study area do not have a fixed schedule for supply of Katta water to the fields. Farmers at Padyadka said that they make a rotation schedule in their block with an irrigation interval of 4 hours every day.[101] Farmers pointed out challenges involving over irrigating of fields throughout night. The farmers at Nerepady Katta complained that the Drinking Water Supply department draws water from the Katta to supply drinking water to 100 families without contributing to the resources in construction of Katta.[102] Lifting of the Katta water through pumps of different capacities during varying hours of pumping to irrigate diverse extent of lands by various farmers has posed challenges to the task of equitable distribution. Unlimited and unregulated usage of water and increasing area of plantations and agriculture are the problems to be addressed. A predominant practice among the Kattas users is the creation of a beneficiary committee for self-regulating the water usage and distribution of the cost to meet the requirement of justice. An alternative to the committee system is the practice of having Neeruganti as prevalent in other parts of Karnataka in the context of managing tank irrigation. Neeruganti is a person appointed by the community to manage distribution of water in a just and equitable manner, and is paid for his

[100] https://www.shabdkosh.com/dictionary/kannada-english/%E0%B2%8F%E0%B2%A4/%E0%B2%8F%E0%B2%A4-meaning-in-english

[101] Interview with farmers at *Padyadka*

[102] Interview with farmers at Yethadka

services. The key functions of the Neeruganti were to- ensure uniform supply of water to all fields in the command area; determine the type of crop to be grown based upon the water available; decide on the dates and times for supply of water; maintenance and repair of water bodies, etc.[103] But the practice of committee of beneficiaries has an advantage of collective decision making and avoidance of errors by engaging in discussions.

The following suggestions from the farmers[104] are noteworthy, in the context of storing Katta water for long period-

1. Introduction of drip irrigation system/ system of controlled irrigation can check water wastage;
2. Raising the height of Katta will substantially enhance water storage capacity;
3. Starting construction of Katta early, i.e., just after rains has stopped, is better. This will increase permeation of water and prolong the water supply towards the end of summer.
4. Immediately closing leakages in Katta- where crabs attack or if there are any leakages due to rains, take immediate action to redress these;
5. Extending support in timely construction of nearby Kattas;
6. When chain of Kattas- from upstream to downstream Kattas are filled with water, it has numerous advantages such as continued water supply. Most importantly, it is necessary that trust and confidence among Katta beneficiary shall be maintained.
7. Regulating timings of water supply, early morning or late evening when heat waves decrease.

Other suggestions[105] included -

1. Monitoring and recording of day-to-day pumping of Katta water provides some insight about the method of distribution. It is a good practice to regularly keep a record estimation of how much horsepower water can be lifted in total, how much shall be each beneficiary's share and the average amount of water that

[103] S.T. Somashekara Reddy, 'Water Management- the neeruganti way', in Sanhya Iyengar (ed) I*nfra* note 124, p.15.
[104] Ibid.
[105] Interview with Girisha, farmer at Yethadka

is pumped daily. These data help in regulating pumping of water. A farmer suggested in having mathematical approach which builds on consumption of Katta water based on proportion of the agricultural land and rotation system.[106]

2. Collective action shall be mobilized to address problems of delay in construction of Katta. Previously Katta construction used to begin in November. These days it has been delayed and diversion channel (*maadu*) is closed around January 15.
3. In order to increase Katta's water storage capacity the height of the Katta may reasonably enhanced.
4. An interval of irrigation shall be provided after every two rotation of irrigation.
5. Coordinating the time of irrigation and not to irrigate the same field for longer period of time, and mulching the land with biomass.

From the above it can be inferred that

(vi) Drainage

With the ongoing changes in climate resulting in unprecedented floods, there is a requirement of a more adaptive and participatory form of drainage. Drainage systems affect areas much larger than individual agricultural lands and has impact upon non-farming land. Farmers at Palimar and Ajekar[107] reported crop losses due to lack of drainage channels. The Vented dams increase the amount of surface water at a site in the form of overbank flows, and side channels. This increase in surface water may flood areas. Flooding of infrastructure, agricultural fields, or private property, or on adjacent properties needs to be addressed during construction of vented dams. Farmers[108] also reported that the Minor Irrigation Department should construct drainage channels, remove the FRP sheets on time as only its staff or specialized persons can operate them.

(vii) Community Participation

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[106] Ibid.
[107] Interview with famers at Palimar & Ajekar
[108] Interview with farmers of Madnoor VD, Puttur

The stakeholders involved in agricultural water management include- farmers, laborers- skilled laborers, MNREGA workers, government officials particularly Minor Irrigation Department, Gram Panchayat members, Water User Association Members, NGO's/ Civil Society volunteers, and participants in construction, management and maintenance of Kattas. There are number of stakeholders involved in the process of bringing water from the source to the field. Stakeholders include the scheme management who decide how the water is distributed, the operators who distribute the water to the farmers who use the water in their field to satisfy the crop water requirements. Most of the times, the farmers manage the distribution of the water over their fields. State relief and disaster management departments, State departments of agriculture/horticulture/irrigation/watershed management, State electricity boards, commercial and cooperative banks; State Agricultural Universities, Village Climate Risk Management Committees are also stakeholders in Katta resource management and governance.

(viii) Disaster Management

Floods, droughts and cyclones have been reported in the study area. The loss due to floods is borne by the affected families. The immediate rescue works are carried by the locals. The disaster management team comes to rescue of the families. The repair work is time consuming as reported by the farmers in Karkala. The Report on State Level Consultation suggests "Community Based Disaster Risk Management (CBDRM) programme empowers the local community to assess their own hazards & vulnerabilities based on their experiences. Under this approach, the local community not only becomes part of creating plans and decisions, but also becomes a major player in its implementation. Community empowerment for disaster risk management demands full participation of the local community in assessing risks; mitigation planning; capacity building; participation in implementation and developing systems for monitoring which ensures their stake. To strengthen the institutional mechanism Village Level Disaster Management Committees needs to be set up."[109]

(c) Possible Legal Framework

[109] 16072019-CBDRM-Consultation_-Report.pdf (kerala.gov.in) (last visited 12/01/2022).

The governance of Kattas is essentially premised upon the customary practice and over the period of time the absence of a regulatory framework and loosened customary practice has resulted in unjust use of the water. The resentment among the users of Kattas is that a few parties have been unjustly enriched without contributing towards its maintenance. The paper proposes the contractual arrangement as the solution with terms regarding investment, maintenance and water shares. The breach of such contract will follow its course as per the law of contracts. The possibility of an alternative dispute resolution may also be explored rather than burden the farmers and users of the Kattas with the tedious litigation. The means of conciliation, mediation and arbitration may be very efficient in resolving the disputes of this nature.

The present law of riparian rights

Water shares and riparian rights are another major concern that drew the attention of this study. The diversions and storage have long been the general disputes concerning watercourses and such disputes have been profoundly adjudicated as per the common law, for instance, *Miner v. Gilmour*[110], *Swindon Water Co. v. Wilts and Ferks Canal Navigation Company*[111], to name a few. The Kerala High Court, by referring to these precedents, decided in *Ram Bhatta and others v. Krishna Bhatta and others*[112] that there shall not be interference with the natural flow of the water. The dispute here was that the defendants being the upper riparian had constructed a new Katta to irrigate their areca plantation which otherwise was not required had they not converted their paddy fields into areca plantations. The plaintiff being the lower riparian had areca plantation which was irrigated by the water of the Katta that had already existed. The Plaintiff prayed for injunction against the construction of the new Katta which obstructed the flow of water and infringe plaintiff's rights. The Court held that,

The natural right of a riparian owner to have the stream flow in its natural state, without diminution or alteration is an incident of his property abutting on the stream. In the absence of a prescriptive right to the contrary, every riparian owner is entitled to have the flow of running water, without sensible diminution in quantity

[110] 12 Moo P. C. 131, 156
[111] L.R. 7R.L. 697, 704
[112] MANU/KE/0342/1961

or sensible alteration in quality. A riparian owner is at liberty to pen back and divert temporarily the waters of a stream flowing by his land in a reasonable way provided of course he does not thereby injure his neighbors above or below the stream.[113]

The Court further observed that no riparian rights exist prima facie on the *ex-jure naturae* on artificial watercourses but the rights of the riparian owners may be acquired by prescription on artificial watercourses when such watercourses are of permanent character and have been used by lower propriety as though they are natural streams.[114] Similarly, the case, *State of Bombay v. Laxman Sakharan Pimpakar and others*[115], was decided on the basis of doctrine of lost grant and the limitation on the *ad libitum* extraction of water. The Court while protecting the rights of the lower riparian owners by holding that upper riparian owners cannot abstract water *ad libitum* for it is conditioned by the right of similar riparian owners who have co-extensive rights to the water of the stream, laid down the following propositions.

1. A riparian owner, in the exercise of his rights to use the water of the stream for extraordinary purposes such as agriculture can impound and divert water to irrigate his land adjacent to the stream.
2. The right is not an absolute or exclusive right. The crucial condition is that the user of the stream by him must be a reasonable use and not capricious or such as would inflict sensible injury on others similarly situated.
3. This standard of reasonableness applies to the volume of water that he can divert, to the purpose for which he can utilize it as also to the mode or method that he may adopt for impounding and channeling such water.
4. There is no rule exclusive or inclusive which defines the mode or specific methods or manner of diverting that water for that must depend on a variety of factors including for instance geographical and natural features of the land of the riparian owners upstream and downstream, the terrain and the magnitude

[113] Ibid.
[114] Ibid. For the purpose of artificial streams the Court clarified that they are those in which the flow of water is caused by the operation of man and not by natural cause.
[115] MANU/MH/0071/1960

of the stream.

5. A normal and usual mode or method of diverting water adopted in many parts of the country and more so in rocky or hilly terrains is that of putting up in the stream Kachha or Pakka Bandharas (dams). But the Bandharas must be such that they permit the flow of the water down stream and without diverting the natural course of the stream.
6. The riparian rights of lower owners is to have the water of the stream transmitted to them continuously and in a manner which does not materially affect their enjoyment on the right. An upper riparian owner who puts up a Bandhara must, therefore, take care to see that the stream continues to flow without interruption and without any substantial diminution in volume.[116]

The approach in the above propositions is basically one of balancing the rights of upper riparian with that of lower riparian. These propositions are not to be limited to the Bandharas, but are to be extended to Kattas since they differ only in their nomenclature. The purpose connected with, and conflict arising out of the Bandharas and Kattas are similar. The Courts have laid down all the essential conditions for the governance of these water structures. The interference of the local authorities, participation of the community and contractual arrangements in adhering to the above principles will effectuate the efficient use of them.

Social Movements and Kattas

Farmers from Mundaje are of the opinion that the community has to once again take up the responsibility of construction of traditional Kattas. Discussions and deliberations followed to plan re-construction of traditional Katta, estimation was prepared and required amount was raised through donations.[117] Shrinivas, with the help of villagers, took up the re-construction work of Kattas. JCB was used to lift soil, 1300 sand bags and layer of plastic sheet was used for construction of Katta. After completion of the construction work, meeting is called and all the users share the costs proportionately. Locals are hopeful that VD can serve the

[116] Id. para 11
[117] Interviews with farmers at Mundaje

purpose if proper work for water storage is taken up.[118] Traditional knowledge of farmers in India's rich tradition of intellectual inquiry and a textual heritage that goes back to several hundreds of years necessitates it's revival towards the path of sustainable development.

Local experiences and conditions also contribute in selection of a field irrigation method in addition to the crop patterns and the soil and hydraulic conditions. These local experiences, availability of equipment and the preferences and knowledge of the farmers are important factors to be taken into consideration by the policy framers. The interaction of managerial aspects and the social movements shape the water futures and sustainable development of resources. The next section details how these innovations were shaped and the factors in making these innovations sustainable.

I. Mobilization efforts by Villagers

Shrihari Bhat, former director of CAMPCO and farmer from Padre narrates the circumstances that led to mass movements in reviving Kattas.[119] Swarga todu and Padpu todu, small streams faced unprecedented drought for the first time in 2019. Due to such grim situation, tankers for drinking water were brought. There are 17 Kattas across the 8 km stream. Earlier there used to be 40-50 Kattas approximately. These Kattas used to irrigate paddy fields and benefitted 100 farmer families.

The team launched 'Namma Nadige-Thodu Kadege' (towards water security) to understand the reasons and solutions to overcome the situation. During these meetings awareness programmes were conducted and importance of traditional wisdom was highlighted. The team came up with following propositions- to conserve water, priority to Katta construction, revival of ponds, role of women in water conservation has to be given its due regard. The team leader suggests that Panchayats have to play leading role and become more inclusive. About Government projects he states that though the plan projects sound successful, execution of these projects has to have workable planning. Further, the team

[118] *Supra* note 90, p. 12
[119] Interview with Shrihari Bhat

appealed the farmers to use the surface water from wells and streams and to resort to bore wells only when there is water crisis.

Further, an attempt to capture the rich nuances of practical experiences is being made through the online support group. By coordinating with research groups, Doordarshan and other media groups for creating awareness, dissemination of information about latest innovations in water conservation methods has taken place. Kerala Doordarshan has broadcast Krishideepam highlighting what is Katta, what are the efforts put by people involved in Katta construction, and what are its benefits to the community and ecology. These conversations reflect the community's expertise in the governance and management of Katta and related aspects. It is their rich experience which calls for attention from the bureaucracy to seriously consider community participation in governing the commons.

II. Campaign led by Zilla Panchayat Member[120]

Severe drought has stimulated cooperation between political elites and non-elites, and led to the development of important institutional processes.[121] Sri. Dharnendra Kumar, Zilla Panchayat Member is on a Mission to revive Kattas. He aimed at constructing 50 kattas across Falguni River. He achieved this mark with the help of NSS students from Alva's college, Moodbidri. Small Kattas require 400-600 sandbags and large katas require 1500-2000 bags. These Kattas increased water levels of water bodies situated within the radius of 1 km and stored water for 0.5 km to 2.5 km.

The campaign was started to address water scarcity arising from the end of February till monsoon rains. Hence, ZP representatives started a movement to construct Kattas. Sri. Dharnendra Kumar was always keen on looking out for locations where Kattas could be constructed. Paldyar Katta was completed in a single day. Earlier, farmers here spent approximately Rs. 2 lakhs yearly for Holethodu Katta. If Kattas are constructed by the first week of December, then the farmers need not face water scarcity. Kattas were constructed using sandbags

[120] Shree Padre, "Holethodugale Nilli! Dharnendra Katta Chalaka" *Adike Patrike* 5-12 (April 2020).

[121] Climate change and State evolution – how severe drought prompted more stable governance – Global Water Forum (last visited 20/12/2021).

and with the help of college students. Villagers provided food and desserts to these students and spent Rs. 17,000/- for food. Expenses of Katta construction came around Rs. 20,000/-, compared to Rs. 2 lakhs required for the Katta. Another Katta constructed over an old bridge stores water of 9 Crore Litre, up to 2.5km.

This has also inspired Youth Groups, college students[122] as part of their projects and NSS Volunteers[123] through *shramadan* activities participating in spreading awareness and construction of Kattas. Hence, the role of youth in driving climate technology innovation and adaptations, and their participation is vital for protection of environment and this needs to be considered as an important aspect for the policy framing.

In addition to the villagers, panchayat members, and the youth groups, there are initiatives to continuously engage the community in water conservation and revival of traditional irrigation system. Some of the notable initiatives are-

a. Shree Padre, Chandrashekar Yethadka[124] and Shivanand Kalave have documented extensively covering the Katta stories through mass media. Shree Padre's book 'Kattagalu-Anushodhanehalu Mattu Varanashi Madari published by Varanashi Research Foundation & Arghyam Trust in 2008 and articles published in Adike Patrike having wide readership in Kasaragod, DK and Udupi Districts serves as a guide to several farmers and a learning tool to understand the various technological improvements made throughout India for water-conservation. Shree Padre proposes a call centre and museum dedicated to Kattas.[125] With the availability of guides, there will be more new Kattas, he believes. There is a need to create experts who can guide people about construction of Kattas through field visits. He anticipates that there are few

[122] Bhashya Laxmi P et. al., "Improvement of Groundwater by replacement of earthern Kattas by Bison Panel Sheet Katta System" *International Journal of Advances in Mechanical and Civil Engineering* Vol-5, Issue 2 (Apr. 2018).

[123] https://www.deccanherald.com/state/mangaluru/citizens-build-kattas-in-padre-784772.html (last visited on 20/3/2021).

[124] Sandhya Iyengar, "Waternama", Communication for Development and Learning, Bangalore, (2007); *Also* Chandrashekar Yethadka has uploaded various educational videos on youtube.

[125] Shree Padre, "Beku, Katta Call Centre, Katta Museum" *Adike Patrike* 7 (April, 2020).

practical problems in doing so such as the site selection chosen by consultants for Kattas need not necessarily be the best one. However, even without consultants mistakes might take place such as breach of Katta, is water flows forcefully from upstream. Whatever the drawback, we must generate Kattas experts. There is an urgent need to spread awareness. Each Katta dominant districts/ taluqs should have one Katta call center and Katta museum to guide the needy on aspects concerning Timing of construction of Katta, appropriate model of Katta based on location, construction of diversion channel, measures needed to be undertaken while using plastic/ HDPE sheet etc. Similarly, guidance on improvising/ upgradation to construct cost saving and less labour intensive structures. There is also a need to have a museum to learn by application.

b. Research Studies- There have been lot of discussion surrounding Kattas from academia. Mangalore University, Indian Institute of Management, Calicut,[126] Centre for Water Resources Development and Management and researchers[127] have studied the problems and recommended changes needed to be adopted.

c. Mass media- Doordarshan channel at National and State, news channels and institutes such as Educational Research Multimedia Research Centre, Mysore have covered stories on Kattas. Kannada and Malayalam newspapers, journals, and magazines have been regularly reporting issues and problems concerning Kattas. These discussions have generated problem solving approach. All these stories have uplifted confidence of local people.

d. Kasaragod district administration started the *Thadayana Utsavam* (Check dam festival) and created around 2,000 temporary check dams[128]. Farmers have sustained construction of Katta due to encouragement from gram panchayat. For ex. Incentive from Kumbdaje panchayat for construction of Katta[129].

III. Entrepreneurs, civil society and local support for water conservation

[126] Balooni, K. et al., "Community initiatives in building and managing temporary check-dams across seasonal streams for water harvesting in South India, Agricultural and Water Management" *Elsevier*(2008) .

[127] Chandrashekar Yethadka, "Sarani Katta Ulisikonda Yethadka", *Supra* note 6, p. 43

[128] Haritha John, **"**Severe groundwater depletion in Kasaragod: Why water literacy is the need of the hour", *The News Minute,* Sept. 22, 2020.

projects

The emergence of social entrepreneurship to solve agrarian crisis through rain water harvesting projects and by linking farmer producers and urban consumers for organic food has served in social and financial upliftment of the villagers. This model has been recognized by the IIMWSA Vibrant Village Project[130] . The drought situation in coastal regions of Maharastra collectively raised efforts by Rashmin Shanghavi from Vicharta Samuday Samarthan Manch (VSSM)[131] in Drought Relief through water management. Under this programme villagers will take responsibility & execute the work; and team of VSSM provides the finance for the projects.[132] Another innovative step in reducing women's efforts in carrying heavy pots on the head, Water Wheels was introduced.[133] This project also covers micro-finance business for cattle rearing. The team experimented with a "fixed cost model". Instead of paying daily wages, giving a fixed amount, after supplying the gunny bags to do the work efficiently and as quickly as the villagers can. The project has not been able to accomplish the work on daily wage model in Aptaley, since monitoring the project all day long became challenging.

The project lead suggests that setting up of water committee for regular maintenance and repairing of community structures is necessary to sustain these projects. Another learning is to give work on fixed rate contracts and specification of the conditions such as- requirement of women workers for construction etc.

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[129] *Supra* note 127.

[130] IIM Women for Social Action (IIMWSA) is a global group of diverse alumnae from various Indian Institutes of Management (IIMs), united by a shared purpose - to make a difference through social impact. The IIMWSA #VibrantVillages team has been working towards the goal of a self-reliant vibrant rural India, with a special focus on water management, rural livelihoods and empowerment of women. Water sufficiency is key to rural self-sufficiency. The team has been constructing rainwater harvesting structures and mobilizing the village community to work for natural resource conservation. Along with water projects, they are also executing livelihood projects for improvement in the financial condition of the area.

[131] Participatory Water Management – VSSM (vssmindia.org) (last visited on 20/06/2021).

[132] Mumbai Magic: Bandhara at Aptale Village, Jawhar region, Maharashtra (mumbai-magic.blogspot.com) (last visited on 27/11/2021).

[133] Wello (wellowater.org) Water wheels are ergonomically designed. They can hold 45 litres, and it means that in one trip they can do what they were otherwise doing in 4 trips. In summer the water sources are further away and toiling for water is a major part of the day's efforts.

along with creating local leadership will enhance the project activities.

Conclusions and the Way Forward

Traditionally, Kattas constitute important means of water conservation and use in coastal districts of Karnataka and north Kerala. Being temporary earthen structures put by faming communities or individual farmers, they are of great importance for agriculture and ecology. There is drastic decline in the number of these mud dams because of their growing costs, non-availability of workers, lack of initiative and switch over to the bore well based irrigation. It is a welcome development that the governments of Karnataka and Kerala are responding to this situation by constructing vented dams across the streams. Kerala's experiment with rubber dam and funding of private Kattas to the extent of 50 per cent of the cost by the Grama Panchayat is a laudable approach. Karnataka has increased the grants for construction of VDs and extended substantive support to the schemes of minor irrigation. There is less space for people's participation in VDs in the matter of selection of sites, planning, execution of the construction work, water distribution and annual maintenance. Obstruction to water flow during monsoon, difficulties of disaster management because of the blocking of the VDs and other inherent problems need to be overcome in order that VDs become effective means of irrigation system. Simultaneously, encouraging the traditional Kattas by financial and technical support becomes essential since VDS do not totally substitute or restore katas but only supplement the common resource.

On the basis of above study, following recommendations may be made in order to address the challenges that the users of the Traditional Kattas and VDs are facing. Firstly, there has to be a well- structured post intervention map that lays down the responsibilities and obligations of the authorities and stakeholders. The rationale is that the project should not be abandoned by the government once the construction is completed. There has to be well defined framework of the work, repair, monitoring and maintenance that has to be included within the project so as to avoid the conflict of scattered jurisdiction. This also ensures the timely laying/ removing the planks thereby increasing the utility of the Katta/VDs.

Secondly, the Water Users Associations have to be strengthened to (a) obtain a better collective bargaining capacity against the authorities to enhance the

maintenance of VDs; (b) to ensure that there is efficient and equitable supply and distribution of water from the VDs/Kattas; and (c) to amicably resolve disputes.

Thirdly, the paper stresses on the strict contractual arrangements between the users of Kattas to ensure the proportionate sharing of costs and benefits. The strict terms of contract checks the unjust enrichment of those beneficiaries who use the water of Kattas but are unwilling to share the annual maintenance cost.

Fourthly, the general absence of contract spelling out the rights and obligation of stream users has given rise to the violation of riparian rights. The implications of the judicial decisions on riparian rights associated with Kattas call for mutual cooperation, harmony and sharing of resources and burdens by all the riparian owners. Hence, it calls for two-folded action, one by the users of streams to have specific contract ensuring that there is no overstepping of the rights and conditions thereby protecting riparian rights of lower regions and the intervention by authorities through monitoring the use. Application of ADR method of dispute resolution is an appropriate approach in this sphere.

Fifthly, there has to be revival of the role of the committee of beneficiaries in allocating equitable shares of water among the beneficiaries and also in sharing the burden of the cost fairly. This arrangement will promote distributive justice.

Sixthly, the paper recommends that the projects concerning VDs have to be placed in the public domain to necessitate proper impact assessment and public hearing. This provides the required platform for the public to deliberate upon the consequences of the project. This also provides for an opportunity to include the local communities to participate in the projects.

Finally, the paper emphasizes on the importance of community led participation in making these irrigation systems successful. There have been a few mass movement led by youth groups, NGOs, journalists and activists to sustain the practice of Kattas.[134]

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[134] Sri. Dharnendra Kumar, Zilla Panchayat Member is on a Mission to revive Kattas. He led the construction of 50 kattas across Falguni river with the help of NSS volunteers. *See* Shree Padre, "Holethodugale Nilli! Dharnendra Katta Chalaka" *Adike Patrike* 5-12. (April 2020).

5

THE ELEMENTS OF ECOLOGY, EQUITY AND DEVELOPMENT WITH JUSTICE IN THE MAHADAYI TRIBUNAL'S DECISION ON INTER-STATE WATER DISPUTE: A CRITICAL STUDY

P. Ishwara Bhat

Introduction

"Rivers, watersheds and aquatic ecosystems are the biological engines of the planet," states an international study.[1] When dams fundamentally alter rivers and the use of a natural resource, and reallocate benefits among traditional users and new beneficiaries, the issues of equity, ecology and development with justice and good governance come to the forefront. Sustainable improvement of human welfare shall be the goal of dams for a comfortable position. Whether it is a well-developed river valley or semi-developed one or a virgin, this goal has vital relevance and application. All rivers in India, whether flowing internationally or inter-state or intra-state, have unique and distinct characteristics. Diversity prevails in the matter of quantity of water, length of the river, extent of catchment area, perennial or seasonal nature, number of users, topographical conditions, flora and fauna to which it serves, its tributaries, frequency of floods, multiplicity of projects, and approaches of the riparian parties in the matter of use. From the angle of bracketing of legal interests of the communities depending upon the river, jural relations revolving around the purpose, divine entity or enterprise and analogies of fiction, rivers may be rightly attributed with legal personality.[2] This means that with regard to river, one shall have an approach that it is a bundle of

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1 World Commission on Dams, Dams and Development: A New Framework for Decision Making Report of the World Commission on Dams (Earthscan 2000) xxxv

2 R W M Dias, *Jurisprudence* (5h ed. Butterworths, Aditya Books, 1985) 266-269. Also see *M. Siddiq (D) LRS* v. *Mahanth Surseh Das*, AIROnline 2019 SC 1420 paragraphs 86 to 124 about legal personality.

interests connected with complex factors and a callous approach is totally unjustified.

Indian legal system has addressed numerous inter-state water disputes pertaining to various matters with varieties of contentious issues and arguments among the diverse riparian parties ever since 1956 quite effectively. Law has grown with times gathering support from international legal principles, ethos of the Constitution, aspirations of environmental law and imperatives of distributive justice. Mahadayi Water Disputes Tribunal's report-cum-decision is a milestone in the process of water adjudication and growth of water law as it appears to give upper hand to environmentalism without ignoring equity and development. This paper aims at a critical study of the decision by focusing on these paramount elements which are the key concepts of inter-State water law. It plans to survey the genesis and nature of dispute, issues and arguments and approaches and outcome of the decision with reference to these elements.

River Mahadayi rises in the Western Ghats region of Khanapur taluk of Belagavi district of Karnataka, receives water from a number of tributaries[3] in Karnataka, Maharashtra and Goa and flows westwards through Goa to join the Arabian Sea at Panaji. It has a total catchment area of 2032 sq. km. out of which 375 sq. km of catchment area lies in Karnataka, 77 sq.km. in Maharashtra and the rest (1580 sq.km.) lies in Goa. High hill range in the east, rolling undulating flows in the central slopes, flood plains and coastal plains constitute its topography. Mahadayi valley is known for scenic beauty, richest bio diversity, complexity in plant, animal and bird life, and is a home to endangered bat species. Wild life and bird sanctuaries, breath taking water falls, dense forests form its important and unique biological and ecological pocket. The environmental flow in the river for supporting estuaries, living beings, navigation and exclusion of salinity is also a natural phenomenon. Unlike other inter-state water disputes, Mahadayi has great implications for ecological interests, which the Tribunal has duly considered in its report/decision.

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[3] As many as 75 big and small streams and tributaries join Mahadayi at various points.

Genesis of the dispute, failure to agree and the tribalized justice

The genesis of the dispute is traceable to the developments in 1980s when the farmers' agitation in Naragund demanding for more water from Malaprabha reservoir of Naviluthirtha was responded by the Government of Karnataka through formation of a committee headed by Sri S R Bommai. The Committee suggested inter-basin transfer of water available in the Nalas of Kalsa and Bhanduri of Mahadayi River into Malaprabha River. In March 1989, the Chief Minister of Karnataka Sri S R Bommai had a talk with his counterpart of Goa and wrote about Mahadayi Hydro Electric project, water for irrigation in Karnataka and advantages of continuous flow of water from the proposed dam to Goa. In 1992 an inter-state meeting was held where Karnataka proposed to divert 9 TMC to Malaprabha, 20 TMC for power generation and release of 1 TMC per month to Goa in post-monsoon season. A Technical Committee (TC) was constituted to examine the projects. Karnataka submitted EIA report in 1993,[4] to which Goa objected that it did not deal with EIA upon Goa. The third meeting of TC in 1994 decided to approach national Environmental Engineering Research Institute (NEERI) to undertake EIA studies in Goa region. The meeting of irrigation Ministers of both the States held in 1996 during the pendency of NEERI study gave consent for Karnataka's proposal of diverting 3.34 TMC from Kalasa Nala to Malaprabha river subject to ensuring the release of 1.5 TMC to Goa for Mandovi Project. For the proposed Kotni and Haltar/Potli dams the parties agreed to wait for NEERI report. The NEERI Report 1998 considered 9.00 TMC (4 at at Kotni and 5 at Kalasa, Haltar and Potli) of diversion in addition to the utilisation under Mahadayi HEP keeping in mind the total yield of Mahadayi in Karnataka as 38.21 TMC as per study of National Water Development Agency. NEERI report stated that post-construction effect of reservoirs in Karnataka did not materially alter the flow of water to Goa.[5] It also noted that the projects would help in conservation of water and recharge of ground water, thereby, creating a positive impact on the vegetation. Further, the post-project effect upon flora and fauna or upon the extent of salinity in Goa

[4] Prepared by the Institute of Command Studies and Irrigation Management (ICSIM).

[5] The yield available in Goa after construction of reservoirs in Karnataka is 92. 61 % of average flow during monsoon (June-October) 251.29% during non-monsoon (November-May) and 94.59% during June-May.

was marginal. Goa rejected the NEERI report in 1998 as based on the use of highly unreliable hydrological data.

An inter-state meeting was convened on 27.03.2002 under the aegis of the Central Water Commission (CWC) to consider the proposal of Karnataka for the clearance of Kalasa and Bhandura project. Karnataka highlighted the drinking water problems in Hubli-Dharwar towns where water supply situation had become precarious due to falling ground water level and supply had become possible only once in 10 days or so and requested for clearance for diversion of 7.5 tmc from Madei to Malaprabha reservoir through Kalsa and Bandhuri nala diversion schemes for supplying drinking water to the twin towns. Precedents were cited from Krishna and Narmada Tribunal awards regarding priority to be given to drinking water. Goa did not agree and did not conduct study about water yield in Goa region of Mahadayi. After a month, the CWC gave Karnataka "in principle clearance from water availability angle" to divert 7.56 TMC from monsoon flows and to utilise only to meet drinking water needs of Hubli/Dharwad which will be adjusted against the share of Karnataka in Madei River Basin as and when finalised by the basin States of Goa, Maharashtra and Karnataka. It asked Karnataka to furnish all required design details in order to confine to the limits. Correspondences between the two States exhibited break-down in talks.

In July 2006, Goa moved the Supreme Court under section 3 of the ISWDA for keeping the "in principle clearance" in abeyance and for directing the Union Government to constitute an Inter-State Water Dispute Tribunal. Meanwhile in 2010, after finding futility in negotiation and conciliation, the Government of India considered and approved the proposal of constituting the Mahadayi Water Disputes Tribunal (MWDT) chaired by Hon'ble Mr Justice J M Panchal (Judge, Supreme Court of India), Hon'ble Mr Justice Viney Mittal (Judge, High Court of Madhya Pradesh) and Hon'ble Mr Justice P S Narayana, Former Judge, High Court of Andhra Pradesh. In 2011, the Supreme Court took cognizance of the formation of the Tribunal and referred all the matters pertaining to the dispute to the Tribunal for adjudication and decision in accordance with law. The effective date of commencement of MWDT was August 21, 2013. The MWDT gave its report/decision on 14th August 2018. The State of Maharashtra petitioned the Supreme Court for direction to the Union Government to notify the Report/

Decision. By an order dated 20 February 2020 the Supreme Court allowed the petition and directed the Union Government to notify the Report/Decision.[6]

The above development is another example of failure to seriously pursue the path of negotiation and conciliation under ISWDA and rely upon quasi-judicial adjudication of legal, factual and technical matters. Although it began with good neighbourhood talks, in the absence of clear view about total quantity of water available in each of the catchment area, it could not proceed ahead. The apprehension about ecological imbalance especially upon the wild life sanctuaries and lower stream dependents and lack of political determination to provide drinking water to water scarcity cities due to non-involvement of local communities came in the way of negotiation. Human rights issues like right to drinking water and right to development are also important factors, which the adjudicative process did consider seriously while the parties to negotiation treated them in a low-key manner. Absence of altruistic approach obstructs conciliation efforts. The difference between the "in principle clearance" by CWC in 2002 viz., permission to divert 7.56 TMC to Malaprabha basin for supply of drinking water and the final adjudication in 2018 by the Mahadayi Tribunal conceding Karnataka's claim for in-basin use of 1.5 TMC and diversion of 3.9 TMC from 2 nalas of Mahadayi to Malaprabha basin for the purpose of supplying drinking water in addition to utilization of 8.02 TMC water for non-consumptive use such as hydro-electric project is one of degree and not one of kind. In fact, it is nearer to the original consent in the inter-state meeting for diversion of 3.54 TMC. Loss of economic development for a period of 18 years, denial of drinking water, cost of litigation and other inconveniences speak about the need to strengthen the negotiation and conciliation process rather than to venture litigation. The observation of the MWDT at the end suggesting reform of ISWDA to strengthen negotiation and settlement is worth following.[7] The World Commission

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[6] *State of Maharashtra v. State of Goa* SLP 32517/2018 judgment dated 20th February 2020

[7] It is noticed that the water disputes are merely seen as political issues and water management problems. Thus, for solving such disputes, interminable conferences attended by political representatives, bureaucrats and water management engineers, take place and legal aspects get pushed into the background. With legal aspects getting blurred, such conferences hardly lead to any settlement, with the result that the water disputes drag on. The consequent delay in the settlement of water disputes blocks the development of water resources and causes untold miseries to the concerned States and their people. Volume 13 page 2688

on Dams suggests consultation of stake holders, affected people and local communities. Applying this logic, participative decision making at grass root level could have influenced political decision making which could have countered vicissitudes of party politics and ego of personalities. Further, introspection is very much required in Karnataka about the reasons for denuding water resource in Malaprabha basin due to lack of afforestation, lapses in rain water harvesting and failure to rejuvenate traditional tanks and not confining to the most economic use of water in irrigation. Compared to other Water Dispute Tribunals, the time taken by MWDT is not unreasonable. The MWDT thoroughly discussed ecological and apportionment issues, examined the witnesses and made spot inspections. Its main theme was upholding ecology and human rights, and equitable apportionment was to support this cause, especially in view of non-availability of concrete and vital data about availability of water and quantification of the need.

The factor of ecology

The basin of Mahadayi is situated in the picturesque hill range of Western Ghats shared by Karnataka, Maharashtra and Goa, the former two being upper riparian states. Mahadayi basin is in the process of development from a virgin and pristine position. Regarding ecology of the Western Ghats, the Kasturirangan Committee states, "The management of Western Ghats ecology involves conservation, protection and rejuvenation as well as sustainable development in Western Ghats through periodic assessments of environment and ecology on a long term basis across the Six States of Western Ghats region using state-of-art geospatial technologies."[8] This is because the Western Ghats constitute one of the world's hottest hotspots of biodiversity. The main plank of argument of Goa was ecology. *First*, it attacked the very competence of Karnataka to launch various projects that threatened according to it the very survival of the ecology of Goa, its flora and fauna, rich bio diversity, fisheries and navigation. It stated that the very idea of inter-basin transfer was opposed to nature. *Second*, it argued that with the impact of global warming, saline water boundaries would be subjected to a dual mechanism of landward push, due to reduced fresh water

[8] Paragraph 30 of Executive Summary

flow on one hand and increased sea level on the other hand and that with the reduced water flow it became difficult to Goa to withstand the climate change. *Third*, Goa contended that the proposed diversion schemes of the States of Karnataka and Maharashtra would severely result in destruction, exploitation, damage, diversion of habitat from the wildlife sanctuary[9] and also diversion or stoppage of flow of water into and / or outside the wildlife sanctuary.[10] *Fourth*, it apprehended the decrease in natural flow of water will degrade and adversely impact the ground water flow Pattern, the tributaries and will affect the ecology of the Riparian as well as upper Stream areas. *Fifth*, it raised objection on the basis of right to life under Article 21 that since right to wholesome environment was threatened because of projects initiated by Karnataka effective protection and remediation are required. Sixth, the non-compliance with the requirement of getting EIA clearance by Karnataka to the projects was also complained upon. *Finally*, it emphasised that only after assessing and deducting from the available waters of river Mahadayi required for ecological sustenance of the River valley eternally, specifically giving due consideration of the scientifically predicted global warming, sea level increase, increased salinity ingress in coastal areas, etc., the share of all the riparian States should be determined on the basis of remainder water available from river Mahadayi. Hence, environmental flow shall be given priority.

As against the above arguments, Karnataka contended that the assessment of damage to environment is to be calculated and dealt in accordance with the environmental legal regime and that developmental activities cannot be totally sacrificed on the basis of mere apprehension. According to Karnataka, Goa had not established on the basis of convincing scientific data about the impact of projects on wild life sanctuaries, impact upon fish varieties and their quantities,

[9] The river passes through the Mahdei Wildlife Sanctuary, Bhagwan Mahavir Wildlife Sanctuary, Mollem National Park, Dr. Salim Ali Bird Sanctuary, Bondla Wildlife Sanctuary and Bhimgad Wildlife Sanctuary.

[10] According to Goa what the Mahadayi project is set to do is to destroy permanently an area, rich in biodiversity, which ranks second in India after Sundarbans and eighth in the 153 world as the finest Tiger habitat, and is home to many species of flora and fauna, including endangered Wroughton's Free-tailed bat and Theobald's Tomb bat. It is maintained that Barapedi caves in the Mahadayi valley is the only place where Wroughton's Free-tailed bat is found in the whole world, and Theobald's Tomb bat is rare. Volume III of the Report/Decision.

impact of climate change upon ecology superadded by projects, extent of salinization of water augmented because of post-project reduced flow of water. Citing from Environmental Policy 2006, it said, "economic growth permits improvement in environmental quality by making available the necessary resources for environmental investments, and generating societal pressures for improved environmental behaviour, and institutional and policy change." Human being's right to development in harmony with nature and sustainable development as an integral part of the development process were also relied upon. It was said, "The right to development must be fulfilled so as to equitably meet developmental and environmental needs of present and future generations."

The MWDT dealt with the legal position relating to ecology and environmental protection. It referred to the constitutional provisions, case law on right to environment, public trust doctrine, national water policy[11] and international law. About permissibility of inter-basin transfer it referred to the National Water Policy which had said, "Inter-basin transfers are not merely for increasing production but also for meeting basic human need and achieving equity and social justice. Inter-basin transfers of water should be considered on the basis of merits of each case after evaluating the environmental, economic and social impacts of such transfers." (para 5.5) On the requirement of environmental flow, it cited from Krishna Water Dispute Tribunal's award which stated, "The examples of environmental flows requirement were indicated to be flows to maintain the physical habitat flows, to maintain suitable water quality flows, to allow passage for migratory fish, flows to maintaining soil moisture levels, flows to maintain soil/fresh water balance, flows to recharge the aquifers, flows that maintain biodiversity and ecosystem etc." It emphasised on comprehensive EIA well in advance to launching of projects as per the requirement of the law. The Tribunal formed an opinion that (a) after assessing and deducting from the available waters of river Mahadayi required for ecological sustenance of the river valley

[11] National Water Policy 2012 3.3: "Ecological needs of the river should be determined, through scientific study, recognizing that the natural river flows are characterized by low or no flows, small floods (freshets), large floods, etc., and should accommodate developmental needs. A portion of river flows should be kept aside to meet ecological needs ensuring that the low and high flow releases are proportional to the natural flow regime, including base flow contribution in the low flow season through regulated ground water use."

eternally and specifically giving due consideration to the scientifically predicted global warming sea level increase, increased salinity ingress in coastal areas etc., the share of all the riparian states should be determined; (b) that after taking into consideration the long term, in-basin needs of the three states for the purpose of domestic water supplies, irrigation, hydropower generation, navigation, pisciculture and environmental projects, equitable share of three co-basin States should be adjudicated; and (c) that the proposed diversion schemes of the State of Karnataka and Maharashtra will cause severe and irreparable damage and losses to the forests, wild life, other organic life and biodiversity stratosphere of the area in Mahadayi basin, particularly in the upstream areas and also to overall ecology of the Mehdai River Basin. However, absence of scientific data on all these matters was a handicap for the Tribunal in quantifying about the extent of damage to wild life, fisheries etc. Since Karnataka and Maharashtra were intending to inter-basin diversion of water, they were required to make a detailed study of impact assessment. Absence of clear data about availability of water of Mahadayi within the territorial limits of each state and adverse environmental effect of projects compelled the MWDT to allow least quantity of water for diversion and minimum quantity of water for non-consumptive uses such as hydro-electric power generation. Thus, the tilt in favour of ecology is explicit in the overall outcome of the Tribunal's award.

The factor of equitable apportionment

Over the years, the principle of equitable apportionment and utilisation has emerged as the well-recognised substantive law in the Indian inter-state water jurisprudence. In contrast to the absolute principle of prior appropriation, riparian owner theory, or territoriality approach, this principle meets the requirements of international legal principles about water sharing, constitutional principles of economic justice and equity. While ISWDA is providing for procedural framework without hints for substantive principles for water sharing, it is to the credit of a series of water dispute tribunals that an appropriate principle is shaped up in their decisions and the Supreme Court has also recognised the same in the Cauvery judgment of 2018.

Equitable apportionment principle means that "the principle of right and equity shall be applied having regard to the plane of equality on which states stand" or that "each unit shall get a fair share of the common river." The Helsinki Rules laid down by the International Law Association, 1966 states in Article IV, "Each basin State is entitled, within its territory, to a reasonable and equitable share in the beneficial uses of the waters of an international drainage basin." According to Article V, "What is a reasonable and equitable share within the meaning of Article IV is to be determined in the light of all the relevant factors in each particular case." The relevant factors include but are not limited to (a) the geography of the basin, including in particular the extent of the drainage area in the territory of each basin State; b) the hydrology of the basin, including in particular the contribution of water by each basin State; c) the climate affecting the basin; d) the past utilization of the waters of the basin, including in particular existing utilization; e) the economic and social needs of each basin State; f) the population dependent on the waters of the basin in each basin State; g) the comparative costs of alternative means of satisfying the economic and social needs of each basin State; h) the availability of other resources; i) the avoidance of unnecessary waste in the utilization of waters of the basin; j) the practicability of compensation to one or more of the co-basin States as a means of adjusting conflicts among uses; and k) the degree to which the needs of a basin State may be satisfied, without causing substantial injury to a co-basin State.[12] The Supreme Court in Cauvery judgment 2018 has laid emphasis on the following factors in this context: the economic and social needs of each basin state. The population dependent on the waters of the basin in each basin state c. The availability of other resources. The Court observed,

"… The above factors, although not exhaustive, have been construed to be of significant bearing to ascertain the reasonable and equitable share of waters in an international drainage basin. The said principles can be regarded as functional dynamics while equitable distributing the water in an inter-State River dispute.

[12] The weight to be given to each factor is to be determined by its importance in comparison with that of other relevant factors. In determining what is a reasonable and equitable share, all relevant factors are to be considered together and a conclusion reached on the basis of the whole.

The salient feature of all these factors has to have inherent variability and inevitable flexibility thereof having regard to the local conditions, for it is difficult to ignore the undeniable and common emphasis necessary to ensure beneficial use of the available resources for a basin state and logically for its dependent populace 2659 warranted by the economic and social needs. Be it stated, while determining the said needs, amongst others, past and existing utilization of the water have to be borne in mind. To remain oblivious to the same would amount to playing possum with the doctrine of equitable distribution in praesenti. …"[13]

The Mahadayi Tribunal cited from the Principles of International Law Association formulated in its Berlin Conference, 2004 the following points in support of equitable apportionment and utilization approach. As per Article 10 (1), "Basin States have the right to participate in the management of waters of an international drainage basin in an equitable, reasonable, and sustainable manner."

Second, under Article 11, "Basin States shall cooperate in good faith in the management of waters of an international drainage basin for the mutual benefit of the participating States."

Third, according to Article 12, "Basin States shall in their respective territories manage the waters of an international drainage basin in an equitable and reasonable manner having due regard for the obligation not to cause significant harm to other basin States."[14]

Fourth, according to Article 13 (1) Equitable and reasonable use within the meaning of Article 12 is to be determined through consideration of all relevant factors in each particular case. Relevant factors to be considered include, but are not limited to: a. Geographic, hydrographic, hydrological, hydrogeological, climatic, ecological, and other natural features; b. The social and economic needs of the basin States concerned; c. The population dependent on the waters of the international drainage basin in each basin State; d. The effects of the use or uses

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[13] *State of Karnataka by its Chief Secretary* v. *State of Tamil Nadu*, AIR 2018 SC (Supp) 2621 at 2774 para 367 per Dipak Misra CJI

[14] According to Article 12 (2), "In particular, basin States shall develop and use the waters of the basin in order to attain the optimal and sustainable use thereof and benefits therefrom, taking into account the interests of other basin States, consistent with adequate protection of the waters."

of the waters of the international drainage basin in one basin State upon other basin States; e. Existing and potential uses of the waters of the international drainage basin; f. Conservation, protection, development, and economy of use of the water resources of the international drainage basin and the costs of measures taken to achieve these purposes; g. The availability of alternatives, of comparable value, to the particular planned or existing use; h. The sustainability of proposed or existing uses; and i. The minimization of environmental harm. (Article 13[2]). The weight of each factor is to be determined by its importance in comparison with other relevant factors. In determining what is a reasonable and equitable use, all relevant factors are to be considered together and a conclusion reached on the basis of the whole. (Article 13 [3])

Fifth, in determining an equitable and reasonable use, States shall first allocate waters to satisfy vital human needs. (Article 14 [1]). No other use or category of uses shall have an inherent preference over any other use or category of uses. (Article 14 [2]).

Sixth, other basin states may utilize the water allocated to a basin state so long as that state does not in fact, use it.

Seventh, trans-boundary harm shall be avoided. Basin States, in managing the waters of an international drainage basin, shall refrain from and prevent acts or omissions within their territory that cause significant harm to another basin State having due regard for the right of each basin State to make equitable and reasonable use of the waters.

In applying the principle of equitable apportionment, Mahadayi Tribunal noted that despite clear directions, the respective States have failed to provide requisite information which are adequate and consistent, based on proper investigation, backed by scientific research and studies and supported by detailed analysis. In particular, the specific issues such as (a) the economic and social needs of each basin state, (b) the dependence of the population on the waters of the basin in each basin state, and (c) the availability of other resources, have not at all been examined by any of the States in scientific manner. In this background, the Tribunal found itself compelled not to go ahead with application of the principle in the instant case. The Tribunal confined to address the issues of minimal human needs for drinking water and harmless non-consumptive use to a limited extent.

Award and the final decision of the Tribunal

The Tribunal quantified the water availability of the entire Mahadayi river basin (inclusive of all tributaries) with total catchment area of 2032 sq.km at 75% dependability as 2621.8 Mcum (188.06 TMC). Water availability in the Mahadayi basin within Karnataka is 32.11 TMC and that within Maharashtra 7.21 TMC. All the calculations were at 75 per cent dependability. The present level of utilization of Mahadayi water is 5 per cent. The data furnished by the three states were wholly inadequate to apportion water among the riparian states. In order that the activities related to water resources development for the benefit of the society must not stop and people of the party State must not suffer the Tribunal made some apportionment keeping in mind the factors of ecology and environmental flow.

The apportionment to Karnataka is as follows: (1) Allocation of 1.5 TMC for in-basin consumptive use for drinking and irrigation within Mahadayi basin of Karnataka; (2) Permission to Karnataka to divert Mahadayi water to the extent of 2.18 TMC at Bhandura and 1.72 TMC at Kalasa; (3) Permission to undertake hydro-electric project at Kotni by making a non-consumptive use of 8.02 TMC. The claim of Karnataka for diversion of 5.55 TMC of Mahadayi water to Supa dam under Kali Hydro Electric project was rejected. The additional demand for 7 TMC at Kotni for hydro-electric project was also rejected. Environmental clearance and detailed project reports, approval by the technical committee of the CWC were insisted. The diversion permitted is during the period from June to November, i.e., monsoon season.

The apportionment to Maharashtra is as follows: (1) Allocation of 0.56 TMC for consumptive use under Virdi minor irrigation project within the Mahadayi basin; (2) Permission to four proposed minor irrigation projects to use a total of 0.77 TMC.

Regarding Goa, the Tribunal considered all the proposed 59 projects were on positive direction and the Tribunal allocated 24 TMC for all these projects put together. This is in addition to the existing utilization of 9.395 TMC by Goa. No restriction was put on non-consumptive use of Mahadayi water by Goa.

Low key treatment of development with justice

The equitable apportionment principle as developed by the Water Tribunal jurisprudence were more in pursuance of international legal principles and have not used the constitutional principles of socio-economic justice. Two vital provisions in Article 39 (b) and (c) in the DPSP give the following pointers: "(b) that the ownership and control of the material resources of the community are so distributed as best to subserve the common good; (c) that the operation of the economic system does not result in the concentration of wealth and means of production to the common detriment;" Article 38 states, (1) The State shall strive to promote the welfare of the people by securing and protecting as effectively as it may a social order in which justice, social, economic and political, shall inform all the institutions of the national life; (2) The State shall, in particular, strive to minimise the inequalities in income, and endeavour to eliminate inequalities in status, facilities and opportunities, not only amongst individuals but also amongst groups of people residing in different areas or engaged in different vocations. Water is a vital material resource of the community. Entry of the above philosophy and approach in water apportionment will bring a big change in the substantive law on water sharing.[15] In fact, sustainable development with justice is a part of equity and inevitable component of human rights. Insofar as Karnataka's claim for economic development and protection of human rights is concerned, MWDT did not stand to the expectations.

Conclusions

A holistic consideration of all the factors relating to ecology, equity and development becomes essential in resolving the conflict between environment and development. Human beings are part of the ecology and reasonable and sustainable development has the dimensions of human rights also. Overemphasis on ecology without reasonably accommodating sustainable development also causes imbalance.

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[15] See for discussion P. Ishwara Bhat, "Constitutionalism's Challenges and Responses in the domain of Inter-State Water Dispute Law: An analysis Towards Enhancement of Social acceptability" in P. Ishwara Bhat (Ed) *Inter-State and international Water Disputes: Emerging Laws and Policies* 27-58 (Eastern Book Co., Lucknow, 2013).

The Report/decision of MWDT is primarily inchoate as it did not decide many important issues by pleading inadequacy of scientific data. Ecological factor dominated in the decision-making process, and the decision will be more regarded as a pro-environment decision overlooking the aspects of economic development. There cannot be two opinions that ecology shall be given primordial importance. But human beings are also part of the ecology. The legitimate expectation about access to drinking water and management of flood water to feed the tanks and reservoirs have pro-human right and pro-environment approaches.

What was originally agreed by Irrigation Ministers in 1996 was granted permission to Karnataka to divert 3.34 TMC, which after 22 years of dispute and litigation got marginally modified into 4.9 TMC by the award of MWDT. Compared to 32.11 TMC water availability in Mahadayi basin of Karnataka which is collection of drainage within the state, what Karnataka got has been inadequate. Looking from the angle of human need for drinking water and water for irrigation and better utilisation of flood water during monsoon the claim of Karnataka for a bigger share is justified. The original proposal of CWC can provide a clue for this estimation.

There is need for strengthening negotiation and conciliation as methods of settling inter-State River disputes. The idea of co-operative federalism rather than conflicting approaches shall be set into service in order to gain a fair situation in the distribution of natural resoures like inter-State River water.[16] Lapse of 22 years in litigation, lack of access to drinking water and denial of opportunity for development speak about the disadvantages of litigation in water sharing. Amicable settlement through negotiation has a lot of advantages. Participation of people, access to information and mindset for cooperation shall support the process of conciliation.

National water policy and environmental policy recognise inter-basin transfer. Networking of rivers has come to stay as a major policy acceptable to the

[16] Tony George Puthucherril, "Water Federalism, Tribunalization of Water Justice and Hydro-Politics: India's Inter-State River Water Disputes Act at 65 Years" Vol.35, No.1 *Columbia Journal of Asian Law"* 46 (Spring 2022).

society and imperative for sustainable development with justice.[17] In this background, giving weightage to the argument against inter-basin transfer on the basis of apprehension about damage to ecology is not appropriate. Restraint over use of flood water beyond the level of entitlement is also not convincing.

Negligence in developing the catchment area by afforestation, by rain water harvesting and improving the tank irrigation shall be abandoned by the parties to the dispute. In contrast, states shall shoulder the responsibility of planning and implementing an activist policy of greening the earth so that the larger issue of climate change shall be addressed by a long-term solution.

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[17] *In Re Networking of Rivers* 2012 AIR SCW 3787; *Also See* 2005 AIR SCW 3178; 2005 AIR SCW 5688

6

INTERLINKING RIVER PROJECTS IN KARNATAKA : AN OVERVIEW

Akhila Basalalli

1. Introduction

The projects of the Inter-linking of Rivers (ILRs) and Inter-Basin Water Transfers (IBWT) have been emerging from time to time with the inspiration drawn from the foreign projects. The ideas behind the interlinking projects and inter-basin transfers are to increase the flexibility of the water resource systems and address the water scarcity by meeting the water demands of both rural and urban regions. The governments have often justified these projects for the following reasons such as[1]

(a) Flood Control and Drought Mitigation: About seven million hectare (Ha) land, three million Ha of cropped land and 34 million people mostly of the eastern parts are affected annually by floods suffering over 1000 crores loss. The reservoir storages and canal diversions in ILR are expected to reduce the flood damages by 35 percent and ease drought prone by making 12km^3 water available for domestic and industrial water supplies.

(b) Irrigation and Food Security: The IBWT are strategized as a solution considering the irrigational demand of India being 83 percent compared to the world average of 69 percent and feed estimate of 1.5-1.8 billion by 2050 with 450 million tons of food grains requires 160 million ha of irrigated land.

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[1] Interlinking of Rivers in India, Reference Note No. 15/RN/Ref./July/2015, Lok Sabha Secretariat, Parliament Library and Reference, Research, Documentation and Information Service, 2015. This note is prohibited from publication and the service does not take the responsibility of the accuracy of the information. However, the paper culls out the benefits of the ILRs and desirability of the Government towards the projects from the note.

(c) Domestic water needs: The per capita availability of water has been reducing over the period of time, for instance it has reduced to 3450 cubic meters in 1951 to 1250 cubic meters in 2000 and the likelihood of it being further reduced to 760 cubic meters by 2060 is significant. The ILR will provide additional water requirements.

These projects of ILR and IBWT often gain momentum despite involving a costly infrastructure and causing detrimental consequences to the environment and ecological system simply because there can be transfer of large volumes of water over a long distance to feed the water deficient regions and create a significant influence over the economy of the receiving area.[2]

2. Background

In India, there have been two grand proposals in the early 70s that have attracted everybody's attention. The first of its kind is the linking of Ganga-Cauvery Canal by diverting around 60,000 cusecs of floodwater of Ganga near Patna to Cauvery in the South, by Dr. K.L. Rao[3] in 1972.[4] Another equally interesting proposal was made by Captain Dastur[5] to construct the Garland Canal, one for the Himalayan Watershed and other for the Sahyadri Watershed involving 15,000 crores in 1977. These proposals were not pursued further for lack of financial and technological reasons. Despite several other proposals the impetus to the existing regime of ILRs and IBWTs was given by the Ministry of Irrigation in 1980 by formulating a National Perspective Plan (NPP) for Water Resources Development and it was the NPP that comprised of two components (i) Peninsular River Development and (ii) Himalayan Rivers Development. The primary reason for the compartmentalization was the relative complexity in interlinking of peninsular and Himalayan rivers, since the former will be only an inter-state venture, the

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2 S. K. Jain, Vijay Kumar and N. Panigrahy, "Some Issues on Interlinking of Rivers in India" 95(6) *Current Science* 728 (2008)

3 Engineer in service, Government of India

4 B. P. Radhakrishna, "Linking of Major Rivers of India: Bane or Boon" 84 (11) *Current Science* 1391 (2003).

5 Pilot by profession

latter will additionally require international involvement.[6] The NPP is expected to irrigate 35 million hectares of land raising the ultimate potential from 140 million ha to 175 million ha and generate 34000 Megawatt of hydropower apart from the other benefits such as flood control, navigation, water supply, fisheries, salinity and pollution control.[7]

2.1 National Water Development Agency (NWDA)

The National Water Development Agency (NWDA) was set up in 1982 by the Government of India under the Ministry of Water Resource (the then irrigation) to first study the feasibility of the links under the peninsular component and it was only in 1991, Himalayan component was added to its study. [8] The functions of the NWDA have been enhanced *vide* notification passed in 2006, 2011 and 2016. The functions of the NWDA as of now include, (1) to carry out detailed surveys and investigation of the possible reservoir sites and interconnecting links in order to establish feasibility of Peninsular Rivers Development and Himalayan Rivers Development Components; (2) to carry out detailed studies about the quantum of water in various Peninsular River systems and Himalayan River systems which can be transferred to other basins/ States after meeting the reasonable needs of the basin/States in the foreseeable future, (3) to prepare feasibility report of the various components of the scheme relating to Peninsular Rivers development and Himalayan Rivers development, (4) to prepare detailed project report of river link proposals under National Perspective Plan for Water Resources Development after concurrence of the concerned States, (5) to prepare pre – feasibility / feasibility / detailed project reports of the intra-state links as may be proposed by the State, (6) to undertake/construct/repair/renovate/ rehabilitate/implement the projects either on its own or through an appointed Agency that forms a part of the ILR projects, (7) to act as a repository of

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6 T. Prasad, "Interlinking of Rivers for Inter-basin Transfers" 39(12), *Money, Banking and Finance* 1220 (2004)

7 Note on interlinking of river projects by NWDA available at http://nwda.gov.in/upload/uploadfiles/files/Note-on-interlinking-of-rivers-projects-in-the-Country.pdf.

8 Note on interlinking of river projects by NWDA available at Microsoft Word - Note on interlinking of rivers projects in the Country (nwda.gov.in) (last visited 11-02-2022).

borrowed funds or money received on deposit or loan and such other acts incidental thereto.[9]

3.1 Himalayan component

The Himalayan component[10] intends to construct the storage reservoirs to the rivers Ganga and Brahmaputra and their main tributaries to conserve monsoon flows for irrigation and hydro-power generation. The surplus flow of rivers Kosi, Gandak and Ghagra are to be linked to the west. The surplus of Ganga and Yamuna are proposed to provide water to the drought prone areas of Punjab, Haryana, Rajasthan and Gujrat. About 14Mha-m of additional water is to irrigate 22Mha in Ganga-Brahmaputra basin apart from diversion to above water deficient regions of the above-mentioned states. It is also to provide 1120 cusec to Calcutta port and enhance the navigation facility across the country. The component is expected to provide flood moderation in the ganga-Brahmaputra region. Out of 30 links, 14 of them fall within the Himalayan component. Among the fourteen links Manas-Sankosh-Tista-Ganga (M-S-T-G) link Rajasthan-Sabarmati link, Subernarekha-Mahanadi link have completed the stage of feasibility report (FR), Gandak-Ganga link, Ghagra-Yamuna link, Sarda-Yamuna link, Ganga(Farakka)-Damodar-Subernarekha link, Ganga (Farakka)-Sunderbans link have completed feasibility report (Indian Component), Yamuna-Rajasthan link, Chunar-Sone Barrage link are in the stage of draft feasibility report, Kosi-Ghagra link, Sone Dam – Southern Tributaries of Ganga link, Kosi-Mechi link are still in pre-feasibility report (PFR). The only link dropped is the Jogighopa-Tista-Farakka link. A few links are not progressing since they are trans-boundary involving the consent from countries like Nepal.

3.2 Peninsular Component

In the Peninsular component[11] the NWDA made a detailed study of the major river basins such as Mahanadi, Godavari, Krishna, Pennar, Cauvery,

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9 Ibid

10 Hydrology and Water Resources Information System for India, available at http://117.252.14.242/rbis/india_information/interlinking.htm (last visited 11-02-2022).

11 Peninsular Component available at http://nwda.gov.in/content/innerpage/peninsular-component.php (last visited 11-02-2022).

Vaigai, west flowing rivers of Kerala, Karnataka, north of Bombay and south of Tapi and southern tributaries of Yamuna to establish water surplus and deficit regions. The studies reveal that the basins of Mahadayi and Godvari are surplus while Krishna, Pennar, Cauvery and Vaigai are water deficient.

The project of ILR was not without contestation. A writ Petition 724/ 1994 was filed in Supreme Court with the title '*and Quiet Flows the Maily Yamuna'* by a senior advocate Mr. Ranjit Kumar, quoting the speech of the President concerning interlinking of rivers.[12] The petition emphasizing on the need to conserve water and properly utilize the resources, prayed for the writ of mandamus to take appropriate steps to nationalize all the rivers of the country; interlink the rivers of the southern peninsula namely, Ganga, Kaveri, Vaigai and Tambaravani; to formulate a scheme where the west flowing rivers could be channelized and equitably distributed.[13] This turned into a PIL W.P. 512/2002 '*Re: Networking of Rivers*'[14], where the Supreme Court viewed that the interlinking is very beneficial for the nation as a whole and directed for the creation of an appropriate body to create, plan, construct and implement the programs.

4. Literature Debating the ILR and IBTW Projects

For the justification or rejection of the ILR or IBWT projects the following parameters may provide a few guidelines. First, the area of delivery must face a substantial deficit in meeting present or projected future water demands after duly considering the alternative water-supply sources and attempting at reasonable measures for reducing water demands. Secondly, the future development of the area of origin must not be substantially constrained by water scarcity. However, considerations to transfer the constraints of future development of an area of origin may be appropriate if the area of delivery compensates for the area of origin of productivity losses. Thirdly, a comprehensive environmental impact assessment must indicate that there is a reasonable degree of certainty that it will not substantially degrade

12 ILR in Supreme Court, available at ILR in Supreme Court : National Water Development Agency (nwda.gov.in), (last visited 25/04/2022).

13 Writ Petition 724/1994

14 Along with the Write Petition (civil) No. 668/2002

environmental quality within the area of origin or area of delivery. Fourthly, a comprehensive assessment of socio-cultural impacts must indicate a reasonable degree of certainty that water transfer will not cause substantial socio-cultural disruption in the area of origin or area of water delivery. Finally, net benefits from the transfer must be shared equitably between the areas of transfer origin and the area of water delivery.[15]

ILR managed to lure up a massive opposition for environmental, social, economic, cultural and spiritual reasons. A short article written by Ramaswamy R. Iyer in Economic and Political Weekly titled 'Interlinking of Rivers: A Plea to the Government'[16] has briefly summed up the arguments regarding faulty premises on which interlinking projects are proposed and the impact it will have domestically and internationally. This position was in response to the accelerated move towards ILR projects by Uma Bharti the then Union Minister for Water Resource. The following are the arguments against the ILR claiming it to be proposed on the faulty ideas. Firstly, Iyer argues that the projects look for water to be brought from outside rather than looking for the solutions within the basin. He argues, in other words, that the water scarcity in the areas of Rajasthan, Madya Pradesh, Maharashtra, Karnataka, Andhra Pradesh and Tamil Nadu have to be felt upwards whereas the project proceeds from a macro concept downwards. Secondly and interestingly, Iyer points out the anomaly in creation of the national water grid and he observes that the analogy of a power grid or linking of highways is the basis for the national water grid. Such similarity cannot be drawn for the following reasons namely (a) the movement in the power grid or highway is from both sides but in a river, water flows in one direction; (b) power grids and highways are human creations as opposed to the rivers which are natural; and (c) rivers are integral part of cultural, social, economic and spiritual lives. A mere and limited scope of river to mean water and its commodity connotation appears to be the reasons for such an analogy. Iyer, further very sarcastically comments that

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15 W.E. Cox In proceedings of International Workshop on Inter basin Water Transfer, International Hydrological Programme UNESCO, Paris 1999; See S. K. Jain, Vijay Kumar and N. Panigrahy, "Some Issues on Interlinking of Rivers in India" 95(6) *Current Science* 728 (2008).

16 "Interlinking of Rivers: A Plea to the Government" 49 (50) *EPW* 16-18 (2014)

"they are not pipelines to be cut, turned around, welded and rejoined".[17] Thirdly, he argues that moderation of the floods from flood prone areas to drought regions is fallacious for two reasons namely massive diversion of the floods is not feasible or technically difficult and if small diversions are made then there will be no substantial moderation. He supports the above argument with the words of Bharath Singh[18] that "any water resource engineer will immediately discard the idea of the interlinking of rivers as a flood control measure". Fourthly, drawing the attention of the government to geographical terrain of the country and the location of the uplands and dry lands that constitute the majority of the drought areas, Iyer points that these areas are at the elevation of 300-1000m from sea and ILR will not serve in such regions. It might only provide additional water to those regions that have been served water. Fifthly, he ventures into the notions of surplus and deficit rivers calling them problematic, as the term surplus is determined by the availability of the water for the aggregate requirements such as domestic, municipal, industrial and agricultural use ignoring the other purposes of water like supporting aquatic life, recharge of groundwater, influence over salinity and estuaries etc. Similarly, the deficit is not associated with excessive demand, dependency and unsustainable and bad management methods of the basin for water needs. Finally, noting that ILR projects aim at supplying additional water for the irrigational needs, imposing a huge stress on large dams and inter-basin transfers, the article throws light on local solutions for improved water use efficiency in agriculture. The water loss incurred during the diversion, cost of water at destination, quantum of power generation are a few non-negligible parameters to assess the feasibility of such projects.

Adding to the above grounds of rejecting ILR projects is the article 'Linking of Major Rivers of India: Bane or Boon'[19] by B.P. Radhakrishna. The article adds a few more grounds that challenge the feasibility of the ILR projects namely, (a) identification of water-rich and water-poor basins is no

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17 Id. at 16

18 Late Bharat Singh was the former Vice Chancellor of the University of Roorkee and member of the National Commission for Integrated Water Resource Development Plan 1996-99.

19 *Supra* note 4, pp. 1390-1394

unanimous for instance, Mahanadi and Godavari have been regarded by the Central Government as water surplus but the Governments of Orissa and Andhra Pradesh claim otherwise; (b) inaccuracy regarding the flow data of rivers and mostly tributaries of the rivers for they can be an expensive task; (c) unavailability of the information to public disclosure; (d) lack of evidence of similar projects in other parts of the world; (e) apathy against construction of big dams and generally have a big push from political powers and bureaucracy. Preserving rivers in free flow condition is considered ecologically necessary and a few countries like the USA and Sweden generally do not advocate the projects of large dams.

Despite the conservationist position held by a few water experts, the links have nevertheless been initiated and are at different stages, for instance, a few have completed the pre-feasibility test and others are at stage of detailed and comprehensive study.

5. Interlinking River Projects in Karnataka

As mentioned earlier in the paper, the rivers Krishna and Pennar are identified as the water deficit while the west flowing river as water surplus. The Government of Karnataka had made six proposals that NWDA was to study. The two links Bhadra-Vedavathi (Vani Vilas Sagar) and Barapole- Upper Cauvery Link were dropped by NWDA at the request of Karnataka. Linking Almatti -Malaprabha and Malaprabha – Tungabhadra was prima facie not feasible. The PFR (Preliminary Feasibility Report) of Aghanashini-Varada link project has been completed and submitted but has not been taken forward.[20] Hence, of the sixteen probable links carried out by the NWDA in the peninsular component, the paper identifies links of Bedti- Varada, Netravati-Hemavati, and Krishna (Almatti) – Pennar for the study. The Mahadayi-Malaprabha diversion also falls within the scope of the study though not part of the NWDA project. The aspects such as the quantity of water diversion, the estimated area that gets benefited from the projects and the ecological and social impact it creates are recorded in the paper.

[20] Note on Interlinking of River, available at URL: nwda.com, visited on 25/02/2022

Bedthi-Varada Link

This link is proposed to provide water to the drought-prone Raichur district. It provides for the diversion of 242 Mcum of surplus water of Bedti basin to water deficient Tungabhadra sub-basin with two powerhouses with an installed capacity 1.8 MW to meet the requirement of power for lifting the water of 61.10 MW and total lift of 123.70 m in three stages.[21]

The project consists of two stages where reservoirs on Pattanadahalla stream and reservoir on Shalamahalla stream are linked in the first stage which is 8.5 kms long including 2.2 km long tunnel and in the second stage, water from the Shalamalahalla reservoir is linked to a tributary of Varada river through the canal/tunnel which is 14.83 km long with 6.8 km long tunnel.[22] The full reservoir level (FRL) of Pattanadahalla and Shalamalahalla dams are at 512.75m and 480m respectively, while the canal that takes off from the Shalamalahalla reservoir has the full supply capacity (FSL) of 520 m after an initial lift of 57.8m and outfalls into the stream leading to Varada river at the FSL 565m with additional lift of 65.9 m in two stages of 25.78m and 40.12m.[23]

This link has an ecological impact by submerging 787 ha of the forest land of 1005 ha of area in Uttara Kannada district. Around 130 ha of cultivable land and 88ha of non-agricultural land is subject to submergence. There however has been compensatory afforestation that is part of the project. The implementation of the same is a contested aspect.[24] The project also has socio-economic impact as it submerges one village displacing the population of 967. There is a possibility of a rehabilitation scheme to address the displacement but such schemes nevertheless get sidelined. The project has completed the PFR stage and is preparing the DPR (Detailed Project Report).[25]

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21 bedti-varada_link - India Wris Wiki (last visited on 25/04/2022).
22 Ibid.
23 Ibid.
24 *The Goa Foundation and another v. The Konkan Railway Corporation* AIR 1992 Bom 471
25 Note on ILR available at Note on ILR.pdf (nwda.gov.in) (last visited on 23/04/2022).

5.2 Netravati-Hemavati Link

This link is proposed to provide to the drought prone districts of Tumkur, Hassan and Mandya by diverting 188 Mcum of surplus water from Netravati basin to water short Cauvery basin to irrigate an area of about 33,813 ha under the command of Hemavathi irrigation Project.[26] The total lift of 81m is proposed to happen in two stages consuming the power of 6MW with the construction of a canal of 11km and three tunnels with length of 8.4 km.[27] Of the two stages, in the first stage, the surplus water of Yattinhole reservoir of Netravati basin will be lifted to a height of 19.50 to divert into Hemavathi river; and in the second stage, the combined surplus waters of Kerihole and Hongadahalla reservoir of Netravati basin will be lifted to a height of 61.3m for diverting into Hemavati river of Cauvery basin.[28] The water conveyance system from Yattinhole to Hemavathi river is 3.54 km, interlinking tunnel from Keri hole to Hangadhallad hole reservoir is 3.98km and from Hongadahalla hole to Hemavathi river is 3.30km.

The proposal details the submergence by the Yattinhole, Kerihole and Hongadahalla hole reservoir with the full reservoir level (FRL) of 900 m, 865.7 m, and 866 m respectively, as a total area of 765 ha, the submergence of forest land alone is 208 ha, while the non-agricultural land is 93 ha and agricultural land is 464 ha.[29] The project has completed PFR.[30]

Dr. Ramachandra, of IISc., Bangalore argues that the diversion of Yetthinhole will really not help the arid regions but give them only dry canals and on the other hand, the Yetthinhole catchment and regions of Hassan and Mangalore would suffer a water scarcity with lowered agricultural and fisheries yield.[31] The team from IISc has further challenged the availability of the 24

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26 Netravati hemavati Link available at summary_of_link_proposal - India Wris Wiki (last visited on 22/04/2022).

27 Ibid

28 Ibid

29 Ibid.

30 Note on ILR available at Note on ILR.pdf (nwda.gov.in) (last visited on 23/04/2022).

31 Ramachandra T.V. *et.al.* "Environment Flow Assessment in Yettinahole: Where is 24 TMC to divert?" 91, 3 ETR (2015)

TMC of water that the Government of Karnataka has proposed to divert from Yettinahole stating that the available water in the tributary is only about 9.5 TMC even in the monsoon period.[32]

The NGT in a petition that challenged the Yettinahole project for its environmental impact, allowed the government to continue the project subject to a few conditions and also rejected the appeal seeking an order to restrain the project. In the case *K.N. Somashekar v. Union of India,*[33] petitioners sought the intervention of the Green Tribunal to restrain the Yettinhole project arguing that the environmental impact has not been studied adequately and the clearances from the statutory bodies have been compromised. By camouflaging the project as the drinking water scheme, there was watering down of the Environment Impact Assessment. The Tribunal relying on the Kasturirangan Report that only prohibited a few kinds of activities of the project and not a prohibition of the project altogether, dismissed the petition and the appeal stating that they both lacked the merits, the project didn't fall within the national parks or wildlife sanctuaries and it was a drinking water scheme. It is also noteworthy that the Tribunal while imposing a few restrictions directed the State Forest Department and the MOEF to further study the project while in progress, its impact on the Western Ghats and to take appropriate measures to address them. However, the Supreme Court didn't prefer to interfere with the civil appeal against forest clearance for diversion stating that it's a peculiar fact of the case.[34] Now the ground of peculiar facts is a subjective element, it has initiated a huge resentment among the environmentalists.

5.3 Krishna (Almatti)- Pennar Link

The link of Mahanadi- Godavari- Krishna- Pennar- Cauvery- Vaigai-Gundar is one of the prominent parts of the peninsular component. The rivers

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32 Petitions Against Controversial Yettinahole Project Dismissed by NGT, *The News Minute*, available at Petitions against controversial Yettinahole project dismissed by NGT _ The News Minute.pdf (iisc.ac.in) (last visited on 24/04/2022).

33 Original Application No. 2/2016 (Southern Wing), NGT. The case was moved to NGT Principal Bench from the Southern Wing after the resignation of the environmental expert Nagendran.

34 Rithwick Dutta, The Peculiar Case of Yettinahole, available at The peculiar case of Yettinahole| *Deccan Herald*, visited on 24/04/2022. The author is the counsel who has represented the Appellant before the NGT.

Mahanadi and Godavari have been identified as the surplus sources and feeders to the water-deficit rivers such as Krishna, Pennar, Cauvery and Vaigai. The Krishna (Almatti) – Pennar link diverts 1980 Mm^3 of water from Krishna for *en route* utilization in Krishna and Pennar basins, where a 587.175 km long canal starts from Almatti dam and runs through the districts of Bagalkot, Vijayapur, Koppala, Bellary, Raichur in Karnataka and Anantapur district of Andhra Pradesh and finally joins the Maddileru, a tributary of river Pennar.[35] The project has completed the FR stage.[36]

This link has a greater probability of inter- state confrontation as the river Krishna is an inter-state watercourse. The allocation of waters to the riparian states such as Maharashtra, Karnataka and Andhra Pradesh were decided by the Krishna Water Dispute Tribunal as 15857 Mm^3, 19822 Mm^3 and 22654 Mm^3 respectively[37] in the view of total availability of nearly 2060 TMC (at 75% dependability). This award was subject to review by May 2000. The review and draft award estimated the entire average water to be at 2130 TMC (at 65% dependability). For the distribution of 163 TMC and 285 TMC surplus, it was determined to allocate 28345. 46 Mm^3, 25797.2 Mm^3, and 18860 Mm^3, to Andhra Pradesh, Karnataka and Maharashtra respectively[38]. The final verdict by Justice Brijesh Kumar retained the apportionment subject to minimal change. However, the verdict of the KWDT was challenged by Andhra Pradesh at two instances in 2011 and 2014.

Further for the purpose of the diversion through the link, the diversion that is proposed is only 1980 Mm^3 of the total water of 19128 Mm^3 allocated to Karnataka by the KWDT -I. The only conflict was with regard to the height of the Almatti dam which was raised from 160 meters MSL to 524 meters MSL pursuant to Justice Brijesh Kumar Tribunal.

The NWDA has declared to have conducted an environmental, ecological and socio-economic impact of the link at the PFR stage along with the

35 Executive Summary, Krishna (Almatti) – Pennar link, available at Microsoft Word - Execu.Summary.rtf (nwda.gov.in) (last visited on 24/4/2022).

36 Note on ILR available at Note on ILR.pdf (nwda.gov.in) (last visited on 23/04/2022).

37 Krishna Water Dispute Tribunal Award, 1973.

38 Report of the Krishna Water Dispute Tribunal with the Decision, 2010, Vol 1 p. 800-811

assistance of a consultancy along the entire stretch of the canal and the command area.[39] The link requires a forest area of about 71 ha altogether where a portion of which passes through reserved and protected forests and forest plantations in Karnataka such Agoli reserved forest, Manchuri reserved forest and Billakallu reserved forest, Kasankandi protected forest, Karnataka State Forest Department Nursery and Forest Plantation of Karnataka State Forest Department at Village Alipura.[40] The Report provides for the mitigation measures by compensatory afforestation programme to be implemented 142 ha of land and canal bank plantation at the cost of Rs. 39 lakhs as compensation for the loss of vegetation. The wildlife is also expected to be affected by the canal passing through the forest areas and Daroji Bear sanctuary. About four endangered species of animals listed in the Schedule I of the Wildlife Protection Act 1972, such as Leopard, Indian Wolf, Great Indian Bustard and Black Buck are to be affected.[41] The mitigation measures are very minimal and limited, expecting the wildlife will temporarily migrate to other areas of the forest, explore the possibilities of realignment to protect the area and improve the ecology with the budget of Rs. 15 lakhs. The Kalvapalli reservoir on the other hand, is to provide water for the wildlife in all the seasons. The cultivable wastelands account for about 31.6% and uncultivable land of about 7% which arguably have a least adverse impact on agriculture as agricultural practices in these regions are constrained by the lack of irrigation.

The socio-economic benefits are reported to increase agricultural production by 3-4 times, improvement in cropping pattern and agricultural practices, industrial and socio-economic development giving impetus to agro-based small industries, diary, poultry, pisciculture, raising the standards of living with the development of communication network, infrastructure, health and education facilities, improvement in vegetation cover, employment generation

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39 Environmental and Ecological Aspects of the link available as a part of Pre-Feasibility Report at Microsoft Word - Environmental and Ecological aspects.rtf (nwda.gov.in) (last visited on 24/04/2022).

40 Id. at 1

41 Id. at 2

with the potential of 14200 personnel per annum.[42] The submergence of two villages of the Kalvapalli area in Andhra Pradesh is because the Kalvapalli reservoir has been identified for which the Resettlement and Rehabilitation Plan (R & R) has been proposed involving the development of their resettlement sites and compensation. The project however, does not submerge any region within the limits of Karnataka.

5.4 Mahadayi- Malaprabha link

Mahadayi as known as Mhadei or Mandovi originating in the Belagavi district in the Western Ghats of Karnataka, drains an area of 2031 sq.km. of which 375 sq.kms lies in Karnataka, 77 sq.km in Maharashtra and 1579 sq.kms in Goa. The dispute arose when the Government of Karnataka intended for a project that diverted the 7.56 TMC water from the river Mahadayi to Malaprabha basin through the interconnection of Kalasa Canal and Banduri Canal. The Kalasa- Banduri Canal aimed at providing water to four districts of Karnataka namely Belagavi, Bagalkot, Dharwad and Gadag. The drinking water problem of these regions were claimed to be solved if the water was diverted.

In 2002, the State of Goa requested for the constitution of the tribunal and the Central Government also concluded for the adjudication of the matter as per the provisions of the Inter- State River Dispute Act 1956. Subsequently, Goa sought the intervention of the Supreme Court in 2006 for setting up of a water tribunal and stayed the construction activities for the diversion. The Mahadayi Water Dispute Tribunal was constituted in 2010 and it delivered its award in 2018.

The award of the tribunal is as follows (a) 1.5 TMC of water shall be available for in-basin consumptive use of drinking water and irrigation within the basin; (b) the diversion of 2.18 TMC of water at the proposed Bhanduri dam and 1.72 TMC of water at the proposed Kalasa dam is allowed; (c) development of Mahadayi Hydro Electric Power Project at Kotni for hydropower generation, (in addition to aforementioned 1.5 TMC consumptive

[42] Id. at 35-37

use of water within the basin for drinking purpose), where a maximum of 8.02 TMC a non-consumptive use is allowed.[43] The diversion as well as the hydro-electric power project are allowed provided, Karnataka undertakes a fresh planning and development of a scheme for consumptive use within the basin or diversion outside the basin, makes a Detailed Project Reports and gets them technically appraised by the central agencies and takes all the approvals and mandatory clearance required by law.[44] The two other demands of Karnataka for diversion 5.52 TMC of water from Mahadayi basin to Supa reservoir of Kali hydro-electric power project and diversion of 7 TMC from proposed Kotni reservoir of the Mahadayi Hydro Electric Power project were not found justifiable hence rejected by the Tribunal.

The Goa Government has expressed its resentment against the tribunal's award by stating that such a decision has affected about 43% of the Goan population. The award is also said to have ecological impact as it affects the Mhadei wildlife sanctuary which is 300meters away from the proposed Kalsa project and the increased salinity in the estuaries because inadequate water affects the freshwater ecosystem. However, the state parties have approached the Supreme Court on the award. The awards of the tribunal is a green judgment for its emphasis on the DPRs and clearance which is discussed at a great length in a separate chapter of this book. For the purpose of the paper, the affirmative stance of the tribunal for diversion and linking Mahadayi to Malaprabha has fortified the claims of Karnataka to some extent. Further, Shri Javdekar, the Union Minister of MOEF has diluted the requirement of EIA for Kalasa- Banduri by stating that no EIA is required for projects concerning drinking water.[45] The Government of Karnataka has been in the task of preparing a detailed project report of the said linking. On the petition by Goa that Karnataka has breached the Supreme Court's order by diverting the water through the Kalasa canal, the Supreme Court has ordered a Joint Inspection Committee constituting the members of Goa, Karnataka and

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43 Award and Final Decision of the Mahadayi Water Dispute Tribunal, Vol XII, p. 2697- 2700

44 Ibid.

45 If required we will go against Union Minister Javedkar: Goa CM on Mahadayi river issue- *The New Indian Express*, (last visited on 25/04/2022).

Maharashtra to inspect the spot for any diversion.[46] Karnataka then submitted a report stating that the diversion project has been halted, that there has been no contempt of the Court and the water in the canal is not diverted water but the seepage.[47]

6. Summing Up

The interlinking rivers and inter-basin transfers are often viewed with a great skepticism as their success is highly unpredictable. The success of these projects involving a huge expenditure are not just completely dependent upon the rainfall to water surplus rivers (especially in the peninsular region) but also has the probability of rendering both the supplying and the arid region waterless in the event of failed rains. It is argued that the consequences of these projects on the ecology and environment are significant and immediate as the reservoirs and canal for interlinking projects require a vast area of forest lands which in turn affects the wildlife in the forests. The indirect and relatively remote consequences of these projects have been argued to have on the surface water like estuaries and groundwater in the supplying area. The socio-economic outcome because of the evacuations and displacement is an aspect that cannot be ignored despite the rehabilitation and replacement measures. The ecological and socio-economic factors have often outweighed the benefits of these projects.

The water experts however suggest alternative measures rather than being excessively optimistic about the ILRs. The alternative measures include looking for solutions within the basin, increase the catchment and percolation areas for groundwater, reviving the traditional means of irrigation systems, choice of crop from water intensive to water minimal, reliance on the surface water for non-consumptive uses, rainwater harvesting, reuse of the waste water to name a few.

The links in Karnataka i.e., the Bedthi- Varada, Netravathi- Hemavathi, Krishna (Almatti)- Pennar and Mahadayi- Malaprabha are all in the stage of

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46 Ajith Athrady, No diversion of Mahadayi basin water: Karnataka tells SC | *Deccan Herald* (lastvisited on 25/04/2022).

47 Ibid.

preparing the DPRs with comprehensive reports and obtaining clearances from the concerned authorities. Many of the links have been challenged before the courts and NGT, but the decisions point towards the DPRs and studies that are to be conducted in order to continue or halt the projects. There, however have been instances where the NDWA has dropped the projects finding them non feasible, for instance, and Almatti -Malaprabha and Malaprabha – Tungabhadra. This remotely points towards the reminiscence of the precautionary principle in India where the preliminary study determines if the project is to be taken forward or dropped.

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7

A STUDY OF DRAFT STATE WATER POLICY 2021

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The Water Resource Department, Government of Karnataka, understanding the growing socio-economic conditions, identified the inter-sectoral demands of water and the need for ensuring water security which promotes the food and economic security of the state. This necessitated the need for a revision of orientation and strategies, a policy that will address the water challenges through the means of Integrated Water Resource Management (IWRM).

Preamble

The policy provides certain facts of the State such as the area that it covers measuring 1,90,500 sq. km amounting to 5.83% of the area of India; population figures estimating to be 67.6 million in 2018 and 23% of the people living below poverty line amounting to 14.2 million.

The policy further identifies two river systems, the Krishna and its tributaries such as Bhima, Ghataprabha, Vedavathi, Malaprabha and Tungabhadra of the north and the Cauvery and its tributaries namely Hemavati, Shimsha, Arkavathi, Lakshmana Thirtha and Kabini in the south as the main river systems of Karnataka. The west flowing rivers like Mahadayi, Kalinadi, Bedti, Aghanashini, Sharavathi, Nethravathi, Varaha have not been positioned equivalent to the main rivers systems for their short flow range. However, it is noteworthy that some of these west flowing rivers with a short range are found to be water surplus and have been channelized to water feed the water deficit tributaries of the east flowing rivers in the interlinking projects and inter-basin transfers.

The water availability is found to be limited in Karnataka because of it being drought prone and is also called as the second most water-stressed state within India after Rajasthan. The policy identifies that the irrigation water used is important, but dependency on the ground water for the same is about 26%. The Policy further points out that agriculture accounted for about 84% water diversion and that water demand may reach 52,366 million m^3 by 2025. The demand for water is going to manifest three times by 2025 from the demand in 2000 because of water requirements by the sectors such as livestock, fisheries and aquaculture. The climate has unprecedented and unpredictable change ranging from severe droughts to extreme rainfall. The policy estimates a 10-18% increase in the drought incidents in the northern districts during the Kharif season and other districts doubling the drought frequency. Floods in Karnataka on the other hand is 10-20 times more than the normal rainfall.

Drawing inspiration from the international experience, the Policy argues for the Integrated Water Resource Management (IWRM) as an appropriate model for sustainable outcomes and suitable for transition and adaptation to climate change. The Policy mentions IWRM to include an institutional framework and modern legislation that is inclusive of integrated and adaptive policy approach. The model is also to include water resource assessment, planning and management of surface water, groundwater and recycled water. The participation of the stakeholders and community is identified as key in the management. Regular monitoring and evaluation to determine the planned outcomes is identified as an essential component of the IWRM. The Policy determines that the IWRM will improve the water availability, water resource and environmental conditions. It is also expected to improve the water service and performance.

In formulating a vision on water, the Policy traces the response of the Government of Karnataka and various other related visions which were limited to the scarcity of water resources. The IWRM, on the other hand, prioritizes sustainable and improved use and development of its water resources. It is also to be applied across various sectors and institutions.

Goals of the State Water Policy 2021

The objective of the water policy is to facilitate the water security and optimal utilization of the water resource for health, food, energy, environment and societal purposes. The Policy proposes to achieve this objective in following ways.

1. Ensuring water security for the entire population.

The Policy aims to secure the supply of adequate clean, accessible, affordable and safe water to all citizens for drinking and domestic purposes. The limitation of the water security to the citizens is juxtaposed to the right to clean drinking water under Article 21 and the right is not limited to the citizens but is to be made available to all the people. The drafters had to increase the scope of the water security to make it inclusive and in consonance with the Indian Constitution.

In order to meet the expectations and entitlements of the water users and to promote economic development, the Policy intends to secure sustainable supply of water of adequate quality for agriculture and other uses. The Policy premising on the principles of sustainable development intends to achieve the water security only with due regard to protection of environment and minimizing the vulnerability to drought, floods and pollution.

The water security may only materialize with the appropriate institutional and legal framework that shall regulate and manage both surface water and groundwater. For instance, the scheme of the Central Government, Atal Bhujal Yojna (Atal Jal) centers around the objective of providing water security and has institutionalized and legal framework supporting it.

2. Improving the efficiency of urban and rural water supply, industrial water use

The role of the local self-governments under the 73rd and 74th Amendment especially their role *vide* Article 243 read with Schedule 11 and 12 of the Indian Constitution may be highlighted here. The Policy requires that 24*7 water supply schemes have to be adopted by the urban local bodies and rural bodies, the panchayath raj institutions have to strengthen the access to safe drinking water

from sustainable sources. The sustainability of water sources in the rural areas have to be prioritized.

The reduction of non-revenue water by better managing the losses and wastage through effective measures UWS schemes and RWSS schemes is required by the policy. It also promotes recycling of waste water and promotion of water recovery systems to reduce dependency on fresh water. It also requires recycling, necessary treatment for industrial effluents and use of the recycled water and waste water for secondary uses.

The Policy advocates for achieving full metering coverage for water use to increase the accountability and recover the service charge. A strong tariff system to encourage sustainable use of water is to be put in place with a set of incentives and penalties. Though the strong tariff system encourages the people to use water wisely and be accountable to it, it nevertheless raises theoretical challenge of commodification of water in the light of Permanent Sovereignty over Natural Resources[1]. The principles of PSNR[2] emphasize on free and beneficial exercise of such sovereignty and anything that is violative of such exercise as an international wrong. The concept of 'resource nationalism' and 'public trust' limits the states from commodification of natural resources. However, at the domestic level too, there are the challenges of affordability that the Policy has to meet. The exclusion of a few areas/ wards from 24*7 water facilities may be influenced by the economic incapacity of the poor households to meet the metering raising the challenge of equitable allocation of material resources as per Article 39.[3]

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1 General Assembly Resolution 1803 (XVII) of 14th December 1962, 'Permanent Sovereignty over Natural Resources'. The resolution throughout its texts holds the sovereignty of the people on par with that of the Nations, making the principle of self determination clear.

2 Id. The Principles 1, 5 and 7.

3 Article 39(b) enumerates 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 sub serve the common good."

3. Improving the efficiency and productivity of irrigation water in agriculture and livestock

The Policy greatly emphasizes the modernization of irrigation and introduction of technology and innovation within the sections of agriculture and livestock. The Policy hopes that with modernizing and regulating the reservoir, the irrigation is provided to all the allocated water users and the water demand is met. The modernization is expected to reduce water wastage. It is expected to be achieved by a systematic study and planning making the best use of contemporary technical, economic, environmental and social assessment. Highly controlled irrigation technologies such as automated canal control, drip and spray irrigation technologies are to be introduced where appropriate.

The Policy does not mention anywhere the importance of reviving traditional irrigation systems. Modernizing the irrigation systems for improving the water use efficiency and enhancing the water productivity is no doubt of high priority. The traditional irrigation systems practiced in Karnataka are nevertheless of similar stature. The traditional methods of irrigation like Kattas. Surangas, Kalyanis, Madakas, Jotte, to name a few are excellent alternatives and viable means of irrigation. The Center had made a detailed study on the working of Kattas in the districts of Udupi and Dakshina Kannada in Karnataka and Kasargod of Kerala. The outcomes of the study demonstrated the desirability of the local communities towards the Kattas over the concretized Vented Dams (VDs). The traditional knowledge and the skill with which the Kattas are built is noteworthy. The community sentiment towards these structures was overwhelming. The other traditional irrigation systems have their own benefits to the local communities based on the geographical terrain. There is a need in the Policy to emphasize on the utility of the traditional irrigation structures, conserve and maintain them on par with modern structures.

The Policy requires that in order to protect the livelihoods, food and nutritional security of the people, the water allocation may be prioritized for fisheries and aquaculture both at reservoirs and inland water bodies like tanks. The Policy seeks to achieve economic, social and environmental justice by supporting farmers and industry to adopt suitable engineering, agronomic, crop

intensification and diversification, harvest and post- harvest technologies, processing and marketing.

The Policy promotes conjunctive and sustainable use of both surface water and groundwater to minimize the scarcity and drought. However, the reports from the Atal Jal,[4] shows that there is a deficit in the availability of groundwater and a few areas are identified as over-exploited since the extraction of groundwater is greater than its capacity to replenish. Whereas, the availability of surface water is often found in surplus, raising a strong contention of its non-utilization owing to improper or lack of channelization. The fragmentation of jurisdiction is yet again an underlying reason for such delayed or inefficient channelization. An integration of the departments in furtherance of the holistic objective to best utilize surface water should necessarily be a part of the Policy.

The Policy also lays down the need for establishing participatory irrigation management with the involvement of the primary stakeholders in the planning, operation and maintenance of irrigation systems and transfer of the ownership of assets. Several attempts have been made by the Government of Karnataka[5] to include the farmers and other sections of people in the irrigation management. The reluctance from the community towards the participation renders the initiative inefficient, for instance, only 25%- 30% of the societies registered for the said purpose are efficiently working.

4. Improving the health of watershed and water bodies

The Policy highlighting the importance of the health of land, water, vegetation in the watershed to achieve sustainable and ecological harmony points towards participatory integrated watershed management. This has been the Policy of Andhra Pradesh with the integrated conservation of *Jal, Jungle and Jameen*.[6]

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[4] The Centers' preliminary study of Atal Jal reports of Gadag, Bagalkot and Belgaum before the submission of the Water Security Plan.

[5] Water and Land Management Institute has several initiatives of such nature to involve the farmers with engineers to jointly manage irrigation. Many workshops and capacity building programs are conducted by WALMI Dharwad to further the initiative.

[6] This has been discussed in the chapter on Groundwater of this book.

The Policy further ventures into the conservation and protection of watersheds, water bodies including rivers, lakes, wetlands, coastal zones and groundwater dependent ecosystems through regulation and enforcement of water usage, land use, environmental flows, operation of water infrastructure, water pollution and waste disposal. The decisions of the Courts, in order to protect and conserve water bodies, have gone to the extent of treating them as legal persons. The decisions of *Salim Ali*[7] and subsequently, *Lalith Miglani*[8] didn't limit the legal personality to river Ganga and Yamuna alone, but the ecosystems of Gangotri and Yamunotri after being inspired by New Zealand's move in recognizing River Whanhanui as a legal person. The Supreme Court has, however, stayed the case to examine the legal ramifications of the said position.

Another important observation is that water pollution is not being identified as a theme in itself. It is needless to mention the wrath pollution is causing to the freshwater. The only minimal freshwater is also inutile subject to pollution. The aspect of pollution finds its place only as a problem needed to be mitigated in order to maintain the health of water bodies.

The Policy further draws attention to the problem of encroachment of land around the water bodies, especially the classified ones. In one of the preliminary studies of the Center on the tanks and kalyanis[9] reveals a wide range of encroachments happening on the tanks and the areas around them. An effective legal and administrative regime is essential to address the problem of encroachment. The policy further highlights the need for land use management plans to increase capacity, reduce erosion and protect ecological areas.

5. Moving towards sustainable groundwater management.

The Policy though does not explicitly mention Atal Bhujal Yojna (Atal Jal), it does mention about the Water Security Plan (WSP) at Gram Panchayat level in the over-exploited and crucial talukas to converge both the supply and demand

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7 *Mohd. Salim v State of Uttarakhand*, Writ Petition (PIL) No.126 of 2014

8 *Lalit Miglani v State of Uttarakhand*, Writ Petition (PIL) No.140 of 2015

9 The Center has undertaken study on Tanks and Kalyanis in the Districts of Hassan, Shivamogga and Haveri.

side of the water chain. It also requires setting up an appropriate institutional and legal framework for regulation and management of surface and groundwater quality and quantity. Without reforms within the 2011 Karnataka Groundwater Act, there cannot be progress at the institutional level. It also makes ambiguous reference to base flows of rivers.

6. Improving Water Governance

Improvement in the water governance requires integrated efforts from all the institutions since fragmentation of jurisdiction is a hurdle. To meet the goal of the Policy that is to manage water resources efficiently, effectively and sustainability, there is a need for capacity building both in the governmental as well as non-governmental institutions. The role of NGOs in the protection of environment was recognised by the international community during UNCED 1992[10]. Subsequently, all the parties to such a multilateral framework have identified the role NGOs have to play in sustainable use of resources. Likewise, the Policy also extends the capacity building towards NGOs to equip them for the cause.

The Policy to ensure equitable and efficient sharing of water provides for the development of water entitlements, allocation, infrastructure and their management. The social dimensions in the Policy are subtly paradoxical as the metering of water consumption and equitable allocation both find their place within the goals.

The Policy in need to adapt to change variability and manage climate change intends to utilize the assessment made through the technical, social, environmental and economic studies and further arrange collaborative approaches with leading national and international partners, both government and private sectors. However, it is pertinent to note that there exists a lacuna within the Indian environmental legal regime concerning climate change. India has been

[10] United Nations Conference on Environment and Development 1992 held in Rio de Janeiro, Brazil. The outcome of the Conference was the Rio Declaration, Agenda 21, United Nation Framework Convention on Climate Change, Convention on Biological Diversity and the Statement on Forest. The Declaration and the Agenda 21 emphasized on the role NGOs have to play in ensuring sustainable development.

party to UNFCCC[11], Kyoto Protocol[12] as Non- Annex I state[13] and the Paris Agreement.[14] The only initiative towards climate change is the National Action Plan on Climate Change (NAPCC) 2008, with its eight subsidiary missions. The environmental legal regime is piecemeal and inadequate to comply with the international obligations India has undertaken. There is all the more need for a comprehensive domestic law in this direction.

The Policy provides sufficient space for the privatization of water management by mentioning the financing and water charging systems to ensure long-term operation and maintenance of water infrastructure assets and meet needs of water users. On the other hand, it encourages effective participation of the users in development and management of the State's water resource. This might be drafted in line with the National Environmental Policy 2006, that lays out the strategy of involving multi stakeholders by encouraging different kinds of partnership[15]. The newest kind is Public-Private- Community Partnership and this kind is perhaps what the Policy is indicating.

7. Managing water resources by adopting integrated approach

The Policy from its preamble has maintained the importance of an Integrated Water Resource Management as an appropriate means of preservation and conservation of the water resource and allow development sustainably. The Policy recognizes that in order to achieve such goals the water balance is to be maintained, river-basin and sub-river basins are to be treated as a management unit and the development of the basin has to be holistic.

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[11] India Signed on 10 June 1992 and ratified on 01 November 1993

[12] India Ratified on 26 August 2002

[13] The Kyoto Protocol splits the nations into Annex I and Non- Annex nations. Annex I are the industrialized nations who are obligated to reduce greenhouse gas emissions subject to their ratification. The Non- Annex I parties are the developing states like China and India who are just to report their emissions and do not have legally binding emission reduction targets.

[14] Indian signed on 22 April 2016 and ratified on 02 October 2016

[15] The different kinds of partnership encouraged by the National Environmental Policy 2006, is Public-Community Partnerships, Public-Private Partnerships, Public-Community-Private Partnerships, Public-Voluntary Organization Partnerships, Public-Private-Voluntary Organization Partnerships.

The interdependencies between the surface and groundwater as a part of one resource with special needs of water flow and adequate water quality is another interesting feature of the Policy. This development of treating the surface water and groundwater as one unit can be traced from the decision of Supreme Court (concerning Cauvery) in *State of Karnataka v. State of Tamil Nadu*,[16] where it was laid down that the availability of water in the inter-river basin is to be estimated by an inclusive calculation of the surface and groundwater.

There is also a need felt for a comprehensive, shared, cross-sectoral accessibility of information and knowledge system and consistency of objectives and approaches.

The Policy further adds a gender aspect to the goals to recognize the important role of women in water resource management and ensuring their direct involvement at the different levels of governance. The Policy takes refuge in cultural feminist school by encouraging participation of women in decision making and governance. This feminist school celebrates 'feminine' attribute of women as strong, innate and powerful as distinguished from 'masculine'. Since the 'feminine' is also associated with traits of nurture, care and compassion, the Policy presumes such manifestations in the governance if provided adequate participation.

The goals of the Policy are identified in the above seven broad themes. Water pollution has failed to be recognized as one of the themes to be strategically solved. There has been, however, a mention of water pollution in one of the sub themes on 'improving the health of watersheds and water bodies. Such neglect of water pollution as a specific head has watered the ideals of integrated approach towards water management. With inclusion of pollution as one of major challenges there would have been sufficient room to involve the Karnataka State Pollution Control Board. This would have served the dual purpose (a) Making the Policy more inclusive and apt to water challenges and (b) increase the efficiency of the SPCB.[17]

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[16] (2018) 4 SCC 204-206 paragraphs 426-430fo (India).

[17] Sec 4 and 17 of the Water (Prevention and Control of Pollution) Act 1974. The provisions provide for the constitution of the state board and lay down its functions respectively.

Strategies

The Policy in order to fulfill the goals proposes thirteen strategies. The paper provides an overview of the strategies.

a. Priorities for water use

The water uses within the state has to be prioritized by allowing the domestic uses to have an overriding priority and in normal conditions water allocation will be optimized for other uses. However, at times of scarcity the priorities for the supply of the water will be given in the order of domestic uses, irrigation, livestock, fisheries and aquaculture, hydro-power, industry, ecology and other uses. The prioritization of water use is just not limited to being a subject matter of policy but is also a legal principle that operates as a restriction on the upper riparian owners not to obstruct water *ad libitum*. *McCartney v. Londonderry and Lough Swilly Rly, Co. Ltd.*[18], Lord Macnaghten observed

There are, as it seems to me, three ways in which a person whose lands are intersected or bounded by a running stream may use the water to which the situation in his property gives him access. He may use it for ordinary or primary purposes, for domestic purposes, and the wants of his cattle. He may use it also for some other purposes - sometimes called extraordinary or secondary purposes - provided those purposes are connected with or incident of his land, and provided that certain conditions are complied with. Then he may possibly take advantage of his position to use the water for purposes foreign to or unconnected with his riparian tenement. His rights in the first two cases are not quite the same. In the third case he has no right at all.

Subsequently several decisions by Indian Courts made distinction between the water uses i.e., primary/ordinary, secondary/extraordinary and uses not connected to riparian tenement. For instance, *Ram Bhatta and others v. Krishna Bhatta and others*[19], *State of Bombay v. Laxman Sakharan*

[18] 1904 AC 301 reiterated in the decision of *Mahi Singh And Ors. vs Chunko And Ors*. AIR 1970 Delhi 114

[19] 1962 KLJ 45

Pimpakar and others[20]*, Devinder Singh Kalta v. State of H.P.* [21] *, Bhagaban Panda v. Bairagi Naik,*[22] *Mahi Singh v. Chunko*[23]*, Palapati Ravichandra Reddy, v. The Government of Andhra Pradesh*[24] to name a few.

b. Rural and Urban Drinking Water

Prioritizing the drinking water needs of the urban and rural communities, the State has to undertake the drinking water supply programs to increase 24*7 also during the times of scarcity. Extraction, treatment, supply, transmission of water and service providers for effective bulk supply and distribution has to be made. However, since the public private partnership is encouraged in the supply and distribution, it remains to be seen how the IWRM through convergence of such agencies will effectively function. The Policy requires the user charge system to be implemented effectively through incentives and penalties keeping in sight the affordability of all sections. The Policy perhaps intends on a different pricing pattern depending upon the socio-economic status.

The Policy imposes a limitation on the groundwater use to be used for domestic purpose and not for commercial purpose. It however doesn't specify if this is applicable to rural areas as the 65% of the irrigational needs of the rural areas are met through groundwater.[25]

c. Managing State's Water Infrastructure for Irrigation

The Policy points towards the creation of a State Dam Safety Organization (DSO) that shall aim at minimizing the impacts of development on the environment, minimizing the costs and impacts from water disasters, mitigating climate variability and climate change and avoidance of infrastructure failure.

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[20] AIR 1960 Bom 490

[21] CWPIL No. 79 of 2018. The court held that "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."

[22] AIR 1964 Ori 165

[23] AIR 1970 Delhi 114

[24] PIL No.337 of 2012

[25] See Atal Bhujal Yojna Guidelines, available at Atal_Bhujal_Yojana_Program_Guidelines_Ver_1.pdf (mowr.gov.in) (last visited on 09/04/2022).

The disaster management regime, environment impact assessment, sustainable development through NAPCC to name a few have the above listed goals. The DSO[26] on the other hand, are the bodies with the advisory capacity to intervene in dam safety and rehabilitation measures. The DSO with undefined roles and skeletal staff handling the challenges of climate change and infrastructure failure is farfetched.

The Policy mandates the State to ensure the water management agencies manage their water infrastructure through assets management plans that include operation and maintenance. There is also a need felt for the overall water services approach with user feedback and their involvement. The expenses of the operation and maintenance of the water infrastructure is to be met through a combination of water service charges and government finances. The water service charges, nevertheless, will be monitored and regulated by the government.

d. Modernizing Irrigation

For enhancing the water productivity of the irrigation system, priority is to be given to the management, operation and maintenance of irrigation. An assessment of overall river basin has to be made in order to raise efficiency and re-allocate water to other uses.

The Policy further requires the state to progressively upgrade the infrastructure to modern standards with the utilization of IT and automated systems in upgrades and modern irrigation technologies after making assessment of the conditions and demands. It furthers the idea of demand management and improved on-farm agronomics.

The participation of water users through WUCS[27] and WUC federations as a principle of Participatory Irrigation Management (PIM) is encouraged in planning, implementation, and MOM.[28]

The Policy mentions the role of river basin water manager in operation of the dams. Such an authority has to coordinate to maximize benefits from

[26] http://www.cwc.gov.in/damsafety/sdso
[27] Water Users Cooperative Societies
[28] Maintenance, Operation & Management

supplying downstream water entitlements and mitigate the effects of drought and flood control.

e. Agriculture, Livestock and allied sectors

Water Productivity (WP), which connotes the quantity of crops produced using a unit quantity of water, should be documented and monitored. A system of motivation and incentives will be brought to encourage farmers for changing from water intensive crops to water economic ones and for growing less water demanding varieties of crops. Incentives shall be extended to farmer innovations in irrigation as the experience on the field study showed that the farmers' innovations have been significant in the field of irrigation. The scope of the incentives and motivational measures in Policy may be extended to cover such innovations as well. The Policy mandates the State to provide incentives, finances and material to promote Natural Farming/ Organic Farming/ Zero Budget Farming and Integrated Farming System in agriculture, horticulture and sericulture to reduce evaporation losses and increase the income of farmers. The State further has to encourage fisheries and aquaculture in water logged, saline lands and brackish areas. The water shares in the water budget of reservoirs have to be allotted to fisheries and aquaculture. Also, coordination among animal husbandry, RDWS[29] and gram panchayats for promotion of green fodder production has to be made.

f. Recycling, reuse of treated wastewater and rainwater harvesting

The State has to encourage the use of treated wastewater and recycled storm water for non-potable purposes in the urban areas. The water demand may be addressed with the inclusion of recycled water within the urban water supply. The use of waste water may be extended to irrigation where the water availability to the crops is enhanced. Rain harvesting and water conservation measures in the rural and urban areas in partnership with the institutions have to be enhanced.

The problem of pollution and its measure finds place within this strategy. Adequate measures are to be taken to address the problem of point source and

[29] Rural Drinking Water and Sanitation Department.

nonpoint pollution from various sectors and also the solid pollution of water bodies have to be prevented.

g. Industrial water use planning

The water planning has to transfer water to industry to increase the overall state economic growth, productivity and employment. The industries in turn have to conserve water, ensure its recycling and reduce discharge of polluted water. This has to be supported by a system of pollution discharge licensing. Water intensive industries, such as thermal power plants to upgrade their technologies and move towards less water consumptive processes.

h. Information and knowledge management

To ensure evidence-based policy making, water resources planning, development, operations and management a statewide system called Karnataka Water Resource Information System is to be developed. This system will integrate hydro-meteorological, surface & groundwater, quantity and quality, land and water use, water related environmental assets and conditions, demographic, economic, social and other data. The data has to be reviewed and upgraded to address the new emerging challenges.

A state 'Karnataka Water Resources Inventory' will be produced to assess the extent, uses and condition of water resources and provide a basis for making future policy and planning.

i. Water resources planning and development

The State has to initiate multi-sector water resource planning of the river basin and sub-basins so that there is development of water resources and extension of water supply and food security. The plans include surface and groundwater, water quantity & quality, future water uses and demands, economic, social and environmental aspects. They shall also determine sustainable use of water, health of the hydrological system with necessary strategic environment assessments. The environment impact assessment includes the impact upon the existing users, cultural assets, social impact assessment, appropriate resettlement and rehabilitation arrangements.

j. Conjunctive use of surface and groundwater

The Supreme Court decision[30] has laid down that the water availability in the basin has to be estimated by calculating the surface and groundwater. Here, the Policy emphasizes on the overall water entitlements and annual water allocations approach to be based on the availability of both surface and groundwater. The Policy further highlights the need for a strong system that regulates, measures and monitors surface and groundwater so that water use is clear, transparent and equitable. The efficiency of the permit system of Karnataka Ground water Act 2011 might be challenged. The conjunctive use has to be planned for water resources to be used optimally.

k. Improving watersheds, rivers and environment

The State has to improve the health of the watershed and water bodies by exploring partnership with the watershed committees, communities, panchayats and national government. A need for a long term strategic approach that will guide future policy and government investment is felt. Water quality and ecological conditions, management of coastal zones and erosion in critical areas have to be addressed with suitable measures. The chemical infiltration to the groundwater is another problem Karnataka is grappling with, as the composition of chemicals like chloride and fluoride is being found in increasing quantities because of the overdraft of groundwater. The Policy may highlight the need for measures to be taken to improve the health of groundwater. The specific mention of chemical infiltration may be added to this strategy.

Community based integrated land and water management plans have to be developed on a pilot basis. The Policy encourages research and extension activities to assist farmers adopt sustainable agricultural methods. Afforestation activities have to be continued as they have proven to improve the health of watershed and water assets.

l. Climate change, flood and drought management

The Policy proposes a combination of structural measures such as flood retention, by-pass works and non-structural measures such as flood risk

[30] *State of Karnataka v. State of Tamil Nadu,* (2018) 4 SCC 204-206

mapping, land use zoning and regulation, modern flood forecasting and warning systems, flood preparedness and disaster relief to be an integral part of flood management. The use and conservation of water from the floods may be explored with planning and infrastructure to address the problem of water scarcity.

The risk of drought is to be managed with improved forecasting and drought preparedness, improved water sharing and entitlement systems, appropriate watershed management and harvesting measures, groundwater recharge, insurance and government assistance. Also, the Policy recommends a State Specific Action Plan for Climate Change in line with NAPCC.

m. Participation of the community

The participation of the communities in the water management has its own significance. The participation of the end users of the urban and rural water supply and participatory irrigation management have to be encouraged. The women are to be included in a customer and service focused approach. Participatory arrangements are to be implemented in the management of tank systems and in the administration of watershed areas. Voluntary participation of the community in land and water management are to be promoted and programs to create awareness and concern have to be undertaken.

The Policy thus enumerates a long list of strategies, but doesn't provide for the facilitation of the interlinking of rivers or the inter-basin transfers. The National Water Development Agency (NWDA) was to conduct the study on six proposals made by Karnataka. The Karnataka Government, however, requested two links to be dropped namely Bhadra- Vedavathi (Vani Vilas Sagar) and Barapole- Upper Cauvery Link). The pre-feasibility report (PFR) of Aghanashini-Varada link project has been completed and submitted. The other three links namely, Netravati-Hemavati link, Bedti- Varada link and Krishna-Pennar link are yet in the stage of PFR. Further, the Paschimavahini Project which is linking the tributaries of west flowing rivers and conserving the water with check dams and barrages also has failed to get mention in the Policy. The Policy has to accommodate and urge the preparedness for these projects.

Governance and Strengthening the Institutions

Institutional Aspects

In order to achieve the said goals and enable a strong water resource management approach in the state, the Policy requires an appropriate institutional and a strong legal framework. The Policy further points out fragmentation in the laws and policies concerning water, for instance 29 key legislations and statutory instruments of which 15 are central and 14 state- level representing a complex maze of statutory provisions. It continues to highlight the intersections and conflicts arising out of multiplicity of norms and actors with some of the important water challenges being neglected. From the assessment of the organizational mandates and responsibilities of agencies, the Policy identifies a significant functional overlap and intersection in terms of regulatory, management and service delivery particularly in irrigation. The need for an authority that mandates state water planning, river basin management, environmental flow and health is all the more felt.

The Policy to strengthen the institutional aspects proposes creation of the Inter-departmental State Water Resources Authority that shall involve all water related departments under the chairmanship of Hon'ble Chief Minister. Strengthening of water users' associations such as WUCS[31], TUGs[32], watershed committees, fisheries cooperatives and other groups are provided by the Policy. The participation of women in such federations is also encouraged with required legislative backing and assistance. The capacity building of the staff to strengthen their understanding of IWRM and efficiency in using modern technology and management practices with the support of international and national agencies is to be prioritized. The capacity building has been a part of both national and international agendas and initiatives. The National Environmental Policy 2006, too points out the flaws in implementing the initiatives, primarily due the lack of capacity in handling such programs. Atal Jal has addressed this issue by allocating a substantial share of the finances in the scheme purely to capacity building.

[31] Water Users Cooperative Societies
[32] Tank User Groups

Legal Aspects

The Policy to strengthen water resource management requires revisiting the existing legal regime with necessary up-gradation and progressively improving arrangements. The role and performance of the agencies that are responsible for regulating, managing and delivering water services have to be strengthened with suitable legislatures. However, the core issue of fragmented jurisdiction and multiplicity of norms leading to conflicts and neglect is not addressed through the proposal towards a framework legislation.

Implementation of Policy

To effectively implement the Policy, the Government is to formulate plans and programs through various departments and a high-level Water Policy Committee is to be created headed by the Chief Secretary to the Government to coordinate among the departments. The meetings are to be held to provide guidance, coordinate and review the performance as per the Policy.

The very absence of any formal regulation stipulating the water sharing principles in the Policy, makes it all the more imperative to formulate one. The scope of Karnataka's legislative power on the subject of water is limited by Entry 14 & 18 of the List II of the Seventh Schedule and any legislative attempt done overtly will contest the constitutional structure. There is nevertheless scope for being bound by the code that premises on the sound principles of apportionment and utilization which are equitable and reasonable. The Policy may also stress on the procedural reforms in the water dispute mechanism by including the participatory procedure, shifting towards the inquisitorial system and housing multidisciplinary aspects.

Conclusion

The Draft State Water Policy 2021, is a comprehensive attempt to provide solutions to water problems with Integrated Water Resource Management (IWRM). However, there has been oversight of a few aspects like attention to inter-linking projects and inter basin transfers, problem of pollution, traditional irrigation structures, incentives to farmers for innovations in irrigation, institutional capacity, strengthening supply side capacity over demand side to name a few. With necessary inclusions, the Policy will nonetheless go a long way in ensuring water security in Karnataka. ■■

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