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WATER, HEALTH AND WATER QUALITY REGULATION

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XIII. Water, health and water quality regulation

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INTRODUCTION

The obvious link between the protection and promotion of public health and access to safe and adequate water is indisputable.¹ Access to safe water is essential to health which is a basic human right.² Safe drinking water plays a major role in the overall health of human beings. It is estimated that about 70 to 80 per cent of illnesses are water and sanitation related. It must be noted that women and children suffer most from lack of access to safe water. The total number of deaths caused by malnutrition due to unsafe water, inadequate sanitation and insufficient hygiene is estimated at 860,000 per year in children under five years of age.³ Unsafe drinking water has also been identified as one of the major health problems in India. It is estimated that water and sanitation-related infections and diseases constitute 60 to 80 per cent of all illnesses in India.⁴

This link and implications could be considered as one of the major reasons why governments across the world have played and continue to play a key role in providing water supply to all. Added to that, access to safe and adequate water is also perceived as an essential input to the overall development of the nation, both

- 1 Some studies expose the staggering health implications of unsafe and inadequate access to water, which are estimated to account for 1.73 million deaths each year due to diarrhoeal diseases. For details, see Guy Howard Jamie and Bartram, *Domestic Water Quantity, Service Level and Health* (Geneva: World Health Organization, 2003); Annette Pruss-Ustun *et al.*, *Safer Water, Better Health: Costs, Benefits and Sustainability of Interventions to Protect and Promote Health* (Geneva: World Health Organization, 2008) and Anil Agarwal *et al.*, *Water, Sanitation, Health – for All?: Prospects for the International Drinking Water Supply and Sanitation Decade, 1981–1990* (London: Earthscan, 1981).
- 2 World Health Organization, *Guidelines on Drinking Water Quality* (Geneva: WHO, 3rd edn 2006).
- 3 Pruss-Ustun *et al.*, note 1 above, 7.
- 4 Government of India, *Implementation Manual on National Rural Water Quality Monitoring and Surveillance Programme 18* (New Delhi: Government of India, Ministry of Rural Development, 2004).

in social and economic aspects.⁵ The development of policy and institutional frameworks *vis-à-vis* drinking water supply demonstrates this health concern. For instance, concern for public health was the major reason for bringing water supply under the direct and complete control of the government in Europe and North America during the nineteenth and early twentieth centuries.⁶

Public health concerns are also one of the most important reasons, if not the primary reason, behind the setting up of water supply systems in particular and water resource regulation and management in general. The evolution of a number of rules, regulations and standards in the international and Indian contexts seem to testify to this observation. In the international context, the World Health Organization (WHO) has formulated several guidelines and standards regarding water quality and quantity primarily to address health issues.⁷ In the Indian context, one important example in this regard is the Manual on Water Supply and Treatment formulated by the Government of India.⁸

Despite the presence of a number of binding and non-binding instruments, the problem of unsafe and inadequate water supply and its implications for public health is often highlighted as a persisting critical issue.⁹ This raises, importantly, the question of the legal nature of the existing framework and the effectiveness of implementation. In this context, this chapter tracks the existing law and policy framework in India and at the international level, addressing health concerns in water resource regulation and management. This chapter further seeks to address the reasons for any ineffectiveness in the implementation.

The scope of this chapter is limited to the examination of the regulatory framework, mainly in India, addressing water quality. This essentially includes analysis of water quality standards and guidelines. Unavoidably, this chapter also aims to examine the framework provided under the Water (Prevention and Control of Pollution) Act, 1974. Since an examination of water quality regulation in isolation would be highly artificial and incomplete, a brief account of its relation and link with relevant human rights (right to health, right to sanitation and human right to water) and the nature of the consequent government obligations are also examined.

5 N. Praveen *et al.*, 'Drinking Water Quality in Urban India: Why and How it is Getting Worse – A Case Study of South Indian Cities', in K.V. Raju (ed.) *Elixir of Life: The Socio-Ecological Governance of Drinking Water* 353 (Bangalore: Books for Change, 2006).

6 Werner Troesken, 'Typhoid Rates and the Public Acquisition of Private Waterworks – 1880–1920', 59/4 *Journal of Economic History* 927, 929 (1999).

7 See, e.g., World Health Organization, note 2 above.

8 Government of India, Manual on Water Supply and Treatment (New Delhi: Government of India, Ministry of Urban Development, 3rd edn 1999). See also Ministry of Rural Development, Agenda Notes for State Secretaries' Conference on Rural Drinking Water and Sanitation (New Delhi: Government of India, Ministry of Rural Development, 2008).

9 Central Pollution Control Board, Status of Water Quality in India – 2007 at 19 (New Delhi: Central Pollution Control Board, 2008). See also Smita Misra and Bishwanath Goldar, 'Likely Impact of Reforming Water Supply and Sewerage Services in Delhi', 43(41) *Economic & Political Weekly* 57 (2008).

A. Health and water: Historical context and development

1. General historical context

The importance of the quantity of water available for human consumption has been a major concern for a long time. However, the emphasis on quality came to light only after the sources and effects of drinking water contaminants came within human understanding in the latter half of the nineteenth century. During this period, it was proven by scientists that diseases such as cholera could be eradicated by providing safe water for all.¹⁰ This understanding seems to have triggered government efforts to set water quality standards and to promote water treatment mechanisms. In fact, the idea and practice of water treatment is regarded as one of the most significant public health advances of the twentieth century.¹¹

Water quality concerns seem to have been a major reason why governments in the United States and the United Kingdom took responsibility for water supply, particularly in urban areas. For instance, the outbreak of cholera in London in 1840 is considered as a major impetus for the enactment of the Metropolis Water Act, 1852. The government had begun to exercise significant control over suppliers by virtue of this legislation and required quality requirements such as filtering of water.¹² The concern of the government even resulted in the taking over of the operational assets of some private water supply companies.¹³

In the United States, the major highlighted rationale for institutional changes in water supply in the late nineteenth and the first quarter of the twentieth century was the protection of public health through preventing waterborne epidemics.¹⁴ The emphasis on health concerns resulted in the wide promotion of water treatment methods such as filtration and chlorination.¹⁵ The regulatory framework was also developed to ensure safety. Legal regulation of drinking water quality in the United States began in the early twentieth century. The federal regulation of drinking water was initiated in 1914 and set standards for the bacterial quality of drinking water. This initiative ultimately culminated in the enactment of Safe Drinking Water Act, 1974.¹⁶

Ever since the government started taking major initiatives in providing water supply, the main impetus was the perceived connection between unsafe water and

10 United States Environmental Protection Agency (USEPA), *The History of Drinking Water Treatment*, EPA-816-F-00-006, February 2006.

11 *Ibid.*

12 James Salzman, 'Thirst: A Short History of Drinking Water', Duke Law School Legal Studies Research Paper No. 92, December 2005, available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=869970.

13 *Ibid.*, at 21.

14 Troesken, note 6 above, 929.

15 *Ibid.*, at 930.

16 USEPA, note 10 above, 18.

epidemic diseases. Hence, the major focus was on 'safety'. Indeed, the regulatory effort in this regard in the West has successfully eradicated epidemics such as cholera.¹⁷ This shows the crucial role of water quality regulation in public health advancement, and thereby overall social and economic development.

2. Developments at the international level

There is no binding legal instrument at the international level regulating water quality standards. One of the reasons for this could be the unfeasibility of having a universal regulatory approach and standards. It has been argued that no single approach regarding water quality regulation is universally applicable. The regulation largely depends upon such factors as needs, regulatory potential and the capability of individual countries.¹⁸ Another reason that has been highlighted is the advantage provided by the use of a risk-benefit approach in the establishment of national standards and regulations.¹⁹

However, international instruments also play a crucial role in the regulation of water quality, particularly those prepared under the auspices of the WHO. Special mention in this regard should be given to the drafting and periodical updating of the Guidelines for Drinking Water Quality (hereafter the WHO Guidelines). The third edition in this series was published in 2006.²⁰ The role of the WHO as a knowledge producer is also significant because the WHO produces a number of educative and informative publications that could be a help or guidance for individual countries.²¹

The WHO initiatives can be considered as major developments at the international level directly addressing the issue of water quality regulation. However, there are other international instruments, though broad in scope, which recognize the close link between water quality regulation and public health. For instance, some documents expressly state the protection of human health and wellbeing through prevention, controlling and reducing water-related diseases.²² The need for emphasis on water quality regulation can also be seen in a number of policy statements at the international level.²³ Some instruments at the regional level such

17 Maggie Black and Rupert Talbot, *Water – A Matter of Life and Health* 18 (New Delhi: Oxford, 2005).

18 World Health Organization, note 2 above, 2.

19 *Ibid.*, at 2.

20 *Ibid.*

21 For example, the WHO in collaboration with IWA Publishing brings about the *Journal of Water Health*. This journal covers a range of issues related to water and health.

22 See, e.g., Protocol on Water and Health to the 1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes, London, 17 June 1999, UN Doc. MPWAT/AC.1/1999/1.

23 See, e.g., Agenda 21, Report of the UNCED, Rio de Janeiro, 3–14 June 1992, UN Doc. A/CONF.151/26/Rev.1 (Vol. 1, Annex II); Local Actions for a Global Challenge, the Ministerial Declaration of Fourth World Water Forum, 21–22 March 2006; UN General Assembly Resolution 58/217, International Decade of Action 'Water For Life', UN Doc. A/RES/58/217 (2004); United Nations Water Conference – Resolutions, in Report of the United Nations Water

as the Helsinki Declaration on Health and Environment, 1994 address this issue directly.²⁴

These documents at the international and regional levels generally serve the purpose of highlighting the health impacts of unsafe and inadequate water and urging all member countries to take appropriate action. While the normative value of these instruments can be acknowledged, specific norms on water quality regulation are clearly missing at the international level. It could further be said that existing instruments are not more than mere policy statements by the international community broadly acknowledging the need for water quality regulation.

3. Developments in India

Water quality problem is a critical issue in India that needs to be addressed legally. For instance, fluoride and arsenic contamination of groundwater is widely cited as one of the major challenges in drinking water quality regulation. The reported population directly affected and at risk in case of fluoride and arsenic contamination is estimated as 25.1 and 71.3 million respectively.²⁵ The alarming situation of water quality in India is also confirmed by the Planning Commission of India in one of its documents. It is estimated that there are about 217,000 habitations suffering from water quality problems, with 118,088 habitations suffering from excess iron, 31,306 from excess fluoride, 23,495 from excess salinity, 13,958 from excess nitrate and 5,029 from excess arsenic.²⁶

The issue of water quality gained the attention of the government long back. Water pollution was one of the earliest environmental issues on the agenda of the Indian State. Government initiatives to formulate a legal framework to ensure the quality of water resources started in the early 1960s. As early as 1962, the Ministry of Health had appointed an expert committee on water pollution.²⁷ This initiative eventually culminated in the enactment of the Water (Prevention and Control of Pollution) Act, 1974 (hereafter the Water Act).

Conference, Mardel Plata, 14–25 March 1977, United Nations publication, Sales No. E.77.II.A.12, available at www.ielrc.org/content/e7701.pdf; UN General Assembly Resolution 55/2, United Nations Millennium Declaration, UN Doc. A/RES/55/2 (2000).

24 Declaration on Action for Environment and Health in Europe adopted by the Second European Conference on Environment and Health, Helsinki, 20–22 June 1994.

25 Ramesh Chandra Panda, 'Water Quality Scenario in India – An Overview', in International Life Science Institute-India, *Water Quality Management: South Asian Perspective Vision 2025* at 37 (New Delhi: International Life Science Institute-India, 2002). In the case of Gujarat, it has been observed that water in as many as 38 per cent of habitations was found not to comply with WHO guidelines with respect to fluoride content and 23.6 per cent were above the maximum permissible limit. See Indira Hirway, 'Ensuring Drinking Water to All: A Study in Gujarat', in K.V. Raju ed., note 5 above, 78.

26 Planning Commission – Government of India, *Eleventh Five-Year Plan 2007–12 – Volume II – Social Sector* (New Delhi: Oxford University Press, 2008).

27 Bharat Desai, *Water Pollution in India: Law and Enforcement* 45 (New Delhi: Lancer Books, 1990).

The enactment of the Water Act can be seen as a landmark in the water quality regulatory framework in India. Apart from the Water Act, there are other legal instruments addressing water quality issues such as the Food Safety and Standards Act, 2006 and the Environmental (Protection) Act, 1986. For instance, the Food Safety and Standards Act, 2006 includes the quality regulation of packaged 'drinking water' and 'water used in the food during its manufacture' within its scope.²⁸

In addition to these enactments, water quality issues are directly and expressly addressed through certain instruments at the national level. Key instruments in this regard are the water quality specifications prepared by the Bureau of Indian Standards (BIS)²⁹ and the Manual on Water Supply and Treatment issued by the Central Public Health and Environmental Engineering Organization (CPHEEO).³⁰ While BIS specifications seek to address water quality issues in the rural water supply, the CPHEEO Manual addresses the quality aspects of the urban supply. However, these instruments are not mandatory in nature and therefore not legally enforceable.

Government initiative towards water quality management and regulation is not confined to the above mentioned key documents. The concern of the government to promote public health by ensuring safe water can be found in various other efforts and initiatives. There has been a constant effort on the part of the government towards ensuring the quality of drinking water, particularly through the promotion of several drinking water schemes, missions, programmes and the establishment of various institutional mechanisms to address the issue of safe and sufficient drinking water for all.

The Accelerated Rural Water Supply Programme (ARWSP) can be considered as a pioneer effort by the government in this regard. The ARWSP was introduced in 1972–1973 to provide financial assistance to state governments to ensure the supply of drinking water in rural India. Significantly, the ARWSP guidelines mention quality concerns. One of the primary objectives of the ARWSP is to preserve the quality of water. This concern is further reflected in the classification of rural habitations with water resources of inadequate quality as 'not covered/no safe source' habitations.³¹ The increasing concern for water quality can also be seen in the recent enhancement of funds under the programme to address water quality problems. Financial assistance to tackle the quality problems has been enhanced from 15 per cent to 20 per cent of the total ARWSP fund.³²

28 Food Safety and Standards Act, 2006, s. 2(j).

29 BIS is a statutory institution established under the Bureau of Indian Standards Act, 1986 to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in India.

30 The CPHEEO is a Technical Wing of the Ministry of Urban Development, Government of India, and deals with the matters related to Urban Water Supply and Sanitation Including Solid Waste Management in the country.

31 Government of India, Accelerated Rural Water Supply Programme Guidelines, available at http://ddws.gov.in/popups/arwsp_pop.htm.

32 Ministry of Rural Development, Annual Report 2007–08 at 185 (New Delhi, Government of India, Ministry of Rural Development, 2008).

The ARWSP was given a mission approach with the launch of the National Drinking Water Mission in 1986, which was later renamed the Rajiv Gandhi Drinking Water Mission in 1991.³³ Water quality concerns continue to get significant attention in the Mission. The primary objectives of the Mission include: monitoring water quality; resolving identified problems through science and technology to ensure that available water is of acceptable quality; and ensuring the sustainability of water quantity and quality on a long-term basis through proper water management techniques and implementation of management information systems. Water quality was accorded high priority in the Mission. Parameters and safety standards on water quality have clearly been laid down in the Mission document. A separate document was prepared for this purpose, namely the Executive Guidelines for the Implementation of Water Quality Testing Laboratories.³⁴

Initiatives taken by the Government of India since the 1980s show that emphasis is placed on wider health implications in relation to water quality regulation. Major initiatives include 55 Mini-Missions and five Sub-Missions formed under the National Drinking Water Mission, 1986. The major object of these Mini-Missions was to develop an integrated approach and cost-effective technological packages to tackle water quality issues.³⁵ The initiative by the central government has continued in subsequent years (e.g., the constitution of a Sub-Mission to deal with the problem of arsenic in West Bengal in 1994, and the Expert Committee on Rural Water Supply Program, 1994).³⁶

The Constitution of National Rural Drinking Water Quality Advisory Committee under the auspices of the Ministry of Rural Development, Government of India in 2006 is a recent initiative which shows the constantly increasing concern about water quality.³⁷ The Mandate of the Committee includes the enhancement of drinking water quality monitoring and surveillance. Promotion of the standardization of water quality is also a major task.³⁸

Altogether, governmental efforts towards establishing a water quality regulatory framework have existed since the early 1960s. From a legal point of view, there are a number of instruments – enactments, administrative regulations and guidelines – addressing water quality issues. However, the scope and application of these instruments are different. This reveals a scenario of a water quality regulatory framework in India which is highly fragmented and complex.

33 Government of India, *Water Quality – An Overview* (New Delhi: Government of India, Department of Drinking Water Supply), available at www.ddws.gov.in/water_quality_pop.htm.

34 *Ibid.*

35 Som Pal, 'Key Issues in Water Quality Management', in International Life Science Institute-India, note 25 above, 18.

36 *Ibid.*, at 19.

37 The notification on the Constitution of National Rural Drinking Water Quality Advisory Committee by the Ministry of Rural Development, Government of India, No. W-11027/4/96-TM II (Pt.), 8 March 2006, available at www.ddws.gov.in/WQAdvisoryCommittee.doc.

38 *Ibid.*, at 2.

B. Water quality regulation in the human rights context

The relationship between water quality regulation and human rights jurisprudence is very significant. This is particularly because human rights jurisprudence is an important legal basis from which a rights–duty discourse on water quality regulation emanates. There are at least three human rights which can be considered as highly relevant in this context: the right to health, the right to sanitation, and the right to water.³⁹ This close link can be explained in the following way. Firstly, water quality concerns form an important part of the normative content of these human rights. Secondly, safe and potable drinking water is generally regarded and recognized as an indispensable element for their realization. Thirdly, the human rights context is critical and relevant given the obligation it casts on the state to ensure proper and effective water quality regulation.

1. The right to health

International human rights law expressly recognizes the right to health, which is found in a number of legal instruments. For instance, the Universal Declaration of Human Rights recognizes a right to a ‘standard of living adequate for the health of himself and of his family’.⁴⁰ The International Covenant on Economic, Social and Cultural Rights (ICESCR) provides the most comprehensive provision on the right to health. The ICESCR recognizes the ‘right of everyone to enjoy the highest attainable standard of physical and mental health’.⁴¹ This right has been given an elaborate form and content through General Comment No. 14.⁴²

General Comment No. 14 recognizes health as a fundamental human right indispensable for the exercise of other human rights. It further provides that ‘every human being is entitled to enjoy the highest attainable standard of health conducive to living a life in dignity’.⁴³ It is expressly recognized that ‘safe and

39 The list of human rights having legal implications for water quality regulation is not exhaustive. For instance, right to a clean and healthy environment as constructed by the Supreme Court of India could also be a legal basis to argue for the responsibility of the government to undertake efforts to prevent and control water pollution. Indeed, this right has been invoked at least in some cases to this effect. For details, *M.C. Mehta v. Union of India*, AIR 1988 SC 1115.

40 Universal Declaration of Human Rights, UN General Assembly Resolution 217 A (III), 10 December 1948, Art. 25(1). For a brief survey of other instruments at the international level, see Mihir Desai and Kamayani Bali Mahabal, *Health Care Case Law in India: A Reader* 5–11 (Mumbai: Centre for Enquiry into Health and Allied Themes and India Centre for Human Rights & Law, 2007).

41 Art. 12.1 of the International Covenant on Economic, Social and Cultural Rights, New York, 16 December 1966, UN Doc. A/6316 (1966).

42 Committee on Economic, Social and Cultural Rights, General Comment No. 14, *The Right to the Highest Attainable Standard of Health* (Art. 12 of the International Covenant on Economic, Social and Cultural Rights), UN Doc. No. E/C.12/2000/4 (2000).

43 *Ibid.*, at para.1.

potable water and adequate sanitation' is an important 'underlying determinant' of the right to health.⁴⁴

Another important feature of the right to health under international human rights law is that it has been recognized as 'a right to enjoy a variety of facilities, goods, services and conditions necessary for the realization of the highest attainable standard of health'.⁴⁵ This expression implicitly gives reference to drinking water supply and water supply for other domestic purposes. The quality concern has also been expressly recognized by providing that 'as well as being culturally acceptable, health facilities, goods and services must also be scientifically and medically appropriate and of good quality'.⁴⁶

Two aspects of the right to health are particularly relevant in the context of water quality regulation. First, the right to health expressly comprises 'safe and potable' water as an important underlying determinant. Second, the right casts specific obligations upon state parties. This includes the obligation of state parties to take appropriate legislative measures for the progressive realization of human rights.⁴⁷ In the context of water quality regulation, it could be said that state parties are in principle obligated to formulate and implement a water quality regulatory framework.

A similar rationale can be applied in the Indian context. The right to life under Article 21 of the Constitution has been interpreted very liberally and progressively by the higher judiciary in India during the past decades to include apparently all related aspects of life such as livelihood, health and education. The right to health has also been read under Article 21 by the Supreme Court of India in a few cases.⁴⁸ Hence, it could be argued that the obligation of the state *vis-à-vis* water quality regulation could be constructed from the right to health in the international and Indian legal contexts.

2. *The right to sanitation*

Sanitation plays a significant role in achieving public health goals. Inadequate sanitation facilities, unsafe sanitation practices and lack of environmental hygiene are considered major routes to water-related epidemics. This obvious link between sanitation and public health has elevated sanitation as one of the major

44 *Ibid.*, at para. 11.

45 *Ibid.*, at para. 9.

46 *Ibid.*, at para. 12(d).

47 For details on obligations of state parties, Committee on Economic, Social and Cultural Rights, note 42 above and Committee on Economic, Social and Cultural Rights, General Comment No. 3, The Nature of State Parties Obligation (Art. 2, para. 1 of the International Covenant on Economic, Social and Cultural Rights), UN Doc. E/1991/23 (1990).

48 *Consumer Education and Research Centre v. Union of India* (1995) 3 SCC 42. See also *Virender Gaur v. State of Haryana* (1995) 2 SCC 577; *Kirloskar Brothers v. ESI Corporation* (1996) 2 SCC 682 and *State of Punjab v. Mahinder Singh Chawla* (1997) 2 SCC 83. For an account of the relationship between Art. 21 and the right to health, see Manoj Kumar Sinha, *Enforcement of Economic, Social and Cultural Rights: International and National Perspectives* 268–277 (New Delhi: Manak Publications, 2006).

concerns at the international and national levels. The growing concern of the international community can be seen in the declaration of 2008 as the International Year of Sanitation.⁴⁹ Moreover, virtually all member states of the United Nations have recognized the right to sanitation in at least one political declaration.⁵⁰ This concern further emphasizes the need for treating sanitation along with water in human rights terms.

Even though sanitation as a single point intervention has the potential to support the realization of other human rights, human rights instruments offer little guidance as to the scope and content of the term 'sanitation'. A UN report acknowledges that 'the contour of the human rights framework for sanitation remains imprecise'.⁵¹ However, express reference to the 'right to sanitation' can be found in several soft law instruments and implicit reference could be deduced from several, if not all, human rights treaties.⁵² For instance, a document at international level refers to the right to sanitation and defines it as 'the right of everyone to have access to adequate and safe sanitation that is conducive to the protection of public health and the environment'.⁵³ The Delhi Declaration of the Third South Asian Conference on Sanitation expressly recognizes access to basic sanitation as a human right.⁵⁴ Accordingly, the broad normative contents of the right to sanitation have been constructed, at least in principle, by emphasizing physical accessibility, affordability, adequacy, cultural acceptability and physical security.⁵⁵

The legal conceptualization of right to sanitation in human rights terms is highly significant in the context of water quality regulation. This is mainly because inadequate sanitation is a major root cause of unsafe drinking water. Moreover, water quality regulation in isolation would be unable to achieve public health goals given the close link between water quality management and public health goals on the one hand and access to sanitation on the other.⁵⁶ Therefore, any approach which treats access to safe water and sanitation differently and in a compartmentalized manner would be highly artificial and counterproductive.

49 UN General Assembly Resolution 61/192, International Year of Sanitation, 2008, UN Doc. A/RES/61/192 (2007).

50 Centre on Housing Rights and Evictions (COHRE), *Sanitation: A Human Rights Imperative* (Geneva: Centre on Housing Rights and Evictions, 2008).

51 Report of the United Nations High Commissioner for Human Rights on the Scope and Content of the Relevant Human Rights Obligations Related to Equitable Access to Safe Drinking Water and Sanitation Under International Human Rights Instruments, UN Doc. A/HRC/6/3 (2007).

52 *Ibid.*, Annexes I and II.

53 Sub-Commission on the Promotion and Protection of Human Rights, Report of the Special Rapporteur on the Realization of the Right to Drinking Water and Sanitation, UN Doc. No. E/CN.4/Sub.2/2005/25 (2005).

54 Delhi Declaration on 'Sanitation for Dignity and Health' by the Third South Asian Conference on Sanitation held in New Delhi on 16–21 November 2008, available at www.ielrc.org/content/e0802.pdf.

55 United Nations High Commissioner for Human Rights, note 51 above, 12.

56 Black and Talbot, note 17 above, 96.

Recognition and realization of human right to sanitation, in this regard, could be considered as a complementary legal step towards an effective water quality regulation. This is particularly relevant in the Indian context given the abysmal scenario of access to sanitation. For instance, some studies show that only 200 of India's 400 major cities partially have sewers and only three per cent of effluent is treated.⁵⁷

3. *The right to water*⁵⁸

At international level, there are several binding and non-binding instruments establishing the right to water. Added to that, some of the recent developments have emphasized or re-emphasized the nature and scope of the right and the kind of obligation it casts upon the state. For instance, General Comment No. 15 adopted by the Committee on Economic, Social and Cultural Rights expressly provides that everyone is entitled to 'sufficient, safe, acceptable, physically accessible and affordable water for personal and domestic use'.⁵⁹ The legal concept of the human right to water also entails obligations for governments to take all possible measures towards its realization. As it has been conceptualized in international law, the right to water can be seen to provide for express references to a quality criterion.

The Indian legal system has also, at least in principle, recognized the right to water. There are a number of cases wherein the higher judiciary has interpreted the right to life under Article 21 of the Constitution to include the right to water. A reference, howsoever abstract it may be, to water quality and the obligation of the government to ensure it, can be read in these judgments. In one case the Supreme Court of India has recognized that the right to water under Article 21 imposes a duty upon the State to provide its citizens with 'clean drinking water'.⁶⁰ In another case, the Andhra Pradesh High Court expressed a well-articulated enunciation of the right with respect to the quality element by stating that under Article 21 the state has a duty to provide all its citizens with 'clean and adequate drinking water'.⁶¹ Therefore, the obligation of the government to formulate and implement water quality regulation could be considered as directly emanating from the concept of the human right to water also.

57 Manoj Nadkarni, 'Drowning in Human Excreta', 10(19) *Down to Earth* (2001), available at www.indiaenvironmentportal.org.in/node/9699.

58 This section briefly explores the link between the right to water and water quality regulation. For details on the legal concept of the right to water, see Chapter XI.

59 Committee on Economic, Social and Cultural Rights, General Comment No. 15: The Right to Water (Articles 11 and 12 of the International Covenant on Economic, Social and Cultural Rights), UN Doc. E/C.12/2002/11 (2002), para. 2.

60 *AP Pollution Control Board (II) v. Prof. M.V. Nayudu*, 2000 (3) SCALE 354, available at www.ielrc.org/content/e0010.pdf.

61 *P.R. Subas Chandran v. Government of Andhra Pradesh* 2001 (5) ALD 771.

C. Regulatory framework

1. *International regulatory framework*

It has already been observed that there is no binding legal instrument at the international level which lays down water quality standards. Existing instruments, including at the regional level, remain largely limited to recognizing the need for dealing with water quality regulation to achieve public health goals.

In this legal vacuum, the WHO Guidelines represent an important instrument which expressly provides for norms and values regarding water quality regulation. The significance of the WHO Guidelines is illustrated by the broad acceptance of the standards enshrined in the Guidelines at the national level, although there is no binding legal obligation for countries to implement them. For instance, the BIS standards on drinking water in India more or less follow the WHO Guidelines. On this basis, the present section briefly examines the content of the Guidelines.

The WHO Guidelines are a comprehensive document which covers almost all aspects of water quality regulation. Most importantly, they describe the acceptable limit of various substances in drinking water, which is referred to as the 'guideline value'.⁶² The guideline value is specified on the basis of separate consideration of various aspects of water quality, such as the microbial, chemical and radiological aspects.

In addition to the incorporation of scientifically approved water quality standards, the WHO Guidelines also cover desired institutional mechanisms and management approaches. They set out the role of various governmental agencies, at both the central and local levels, in water quality regulation and management. It is important to note that the Guidelines recognize and emphasize the crucial role of local authorities in water quality management and regulation, and in educating the public on water quality management.⁶³ They also underline the important role of other actors such as water vendors, water suppliers and the public in water quality management.⁶⁴

Another important feature of the WHO Guidelines is their emphasis on pragmatism. They state that national water quality standards may differ 'appreciably' from the standards contained in the Guidelines after taking into account a variety of environmental, social, cultural, economic, dietary and other conditions affecting potential exposure.⁶⁵ It is further stated that:

A programme based on modest but realistic goals – including fewer water quality parameters of priority health concern at attainable levels consistent

62 A 'guideline value' is defined as representing 'the concentration of a constituent that does not exceed tolerable risk to health of the consumer over a lifetime of consumption'. See World Health Organization, note 2 above, 31.

63 *Ibid.*, at 11–12.

64 *Ibid.*, at 15.

65 *Ibid.*, at 33.

with providing a reasonable degree of public health protection in terms of reduction of disease or reduced risk of disease within the population – may achieve more than an overambitious one, especially if targets are upgraded periodically.⁶⁶

It could be stated that the WHO Guidelines occupy a significant position in that they are a valid reference source for individual countries intending to frame or modify water quality standards. They also serve an educative purpose by constantly promoting emphasis on water quality management and regulation, mainly through knowledge production and dissemination processes.⁶⁷

2. Regulatory framework in India

The water quality regulatory framework in India consists of different legal and institutional arrangements addressing water quality issues at different angles. This multi-faceted regime includes statutory frameworks, rules, administrative regulations and guidelines. Adding to this complexity, the nature and scope of these regimes are significantly different. While some are binding in nature, others are not. Some frameworks address water quality issues at a national level, while others address them at the local level. Some regimes focus specifically on drinking water quality issues. At the same time, some regimes influence water quality issues by addressing generally the environmental quality or the protection of public health. Having noted the complexity and multiplicity of the Indian regulatory framework, this section focuses primarily on instruments providing for water quality standards.

National-level regulation

There are a number of instruments at the national level which address water quality issues directly or indirectly. It is not the purpose of this chapter to mention and analyze each and every instrument separately. Generally, this section examines the regulatory approach enshrined in the regulatory framework at the national level as a whole, with special mention and reference given to certain key instruments.

The regulation of water quality has two main aspects. The first is the setting up of water quality parameters (i.e., the provision of acceptable limits of various constituents that could cause health hazards). The second aspect is the establishment of institutional mechanisms to effectively implement regulations. Institutional mechanisms essentially include the establishment of agencies at various levels for monitoring and surveillance.

⁶⁶ *Ibid.*

⁶⁷ WHO guidelines have been used as a valuable reference in various instruments at the national level. In the Indian context, see Ministry of Rural Development, Draft Guidelines for the Preparation of Legislation for Framing Drinking Water Regulation (New Delhi: Ministry of Rural Development, 2007).

Key instruments related to water quality standards in India are the Bureau of Indian Standards (BIS) Specification IS:10500 and the CPHEEO Manual on Drinking Water Quality. Both these instruments follow a similar regulatory approach, at least with regard to water quality parameters.

Under BIS IS:10500, there are two quality characteristics of drinking water, namely essential and desirable characteristics. All essential characteristics are to be examined routinely (crucially, there is no exact indication as to what 'routinely' entails), while all desirable characteristics should be examined either when a doubt arises as to water quality or when the potability of water from a new source is to be established. The acceptable limit of different constituents also follows the same classification (i.e., a desirable limit and a permissible limit). The idea of a permissible limit is subject to the condition of the 'absence of an alternate source'.

The objective of BIS IS:10500 was to assess the quality of water resources, and to monitor the effectiveness of water treatment and supply by the concerned authorities. Other instruments adopted under the auspices of the BIS address water quality issues which are not covered under BIS IS: 10500. For instance, the quality of packaged drinking water is covered under BIS IS: 14543 of 2004 and the quality of packaged natural mineral water is covered under BIS IS: 13428 of 2005.

The CPHEEO Manual also follows a similar approach in the case of the prescription of parameters. The only difference resides in the usage of terminology. The CPHEEO Manual uses the term 'acceptable' in the place of 'desirable' and 'cause for rejection' instead of 'permissible'. The parameters included in the CPHEEO Manual are also similar to those contained in BIS IS:10500.

Another important aspect of water quality regulation is the protection of water at the source point. This can be achieved mainly through preventive measures taken to control the pollution of water sources. It is a fact that the major source of water pollution in India is the discharge of untreated or partially treated effluent into water resources.⁶⁸ To address this issue, the central government enacted the Water (Prevention and Control of Pollution) Act of 1974 (hereafter the Water Act). The Water Act lays down various means and procedures to ensure the quality of water resources in the interest of public health and the environment.⁶⁹

The Water Act focuses mainly on the control of the discharge of various effluents into rivers and streams. Most importantly, it provides for two kinds of regulatory tools. The first is the permit system or the consent procedure. This means that a person must obtain consent from the State Pollution Control Board before taking steps to establish any industry, operation or process, any treatment

68 *Ibid.*, at 39.

69 The health concern is expressly recognised in the Water Act. The definition of 'pollution' explicitly states 'public health and safety' as a concern. See Water (Prevention and Control of Pollution) Act, 1974, s. 2(c) available at www.iclrc.org/content/c7402.pdf.

and disposal system or any extension or addition to such a system which might result in the discharge of sewage or trade effluents into a stream, well or sewer or onto land.⁷⁰ The permit or consent may contain conditions related to the location, construction and use of the outlet as well as the nature and composition of the new discharges. The second regulatory tool is the prescription of standards for the discharge of effluents. The Water Act enables concerned State Pollution Control Boards to prescribe such standards. For instance, the Kerala Pollution Control Board has prescribed quality parameters with respect to groundwater⁷¹ and the Uttar Pradesh Pollution Control Board has prescribed quality parameters for river water.⁷²

The Water Act also provides for various measures to enforce regulations. The State Pollution Control Boards are authorized under section 33A to issue orders to any person, officer or authority, including orders to close, prohibit or regulate any industry, operation or process, and to stop or regulate the supply of water, electricity or any other service.⁷³ Until 1988, the enforcement tool of the State Pollution Control Board was criminal prosecution. This was revised by the 1988 amendment to the Water Act of 1974. The Board now has the power to close non-compliant companies or to cut their water and power supply.

The second key aspect of water quality regulation consists in the institutional mechanism which is complementary to the substantive framework. A few institutions at national level are addressing water quality regulatory issues directly. It is a fact that the implementation of water quality regulation needs to be done at the local level, and that modes of implementation largely depend upon the nature of water resources and their prevailing uses. Therefore, powers and functions of the national level institutions are mostly directive in nature, which need to be followed by agencies such as public health departments, State Pollution Control Boards, or water supply agencies at the state and municipal levels.

The Central Pollution Control Board (CPCB) plays a key role in water quality management and regulation at the national level. One significant example of its role in this regard is the Guidelines for Water Quality Management, 2008. This comprehensive document covers different aspects of water quality regulation such as prescription of quality parameters, frequency of sampling and guidance as to the containers to be used for the collection of samples.⁷⁴ The CPCB also plays a significant role in the Union Territories since the mandate of

70 *Ibid.*, s. 24.

71 The Kerala Pollution Control Board at least provides for parameters on chemical contaminants consistently with the BIS IS: 10500 of 1991. See Kerala Pollution Control Board, Water Quality Monitoring (Thiruvananthapuram: Kerala Pollution Control Board), available at www.keralapcb.org/standards/standards_municipal.htm#mun6.

72 Uttar Pradesh Pollution Control Board, Primary Water Quality Criteria for Designated Best Use Classes, available at www.uppcb.com/river_quality.htm.

73 Water (Prevention and Control of Pollution) Act, 1974, s. 33A.

74 Central Pollution Control Board (CPCB), Guidelines for Water Quality Management (Delhi: Central Pollution Control Board, 2008).

water quality regulation in the Union Territories comes directly within its purview.⁷⁵

Other key agencies at the national level include the Department of Drinking Water Supply under the Ministry of Rural Development, the Central Ground Water Board and the Water Quality Assessment Authority (WQAA) constituted under the Environmental (Protection) Act, 1986.⁷⁶ The Ministry of the Environment and Forests (MoEF) also plays an important role in water quality regulation on the basis of its power derived from the Water Act and the Environmental (Protection) Act. The Uniform Protocol on Water Quality Monitoring Order, 2005 can be considered as a good example of the role of MoEF in this regard.⁷⁷

State-level regulation

Under the Constitution of India, water supply and public health fall within the legislative competency of the concerned state governments.⁷⁸ Consequently, water quality regulation falls primarily within their mandate. The regulatory framework at the central level makes little sense if the standards that it sets out are not respected and recognized through legal (or at least policy) instruments at the state level. There are exceptions to this general observation, one of which is the Food and Safety Act, 2006, which includes packaged drinking water.⁷⁹ Moreover, the effectiveness of water quality regulation is ultimately tested by examining the quality at the consumption point. Therefore, a legal framework for water supply systems at the state level is crucial insofar as quality regulation is concerned.

The water supply system in India is highly complex and consists of different legal and institutional frameworks. The responsibility for rural water supply in most of the States lies with public health engineering departments, water authorities, locally constituted statutory agencies or panchayati raj institutions. Urban water supply is mostly entrusted to municipal corporations, municipal authorities, water authorities, water boards or developmental authorities. For instance, in Andhra Pradesh, water supply and sanitation is the exclusive responsibility of the

75 See, e.g., the notification which lays down standards for compliance by small-scale industries located in the Union Territories, CPCB Notification No. 1/2 (71)87 Plg. 7 April 1988, available at <http://envfor.nic.in/legis/water/no1-2-71-87.html>.

76 Ministry of Environment and Forests, Water Quality Assessment Authority Order, Order No. S.Q. 583 (E), 29 May 2001. The WQAA has taken some significant steps in water quality regulation in India. Examples include the role played by the WQAA, together with the Water Quality Monitoring Committee constituted by the MoEF, in bringing about the Uniform Protocol on Water Quality Monitoring Order and the constitution of thirty-three state-level water quality review committees. See Action Taken/Status Note on the minutes of the meeting held on 5th September 2006 to discuss the 'National River Conservation Programme', available at http://nac.nic.in/atrs/river_conservation_5sept.pdf.

77 Ministry of Environment and Forests, Uniform Protocol on Water Quality Monitoring Order, 2005, Notification No. S.Q. 2151, 17 June 2005.

78 Constitution of India, Art. 246(3) together with Schedule 7, List II, Entry 6 and 17.

79 Food Safety and Standards Act, 2006, s. 2(j).

Panchayat Raj Engineering Department. Whereas in Delhi, the agency responsible for water supply is the Delhi Water Board constituted under the Delhi Water Board Act, 1998.

These different agencies derive powers and responsibilities from different sources. For instance, the Panchayat Raj Engineering Department in Andhra Pradesh functions as a separate department directly under the control of the state government. Water supply agencies in urban areas derive their powers mainly from municipal acts or separate statutes constituting water boards. For instance, the Delhi Water Board Act, 1998 sets forth all norms and procedures regarding water supply in Delhi. Therefore, water quality regulation at the local level depends primarily upon the quality criteria provided in Municipal Acts.

Municipal Acts use a variety of criteria applicable to the levels of water quality and quantity that need to be ensured; these include the terms 'proper and sufficient', 'insufficiency and unwholesomeness', 'fit for human consumption', 'sufficient supply of pure and wholesome', 'pure and fit for human consumption' and 'defective and insufficient'.⁸⁰ Certain Acts actually empower the State governments to adopt rules specifying exact quantity or quality standards – and the same would be binding upon the municipalities.⁸¹

These criteria suffer from at least two important shortcomings. Firstly, they are highly discretionary and vague, and their meaning and scope can easily be contested. It is unlikely that application of these criteria could create any concrete and legally enforceable duty upon water supply agencies, and it can at least be said that they are of a minimally binding nature. Moreover, such criteria cannot be considered as an adequate alternative to a precise code containing scientific and legally binding parameters and procedures.

Secondly, the criteria and the duties they create are subject to exceptions, with regard to which the cost factor is critical. Thus, while several of the Acts exhort municipalities to provide water of adequate amount and quality, this has to be done keeping in mind 'reasonable costs'. Costs and the non-performance of the statutory duties of municipalities have been at the core of numerous cases argued before the courts in the last few decades. In principle, the Supreme Court of India has rejected the defence based on financial constraints at least in a couple of cases.⁸² However, this 'reasonable cost' exception continues to exist and there does not seem to be any clarity regarding its nature and scope.

In the case of rural water supply, the BIS specifications are generally referred to as the 'recommended standards' for drinking water supply. For instance, the Madhya Pradesh Public Health Engineering Department – the agency responsible for the supply of safe, potable and pleasant water – refers to water quality criteria provided in the BIS specification. Some documents at the national level

80 See, e.g., New Delhi Municipal Council Act, 1994, ss. 11(d)(ii) and 147(4) and Cantonments Act, 2006, s. 186(2).

81 Bengal Municipalities Act, 1932, s. 311 and Bihar and Orissa Municipal Act, 1922, s. 314.

82 *Municipal Council, Ratlam v. Vardichand Ors* (1980) 4 SCC 162 and *Dr. BL Wadhwa v. Union of India and Ors.* (1996) 2 SCC 594.

also refer to the BIS IS 10:500 insofar as the monitoring of the concentration of contaminants is concerned.⁸³

Another instrument relevant in the context of rural drinking water supply is the CPCB Guideline.⁸⁴ The Guideline essentially covers water at the source point and it inevitably includes groundwater resources. This is particularly relevant given the fact that groundwater is a major source of drinking water, and that groundwater resources are in a critical situation mainly due to contamination and depletion.⁸⁵

Hence, it could be stated that the water quality regulatory framework in India consists mainly of legally non-binding instruments at the national level and some rudimentary provisions in Municipal Acts. The major limitation of the existing framework is that it does not confer any significant legally enforceable rights and duties.

D. Monitoring and surveillance: Practice in India

Substantive aspects such as standardization and rules related to sampling form only one part of the regulatory regime for water quality. Equally important are the monitoring and surveillance elements, which represent perhaps the most critical part of the regime since they require substantive investments in financial and human resources as well as a considerable infrastructure. In a simple sense, monitoring and surveillance refer to the means and processes for ensuring compliance with substantive norms. The effectiveness of the water quality regulatory framework depends upon the effectiveness of the monitoring and surveillance mechanisms.

In this context, this section broadly examines certain key aspects of water quality monitoring and surveillance, but does not intend to elaborate upon the details and effectiveness of all monitoring and surveillance programmes in India. In fact, this can be done only through specific case studies. The scope is limited to examining the broad spectrum of the monitoring and surveillance framework in a legal perspective by referring to certain key programmes.

1. Monitoring and surveillance

By definition, the concept of monitoring and surveillance are different. In relation to drinking water quality control, 'surveillance' refers to constant supervision,

83 Government of India, Guidelines for National Drinking Water Quality Monitoring and Surveillance Programme 3 (New Delhi: Ministry of Rural Development, 2006).

84 Central Pollution Control Board, note 74 above.

85 Planning Commission of India, Report of the Expert Group on 'Ground Water Management and Ownership' (Delhi: Government of India, Planning Commission, 2007); M. Dinesh Kumar and Tushar Shah, Groundwater Pollution and Contamination in India: The Emerging Challenge (IWMI-TATA Water Policy Briefing Paper, 2006); National Academy of Agricultural Sciences, Emerging Issues in Water Management – The Question of Ownership (New Delhi: National Academy of Agricultural Sciences, Policy Paper No. 32, 2005); Prabir Naik, Drinking Water Problem in Rural India, 94(8) *Current Science* 964 (2008).

from a public health point of view, of the safety and acceptability of drinking water supplies. It requires a continuous and systematic programme of sanitary inspection and water quality testing, carried out at different points of the water distribution system.⁸⁶ 'Monitoring' involves laboratory and/or spot testing of water samples collected from different locations in the water supply system, including sources, water treatment plants, distribution systems and house reservoirs.⁸⁷ However, the two concepts are complementary to each other and could be considered as indispensable parts of the water quality regulatory framework.

Monitoring and surveillance mechanisms generally seek to address such issues as the frequency of sampling, the location from where samples need to be taken and particular parameters which need to be tested in particular locations. They also comprise remedial measures to be taken in cases of the existence of risks posed to public health due to water contamination or threat of contamination. Hence, an effective monitoring and surveillance mechanism leads to pollution prevention, and prompt and timely action in case of identified health risks.

Having noted the importance and the role of water quality monitoring and surveillance in the protection of public health, some critical questions need to be addressed from a legal point of view: who is responsible for carrying out monitoring and surveillance? If there is a responsible agency, what is the legal framework which it must abide by? And what is the legal nature of such responsibility?

The key legal framework addressing the issue of water pollution in India is the Water Act, 1974. The CPCB and State Pollution Control Boards (SPCBs) are the agencies responsible for implementing the Water Act.⁸⁸ The CPCB and SPCBs were constituted to maintain or restore the wholesomeness of water resources in the country.⁸⁹ The responsibility of water quality monitoring and surveillance can also be read into the broad mandate of the CPCB and SPCBs as provided in the Water Act.

Indeed, the CPCB has taken some initiatives in water quality monitoring and surveillance. The CPCB together with the SPCBs have formed a network of monitoring stations across the country. The present network comprises 1,245 stations in twenty-seven States and six Union Territories spread over the country. The monitoring is done on a monthly or quarterly basis for surface waters and on a half-yearly basis in the case of groundwater.⁹⁰ The monitoring network covers 50 rivers, 78 lakes, six tanks, twenty-six ponds, eight creeks, nineteen canals,

86 Government of India, Draft Guidelines for Preparation of Legislation for Framing Drinking Water Regulations (New Delhi: Government of India, Ministry of Rural Development, 2007).

87 *Ibid.*, at 39–40.

88 The major instruments remain inadequate insofar as monitoring and surveillance of water quality are concerned. For instance, the BIS Standards use only guiding phrases such as 'routine' (in case of essential characteristics) and 'to be tested when pollution is suspected' (in case of toxic substances). These kinds of provisions are unlikely to have major practical impact.

89 Statement of Objects and Reasons of the Water (Prevention and Control of Pollution) Act, 1974.

90 Central Pollution Control Board, note 9 above, 10.

nineteen drains and 382 wells. Among the 1,245 stations, 695 are on rivers, 86 on lakes, nineteen on drains, nineteen on canals, six on tanks, twelve on creeks/seawater, twenty-six on ponds and 382 on groundwater stations.⁹¹ Presently the inland water-quality monitoring network is operated under a three-tier programme – the Global Environmental Monitoring System (GEMS), Monitoring of Indian National Aquatic Resources System and Yamuna Action Plan.⁹² Water samples are being analyzed for twenty-eight parameters consisting of physico-chemical and bacteriological parameters for ambient water samples apart from field observations.⁹³

The CPCB follows a use-based approach in water quality monitoring and surveillance. This means the water quality will be regulated according to the use that a particular water source is put to. This has been termed as the ‘designated best use’ approach. As per this approach, out of several uses a particular water body is put to, those that demand the highest quality of water are ‘designated best uses’ and quality will be regulated accordingly. The CPCB guidelines lay down quality criteria for different uses. For instance, ‘A’ class water body means a water source which is used for drinking without any treatment. Quality parameters prescribed are high for this class of water bodies.⁹⁴

The monitoring process promoted by the CPCB follows a further classification according to the element of human influence on water resources. It follows a classification of ‘baseline station’ and ‘trend station’. The former refers to a station where there is no human activity influence. All sources other than ‘baseline stations’ are classified as ‘trend stations’.⁹⁵ The frequency of monitoring needs to be based on this classification. All trend stations will be monitored with increased frequency. For instance, the CPCB Guidelines provide that all baseline stations, in the case of groundwater sources, will be monitored once a year, whereas all trend stations will be monitored four times a year.⁹⁶

It appears that the key focus of the mandate of the CPCB and SPCBs is on monitoring water resources at the source point, for instance rivers, streams, ponds and groundwater resources. This forms only one part of the total monitoring and surveillance spectrum. This role of PCBs can be considered as little less than sufficient to ensure safe drinking water for those who collect and directly use surface water or groundwater resources.⁹⁷ However, the focus of the CPCB does not seem to cover the monitoring and surveillance of water treatment, distribution networks and individual storage systems. These aspects are particularly critical in urban water supply and piped rural water supply where unsafe

91 *Ibid.*, at 10.

92 *Ibid.*

93 *Ibid.*, at 11.

94 Central Pollution Control Board, note 74 above, Annex I.

95 *Ibid.*, Annex II.

96 *Ibid.*

97 The quality monitoring of groundwater resources also comes within the purview of groundwater authorities envisaged under groundwater laws. For details, see Chapter IX.

distribution network and individual storage systems can pose a threat to public health.⁹⁸

It has already been observed that agencies responsible for urban water supply are mainly municipal bodies or separate water boards. The legal framework that determines the powers and functions of these agencies contains only minimal provisions regarding water quality regulation. Most of the Municipal Acts do not contain specific legal provisions as to water quality monitoring and surveillance. In practice, water quality monitoring and surveillance in urban water supply are undertaken either inadequately or not undertaken at all.

A survey conducted by the National Institute of Urban Affairs shows that around 57 per cent of urban centres do not monitor raw water at all.⁹⁹ The study also shows that in seven metropolitan cities, the situation is similar.¹⁰⁰ The periodicity of water quality monitoring varies from alternate days to once every six months. The study also shows that a majority of urban centres do not monitor distribution networks. The main reasons highlighted for this situation are lack of infrastructure and of human resources.¹⁰¹

Hence, it can be said that quality monitoring and surveillance in urban water supply in India is highly localized, and that as a consequence there is no uniformity in practice among water supply agencies across the country. Legal provisions in this regard are minimal and do not seem to have any practical impacts. The situation is similar with regard to rural water supply in that monitoring and surveillance of rural water supply quality have been identified as 'extremely inadequate'.¹⁰² It has also been observed that there is no institutionalized quality monitoring and surveillance system in India.¹⁰³ To overcome this, a new management approach is being promoted by the central government, particularly with regard to rural water supply, which gives a more important role to local authorities as well as local communities.¹⁰⁴

2. Legal aspects: A critique

At the outset, it should be noted that there is no specific and mandatory legal framework in India laying down rules and procedures for water quality regulation. The monitoring and surveillance mechanisms, which have been described above, appear highly fragmented and discretionary. The problem of fragmentation appears as a result of the existence of a number of institutional mechanisms

98 For an express recognition of the importance of water quality monitoring and surveillance of water distribution systems, Ministry of Rural Development, note 67 above, 40.

99 National Institute of Urban Affairs, Status of Water Supply, Sanitation and Solid Waste Management in Urban Areas 45 (New Delhi: National Institute of Urban Affairs, 2005).

100 *Ibid.*, at 46.

101 *Ibid.*, at 47 and 51.

102 Government of India, note 4 above, 3.

103 *Ibid.*, at 4.

104 Government of India, Guidelines for National Drinking Water Quality Monitoring and Surveillance Programme (New Delhi: Ministry of Rural Development, 2006).

which can be identified as responsible for monitoring and surveillance. Despite the number of institutions, there is hardly any legal provision which makes it mandatory for these agencies to conduct proper, effective and periodical monitoring and surveillance. The existing documents laying down the processes and procedures for water quality monitoring and surveillance are optional and therefore not legally binding at all.

Resource constraints are another main problem often highlighted as contributing to the inadequacy of monitoring and surveillance mechanisms. These constraints include limited infrastructure, as well as financial and human resources. The financial constraint argument makes very little sense while comparing the public health cost of inadequate monitoring and surveillance. Moreover, the financial constraint argument is limited by the fact that the protection of public health is supposed to be a matter of high priority for the government. Not only that, a pollution-free environment in general, and access to adequate water in particular, are fundamental rights of every individual as per the interpretation of Article 21 of the Constitution by the higher judiciary.¹⁰⁵ Such an interpretation confers a duty upon the government to ensure that all citizens are provided with 'clean and adequate drinking water'.¹⁰⁶ Though limited in scope, the phrase 'clean and adequate' emphasizes the quality criterion.

In order to achieve effective water quality regulation, a well-equipped institutional mechanism responsible for monitoring and surveillance is essential. The institutional mechanism should be buttressed by a legal framework, preferably at the central level, prescribing the necessary elements of monitoring and surveillance.¹⁰⁷ A legal framework at the central level should establish legally binding rules and aim to significantly harmonize existing regulations. As many water quality problems are local in nature, a decentralized organizational structure such as village-level and district-level units would be most effective and thus preferable. Over and above, an adequate legal framework for water quality regulation would be a significant step towards the realization of human rights in general and the rights to health and water in particular.

CONCLUSION

In India, public health concerns have been a major impetus behind the number of initiatives undertaken to improve drinking water supply. Attaining a safe and

105 See, e.g., *Virender Gaur v. State of Haryana* (1995-1) 109 PLR 591 (S.C.); *Subhash Kumar v. State of Bihar* AIR 1991 SC 420; *V. Lakshmi paty v. State* AIR 1992 Kant. 57 and *Damodar Rao v. SO Municipal Corporation, Hyderabad* AIR 1987 AP 170.

106 *PR Subash Chandran v. Government of Andhra Pradesh* 2001 (5) ALD 771.

107 Under the Constitution of India, the power to legislate on drinking water lies with the concerned state government. However, the Constitution allows the central government to legislate upon this matter provided that such powers have been conferred by state governments. Constitution of India, Art. 252.

adequate water supply has been an important item on the government's agenda at least since the introduction of five-year plans. It cannot be stated that these initiatives have failed completely; in fact, they have produced some significant results, one example being the increased coverage of drinking water supply. Another major achievement of government initiatives is 100 per cent eradication of guinea worm disease.¹⁰⁸

However, water quality regulation, in a strict legal sense, is still at an early and rudimentary stage, primarily because water quality regulatory frameworks in India are largely dominated by non-binding guidelines, codes and manuals. Even though Municipal Acts contain reference to water quality, they are minimal and as such not likely to bring about any significant results. This reveals the fact that water quality regulation in India is highly obscure and complex. Adding to this complexity the responsibility for water supply is fragmented among a number of agencies. This often leads to a situation wherein water quality monitoring and pollution prevention happens primarily during the outbreak of epidemics.¹⁰⁹ In all probability, this situation has severe public health implications.

One of the important legal consequences of the present obscurity and complexity of water quality regulatory frameworks is the absence of clearly defined right-duty norms. In other words, opportunities for legal action against a water supplying agency because of inadequate water quality are very rare or unclear. In addition, because of the lack of a legal framework prescribing quality parameters and other procedures, different agencies follow different norms. For instance, some agencies monitor water quality every month, while others do not monitor it at all.

This complex and unclear scenario points to the need for the adoption of a comprehensive drinking water legislation, preferably at the central level, prescribing mandatory quality standards and rules related to monitoring and surveillance. In fact, some initiatives have already been taken in this direction. For instance, in 2007 the Ministry of Rural Development formulated 'Draft Guidelines for the Preparation of Legislation for Framing Drinking Water Regulation'.¹¹⁰

The legal responsibility of the supplier should be clearly and expressly defined in such a legal framework so that any violation results in legal action. The standard of duty of care that the supplier should comply with also needs to be stated expressly. A proper articulation of 'right-duty' aspects can bring about effective results in water quality regulation. The burden of proof should also be preferably on the supplier. Water quality parameters, as well as requirements for monitoring

108 Panda, note 25 above, 37.

109 *Ibid.*, at 37.

110 The draft guidelines are currently being discussed by various central government departments and ministries (including the Department of Drinking Water Supply, the Central Groundwater Board, the Department of Legal Affairs and the Ministry of Urban Development) and relevant state government departments (including the Public Health Engineering Departments, Public Health Departments, State Groundwater Boards and Rural Water Supply and Sanitation Departments) as well as certain international agencies (UNICEF, WHO and the WSP).

and surveillance, can be modelled on existing documents such as the BIS Code IS: 10500, CPHEEO Manual and Uniform Protocol on Water Quality Monitoring Order, 2005. Alternatively, these relevant documents could be annexed to any future drinking water legislation.

An effective legal framework to ensure water quality requires an effective institutional mechanism to periodically monitor water quality. This should be buttressed by effective cooperation between the water supplier and the monitoring agency. The aim of surveillance should be to undertake routine, independent monitoring of the water supply from a public health point of view. Implementation should be at the local level. Therefore, the institutional mechanism should be decentralized as this would enhance the effectiveness and reduce the cost.

All states should have a clear-cut water surveillance policy, which includes monitoring of water quality at the source point and user's end. The efficiency of these policies will depend upon adequate institutional mechanisms sustained by sufficient resources, such as mobile testing laboratories in all district headquarters. The responsibility of the government *vis-à-vis* water quality regulation needs to be addressed primarily from the point of view of human rights to establish a comprehensive and binding legal framework regulating water quality.

However, this regulatory framework can only ensure quality up to the point of consumption. To achieve comprehensive results, it should be complemented by government initiatives to educate the public to promote in-house practices such as hygiene, storage, and use. This is critical because individual behaviour such as boiling drinking water and the proper washing of hands are a crucial determining factor in eradicating water-related diseases.