

A CRITICAL APPRAISAL OF THE DAM SAFETY ACT, 2021

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Abstract

Dams are critical national infrastructure driving a nation's development and considering the disastrous consequences that can occur in the event of dam failure, it is vital for a developing country like India to have adequate institutional and structural mechanisms in place to ensure dam safety and prevent dam failure. The issue of dam safety has been there since independence, however a need for a uniform legislation for dam safety in India was first felt in the year 1979 with the establishment of the Dam Safety Organization. The recently enacted Dam Safety Act, 2021, is a result of over 30 years of discussions and deliberations between the Centre and State Governments and incorporates a federalist approach in dealing with the issue of dam safety. It aims to prevent dam failure related disasters through regular surveillance, inspection, operation and maintenance. It also establishes the necessary institutional mechanism for this purpose.

Ensuring dam safety requires a holistic approach due to its intersection with right to life, disaster preparedness and response, constitutional and environmental law, public policy, transparency, engineering principles, accountability and state liability. Hence, the authors in this paper undertake a critical appraisal of the Dam Safety Act, 2021 in order to evaluate and assess the law on the above parameters. Further, as issues relating to dam safety can impact international transboundary rights among neighboring nations and affect inter-state relationship within India, an examination of the law from the perspective of India's international obligations and over-arching constitutional framework is also undertaken.

Key words: Dam Safety Act, 2021; Environmental law, Transparency, Accountability, Federalism, Public Policy, State Liability, Interstate-relations, Transboundary rights

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Introduction

Dams are not only marvels of human innovation, ingenuity and engineering but are also crucial national assets' ' driving a country's economic growth and industrial development. By providing water for diverse activities such as irrigation, industrial use, human consumption, and hydropower etc., they have served a pivotal role in the advancement of human civilisation. From ancient times to the modern age, dam construction has seen exponential growth in number, scale and size. Dam construction is one of those activities prioritized by any state to modernize its industry, agriculture and economy rapidly. In India, large-scale dam construction was given priority after independence.³ As of December 2021, there are a total 5701 dams in India which is the third highest across the world, only behind China and USA.⁴ Despite their several advantages and pivotal role in the advancement of civilization, dams do come with bane. Under customary international humanitarian law dams have been described as “works and installations containing dangerous forces”⁵ as they pose major hazards and their failure can be catastrophic endangering human life, ecology and environment. For e.g. the Banqiao dam failure incident of 1975 in China resulted in the death of 171,000 people and displaced more than 10 million people.⁶ It is pertinent to note that dam failures in the past have occurred not only in dams built without proper application of engineering principles but also in dams that are considered “state of art of dam engineering”.⁷ In this context, a personal letter written by

³ CENTRAL WATER COMMISSION, GOVERNMENT OF INDIA, REPORT ON DAM SAFETY PROCEDURES (1986).

⁴ CENTRAL WATER COMMISSION, NATIONAL REGISTER OF LARGE DAMS, http://cwc.gov.in/sites/default/files/NRLD_04012017.pdf (last visited Feb. 12, 2022).

⁵ JEAN-MARIE HENCKAERTS & LOUISE DOSWALD-BECK, CUSTOMARY INTERNATIONAL HUMANITARIAN LAW: VOL. 1 RULES 139 (2005) (Rule 42 r/w Rule 7 of the study prescribes that care must be taken while attacking civilian works and installations containing dangerous forces in order to avoid the release of dangerous forces and consequent severe losses among the civilian population. They should not be made the object of attack unless they qualify as a military objective).

⁶ Evan Osnos, Faust, China, and Nuclear Power, THE NEW YORKER, <https://www.newyorker.com/news/evan-osnos/faust-china-and-nuclear-power> (Oct. 12, 2011)

⁷ CENTRAL WATER COMMISSION, GOVERNMENT OF INDIA, REPORT ON DAM SAFETY PROCEDURES (1986).

Karl von Terzaghi⁸ to Andr Coyne⁹ (who was the engineer of the Malpasset dam) after the Malpasset Dam catastrophe of 1959¹⁰ (that killed 423 people) is worth mentioning:

“In situations of this kind it is at the outset impossible to divorce the technical aspects of the event from the human tragedies involved. Yet every fair-minded engineer will remember that failures of this kind are, unfortunately, essential and inevitable links in the chain of progress in the realm of engineering, because there are no other means for detecting the limit to the validity of our concepts and procedures.

Having known you well for many years, I feel confident that the failure was not a consequence of an error in your design. Therefore, it will serve the vital purpose of disclosing a factor which in the past has not received the attention which it requires. The fact that its implications became manifest on one of your jobs is not your fault, because the occurrence of failures at the borderline of our knowledge is governed by the laws of statistics, and these laws hit at random. None of us is immune. You as an individual, and the equally innocent victims of the failure have paid one of the many fees which nature has stipulated for the advancement in the realm of dam construction.”¹¹

In India also there have been several incidents of dam failure. As per Central Water Commission (“CWC”) data there have been a total of 36 dam failures in India which has resulted in significant damages thereafter.¹² Rajasthan and Madhya Pradesh top the list of states which witnessed the most dam failures in India. The primary cause of dam failures in India have been breaches due to flooding.

⁸ Karl von Terzaghi was a renowned Austrian mechanical engineer and considered as the “father of soil mechanics and geotechnical engineering”; See B M DAS, PRINCIPLES OF GEOTECHNICAL ENGINEERING 7 (2010).

⁹ Andr Coyne was the engineer of the Malpasset Dam. He was the President of the International Association of Large Dams and a renowned dam construction specialist. Frank Bruel, The Malpasset Catastrophe in 1959, Ecolo, http://www.ecolo.org/documents/documents_in_french/malpasset/malpasset.htm (last visited Feb. 07, 2022).

¹⁰ Frank Bruel, The Malpasset Catastrophe in 1959, Ecolo, http://www.ecolo.org/documents/documents_in_french/malpasset/malpasset.htm (last visited Feb. 07, 2022).

¹¹ CENTRAL WATER COMMISSION, GOVERNMENT OF INDIA, REPORT ON DAM SAFETY PROCEDURES 2 (1986).

¹² Reported Failure of Dams in India, https://damsafety.in/ecm-includes/PDFs/List_Reported_Failure_of_Dams_in_India.pdf. (Last visited December 27, 2021)

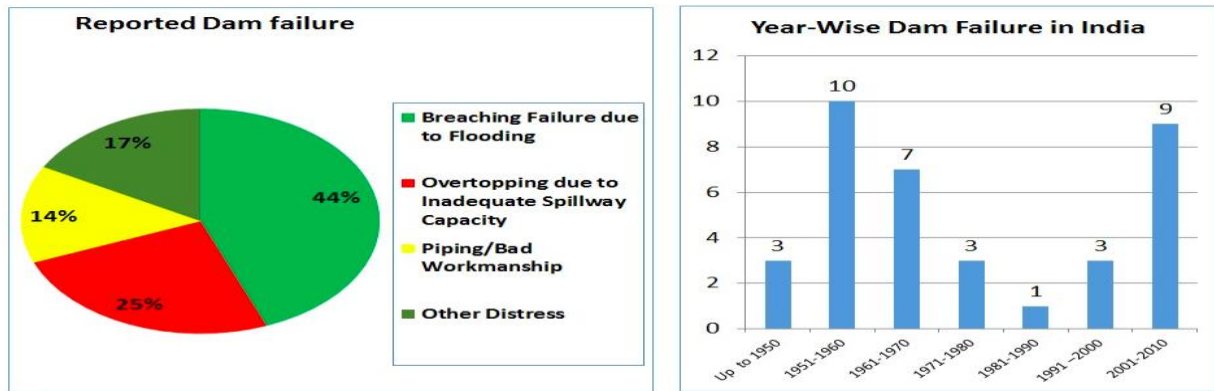


Figure 1 Dam Failures in India¹³

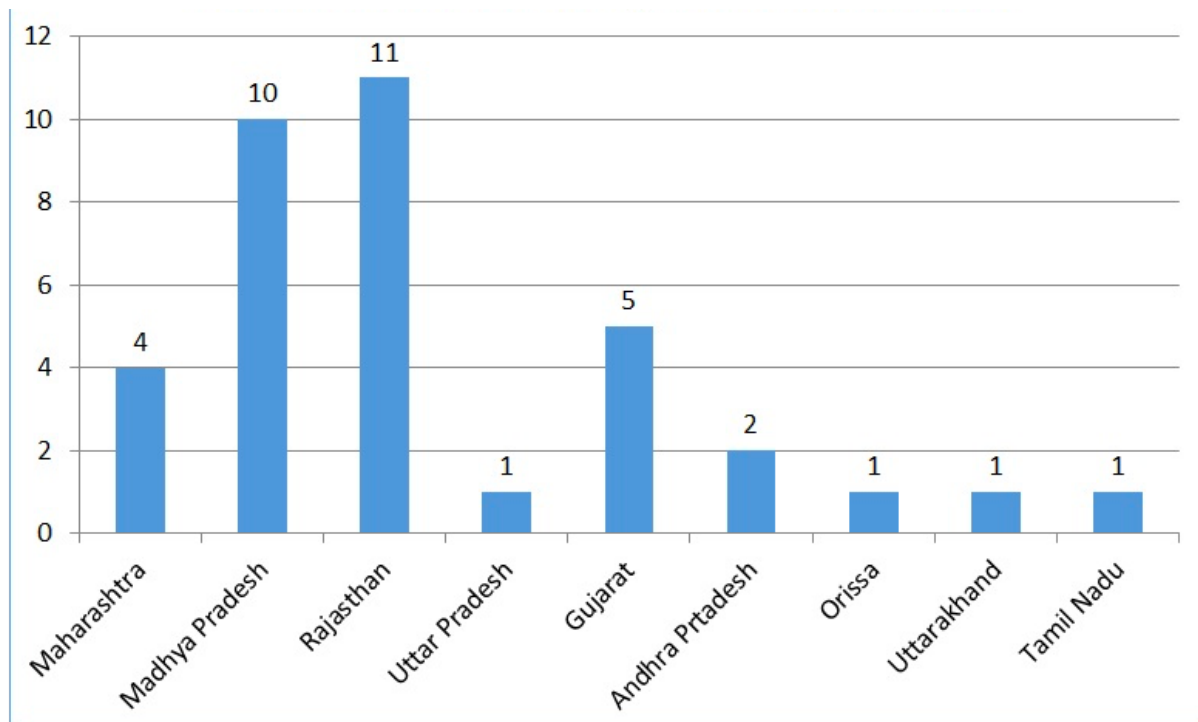


Figure 2 State Wise Dam Failure in India¹⁴

Besides the safety concerns, dams also pose significant environmental challenges. Construction of large “state of the art” dams is achieved at the cost of large scale deforestation, loss of biodiversity hotspots, alterations in topography, and damage to flora and fauna. Dams also generate a large amount of greenhouse gasses which lead to global warming and it also put forth that among all nations, dams in India are the largest contributors to global warming as they emit 27.86% of the methane (a greenhouse gas), from all the dams across the globe..¹⁵ Other adverse impacts of constructing and operating dams include increased soil erosion, loss

¹³ Central Water Commission, http://www.cwc.gov.in/damsafety/dam_fail_india (Last visited Dec 21, 2021).

¹⁴ Central Water Commission, http://www.cwc.gov.in/damsafety/dam_fail_india (Last visited Dec 21, 2021).

¹⁵ A.S. Jethoo, Environmental Implications of Dam Building Activities in India, 7 NATURE ENVIRONMENT AND POLLUTION TECHNOLOGY 177 (2008), <https://neptjournal.com/upload-images/NL-19-35-35-comB-11.pdf>.

of habitat in the river valleys, significant decrease in the biodiversity of the river, changes in downstream morphology, changes in water quality and many other significant changes all across the area where it is constructed.¹⁶ Dam construction also creates social and humanitarian challenges as they create massive displacement of the people from their native places.

Therefore, considering the critical nature of dams in development, the disastrous consequences in cases of failure, and the environmental and social costs borne for their construction and operation, it is very pertinent for a country like India (having third largest concentration of dams in the world), to evolve an effective and efficient legislative framework to ensure safe functioning of dams and to prevent disaster. The recently enacted Dam Safety Act, 2021¹⁷ is a welcome step in this direction. As stated in the preamble, the Act aims *“to provide for surveillance, inspection, operation and maintenance of the specified dam for prevention of dam failure related disasters”*. It also establishes the National Dam Safety Authority (NDSA),¹⁸ State Dam Safety Organizations (SDSOs),¹⁹ National Committee and State Committees on Dam Safety²⁰ as the institutional authorities responsible for ensuring and regulating safe functioning of dams in the country.

¹⁶ A.S. Jethoo, Environmental Implications of Dam Building Activities in India, 7 NATURE ENVIRONMENT AND POLLUTION TECHNOLOGY 177 (2008), <https://neptjournal.com/upload-images/NL-19-35-35-comB-11.pdf>.

¹⁷ The Dam Safety Act, 2021.

¹⁸ The Dam Safety Act, 2021 § 8.

¹⁹ The Dam Safety Act, 2021 § 14.

²⁰ The Dam Safety Act, 2021 §§ 5. & 11(1).

Legislative History

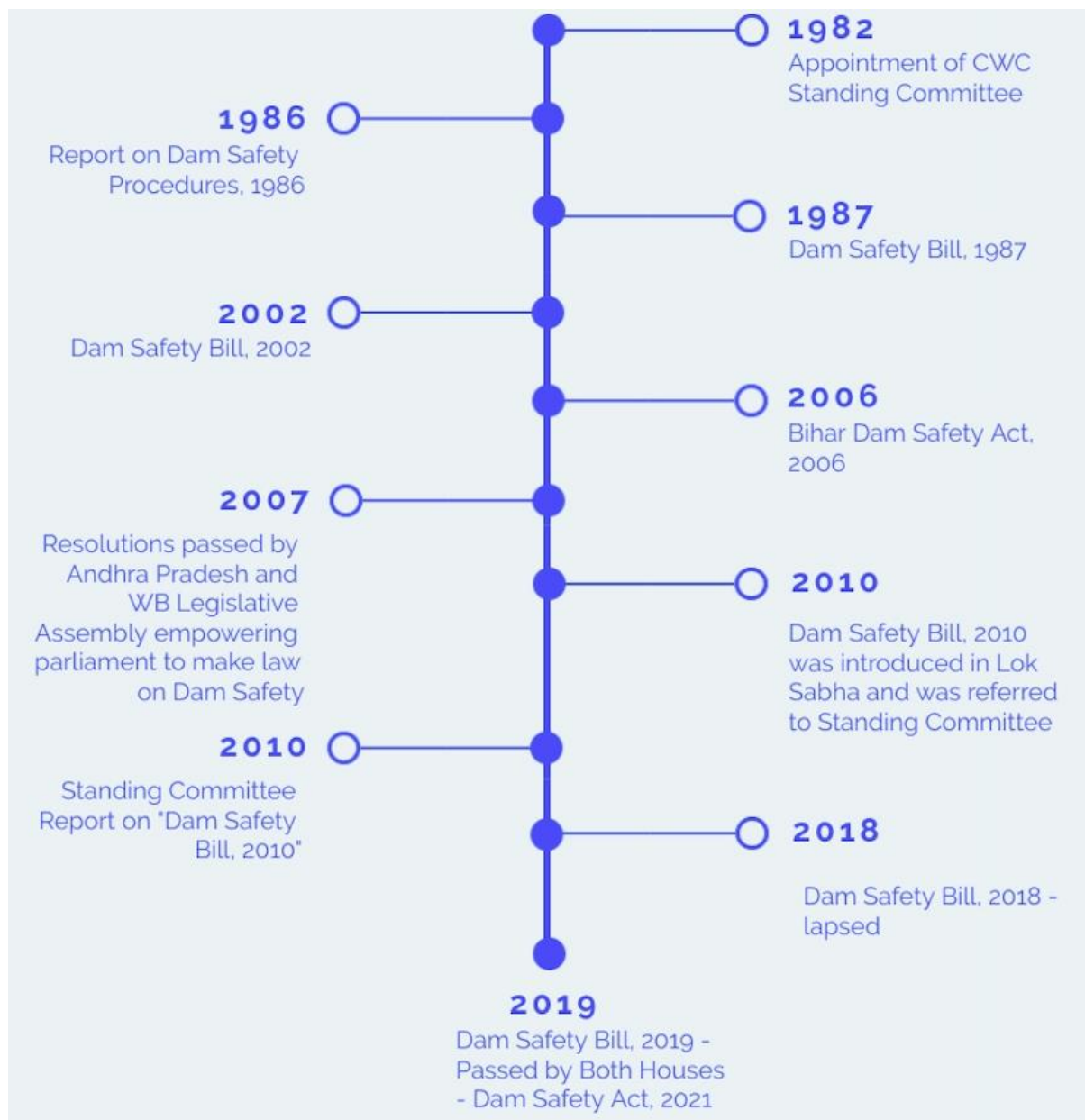


Figure 3 Timeline of Enactment of Dam Safety Law in India

India has been in the process of forming a dam safety legislation for more than 30 years. Realizing the importance of ensuring dam safety in the country, the Dam Safety Organization (DSO), was established in May 1979, in the Central Water Commission.²¹ The need for ensuring safe functioning of the dams was further pressed upon in the wake of Machchu Dam

²¹ CENTRAL WATER COMMISSION, GOVERNMENT OF INDIA, REPORT ON DAM SAFETY PROCEDURES (1986), https://prsindia.org/files/bills_acts/bills_parliament/2019/Report%20on%20Dam%20Safety%20Procedure.pdf.

Failure in Gujarat (also known as Morbi disaster)²² that occurred on August 11, 1979²³ and cost thousands of lives.²⁴ As the responsibility to ensure safety of dams falls primarily on the State Governments, which have their own practice, procedures, guidelines and manuals,²⁵ The initial task of the DSO initially was to assist the State Governments in various activities relating to dam safety.²⁶ However, the need for evolving standardized uniform procedures for dam safety was soon felt by the Government of India. The first step in this direction was taken in 1982 when the erstwhile Ministry of Irrigation, Government of India constituted a Standing Committee under the Chairmanship of M A Chitale (Chairman of CWC).²⁷ The task of the standing committee was to review the then existing practices and procedures on dam safety across various and evolve unified procedures and guidelines for all dams in India.²⁸ After reviewing the existing practices and procedures related to dam safety in the states of Gujarat, Maharashtra, Uttar Pradesh, Kerala, Orissa, Tamil Nadu, West Bengal and Karnataka, and comparing the Indian situation with that of the other countries such as the USA, where dams are mostly managed and operated by private agencies, the committee was of the view that there is no requirement of a legislation in India along the lines of the model bill in US. However, the committee in its Report, submitted in 1986, *inter alia* recommended enactment of a legislation on Dam Safety.²⁹ It recommended the constitution of “Dam Safety Organizations” at the state level for regular monitoring and reporting to the CWC on matters related to dam safety in the state.

Consequently, the Central Water Commission prepared the first draft “Dam Safety Bill” 1987.³⁰ After years of deliberations and consultations with the State Governments, the draft bill was reviewed comprehensively and a revised draft was circulated to the state governments in the year 2002.³¹ As water, water storage and water power are state subjects under List II of the Seventh Schedule of the Constitution, the responsibility of enactment of legislation on dam

²² A G Noorani, The Inundation of Morvi, 14 ECONOMIC AND POLITICAL WEEKLY 1454 (1979).

²³ Dam Safety Bill 2019: Will it Help Prevent Dam Disasters in India, SANDRP <https://sandrp.in/2019/09/30/dam-safety-bill-2019-will-it-help-prevent-dam-disasters-in-india/> (the year 1979 is considered the watershed year relating to Dam Safety in India). (Sep. 30, 2019),

²⁴ *Id.*

²⁵ India Const. Seventh Sched. List II item 17.

²⁶ CENTRAL WATER COMMISSION, GOVERNMENT OF INDIA, REPORT ON DAM SAFETY PROCEDURES (1986), https://prsindia.org/files/bills_acts/bills_parliament/2019/Report%20on%20Dam%20Safety%20Procedure.pdf.

²⁷ CENTRAL WATER COMMISSION, GOVERNMENT OF INDIA, REPORT ON DAM SAFETY PROCEDURES (1986), https://prsindia.org/files/bills_acts/bills_parliament/2019/Report%20on%20Dam%20Safety%20Procedure.pdf.

²⁸ CENTRAL WATER COMMISSION, GOVERNMENT OF INDIA, REPORT ON DAM SAFETY PROCEDURES (1986), https://prsindia.org/files/bills_acts/bills_parliament/2019/Report%20on%20Dam%20Safety%20Procedure.pdf.

²⁹ *Id.* Chapter IX.

³⁰ MINISTRY OF WATER RESOURCES, REP. NO. 7, THE DAM SAFETY BILL, 2010 (2011), https://prsindia.org/files/bills_acts/bills_parliament/2019/SCR%20Dam%20Safety_0.pdf.

³¹ *Id.* at 9.

safety fell on the state legislatures.³² Accordingly, the State of Bihar enacted the Dam Safety Act, 2006.³³ However, the states of Andhra Pradesh and West Bengal were of the opinion that there should be uniform central legislation on dam safety across the country. Both Andhra Pradesh and West Bengal Legislative Assemblies passed resolutions to this effect³⁴ which empowered the Parliament to enact a national legislation on dam safety.³⁵

Accordingly, the Dam Safety Bill, 2010 was introduced in the Lok Sabha. The Bill was enacted under Article 252 of the Constitution and extended only to the State of Andhra Pradesh, West Bengal and Union Territories. Other States had the option to adopt the Act in their territory as per Article 252(1) of the Constitution .

The Bill sought to establish the following institutions for carrying the activities relating to dam safety: (i) National Committee on Dam Safety;³⁶ (ii) Central Dam Safety Organization;³⁷ (iii) State Committee on Dam Safety;³⁸ (iv) State Dam Safety Organization (where number of dams is more than 20);³⁹ (v) State Dam Safety Cell (where number of dams is 20 or less than 20);⁴⁰ (vi) Non-State Dam Safety Organization (for dam owners having more than 10 dams)⁴¹ and (vii) Non-State Dam Safety Cell (for dam owners having 10 or less than 10 dams).⁴² The National Committee was intended as the national policy making and monitoring body. Its functions included: (i) monitoring the functioning of State and Non-State Dam Safety Organizations; (ii) evaluating dam safety procedures in various states and suggest ways to improve dam safety; (iii) evolving a comprehensive dam safety management approach; (iv) advising central and state governments on matters related to dam safety.⁴³ which was subsequently referred to the standing committee. The Central Dam Safety Organization was envisaged as the technical support body for the State and Non-State DSOs and DSCs with the responsibilities of maintaining national level database and records, publishing and updating standardized guidelines and checklists/format/proformas for routine inspection and

³² India Const. Seventh Sched. List II item 17.

³³ The Dam Safety Act, 2006 (Bihar).

³⁴ The Resolution by Andhra Pradesh Legislative Assembly was passed on Mar 24, 2007 and the Resolution by West Bengal Legislative Assembly was passed on July 24, 2007. See MINISTRY OF WATER RESOURCES, REP. NO. 7, THE DAM SAFETY BILL, 2010 (2011),

https://prsindia.org/files/bills_acts/bills_parliament/2019/SCR%20Dam%20Safety_0.pdf; See also The Dam Safety Bill, 2019, Bill No. 190 of 2019, Statement of Objects and Reasons (July 29, 2019).

³⁵ India Const. art. 252.

³⁶ The Dam Safety Bill, 2010, cl.4. No. 108 of Act of Parliament , 2010(India)

³⁷ The Dam Safety Bill, 2010, cl.9 No. 108 Act of Parliament , 2010(India)

³⁸ The Dam Safety Bill, 2010, cl.12 No. 108 Act of Parliament , of 2010(India)

³⁹ The Dam Safety Bill, 2010, cl.15 No. 108 Act of Parliament , 2010 (India).

⁴⁰ The Dam Safety Bill, 2010, cl.16. No. 108 Act of Parliament , 2010, (India)

⁴¹ The Dam Safety Bill, 2010, cl.17 No. 108 Act of Parliament , 2010, (India)

⁴² The Dam Safety Bill, 2010, cl.18 No. 108 Act of Parliament of 2010, (India)

⁴³ The Dam Safety Bill, 2010, cl.8 No. 108 Act of Parliament 2010(India)

investigations, etc.⁴⁴ The State and Non-State DSOs and DSCs were the ground level bodies responsible for carrying out the objectives of Act and implementing its provisions related to dam safety evaluation (including compulsory evaluation), surveillance and inspection, maintenance of log books, issuing instructions to dam owners on safety measures to be taken, reporting, technical documentation etc. The Bill also placed responsibility on the owner of the dams to undertake periodical inspection of dams (pre-monsoon and post-monsoon) installations of instruments for performance monitoring, establishment of hydro-meteorological and seismological stations, and preparation and updating of emergency action plans.⁴⁵ The Bill was referred to the Parliamentary Standing committee which submitted its report in 2011.⁴⁶ The key observations and recommendations of the Standing Committee are summarized as follows:

- *Parliament has power to make law on Dam Safety:* The Committee rejected the contention that Parliament has no power to legislate on the matter of Dam Safety on its own. It was of the opinion that Parliament has ample power under Entry 56 of the Union List to enact such a law. Entry 56 of the Union list relates to “*Regulation and development of Inter-State rivers and river valleys to the extent to which such regulation and development under the control of the Union is declared by Parliament by law to be expedient in public interest*”.⁴⁷ Further, experts also stated before the Committee that Parliament should not follow the route of Article 252 and instead should legislate under entry 56 of List Union List. Thus, the committee recommended the deletion of “parliament has no power to make laws” from the preamble. However, the Committee did not recommend the enactment of a law under entry 56, they merely clarified that the parliament has the power to enact such a legislation and accepted the model proposed in the Bill. Instead, the Committee recommended that after the enactment of the Dam Safety Bill on the proposed lines under article 252, the parliament Ministry of Water Resources (MoWR) should pursue the State Governments to adopt the Act passed by the parliament on priority basis given the serious objectives of the legislation.⁴⁸
- *Addition of Penal Provisions for non-compliance:* The Committee noted that though the Bill casts responsibility on the dam owner in the event of dam failure or for non-compliance with the directions/provisions of Bill, it does not contain any provision for

⁴⁴ The Dam Safety Bill, cl11 , No. 108 of 2010,(India)

⁴⁵ The Dam Safety Bill, cl.31-36, No. 108 of 2010, (India)

⁴⁶ STANDING COMMITTEE ON WATER RESOURCES, REP. NO. 7, THE DAM SAFETY BILL, 2010, (2011).

⁴⁷ India Const. VII Sched. List 1, entry 56.

⁴⁸ STANDING COMMITTEE ON WATER RESOURCES, REP. NO. 7, THE DAM SAFETY BILL, 2010, (2011).

imposing penalty on such owner or the person responsible. Hence, it recommended the incorporation of penal provisions in the Bill.

- *Provision for Compensation:* The committee pointed out that the Bill does not contain any provision to compensate affected people in the event of disaster due to dam failure. Hence, it recommended that an adequate provision should be incorporated in the Bill for the Compensation to the affected people.

Other Key recommendations of the Standing Committee were as follows:

Table 1: Other Key Recommendations of the Parliamentary Standing Committee on Dam Safety	
● Concerned agencies should adopt the latest technologies to ensure their safety.	● Since the NCDS will be held only twice a year, the committee recommended that one meeting should be held pre-monsoon for better preparedness.
● Constitution of an independent regulatory authority	● Under clause 8(2)(d) and clause 11(1)(e) relating to functions of NCDS and CDS with regard to maintain records of dam failures, an analyze cause of failures, the word ‘failure’ should be replaced by “incident” as incidents can happen without failure, and if not attended to they can lead to failure.
● Addition of term ‘safety assurance’ along the lines of Nuclear Safety Bill, and incorporation of definition of terms such as ‘safety’, ‘safety assurance’ and ‘environment’.	● The requisites for appointment as a member for CDSO were absent in the bill and they should be clearly specified.
● The definition of the term ‘inspection’ under clause 3(j) should be modified to replace the word ‘visual’ with ‘on site’ to restrict the scope and process of examination and prevent misuse.	● Incorporation of provision for setting up of National Level Early Warning system and following the standard codes guidelines issued by the Bureau of Indian standards in design and dam safety evaluation.
● Restricting the membership of NCDS to only those which have the largest number of specified dams as the original provision will mean that membership is over 50. Constitution of a Core Technical Committee consisting of only experts. Representation of the reputed institutions such as National Institute of Hydrology, the Central Soil and Materials Research Station, Central Water and Power Research Station and National Disaster Management Authority in the NCDS	● The Bill stipulated that the dam owner should get the evaluation of dam safety done through its “own engineers or”. The committee was of the opinion that this might lead to conflict of interest and any person employed or associated with the dam owner should not be doing the evaluation. Hence, the committee recommended deletion of this option. And also recommended that the majority of the people in the independent panel evaluating dam safety should be experts in service of the State or Union Government.

In view of the changes/modifications recommended by the Standing Committee, the 2010 Bill was withdrawn by the government and reintroduced in the Parliament as the Dam Safety Bill,

2018.⁴⁹ However, due the dissolution of 16th Lok Sabha, the Bill lapsed and hence it was reintroduced in the parliament as the Dam Safety Bill, 2019.⁵⁰ The Bill was passed by the parliament on Dec. 08, 2021. It received the assent of the President on 13th December, 2021.

Dam Safety Act, 2021 – Salient Features

The Dam Safety Act, 2021 was notified in the official gazette on 13th December, 2021. As stated in the preamble, the Act aims “*to provide for surveillance, inspection, operation and maintenance of the specified dam for prevention of dam failure related disasters*”. It also establishes the National Dam Safety Authority (NDSA),⁵¹ State Dam Safety Organizations (SDSOs),⁵² National Committee and State Committees on Dam Safety⁵³ as the institutional authorities responsible for ensuring and regulating safe functioning of dams in the country. The Act is divided into XI Chapters, 56 Sections and Three Schedules. The Salient Features of Act are summarized as follows:

- *National Legislation on Dam Safety*: Unlike, the Dam Safety Bill, 2010, the Act extends to the whole of India and not to only few states⁵⁴ and is enacted under entry 56 of the Union List and not under Article 252 of the Constitution. As per entry 56, the parliament, by law, is required to make a declaration of expediency in order to make legislation regarding regulation and development of inter-state rivers and river valleys.⁵⁵ This declaration as to expediency of Union control with regard to dam safety procedure is provided under Section 2 of the Act.⁵⁶ Although the Standing committee had only clarified the power of Parliament to enact such a law, and had approved the State-oriented model of the 2010 Bill with a recommendation to pursue the matter of adoption of law on priority basis with the state governments, the Union government decided to totally revamp the law and enact it under entry 56. This removes the requirement of adoption of law by state legislatures.

⁴⁹ The Dam Safety Bill, 2018 No. 149 of 2018.

⁵⁰ The Dam Safety Bill, 2019, No. 190 Of 2019.

⁵¹ The Dam Safety Act, S 8, No.41 2021 (India)

⁵² The Dam Safety Act, S14, No.41 2021 (India)

⁵³ The Dam Safety Act, § 5. & 11(1), No.41 2021(India)

⁵⁴ The Dam Safety Act, § 1(2), No,41 2021(India)

⁵⁵ India Const. VII Sched. List 1, entry 56.

⁵⁶ The Dam Safety Act, 2021 § 2 (“It is hereby declared that it is expedient in the public interest that the Union should take under its control the regulation of uniform dam safety procedure for specified dam to the extent hereinafter provided”).

- *Application to specified dams:* The Act applies to “specified dams” which are owned by State Agencies⁵⁷ or private bodies.⁵⁸ It applies to both dams constructed before or after the commencement of the Act. As defined under Section 4(x) all dams which are higher than 15 meters (measured from lowest portion of the general foundation area to the top of the dam) are specified dams. Further, specified dams also include those dams which are between 10 meters to 15 meters if they fulfill any of the following criteria: (a) length of crest is not less than 500 meters; (b) the capacity of the reservoir formed by the dam is not less than 1 million cubic meters; (c) the maximum flood discharge dealt with by the dam is not less than 2000 cubic meters; (d) the dam has specially difficult foundation problems; (e) the dam is of unusual design.⁵⁹ The definition of specified dams is on similar lines with the definition of “large dams” as per the International Commission on Large Dams (ICOLD) but has a wider scope than it with the addition of Section 4(x)(ii)(D-E).⁶⁰ Thus, it can be stated that the Act is not only intended to apply to all Large Dams in the country, whether owned by State Agencies or private parties but also to those dams which have “special foundation problems” or “unusual design”. However, these terms are not defined under the Act.

- *Establishment of Regulatory Institutions:* The Act establishes the following Authorities: (i) National Committee on Dam Safety whose functions include evolving policies and recommending regulations regarding dam safety standards and is mandated to meet twice a year (out of which one meeting being should be held before the onset of the monsoon session); (ii) National Dam Safety Authority whose functions include implementing policies of NCDS, providing technical assistance to SDSOs, and resolving disputes between SDSOs and SDSOs and dam owners. (iii) State Committee on Dam Safety; (iv) State Dam Safety Organisations.⁶¹ The SDSOs will be the primary authorities responsible for surveillance, inspection, and monitoring the operation and maintenance of dams within their respective jurisdictions.⁶² The Act further makes provisions for their composition, member qualification; and functions. Following the recommendation of the Standing Committee, the Act provides a detailed list of the functions of NCDS, NDSA and SDSCs in the three schedules appended to the Act. In comparison to the 2010 Bill, the Act removes the requirement of establishment of Non-State Dam Safety Organisations and Non-State Dam Safety Cells. Instead, it casts a uniform

⁵⁷ The Dam Safety Act, § 3 (a), No.41 2021(India)

⁵⁸ The Dam Safety Act, § 3(b), No.41 2021(India)

⁵⁹ The Dam Safety Act, § 4(x) No.21 No 41 of 2021 (India)

⁶⁰ Peder Hdjorth & Lars Bengtsson, *Large Dams, Statistics and Critical Review*, in LARS BENGTSSON ET AL (EDS), *ENCYCLOPEDIA OF LAKES AND RESERVOIRS* (2012).

⁶¹ The Dam Safety Act, § 5 – 15 No.41 of 2021(India)

⁶² The Dam Safety Act, 2021 § 16 No.41 of 2021(India)

responsibility on all specified dam owners (whether public or private) to create a Dam Safety Unit.⁶³

- *Functions of SDSOs in relation to dam safety* – The NCDS, NDSA, and SDSC are envisaged more in terms of policy making bodies and the primary duty and functions in relation to ensuring dam safety falls upon the SDSOs. They have the responsibility of keeping perpetual surveillance, carrying out inspections, monitoring operation and maintenance of specified dams within their jurisdiction.⁶⁴ Their other responsibilities include vulnerability classification of dams, maintenance of log books, maintaining records of dam failures and dam incidents, giving instructions to dam owners on safety/remedial measures, inspection and investigation etc.⁶⁵

- *Responsibilities of Dam Owners:* The Act casts a number of obligations on the dam owners. As per the Act, they will be responsible for safe construction, operation, maintenance and supervision of the dam. They must establish a Dam Safety Unit⁶⁶ which shall inspect the dams before and after the monsoon, and during and after events like earthquakes, floods etc or during and after any sign of distress. Further, the dam owners are obligated to complete technical documentation, installation of monitoring instruments, establishment of hydrometeorological station, installation of seismological station (for dams of height 30 meters or above), preparation of emergency action plan,⁶⁷ carrying out risk assessment studies, preparation of a comprehensive dam safety evaluation through an independent panel of experts.⁶⁸ The Act has incorporated the recommendation of the Standing Committee with respect to have the safety evaluation done through an independent panel and not through the internal review panel constituted by the dam owner to remove the conflict of interest that can creep in.

- *Offenses and Penalties:* The Act incorporates the recommendation of the Standing Committee and provides a chapter on Offences and Penalties containing Sections 41-44. Section 41 makes the obstruction in discharge of functions of state authorities (or any person authorized in this behalf) and refusal to comply with directions issued under the Act as an offense punishable with imprisonment of a term of one year or with fine or with both. The obstruction or refusal has to be without reasonable cause. Further, if such obstruction or refusal results in loss of life or imminent danger of loss of life, the punishment can be extended to

⁶³ The Dam Safety Act, § 30.No.41, 2021(India)

⁶⁴ The Dam Safety Act, § 16.No.41, 2021(India)

⁶⁵ The Dam Safety Act, Ch. VI. No.41, 2021(India)

⁶⁶ The Dam Safety Act, Ch. VII.No.41, 2021(India)

⁶⁷ The Dam Safety Act, Ch. VIII.No.41, 2021(India)

⁶⁸ The Dam Safety Act, Ch. IX.No 41, 2021(India)

imprisonment of two years. The Act also makes head of government departments, and person in charge of companies vicariously liable for offenses committed under the Act (Section 42-43). However, they are not absolutely liable and are provided with statutory defense of knowledge and due diligence i.e. they will not be liable if they can establish that offenses were committed without their knowledge or that they have exercised due diligence to prevent commission of such offense. The Cognizance of offenses under the Act can be taken by a court of a grade of Metropolitan Magistrate or Judicial Magistrate of First class, or superior courts provided that cognizance can only be taken after a complaint by Central Government, State Government, or a person authorized by NCDS, NSDA, SCDSs, SDSOs.⁶⁹ Thus citizen suits are not allowed under the Act.

Table 2: Comparison of Dam Safety Bill, 2010, Standing Committee Report and Dam Safety Act, 2021			
	Dam Safety Bill, 2010	Parliamentary Standing Committee Report	Dam Safety Act, 2021
Constitutional Provision	Article 252 of the Constitution. Mentioned expressly in the Preamble that Parliament has no power to enact the law with respect to dam safety	Approved with providing clarification that parliament has the power to make the law under entry 56 of the Constitution.	Entry 56 of Union list
Extent	Only to the State of Andhra Pradesh and Union Territories, and to other states which adopt the Act.	Approved but Recommended the government to pursue the state governments on priority basis to adopt the law.	Whole of India
Authorities established	NCDS, CDSO, SCDSs, SDSOs, SDSCs, Non-State DSOs, Non-State DSCs	None	NCDS, NSDA, SCDS, SDSOs and Dam Safety Units
Power and functions of the Authorities	Specified in the provisions of the Act	Recommended incorporation of detailed list of functions of authorities	Functions of NCDS, NSDA, SCDSs are provided in the Three Schedules of the Act.
Offences and Penalties	None	Recommended incorporation of Offences and Penalties	Yes, under Chapter X
Compensation	None	Recommended incorporation of compensation for affected people in case of dam failure	None
Definition of safety Assurance and Dam Safety	Not present	Recommended incorporation of Definition of safety assurance and dam safety	Not present

⁶⁹ The Dam Safety Act, § 44 No.41, 2021(India)

Issues and Challenges

The need for a robust law on Dam Safety (especially relating to dams constructed on inter-state rivers) has been felt not only by the Legislature and Executive but also by the Judiciary. The Indian Judiciary has time and again intervened to ensure that dam operations in India do not pose significant risk to environment, life and property. The Apex Court on multiple occasions has taken an active role in ensuring dam safety. The cases of *N.D. Jayal v. Union of India*,⁷⁰ *Tehri Bandh Virodhi Sangharsh Samiti v. State of U.P.*,⁷¹ and *Narmada Bachao Andolan v. Union of India*,⁷² are instances of the Judicial supervision regarding Dam Safety in India. However, the stance of the Apex Court has not always been proactive in this regard. There is a striking difference between the stance adopted by the Supreme Court in *Tehri Bandh Virodhi Sangharsh Samiti v. State of U.P.*,⁷³ with regard to the Safety concerns of Tehri Dam and in *State of Tamil Nadu v. State of Kerala*,⁷⁴ with regard to the Mullaperiyar Dam. It also highlights the development of jurisprudence with regard to “judicial supervision” in India. In the *Tehri Bandh* case, the Supreme Court refused to intervene with the decision of the Government on safety aspects. However, the level of intervention of Apex Court in the Mullaperiyar Dam case is another story altogether. The Mullaperiyar Dam, (a 53m, 126-year-old dam constituted over the Periyar river) has been a long-standing bone of contention between the state of Kerala and Tamil Nadu. Though situated in Kerala it is operated and maintained by Tamil Nadu.⁷⁵ In *State of Tamil Nadu v. State of Kerala*,⁷⁶ After a long-standing dispute between the two states relating to safety of the dam on one hand and increasing its height on the other, that started in 1979 after the Morbi Disaster, the Apex Court in 2014 constituted a Permanent Supervisory Committee to oversee all the aspects of the Mullaperiyar dam. In the wake of 2018 Kerala floods, the Apex Court was contemplating whether to expand the powers of the supervisory committee or not. However, after the passage of the Dam Safety Act, 2021 the Hon’ble Apex Court has observed that the legislation has the potential to end the “perennial” legal battle

⁷⁰ *N.D. Jayal v. Union of India*, Unreported Judgements, Writ Petition (Civil) 295 of 1992, decided on Sept. 01, 2003 (Supreme Court).

⁷¹ *Tehri Bandh Virodhi Sangharsh Samiti v. State of U.P.*, [1992] Supp. 1 SCC 44.

⁷² *Narmada Bachao Andolan v. Union of India*, [2000] 10 SCC 664.

⁷³ *Tehri Bandh Virodhi Sangharsh Samiti v. State of U.P.*, [1992] Supp. 1 SCC 44.

⁷⁴ *State of Tamil Nadu v. State of Kerala*, unreported Judgment, Original Suit No. 3 of 2006, decided on May 7, 2014 (Supreme Court).

⁷⁵ *State of Tamil Nadu v. State of Kerala*, unreported Judgment, Original Suit No. 3 of 2006, decided on May 7, 2014 (Supreme Court).

⁷⁶ *State of Tamil Nadu v. State of Kerala*, unreported Judgment, Original Suit No. 3 of 2006, decided on May 7, 2014 (Supreme Court).

between Tamil Nadu and Kerala regarding the Mullaperiyar Dam.⁷⁷ It also highlighted that the passage of Act would render its supervisory committee redundant and suggested the Government to expedite the formation and functioning of NDSA.⁷⁸

However, due to non-appointment of the members of the NDSA and delay in start of its functioning, the Supreme court expanded its Supervisory Committee by including a technical member (one from each state) and gave it the powers and functions of NDSA with respect to the Mullaperiyar Dam.⁷⁹ While passing the order under Article 142 of the Constitution,⁸⁰ The Apex Court held that: “Until the regular NDSA becomes functional, the Supervisory Committee, as reconstituted in terms of this order, shall be accountable for all matters relating to safety of the Dam ... and discharge the functions of NDSA specified in Section 9 of the 2021 Act.”⁸¹

The order of the Supreme Court in *State of Tamil Nadu v. State of Kerala*,⁸² brings to light one of the most prominent issues faced by many administrative bodies and quasi-judicial bodies and tribunals in India i.e. vacancies. Non-appointment of members and delayed appointments virtually renders a body dysfunctional. This problem has been faced by bodies such as the National Green Tribunal, the erstwhile Intellectual Property Appellate Board etc. For instance, The National Environmental Appellate Authority Act, 1997 which was the precursor to the National Green Tribunal, though enforced, never became fully functional due to lack of appointments and after the year 2000, no judicial members were appointed to it.⁸³ Hence, it is imperative to expedite the process of constitution and make appointments to the NDSA and other authorities established under the Act as soon as possible to ensure that they become functional as early as possible.

⁷⁷ Mullaperiyar Row: Dam Safety Act can end Disputes, says Supreme Court, The Hindu (Mar. 31, 2022), <https://www.thehindu.com/news/national/mullaperiyar-row-sc-sees-remedy-in-dam-safety-act-2021/article65278191.ece>.

⁷⁸ Id.

⁷⁹ Abraham Thomas, Top Court Seeks Fresh Safety Review of Kerala’s Mullaperiyar Dam, Hindustan Times (Apr. 08, 2022), <https://www.hindustantimes.com/india-news/top-court-seeks-fresh-safety-review-of-kerala-s-mullaperiyar-dam-101649437559003.html>.

⁸⁰ India Const. art. 142 (The Supreme Court under Article 142 has the power to pass any order as is necessary for doing complete justice in any cause or matter pending before it).

⁸¹ Abraham Thomas, Top Court Seeks Fresh Safety Review of Kerala’s Mullaperiyar Dam, Hindustan Times (Apr. 08, 2022), <https://www.hindustantimes.com/india-news/top-court-seeks-fresh-safety-review-of-kerala-s-mullaperiyar-dam-101649437559003.html>.

⁸² *State of Tamil Nadu v. State of Kerala*, unreported Judgment, Original Suit No. 3 of 2006, decided on May 7, 2014 (Supreme Court).

⁸³ Nivit Kumar Yadav & P K Bharath Kesav, National Green Tribunal: A New Beginning for Environmental Cases, CENTER FOR SCIENCE AND ENVIRONMENT, <https://www.cseindia.org/national-green-tribunal--a-new-beginning-for-environmental-cases-> (last visited May 10, 2022).

The primary concerns raised against the Dam Safety Act, 2021 is with respect to its constitution validity. As water, water storage and water power are state subjects under entry 17 of list II of the Constitution, only the state legislatures have the power to enact a law. Keeping this in mind and also that fact the dams in India have been the responsibility of the state government, the 2010 bill was intended to be a law to be adopted by States. However, after the Standing committee clarified that the Parliament under entry 56 of the Union List has the power to enact the law on interstate rivers, the 2021 Act was enacted as a national legislation extending to the whole of India. Now the issue is whether the clarification of the standing committee is correct? And whether the Parliament has the competence to legislate on dam safety in India? It is in this context it was suggested in the Parliament to refer the Bill to a select committee to discuss this issue further.⁸⁴ However, the government chose to proceed with the legislation. States such as Tamil Nadu have fiercely objected to this and a petition has been filed in the Madras High Court relating to the constitutional validity of the Act.⁸⁵ Since the constitutional validity has been assailed and the matter is pending before the hon'ble High Court, it will not be proper to provide a comment on the same here at this stage.

Another concern with the Dam Safety Act is the weak definition of operational safety. Dam Safety includes both structural safety and operational safety. However, the Act has given primary importance to structural safety and not given adequate emphasis to ensuring operational safety. Safe operations of the dams can be hindered not only due to structural issues but events such as cloudburst and sudden release of water. This can cause flooding in downstream houses and agricultural fields. The Act under section 4(f) defines “dam failure” as “failure of the structure or operation of a dam which leads to uncontrolled flow or impounded water resulting in downstream flooding affecting the life and property of people, and environment including flora, fauna and riverine ecology”. The explanation attached to section 4(f) further clarifies that “failure in operation shall mean such faulty operations of the dam which are inconsistent with the operation and maintenance manual”. This is considered inadequate for two reasons (i) “uncontrolled flow” is not defined. So, when the dam gates are opened it is generally considered as controlled flow but it can also lead to disaster in downstream areas (ii) failure in operation means only those failures that happen in violation of

⁸⁴ Prashant Prabhakar Deshpande, National Dam Safety Bill, 2021 – Part 2, TIMES OF INDIA [https://timesofindia.indiatimes.com/blogs/truth-lies-and-politics/national-dam-safety-bill-2021-part-2/\(Dec. 06, 2021\),](https://timesofindia.indiatimes.com/blogs/truth-lies-and-politics/national-dam-safety-bill-2021-part-2/(Dec. 06, 2021),)

⁸⁵ Mohamed Imranullah S, Constitutional Validity of Dam Safety Act challenged in HC, THE HINDU (Jan 05, 2022), <https://www.thehindu.com/news/national/tamil-nadu/constitutional-validity-of-dam-safety-act-challenged-by-dmk-in-madras-high-court/article38121523.ece>.

operation and maintenance manual. Such a manual is not in the public domain and is not legally defined. Thus, there is still a gray area with respect to the definition of dam failure.⁸⁶

Another issue pertaining to the Act is with respect to the power and functions of NCDS, NDSA, and SCDSs. The functions of these authorities are provided in detail in the three schedules of the Act. As per Section 49, the Central Government has the power to amend these schedules by way of a notification. In this regard a legal issue that arise is whether the core functions of a statutory authority should be modified by way of a notification or by way of legislative amendment. In various other legislations such as the Aadhar Act, 2016, the National Medical Commission Act, 2019, the functions of regulatory authorities are provided in the Act itself⁸⁷ with a power to the Central Government to expand those powers and functions through notification.⁸⁸ Expansion of power by way of a notification and giving complete power to amend the same through a notification are not the same thing. Thus, this issue also needs some clarification.

Lastly, the Standing Committee had recommended incorporation of provisions in the Bill to provide compensation to the affected people in case of dam failure. The same are not incorporated in the Act. Since, the Act already provides for offenses, a provision with regard to compensation would have made this law more holistic and effective. The provision with regard to offenses to need a bit of strengthening as One-year punishment for violation is not adequate, also the quantum of fine is also not provided which leave it an open question. Thus, the Act could be strengthened by incorporating provisions of compensation to the people affected by dams. If due to unsafe operations of dams downstream houses and agricultural fields are flooded, there should be a provision to provide compensation for loss of life and property.

Conclusion

India has the third largest number of dams across the globe and a legislation to regulate dams is an essential and an important step towards ensuring dam safety in India. The Dam Safety Act 2021 which is an outcome of over 30 years of deliberations is a positive step in this direction. It presents detailed directions to incorporate safety measures in functioning of the dam by increasing the duties on the state government and the private owners of the dams.

⁸⁶ Dam Safety Bill 2019: Will it Help Prevent Dam Disasters in India?, SANDRP (Sept. 30, 2019), <https://sandrp.in/2019/09/30/dam-safety-bill-2019-will-it-help-prevent-dam-disasters-in-india/>.

⁸⁷ See the Aadhaar Act, 2016 § 17 & 23; the National Medical Commission Act, 2019 § 10. See also The Dam Safety Bill, 2019, PRS INDIA, <https://prsindia.org/billtrack/the-dam-safety-bill-2019> (last visited Feb. 08, 2022).

⁸⁸ See the Aadhaar Act, 2016 § 53(2)(c)(d) the National Medical Commission Act, 2019 § 56(2)(h).

Though 92% of the dams are located on inter-state rivers, most of them are built, owned and operated by the respective state governments. Hence, any law that seeks to provide a robust mechanism for dam safety has to be based on the principle of “cooperative” federalism. Whether the new law will lead to better implementation of dams or open the floodgates of legal disputes remains to be seen. However, there are certain aspects where the Act is lacking behind and would cause problems while enforcing the Act. The questions with regard to constitutionality will be settled by the courts in due course. Other issues such as functions of the Authorities, adequacy of definition of dam failure and absence of compensation related provision do point out certain limitations of the law which should be looked into. Further, the penal provisions under the Act are not commensurate to the potential damage which the dams might cause if the guidelines are not followed and the same shall be looked into by the government and the penalty shall be increased to imprisonment up to five year, so that the deterrence could be increased. Another important aspect that could be looked into for ensuring dam safety will be conducting regular safety drills from time to time. Safety drills should be made part of the safety protocol and included in Safety Manuals prepared in this regard. The workers and staff operating the dam should be trained by regular drills and protocols to ensure failure preparedness and reduce the risk of loss of life and property. Further, ensuring safe operations of the dam requires not only sound management and regulation of the activities of the dam but also requires pro-active community participation. Thus, not only the workers and staff of the dam but also the local population residing in nearby areas of the dams should be made part of regular safety drills.

Despite the issues and challenges, the Dam Safety Act, 2021 is a right step in disaster mitigation and risk reduction. It is a futuristic legislation and gives dam safety a new thrust.⁸⁹ Such legislative measures must be replicated in other possible man made or natural structures in India such as industrial units, oil refineries and power generation structures and other large-scale infrastructure projects to provide safety guidelines and mechanisms, enhance disaster preparedness and provide relief in instances of man-made or natural calamities or accidents that may arise in the future. A robust set legislative measures will not only reduce judicial burden by decreasing public interest litigations but also be a proactive step in ensuring that proper safety measures in place ex-ante as compared to ex-post measures in case of a disaster or calamity, thereby reducing the risk to life, property and environment.

⁸⁹ Sanjay Kundu, Law Seeks to Give Dam Safety a New Thrust, The Tribune (Dec. 21, 2021), <https://www.tribuneindia.com/news/comment/law-seeks-to-give-dam-safety-a-new-thrust-352657>.