

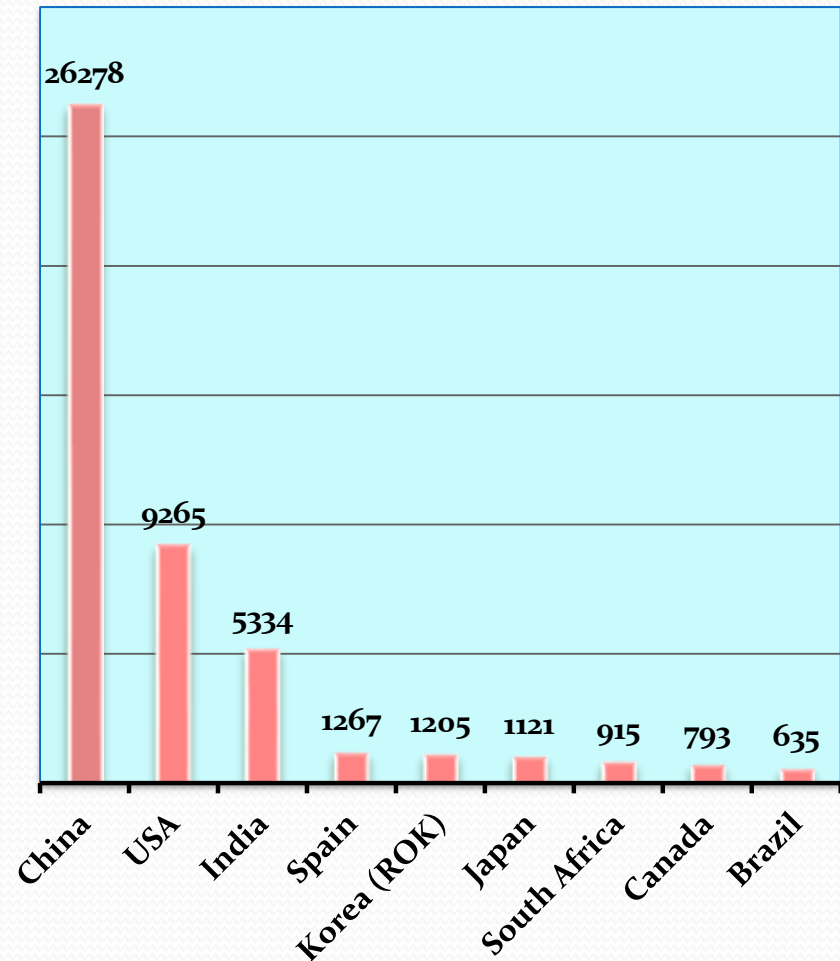
# Overview of Dam Safety Act - 2021

-Gulshan Raj, Chief Engineer  
DSO,CWC



# Need For Dam Safety

- ❑ Dams are key to water, food, energy and health security in India.
- ❑ India has **5334** large dams completed and 411 under construction.
- ❑ Storage capacity created is 258 BCM and 47 BCM is under construction.
- ❑ About 80% of the dams – i.e. about 3700 – are over 25 years old, out of which about 209 dams are more than 100 years old.
- ❑ Safety of dams is of utmost importance on account of their strategic importance and risks of dam failure.



# Need For Dam Safety

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- ❑ Aging of Dams
- ❑ Structural deficiencies and shortcomings in operation and monitoring facilities
- ❑ Not meeting present day design standards – structurally and hydrologically
- ❑ To safeguard investment made and benefits derived
- ❑ Hazard to human life and property in down stream



# Dam Failures in India

- About 200 notable failures of large dams in the world (ICOLD 1973).

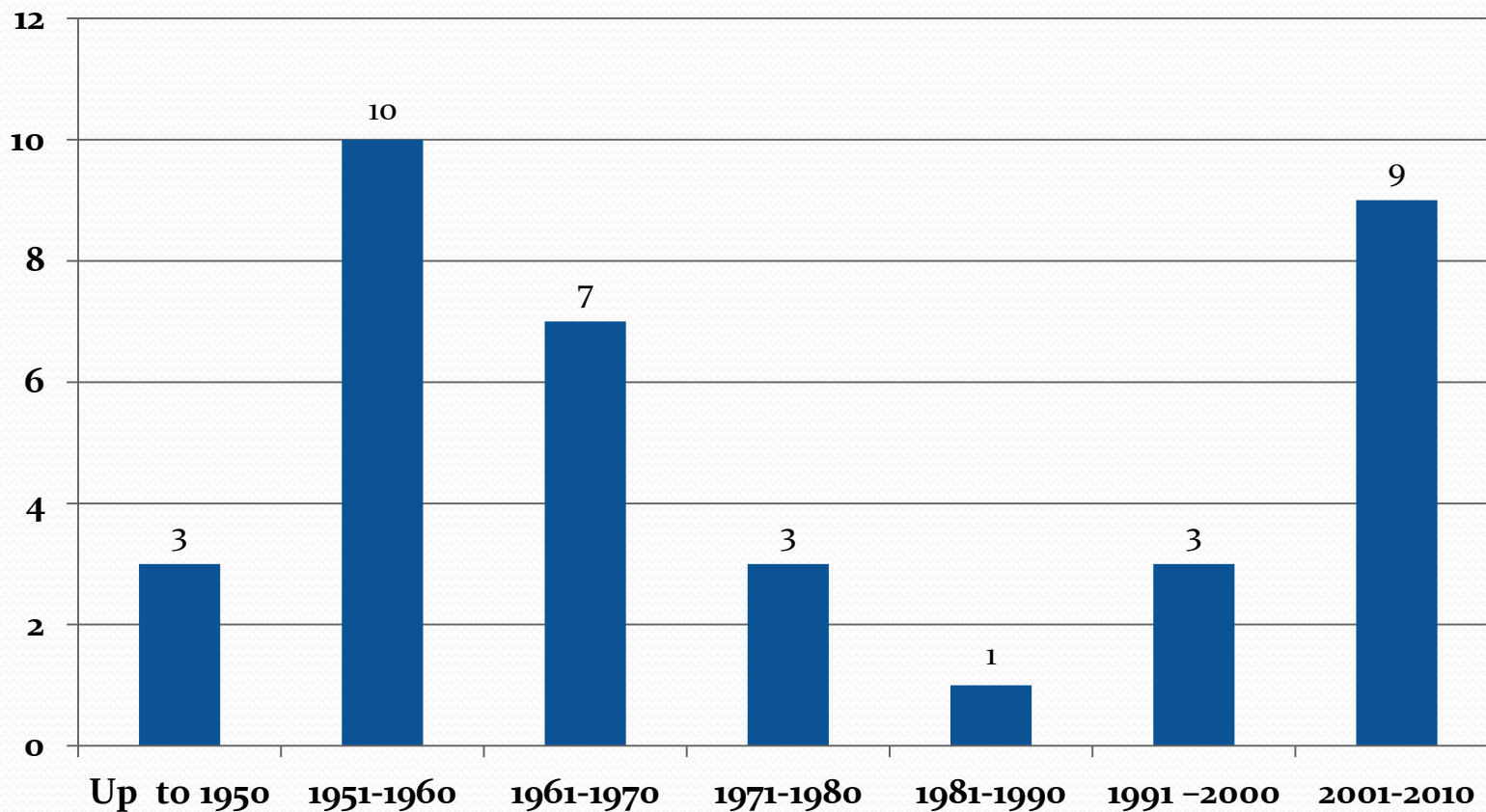
## India

- Many of our dams have deficiencies in structure, operation and monitoring on account of ageing and deferred maintenance.
- The first failure in India was in Madhya Pradesh in 1917 when the Tigma Dam failed due to overtopping. The worst dam disaster was the failure of Machu dam (Gujarat) in 1979 in which about 15,000 people died.
- **There are more than 40 reported failures cases so far.**



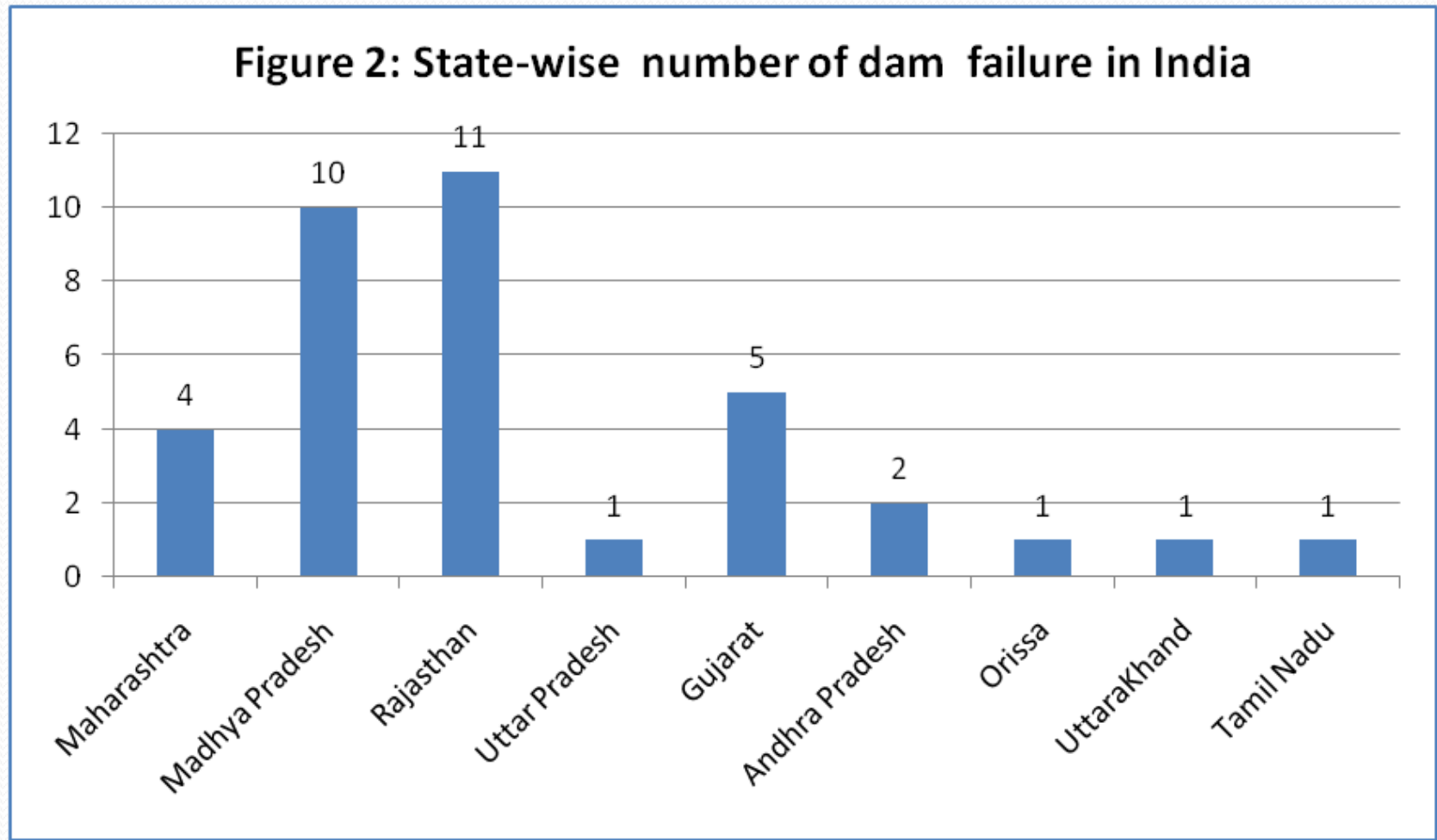
# Dam Failures in India

## Year -wise number of dam failure in India



# Dam Failures in India

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## Age of Indian dams at the time of failures

Age of Dam at failure	Number of failure	% Failure
0 - 5 years	16	44.44%
5 - 10 years	7	19.44%
10 - 15 years	1	2.77%
15 - 20 years	1	2.77%
50 - 100 years	6	16.67%
> 100 years	2	5.56%
Age not defined	3	8.33%
Total	36	

# Development of Dam Safety Activities in India

- ❑ Now a days, world-wide, dam safety is considered an inherent function in the planning, design, construction, maintenance and operation of dams
- ❑ Successful dam safety assurance programme requires a dedicated institutional structure with access to top management attention.
- ❑ Government of India realised the importance of dam safety and took a number of steps to reinforce its concerns
- ❑ The safety of the dams in India is the principal concern of the State agencies and other organisations that own the dams and are involved in various aspects of their investigations, planning, design, construction operation and maintenance.



# Formation of Dam Safety Organisation, Roles

- ❑ Dam Safety Organization (DSO) was established in CWC, in May 1979
- ❑ The Dam Safety Organization in CWC has made enormous efforts in creating awareness in the country and has succeeded to a large extent in convincing the States towards the concept of dam safety s
- ❑ DSO of CWC has compiled guidelines for the safety inspection of dams; check lists and formats for data book for the periodical inspection of dams; guidelines for emergency action plan; and a number of other dam safety literatures
- ❑ So far, 14 States – namely, Andhra Pradesh, Bihar, Chattisgarh, Gujarat, Jharkhand, Kerala, Tamil Nadu, Maharashtra, Madhya Pradesh, Orissa, Karnataka, Rajasthan, Uttar Pradesh, and West Bengal – having significant number of dams, have created State level DSOs.

# National Committee on Dam Safety

- ❑ Review of national scenario concerning safety of dams
- ❑ Preparation of Emergency Action Plan (EAP) and Reservoir Operation
- ❑ Instrumentation of Dams
- ❑ Dam Safety Review Panel (DSRP)
- ❑ National Register of Large Dams – Updating as per new formats
- ❑ Dam rehabilitation and improvement schemes
- ❑ Records of Dam Failures and Major Dam Incidents and their Technical Reports
- ❑ Upkeep and archival of records - Data Book and O&M Manual etc.
- ❑ Setting up Hydrology units and Design Floods Review and
- ❑ Monitoring of safety aspects of inter-state dams by Sub-Committees etc.

# Need For Legislation

- ❑ Safety of dams is very important for safeguarding the huge investment in critical physical infrastructure and the benefits derived from the projects
- ❑ Dam safety is also relevant to a nation's ability to comply with its international obligations.
- ❑ Issues of deferred maintenance or design and construction practices being of an earlier era, may pose risk to life and safety of very vast population
- ❑ Dams have substantial investments in terms of social and environmental costs.
- ❑ Many of the dams have inter-state ramifications in case of actual failure or perceived threats of failures
- ❑ Advisory role of CWC and NCDS without any legal backing
- ❑ The provisions of the proposed Dam Safety Act were to empower the dam safety institutional set-ups in both the Centre and the States.

# Dam Safety Legislation Background

- ❑ Dam poses risk to life and property which has huge financial social and environmental implications with inter-state ramifications
- ❑ Standing Committee constitution in 1982 to evolve unified dam safety procedure in India . Report submitted in 1986
- ❑ It recommended legislation on dam safety
- ❑ Draft “Dam Safety Bill’ drafted in 1987 and circulated among NCDS members. Comments were received from 12 member states
- ❑ Based on these suggestion the Bill was comprehensively revised and modified draft prepared in 2002
- ❑ This draft was circulated among concerned Principle Secretaries of the states

# Dam Safety Legislation Background

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- ❑ Earlier efforts were to encourage the state govt. to enact the legislation on similar lines
- ❑ The state of Bihar enacted the legislation in 2006
- ❑ Some states like Andhra Pradesh and West Bengal favoured uniform central legislation
- ❑ Draft Dam Safety Bill -2010 was introduced in Loksabha in 2010 under Article 252 of the Constitution

# Dam Safety Legislation Background

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- ❑ The Dam Safety Bill 2010 sought to enjoin responsibility on the Central Government, State Governments and owners of specified dams
- ❑ It defined the duties and functions of these institutions in relation to perpetual surveillance, routine inspections, operation & maintenance and funds for maintenance and repairs .
- ❑ The Bill addressed the issues of emergency action plan and disaster management, and also enlisted the requirements of comprehensive dam safety evaluation.

# Dam Safety Legislation Background

## ...contd.

The Article 252 of the Constitution mention about Power of Parliament to legislate for two or more States by consent and adoption of such legislation by any other State. The law so made or enacted by the Parliament applies only to those States whose legislatures have passed resolutions under that provision and also to those States which have afterwards adopted the same by resolution passed by the legislatures of such States in that behalf.

# Dam Safety Legislation Background

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- ❑ The Bill referred to PSC, which gave its report in 2011, suggesting major modifications
- ❑ The bill was withdrawn and Ministry decided to introduce a new Bill
- ❑ Due to lapse of 15th Loksabha the bill could not be taken up then
- ❑ In the meanwhile bifurcation of Andhra Pradesh took place in 2014



# Dam Safety Legislation Background

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- ❑ The possibility of Dam Safety Bill under Entry-56 and Entry-97 of the list -I of the Seventh Schedule of the Constitution under Article 246 was explored.
- ❑ In schedule 7 of the constitution under the State List II the entry 17 provides for “*Water, that is to say, water supplies, irrigation and canals, drainage and embankments, water storage and water power subject to the provisions of Entry 56 of List I*”
- ❑ Water is mainly a state subject but it finds mention in Entry 56 of the Union List I also which covers “*Regulation and development of inter-State rivers and river valleys to the extent to which such regulation and development under the control of the Union is declared by Parliament by law to be expedient in the public interest*””

# Dam Safety Legislation Background

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- ❑ Both Entry 17 and 56 do not contain words like Dams, Dam safety Dam Safety Management etc. So the issue was if the Parliament at all can enact legislation to this effect. This issue was discussed in detail by the PSC and PSC was of the view that Parliament has power to enact legislation for dam safety as dam safety is in public interest and legislation can be brought under Article 246.
- ❑ The learned Solicitor General of India in his considered opinion given in 2016 opined “it will be constitutionally and legally valid to pass the Dam Safety bill by exercising power conferred under article 246 read with Entry 56 and Entry 97 of List I of Seventh Schedule of the Constitution”.

# Dam Safety Legislation Background

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- ❑ The term of the 15th Lok Sabha came to an end, and the Dam Safety Bill, 2010 lapsed with the dissolution of 15th Lok Sabha
- ❑ The Dam Safety Bill, 2018 was prepared for whole of India incorporating the recommendations of the Parliamentary Standing Committee on the Dam Safety Bill, 2010
- ❑ The bill was introduced in Lok Sabha in the Winter Session of the Parliament in 2018 by exercising power conferred under Article 246 read with Entry 56 and Entry 97 of List I of Seventh Schedule to the Constitution.
- ❑ With dissolution of the Sixteenth Lok Sabha, the Dam Safety Bill, 2018 also lapsed.

# Dam Safety Legislation Background

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- ❑ The DSB-2019 was finally passed by Lok Sabha in August 2019 and Rajya Sabha in 2021 as DSB-2021.
- ❑ The Dam Safety Act, 2021 has been notified through Gazette of India on Dec 14, 2021 and has come into force with effect from 30.12.2021.
- ❑ The Act provides for surveillance, inspection, operation and maintenance of the specified dam for prevention of dam failure related disasters and to provide for institutional mechanism to ensure their safe functioning and for matters connected therewith or incidental thereto.
- ❑ It extends to whole of India for Dam constructed before or after the commencement of this Act.

# Dam Safety Legislation and its provisions

The DSB-2021 *inter alia* provides for :

- ❑ constitution of the National Committee on Dam Safety to discharge functions to prevent dam failure related disasters and to maintain standards of dam safety and it shall evolve dam safety policies and recommend necessary regulations as may be required for that purpose;
- ❑ establishment of the National Dam Safety Authority as a regulatory body to implement the policy, guidelines and standards for proper surveillance, inspection and maintenance of specified dams and address unresolved points of issues between the State Dam Safety Organisation of two States, or between the State Dam Safety Organisation of a State and the owner of a dam in that State, and in certain cases, such as dams extending in two or more States or dams of one State falling under the territories of another State. It shall also perform the role of State Dam Safety Organisation thereby eliminating potential causes for inter-State conflicts;

# Dam Safety Legislation and its provisions

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- ❑ constitution of the State Committee on Dam Safety by the State Governments to ensure proper surveillance, inspection, operation and maintenance of all specified dams in that State and ensure their safe functioning;
- ❑ establishment of the State Dam Safety Organisation in States having specified dams which will be manned by officers with sufficient experience in the field of safety of dams;
- ❑ an obligation upon every owner of a specified dam to establish operational and maintenance set up to ensure continued safety of such dams, to earmark sufficient and specific funds for maintenance and repairs of the dams, for undertaking pre-monsoon and post-monsoon inspections and special inspections during and after floods, earthquakes, etc., to carry out risk assessment studies at such intervals as specified by the National Committee on Dam Safety;

# Dam Safety Legislation and its provisions

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- ❑ an obligation upon the concerned State Dam Safety Organisation to keep perpetual surveillance, carry out inspections and monitor the operation and maintenance of specified dams under its jurisdiction to ensure their safety; and to classify each dam under their jurisdiction as per the vulnerability and hazard classification in accordance with the regulations;
- ❑ Every owner of specified dam shall earmark sufficient and specific funds for maintenance and repairs of the dams;
- ❑ All new specified dams shall have a minimum number of set of instrumentations necessary to adequately monitor the performance and safety of dams. A well designed hydro-meteorological network shall be established in the vicinity of every specified dam. A seismological station shall also be installed in case of dams higher than thirty meters or falling in the seismic zone III or above

# Dam Safety Legislation and its provisions

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- ❑ Every dam owner shall carry out risk assessment studies at such intervals as specified by the National Committee
- ❑ Emergency Action Plan for disaster preparedness shall also be prepared for every specified dam and updated at regular intervals
- ❑ Every owner, organization and authority shall render necessary co-operation to the authorities under the Disaster Management Act, 2005 (53 of 2005) to meet or mitigate any disaster or emergency arising out of the specified dams.
- ❑ an obligation upon the National Dam Safety Authority to forward its Annual Report to the Parliament and the National Disaster Management Authority and the State Dam Safety Organisation to forward their Annual Reports on safety status of dams to the concerned State Legislative and State Disaster Management Authority



# Conclusion

- ❑ India has invested substantially in infrastructure necessary to store surface runoff in reservoirs formed by large, medium, and small dams with associated appurtenances.
- ❑ It is very important to ensure that the existing dams continue to operate as designed, producing intended benefits at full potential to the society in the form of water supply, irrigation, flood control and hydropower.
- ❑ So far, the dam safety directions and protocols issued by CWC are basically advisory kind of and have limitations during implementation
- ❑ Enactment of the Dam Safety Bill-2021 resulting in notification of DS Act 2021 will give legal powers to dam safety agencies for implementing dam safety protocols.



**Thank you!**