

MARSEILLE
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2022



ICOLD
27TH CONGRESS
90TH ANNUAL
MEETING



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90^{ÈME} RÉUNION
ANNUELLE



Special Session organized by the World Bank

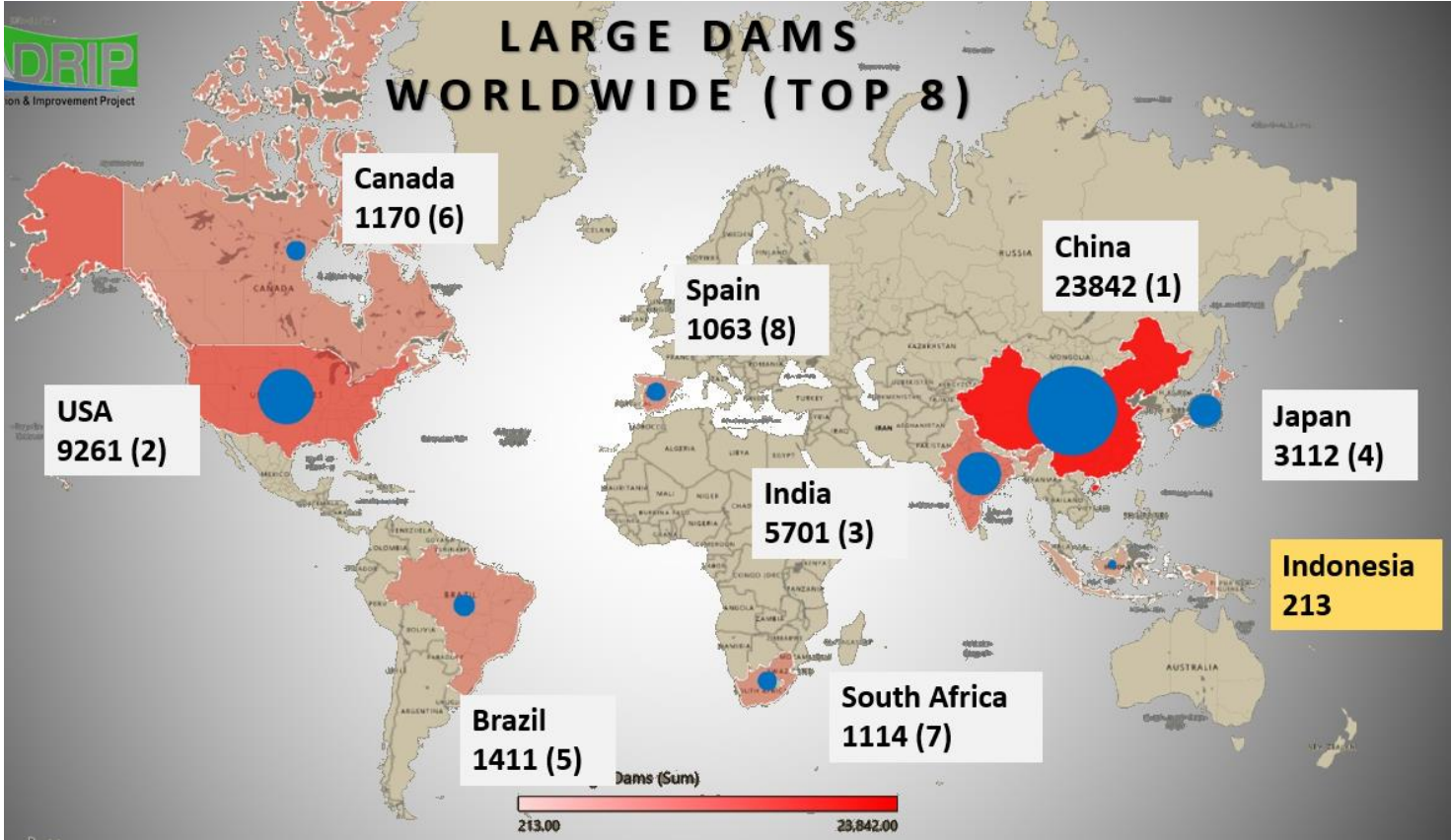
Dam Rehabilitation and Improvement Project - India

Chabungbam Rajagopal Singh & Joop Stoutjesdijk

World Bank

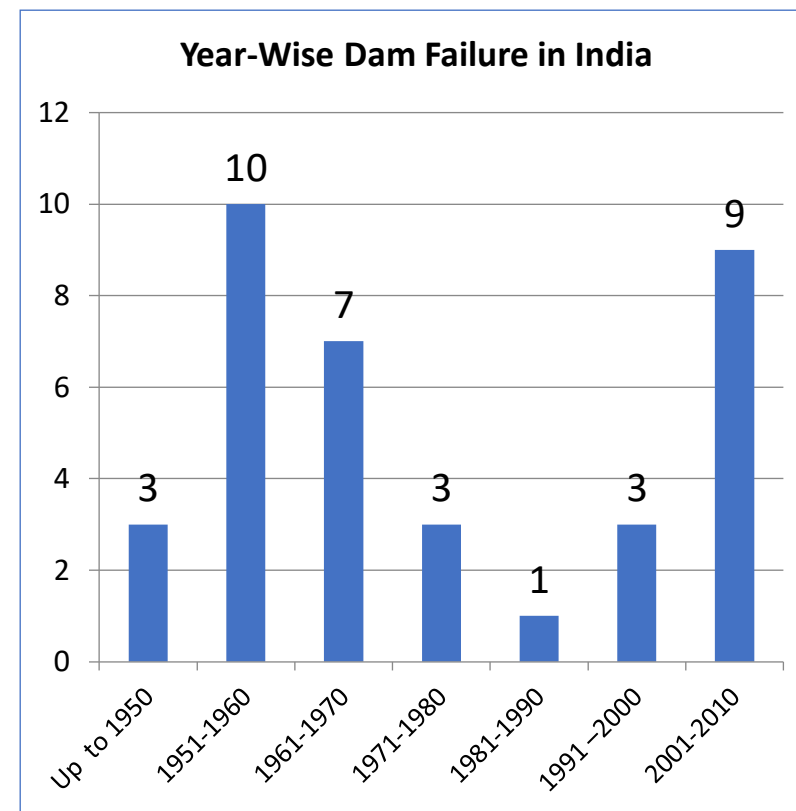


- ❑ Dams have played a key role in fostering rapid and sustained agricultural and rural growth and development in India.
- ❑ Over the last fifty years, India has invested substantially in dams and related infrastructure.



Key issues faced by existing dams in India

- ❑ Pervasive “build-neglect-rebuild” cycle characterized by deferred maintenance and premature deterioration;
- ❑ Insufficient funds and lack of sustainable mechanisms to finance dam operations and maintenance (O&M) and safety measures;
- ❑ Inadequate capacity of dam engineers;
- ❑ Weak institutional set-up for dam safety with inadequate regulatory mechanism;



Dam Rehabilitation and Improvement Project (DRIP-1)

Objective : to improve the safety and operational performance of selected existing dams in the territory of the participating states

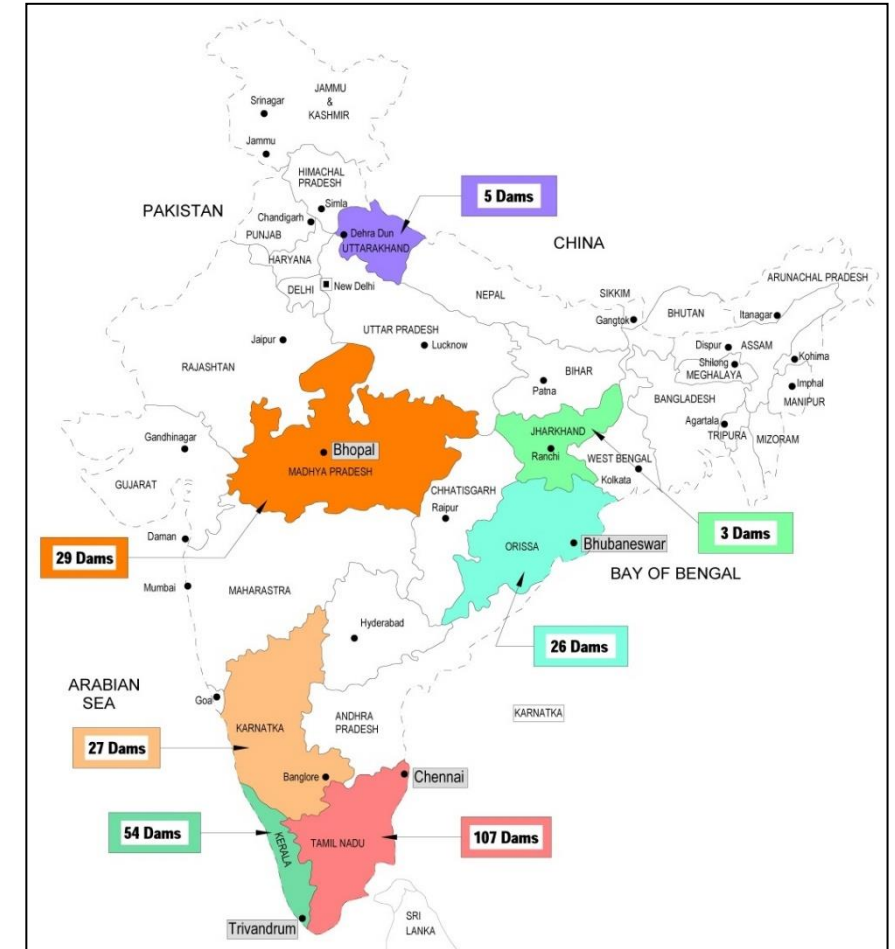
Implementing Agencies: MoJS ; 6 States and 1 RBO (DVC)

Budget Outlay: US\$ 437 Million

No. of Dam covered: 223

Financed by : The World Bank

Start/Close year: 2010/2020





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DRIP has three main components

1. Rehabilitation and Improvement of dams and associated appurtenances:

- ☐ Structural
- ☐ Non-structural interventions (EAP, O&M Manual, Dam Instrumentation etc)

2. Institutional Strengthening:

- ☐ Establishment of Dam Safety Organizations
- ☐ Training and collaboration with national and international institutes
- ☐ Development of operations guidelines

3. Project Management:

- ☐ Establishment of Project Management Units (Federal and states)
- ☐ Engineering and Management Consultation & 3rd Party QA/QC



Comp 1: Rehabilitation and Improvement of dams and associated appurtenances:

☐ Physical rehabilitation of 198 dams

- Grouting of Masonry/Concrete Dams (31);
- Repair of Sluice Structure (35);
- U/S Face Treatment with UV Resistant Mortar (43);
- Reaming of Porous/Foundation Drains (52);
- Earth Dam Re-sectioning (79);
- Spillway Components (101);
- H-M Gates (139);
- Embankment Slope Protection and Drainage (139)

☐ Basic facilities in 175 dams

- Approach roads (155);
- Security facilities (50);
- Power back-up sets and dewatering pumps (68).



Automation of Gates

Before



After



Additional Spillway



Energy Dissipation

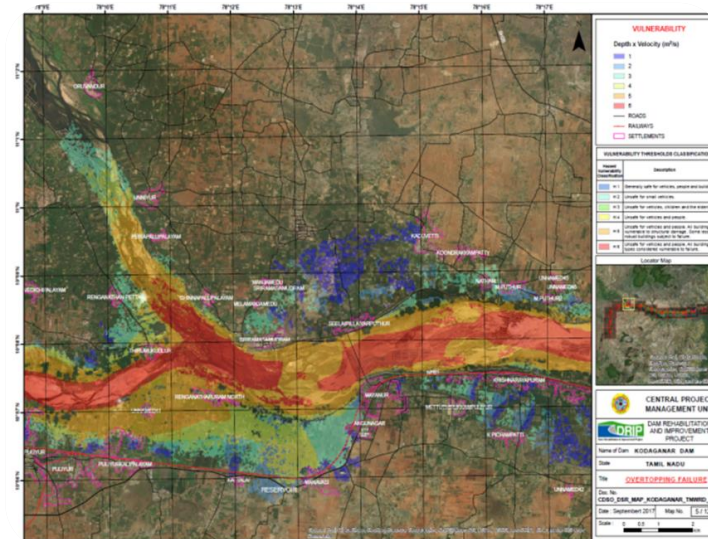


Embankment Slope Protection



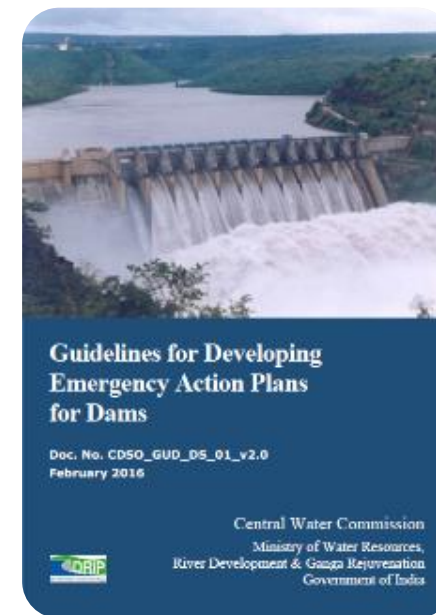
□ Non-structural measures

- Revised hydrology (198);
- Dam break analysis and inundation mapping(198);
- Emergency Action Plan (192);
- Revised O&M (196);
- Instrumentation (118)
- Inflow forecasting system and flood routing



Comp 2. Institutional Strengthening

- ❑ 13 national level guidelines on various aspects of dam safety and management published (e.g.)
- ❑ 186 trainings benefiting 5443 participants.
- ❑ Establishment of Dam Safety Organizations (DSOs)
- ❑ Long-term collaboration renowned with institutes (including the USBR(USA), Deltares (Netherlands), Entura (Australia); JWA (Japan), Valencia University etc.



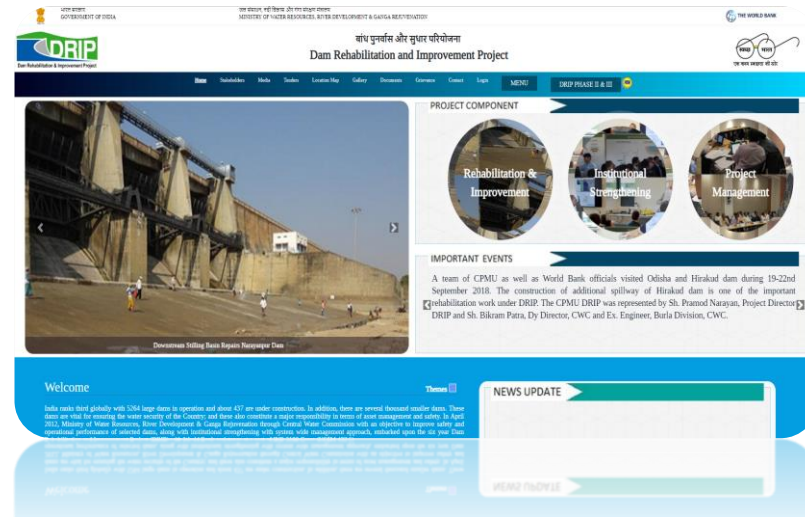
Comp 2. Institutional Strengthening

- ❑ Dam inventory and asset management system (DHARMA – Dam Health and Rehabilitation Monitoring Application)
- ❑ Seismic Hazard Assessment Information System (SHAISYS) has been developed
- ❑ Annual Dam Safety Conference
 - 3 National and 2 international Dam Safety Conferences
 - More than 300 technical papers presented; 1300 delegates in last 2 international conferences



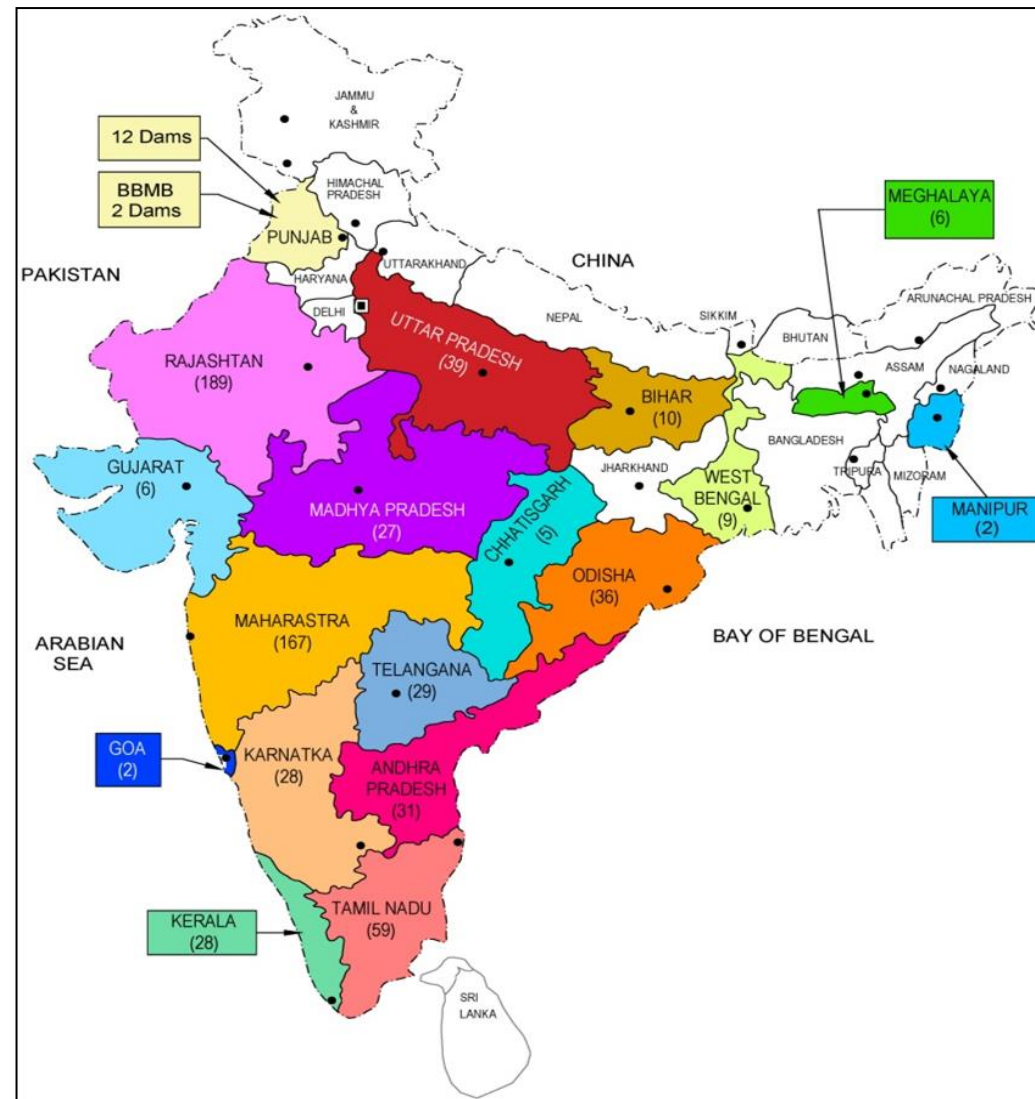
Comp 3: Project Management

- ☐ Establishment of well-staffed Project Management Units.
- ☐ Engineering and Management Consultant
- ☐ Development of MIS for physical and financial progress monitoring
- ☐ 3rd Party QA/QC
- ☐ Robust project review and monitoring mechanism
 - 14 World Bank Review Missions
 - 23 Technical Committee Meetings
 - 9 National Level Steering Committee Meeting



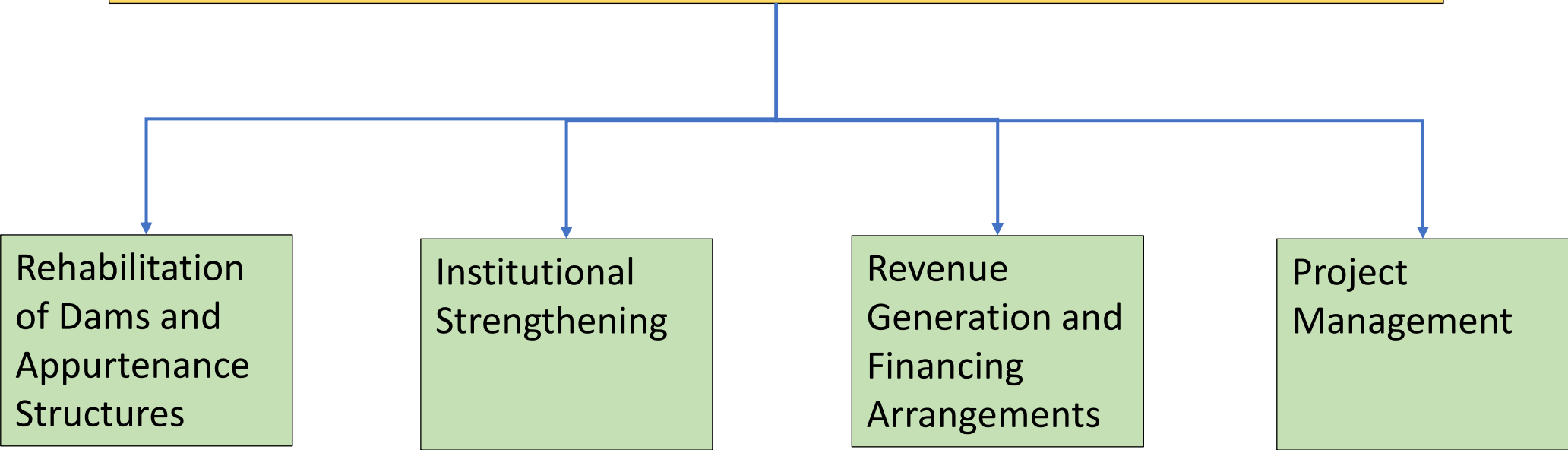
DRIP-2 & DRIP-3

- ☐ Pan-India (approx. 700 dams)
- ☐ Budget Outlay:
 DRIP-2: US\$ 713 million
 DRIP-3: US\$ 700 million
- ☐)
- ☐ DRIP-2 already initiated in October 2021
 (for 6 years)
- ☐ DRIP-3 will be subsequently added based
 on the implementation progress
- ☐ Financed jointly by World Bank & AIIB



DRIP-2 Components

Dam Rehabilitation and Improvement Project – Phase -2





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Thank you!

[Good Practice Note on Dam Safety:](https://hdl.handle.net/10986/35484)
<https://hdl.handle.net/10986/35484>

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