RAJASTHAN WATER GRID CORPORATION LIMITED

Reclamation of Storage Capacity by Desilting of Bisalpur Dam

District Tonk, Rajasthan

95.84 MCM of live storage to be reclaimed • 20-Year Dredging Tenure

CONTEXT

Rajasthan's Water Resources at a Glance

6.86 Cr

Population (2011)

5.67% of India

342 Lac Ha

Area — largest in India

10.45% of India

43.26 BCM

Total Surface Water

just 1.16% of India

SURFACE WATER RESOURCES

Average Annual Rainfall	**417 mm**
Avg. Annual Availability	**25.38 BCM**
Inter-State Water Share	**17.88 BCM**
Total Surface Water	**43.26 BCM**
Surplus River Basins	**Only Mahi & Chambal (of 16)**

GROUND WATER RESOURCES

Available Ground Water	**11.251 BCM**
Gross Draft (all uses)	**16.739 BCM**
Utilization Level	**148.77%**
Annual Deficit	**5.488 BCM**
Blocks: Safe 38 · Semi-Crit. 22	**Critical 23 · Over-exploited 216**

CWC & CWPRS SURVEY DATA

Reservoir Sedimentation Studies — Rajasthan Dams

Survey Period	Dams Surveyed	Capacity Range	Loss Range
2003–2021	12	15.14–3,128.11 MCM	2.96%–26.93%

Basin-wise Sedimentation Analysis

Chambal Basin

- Rana Pratap Sagar (9.49%)
- Parbati (22.52%)
- Kota Barrage (10.01%)

Banas / Gomti Banas

- Bisalpur (6.01%)
- Raj Samand (0%)

Jawai / Som / Mahi / Mej

- Jawai (2.96%)
- Som Kamla Amba (7.15%)
- Mahi (16.422%)
- Gudha (26.93%)

Smaller Reservoirs

- Jakham (9.199%)
- Urmila Sagar (2.97%)
- Ram Sagar (16.09%)

Dams on the Chambal basin show the widest variation in sedimentation rates.

Action Plan for current Year *It has been proposed to do desilting in Parvati Dam and RPS dam on Assured Revenue Modal*

POLICY BACKDROP

National Framework for Sediment Management, 2022

Clause 2.3.2 — De-silting of Reservoirs

1

Storage & Safety

Sediment deposition threatens both storage capacity and dam safety, with direct consequences for downstream habitations and vital installations.z

2

Safety First

Any constructive or operational sediment-management measure must comply with dam-safety requirements — never at the cost of an unacceptable safety state.

3

Lifecycle Management Approach

Focuses on renewing existing storage infrastructure, as suitable sites for new reservoirs are very limited.

Reservoir Sediment Management Plan

Desilting plan for a given reservoir should be comprehensive. It shall be prepared based on latest bathymetry survey inputs etc. The proposed method may be **revenue** or non-revenue model.

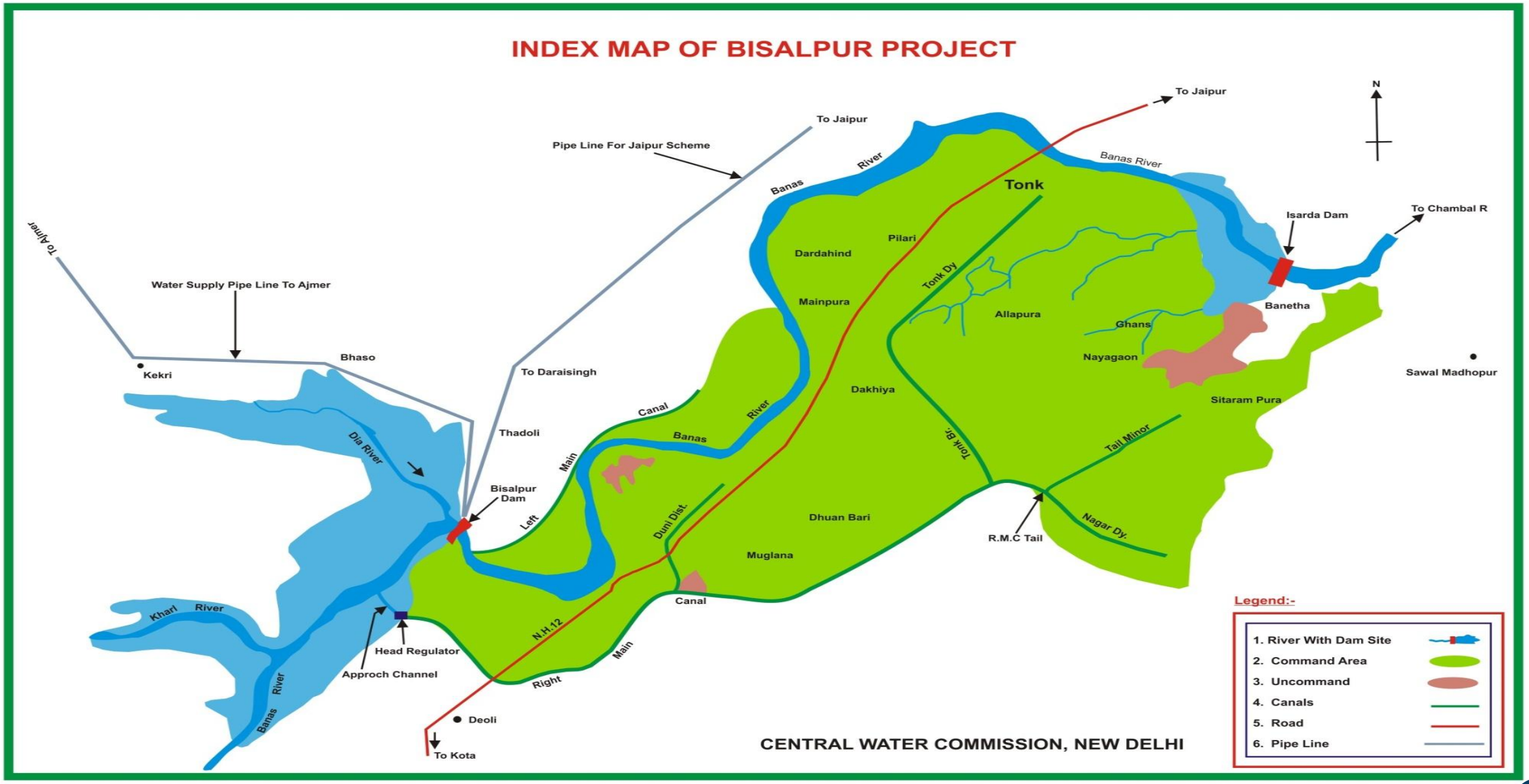
PROJECT SITE

Bisalpur Dam — At a Glance

Village Bisalpur · Tehsil Deoli · District Tonk, Rajasthan



Maximum Water Level (MWL)	**316.345 m**
Full Reservoir Level (FRL)	**315.50 m**
Max. Depth of Water at FRL	**32.50 m**
Minimum Draw Down Level	**304.60 m**
Reservoir Capacity at MWL	**1,271.55 MCM**
Reservoir Capacity at FRL	**1,095.84 MCM**
Water Spread Area at FRL	**212.30 Sq. Km**
Catchment Area	**27,641.4 Sq. Km**


INDEX MAP OF BISALPUR PROJECT
To Jaipur
Pipe Line For Jaipur Scheme
To Jaipur
N
Banas River
Tonk
Isarda Dam
To Chambal R
To Ajmer
Water Supply Pipe Line To Ajmer
Dardahind
Pilari
Tonk Dy
Mainpura
Allapura
Banetha
Ghans
Nayagaon
Bhaso
Kekri
To Daraisingh
Sawal Madhopur
Dakhiya
Sitaram Pura
Canal
Banas
River
Thadoli
Dia River
Main
Tonk Br.
Tail Minor
Bisalpur Dam
Left
Duni Dist.
Dhuan Bari
R.M.C Tail
Nagar Dy.
Muglana
Canal
Khari River
N.H.12
Head Regulator
Approch Channel
Main
Right
Banas River
Deoli
To Kota
CENTRAL WATER COMMISSION, NEW DELHI
Legend:-
1. River With Dam Site
2. Command Area
3. Uncommand
4. Canals
5. Road
6. Pipe Line

BASELINE STUDY

Sedimentation Study by Dredging Corporation of India Ltd.

DCIL (2020) — Geotechnical, Hydrographic, Topographic & Sub-bottom Profiler Survey of Bisalpur Reservoir

149 MCM

Silt deposited in the reservoir

₹4,162 Cr

Estimated total cost of desilting

DREDGED MATERIAL — COMPOSITION

Parameter	Range
Gravel	0 – 28.24 %
Sand	61.30 – 72 %
Silt + Clay	0.01 – 20.41 %
Specific Gravity	2.65 – 2.72
Soil Classification	SP / SM

What this tells us

Sand dominates the deposit, making the recovered material commercially valuable and ideal for mechanical dredging & separation. This finding directly shaped the project's **self-sustaining revenue model** — the sale of processed sand funds the desilting operation instead of relying purely on government spend.

Independent Studies Confirm the Capacity Loss

MERI STUDY, 2010

94.80 MCM live storage lost in 15 years (till 2009)

0.61% per annum loss rate

Projected loss till 2022: **176.96 MCM**

CWC STUDY, 2022

65.90 MCM loss in gross reservoir capacity (2004-2021)

3.88 MCM/year sediment accumulation in Bisalpur

Projected loss till 2022: **69.4 MCM**

Every independent study — MERI, CWC & DCIL — converges on the same conclusion: Bisalpur has lost significant live storage to siltation.

Desilting for Bisalpur Dam

- Bisalpur is a **Drinking water-cum-irrigation lifeline**, supplying Jaipur, Ajmer & Tonk — nearly 80–90 lakh people.
- Continued siltation risks disrupting this drinking-water supply at its source.
- A new dam of equivalent capacity means huge cost, long timelines, and likely land-acquisition litigation.

THE ECONOMICS: DREDGING vs. A NEW DAM

Isarda Dam (new construction)

90 MCM

capacity added

₹1,066 Cr

project cost

Bisalpur Dredging (existing reservoir)

95.84 MCM

live storage to be reclaimed

~₹2,800 Cr

expected revenue

~₹1,000 Cr

saved vs. new dam

Bottom line: Dredging Bisalpur adds live storage equal to an entirely new dam — at a fraction of the cost, with no land acquisition, and no litigation risk. Desilting the existing reservoir is the clear best-suited option.

THE NUMBERS BEHIND THE PLAN

Silt Load Assessment

	Particular	MCM	MMT
A	As per sedimentation study silt deposited (2004–2021)	69.84	111.744
B	Average annual silt-load rate	3.88	6.21
C	Likely deposition during 20-yr dredging period	77.60	124.16
D	Likely total deposition by end of dredging period	147.44	235.90
E	**Targeted capacity to be reclaimed (65% efficiency)**	**95.84**	**153.34**
F	Average silt to be dredged per annum	4.79	7.67

Dredging efficiency factored at 65% · Dredging period: 20 years

Net target: Reclaim 95.84 MCM of storage over 20 years

CONTRACT DELIVERABLES

Scope of Work

Mechanical Dredging

Removal of silt / sand / gravel overburden deposited in Bisalpur's submergence area using dredgers and mechanical means.

Sand–Silt Separation

Separation of sand from recovered silt; clean, silt-free water is returned to the reservoir.

Stockyard Management

Sand and silt stocked at the bidder's designated site for processing and dispatch.

20-Year Target

Reclaim 95.84 MCM of storage capacity — without altering Bisalpur Dam's existing salient features.

Revenue Model

Bidder pays RWGCL a per-unit rate on processed sand, subject to a minimum annual payment.

Farmer Benefit

Dredged silt is available free of cost at the stockyard for farmers wishing to use it on their fields.

EXECUTION APPROACH

Methodology — From Survey to Sand

1 Pre-Dredging

- Topographic & bathymetric survey of ~212.2 sq. km submergence area
- DGPS & echo-sounder used to assess silt depth & original bed level
- Fleet mobilized: 11 dredgers · 20 barges · 5 suction boats · 2 speed boats · 25 excavators

2 Dredging Process

- Hydraulic Cutter Suction Dredgers (CSD) cut & suck silt into slurry
- Slurry piped via floating HDPE pipeline / barge to shore dewatering sites
- Booster pumps deployed for extended discharge distances

3 Material Dispatch

- 24×7 manned check-posts; Rawanna issued only to authorized transporters
- Loading & weighment via excavators and in-situ weighbridges linked to Mining Dept.
- Entry/exit under CCTV surveillance; unauthorized movement reported

BOOTS ON THE WATER

Dredger Fleet & Locations

#	Location	Nos.
1	Bad Ka Jhopda, Tehsil Sawar, Dist. Ajmer	2
2	Dhuwala, Tehsil Jahajpur, Dist. Bhilwara	7
3	Raghunathpura, Tehsil Deoli, Dist. Tonk	2
	TOTAL	**11**



OUTPUT CAPACITY PER DREDGER

2,200
Cum/hr
total output

330
Cum/hr
solid discharge (12-20%)

495 MT
per hour
(@1.5 avg. density)

~3,960 MT
per dredger,
per 8-hr working day

Dredging Equipment in Action



Cutter Suction Dredger at Work



Pipeline & Containment Boom



Dredger Deployment Across the Reservoir

GUARANTEED ANNUAL RETURN CONTRACT

Revenue Model

A self-sustaining structure: sale of processed sand funds the desilting operation and generates revenue for the State.

₹150.80

per tonne

Revenue to RWGCL

+5% increase every year

18%(₹ 27.14)

GST

9% CGST + 9% SGST

Statutory tax component

₹60

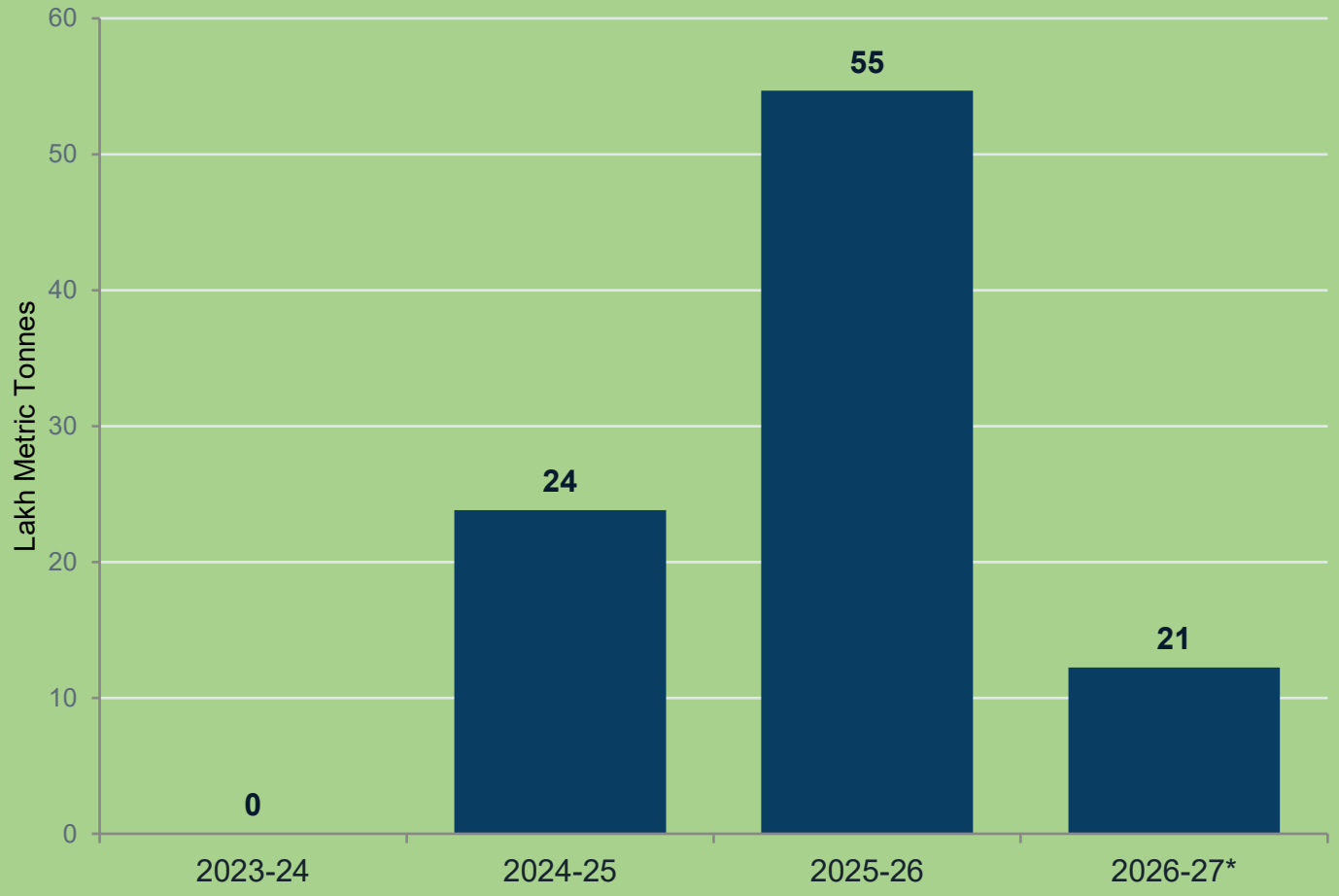
per tonne

Revenue to Mining Department

Payable alongside RWGCL share

Applicable on Bisalpur's Reclamation of Storage Capacity by Desilting contract, District Tonk, Rajasthan.

Dredged Quantity, Year on Year



TOTAL DREDGED Till DATE

100.92

Lakh Metric Tonnes (10092111.46 MT)

2025-26 was the standout year

More than 54 lakh MT dredged — 60% of the total dredged quantity so far — showing the programme's operations scaling up steadily year on year.

**2026-27 figures as of June 2026*

RESULTS SO FAR

Conclusion — Impact Since June 2024

10.092 MMT

Total quantity dredged

June 2024 – August 2026

6.30 MCM

Extra drinkable water storage

630 crore litres gained

₹129.05 Cr

Total Revenue generated for RWGCL

till date

Additional revenue generated: ₹50.21 Cr to Mining Department + ₹23.57 Cr as GST

Total Revenue Generated for the Government till date : ₹ 202.83 Crores

The Assured Revenue Generation model is working: **live storage capacity is being reclaimed, drinking-water supply is being safeguarded for lakhs of people, and the project is generating revenue for the State — all without the cost or delay of building a new dam.**



THANK YOU

Rajasthan Water Grid Corporation Limited

Reclamation of Storage Capacity by Desilting of Bisalpur Dam, District Tonk, Rajasthan