RESEARCH PAPER

HN-RP-001

The Nagmati Programme

A water-positive framework for data centres in India

Watershed accounting. Dry cooling. Why PUE alone is not enough.

This is what is Next.

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The Nagmati Programme

This paper is part of the HyperNext Research series. Methodology, assumptions, and source data are stated openly so other operators can reproduce the analysis on their own facilities. Citation as "HyperNext Research, HN-RP-001" is welcome.

Contents

1. Why this paper

ABSTRACT

A gigawatt-class AI campus moves through four to fifteen billion litres of water a year. The number depends on the cooling architecture and on how honest the accounting is. PUE has been the industry default metric for twenty years. It says nothing about that water. It also stays silent on the water embedded in the electricity the facility buys. This paper proposes a more honest accounting. It separates three layers of water responsibility: on-site use, water embedded in electricity, and watershed-scale impact in the geography of operation. It also introduces the Nagmati Programme, which is the commitment HyperNext made on World Environment Day 2025 to restore more watershed capacity than the company consumes. The framework is non-proprietary. We hope other Indian operators pick it up.

Every choice a data centre makes about cooling is also a choice about water. Choosing evaporative cooling for the lowest PUE has been the default for fifteen years. That worked in temperate climates with plenty of water. It does not work in India.

India is the most water-stressed major economy in the world. NITI Aayog has eighteen of twenty-one major Indian cities at severe water risk by 2030. Per-capita freshwater availability has dropped from 5,177 cubic metres in 1951 to under 1,400 today. The trajectory points below 1,100 by 2050. Designing a hyperscale data centre on the assumption that cooling water will be available at scale is not a defensible engineering posture here.

So the question is not how to use less water in the existing architecture. It is how to change the architecture.

Where the water actually is

Three different things get called "data centre water consumption." They behave differently and they need separate measurement.

Layer one is direct on-site water. Water drawn through the site meter for cooling makeup, humidification, sanitation, process. WUE reports this. Operators have direct control over it.

Layer two is water embedded in the electricity supply. Thermal generation needs cooling at the power station. CEA puts the average Indian thermal plant at 3.5 cubic metres of water per MWh generated. A 1 GW campus at PUE 1.3 sources roughly 25 million cubic metres of embedded water a year through its electricity alone. Most operators have never measured this.

Layer three is watershed-scale impact. The construction footprint. Access roads. Substations. Fibre routes. Staff settlements. Catchment degradation, monsoon runoff loss, groundwater recharge interruption. None of this appears on the books. This is the layer that turns a regional water crisis into a local one for the people living next to the facility.

The Nagmati Programme accounts for all three layers. Named after the Nagmati river that drains the central plateau of Kutch, the founding watershed-scale project is at Zarpara village in Mundra taluka of Kutch district, Gujarat. It launched on World Environment Day in June 2025. The framework asks a different question than PUE. Not how efficient the facility is, but whether the watershed it sits in is better off because the facility exists.

2. The accounting

A complete water budget for a 1 GW AI campus

These numbers are the engineering basis for HyperNext planning at the 1.2 GW Kakinada AI Factory. They are presented so other operators can run the same analysis on their own facilities. Where assumptions are made, they are conservative. The methodology is open for critique.

Component	Annual water (million m^3)	Layer	Notes
Direct cooling makeup (evaporative architecture)	9.2	1	Cooling towers at PUE 1.30
Direct cooling makeup (closed glycol → dry coolers)	0	1	HyperNext baseline. Closed loop, sealed, no evaporation.
Humidification and process	0.15	1	Stable across architectures
Sanitation, staff facilities	0.08	1	2,500 staff equivalent
Water embedded in grid electricity (thermal share)	22.5	2	Indian grid mix, 1 GW IT load
Water embedded in captive renewable electricity	0.3	2	Khawada captive solar plus partnership wind
Watershed-scale catchment impact	3.0	3	Construction footprint and runoff

Layer two dominates. For a campus on the standard Indian grid mix, the water embedded in the electricity supply is two to three times what the site meter reports. Operators reporting WUE from the site meter alone are missing two thirds of the real footprint.

Cutting on-site cooling water to essentially zero (which the closed-glycol dry-cooler architecture does) saves 9.2 million cubic metres a year. Switching the same site to renewable PPAs saves another 22.2 million cubic metres of embedded water. PUE tells you nothing about either move.

KEY FINDING

- Site meter water typically captures 25 to 35 percent of the actual footprint. The rest sits in electricity supply and watershed impact.
- Going from evaporative to dry-cooling primary cuts layer one by about 95 percent. PUE cost is 0.05 to 0.10.
- Going from thermal grid to renewable PPA cuts layer two by about 98 percent. Cost depends on the local renewable market.
- Together those two moves take a campus from 35 million cubic metres a year to under 4 million. Watershed restoration sits on top of that.

Why we do not optimise PUE alone

PUE is total facility power divided by IT power. A ratio. It rewards reductions in cooling overhead. It is silent on the water the cooling system consumes to get those reductions.

A facility running aggressive evaporative cooling in Mumbai will report PUE around 1.18 and consume 12 million cubic metres of water a year doing so. A facility running the HyperNext architecture (closed glycol to dry coolers, direct-to-chip) in the same city will report PUE around 1.25 and consume close to zero cooling water year-round. The first facility looks marginally better on the PUE metric. It also drains the regional groundwater at an industrial rate against a facility that effectively does not draw cooling water at all.

The Nagmati framework recommends reporting PUE, WUE, and CUE alongside the WUE-3 composite. The HyperNext published targets are PUE between 1.25 and 1.30 in moderate conditions (1.35 at 42 degrees Celsius peak ambient), WUE below 0.05 litres per kWh of IT load, and CUE below 0.15 kgCO2e per kWh of IT load. WUE is aligned to ISO/IEC 30134-9; PUE and CUE are aligned to ISO/IEC 30134-2. On a per-MWh basis the WUE target is 0.05 cubic metres per MWh, between one and two orders of magnitude below typical industry reporting where values between 1.0 and 1.8 are common. The dry-cooler architecture (closed glycol loops, no evaporative cooling) achieves close to zero cooling-water consumption, with the small residual driven by humidification, sanitation, and facility services. The CUE target is driven by captive renewable energy, sliding toward zero as the portfolio approaches 2030. PUE optimisation alone will not get a facility to all three. The three metrics have to move together.

3. The Nagmati Programme

Programme structure

Nagmati runs three workstreams in parallel. Each one alone would not be enough.

Workstream A is cooling redesign. Every HyperNext facility uses dry cooling as the sole heat rejection method, across all ambient conditions. There is no evaporative supplement, no cooling tower, and no water chiller in the cooling path. Inside the white space, direct-to-chip liquid cooling carries the rack-level heat through a closed loop of propylene glycol coolant. The glycol loop rejects its heat through external dry coolers to ambient air through sensible heat transfer. Because the heat is captured at the chip via cold plates (rather than via air heated by the chip), the coolant supply temperature can run between 35 and 40 degrees Celsius. Dry coolers can reject heat to ambient air across the full Indian operating envelope, including peak summer conditions, at those coolant temperatures. The cooling-water consumption of a HyperNext facility, in normal operation, is therefore zero. The architecture removes 92 to 95 percent of on-site water consumption compared with a fully evaporative facility of equivalent IT capacity.

Workstream B is renewable electricity. HyperNext operates a 700 MW captive solar plant at Khawada in Kutch, Gujarat, today. A further 2 GW of captive renewable capacity is under planning, with the staging matched to the operational ramp at Hyderabad, Kakinada, and Nava Raipur. Partnership wind allocations supplement the solar base where geography and seasonality dictate. The renewable energy factor target across the operational portfolio is above 85 percent by 2028, aligned to ISO/IEC 30134-2. Each MWh of renewable supply that displaces thermal generation cuts embedded water by roughly 3.4 cubic metres.

Workstream C is watershed restoration. For every cubic metre HyperNext consumes across all three layers, the programme commits to restoring two cubic metres at the watershed scale. Implementation runs through partnerships with local water authorities and accredited NGOs. The first project, signed on World Environment Day in June 2025, is at Zarpara village in Mundra taluka of Kutch district, Gujarat. It works on the Nagmati river catchment that drains the central Kutch plateau toward the Gulf of Kachchh. The 2025 to 2028 commitment is 5 billion litres of net positive watershed contribution.

Nagmati Programme launch ceremony

Figure 1. Nagmati Programme launch ceremony at Zarpara village, Mundra taluka, Kutch district, on World Environment Day 2025. The MoU between HyperNext, the local water authority, and the implementing NGO partners committed the first 5 billion litres of watershed restoration to the Nagmati catchment of central Kutch.

Why watershed restoration counts

Depletion is the alternative. A facility drawing from a stressed aquifer accelerates the depletion unless recharge is actively restored. That is the case for treating restoration as a legitimate offset.

The geography is non-fungible. A facility consuming water in Hyderabad cannot make up for it by funding restoration in Brazil. Every Nagmati project operates inside Indian watersheds.

The time horizon matters too. Projects that take twenty years to recover the consumed volume are not credible offsets. Nagmati prioritises projects with recovery horizons of three to five years.

The mechanics are well documented in Indian water management literature for the arid northwest. Check-dam construction. Contour bunding. Gabion structures along seasonal streams. Replanting of native species in degraded catchments. Cost per cubic metre of restored capacity varies by terrain. Published rates for the Kutch-Saurashtra arid belt run between INR 1.20 and INR 2.80 per cubic metre per year of additional recharge. At INR 2 per cubic metre, the 5 billion litre commitment is a 10 crore INR investment over the 2025 to 2028 period. That is the price of a single MV switchgear lineup. It is not a budget that should give any operator at this scale pause.

4. The harder questions

Humidity in the data hall

The argument against dry-cooling primary architectures is usually framed around equipment reliability and ASHRAE compliance. The worry: dry cooling cannot hold the same hall humidity profile as evaporative cooling, and humidity excursions accelerate wear, ESD events, and tin-whisker failures in legacy hardware.

The worry is real for older equipment. For modern AI rack systems using direct-to-chip liquid cooling and largely indifferent to hall humidity inside the ASHRAE A1 to A4 envelope, the argument no longer holds. HyperNext halls operate between 30 and 60 percent relative humidity at 24 degrees Celsius. That sits inside ASHRAE A3, with no humidification required for normal Indian climate conditions.

The hot days

Interior Indian cities cross 40 degrees Celsius dry-bulb on between 15 and 45 days a year. The HyperNext cooling architecture handles these days through engineered headroom: the dry coolers are sized for peak ambient conditions of 45 degrees Celsius dry-bulb, with fan-speed and coolant-flow modulation absorbing the seasonal variation. PUE rises modestly during these periods (from a design point of 1.25 to 1.30 to approximately 1.35 at 42 degrees Celsius peak ambient), but the cooling-water consumption does not move because the architecture does not switch to an evaporative mode.

This is a deliberate engineering choice. An evaporative supplement on the hottest 15 to 45 days a year would lower peak PUE by roughly 0.05 points, at the cost of approximately 0.3 to 0.5 million cubic metres of water consumption per facility per year. In water-stressed Indian geographies that trade-off does not favour the water saving. The HyperNext architecture accepts a small power penalty at peak ambient to keep the cooling-water consumption at zero year-round.

Cost

Dry cooling costs more in capital terms than evaporative cooling. The differential for a 64 MW phase runs roughly 12 to 15 percent of total cooling-system capex. Over the asset lifetime the operating cost story flips. Dry cooling has higher fan power. It also eliminates water chemistry, biocide treatment, blowdown losses, and water treatment capex. The whole-of-life cost analysis for Phase 1 Hyderabad shows the dry-cooling primary architecture as cost-neutral against evaporative inside a 10-year horizon, and favourable beyond that. The water savings come at zero net cost over the asset lifetime, before anyone prices water risk into the contract.

Credibility of the restoration credits

Watershed restoration accounting is not yet standardised across the industry. Double-counting and inflated claims are real risks. Nagmati addresses this in three ways. Every restoration project is independently audited by an accredited third party (we engaged the Watershed Organisation Trust). The implementing NGO partners publish before-and-after recharge measurements on a public dashboard. The credits HyperNext claims against its consumption are matched one-for-one to specific projects with traceable interventions. There is no portfolio-level aggregation. We will publish the full methodology and audit reports annually starting with the 2025 to 2026 financial year.

5. What other operators should consider

Most of what this paper has described is not proprietary. The cooling architecture decisions are available to any operator willing to accept the PUE cost. The renewable PPA strategy is available to any operator willing to commit to long-term contracts. The watershed work is available to any operator willing to do the hard work of partnership with local water authorities. We publish this paper because we want the practice to become normal, not because we want HyperNext to be unique.

For operators planning new facilities in India over the 2026 to 2030 horizon, our specific recommendations are below.

1. **Adopt WUE-3 reporting alongside PUE and WUE-1.** The methodology in Section 2 is reproducible by any operator with electricity contract terms and CEA grid mix data.
2. **Specify cooling architecture before site selection.** A dry-cooling primary facility operates in geographies that an evaporative-primary facility cannot. The site selection logic is materially different.
3. **Sign renewable PPAs early.** Water savings in layer two depend on contracts that take 12 to 24 months to execute. Starting now means renewable supply is in place when the facility goes live.
4. **Partner with local water authorities on the watershed side, not just the supply side.** The relationship that secures the raw water source is the same relationship that should fund watershed restoration. Treating them as separate negotiations gives up bargaining room that the watershed-side relationship would otherwise provide.
5. **Publish the accounting.** The industry will not converge on a defensible water reporting standard until enough operators publish the methodology behind their numbers.

HEADLINES

- PUE is necessary. It is not sufficient as a sustainability metric for the AI data centre industry in India.
- Complete water accounting covers direct, embedded, and watershed-scale impacts. All three are addressable.
- Dry-cooling primary architecture and renewable PPAs address layers one and two. Watershed restoration takes care of the rest and converts a facility from extractive to additive.
- Nagmati commits HyperNext to net positive watershed contribution from 2025 to 2028: 5 billion litres restored against approximately 2.5 billion litres consumed across all three layers.
- The framework is non-proprietary. We encourage other Indian operators to adopt it.

The next paper in the series, HN-RP-002, looks at the second-largest lever. Inside the facility, the architecture of electricity delivery determines what fraction of each megawatt actually reaches the chip.

Every 415 VAC distribution path now leaves roughly twenty percent of that megawatt on the floor as heat. HN-RP-002 walks through why, and what to do about it.

6. Methodology: how we built the WUE-3 framework

The WUE-3 framework draws on four published water accounting standards. Each contributes a piece. None of them alone covers the full scope this paper proposes.

Standard	Scope	What it covers	What it misses
The Green Grid WUE (2011)	Site-only	Direct site-meter water per IT kWh	Embedded water, watershed impact
WRI Aqueduct Water Risk Atlas	Regional risk	Catchment-scale stress mapping	Operator-level accounting
CDP Water Security disclosure	Corporate	Withdrawal, discharge, consumption	Sector-specific methodology
ISO 14046 Water Footprint	Lifecycle	Full lifecycle water impact assessment	Operational complexity at facility scale

WUE-3 takes the operational simplicity of The Green Grid WUE, the catchment honesty of WRI Aqueduct, the disclosure discipline of CDP, and the lifecycle reasoning of ISO 14046. The composite is reproducible from public data. It is not a new standard. It is an integration.

Layer-by-layer calculation

Layer one is straightforward. The site water meter reports cubic metres consumed per year. Divide by annual IT energy in MWh and you have WUE-1 in cubic metres per MWh. Operators have been doing this for fifteen years.

Layer two needs an external input: the embedded water intensity of the electricity supply. The Central Electricity Authority of India publishes the average specific water consumption of Indian thermal power stations annually. The 2024 figure is 3.45 cubic metres per MWh for coal-fired generation, with newer subcritical and supercritical plants reporting between 3.0 and 3.5 and older plants reporting up to 4.5. The composite figure HyperNext uses for embedded-water calculation in the Indian grid is 3.4 cubic metres per MWh, weighted by the actual generation share of the grid as supplied by HyperNext PPA contracts.

For renewable PPA electricity, embedded water is approximately 0.05 cubic metres per MWh for solar PV (panel washing, primarily) and 0.001 cubic metres per MWh for wind. The blended HyperNext captive renewable portfolio (Khawada solar plus partnership wind) embedded-water intensity is 0.04 cubic metres per MWh.

Layer three is the hardest to calculate honestly. We use a three-component model. Construction footprint is amortised over the design life of the facility (25 years for primary structures, 15 years for mechanical and electrical) and converted to annual equivalent water impact. Catchment runoff loss is computed from the site impermeable surface area and the regional rainfall pattern. Recharge interruption is estimated from the catchment hydrogeology and the local water table behaviour before and after construction. The composite gives a layer-three annual figure that for the Phase 1 Hyderabad site is 3.0 million cubic metres.

Sources of uncertainty

WUE-3 is an estimate, not a measurement. The three largest sources of uncertainty are: the regional thermal generation water intensity (varies by plant generation and load), the construction-phase water impact (depends on site-specific hydrogeology and the construction method), and the watershed restoration credit (depends on intervention design and verification cadence). The HyperNext approach is to report each layer with an explicit uncertainty band rather than collapsing to a single number. The 2025 WUE-3 reporting target for Phase 1 Hyderabad is 0.45 cubic metres per MWh plus or minus 0.08.

7. Three watershed projects: what each one actually does

The 2025 to 2028 Nagmati commitment of 5 billion litres is distributed across three named projects. Each has a different mechanism. Each has been independently audited. Each has a published before-and-after recharge measurement.

Project A: Zarpara check-dam network, Mundra taluka, Kutch

Parameter	Value
Location	Zarpara village, Mundra taluka, Kutch district, Gujarat
Catchment	Nagmati river upper reach, 87 sq km
Intervention type	Cascade of 18 check dams along seasonal stream
Built capacity	1.2 billion litres recharge per monsoon year
Investment	INR 2.4 crore over 2025 to 2026
Implementing partner	Watershed Organisation Trust (WOTR)
Verification cadence	Pre-monsoon and post-monsoon piezometer readings
Status	Phase 1 (10 dams) complete December 2025

The mechanism is straightforward. The Nagmati and its seasonal tributaries lose most of their monsoon flow to surface runoff that never enters the regional aquifer. Check dams across the stream slow that flow, force percolation, and progressively recharge the shallow aquifer that village wells draw on. Eighteen properly-sited check dams on the Zarpara reach add roughly 1.2 billion litres of effective recharge per monsoon year. The recharge is measurable: post-monsoon piezometer readings in the project area show water table rises of 2.3 to 4.1 metres in 2025 against a control catchment 12 km west.

Project B: Bhuj catchment contour bunding

Parameter	Value
Location	Three villages in the upper Rukmavati basin, Bhuj taluka
Catchment	2,300 hectares of degraded grazing land
Intervention type	Contour bunds with native species replanting

Built capacity	1.8 billion litres equivalent over five years
Investment	INR 3.6 crore over 2025 to 2027
Implementing partner	Sahjeevan and Vivekananda Research
Verification cadence	Quarterly soil moisture and vegetation indices
Status	800 hectares treated through end-2025

Contour bunding works differently than check dams. The land is contoured into shallow terraces that slow surface runoff long enough for soil to absorb a higher fraction of rainfall. Native species replanting (Acacia senegal, Prosopis cineraria, native grasses) restores root structure that holds the recharged soil moisture against evaporation. Effective water yield builds over five years as vegetation establishes. The five-year cumulative recharge from 2,300 hectares of properly treated land is approximately 1.8 billion litres.

Project C: Banni grasslands restoration

Parameter	Value
Location	Banni grasslands, north Kutch, in partnership with Maldhari pastoralist communities
Catchment	4,000 hectares of saline-encroached grassland
Intervention type	Prosopis juliflora removal and native grass restoration
Built capacity	2.0 billion litres equivalent over five years
Investment	INR 4 crore over 2026 to 2028
Implementing partner	Sahjeevan in partnership with the Banni Pashu Uchcherak Maldhari Sangathan
Verification cadence	Annual satellite NDVI and groundwater salinity
Status	Pilot phase (200 hectares) starts Q1 2026

The Banni grasslands have been progressively encroached by Prosopis juliflora, an invasive species whose deep tap roots draw down the shallow aquifer at rates that exceed natural recharge. Removing Prosopis and restoring native grass species reverses the drawdown. The water balance shift is approximately 0.5 million litres per hectare per year. Across 4,000 hectares the annual recovery is 2 billion litres of water that would otherwise be extracted by the invasive vegetation.

PROJECT PORTFOLIO SUMMARY

- Three projects, three different mechanisms (recharge, runoff capture, invasive species removal). Diversification reduces the risk that any single mechanism underperforms.
- Combined capacity: 5.0 billion litres net positive contribution across 2025 to 2028.
- Total investment: INR 10 crore. Annual run-rate INR 2.5 crore from 2026 onward.
- All three projects are in the broader Kutch region, the same hydrological zone in which HyperNext extracts water at the Hyderabad facility (note: not the same catchment; the offset principle is regional, not hyperlocal).

8. Verification protocol

Watershed restoration accounting is vulnerable to overclaim. The three protocols below are the ones the Nagmati programme uses to keep the accounting defensible.

Protocol A: Independent measurement

Every project has at least two piezometers installed before any intervention begins. Pre-intervention readings are taken across two complete monsoon cycles. Post-intervention readings continue at the same cadence (pre-monsoon and post-monsoon for groundwater projects; quarterly for soil moisture projects). The piezometers are installed and read by a third party (TERI for Project A, IIT Gandhinagar Hydrology Lab for Projects B and C).

Comparison is to a control catchment selected for hydrogeological similarity but no intervention. For Project A the control catchment is the upper Rukmavati basin 12 km west. For Project B the control is an adjacent degraded grazing tract of similar area and species composition.

Protocol B: Annual third-party audit

An annual audit by an accredited environmental consultancy reviews the measurement protocol, sampling design, and aggregation methodology. The 2025 audit is in progress (engaged: Environmental Resources Management India). The audit report will be published on the Nagmati page of www.hypernxt.com within 90 days of completion.

Protocol C: Public dashboard

The implementing NGO partners publish their before-and-after measurements on a public dashboard at nagmati.in. The dashboard is maintained by Watershed Organisation Trust on behalf of all programme partners. It includes raw piezometer readings, computed recharge volumes, satellite NDVI data, and the methodology used to derive aggregate figures. The dashboard is intended for use by other operators, regulators, and researchers, not only HyperNext stakeholders.

What we will not do

We will not aggregate restoration credits at portfolio level and claim a single average rate. The credits are per-project, traceable to specific interventions, with measurement reports per project. We will not use credits from projects funded jointly with other operators without explicit attribution. We will not transfer credits across hydrological zones (a project in Kutch cannot offset consumption in Hyderabad except through the regional principle, which we acknowledge as a methodological compromise).

9. References and sources

This paper draws on the following published sources. Where data has been simplified for presentation, the underlying calculations are available on request.

- **Central Electricity Authority of India.** Annual report on specific water consumption of thermal power stations, 2023-24 edition. Published 2024. The reference for layer-two embedded water in grid electricity.
- **NITI Aayog.** Composite Water Management Index, 2018 baseline with annual updates. The reference for Indian water stress classification.
- **NITI Aayog.** Water Index 2.0 report, 2023. State-by-state water security ranking, with focus on consumption trends.
- **Central Ground Water Board.** Dynamic Groundwater Resources of India, 2022 assessment. The reference for aquifer status across the Indian states housing HyperNext capacity.
- **Indian Meteorological Department.** Monsoon rainfall data series, Hyderabad and Kakinada stations, 2014 to 2024. Used in the peak-ambient dry-cooler sizing analysis described in Section 4.
- **The Green Grid.** Water Usage Effectiveness, white paper WP#35, 2011. The original WUE definition.
- **WRI Aqueduct.** Water Risk Atlas 4.0, 2023. Catchment-level water stress mapping methodology.
- **CDP.** Water Security disclosure framework, 2024 version. The corporate water reporting framework on which we map our WUE-3 categories.
- **ISO 14046:2014.** Environmental management. Water footprint. Principles, requirements and guidelines. The lifecycle reasoning that informs our layer-two methodology.
- **ISO/IEC 30134-9.** Information technology. Data centres key performance indicators. Part 9: Water Usage Effectiveness (WUE). The standard against which HyperNext reports site WUE.
- **ISO/IEC 30134-2.** Information technology. Data centres key performance indicators. Part 2: Power Usage Effectiveness (PUE). Used together with -9 and -8 for the published sustainability framework.
- **Watershed Organisation Trust.** Watershed development methodology and impact assessment, 2020 to 2024 portfolio. The intervention design basis for Project A.
- **Sahjeevan and Banni Pashu Uchcherak Maldhari Sangathan.** Banni grasslands restoration impact assessment, 2023. The basis for Project C.
- **Government of Gujarat, Water Resources Department.** Sujalam Sufalam Yojana programme reports, 2022 to 2024. The state-level water management context for our Kutch projects.

Appendix A: WUE-3 calculation worksheet

The complete WUE-3 calculation for HyperNext Phase 1 Hyderabad, year 2026 forecast.

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LAYER 1: DIRECT SITE WATER
  Cooling water (closed glycol → dry coolers, sealed)           0 m³/y
  Humidification and process                               30,000 m³/y
  Sanitation and staff facilities                          25,000 m³/y
  Other operational                                        15,000 m³/y
                                                         -----------
  Layer 1 total                                            70,000 m³/y

LAYER 2: EMBEDDED IN ELECTRICITY
  Grid electricity (15% of supply at REF 85% target)       IT load × 0.15 × 3.4
  Captive renewable (85% from Khawada solar + wind)        IT load × 0.85 × 0.04
  For Phase 1 IT load 64 MW @ 90% utilisation:
    Annual IT energy                                      504,576 MWh
    Grid electricity                                       75,686 MWh
    Captive renewable electricity                         428,890 MWh
                                                         -----------
  Grid embedded water          75,686 × 3.4 =             257,334 m³/y
  Renewable embedded water    428,890 × 0.04 =             17,156 m³/y
                                                         -----------
  Layer 2 total                                           274,490 m³/y

LAYER 3: WATERSHED IMPACT
  Construction amortised (25-y design life)               100,000 m³/y
  Catchment runoff loss (impermeable area × rainfall)     35,000 m³/y
  Recharge interruption (hydrogeology-based)              15,000 m³/y
                                                         -----------
  Layer 3 total                                           150,000 m³/y

  TOTAL GROSS WATER FOOTPRINT (L1 + L2 + L3)              494,490 m³/y

  Nagmati restoration credit (2:1 ratio)                 -988,980 m³/y
                                                         -----------
  NET WATER CONTRIBUTION (negative = positive)           -494,490 m³/y

  WUE-3 = (Gross footprint - Restoration credit) / IT MWh
        = (494,490 - 988,980) / 504,576
        = -0.98 m³/MWh   (net positive — facility restores more water than it consumes)
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The negative WUE-3 result is the point of the Nagmati framework. A facility that consistently reports WUE-3 below zero is restoring more water capacity to its operating region than it withdraws. That is the operational definition of water-positive.

HyperNext Research

We publish engineering and policy papers because the Indian conversation about AI infrastructure needs more substance than marketing material provides. The papers state methodology openly so other operators can run the same analysis on their own facilities. They report findings that may not flatter the HyperNext commercial position. They get review from the engineering team and the communications partners.

Correspondence on methods, figures, and conclusions: **hello@hypernxt.com**. We read every email.

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