ShodhSamajik: Journal of Social Studies
July-September 2026 3(2)
https://shodhsamajik.com/

Original Article

WATER, DROUGHT AND SOCIETY IN COLONIAL BUNDELKHAND: A HISTORICAL STUDY

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ABSTRACT

Water, or rather its scarcity, has shaped the history of Bundelkhand more decisively than almost any other single factor. This paper examines the region's long relationship with water as a socio-ecological resource, tracing the shift from the decentralised, community-anchored tank-and-well regime built up over centuries by the Chandela and Bundela rulers to the centralised, revenue-oriented hydraulic interventions of British colonial administration. Drawing on District Gazetteers, the reports of the Indian Irrigation Commission of 1901–03, epigraphic and archaeological literature on Chandela hydraulic works, and the broader historiography of Indian irrigation and common-pool resource governance, the study reconstructs three case studies: the great tank complex built at Mahoba between the tenth and twelfth centuries, the colonial-era Betwa Canal system anchored on the Parichha and Dhukwan weirs, and the persistence of well irrigation and small-scale water management in the vast tracts the canal never reached. The paper argues that colonial hydraulic policy, concentrated on a small number of technically impressive but narrowly targeted engineering works, effectively bypassed and allowed to decay the older decentralised tank system on which the great majority of Bundelkhandi cultivators had depended, and that this reallocation of hydraulic priority left the region structurally exposed to the very droughts that fed its recurrent famines. Read alongside Wittfogel's hydraulic-society thesis and Ostrom's theory of commons governance, Bundelkhand's experience illustrates how a functioning common-pool institution can be undermined not by overuse but by administrative neglect and the diversion of investment elsewhere. The paper closes by tracing a direct historical line from this colonial-era neglect to Bundelkhand's well-documented twenty-first-century water crisis and the contemporary movement to revive traditional water harvesting.

Keywords: Bundelkhand, Water History, Drought, Irrigation, Tank Irrigation, Chandela, Betwa Canal, Hydraulic Society, Commons Governance, Colonial Administration

INTRODUCTION

Water in Bundelkhand has never been simply a matter of rainfall. The region sits on a hard granite and gneissic base overlain, in patches, by heavy black cotton soil—locally mar and kabar—that swells and holds water when wet but cracks into deep, moisture-losing fissures within weeks of the monsoon's withdrawal. Its rivers, the Betwa, Dhasan, Ken, Tons and Pahuj, are seasonal in temperament even where perennial in name: they rise in brief, often violent monsoon spate and then retreat into deep, rocky, ravine-bound channels that lie far below the level of the surrounding fields, so that the water a farmer can see flowing past is, for most of the agricultural year, useless to him without considerable engineering effort to lift or divert it. Rainfall itself is not merely scanty in the districts and princely territories of Bundelkhand—it is markedly uneven from year to year and from one micro-region to the next, so that a normal monsoon in one tehsil can coincide with drought in the next.

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Received: 14 July 2026; **Accepted:** 18 August 2026; **Published:** 23 September 2026
DOI: 10.29121/ShodhSamajik.v3.i2.2026.164
Page Number: 176-183
Journal Title: ShodhSamajik: Journal of Social Studies
Journal Abbreviation: ShodhSamajik J. Soc. Stud.
Online ISSN: 3049-2319, **Print ISSN:** 3108-2009
Publisher: Granthaalayah Publications and Printers, India
Conflict of Interests: The authors declare that they have no competing interests.
Funding: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.
Authors' Contributions: Each author made an equal contribution to the conception and design of the study. All authors have reviewed and approved the final version of the manuscript for publication.
Transparency: The authors affirm that this manuscript presents an honest, accurate, and transparent account of the study. All essential aspects have been included, and any deviations from the original study plan have been clearly explained. The writing process strictly adhered to established ethical standards.
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It was this combination of hard terrain, incising rivers, moisture-retentive but fragile soils, and capricious rainfall that pushed the region's rulers, over many centuries, toward an engineering solution of a particular kind: not the long, gravity-fed canal networks that came to characterise the Gangetic doab or the Indus basin, but the artificial tank—an embanked reservoir, dug or dammed across a natural depression, that captured monsoon runoff and released it, by gravity or by lift, over the following months. Long before any British engineer surveyed the Betwa for a canal alignment, the Chandela kings who ruled Bundelkhand between roughly the ninth and thirteenth centuries had already built, at Mahoba, Khajuraho and elsewhere, a network of substantial tanks that remain, in many cases, in use today. This was a hydraulic tradition suited to the terrain: decentralised, reliant on local labour and customary maintenance obligations, and integrated—often quite literally, since many tanks were built beside or beneath temples—into the region's religious and social life.

Colonial rule did not ignore water in Bundelkhand—no government could, given the region's exposure to famine—but it approached the problem with a different set of priorities and a different institutional logic. Nineteenth-century British engineers, trained in the doctrine of large-scale, revenue-generating canal works that had proved successful, in fiscal terms, in Punjab and parts of the United Provinces, looked at Bundelkhand's deep-cut rivers and asked where a barrage could be thrown across them to feed a gravity canal, rather than how the region's own tank tradition might be extended, repaired and multiplied. The result, examined in this paper, was a hydraulic landscape sharply divided between a small number of well-engineered, well-funded canal commands and a much larger hinterland left dependent on tanks and wells whose maintenance the new revenue and administrative order had steadily weakened. This paper traces that divergence and asks what it meant for the society that had to live with its consequences.

RESEARCH OBJECTIVES

1) To examine the pre-colonial indigenous water-harvesting tradition of Bundelkhand, focusing on the Chandela tank-building programme at Mahoba, Khajuraho and other sites.
2) To analyse how these tank systems functioned as socio-ecological institutions, including their construction, maintenance obligations, and integration with temple and community life.
3) To trace the decline and administrative neglect of tank irrigation under colonial rule relative to investment in engineered canal works, particularly the Betwa Canal system.
4) To examine the priorities of colonial hydraulic policy, including the preference for centralised, revenue-generating canal works over the extension or repair of decentralised tank systems.
5) To situate drought as a recurring environmental phenomenon shaped by the specific interaction of Bundelkhand's geology, soils and rainfall variability.
6) To study the social organisation of water access and control, including caste dimensions of well and tank access and the customary and legal basis of water rights.
7) To assess the role of wells and associated lift technologies—the Persian wheel (rahat) and the leather bucket (charsa)—as a supplement to surface storage.
8) To compare Bundelkhand's tank-dependent water regime with other water-scarce traditions in India, including Rajasthan's johads and baoris, Tamil Nadu's tank cascade (eri) systems, and the Deccan's percolation tanks.
9) To situate the historiography of Indian irrigation and hydraulic history in relation to Bundelkhand, and to identify the comparative neglect of the region's water heritage relative to Rajasthan's.
10) To draw connections between this colonial-era history and Bundelkhand's contemporary water crisis and the present-day movement to revive traditional water-harvesting structures.

SCOPE AND LIMITATIONS OF THE STUDY

This study covers the period from the Chandela hydraulic works of the tenth to thirteenth centuries through the colonial era to the opening years of the twentieth century, with a concluding section connecting this history to the present. Geographically it concentrates on the districts of Jhansi, Jalaun, Hamirpur and Banda (British Bundelkhand) and the princely territories immediately around Mahoba, while drawing comparative material from Rajasthan, Tamil Nadu and the Deccan.

Several limitations constrain the analysis. Precise construction dates, dimensions and command areas for many of the region's historic tanks are not consistently documented, and where sources disagree or figures could not be verified, this is noted explicitly rather than resolved by invention. The colonial-era irrigation statistics found in District Gazetteers and the Irrigation Commission's reports were compiled by an administration with its own priorities and are strongest on state-funded canal works and comparatively thin on the small, informally managed tanks and wells that served most of the rural population—an asymmetry that is itself part of the story this paper tells. Finally, sources documenting customary water-rights arrangements and caste-based patterns of access from the perspective of the cultivators themselves are scarce, so that much of this dimension must be reconstructed from indirect evidence and from the wider literature on rural water rights in similar regions of India.

LITERATURE REVIEW

HISTORIOGRAPHY OF INDIAN IRRIGATION AND HYDRAULIC POLICY

The scholarly starting point for any study of colonial irrigation in north India is Whitcombe (1972), which traces how the colonial state's canal-building programme, while it undeniably extended cultivation and offered some protection against famine in the tracts it served, also reshaped agrarian relations, land values and cropping patterns in ways that were not uniformly beneficial, and which she shows were driven substantially by the state's own revenue interest in the water rate. Stone (1984) extends this account technically, examining how canal engineering choices interacted with peasant cropping decisions and credit relations in the doab. Both scholars are centrally concerned with large gravity-canal tracts; neither addresses Bundelkhand's very different hydrological problem in depth, which is itself indicative of how the historiography has tended to follow the geography of colonial capital investment.

The most direct intervention on the fate of India's traditional water-harvesting systems is Agarwal and Narain (1997), the fourth of CSE's Citizens' Reports on the state of India's environment. The report argues that India possessed, before colonial rule, an extraordinarily diverse repertoire of locally adapted water-harvesting technologies—named variously johad, kund, eri, ahar-pyne, and, in Bundelkhand's case, the sagar or talab—and that these systems, embedded in community management and customary rights, were substantially weakened under colonial administration as revenue and forest policy disrupted the local institutions responsible for their upkeep, and were further eroded by twentieth-century modernisation that favoured centralised infrastructure. Agarwal and Narain's account has been especially influential in reframing traditional tanks not as primitive technology superseded by modern engineering but as a sophisticated, decentralised institutional response to India's ecological diversity.

CHANDELA HYDRAULIC ENGINEERING: ART-HISTORICAL AND ARCHAEOLOGICAL LITERATURE

The tanks of Mahoba and Khajuraho are documented chiefly within the art-historical and archaeological literature on Chandela temple architecture, since in this tradition water body and temple were frequently conceived and consecrated together. Epigraphic evidence and dynastic chronicles attribute specific tanks to specific rulers: Rahilya Sagar to Rahiladeva in the late ninth century, Vijay Sagar to Vijayapala in the second quarter of the eleventh century, Kirat Sagar to Kirttivarman in the later eleventh century, and Madan Sagar to Madanavarman in the twelfth century, with inscriptions recording that Kirttivarman also commissioned a ghat, or flight of steps, on the banks of the Betwa near Deogarh. This tradition of attaching hydraulic works to named rulers, commemorated in stone, offers a rare instance in Indian historiography where the patronage of water infrastructure can be dated with reasonable confidence, even where the exact engineering specifications of the structures cannot always be reconstructed.

THEORETICAL FRAMEWORKS: HYDRAULIC SOCIETY AND COMMONS GOVERNANCE

Two contrasting theoretical traditions inform this paper's analytical framework. Wittfogel (1957) argued that societies dependent on large-scale irrigation tend toward centralised, despotic forms of political authority, because only a powerful state apparatus can mobilise the labour needed to build and maintain major hydraulic works. Bundelkhand's tank tradition complicates this thesis in an interesting way: the region's water infrastructure, while patronised by kings, was decentralised in its physical form—many small to medium tanks scattered across the landscape rather than one commanding canal network—and its maintenance appears to have rested substantially on local and customary arrangements rather than on a continuously mobilised central bureaucracy.

This decentralised pattern aligns more closely with Ostrom (1990), which demonstrated, against both pure state-control and pure privatisation models, that communities can and often do develop durable, self-governing institutions for managing shared resources such as irrigation water, forests and fisheries, without either a coercive external authority or a market in property rights. Read through Ostrom's framework, the Bundelkhand tank system appears not as a primitive precursor to modern engineering but as a common-pool resource regime that had evolved its own—admittedly imperfectly documented—rules of access, contribution and maintenance, a regime that the colonial administrative and revenue order subsequently disrupted, less by seizing the tanks outright than by dismantling the customary and fiscal arrangements that had kept them functional. The environmental-history scholarship of David Arnold and Mahesh Rangarajan on colonial India's ecological transformations provides useful further context for understanding how administrative categories and revenue priorities reshaped rural resource regimes more broadly.

GAPS IN THE LITERATURE

Despite this rich theoretical and comparative literature, Bundelkhand's own water heritage remains markedly underdocumented relative to Rajasthan's, whose johads, baoris and step-wells have received sustained scholarly and popular attention—not least through the advocacy and writing associated with the Rajasthani water conservationist Anupam Mishra and the water-harvesting revival led by Rajendra Singh's organisation in Alwar district. Bundelkhand's Chandela tanks, though comparable in scale and historical significance, appear in the specialist literature chiefly as an adjunct to the study of Khajuraho's temples rather

than as a subject of water history in their own right. This asymmetry of attention is itself worth noting as a historiographical gap this paper seeks to address.

METHODOLOGY

This study adopts a historical-analytical method combining primary administrative sources with the art-historical, archaeological and theoretical secondary literature. Primary materials include the irrigation sections of the District Gazetteers of Jhansi, Jalaun, Hamirpur and Banda, the Report of the Indian Irrigation Commission, 1901–03 (issued in several parts by the Government of India, Calcutta), and available documentation—engineering, heritage and departmental—on the Betwa Canal system and its associated Parichha and Dhukwan weirs, including recent material generated by the international recognition of the Parichha structure as a heritage irrigation work. Where precise historical statistics (tank numbers, command areas, exact percentages of cultivated area under each form of irrigation) could not be independently verified across sources, this is flagged rather than resolved by invented precision.

The comparative dimension draws on the secondary literature concerning Rajasthan, Tamil Nadu and the Deccan's traditional water-harvesting technologies, chiefly as synthesised in Agarwal and Narain's Dying Wisdom. Analytically, the paper reads the resulting historical narrative against Wittfogel's hydraulic-society thesis and Ostrom's commons-governance framework, treating these not as rival explanations to be adjudicated definitively but as complementary lenses that illuminate different aspects of the Bundelkhand case.

HISTORICAL BACKGROUND

The Chandela dynasty, which rose to prominence in the ninth century and dominated Bundelkhand (then known as Jejakabhukti) through the twelfth and into the thirteenth century, is remembered above all for the temples of Khajuraho, but its rulers were equally notable as builders of water infrastructure. Rahiladeva, an early Chandela ruler active around the turn of the tenth century, is credited with the tank later known as Rahilya Sagar near Khajuraho. At Mahoba, which succeeded Khajuraho as the dynasty's political capital, successive kings built a chain of large artificial lakes: Vijayapala constructed Vijay Sagar in the second quarter of the eleventh century, his successor Kirttivarman built Kirat Sagar later in that century, and Madanavarman, in the following century, built Madan Sagar, on whose island now stand the ruins of a temple to Karka Deva. Scholarly surveys of the region's water heritage count roughly a hundred such historic tanks scattered across the tehsils of Bundelkhand, of which Madan Sagar, Rahilya Sagar and Barua Sagar in the Uttar Pradesh portion, and Radha Sagar and Gwal Sagar in the Madhya Pradesh portion, are among the largest and best documented; the precise construction history of many of the smaller tanks, however, is no longer recoverable.

These were not merely reservoirs but hydraulic-religious complexes: many were dug beside or below temples, their embankments doubled as processional and bathing ghats, and their maintenance appears to have depended on a mixture of royal patronage, temple endowment, and local customary labour rather than on a standing bureaucratic department. This pattern—decentralised construction and maintenance responsibility, spiritual sanction reinforcing practical obligation—persisted in modified form under the Bundela Rajputs who dominated the region from the sixteenth century, and even, to a degree, under Maratha overlordship in the eighteenth century, before the British administrative and revenue settlement that followed annexation replaced customary arrangements with a cash-revenue, individually assessed agrarian order that had little institutional space for collective tank maintenance.

Colonial engineers did not overlook Bundelkhand's water problem; the earliest formal proposal for a canal system to serve the region was made by Captain Strachey in 1855, following a detailed survey, in direct response to the region's chronic vulnerability to drought and famine. But the solution that Strachey's proposal set in motion—a barrage across the Betwa feeding a gravity canal network—was of a fundamentally different institutional character from the tank tradition it was, in effect, superseding: capital-intensive, centrally engineered, revenue-assessed by the Public Works Department, and geographically confined to whatever tract lay within reach of the canal's gradient, rather than spread, however thinly, across the whole drought-prone region.

CASE STUDIES

CASE STUDY 1: THE MAHOBA TANK COMPLEX AS CHANDELA HYDRAULIC ACHIEVEMENT

The cluster of large tanks at Mahoba—chiefly Vijay Sagar, Kirat Sagar and Madan Sagar, together with the older Rahilya Sagar near Khajuraho—represents the most substantial surviving evidence of pre-colonial hydraulic engineering in Bundelkhand. Built across natural depressions in the granite terrain and retained by substantial stone-faced earthen embankments, these tanks served multiple functions simultaneously: irrigation storage for the surrounding countryside, drinking-water supply for the city, a habitat that even today attracts large numbers of waterbirds and supports fisheries, and a setting for temple ritual and public ceremony. The association between tank and temple was not incidental. Madan Sagar's central island carries the remains of a temple to Karka Deva, a form of Surya (the sun god), and this pairing of water body and shrine recurs across the Chandela tank tradition, suggesting

that the maintenance of the reservoir was bound up with the ongoing life of the religious institution it adjoined—an arrangement that gave the tank a form of social protection independent of, and older than, any state irrigation department.

Under colonial administration, the fate of these tanks was mixed. They were not physically destroyed, and several—Madan Sagar and Kirat Sagar prominently among them—survive as recognisable water bodies to the present day, valued now chiefly for their scenic, ecological and pilgrimage significance rather than as engineered irrigation assets. But the institutional structures that had kept them silted, repaired and functioning as irrigation storage in earlier centuries were not replicated by the colonial state, whose Public Works Department directed its engineering and financial resources toward the new canal works rather than toward the systematic desilting, embankment repair and command-area extension of the old Chandela tanks. The result, over the colonial period, was a gradual functional decline in tanks that remained physically present but decreasingly effective as irrigation infrastructure—a pattern precisely consistent with the broader argument of Dying Wisdom regarding the erosion, under colonial rule, of the customary institutions that had once maintained India's traditional water-harvesting systems, even where the physical structures themselves were not deliberately dismantled.

CASE STUDY 2: THE BETWA CANAL SYSTEM — PARICHHA AND DHUKWAN WEIRS

The Betwa Canal system represents the colonial state's principal engineered response to Bundelkhand's water problem, and its history illustrates clearly the shift toward centralised, capital-intensive hydraulic investment. Following Captain Strachey's 1855 proposal, construction of the headworks at Parichha, on the Betwa River roughly twenty-five kilometres from Jhansi, began in 1881 and was completed in 1886: a substantial rubble-stone masonry weir some 1,174 metres long and nearly seventeen metres high, fitted with 318 steel falling shutters and impounding a reservoir with a capacity of around 2,400 million cubic feet. A subsidiary storage weir was subsequently built upstream at Dhukwan, between 1905 and 1909, to regulate supply to Parichha; the Dhukwan structure itself, some 3,845 feet in length, was designed to store roughly 3,759 million cubic feet, submerging around 5,000 acres of land in the process. Contemporary and later engineering assessments describe the impetus for the Dhukwan works explicitly in terms of the acute water scarcity of the surrounding tract—where, as one technical account puts it, groundwater lay at immense depth, rainfall was scanty and uncertain, and wells could only be sunk at a cost prohibitive for irrigation purposes, so that people had historically been driven to migrate whenever drought threatened.

From the Parichha headworks the canal ran downstream and, roughly thirty-one kilometres below the weir, split into the Kuthond branch and the Hamirpur branch, eventually forming a network extending, in its fully developed later form, to some 2,654 kilometres of channels serving parts of five districts across Uttar Pradesh and Madhya Pradesh, chiefly Jhansi, Jalaun and Hamirpur. This was, by any measure, a substantial and technically impressive achievement—so much so that the International Commission on Irrigation and Drainage recognised the Parichha weir as a World Heritage Irrigation Structure in 2026, in recognition of its more than a century of continuous operation. But its very success as an engineering solution throws into relief the narrowness of its geographic reach during the colonial period itself: it served, at best, portions of three of the four British Bundelkhand districts, leaving Banda largely untouched and leaving even within the served districts substantial tracts beyond the canal's command. The 1897 relief resolution on the Bundelkhand famine noted explicitly that, apart from the area commanded by the Betwa Canal, the region remained unprotected by irrigation—a formulation that captures precisely the two-tier hydraulic landscape this paper is concerned with: a small, well-engineered, well-funded island of protection within a much larger sea of exposure.

The institutional logic of the canal, moreover, differed fundamentally from that of the older tanks. Water was supplied under an assessed water rate, administered by the Public Works Department as a revenue-generating asset in the same manner as canals elsewhere in British India; access and maintenance were matters of state engineering and state finance rather than of customary local obligation. This was, in Wittfogel's terms, a genuinely centralising hydraulic intervention layered onto a region whose older water culture had been organised on almost the opposite, decentralised, community-anchored principle.

CASE STUDY 3: WELL IRRIGATION AND THE PERSISTENCE OF SMALL-SCALE WATER MANAGEMENT

Outside the Betwa Canal's command, and increasingly within the ambit of decaying tanks, the great majority of Bundelkhandi cultivators depended on wells, supplemented wherever possible by whatever tank storage local communities could keep in repair. Well irrigation in this terrain was neither simple nor cheap: the region's hard granite substrate meant that wells often had to be sunk to considerable depth to reach a reliable water table, and lifting that water to field level required either human and animal labour applied through a leather bucket and pulley (the charsa) or, where a cultivator's resources allowed, the geared Persian wheel (rahat), a chain of pots that lifted a continuous, if modest, flow. Colonial administrative accounts of the Dhukwan tract are candid that wells in parts of Bundelkhand could only be sunk and worked at a cost that was, for most cultivators, prohibitive—an observation that underscores how far well irrigation in this region fell short of being a universally available fallback.

The social organisation of well and tank access in this setting is not richly documented from the cultivators' own vantage point, but the wider literature on rural water rights in comparable dry regions of India makes clear that access to irrigation water—whether from a well, a tank, or a shared channel—was rarely distributed evenly across the caste and class structure of a village. Landholding castes and those with the capital to sink and maintain a well, or to command labour for tank repair, typically secured more reliable

access than landless labourers and tenant cultivators, who were correspondingly more exposed when both tank and well failed together in a drought year. This unevenness in water access maps onto, and likely reinforced, the unevenness in famine vulnerability documented in the broader historiography of Bundelkhand's colonial-era famines, without being reducible to it: water scarcity and food scarcity were connected but analytically distinct dimensions of the same underlying rural vulnerability.

COMPARATIVE TABLES

Table 1

Table 1 Tank, Canal and Well Irrigation in Colonial Bundelkhand

Feature	Tank Irrigation	Canal Irrigation (Betwa system)	Well Irrigation
Origin	Chandela and Bundela era (10th–16th century)	Colonial era (proposed 1855; built from 1881)	Ancient and continuous; supplemented by Persian wheel/charsa
Control	Decentralised; customary, temple-linked, local labour	Centralised; Public Works Department, assessed water rate	Individual/household; caste- and capital-dependent
Geographic reach	Scattered across the region (~100 historic tanks noted)	Narrow command; parts of Jhansi, Jalaun, Hamirpur only	Wherever the water table and sinking cost permitted
Colonial investment priority	Low; largely unmaintained by the state	High; substantial capital works (Parichha, Dhukwan)	Minimal state investment; private cost and risk
Resilience to drought	Formerly significant; declined as maintenance lapsed	High within command area	Limited; deep, costly wells often failed in prolonged drought

Table 2

Table 2 Bundelkhand's Tank Tradition Compared with other Indian Water-Harvesting Systems

Parameter	Bundelkhand (sagar/talab)	Rajasthan (johad/baori)	Tamil Nadu (eri cascade)	Deccan (percolation tanks)
Technology	Large embanked lakes across natural depressions, often temple-linked	Small earthen check-dams (johad) and stepwells (baori)	Chained cascade of tanks capturing runoff sequentially	Small tanks storing runoff to recharge groundwater
Social management	Royal patronage; temple/customary maintenance	Village-level customary institutions	Village and ayacutdar (beneficiary) management	Village-level, often caste-linked control
Colonial-era fate	Physically preserved but functionally neglected	Widely neglected; partially revived in late 20th century	Partially preserved; some cascades broken by urbanisation	Neglected relative to canal investment
Modern revival profile	Limited; comparatively low scholarly and public attention	High-profile revival (e.g. Alwar district efforts)	Moderate; urban encroachment a major challenge	Moderate; linked to watershed development programmes

FINDINGS AND DISCUSSION

Several conclusions emerge from this comparative reconstruction. First, Bundelkhand possessed, well before colonial rule, a hydraulic tradition genuinely suited to its terrain: the Chandela tank system was not a primitive or partial solution awaiting the arrival of modern engineering, but a sophisticated, locally calibrated response to a landscape of hard rock, deep-cut rivers and unreliable rainfall. Its scattered, decentralised form was, if anything, better matched to the region's spatial variability in rainfall than a single canal network could ever be.

Second, colonial hydraulic policy did not so much destroy this tradition as starve it of institutional and financial support while directing state capital toward a different kind of project entirely. The Betwa Canal system was a genuine engineering achievement, eventually recognised as such by international heritage assessment, but its narrow command area meant that it could protect only a

fraction of Bundelkhand's cultivated area, while the older tank system, on which the remainder continued to depend, received no comparable investment in desilting, embankment repair, or the restoration of customary maintenance arrangements. This pattern is consistent with the account offered in Dying Wisdom of a more general colonial-era erosion of the institutions—rather than necessarily the physical structures—that had kept India's traditional water-harvesting systems functional.

Third, read through Ostrom's framework, the Chandela tank system appears as a common-pool resource regime whose decline illustrates a mechanism her theory does not centrally emphasise: not overuse or the erosion of rules from within the community, but the withdrawal of the wider political and fiscal context that had once reinforced those rules—royal patronage, temple endowment, and a revenue order that had left room for collective labour obligations. Read through Wittfogel's contrasting framework, the colonial canal-building programme itself appears as a genuinely centralising hydraulic intervention, administered by a distant engineering bureaucracy and assessed through a cash water rate, layered onto a region whose water culture had for centuries operated on the opposite principle. Tyagi et al. (2026)

Fourth, the social burden of this uneven hydraulic landscape did not fall evenly. Cultivators within the Betwa Canal's command enjoyed a degree of drought protection their neighbours a few kilometres away, outside it, did not; and within the unprotected tracts, those with the capital to sink and maintain a well, or the social standing to command labour and priority access to whatever tank water remained, fared better than landless labourers and marginal tenants. Water access in colonial Bundelkhand was, in this sense, another axis—alongside revenue burden and market entitlement—along which existing social hierarchies were reinforced under conditions of scarcity.

Fifth, and finally, this hydraulic history bears directly, if not exclusively, on the region's exposure to the famines documented elsewhere in the literature: a countryside whose traditional buffering capacity against drought had been allowed to decay, while a substitute was built only for a fraction of it, was structurally more vulnerable to the monsoon failures that recurred through the second half of the nineteenth century than a countryside whose tank tradition had been actively sustained might have been.

CONTEMPORARY RELEVANCE AND PRESENT-DAY SIGNIFICANCE

Bundelkhand's water history is not merely of antiquarian interest. The region has, in recent decades, become one of the most visible symbols of India's contemporary rural water crisis, with successive drought years placing severe strain on drinking-water supply, groundwater levels, and agricultural livelihoods across its districts on both sides of the Uttar Pradesh–Madhya Pradesh border. Against this backdrop, there has been renewed public and policy interest in traditional water-harvesting structures of precisely the kind this paper has examined—an interest that echoes, at a national level, the water-harvesting revival movements documented by Agarwal and Narain in Rajasthan and elsewhere, where the restoration of johads and similar structures has demonstrably improved local water security in drought years. Government and non-governmental efforts at tank rejuvenation, desilting and check-dam construction in Bundelkhand today can be understood, in this light, as an attempt to recover institutional capacity that the colonial-era shift in hydraulic priority had allowed to lapse, even where the underlying reservoirs themselves—Madan Sagar, Kirat Sagar and their smaller counterparts across the region's hundred-odd historic tanks—have physically survived to the present day. Kumar and Yadav (2024)

FUTURE PROSPECTS AND SCOPE FOR FURTHER RESEARCH

Several directions for future research suggest themselves. A systematic archaeological and hydrological survey of Bundelkhand's surviving historic tanks—assessing current storage capacity, siltation levels, and command-area condition against whatever documentary evidence of their original design can be recovered—would place this history on a firmer empirical footing than the scattered and sometimes inconsistent figures available in the existing literature allow. GIS mapping of historic tank commands alongside the Betwa Canal's actual service area would permit a more precise spatial reconstruction of colonial-era hydraulic inequality than has been attempted here. Oral-history work with communities still involved in tank and well maintenance could recover institutional knowledge about customary water-rights arrangements that documentary sources scarcely touch. Finally, interdisciplinary collaboration with hydrologists and environmental scientists studying Bundelkhand's contemporary groundwater and rainfall patterns would allow historians to test more rigorously the connections this paper has drawn, at the level of historical argument, between colonial-era hydraulic neglect and present-day water stress. Kumari (2025)

CONCLUSION

Bundelkhand's history is, in an important sense, a history written in water—or in its absence. The region's Chandela rulers had, centuries before British administrators arrived, developed a hydraulic tradition well matched to a difficult terrain: decentralised, community-anchored, and integrated into the religious and social fabric of rural life. Colonial rule brought genuine engineering achievement in the form of the Betwa Canal system, but it brought that achievement to only a fraction of the region, while allowing the older tank tradition, on which the remainder continued to depend, to decline through institutional neglect rather than deliberate destruction. The resulting two-tier hydraulic landscape—a narrow island of canal-protected security within a much larger expanse

of tank- and well-dependent exposure—left colonial Bundelkhand structurally vulnerable to the droughts that recurred across the nineteenth century, and its legacy is still visible in the region's twenty-first-century water stress and in the contemporary efforts to revive the very traditions that colonial hydraulic priority had once bypassed. Understanding this history is not simply an exercise in regional antiquarianism; it is a necessary part of understanding why Bundelkhand's relationship with water remains, to this day, an unfinished and urgent problem.

ACKNOWLEDGMENTS

None.

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