

## ICOLD'2024 : Release of Special Publications

During the opening session of the prestigious 92nd Annual Meeting and Symposium of ICOLD'2024 held at Bharat Mandapam, New Delhi, the following Special Publications were officially released by INCOLD. These books were launched during the event by Ms. Debashree Mukharjee, the Hon'ble Secretary, Ministry of Jal Shakti, Government of India.

- **DAM DEVELOPMENT IN INDIA - From Ancient to Modern Time**
- **A Pictorial Display of DAMS IN INDIA**

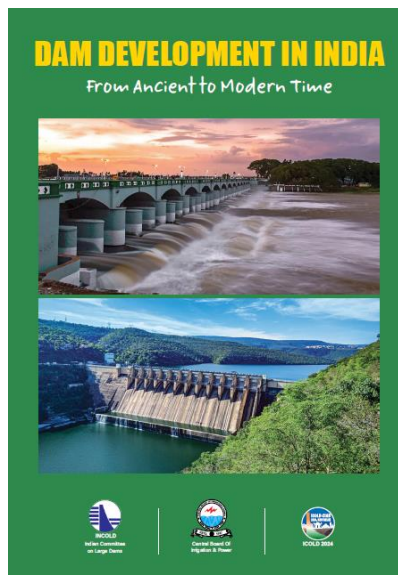
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*Aditya K. Dinkar, Secretary General, INCOLD & Secretary, Central Board of Irrigation & Power*

*Kamlesh K. Singh, Treasurer, INCOLD & Director (Water Resources), Central Board of Irrigation & Power*

***Dam Development in India - From Ancient to Modern Time:*** This important publication documents the five thousand years of dam development history of India, to acquaint about the rich heritage of dam building of this nation. This book presents the chronology of dam development in India. It traces the evolution of dam building in this subcontinent, spanning across different eras - from Ancient to Modern time. It illustrates the knowledge of hydraulics that prevailed in the ancient time and portrays the engineering marvels built in this country through centuries. The activities during the different periods are elaborated that highlight the country as a leading dam building nation. **[208 pages]**

***A Pictorial Display of Dams in India:*** A Coffee table book that pictorially illustrates a panorama of dams built in India. The book showcases over hundred number of dams of various types, known for their merits based on great height, large reservoir capacity as well as for the design features and methodology of construction. Besides portraying state-of-the-art large multipurpose & hydropower dams and highlighting their technical features, the book also exhibits some of the old structures that rank among globally historic dams still in operation. **[234 pages]**



The publications are ideal additions to the libraries of policy makers, engineers, and professionals in the water resources sector, contributing to research and development in dam infrastructure.

### ***Cost of the publications (Hardbound):***

- **Dam Development in India:** ₹ 3,000 per copy, excluding Postal charges [USD 50, inclusive of Postal charges]
- **Dams in India:** ₹ 3,000 per copy, excluding Postal charges [USD 50, inclusive of Postal charges]
- **Set of two publications:** ₹ 5000, excluding Postal charges [USD 100, inclusive of Postal charges]

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**THE ABRIDGED VERSIONS OF BOTH THE BOOKS ARE PRESENTED HEREUNDER**

# DAM DEVELOPMENT IN INDIA

From Ancient to Modern Time



INCOLD

Indian Committee  
on Large Dams



Central Board Of  
Irrigation & Power



ICOLD 2024

# DAM DEVELOPMENT IN INDIA

*From Ancient to Modern Time*



**INCOLD**  
Indian Committee  
on Large Dams



Central Board Of  
Irrigation & Power



ICOLD 2024

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**Front Cover Photo**

**Top:** Second Century Kallaini dam, an International heritage structure, still in operation

**Bottom:** Srisaillam dam, a modern marvel

**Back Cover Photo**

Sardar Sarovar, a mega multi-purpose landmark dam

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## FOREWORD



India is among the foremost countries in the world to utilise its water resources and lay the foundations of dam development. Dam construction in the subcontinent began about five thousand years ago. The ingenuity of the dams and waterworks structures developed in the past are proof of the hydraulics wisdom in the history of India. The traditional knowledge systems of development and management of water resources has survived in India from pre-historic to contemporary time. Across this vast subcontinent, numerous dams of various types and sizes have been built at different geographic locations, over different periods of time. Many of these remarkable dams stand out as technological marvels internationally and some of the old structures rank among globally historic dams that are still in operation.

Presently, with its rich heritage, India is a leading dam-building nation that incorporates most modern science of engineering and design in large dam construction. Several world-class large multi-purpose dams with storage facilities along with some hydropower projects are being built in India. At present time, the nation ranks third after China and the USA in terms of number of dams. As we enter an era defined by complex challenges, including climate change, population growth and heightened demands for water resources, the importance of sustainable dam development, in safeguarding our future, becomes increasingly significant.

The International Commission on Large Dams (ICOLD) is holding its 92nd Annual Meeting & Symposium from 29th September to 3rd October, 2024 in New Delhi. On such occasions, it is customary for the host country to bring out special publications on dams, which form an important component in illustrating the dam development in the country: It was decided, therefore, to bring out this important publication, to acquaint professionals about the rich heritage of dam building in India.

This book presents the chronology of dam development in India. It traces the evolution of dam building in the subcontinent, spanning across different eras - from Ancient to Modern times. It illustrates the knowledge of hydraulics that prevailed in the ancient time and portrays the engineering marvels built in India through centuries. The activities during the different periods are elaborated that highlight the country as a leading dam-building nation.

To capture the history of dam development spanning more than 5000 years is not an easy task and I wish to compliment the members of the 'Publication Committee', for the dedicated efforts made by them in bringing out this valuable book.

I trust that the book will be of immense interest to professionals and individuals throughout the world, who are involved in the field of dam development.

**R.K. VISHNOI**

*President INCOLD &  
Chairman & Managing Director,  
THDC India Ltd. Rishikesh*

## PREFACE



**H**istorically, India has been a dam building nation - This is the culmination of achievements through ages by successive regimes, with their knowledge of hydraulics, foresightedness and dedicated professionalism. In India, dam construction has been one of the oldest engineering practices from the time immemorial to harness water resources for irrigation, drinking and other needs.

India is credited with a long history of human intervention in the management of water due to its typical climatic conditions of intense monsoons followed by prolonged droughts. Irrigation of cultivable land has been practiced in India for many centuries.

Ancient scriptures give insight into the traditional water storage and conservation systems prevailing in the past. Historical evidence reveals that dam building works in the Indian subcontinent began about five thousand years ago, in 3rd millennium BC. The Kallanai dam (2nd Century AD) is considered to be the fourth oldest dam in the world which is still in use.

Medieval planners and hydraulic engineers had the benefit of the knowledge system already established in the field of water harvesting. Traditional dams and big earthen embankments appear to have been designed with knowledge of hydraulics. Earthen as well as masonry dams were constructed in very large numbers from 2nd century to 17th century AD. Many of these are functioning even at present. The advances in design of high masonry dams brought to India by the British engineers had added to the construction technology and boosted dam development. During the Colonial period beginning 1800 AD, the British played a major role in numerous dam constructions. As construction of dams continued with increasing water needs, development in the design and types of these dams evolved. Large dams with storage reservoirs began to appear especially after the introduction of concrete in construction.

From the beginning of the Post-Independence period in 1947, numerous dams of varied types and sizes have been built for the purpose of irrigation, water supply, hydropower development, flood control and other purposes. Remarkable development has been made in dam building during the last several decades. A number of world-class large multi-purpose dams with storage facilities and hydropower projects are being built in India and some of the dams are considered globally outstanding, based on their merits. Moreover, safety of the dams being important, the Government of India has taken due steps in this direction, including rehabilitation of the old structures as well.

As per the records of the National Register of Dams, India has 6138 large dams in operation today, with another 143 under construction. As the demand for water is steadily increasing with the economic and demographic growth, India continues to construct world-class large dams, involving state-of-the-art tools and technology, keeping in consideration the safety and sustainability concerns. Number of large multipurpose dams, including mega hydroelectric projects are being built in India, and in future, in meeting growing needs and mitigating the adversities of climate changes, the legacy of building world-class large dams will continue.

This book portrays five thousand years of dam development practices in India: It traces the evolution of dam building engineering, stretching across the different eras and documents, the involvement of successive regimes in dam development across space and time. It covers the chronology of dam development in India, spanning over - Ancient, Medieval, Colonial and Post-Independence periods, encompassing the Modern era and the foreseeable future scenario.

**ADIYTA K. DINKAR**

*Secretary General, INCOLD & Secretary  
Central Board of Irrigation & Power, New Delhi*

## **CONVERSION FACTORS**

India adopted the 'metric system' of weights and measures since 1958. For some centuries prior to that, during the British Colonial time, the 'British system' was in use. In the present document which spans the history of dam encompassing several centuries, most of the past records were not in the 'metric system' now in use. Attempt has been made to present most data after conversion to 'metric units', but in some cases of data taken from the past records, it became necessary to present the details in the system originally used.

Conversion factors from 'British system' to 'metric system':

### ***Length***

1 m = 100 cm = 3.2808 ft

1 km = 1000 m = 0.6214 mile

1 mile = 1.6093 km

### ***Area***

1 sq.m = 10.764 sq.ft

1 ha = 10000 sq.m = 2.4711 acres

1 acre = 0.4047 ha

1 sq.mile = 640 acres = 2.59 sq.km = 259 ha

### ***Volume***

1 cubic metre = 35.315 cubic feet

1 acre feet = 1233.48 cubic meters

1 ha.m = 8.1 acre feet

1 cubic km = 1 BCM = 1000 MCM = 810713 acre feet

1 TMC = 28.317 Million cubic meters

1 M acre feet = 1.233 cubic km = 43.56 TMC

### ***Rate of flow***

1 cubic metre/sec = 1 cumec = 35.315 cusec = 22.82 MGD

## **TIME PERIOD**

This book covers the chronology of dam development activity in India, encompassing the following broad periods:

Pre-3000 BC to 550 AD: Ancient Period including Pre-historical time

550 AD to 1800 AD: Medieval Period including Late Medieval times

1800 AD to 1947 AD: Colonial Period under the British

1947 AD to the Present: Post-Independence Period and Modern Time

## **ABBREVIATIONS**

TE : Earth

ER : Rockfill

PG : Gravity/Masonry

I : Irrigation

H : Hydel

C : Flood control

S : Water supply

N : Navigation



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# PROLOGUE

**D**ams are structures designed by humans to impound water and modify its flow downstream. From antiquity, dams have provided mankind with critical infrastructure, as humans have endeavored to efficiently exploit the natural resources to aid supply of water for irrigation and domestic needs, towards sustenance of civilization. The practice of dam building, in the concept of water harvesting, has always been considered as a basic requirement to harmonize the natural hydrological regime with the human needs. Dams have served to ensure adequate supply of water by storing in times of surplus and releasing it in times of scarcity, thus also mitigating floods and making significant contribution to the management of the finite water resources. As civilizations have matured, dam infrastructures have been further developed for power generation towards industrial growth, domestic utility and various other services. The scientific achievements in the field of hydraulics of large-scale dams have a very long history. In thousands of years of dam development, millions of dams of various types have been beneficially constructed worldwide.

India is credited with having a long history of human intervention in the management of water because of the distinctive climatic binary conditions of intense monsoons followed by prolonged droughts. Rainfall is confined to a few months of the year and that too uncertain, erratic and uneven. Thus, historically making Indian agriculture dependent heavily on irrigation. Hydraulic wisdom in India has historical footprint of several millenniums. The need to efficiently harness water for irrigation and domestic utility, propelled the growth of hydraulic science and development of waterworks. Dams appear to have been developed through ages, with knowledge and understanding of dam engineering and the hydrological processes, for harvesting and maneuvering the vagaries of nature.

Dam construction in this land began about five thousand years ago, during pre-historic time. Information about the growth of knowledge of science of hydraulics in building dams in India since ancient time have been uncovered by historical research. Ancient scriptures and evidences from archeological investigations in the contemporary time suggest the likelihood that - this land may have been the birthplace of 'the art of dam building'.

Since long, people understood the pragmatic utilization of water resources, compelled by necessity of existence. The ingenuity of the dams and waterworks structures developed in the past are proof of the hydraulics wisdom in early history of India. The traditional knowledge systems of development and management of water resources has survived in this country from pre-historic to contemporary time. Numerous dams of various types and sizes have been built at different geographic locations, over different periods of time, across this vast subcontinent. Of these, several remarkable dams stand out as technological marvels internationally and some of the old structures rank among globally historic dams that are still in operation. Study revealed that the dams appear to have been designed not only with a sophisticated knowledge of dam engineering but also with an understanding of the principles of basin water balance. Insights into such dams, relevant to their apparent characteristics of durability, adaptability to the environment, that exemplify sustainability, provide valuable guidance for the future developments.

While the early dam developers relied more on proven experience and empiricism, besides their knowledge of hydraulics as well as understanding of the principles of basin water balance, the art of building dams transformed with advancements in construction materials and rational design methods. In the late 19th century and during the 20th century, developments in the related scientific domains, brought significant changes. As construction of dams continued to progress with demographic growth, variants in types of dams evolved. Large dams began to appear especially after the introduction of concrete in construction. Advances were made by taking a more three dimensional approach to dam designing. Introduction of soil & rock mechanics and numerical methods, resulted in further enhancement in dam engineering.

In the modern time, dams are being built in a planned manner, adopting state-of-the-art technology. The advent of new technologies has boosted the dam construction activity in the country. Several world-class large multi-purpose dams with storage facilities, and hydropower projects are being built in this nation and some of the dams are considered globally outstanding, based on their merits.

With its rich heritage, India is among the foremost dam-building nations that incorporate most modern science of engineering and design in large dam construction. At present time, this nation ranks third after China and the USA in terms of number of dams. This is the culmination of achievements dating back millennia. According to the National Register of Large Dams, India has 6138 large dams in operation today, with another 143 under construction.

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With the steadily increasing demand for water resources and dam development, as consequence of economic growth and rising population, this nation continues to establish large dams, adopting modern technology and innovations in design and construction methodology. The Indian government has been actively promoting the development of large multipurpose dams, including mega hydroelectric schemes in national interest.

As we enter an era defined by complex challenges, including climate change, population growth, and heightened demands on water resources, the importance of dams in safeguarding the future becomes increasingly significant. In foreseeable future, in meeting the growing needs in various sectors, the rhythm of building safe and sustainable multipurpose large dams will continue in this nation, in keeping with the ICOLD vision: *"Better Dams for a Better World"*.

This book titled, *'History of Dam Development in India'*, embodies the five thousand years of dam building history of this nation, tracing its evolution and the accomplishments across space and time. It covers the chronology of dam development in India, elaborating the building activities spanning over - Ancient, Mediaeval, Colonial and Post-Independence periods, and encompassing the Modern era and the foreseeable future scenario.

As we embark on an enthralling journey through time and explore deeper into the realm of dam building in this subcontinent, many fascinating dimensions of the early scientific endeavours emerge. While navigating through the annals of history we realize that: The past legacies are the underpinning of the achievements in dam engineering in the modern time.



## EPILOGUE

**I**nformation about the knowledge of hydraulics in building dams in ancient India has been uncovered through archaeological explorations and research. In the Indian subcontinent, dams have been built since antiquity, driven by the necessities of water harvesting for irrigation and domestic needs, to sustain civilization. Evidence has revealed the enriched knowledge of waterworks management and dam building that existed in the past. Studies have provided insight into the hydrological wisdom of the civilization since prehistoric times.

By exploring the past, fascinating dimensions of the accomplishments in dam-building activity in ancient times have emerged. Dam-building in the Indian subcontinent dates back to the beginning of the 3rd millennium BC. The Gabarband (dam) tradition of water management is an unsurpassed marvel of civilization in prehistoric times. In the 3rd and 2nd centuries BC, discoveries at the Harappan site at Dholavira provided evidence of a unique hydraulic network and stone dams built for water harvesting, which was their legacy. The number of dams discovered at the Buddhist monastic site at Sanchi (3rd to 2nd century BC) with surplus flow arrangement and flood protection capabilities, display the knowledge of irrigation and water-work development that prevailed in early times. Excavations at Inamgaon in Maharashtra, a Chalcolithic settlement dating from 1400-1000 BC, have brought to light an extensive stone rubble and mud embankment for impounding water. Rock edicts of Junagarh in Gujarat and ruins provide evidence of one of India's oldest dams that created Lake Sudarsana, an outstanding work of the Maurya dynasty (335-320 BC). The Kallanai Dam, constructed by the Chola King Karikala in the 2nd century AD, still in operation, provides insight into the hydrological wisdom of the past in sustainable dam building.

Until systematic studies were undertaken in contemporary times to uncover the past, much of the information about ancient dam-building feats would have remained unknown. Indeed, the planners and dam developers in later periods benefited from the knowledge system already established in the field of water harvesting and dam building in ancient times in the Indian subcontinent.





## EPILOGUE

In Medieval period, irrigation is said to have been one of the major reasons for the growth and expansion of Empires in India. As agricultural development was the pillar of the economy, hydraulics and waterworks were paid special attention, as irrigation was seen to be a catalyst for enhanced agricultural production. This is demonstrated by the fact that all stable empires, regional kings and local communities paid attention to irrigation and waterworks development. The other compelling reason for building water harvesting structure was due to repeated droughts that had often caused famines. The construction of the dam had brought extended areas under controlled cultivation that sustained a large population and elevated prosperity.

In Medieval India, farming was in a way 'hydro-agriculture' with a strong role for village communities. Traditional society had a significant technical sophistication towards water management. The inscriptions, literary sources and the archaeological data emphasize technical competence in building dams and embankments. During the period, numerous dams of various sizes and types were built. Some of the notable dams of the period are engineering marvels, by global standards. The structures were designed using indigenous wisdom and constructed with the generous support of native rulers and chieftains over centuries. A number of these dams are operational even at present time. These structures have withstood the test of time and survived over several centuries, and proven themselves to be environmentally sustainable. These exemplify the technological innovations developed by the society, in the past, to accommodate their primary needs. They demonstrate the level of knowledge in dam engineering that prevailed and exhibit the water harvesting skills developed in this country towards social sustenance and prosperity by adapting to the distinctive Indian climate and maneuvering the vagaries of nature.

The scale of development of numerous dams and related waterworks in India, before the advent of the British, gives an idea of the vastness of the system across the subcontinent and it can be stated that anything comparable of it did not exist in other parts of the world in that period.

It is worth mentioning, in this context, that the traditional technical skill in building earthen as well as masonry weirs - perfected over time, had won the admiration of British officials, which is documented in their writings later in the 19th century AD. As an example, Sir Arthur Cotton, the celebrated British engineer, in his writing in 1874, had noted that:

*"While the British had been cautious about laying a foundation in shifting sand for the Ganges Canal, the natives had proceeded with boldness and engineering talent to build weirs. These were built in sandy beds of rivers without any rock or sound stratum to found them on...."*

In fact, adds Cotton, *"the natives have constructed tens of thousands of tank in almost every kind of soil with earthen dams without the puddle bank which English engineers have fancied necessary... .."*



## EPILOGUE

**W**ith the advent of Colonial era, the story of irrigation waterworks transformed in this country. This phase is often referred to as the beginning of the epoch of 'modern hydraulics'. In the British period, there emerged a centralized system of irrigation management with bureaucratic structure. Broad changes in the administrative background gave fillip to development projects. British Colonialism initiated a radical break in both technique and hydraulic principle by introducing perennial irrigation systems in several parts of the subcontinent. In the beginning of the 19th century began irrigation development with the renovation, improvement and extension of existing canals and waterworks. After studying the Indian practice of irrigation, the British ventured on new major works. Permanent headworks in the form of dams/weirs were built across rivers. By flattening the river's variable flow regime, irrigation, in effect, was transformed from seasonal to perennial possibility - towards sustainable development. Number of dams constructed by the British engineers in the country during the Colonial period incorporated intricate canal networks.

Initially, the British dam practice was dominated by the adoption of earthen embankments with puddle clay cores. Later, the British engineers, benefitting from the advanced academic trainings, entered upon the domain of building large masonry dams. The real contribution to dam engineering was in the construction of masonry dams with advance hydraulic arrangements. Dams of higher heights and storage capacities were built during the Colonial time. The British constructed high dams with an idea of developing storage reservoirs so that the stored water could be utilised even during droughts and in flood mitigation. The methodology of dam construction changed from coursed rubble masonry on the exposed faces to cement concrete construction. Emergence of new technology and inventions enhanced the efficiency of dam building and led towards scientific development of large masonry dams in the country. Long-term dynamics of these facilities is credible.

Till the time the Union Jack was lowered in 1947, British engineers had constructed some of the most advanced dams and irrigation waterworks in the country. The advances in design of high masonry dams were initiated in this country in the period and the legacy continued. In fact, a few of the initial large dam projects of independent India were envisaged during the Colonial period. Colonial irrigation in India, in a way, demonstrated that State, in alliance with science of engineering, can possibly tame the rivers for sustainable water harvesting. This ideology survived until the end of the Empire and influenced the water management vision in the Post-Colonial Independent India.



## EPILOGUE

**A**fter Partition of the country, over half of the area irrigated by the British government waterworks in undivided India ended up in Pakistan. The slow pace of irrigation development during the last decades of Colonial regime had also aggravated the problem. Accordingly, to make the nation self-sufficient in food production and make it economically self-reliant, the first Prime Minister of Independent India campaigned for dam development in the country. Irrigation was made mostly a state subject. A series of Soviet-style Five Year Plans opened up new avenues in large multipurpose dam development, with renewed emphasis on bringing more areas under irrigation. Colonial legacy, in many ways, reinforced the pursuit of hydraulic capitalism through large dams.

Progressively, after the Bhakra, enormous dams became the order of the day. The 20th Century and thereafter witnessed the establishment of several irrigation and multipurpose large dams in India. One of the potent solutions to the multi-faceted challenges, due to steep rise in population, demand for food, water and power, as well as flood mitigation, has been the creation of water storage facilities. Construction of hydropower storage dams has been a major component of investment in water management in the country.

Right from Independence, India has been developing at a fast pace. The country is placed amongst the most progressive dam-building nations that incorporate modern science of engineering. And the zeal for large dam construction continued, as the nation embarked on a modern phase of development.



*As this country shifts towards cleaner energy sources and the demand for energy rises, hydropower, especially pumped storage, is gaining significant traction, particularly for enhancing system flexibility: Recent Government of India policy initiatives and guidelines for pumped storage plants are expected to invigorate the sector in the coming years.*



**ICOLD Vision**  
***"Better Dams for a Better World"***



**CENTRAL BOARD OF IRRIGATION & POWER**  
Malcha Marg, Chanakyapuri, New Delhi

A Pictorial  
Display  
of  
**DAMS  
IN  
INDIA**





Image: Idukki Dam



Image: Paithan (Jayakwadi) Dam

# A Pictorial Display OF DAMS IN INDIA

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Indian Committee  
on Large Dams



Central Board Of  
Irrigation & Power



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**Front Cover Photo**

Tehri dam, a modern engineering marvel

**Back Cover Photo**

Bhakra dam, proclaimed as the new temple of resurgent India

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This Coffee Table Book titled "A Pictorial Display of Dams in India" presents a compilation of photographs & information received from the various concerned dam owners and data available in NRLD (2023) as well as in websites. This pictorial book is prepared for general information purpose. It is in no way intended for any other purpose. Though all efforts have been made to present the data correctly, there may be errors. It does not constitute legal, engineering or technical advice.



Image: Mulshi Dam

## FOREWORD



Building dams has been an important part of India's history. The tradition of conserving, storing, and using water is as old as our civilization. Because of India's unique climate, the country has a long history of managing water resources.

Today, India is one of the leading countries in the world in dam construction. According to the National Register of Dams, India has 6,138 large dams in operation, with 143 more under construction. India ranks third in the world, after China and the USA, in terms of the number of large dams. As we continue to build large multipurpose dams, including major hydroelectric projects, India will play a key role in meeting future needs and tackling climate change.

As part of the 92nd Annual Meeting of the International Commission on Large Dams (ICOLD), taking place on 29th September 2024 in New Delhi, it is customary for the host country to publish special books about its dams. This Coffee Table Book is created to showcase India as a leading nation in building world-class large dams, including hydropower and multipurpose dams, as well as heritage dams that are still in use.

I want to thank the members of the 'Publication Committee' for their teamwork in putting together this special pictorial book on India's notable dams. I believe it will be of great interest to professionals and individuals worldwide who are involved in dam construction.

**R.K. Vishnoi**

President, INCOLD &  
Chairman & Managing Director, THDC India Ltd.



Image: Koteswar Dam

## PREFACE



The creativity and skill behind the dams and waterworks built in India over the years show the country's deep understanding of water management. The traditional knowledge of developing and managing dams has survived from ancient times to the present day. Many dams of different types and sizes have been built in various parts of this vast country over time. Today, India is one of the leading countries in the world in using its water resources and building dams.

This Coffee Table Book showcases some of the most remarkable dams built in India over different periods. The book features pictures of various dams known for their impressive height, large reservoir capacity, and unique design and construction methods. In addition to highlighting state-of-the-art multipurpose and hydropower dams, the book also presents some older structures that are still in operation and are considered historic on a global scale.

The book provides a broad view of dams built across India, including the famous 2nd century Kallanai Dam, an international heritage structure that is the fourth oldest dam in the world, and the modern Tehri multipurpose dam, known worldwide for its remarkable features. The book includes notable dams from all states in India.

**Aditya Kr. Dinkar**

Secretary General, INCOLD &  
Secretary, Central Board of Irrigation & Power, New Delhi

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# ALMATTI DAM

The Almatti Dam is a major engineering feature in the development of water resources in the upper Krishna River in Karnataka. Also known as Lal Bahadur Shastri dam, it forms the main reservoir of the Upper Krishna irrigation project and is one of the largest reservoirs in Karnataka. It was built in 2000 and the entire construction work of the dam was accomplished in less than 40 months.

It consists of a Spillway portion for a length of 486.5 m in the center of the river gorge, two non-overflow masonry sections of the dam on either side, and an earth dam of 402 m on the left flank. The power dam section consists of six non-Spillway masonry blocks. The end blocks of the Spillway portions consist of 26 radial crest gates and a number of river sluice gates.

The 290 MW powerhouse is located on the right side of the Almatti dam and uses vertical kaplan turbines: five 55 MW generators and one 15 MW generator.

Over 20,000 ha have been irrigated by the Almatti left bank canal lift irrigation project while the Almatti right bank canal project has helped irrigate 9,900 ha.



Total installed capacity  
**290 MW**



Year of Completion  
**2000**



Map not to scale



Gross storage capacity  
**3485 MCM**

<b>Owner &amp; Operator</b>	Government of Karnataka
<b>Purpose</b>	Irrigation(I) / Hydrel(H)
<b>Location</b>	Bijapur, Karnataka
<b>Latitude</b>	16°19'52" N
<b>Longitude</b>	75°53'13" E
<b>River</b>	Krishna
<b>River Basin</b>	Krishna
<b>Year of Completion</b>	2000
<b>Reservoir</b>	
Gross storage capacity	3485 MCM
Effective storage capacity	2985 MCM
Reservoir area	487.8 km <sup>2</sup>
<b>Dam</b>	
Type	Earth (TE)/ Gravity/ Masonry (PG)
Height above foundation	49.29 m
Length of dam	1564.83 m
Seismic Zone	II
<b>Spillway</b>	
Type	Ogee/Radial
Design Spillway capacity	31007 m <sup>3</sup> /sec
<b>Power Facilities</b>	
Type	Dam toe
Total installed capacity	290 MW



# VANIVILASA SAGARA DAM

The Vanivilasa Sagara Dam, popularly known as Mari Kanive, is a dam in Hiriyur Taluk, Chitradurga, Karnataka. The dam is over 110 years old, built between 1898 to 1907 by the Maharaja of erstwhile Mysore.

It is the oldest dam in the state that has a length of 405.4 m spanning between hill abutments. A unique storage structure of its kind in India — constructed across the Vedavathi River which a tributary of Krishna — the dam is an exquisite piece of architecture and an engineering marvel of that time. The main objective was to provide irrigation facilities in the drought-prone areas through its right and left bank canals. The project provides irrigation to 25,000 ha. of land.

The catchment area of the Vedavathi River at the dam site is 5,374 sq. km. Initially, the idea of the project was to build a dam high enough to store all the water of an exceptionally good rainy year to tide over the deficit of several dry years: Accordingly, the dam with an effective storage capacity of 802.50 MCM was built with a height of 49.37 m with spillage and freeboard arrangements.

The dam is constructed using uncoursed rubble in mortar throughout. It consists of non-overflow and the surplussing arrangement comprising a waste-weir located 2.40 km to north of the dam by cutting the saddle. At the time of its construction, it was the largest artificial lake in the world in terms of capacity and water spread area.



Gross storage capacity  
**850.30 MCM**

Map not to scale

<b>Owner &amp; Operator</b>	Government of Karnataka
<b>Purpose</b>	Irrigation (I)
<b>Location</b>	Hiriyur, Karnataka
<b>Latitude</b>	13°53'17" N
<b>Longitude</b>	76°29'18" E
<b>River</b>	Vedavathy
<b>River Basin</b>	Krishna
<b>Year of Completion</b>	1907
<b>Reservoir</b>	
Gross storage capacity	850.30 MCM
Effective storage capacity	802.50 MCM
Reservoir area	87.63 km <sup>2</sup>
<b>Dam</b>	
Type	Gravity/Masonry (PG) / Earth (TE)
Height above foundation	49.37 m
Length of dam	405.40 m
<b>Seismic Zone</b>	II
<b>Spillway</b>	
Type	Broad Crested Weir
Design Spillway capacity	991 m <sup>3</sup> /sec



Year of Completion  
**1907**



# VANIVILASA SAGARA DAM



State	Name of Dam	Page No	State	Name of Dam	Page No	State	Name of Dam	Page No
Andhra Pradesh	Dowleswaram Anicut (Sir Arthur Cotton Barrage)	36	Himachal Pradesh	Pandoh Dam	132	Kerala	Kundala Dam	92
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Chhattisgarh	Murrum Silli Dam	116	J&K	Sewa II Dam	166	Madhya Pradesh	Omkareshwar Dam	126
Goa	Salaulim Dam	160	J&K	Uri-I Barrage	217	Madhya Pradesh	Rani Awanti Bai Lodhi Sagar Dam	152
Gujarat	Dharoi Dam	32	J&K	Uri-II Dam	218	Madhya Pradesh	Tawa Dam	185
Gujarat	Kadana Dam	64	Jharkhand	Maithon Dam	98	Maharashtra	Bhandardara Dam	14
Gujarat	Karjan Dam	76	Jharkhand	Tenughat Dam	194	Maharashtra	Bhatsa Dam	16
Gujarat	Sardar Sarovar Dam	162	Karnataka	Almatti Dam	2	Maharashtra	Ghatghar Dam	44
Gujrat	Ukai Dam	212	Karnataka	Bhadra Dam	10	Maharashtra	Isapur Dam	60
Himachal Pradesh	Baspa Stage II (Kuppa Barrage)	9	Karnataka	Chakra Dam	24	Maharashtra	Koyna Dam	88
Himachal Pradesh	Bhakra Dam	12	Karnataka	Hemavathy Dam	46	Maharashtra	Middle Vaitarna Dam	106
Himachal Pradesh	Chamera-I Dam	25	Karnataka	Hidkal Dam	47	Maharashtra	Mulshi Dam	112
Himachal Pradesh	Chamera-II Dam	26	Karnataka	Krishna Raja Sagara Dam	90	Maharashtra	Paithan (Jayakwadi) Dam	128
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			Karnataka	Tungabhadra Dam	206	Meghalaya	Umiam (Stage-I) Dam	214
			Karnataka	Vanivilasa Sagara Dam	220	Mizoram	Tuirial Dam	204
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			Kerala	Kallada (Parappar) Dam	68	Odisha	Hirakud Dam	48
						Odisha	Rengali Dam	154
						Odisha	Upper Indravati Dam	215
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						Tamil Nadu	Mettur Dam	103
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						Tamil Nadu	Sholayar Dam	168
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						Uttar Pradesh	Dhukwan Dam	34
						Uttar Pradesh	Rajghat Dam	140
						Uttar Pradesh	Rihand Dam	156
						Uttarakhand	Dhauliganga Dam	33
						Uttarakhand	Ichari Dam	50
						Uttarakhand	Koteshwar Dam	84
						Uttarakhand	Ram Ganga Dam	144
						Uttarakhand	Tehri Dam	190
						West Bengal	TLDP-III Barrage	196
						West Bengal	Kangsabati Kumari Dam	73
						West Bengal	Teesta IV Low Dam	186



Image: Srisaillam Dam







Indian Committee  
on Large Dams



Central Board Of  
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ICOLD'2024: Launching of the book 'DAM DEVELOPMENT IN INDIA'



ICOLD'2024: Launching of the book 'DAMS IN INDIA'