

SNJB's

Late Sau. Kantabai Bhavarlalji Jain

COLLEGE OF ENGINEERING

Accredited With A Grade By NAAC

(CGPA 3.05), October 2017



VASTU SHILP

Technical Magazine

A.Y. 2022-23

Civil Engineering is considered to be the most versatile branch among all the engineering branches. It is the branch with a lot of diversity from Geotechnical Engineering to Structural engineering, Environmental to Hydraulics, Transportation to Hydrology; Civil Engineering can be considered as a single largest branch among all the engineering branches.

Head Of Magazine

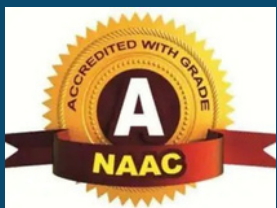
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Principal Desk



Dr. R.G.Tated

Creativity and inspiring innovation are two of the key elements of a successful education and a civil engineering department magazine is the perfect amalgamation of both. It gives me great pleasure to know that 'Vastu Shilp' is a departmental technical magazine of 2022-23 is ready for publication. The title of the magazine 'Vastu Shilp' may seem difficult but it just means to construct a clear vision of civil engineers. I take this opportunity to congratulate the editorial board for bringing out this magazine as per schedule, which in itself is an achievement considering the effort and time required. May all our students soar high in uncharted skies and bring glory to the world and their profession with the wings of education.



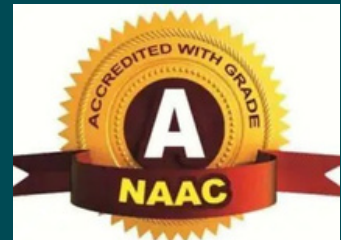
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Head of Department Desk



Dr. Kisan L. Bidkar

To encourage creativity and innovation among the students has always been a foremost objective of the department. The departmental magazine provides the students a platform to share their creative ideas in the form of articles with fellow students and faculty members. 'Vastu Shilp' the departmental technical magazine of students, has gained popularity among the students and faculty because of its thought provoking and analytical articles. I convey my best wishes for the current issue of 'Vastu Shilp'. I also congratulate the editorial board of Umang 2022-23 for publishing the magazine for last one year on a regular basis



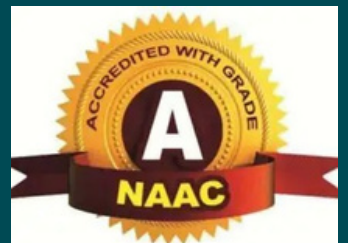
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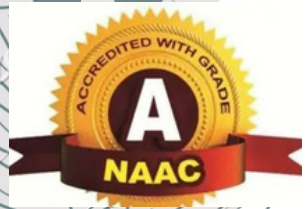


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College of Engineering

(Jain Gurukul) Neminagar, Chandwad, Dist. Nashik (MS)



Department Of Civil Engineering

VISION

To empower students to get knowledgs and excellence in civil engineering and to cultivate a sense of commitment to society

MISSION

- To develop outstanding Civil Engineering graduates with highest ethics
- To Provide advanced skills of learning which helps to travel the journey from academics to industry
- To impart basic Knowledge to serve the society.



॥ गुरुकुल संस्कार एवम् आधुनिक शिक्षा ॥

Designed By: Mr. Anand Ghosh
(B.E. Computer -2019-20)



Program Educational Objectives (PEOs):

1. Graduates in Civil Engineering will acquire learning skills which serves the society..
2. Graduates in Civil Engineering will practice in a responsible, professional and ethical manner.
3. Graduates in Civil Engineering will able to analyze, design and use skills in order to formulate and solve Civil Engineering problems.

Program Specific Outcomes (PSO's):

1. To offer engineering services with professional and ethical responsibility.
2. To demonstrate knowledge in analysis, design, laboratory investigation with high proficiency in mathematics, science.
3. Interact with stakeholders effectively and execute quality construction work applying necessary tools.

॥ गुरुकुल संस्कार एवम् आधुनिक शिक्षा ॥

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STAFF ARTICLES



Technical Magazine

INFRASTRUCTURE DEVELOPMENT IN INDIA AFTER INDEPENDENCE



Introduction:

The prosperity of every country is directly depending upon the development of agriculture, industry, and services sectors. Agriculture sector requires irrigation, power credit transport facilities sound marketing system etc. industrial sector requires not only machinery and equipments but also, skilled manpower management energy banking and insurance facilities, marketing facilities transport facility. It includes roads, railways, shipping and communication facilities etc. all these facilities development and expansion is most imported in to the development of every economy from 200 years or more. After Industrial revolution in England & agriculture development worldwide accompanied by the revolution in transport and communication the extensive use coal and oils as a source of energy tremendous.



Growth of Infrastructure Facilities in India:-

Before British regime India was divided in to the regime of so many local administrators, these administrators develop infrastructure for their own use and for only irrigation and drinking water facility for their people. In British regime, British developed the Basic infrastructure in the form of Railways and, irrigation, and in a few states in electricity works with a view to promote foreign trade & exploit India's natural resources to their advantages.

Direct British investments were made in consumer goods like Tea, Coffee and rubber plantation, but no efforts were made to develop basic infrastructure. The British rule was a long story of the systematic exploitation by an imperialistic government. The benefits of British rule was only incidental the main motive of British rule was to serve the interest of England only.

Technical Magazine

INFRASTRUCTURE DEVELOPMENT IN INDIA AFTER INDEPENDENCE



Infrastructure sectors in India:

Energy

- a) Coal
- b) Electricity
- c) Petroleum

Transport

- a) Railways
- b) Civil Aviation
- c) Roads
- d) Ports

Services

- a) Telecommunication
- b) Banking
- c) Medical Facilities

Above sectors are the main catalyses sectors, which promote the economic development of a nation. Expansion in these sectors promotes growth of other sector and an overall growth in economic development.

URBAN INFRASTRUCTURE DEVELOPMENT

Urban infrastructure consists of drinking water, sanitation, sewage systems, electricity and gas distribution, urban transport, primary health services and environmental regulation. The process of urbanization has gathered considerable momentum in recent years and this has put urban infrastructure and services under severe strain. Urban transport is one another key elements of urban infrastructure. The major objective of urban transport initiative is to provide efficient and affordable public transport.

A National Urban Transport Policy (NUTP) has been formulated with the objective of ensuring easily accessible, safe, affordable, quick, comfortable, reliable and sustainable mobility for all. Revised guidelines for preparation of comprehensive city transport plans and DPRs have been prepared and circulated to all State Governments/UTs for availing of financial assistance to the extent of 40 % of cost as Central assistance under the present scheme of Urban Transport Planning.

INVESTMENTS REQUIREMENT INFRASTRUCTURE DEVELOPMENT IN INDIA

India is expected to grow at an average 9 percent per annum in next few years. Accompanying this growth will be an increase in demand for infrastructure services. Economic and population growth prospects are expected to place additional pressure on existing infrastructure facilities. Therefore,

addressing these challenges will be essential is the infrastructure sector is to continue fostering economic growth rather than becoming a constraint. In other words, a failure to respond to this demand will cause bottlenecks to growth and hamper poverty alleviation efforts.

Technical Magazine

INFRASTRUCTURE DEVELOPMENT IN INDIA AFTER INDEPENDENCE

Table 3: Requirement of Infrastructure Investments in India during 2007-2011

Sectors Anticipated	Investment in 10th FYP (2002-2007)	Projected Investment in 11th FYP (2007-2011)	%Change US\$ billion %
Electricity	70.5	150.3	111.7
Roads and bridges	31.7	76.1	140.1
Railways	20.3	62.2	206.4
Irrigation	32.1	53.1	65.4
Telecom	22.4	65.1	189.3
Ports	1.3	18.01	128.4
Airports	2.1	8.5	304.8
Storage	2.3	5.5	139.1

GOVERNMENT POLICY FOR INFRASTRUCTURE DEVELOPMENT IN INDIA:

India has created specialized institutions for long-term infrastructure financing and there are certainly many arguments for establishing a regional investment bank, similar to the line of India's IIFC. Viability Gap Financing (VGF) is likely to be successful instrument in managing much needed gaps in road development in developing Asia and LDCs where domestic resources are limited and suffer from capacity constraints.

While this institution could certainly play an important role by tapping into global financial markets and channeling funds to infrastructure projects, their mere existence will not increase investment if the underlying obstacles precluding investor confidence are not addressed—as the shortage of viable projects for funding by the IDFC or IIFC illustrates.

Technical Magazine

INFRASTRUCTURE DEVELOPMENT IN INDIA AFTER INDEPENDENCE

CONCLUSIONS:

It is not so easy for every nation to develop all kind of infrastructure at once but, Provision of quality and efficient infrastructure services is essential to realize the full strength and potential of the emerging Indian economy. Indian government's first priority is therefore rising to the challenge of maintaining and managing high growth through investment in infrastructure sector, among others. To sustain 9 percent growth, the Government of India has estimated that an investment of over US\$ 492.5 billion during the 11th Five Year Plan (2007-2012) is required. Therefore, there is substantial infrastructure needs in infrastructure sector in India, which, in other words, also offers large investment opportunities. Public-Private-Partnership (PPP) is emerging as the preferred instrument,

where the private sector gets especially transportation its normal financial rates of linkages and energy pipelines return while the public sector with neighboring countries is partner provides concessional funding based on the long-term direct and indirect benefits to the economy. New transportation costs and instruments such as Viability Gap Funding (VGF) through a special purpose vehicle (SPV) set up recently by the Government of India to fund its mega infrastructure projects may be relevant for other Asian countries as well. The cross-border infrastructure component is an important determinant of regional integration. If countries are not inter-linked each other through improved transportation network, regional integration process will not move ahead at a desired pace. In India, development of cross-border infrastructure, especially transportation with neighboring countries is underway and expected to contribute to the regional integration in Asia by reducing transportation costs and facilitating intra-regional trade and services. Nevertheless, there are many challenges. It is important for India to enhance its overland connectivity with East Asia in order to effectively facilitate the Asian regional integration.

Mr. Harkal S.P
Asst Professor Civil
Department

Technical Magazine

DIAGRID STRUCTURES A MARVEL OF ENGINEERING EFFICIENCY AND AESTHETICS



Abstract

This technical article explores the innovative engineering concept of diagrid structures in modern architecture. Diagrids are a form of structural system that optimizes both strength and aesthetics, allowing architects and engineers to create iconic and sustainable buildings. This article explores into the design principles, advantages, challenges, and real-world examples of diagrid structures, showcasing their potential to shape the future of high-rise construction.

Introduction

As cities continue to grow vertically, architects and engineers face the challenge of creating tall buildings that are not only structurally sound but also visually striking. The development of the diagrid system has revolutionized the way skyscrapers and other large structures are designed and constructed, combining strength, efficiency, and artistic expression in one



Understanding Diagrids

A diagrid, short for diagonal grid, is a framework of diagonal members that form a lattice-like pattern. Unlike conventional vertical and horizontal framing systems, diagrid structures rely on triangular or rhombic facets to provide support and stability. This unique design approach ensures that the building's load is evenly distributed and efficiently transmitted to the foundation.

Design Principles and Advantages:

- **Structural Efficiency:** Diagrids reduce the need for excessive vertical columns, resulting in more usable space, increased flexibility in floor plans, and enhanced open vistas.
- **Wind Resistance:** The diagonal configuration of diagrid members enhances the building's ability to resist lateral loads, such as wind forces, making it ideal for tall and slender structures.

Technical Magazine

DIAGRID STRUCTURES A MARVEL OF ENGINEERING EFFICIENCY AND AESTHETICS

- **Aesthetics:** Diagrid structures offer a visually captivating appearance, often becoming iconic landmarks in city skylines.
- **Sustainability:** The reduction in materials and increased energy efficiency due to improved natural lighting and ventilation contribute to the sustainability of diagrid buildings.

Challenges and Solutions

- **Complex Geometry:** Diagrid structures can pose challenges during construction due to their intricate geometry. Advanced computer simulations and modeling help optimize the design and fabrication process.
- **Connection Details:** Ensuring the reliable connection between diagonal members requires precise engineering and innovative construction methods.
- **Cost Considerations:** While diagrid structures may be more expensive to build initially, their long-term benefits, including reduced energy consumption and maintenance costs, often outweigh the initial investment.

Real-world Examples

The Shard, London: This iconic 95-story skyscraper, designed by Renzo Piano, features a diagrid facade that adds to its distinctive profile and structural efficiency.

CCTV Headquarters, Beijing

Designed by Rem Koolhaas, this building's unique form, resembling a loop of interconnected blocks, showcases the creative potential of diagrid structures.

Hearst Tower, New York:

This sustainable high-rise, designed by Norman Foster, utilizes a diagrid structure to create an aesthetically pleasing and environmentally friendly office space.

Real-world Examples

Diagrid structures represent a compelling fusion of engineering prowess and architectural artistry. As cities continue to reach new heights, the diagrid system offers a promising solution to the challenges of sustainable and efficient tall building construction. Through ongoing research and advancements in construction technology, diagrids are likely to shape the skylines of the future, creating breath-taking landmarks that stand as a testament to human innovation and creativity.

Mr. P.M.Yeole
Asst Professor Civil
Department



Technical Magazine

THE BRIHADEESWARA TEMPLE AN ANCIENT ENGINEERING MARVEL

Abstract

This technical article delves into the magnificent Brihadeeswara Temple, also known as the Rajarajeswaram Temple, a UNESCO World Heritage site located in Thanjavur, Tamil Nadu, India. Built during the Chola dynasty in the 11th century, this temple stands as a remarkable testament to the ingenuity of ancient Indian architects and engineers. This article explores the temple's historical context, architectural features, construction techniques, and cultural significance, shedding light on its enduring legacy as a masterpiece of Dravidian architecture.

Introduction

The Brihadeeswara Temple, also known as the Peruvudaiyar Kovil or Rajarajeswaram, is a magnificent Hindu temple located in Thanjavur, Tamil Nadu, India. Built during the reign of the Chola dynasty in the 11th century, this architectural masterpiece stands as a testament to the ingenuity, skill, and creativity of ancient Indian engineers and artisans. The temple is dedicated to Lord Shiva and is a UNESCO World Heritage site, drawing thousands of visitors from across the globe who marvel at its grandeur and engineering brilliance.

Historical Background

Commissioned by the Chola Emperor, Rajaraja I, the Brihadeeswara Temple was constructed between 1003 and 1010 AD. It was conceived as a celebration of the Chola dynasty's power and authority, as well as a place of worship for Lord Shiva. The temple complex not only served religious purposes but also acted as a social, cultural, and economic centre during its time, demonstrating the importance of architecture in shaping societies.

Historical Background

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The temple complex not only served religious purposes but also acted as a social, cultural, and economic centre during its time, demonstrating the importance of architecture in shaping societies.

Architectural Design

The Brihadeeswara Temple is a classic example of Dravidian architecture, a style prominent in South India. The temple's design follows a traditional layout plan, consisting of a GARBHAGRIHA (sanctum sanctorum), a connected ARDHAMANDAPA (anteroom), and a spacious MAHAMANDAPA (main hall). The towering vimana (shikhara) rises to an impressive height, dominating the skyline with its pyramidal shape. The SIKHARA of the temple weighted 25 tons. Height of the temple from the ground level is 66 m (217 ft).



Technical Magazine

THE BRIHADEESWARA TEMPLE AN ANCIENT ENGINEERING MARVEL

What truly sets the Brihadeeswara Temple apart is its massive granite monolithic structure, which forms the main body of the temple. The NANDI MANDAPAM, located at the entrance, houses an enormous monolithic statue of Nandi, Lord Shiva's sacred bull, carved from a single stone block. This statue alone weighs around 25 tons and showcases the architectural prowess of the artisans of that time.

Engineering Marvels

- **Rock Foundation**

The temple's foundation was constructed using an ingenious technique called the "sandy soil" method. The temple was built on a raised platform, which evenly distributed the weight of the massive structure. This foundation effectively protects the temple from earthquakes, ensuring its stability over the centuries.

- **Fresco Paintings**

The interiors of the temple once boasted exquisite frescoes that depicted scenes from Hindu mythology and the daily life of the Chola people. While many of these frescoes have faded over time, the remnants that remain are a testament to the artistic skill of the craftsmen.

- **Shadow and Light Play**

The temple's architecture is designed in a way that during the equinoxes, the temple casts no shadow, a remarkable feat that showcases the precision in alignment achieved by the Chola architects.

- **Copper Dome**

Atop the towering vimana, there is a massive copper dome that adds to the temple's allure. The engineering techniques employed in crafting this dome are a testament to the advanced metallurgical knowledge of the Chola civilization.

Legacy

The Brihadeeswara Temple continues to inspire architects and artists to this day. Its unparalleled beauty and innovative engineering have left an indelible mark on the world of architecture.

The temple's preservation as a UNESCO World Heritage site ensures that future generations will also marvel at its grandeur and learn about the rich cultural heritage.

Conclusion

The Brihadeeswara Temple stands tall as a timeless marvel, a symbol of human creativity and ingenuity. Its awe-inspiring architecture, elaborate carvings, and advanced engineering techniques make it one of the most remarkable structures in the world. As we continue to admire and protect this historical treasure, we also pay homage to the brilliance of ancient engineers and artisans who crafted this enduring legacy for generations to come.



Mr. L.B.Pawar
Asst Professor Civil
Department

STUDENT ARTICLES



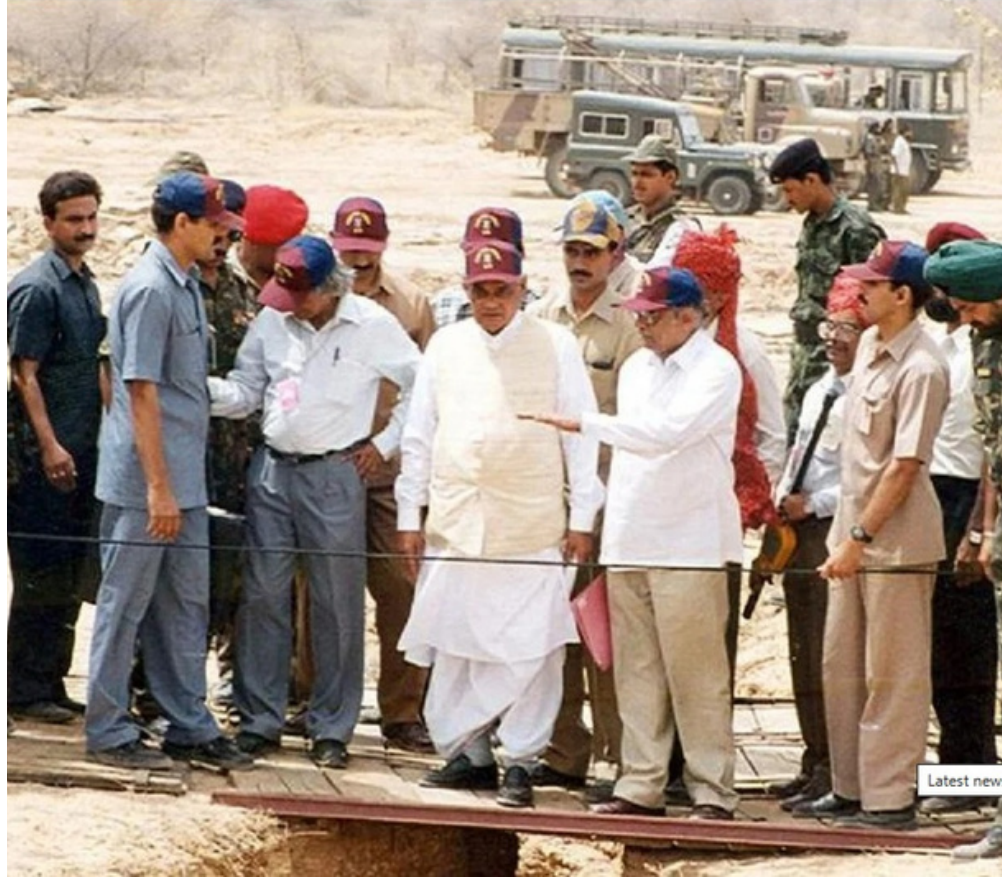
परमाणु परीक्षण' से 'अग्निपथ' तक



देश आजादी का 'अमृत महोत्सव' मना रहा है। देशवासी बड़े ही जोश से आजादी के इस महापर्व को मनाने में जुटे हैं। कहीं सांस्कृतिक कार्यक्रमों को लेकर तैयारी हो रही है तो कहीं पर कोई सोशल इवेंट हो रहे हैं। इन 75 सालों में देश में काफी कुछ हुआ, कुछ अच्छे इवेंट हुए तो कभी देश कुछ कष्टों से भी गुजरा। नापाक दुश्मनों की जब भी नजर हमारी ओर पड़ी, हमारे देश के वीरों ने उन आंखों को ही फोड़ दिया। देश प्रगति के पथ पर आगे चल रहा है, आइए आजादी के इस महापर्व पर हम कुछ बड़े फैसलों की बातें करें, जिसने देश और समाज की दिशा और तस्वीर को ही बदल कर रख दिया।

परमाणु परीक्षण से लेकर कारगिल युद्ध तक

- परमाणु परीक्षण: साल 1998 में पोखरण में सफल परमाणु परीक्षण करके भारत ने नया इतिहास रचा था।
- हाईवे नेटवर्क योजना: दिल्ली, मुंबई, चेन्नई, कोलकाता को हाईवे नेटवर्क के जरिए जोड़ा गया।
- सदा-ए-सरहद बस सेवा : इस योजना का प्रारंभ अटल सरकार ने किया था लेकिन 2001 में हुए संसद हमले के बाद इस सेवा को बंद कर दिया गया था लेकिन साल 2003 में ये सेवा फिर से प्रारंभ हो गई।



- सर्व शिक्षा अभियान: शिक्षा को मौलिक अधिकार माना गया।
- 'चंद्रयान 1' : 'जय जवान, जय किसान और जय विज्ञान' का नारा देने वाली अटल सरकार ने ' चंद्रयान 1' के जरिए भारत के पहले चंद्र मिशन की शुरुआत की थी।
- कारगिल युद्ध : ऑपरेशन विजय के जरिए 26 जुलाई 1999 को भारतीय सेना ने कारगिल में पाकिस्तान को हराकर तिरंगा फहराया था लेकिन इस युद्ध में भारतीय सेना के 527 जवान शहीद हुए थे।
- भारत संचार निगम लिमिटेड : संचार क्रांति के तहत 15 सितंबर 2000 को बीएसएनएल का गठन हुआ था।

मनरेगा से लेकर अधिकार अधिनियम तक

- मनरेगा : महात्मा गांधी राष्ट्रीय ग्रामीण रोजगार गारंटी अधिनियम ने देश की तस्वीर बदलने में बड़ा रोल अदा किया है। इस योजना का प्रारंभ साल 2006 में हुआ था।
- खाद्य सुरक्षा कानून: गांव की 75 फीसदी आबादी को सस्ते दामों में अनाज मुहैया कराना मकसद।
- DBT: सब्सिडी में करप्शन रोकने के लिए DBT की शुरुआत हुई।
- शिक्षा अधिकार अधिनियम 2009 : 6 से 14 साल की उम्र के बच्चे को मुफ्त शिक्षा का अधिकार।
- सूचना का अधिकार अधिनियम 2005 : इस नियम के तहत नागरिकों के प्रति सरकार की जवाबदेही तय हुई।

Mr. Shubham Jadhav
TE Civil

परमाणु परीक्षण' से 'अग्निपथ' तक

राम मंदिर फैसले से लेकर सुकन्या समृद्धि योजना तक

- अयोध्या मंदिर-मस्जिद विवाद का फैसला: राम मंदिर का फैसला देश के बड़े फैसलों में से एक रहा।
- जनधन योजना: इस स्कीम के तहत हर परिवार को बैंकिंग सिस्टम से जोड़ा गया।
- आयुष्मान भारत: BPL परिवारों को 5 लाख रुपए तक कैशलेस स्वास्थ्य बीमा देना।
- उज्वला योजना: BPL परिवारों को घरेलू रसोई गैस कनेक्शन मुफ्त।
- स्वच्छ भारत योजना: ग्रामीण और शहरी इलाकों में शौचालय बनवाना।
- सुकन्या समृद्धि योजना: बालिकाओं के सुखद भविष्य के लिए शुरु की गई है।

कश्मीर से कन्याकुमारी तक एक भारत

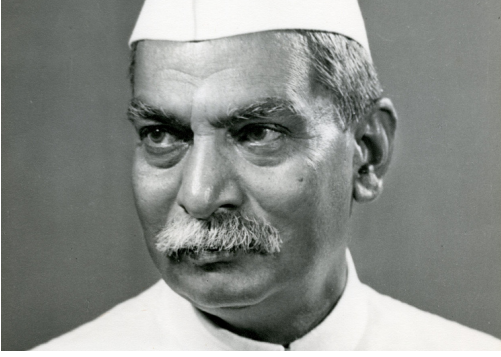
- जम्मू कश्मीर से अनुच्छेद 370 हटाना देश के बड़े फैसले में से एक है।
- नोटबंदी: 8 नवंबर 2016 को मोदी सरकार ने 500 और 1000 रुपयों को बंद करने का ऐलान किया था।
- जीएसटी: जीएसटी को 'एक देश, एक कर' के नारे के साथ पेश किया गया।
- सर्जिकल स्ट्राइक : भारतीय जवानों ने पाक अधिकृत कश्मीर में घुसकर आतंकियों को निशाना बनाया।
- बालाकोट एयर स्ट्राइक: भारतीय वायुसेना ने पीओके में घुसकर बमबारी की थी।
- तीन तलाक के खिलाफ कानून ने भी देश की बदली तस्वीर को पेश किया।

- CAA-NRC पर आए फैसले ने भी देश के सामने नई तस्वीर आई।
- सरकारी बैंकों का विलय भी देश के बड़े फैसलों में शामिल है।
- सवर्ण समुदाय को आर्थिक आधार पर 10 फीसदी आरक्षण भी सरकार के अहम फैसलों में से एक है।
- अग्निपथ योजना भी देश के बड़े फैसले का हिस्सा है।

Mr. Thombare Rohan S.
BE Civil



This photograph released by the Indian government 17 May shows the Shakti-3 nuclear site after a nuclear device was detonated underground 11 May.



डॉ. राजेंद्रप्रसाद सहाय (जन्म :
३ डिसेंबर १८८४; - २८
फेब्रुवारी १९६३)

स्वतंत्र भारताचे पहिले राष्ट्रपती होते. त्यांनी सन १९५० ते १९६२ या काळात भारताच्या राष्ट्रपतीचे पद भूषविले. व्यवसायाने वकील असलेले डॉ. राजेंद्रप्रसाद, भारताच्या स्वातंत्र्यलढ्यादरम्यान काँग्रेस पक्षात सामील झाले व बिहारमधील एक प्रमुख राजकीय नेते बनले. महात्मा गांधींचे समर्थक असलेल्या राजेंद्रप्रसाद ह्यांना ब्रिटिश सरकारने १९३१ मधील मिठाचा सत्याग्रह व १९४२ मधील भारत छोडो आंदोलनादरम्यान तुरुंगात डांबले होते. स्वातंत्र्य मिळाल्यानंतर २६ जानेवारी १९५० रोजी भारताने नवीन संविधानाचा स्वीकार केला व राजेंद्रप्रसादांची भारताचे पहिले राष्ट्रपती म्हणून निवड केली गेली. ह्या पदावर ते १२ वर्षे राहिले.

प्रारंभिक जीवन

राजेंद्र प्रसाद यांचा जन्म ब्रिटिश राजवटीत बिहारमधील सिवान जिल्ह्यातील झिरादेई येथील कायस्थ कुटुंबात झाला. त्यांचे वडील महादेव सहाय श्रीवास्तव हे संस्कृत आणि फारसी या दोन्ही भाषांचे अभ्यासक होते. त्यांची आई कमलेश्वरी देवी ही एक धर्माभिमानि स्त्री होती जी आपल्या मुलाला रामायण आणि महाभारतातील कथा सांगायची. राजेंद्र प्रसाद हे त्यांच्या भावंडात सर्वात लहान होते आणि त्यांना एक मोठा भाऊ आणि तीन मोठ्या बहिणी होत्या. ते लहान असतानाच त्यांची आई वारली आणि नंतर त्यांच्या मोठ्या बहिणीने त्यांची काळजी घेतली

कारकीर्द

• शिक्षक

राजेंद्र प्रसाद यांनी विविध शैक्षणिक संस्थांमध्ये शिक्षक म्हणून काम केले. अर्थशास्त्रात एम.ए. पूर्ण केल्यानंतर ते बिहारमधील लंगत सिंग कॉलेज ऑफ मुजफ्फरपूर येथे इंग्रजीचे प्राध्यापक झाले आणि पुढे जाऊन ते प्राचार्य बनले. तथापि, पुढे त्यांनी आपल्या कायद्याच्या अभ्यासासाठी महाविद्यालय सोडले आणि रिपन कॉलेज, कलकत्ता (सध्याचे सुरेंद्रनाथ लॉ कॉलेज) मध्ये प्रवेश घेतला. १९०९ मध्ये कोलकाता येथे त्यांचे कायद्याचे शिक्षण घेत असताना त्यांनी कलकत्ता सिटी कॉलेजमध्ये अर्थशास्त्राचे प्राध्यापक म्हणूनही काम केले. १९१५ साली, प्रसाद मास्टर्स इन लॉच्या परीक्षेत उत्तीर्ण झाले आणि त्यांनी सुवर्ण पदक जिंकले. १९३७ मध्ये त्यांनी अलाहाबाद विद्यापीठातून कायद्याच्या क्षेत्रात डॉक्टरेट मिळवली

तथापि, आपली निवड केल्यावर, त्याने घुसखोर विचार बाजूला ठेवले आणि नव्या जोमाने आपल्या अभ्यासावर लक्ष केंद्रित केले. १९१५ मध्ये, त्यांनी मास्टर्स इन लॉ परीक्षा सन्मानाने उत्तीर्ण केली आणि सुवर्णपदक जिंकले. त्यानंतर त्यांनी कायद्यातही डॉक्टरेट पूर्ण केली. १९१६ साली ते बिहार आणि ओडिशाच्या उच्च न्यायालयात दाखल झाले. नंतर १९१७ मध्ये सिनेट अँड सिंडीकेट ऑफ पटना युनिव्हर्सिटीचे प्रथम सदस्य म्हणून त्यांची नियुक्ती झाली. बिहारमधील रेशीमसाठी प्रसिद्ध असलेल्या भागलपूर येथेही त्यांनी वकिली केली.

भारताचे राष्ट्रपती

- स्वातंत्र्यानंतर अडीच वर्षांनी, २६ जानेवारी १९५० रोजी, स्वतंत्र भारताच्या संविधानाला मान्यता देण्यात आली आणि ते भारताचे पहिले राष्ट्रपती म्हणून निवडले गेले. दुर्दैवाने, २५ जानेवारी १९५० च्या रात्री (भारतीय प्रजासत्ताक दिनाच्या एक दिवस आधी) त्यांची बहीण भगवती देवी यांचे निधन झाले. त्याने तिच्या अंत्यसंस्काराची व्यवस्था केली पण तो परेड ग्राउंडवरून परतल्यानंतरच.

- भारताचे राष्ट्रपती या नात्याने, प्रसाद यांनी राज्यघटनेच्या आवश्यकतेनुसार कार्य केले आणि ते कोणत्याही राजकीय पक्षापासून स्वतंत्र होते. त्यांनी भारताचे राजदूत म्हणून जगभर प्रवास केला, परदेशी राष्ट्रांशी राजनैतिक संबंध निर्माण केले. १९५२ आणि १९५७ मध्ये ते सलग दोन वेळा पुन्हा निवडून आले आणि ही कामगिरी करणारे ते भारताचे एकमेव राष्ट्रपती आहेत. राष्ट्रपती भवनातील मुघल गार्डन्स त्यांच्या कार्यकाळात प्रथमच सुमारे एक महिना लोकांसाठी खुले होते आणि तेव्हापासून ते दिल्ली आणि देशाच्या इतर भागांतील लोकांसाठी एक मोठे आकर्षण बनले आहे.
- संविधानाच्या आवश्यकतेनुसार अध्यक्षीय अपेक्षित भूमिकेचे पालन करून प्रसाद यांनी राजकारणापासून स्वतंत्रपणे काम केले. हिंदू कोड बिलाच्या अंमलबजावणीवरून झालेल्या भांडणानंतर, त्यांनी राज्य कारभारात अधिक सक्रिय भूमिका घेतली. १९६२ मध्ये, अध्यक्ष म्हणून १२ वर्षे सेवा केल्यानंतर, त्यांनी निवृत्तीचा निर्णय जाहीर केला. मे १९६२ मध्ये भारताच्या राष्ट्रपती पदाचा त्याग केल्यानंतर, ते १४ मे १९६२ रोजी पाटणा येथे परतले आणि त्यांनी बिहार विद्यापीठाच्या कॅम्पसमध्ये राहणे पसंत केले. भारत-चीन युद्धाच्या एक महिना आधी ९ सप्टेंबर १९६२ रोजी त्यांच्या पत्नीचे निधन झाले.
- १९६२ मध्ये, राष्ट्रपती म्हणून १२ वर्षांनी, डॉ. प्रसाद सेवानिवृत्त झाले आणि त्यानंतर त्यांना भारतरत्न हा देशाचा सर्वोच्च नागरी पुरस्कार प्रदान करण्यात आला.
- आपल्या उत्साही आणि कर्तृत्ववान जीवनातील अनेक गोंधळांसह त्यांनी आपले जीवन आणि स्वातंत्र्यापूर्वीचे दशक अनेक पुस्तकांमध्ये नोंदवले, त्यापैकी "चंपारण येथील सत्याग्रह" (१९२२), "भारत विभाजित" (१९४६), त्यांचे आत्मचरित्र "आत्मकथा" (१९४६), "महात्मा गांधी आणि बिहार, काही आठवणी" (१९४९)

Technical Magazine

THE EVOLUTION OF SOFTWARE APPLICATIONS IN THE CONSTRUCTION INDUSTRY: A COMPREHENSIVE ANALYSIS

I. INTRODUCTION

The construction industry has undergone a significant transformation over the years, with the integration of advanced software applications playing a pivotal role in reshaping how projects are planned, executed, and managed. This article delves into the evolution of software use in construction, exploring key milestones, technological advancements, and their impact on the industry.

I. Early Adoption of CAD Software:

In the late 20th century, Computer-Aided Design (CAD) software emerged as a revolutionary tool in the construction sector. Architects and engineers transitioned from traditional paper-based drawings to digital platforms, allowing for more precise and efficient planning. CAD enabled professionals to create detailed 2D and 3D models, facilitating improved visualization and collaboration among project stakeholders.

II. Rise of Project Management Software:

As the complexity of construction projects increased, the demand for effective project management tools grew. In the early 2000s, project management software solutions gained prominence, streamlining tasks such as scheduling, resource allocation, and budget tracking. These tools empowered project managers to enhance efficiency, minimize errors, and ensure timely completion of construction projects.

III. Building Information Modeling (BIM) Revolution:

The 21st century witnessed the widespread adoption of Building Information Modeling (BIM) - a transformative approach to project design and execution. BIM software enables stakeholders to collaborate in a shared digital

environment, fostering seamless communication and coordination. The ability to create a comprehensive 3D model with embedded data revolutionized the construction process, improving accuracy and reducing costly errors.

IV. Integration of IoT and Sensors:

The advent of the Internet of Things (IoT) brought a new wave of innovation to the construction industry. Smart sensors embedded in construction equipment and materials enabled real-time monitoring of job sites. This data-driven approach enhanced safety, efficiency, and decision-making, providing project managers with valuable insights into various aspects of construction operations.

Technical Magazine

THE EVOLUTION OF SOFTWARE APPLICATIONS IN THE CONSTRUCTION INDUSTRY: A COMPREHENSIVE ANALYSIS

V. Mobile Applications for On-Site Management:

The proliferation of smartphones and tablets led to the development of mobile applications specifically designed for on-site construction management. These applications facilitate instant communication, document sharing, and project updates, empowering construction teams to stay connected and make informed decisions, even in remote locations.

VI. Cloud-Based Collaboration Platforms:

Cloud technology revolutionized collaboration in the construction sector by providing a centralized platform for storing and sharing project data. Cloud-based collaboration tools facilitate real-time access to project information, ensuring

that all stakeholders can work together seamlessly, regardless of geographical locations. This has significantly improved project transparency and accountability.

VII. Artificial Intelligence for Predictive Analytics:

In recent years, Artificial Intelligence (AI) has emerged as a game-changer in construction software. AI-powered predictive analytics help in forecasting project outcomes, identifying potential risks, and optimizing resource allocation. Machine learning algorithms analyze historical data to provide valuable insights, enabling construction professionals to make informed decisions and enhance project outcomes.

Conclusion:

The evolution of software applications in the construction industry has been marked by continuous innovation and technological advancements. From the early days of CAD to the current era of AI-powered analytics, these tools have not only improved efficiency and accuracy but have also transformed the way construction projects are conceptualized, planned, and executed. As the industry continues to embrace emerging technologies, the future promises even more sophisticated software solutions that will redefine the landscape of construction management.

Miss. Ghule Shradha
BE Civil

Technical Magazine

RAIN / ROOF TOP WATER HARVESTING

Water is essential for life and plays a major role in earth's climate. By modifying land use, the proportion of the different pathways, evaporation, percolation and run off change. The never ending exchange of water from the atmosphere to the oceans and back again is known as the Hydrological Cycle.

In the present day world, rapid urbanization coupled with industrialization has become the order of the day. Added to urbanization, scanty and erratic rainfall is often resulting in reduction in water levels indicating depletion in storage in the surface reservoirs. Dependence on groundwater is increasing rapidly over the past two decades. The demand is so high that indiscriminate use of groundwater resulting in a steep fall of the groundwater levels and there is also a reduction in yields.

Apart from this, sealing of permeable soil zones is gradually increasing due to construction activities, thereby resulting in reduced percolation of rainwater into the subsurface and increased surface run-off.

Therefore, there is an urgent need to take up rain / roof water harvesting / conservation methods in urban and rural areas on a large scale, which subsequently help to recharge and maintain groundwater balance, in order to make it a sustainable source.

RAIN WATER HARVESTING:

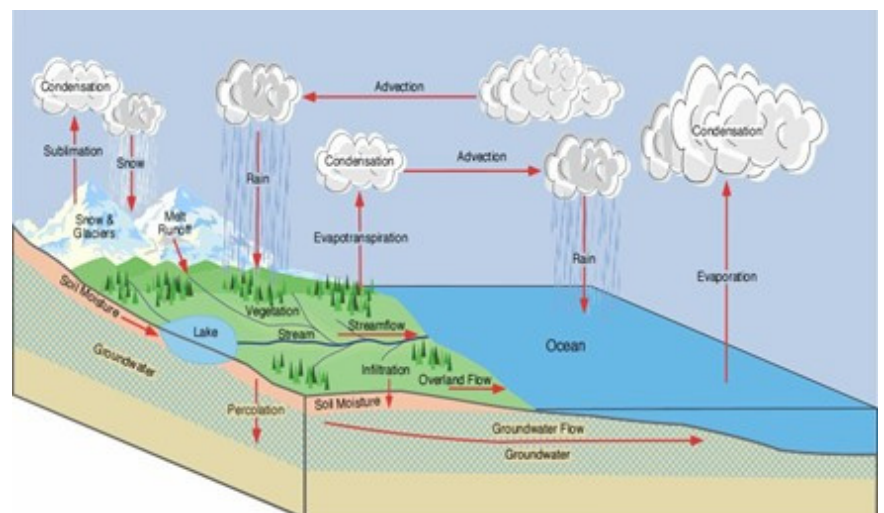
-Tapping the rainwater from where it falls

-Techniques of rainwater harvesting involve

Catch the rainwater from localized catchment surfaces such as the roof of a house, plain and sloping ground surfaces etc. It is an easy process to collect rainwater and divert it into ponds, vessels or underground tanks to store for longer periods and to recharge by construction of RWH Structures in suitable sites.

Rainwater harvesting is in two ways --

1.Direct Use: The process of collecting and storing the rainwater by construction of sump through filters for future productive use and



RAIN / ROOF TOP WATER HARVESTING

2. Artificial recharge to groundwater: Recharge the rainwater in a scientifically planned way by construction of rain / roof top water harvesting structures to augment the groundwater.

Guidelines for construction of Rain / Roof top water harvesting Structures:

1. Recharge structures should be designed and constructed in favourable geological conditions i.e. permeable soils followed by murrum etc. The structures should not be taken up in impervious clayey soils, rock and steep sloped areas.

2. Recharge structures should be preferred for recharging to depleted aquifers with deep water table. They should not be taken up in the shallow water table areas. The depth to water level should be not less than 5 to 6 meters in post-monsoon period.

3. Recharge structures should be taken up with unpolluted surface water only.

Adequate precautions should be taken to prevent entry of polluted urban surface runoff water, sewerage water into recharge structures.

4. Recharge structures should be planned and taken up in over exploited and critical areas experiencing intensive ground water development for various uses.

5. All existing kuntas and tanks in and around the urban agglomeration areas are to be protected against encroachments and should be converted as percolation ponds and tanks. The polluted drainage and other industrial pollutants should not be allowed to let into these tanks.



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