



Advancing SDG9 in Bihar: Challenges and Opportunities in Building Sustainable Infrastructure, Promoting Industrial Growth and Fostering Innovation

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ABSTRACT

Bihar, one of India's high population states, faces significant challenges in achieving Sustainable Development Goal 9, which emphasizes resilient infrastructure, inclusive and sustainable industrialization and fostering innovation. Despite its potential, Bihar faces inadequate infrastructure, underdeveloped manufacturing sectors and a limited innovation ecosystem, which hamper its socio-economic progress. However, these challenges also present opportunities to Bihar to implement transformational changes that are aligned with the goals of SDG 9. This study examines Bihar's present status in implementing SDG 9, focusing on key areas such as infrastructure development, industrial growth and innovation. It examines the state's efforts to enhance transportation networks, energy systems, and digital connectivity to bridge regional disparities and promote economic inclusion. In addition, the study highlights the role of agro-based industries, small and medium enterprises (SMEs) and government policies of Bihar in driving industrial growth and entrepreneurship. This paper identifies critical barriers, including limited funding, bureaucratic challenges and skills shortages that are preventing progress in these areas. It also highlights the potential for leveraging public-private partnerships, fostering regional cooperation and implementing community-led initiatives to overcome these challenges.



This study provides actionable insights and recommendations to help the state unlock its potential and achieve the transformative goals of SDG 9. The findings underscore the importance of a strategic, inclusive and sustainable approach to development that can lead the way for a resilient and innovative Bihar.

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INTRODUCTION

Bihar, one of the most populous and historically important states of India, is at a critical point in its development journey. Despite its rich cultural heritage and abundant human resources, the state faces persistent challenges in infrastructure development, industrialization and innovation. Solving these challenges is important for promoting economic growth, reducing regional disparities and improving the overall quality of living standard of its inhabitants. Sustainable Development Goal 9 (SDG 9) serves as a blueprint for achieving these goals, focusing on resilient infrastructure, inclusive industrial growth and a thriving innovation ecosystem. SDG 9 emphasizes the role of infrastructure in connecting communities, facilitating trade and supporting economic activity. For Bihar, improving transport networks, energy systems and digital connectivity is critical to overcoming the structural barriers that have long impeded its progress. A state's economic growth depends heavily on these essential elements, as they allow businesses to flourish and individuals to access services and opportunities. Moreover, sustainable infrastructure can help in reducing the gap among urban and rural areas and ensure that the benefits of economic development reach even the most remote parts of the state. Bihar has a huge potential to become a hub for agro-based industries, small and medium enterprises (SMEs) and other labor-intensive industries. Leveraging on its strategic location, rich agricultural base and growing young population, Bihar can pave the way for sustainable industrialization that creates employment and drives economic inclusion. Innovation, the third component of SDG 9, is essential for Bihar to adapt to modern economic challenges and seize emerging opportunities. By encouraging entrepreneurship, supporting R&D and providing financial and infrastructural support to startups, Bihar can position itself as a hub for technological advancement and creative solutions. Enhancing collaboration between academia, industry and government agencies will be key to achieving this goal. Moreover, disparities in development between urban centers and rural areas represent a significant obstacle to inclusive progress. To solve



these challenges requires a multi-pronged approach involving public-private partnerships, community engagement and effective policy implementation. This study examines the challenges and opportunities Bihar faces in achieving SDG 9, focusing on infrastructure, industrialization and innovation. It aims to provide actionable insights and strategies that are aligned with Bihar's unique context and development needs.

OBJECTIVE

1. To analyse the current state of infrastructure development in Bihar, focusing on transportation, energy, and digital connectivity.
2. To analyze the role of small- and medium-scale industries (SMEs) in Bihar's economic growth and their alignment with SDG 9.
3. To evaluate the innovation ecosystem in Bihar, including government initiatives, academic institutions, and start-up culture.
4. To identify challenges and opportunities for sustainable industrialization and propose strategies to enhance progress toward SDG 9.

LITERATURE REVIEW

P Kynčlová, S Upadhyaya, T Nice (2020):- This article explains the SDG-9 index, which assesses a country's progress against Sustainable Development Goal 9's industry-specific targets. The indicators were selected in accordance with the United Nations General Assembly's global indicator framework for the 2030 Agenda's goals and ambitions. The derived SDG-9 score compares inclusive and sustainable industrial development in 128 countries between 2000 and 2016. In overall, industrialized nations perform better than other nations, with Ireland, Germany, the Republic of Korea, Switzerland, and Japan placed first to fifth in 2016.

S Küfeoğlu(2022):- This article describes 59 companies' business strategies and use cases for exploiting new technologies to generate value under SDG-9. They also emphasize the importance of long-term infrastructure investments, sustainable industrial breakthroughs, and new approaches to achieving long-term economic growth, social and regional development, and climate change prevention. SDG-9 breaks down Industry, Innovation, and Infrastructure into three major areas. To establish transportation, information, and communication infrastructures, which are critical components of economic growth in accordance with these goals, the key to conserving economic development and increasing society's



welfare level is to develop industrial development, as well as new technological developments and skills aligned with inventions.

S Raihan(2020):- Since SDG 9 (industry, innovation, and infrastructure) has close relationships to other SDGs, it ought to be at the forefront of India's economic development ambitions. According to a recent study, South Asia's computed infrastructure index is significantly lower than the average for Asia-Pacific developing nations, and the difference is even more pronounced when compared to the average for Asia-Pacific developed nations. India's early deindustrialization puts the nation behind schedule for the SDG 9 industrialization target. Regarding the manufacturing value-added percentage of GDP from 1960 to 2015, which varied greatly, India, was able to gradually grow its contribution from 13.7 to 18% (between 1960 and 2008). However, the difficulty is that manufacturing value-added in GDP has been dropping since 2008 (by 2015, it had dropped to 16.6%). Successful nations' experiences indicate the substantial importance of human capital. India has significantly less human capital, both in quantity and quality, than East and Southeast Asian countries. To establish special economic zones, attract foreign direct investment (FDI) for diverse industrial businesses, and provide adequate incentives to domestic investors, proactive trade and industrial policies are also required. Integration of the indigenous industrial sectors with the global value chains should be another goal of such programs.

SP Vijayapur, R Shashidhar(2021):- They conducted this study to learn how sustainability contributes to community well-being. The paper also identifies how the people of India manage sustainable development goals like gender equality, zero hunger, poverty, caste based equality, etc., and attempts to determine how these goals relate to one another for the good of society. The rate of industrialization in India is changing the country's image in comparison to other developed countries, and it is also having an impact on the environment. Therefore, it is time for everyone to consider what can be done to improve society or the environment using the sustainability concept.

RR Anand, SK Sanu, M Singh, VR Sharma (2022):- This paper analyzes the status of various SDG goals in Bihar. They also emphasize what kind of policy where adopted by state government to meets SDG goals. Their analysis provides a thorough understanding of Bihar's performance in relation to SDG standards, challenges, and the actions taken to solve them. According to them, the SDGs are the global objectives that are part of a universal agreement to eradicate poverty, safeguard the environment, improve its habitability, and guarantee peace and prosperity for all people. The goals offer a thoroughly researched, scientifically robust, globally acceptable, and society intuitive framework.



Dr. Ajit Dhar Dubey(2014):- This study primarily concerns a survey of cottage industries, or self-employment, in Bihar's capital. They concentrated on the current state of entrepreneurship in Bihar's poorer regions. It also assesses the function of groups in charge of encouraging entrepreneurship through different programs, such as self-help groups and microfinance. This study also highlights the causes of Bihar's insufficient entrepreneurship growth and offers solutions for the state's small-scale industries' future entrepreneurial growth.

METHODOLOGY

This study employs a secondary data-based methodology to analyze the challenges and opportunities in advancing Sustainable Development Goal 9 (SDG 9) in Bihar. Data is sourced from government reports, such as the Bihar Economy Survey 2022-23, Bihar Budget 2024, and national databases, such as those of NITI Aayog and SDG India report 2023-24. Additionally, academic research papers and case studies are reviewed to comprehend Bihar's progress in infrastructural development, industrial growth, and innovation. The study critically reviews existing policies and their execution, using the data to identify gaps and give practical changes. This technique ensures a thorough, evidence-based approach to tackling Bihar's development difficulties under SDG 9.

RELEVANCE OF SDG9 AND PERFORMANCE OF BIHAR

In order to support our economic growth and development, SDG 9 promotes investment in innovative and resilient infrastructure. Additionally, it is encouraging increased adoption of clean and environmentally friendly technology and industrial processes, as well as improved resource usage efficiency. To achieve SDG9 objective, SDG 9 is divided into 8 particular targets. 'Outcome targets' (9.1-9.5) is the first five targets, while 'means of accomplishing targets' (9.a-9.c) are the final three. Specific intended results that accomplish the SDG goal's objective are known as outcome targets. Building robust infrastructure, encouraging equitable and sustainable industrialization, expanding access to small businesses, improving scientific research, and upgrading current infrastructure are a few of the goals.

Global SDG target 9.1 aims to develop quality, reliable, sustainable and resilient infrastructure to support economic development and equitable access for all. It is intended that all targeted unconnected habitations under PMGSY be interconnected. In Bihar, 99.59 percent of communities are connected by all-weather roads, yet this is still lower than the national average and the aim.

Table1: Performance of Bihar and India on Indicators of SDG9

INDICATORS	BIHAR	INDIA	TARGET
Percentage Of targeted habitations connected by all weather roads under PMGSY	99.59	99.7	100
Percentage share of GVA in Manufacturing to total GVA(current price)	8.67	14.34	25
Manufacturing employments as a percentage of total employment	5.71	11.42	19.66
Percentage share of GVA in services to total GVA(current price)	59.98	54.15	63.26
Service employment as percentage of total employment	25.45	27.75	52.98
Innovation score as per the India innovation index	11.58	36.4	100
Percentage of households that own at least one mobile phone	93.4	93.3	100
Percentage of inhabited villages with 3G/4G mobile internet coverage	96.08	95.08	100
SDI index score	53	61	100

Source: SDG India report 2023-24

The global SDG target 9.2 promotes inclusive and sustainable industrialization. Four major industries of importance for the growth of the secondary sector are mining and quarrying, manufacturing, electricity, gas, water supply and other utility services (EGWUS) and construction. If you see Bihar performance in SDG 9 as per SDG report Bihar comes under Performer group with 53 score but much below than target and India on average score.

Between 2021-2022 construction sector grew by 12 percentage and manufacturing and EGWUS by 6 percentage during same periods. The secondary sector had 20.7 % share in the value added in Bihar in 2021-22 compared to 29.2% at the all India level. This sector gives employment to 25.9% in Bihar and 24.6% in all India. Within secondary sector construction gives highest employment in Bihar (18.6%) and India (12.4%) in 2021-22. the manufacturing sector has a 8.67% share in the GVA in Bihar and 14.34% share in all India which is below the target level of 25%. In comparison the share of manufacturing in employment in Bihar and India is 5.71% and 11.42% respectively which is very lower than targeted value of 19.66% for both.

Service sector has performed very well in GVA share in both Bihar and India but they are not able to provide jobs in the economy as targeted. Service sector contributed 59.98% in Bihar and 54.15% in India in total GVA but provide only 25.45% in Bihar and 27.75 % share in India as percentage of total employment.



The World Intellectual Property Organization's Global Innovation Index evaluates countries on a scale of 0 to 100, with 100 representing the best performance. Both India and Bihar not perform well in innovation index and Bihar performance is very poor as we compare with Indian average. The global SDG goals 9.c aim to considerably enhance availability to information and communication technology. Universal mobile connectivity is one of the "Digital India Initiative's pillars. Around 93% in Bihar as well in all India as average has connectivity of one mobile phone per households and 95% of population has connectivity of 3G/4G

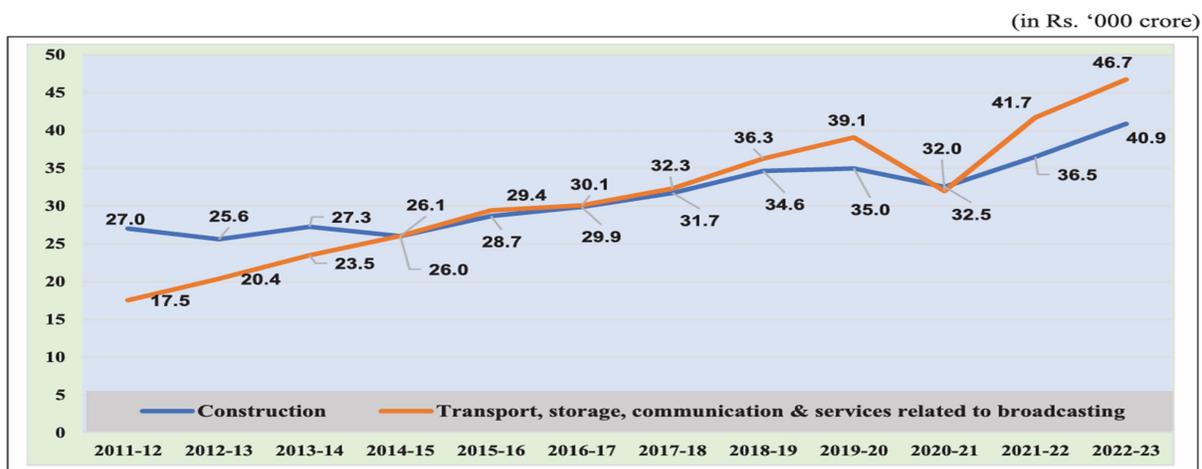
INFRASTRUCTURE DEVELOPMENT:

1. ROAD, RAIL AND AIR CONNECTIVITY

Physical infrastructure is crucial for market access, countries growth and prosperities. An appropriate physical infrastructure, such as transportation facilities, road connectivity, energy, and telephone connectivity, is a prerequisite for growth in economy in any region. Infrastructure creation provides development in numerous ways. 1) Access to public services such as health and education 2) job creation 3) poverty alleviation 4) input into production 5) flow of merchandise and services 6) Establish a link between markets 7) Economic linkages between rural and urban areas, as well as firm-nonfarm relationships.

The sectors that closely reflect the growth of the physical infrastructure are the construction and communication sector. During recent period construction as well as communication sectors emerged as important growth drivers of the Bihar's economy.

Chart1: Growth trend of GSVA of Bihar in construction and transport, storage & communication



Note : 2020-21 is the Covid year



Chart 1 displays the development paths of these two major sectors during the previous 12 years. According to data, the construction sector has increased by 1.5 times, from Rs 27.0 thousand crore in 2011-12 to Rs 40.9 thousand crore in 2022-23 at constant price. The transport, storage, and communication industry grew quicker than the construction sector, reaching Rs 46.7 thousand crore by 2022-23 from Rs 17.5 thousand crore in 2011-12. This sector has expanded by nearly two-and-a-half times. This demonstrates that the infrastructure industry's overall growth has been strong during the last twelve years (save for fiscal year 2020-21). Following the covid year, both sectors grew by double digits. The construction industry experienced a 12% annual growth rate in 2021-22 and 2022-23, while the communication sector expanded by more than 30 percent during 2021-22 and around 11 percentages in 2022-23.

The construction, transport, communication, trade and hotel sectors, overall, contributed 37 percent share in the Bihar economy, compared to 27 percent in the Indian economy. It is important to note here that these sectors increased by 2 percentage points at the state level; while at the national level, they increased by 1 percentage point only during 2022-23, compared to the previous year.

In 2005-24, the Bihar government invested Rs. 1.54 lakh crore on bridges and roads, including the rural road network. The highest investment, Rs. 21,567 crore, was made for road building between 2015-20. However, throughout the last four years (2020-24), the Bihar government spent Rs. 17,844 crore on road infrastructure in the state. During 2005-24, Rs 52,756 crore was spent on the expansion of the rural road network.

In order to fulfill the increasing need for physical infrastructure, the State government has been actively involving the private sector in addition to increasing public investment in infrastructure. In terms of road density (per 1000 sq.km.), Bihar ranks third among the major states of India. Further, Bihar (1.25 lakh) is at the third place in the list on account of the highest number of transport motor vehicle registrations during the calendar year 2022, after Uttar Pradesh (2.76 lakh) and Maharashtra (1.88 lakh). The State government has adopted many policies to curb vehicular air pollution through Bihar Clean Fuel Policy 2019, Electric Vehicle Policy 2023, Vehicle Scrapping Policy, etc. and strict enforcement of Pollution-under-Control norms.

The railways grew by almost two times during the last 12 years, from Rs. 2.8 thousand crore in 2011-12 to Rs. 5.4 thousand crore in 2022-23. The size of air transport in GSVAs jumped by seven times, from Rs. 30.8 crore in 2011-12 to Rs. 228.2 crore in 2022-23.

2. AVAILABILITY AND RELIABILITY OF ELECTRICITY FOR SUSTAINABLE ECONOMIC GROWTH

The availability of energy is a criterion for economic growth and social progress. In the recent past , Bihar has progressed remarkably in terms of availability of power. The increase in supply hours and availability of quality power has increased the per capita consumption of power from 134 KWH in 2011-12 to 329 KWH in 2021-22 i.e. an increase of 145.5 percentages over a decade. The expected peak hours demand in the state was 7495 MW in 2022-23 which will increase to 8908 MW in 2024-25, implying a growth of 18.9%.

The total power capacity of Bihar is expected to be 12862 MW in 2025-26 of which 8396 MW (65.3%) will be conventional and the remaining 4466 MW (34.7%) are non conventional. around 31% of power came from renewable energy sources , while 69% was Thermal power during 2021-22. The state would achieve the target of 35% power generation from renewable energy source by 2025-26.

Table2: Year and source wise details of capacity expansion (2021-22 to 2025-26)

(Figures in MW)

Sources	SGS Small Hydro	SGS NCE/ RNES (Solar etc.)	Share in Central Generating Station (CGS)					Total
			Thermal	Hydro	IPPs Projects (Case 1)	NCE/RNES (Solar)	NCE/RNES (Wind)	
2021-22	54	—	4675	754	688	890	724	7785
2022-23	54	242	6260	771	488	910	699	9424
Cumulative Proposed Capacity								
2023-24	54	692	6666	771	488	1390	699	10760
2024-25	54	742	7908	771	488	2200	699	12862
2025-26	54	742	7908	771	488	2200	699	12862

Note : IPP = Independent Power Producer; NCE =Non-Conventional Energy;
RNES = Renewable Energy Source, Source: Department of Energy, GoB

The Bihar government has been able to incorporate significant reforms in the electricity sector of the state in recent years. A major scheme “Har Ghar Bijili” have been efficiently executed to provide electricity to all villages and all other human habitations. Under “Mukhyamantri Krishi Vidhyut Sambandh Yojana (MKVSY) provides around 3.75 lakh agriculture connection to the farmers. At the



same time, power supply to the agriculture sector is also being made at a very subsidized rate which is now is Rs0.70/KWh. Another remarkable trend in the energy sector in Bihar is that the share of domestic connections has been gradually declining due to corresponding increase in the share of commercial, industrial, agricultural, etc. connections in the total. This shows that Bihar is attracting investment in industries and trade.

INDUSTRIALIZATION: ROLE OF MSMEs AND INDUSTRIES IN CONTRIBUTING TO GDP AND EMPLOYMENT

MSMEs play a very important role in Bihar's economic development by generating employment, fostering entrepreneurship, and contributing to state GDP. In context of Bihar, as a labour surplus society, the establishment of micro-small and medium enterprises might be useful in solving unemployment and underemployment problem.

In 2023, a large number of micro enterprises started their operation in Bihar, with 196 new micro enterprises coming up in the year vis-vis 45 in 2021-22. The total amount of investment in the micro enterprises was Rs250.2 crore in 2022-23, which was more than three times the previous year investment. Consequently the micro enterprises also generated a large number of jobs. In 2022-23 5451 people have received employment in 196 micro enterprises which is 3.4 times more than the employment generated in 2021-22.

Table3: Details of the number of units, investment and employment by types of enterprises

Category of enterprise	No. of Units		Investment (Rs. crore)		Employment (number)	
	2021-22	2022-23	2021-22	2022-23	2021-22	2022-23
Micro	45	196	68.3	250.2	1612	5451
Small	36	111	236.9	684.02	3108	8560
Medium	5	14	162.7	470.32	801	5623
Large	11	7	3109.5	1881.21	3154	5111
Total	97	328	3577.4	3285.75	8675	24745

Source : BIADA, GoB

On the same line, 111 small enterprises have started their operation in Bihar in 2022-23, compared to 36 in 2021-22. The total investment in small enterprises was Rs684.02 crore which was 189% more than



the investment in 2021-22. On the employment front 8560 fresh jobs were created in the 111 small enterprises in 2022-23, which is 2.8 times more than the number in previous years.

In medium sized enterprises, with a 2.9 fold increase in investment from Rs 162.7 crore in 2021-22 to Rs 470.32 crore in 2022-23. The number of workers employed has increased from 801 in 2021-22 to 5623 in 2022-23, an increase of 602% in one financial year.

Among all unit textiles have absorbed a large number of workers. The textiles received investment of Rs 389.56 crore in 2022-23, which was 6.6 times more than the investment received in 2021-22. Within a financial year 44 new textiles units were setup in Bihar. The employment generation has also shown remarkable increase from 303 in 2021-22 to 8004 in 2022-23 registering an increase of 26 times. Same as textile between 2021-22 and 2022-23, in the leather industry, with a 8 fold increase in investment, the number of jobs increase by 9 folds. This shows the labour intensive nature of the leather industry.

The policy framework of Bihar Industrial Investment Promotion Policy 2016 ensures a conducive environment for investment in different sectors. Under this Bihar has released a grant of Rs 886.62 crore. The majority of investment came in food processing units and the amount of investment was worth Rs 1869.45 crore (39.7% of the total investment) in 233 production units.

Of the proposed investment in ethanol production, Rs 686.74 crore (which was 14.6% of the total investment in the operational units) has already been invested in six ethanol production units. The thrust on ethanol production came after the state government laid down a concrete incentive structure for the ethanol producers in the Ethanol Production Promotion policy 2021.

The cement industry has also received a substantial investment of Rs 503.84 crore which is 10.7% of the total investment in the operational units. Other major areas where substantial capital was invested are general manufacturing, plastic and rubber, renewable energy, health care and tourism in that order.

Table4: Status of industrial unit in Bihar

Area	Stage-1 clearance		Operational units	
	Number	Investment (Rs. crore)	Number	Investment (Rs. crore)
Food processing	1157	12166.32	233	1869.45
General manufacturing	603	3103.71	111	489.26
Plastic and rubber	277	1176.40	76	297.07
Tourism	79	968.41	21	163.07
Health care	106	1436.86	30	224.28
Textile	116	631.90	7	106.42
Renewable energy	59	10397.29	6	294.83
Small machine manufacturing	26	156.68	5	7.52
IT and IT-enabled services	22	146.82	12	29.12
Technical education	12	94.40	1	1.24
Electrical and Electronic hardware	12	56.97	0	0
Leather	8	172.82	3	3.18
Wood Industry	25	95.66	7	16.64
Ethanol	164	30747.55	6	686.74
Cement	12	3616.92	4	503.84
Sugar mill (expansion)	5	1922.34	0	0
Private industrial park	3	683.94	0	0
Others	9	39.95	2	20.31
Total	2695	67614.94	524	4712.97

Source : Department of Industries, GoB

For effective implantation of the Bihar Industrial Investment Promotion Policy 2016 of Bihar government, the Bihar Industrial Area Development Authority (BIADA) was set up. The important mandate of BIADA was to develop land and other logistic for the enterprises. BIADA has created 9 clusters with 75 Industrial Estate, Growth Centre and Mega Industrial Parks. Till the end of 2023 BIADA has already acquired 7347.53 acres of land and constructed 711 sheds.

INNOVATION ECOSYSTEM: STATUS OF INNOVATION CENTRES, START-UPS, E-GOVERNANCE AND SKILL DEVELOPMENT FACILITIES IN BIHAR

1. START-UPS

Startups and Economic growth is largely dependent on innovation. This can be accomplished by encouraging innovation and developing an environment that supports start-ups from concept to



execution. Aside from producing jobs, start-ups focus on innovation to develop next-generation solutions that drive economic growth. In 2016, the Bihar government formulated and announced the Bihar Start-up Policy aimed at building a self-sufficient and transparent ecosystem where the state government would offer funding, promotion, and policy support, which was subsequently revised as the Bihar Start-up Policy 2017. The State created a Trust with an initial funding of INR 500 crores to act as the primary body for executing this startup policy.

The Bihar Start-up Policy, 2022, has been adopted by the government to strengthen the ecosystem and make it more comprehensive and advantageous to the state's young and entrepreneurs. This strategy also intends to broaden coverage while ensuring an effective and timely implementation procedure. In 2022-23, the state government spent Rs9.75 crore on financial assistance to start-ups. The state government has recently unveiled its IT policy 2024 to attract investors in the IT, ITeS, ESDM and ancillary industries by offering a range of subsidies and other benefits. An impressive range of provisions like Capital Subsidy, Lease Rental Subsidy, Power Tariff Subsidy and Employment Generation Subsidy has been provided under the policy. Under Mukhyamantri Mahila Udyami Yojana (MMUY) the state government aims to encourage different section of youth and women of the state to setup enterprises. Between 2021-22 and 2022-23 the number of applicant under all the scheme has increased by 260 percentage.

In 2022-23 the state government received 10856 applications from aspiring enterprises. Most of them are related to Agriculture & allied sector, food processing, Fashion and apparels and architecture sector. Out of that 181 application for startup were recognized as certified startup. Among 181 applicants 152 received the first installment of the seed fund, amounting to Rs7.53 crore.

2. E-GOVERNANCE

E-governance and digital technologies are important tools for communication and collaboration between policy makers, private sectors and societies across the countries. E-governance provides a close interaction between the government and the citizens. The adoption of IT-enabled governance could usher in a new definition of public governance marked by increase efficiency, transparency, accountability and a people centric focus after becoming overwhelmed by escalating expectation and demands of highly informed citizen.



The government of Bihar has launched the Mobile Service Delivery Gateway (MSDG). Forest MIS is an Android application designed for managing and overseeing the nurseries, plantations, and assets of the Forest Department, incorporating e-Nursery, e-Plantation, and e-Asset functionalities. This initiative is connected to the Bihar GIS portal, featuring geo-tagged images that enable administrators to confirm the real site, advancements, etc., by utilizing Google or Bing map services or pictures. Another application is the PHED MIS, which utilizes ground-truth reports of active schemes/projects confirmed by uploading latitude/longitude coordinates and geo-tagged photos via Android apps. The Building Construction Department is also implementing Project MIS, which combines Android applications with GIS. Messaging services are currently utilized for communication by various departments down to the Panchayat level.

Bihar has received several prestigious award in the field of E-governance such as Prime Ministerial National Award for excellence in public administration , Digital India Award ,CSI Nihilent E-governance Award, Skill development and Employability under National E-governance Award, CSI SIG E-governance Award of excellence 2021 for ASHWIN portal and MEDHA soft-portal.

3. INNOVATION CENTRES AND SKILL DEVELOPMENT

The Bihar Skill Development Mission (BSDM) was established by the Bihar government to empower young by providing them with the necessary skills to drive the state's progress. BSDM's key responsibilities are to develop a large network of training centers for youth and to give employment possibilities for adolescents. BSDM organizes programs such as the Kaushal Yuva Programme (KYP), Domain Skilling Recruit Train Deploy (RTD), Recognition of Prior Learning (RPL), and Bihar State Certificate in Financial Accounting (BS-CFA).

JEEVIKA is the implementing body of DDU-GKY (as aligned with Digital India, Make-in-India, Smart City mission, and Start-Up India, Stand-Up India). As of September 2023, 80431 candidates have received training and, of them, 39282 have received employment. JEEVIKA is the nodal agency to support the RSETIs. The number of on-going training programmes at these RSETIs is 915, and the total number of trained individuals was 28292 in 2022-23. Further, 22769 people were trained to become self-employed in 2022-23.

The number of cooperative societies has increased by 6.0 percent between 2021-22 and 2022-23. In 2022-23, the average daily milk collection increased to 1662.0 thousand kg, which is 35.3 percent more than that in 2021-22. Till August 2023, the average daily milk collection was 2148.60 thousand kg.



There are 151 Government Industrial Training Institutes (ITIs), including 38 Women ITIs in the state. In 53 ITIs, 11 new trades have been started. Further, in 11 Women's ITIs, 4 new trades have been initiated.

The Bihar government has implemented the first-ever Green Budget in the country, and launched the Jal-Jeevan-Hariyali Abhiyan in 2019, aiming to balance environmental sustainability with economic development, addressing climate change, biodiversity, and environmental pollution. Under the Jal-Jeevan-Hariyali Abhiyan, about 288.31 lakh plantations were undertaken in 2022-23. For Eco-tourism and Parks Development Scheme, for 2023-24, total allocation is Rs. 64.24 crore and 87.8 percent of this has already been spent on various projects.

WHAT KIND OF INDUSTRIAL POLICY IS NEEDED IN BIHAR?

1. Industrial policy aims to provide economic opportunities and support new livelihoods. Industrialization demands a continued and consistent shift of the population from low-productivity sector to high-productivity sectors. It is the process of developing fresh abilities and skills among the labor force, both individually and as individuals working together.
2. Industrialization is not only about manufacturing and the rise of 'industries'. It also focuses on increasing productivity in agriculture and the service industry. Manufacturing has traditionally served as the most important driver of productivity and income growth. However, improved agricultural productivity and supporting services have also been needed to free labor to move to the manufacturing process.
3. Climate change is a serious issue for every country on earth. So far, industrialization has been strongly dependent on the availability of fossil fuels. To reduce their dependence on fossil fuels, every society needs to switch to less fossil-fuel-intensive technology. Water and other resource depletion, as well as waste from production and consumption, will need to be controlled.
4. Giving preference to MSMEs as there is very less land requirements and ability to give more employment per unit of energy and capital. Encourage different small and medium industry growth in MSME sectors. Focusing on industries that depend on local production, expertise, and consumption. Giving preference to those who work on low-energy and that were non-polluting industries.
5. Increase investment in heritage tourism, which the Bihar offers numerous potential. Investments in creating new potential and operating existing facilities under the PPP model would be



affirmative. Encouraging the development of additional units to meet forthcoming investments in the public and commercial sectors.

CONCLUSION

To attain Sustainable Development Goal 9 (SDG 9) in Bihar is a challenging task due to the deep-rooted socio-economic and infrastructural deficiencies of the state. Despite various government initiatives, Bihar continues to face systemic issues that have slowed down its progress. The state suffers from one of the weakest infrastructure networks in the country, including inadequate road and rail connectivity, unreliable power supply and limited digital penetration. These deficiencies act as significant barriers to industrial growth and impede economic activity, particularly in rural and underserved regions. Despite these obstacles, Bihar is not without hope. Initiatives like the Bihar StartUp Policy 2022 and efforts to attract public-private partnerships are steps in the right direction. The state's rich agricultural resources, strategic location, and young population are assets that, if harnessed effectively, can drive meaningful progress. However, to truly align with SDG 9, Bihar must address its shortcomings by adopting a more strategic and inclusive approach. This involves prioritizing sustainable infrastructure investments, fostering a business-friendly environment, and providing education and training programs to develop a skilled workforce. Moreover, stronger governance, reduced bureaucratic delays, and targeted regional policies will be essential to ensure that the benefits of development reach all sections of society. Bihar's journey toward achieving SDG 9 will not be easy, but with persistent effort, innovative solutions, and collective action, it can build a foundation for resilient and inclusive growth. This transformation is not only vital for Bihar's future but also contributes to India's broader development goals.

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