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"The Enduring Relevance of Ancient Indian Urban Practices for Sustainable Development"

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ABSTRACT:

Accomplishment of Sustainable development goals is very crucial and has become a worldwide concern to be achieved by 2030. While India is currently lagging behind in some of these goals, its Ancient and medieval history tells a different story. The Twin cities (Harappa and Mohenjo-daro) of Indus valley civilization serve as remarkable evidence of its sustainable town planning and water management facilities. Although much of the attention has been paid to its advance urban planning and engineering, limited work aligns it with the sustainable development goals. An attempt is made to employ interdisciplinary Perspective on sustainability of these cities by analysing it with Contemporary sustainable development goals. A comparative study is done to analyse effectiveness of sustainable practices in ancient India. The paper highlights importance of traditional knowledge system with modern scientific approach in achieving SDGs. This study clearly elucidates how these Harappan cities had unique approach towards sustainability offering valuable suggestion for today's modern society.

KEYWORDS: Indus valley civilization, Town planning, Great Bath, Sustainable Cities, Drainage, SDGs.

1. INTRODUCTION

In 2015, 17 Sustainable development goals were adopted by United Nations as a part of 'Agenda 2030' for Sustainable development. The attainment of these goals is quite crucial due to rapid urbanization, climate change and for environmental protection. While the shift is evidently visible, 'The 2025 progress assessment revels that the world is yet far off track to achieve this agenda' However, India has shown a steady progress by securing 99th position

out of 167 nations in 2025. While India is coping up with other goals its Urban sustainability under SDG 11 (Sustainable cities and Communities) remains a major challenge. Acknowledging the impact of Over-Urbanization, the then UN Secretary General, Ban Ki-moon clearly stated, 'our struggle for global sustainability will be won or lost in cities'. These 17 SDGs are Interlinked and integrated in nature that attainment of one can improve the performance of other. SDG 11 attainment can serve as a link to attain SDG09 (Industry, Innovation and Infrastructure), SDG 06 (Clean Water and Sanitation), SDG 10 (Reduced Inequalities) and SDG 13 (Climate Action). While looking back in the time, India's Bronze age cities mainly Harappa and Mohenjo-daro flaunt their Advance Urban living, water management and drainage system and an organised market driven by clever trade and commerce networking. Harappans followed a framework of sustainable practices, demonstrating their self-sufficiency and skill full Architecture without the use of modern technology. Modern India still faces challenges in the areas of urban infrastructure, Drainage system and water management due to excessive population growth and poor planning. This paper incorporated interdisciplinary analytical approach by mapping selected SDG targets and indicators with the urban features of Harappa and Mohenjo-daro. The study underlined the relevance of Harappans cities with the modern framework of sustainability.

https://unstats.un.org/sdgs/report/2025/

2. LITERATURE REVIEW

2.1 Sustainability of Indus Cities:

The twin cities of Indus valley civilization serve as a remarkable historical existence of sustainable and Advance Urban architecture and highly developed infrastructure. These cities were rich in its culture, art, design and trade. The proof of their self-sufficiency has been reflected in works of various authors.

(Shinde, 2016) in his work summarised the current state of knowledge about the Harappan civilization based on its more than 100 excavation sites. It emphasised that the Harappan cities had a unique character and a level of planning and organization unmatched in the ancient world. The author paid attention to some of the extraordinary contribution of this civilization to world history in the areas of water management and harvesting, civic amenities and scientific construction methods due which the Harappans managed to create a very well-planned cities and towns referred to as 'grid-planned'.

The similar study by (Nauman, 2025) discussed about the similarities in planning and construction between Mohenjo-daro and Harappa indicating that they were part of unifies government with extreme organization. It gave details about the cities grid structure, drainage system, granaries, burials, Indus script and its Sustainable building materials, which elaborated that IVC was city -based culture, indicating that the towns served as the centre of all the activity and also stated that in comparison to other civilizations, town planning was the IVC's most significant characteristic. However, the precise reasons for the decline are debatable with the probable claims of Aryans invasion or due to seismic disturbances leading to earthquake or Drought.

Where Most of the Authors worked towards the Architectural and Archaeological findings of Harappan civilization, the author (Bhardwaj, 2024) gave a contemporary relevance of different Ancient and Medieval India cities with sustainability framework. This paper addressed structure of many ancient Indian cities which also included Harappa and Mohenjo-daro and stated that their sewage system was a great achievement on Indus people and the drainage system was more efficient than the Roman Empire. Outlined about how these cities were ahead in agricultural surplus, indicating sustainable consumption.

An Analytical study by (DR UMESH KUMAR - et al., 2025) argues that the Indus urban model was carefully engineered system designed for efficiency, control, resilience, reflecting a distinct and highly organized worldview. The comparative analysis with other contemporary civilization shows that IVC stands out for its civic-focused urban model and its technical achievements were dedicated to solving practical problems of urban living. The study concluded that these cities that a sophisticated system of order, hygiene, and functional efficiency and serves as a testament to a civilization that mastered the art of urban living itself.

2.2 India's Progress and challenges to attain Sustainable Development Goals:

Sustainability has become a global concept and achievement of 17 SDGs is extreme necessity. Researchers globally have studied about its progress and challenges to which (Gorakh Moreshwar & Sushil Babanrao, 2025) focused on India's advancements in five key SDGs: No Poverty (SDG 1), Quality Education (SDG 4), Clean Water and Sanitation (SDG 6), Affordable and Clean Energy (SDG 7), and Sustainable Cities and Communities (SDG 11). Through a mixed-methods approach, combining quantitative data and qualitative insights, the study highlights achievements in poverty reduction,

education, and infrastructure, while highlighting ongoing challenges such as regional disparities and policy gaps.

Similar study by (Rawat et al., 2023) highlighting both transformative achievements and enduring challenges. The paper explored India's policy frameworks, international

collaborations, and climate diplomacy efforts, emphasizing their global implications.

(Le Blanc, 2015) analysed that the proposed SDGs and targets can be seen as a network, in which links among goals exist through targets that refer to multiple goals. The SDGs as a whole are a more integrated system than the MDGs were, which may facilitate policy integration across sectors. The study demonstrated that SDG 11 (sustainable cities and communities), SDG 06 (Water and sanitation), SDG 09 (Infrastructure) and SDG 13 (climate action) are interlinked through shared targets.

Similarly, (Liashenko & Demianiuk, 2024) emphasise the interconnected nature of the SDGs in terms of advancements in one area, which can lead to positive outcomes in others and the synergies and trade-offs among the goals. The author emphasises the importance of integrated approaches that recognise the complexity of development challenges and the necessity for coordinated efforts across sectors and governance levels.

A direct link was shown by (Hussain et al., 2023) where the study gave a holistic understanding of the effects of climate change on different sectors to identify India's challenges in achieving SDG 13 and SDG 11. The author urged that urban areas are contributors and well as victims of climate change hence climate resistance urban planning is needed.

www.un.org/press/en/2012/sgsm14249.doc.htm

3. OBJECTIVES

1. To analyse India's recent performance under 17 SDGs and determine the key goals likely to intensify over time.
2. To conduct a comparative analysis of selected sustainable development goals with Harappa and Mohenjo-daro's sustainable urban living.

4. CONCEPTUAL FRAMEWORK

4.1 India's progress under 17 SDGs and rising importance in attainment of selected goals.

As per the India's Sustainable development report, two of the 17 SDG goals, no poverty (SDG 1) and Reduced Inequalities (SDG 10) are on track and has maintained its achievement. The progress on Zero Hunger (SDG 2), Industry, Innovation and infrastructure (SDG 9), Sustainable cities and Communities (SDG 11), Responsible consumption and production (SDG 12), Life on Land (SDG 15), Peace Justice and Strong institution (SDG 16) and Partnership for future goals (SDG 17) is stagnating. Other goals such as good health and well-being (SDG 3), Quality education (SDG 4), Gender Equality (SDG 5), Clean water and sanitation (SDG 6), Affordable and Clean energy (SDG 7), Decent work and Economic growth (SDG 8) and Life below water (SDG 14) shows moderate improvement yet remains significant challenges. The most concerning is Climate Change (SDG 13) which shows worsening trend indicating that India's efforts to combat against climate change and its impact are not improving.

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Achieving these SDGs by 2030 seems sceptical as India has now become the most populous country in the world and holds 17.79% of global population. This overcrowding phenomenon leads to development of urban slum which leads to poor housing facilities and lack of basic services. This again results in irregular water supply and lack of basic sanitation facility in slum households. With this Rapid increase in population rate, India will need more absolute measures to expand its urban as well as rural areas while keeping sustainability as a priority. Therefore, it is a necessity to achieve SDG 11 to mitigate the urban sprawl.

Achievement of SDG 11 (Sustainable cities and communities) will pave way for SDG 06 (Clean water and sanitation). India only has 4% of global freshwater water resources which creates a severe water crisis. This gives rise to several issues pertaining to disparities in access to water supply, untreated wastewater discharge and quality deterioration due to unplanned urbanization. "India ranked 13th among the world's 17 'extremely water-stressed' countries and its per capita water availability have touched the water-stressed benchmarks and is expected to decline further towards water-scarce conditions by 2050." Other goals such as SDG 9 (Industry, Innovation and infrastructure) and SDG 10 (Reduced Inequalities) goes hand in hand with SDG 11. Adequate and safe infrastructure will lead to sustainable cities, which will subsequently reduce the inequalities in standard of living. Subsequently due to the integrated nature of these SDGs, Climate change can be addressed which is the foremost priority of the whole world.

https://namanjain.in/2025/08/24/sdg-6-clean-water-and-sanitation

4.2 Comparative Analysis of selected sustainable development goals with Harappa and Mohenjo-daro's sustainable Urban Living.

India is implementing Targets set by United Nations for the achievement of 17 SDGs under 'Agenda 2030' through National Indicator Framework (NIF) developed by Ministry of statistics and programme Implementation (MoSPI). An Attempt is made to compare these Targets and Indicators with Standardised Urban System of Harappa and Mohenjo-Daro with the help of NIF Progress Report 2025, archaeological evidences of these cities and other official reports and articles.

Table 3 : Relevance between SDG 11 and Harappan cities

Sustainable Development Goals	Targets	Key Indicators (NIF 2025)	Current Status of India	Relevance with Harappa and Mohenjo-daro
SDG 11- Sustainable Cities and Communities	11.1 Access for all to adequate, safe and affordable housing and basic services and upgrade slums	11.1.1 Proportion of Urban Population Living in slums, informal settlements or inadequate housing.	• As per Census 2011, Proportion of Urban population living in slums is 17.4%. There is no official record of recent data creating a significant data gap. • Nearly half of slum households live in inadequate, non-pucca homes[10]. • India's major challenge in achieving this indicator is excessive crowding of cities and urban areas with lack of basic housing facilities.	• The entire civilization displayed the use of sun-dried and burnt bricks, made with a standard size which exhibits a level of organized construction. • Indus people used to live in a Double story houses equipped with proper ventilation where some houses even had mud plasters on walls to keep the indoor temperature cool. • These all elements add up to the fact that they had a robust engineering, which is yet intact even after thousands of years.

	11.3 Enhance inclusive and Sustainable Urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries.	11.3.1 Proportion of cities with Master plans (similar to indicator 11.a.1)	• The NIF progress report 2025, shows moderate improvement from 2015 to 2025 in proportion of cities with master plan. Only around 37.30% cities are built with structured planning. • This shows that most of Indian Cities have a fragmented and unplanned structure.	• The most significant characteristics of these cities were its town planning which was a Grid-based structure divided into an upper town (Citadel) comprising of administrative and ceremonial building and a lower town involving houses, market places and industrial zones. • The streets featured wide straight roads intersecting each other at right angle. • The city was built on raised platforms to manage floods and also served as convenient removal of waste water from the town which gives a clear hint of having master planning with farsightedness.

Table 2: Relevance between SDG 06 and Harappan cities

Sustainable Development Goals	Targets	Key Indicators (NIF 2025)	Current Status of India	Relevance with Harappa and Mohenjo-daro
SDG 06- Clean Water and Sanitation	6.1 Achieve universal and equitable access to Safe and affordable Drinking water for all	6.1.1 Percentage of households getting safe and affordable drinking water within premises through pipe water supply (PWS) (Urban and Rural) 6.1.2 Percentage of population using and improved water source. (Rural)	• As per NIF progress report 2025, Rural and Urban areas percentage of safe and affordable drinking water have shown improvements and grown up to 80.22% and 75.05% significantly. • Similarly, percentage of population using improved water source as of 2025 is 99.62%.	• Archaeological Excavations reveals the presence of 700+ Public and private water wells in these cities, even when the whole civilization was near the Indus River, which clearly implies that these people were proactive to the sudden changes in river drying up.
	6.2 Achieve access to adequate and equitable sanitation and hygiene for all and end open defecation.	6.2.1 Proportion of households having access to toilet facilities. (Urban and Rural)	• The NIF progress 2025 report shows rapid progress between 2015 -2025 in expansion of toilet facilities with 100% coverage. • Yet several official surveys and reports show continuing challenges. As per National Family health survey (NFHS-5) between 2019-2022, 19% population of India did not use toilet facility and practiced open defecation.	• The Harappan people were early adopters and are known for their Civic Hygiene and sanitation even before when it was popular. • The whole civilization exhibits a marvellous drainage system connecting every small house and building with drain pipelines. • Mohenjo Daro known for its "great bath" flaunts as the 1st evidence of modern engineering in the whole world, with manholes to flush water. • Manually operated flush toilets connected to covered sewage system.

There are many more of such explicit features of these cities which indirectly connects with other SDGs like SDG 09 (Industry, innovation and Infrastructure), SDG 17 (Partnership for goals) and SDG 13 (Climate Action). These goals were formed with aims to achieve progress in the areas of Industrialization, innovation, trade relations between countries and to combat against climate change. Now back in the time Harappans had a clear understanding of these prospects.

- The great bath walls were covered with Gypsum (Plaster) and bitumen (Water proof hydrocarbon) which is even used today as a water proofing agent. This clearly shows their advance understanding of science in those days which even serves as a reference for today.
- The upper town citadel had large granaries used for storage purposes, flaunting their farsightedness to Combat in times of shortage or any natural calamities that might occur. Such Granaries storage was also found in most of the houses.
- Indus people were highly skill full and their timeless artistry and craftsmanship, lives today. There is presence of market areas where finding exhibits existence of seals, coins, stamps, Standard weighting stones, which showcase that these people were quite serious about their economy and business. Their major occupation was agriculture and were the 1st one from the other civilization to cultivate cotton, its evidences has been found in these cities. On these Stamps, archaeologist found Indus script (Indus people language) which until now is not deciphered.
- Such seals and stamps, pottery and other items engraved with Indus script have been found by archaeologist in Mesopotamian and Egyptian civilization, depicting their trade relations across the world even before the establishment of Modern trade technology.

5. CONCLUSION

Harappa and Mohenjo-daro survived for several centuries which itself is a remarkable achievement. Resilience in Urban features of these cities can be meaningfully examined through Lense of Sustainable development goals. By aligning archaeological evidences with SDG targets particularly Sustainable cities and communities (SDG 11), Industry, innovation and Infrastructure (SDG 09), Clean water and sanitation (SDG 06) and climate action (SDG 13), the findings shows that many principles which are considered today as 'modern' were inculcated in the planning of these Indus cities. Even when several studies depicted that the decline of Indus valley civilization was prolonged drought or floods due to climate change, the sustainability of these cities cannot be questioned. In contrast, India despite of having sustainability farmwork faces challenges in areas pertaining to water management, basic housing services, fragmented expansion, unplanned growth and rising climate vulnerability. Therefore, highlighting an important lesson that sustainability is not merely about the use of advance technology or policy declaration, but it's about consistent and organized planning, long-term vision and its implementation as per environmental needs. Hence, the said study suggests that Ancient Indian history and its enduring infrastructure can serve as a foundation for modern Urban planning, providing vital insights for future policy development.

6. REFERENCES

1. Bhardwaj, K. (2024). The historical sustainable cities in India: A survey of sustainable practices followed in cities of India in ancient and medieval times. IOSR Journal of Humanities and Social Science, 29(9), 31–34. https://doi.org/10.9790/0837-2909073134

2. Deokar, G. M., & Sonone, S. B. (2025). Accelerating progress towards Sustainable Development Goals in India: A 2025 perspective. International Journal of Economics. https://doi.org/10.5281/zenodo.15674062

3. Government of India, Ministry of Statistics and Programme Implementation. (2025). National indicator framework progress report on Sustainable Development Goals (2025). https://mospi.gov.in/

4. Hussain, S., Hussain, E., Saxena, P., Sharma, A., Thathola, P., & Sonwani, S. (2023). Navigating the impact of climate change in India: A perspective on climate action (SDG 13) and sustainable cities and communities (SDG 11). Frontiers in Sustainable Cities, 5, Article 1308684. https://doi.org/10.3389/frsc.2023.1308684

5. Kumar, U. (2025). Patterns of town planning in the Indus civilization: An analytical study. TPM – Testing, Psychometrics, Methodology in Applied Psychology, 32, 1651–1654.

6. Le Blanc, D. (2015). Towards integration at last? The Sustainable Development Goals as a network of targets. Sustainable Development, 23(3), 176–187. https://doi.org/10.1002/sd.1582

7. Liashenko, O., & Demianiuk, O. (2024). The interconnected nature of Sustainable Development Goals: A holistic approach to global development. Economic and Social Development (Book of Proceedings), 119–127. https://doi.org/10.24263/edsd-2024-6-15

8. Nauman, I. (2025). The city of Harappa: An architectural and archaeological study of the Indus Valley Civilization [Unpublished manuscript].

9. Rawat, G., Gupta, A., & Gupta, V. N. (2023). Achieving Sustainable Development Goal 2030 in India: Challenges, strategies, and global implications. Journal of Health Politics.

10. Sachs, J. D., Lafortune, G., Fuller, G., & Drumm, E. (2025). Sustainable Development Report 2025: India country profile. Sustainable Development Solutions Network. https://dashboards.sdgindex.org/profiles/india/

11. Shinde, V. (2016). Current perspectives on the Harappan civilization. In G. R. Schug & S. R. Walimbe (Eds.), A companion to South Asia in the past (pp. 125–144). Wiley Blackwell. https://doi.org/10.1002/9781119055280.ch9

12.United Nations. (2015). Transforming our world: The 2030 Agenda for Sustainable Development. https://sdgs.un.org/2030agenda