

Infrastructure Without People: The Hidden Crisis of Human Capital in Pakistan's Growth Strategy

ABSTRACT

Pakistan's economic development strategy has been heavily centered on infrastructure expansion, with major investments channeled into large-scale projects such as highways, power plants, and industrial zones, particularly under the China-Pakistan Economic Corridor (CPEC). While these initiatives are vital for improving physical connectivity and energy access, they have not been matched by equivalent efforts to build and retain a qualified and skilled workforce. This lopsided approach threatens to undermine the sustainability and effectiveness of infrastructure projects. This manuscript explores the short- and long-term implications of underinvestment in human capital, including missed economic opportunities, a widening skills gap, and increasing dependency on foreign labor. By applying Human Capital Theory and analyzing empirical data from national and international sources, the study identifies systemic challenges such as inadequate education spending, talent migration, and limited vocational training capacity. The findings indicate that these issues collectively constrain Pakistan's growth potential and exacerbate inequality. The paper concludes with targeted policy recommendations to align workforce development with infrastructural growth, emphasizing the urgent need for education reform, technical training expansion, talent retention incentives, and integrated planning. By prioritizing human capital alongside infrastructure, Pakistan can chart a path toward inclusive, sustainable, and innovation-driven development.

KEYWORDS: *Human capital, infrastructure development, skilled workforce, education reform, vocational training, talent retention, brain drain, economic sustainability, inclusive growth, labor force participation, CPEC, TVET, public investment, migration trends, workforce planning, Human Capital Theory, development economics, innovation-driven growth, healthcare workforce, information technology professionals.*

INTRODUCTION

Infrastructure development has long been considered a cornerstone of national economic growth. Roads, bridges, power plants, and industrial zones create the physical foundation necessary for commerce and connectivity. In Pakistan, large-scale projects such as highways, energy corridors, and special economic zones have received significant public and foreign investment, particularly under initiatives like the China-Pakistan Economic Corridor (CPEC) (Government of Pakistan, 2022).

However, while such physical infrastructure is necessary, it is not sufficient for sustainable development. Pakistan continues to lag behind in key human development indicators such as

education, health, workforce participation, and innovation capacity. Human capital is a foundational element of any thriving economy, yet Pakistan's investment in this area remains low compared to regional and global peers. According to the World Economic Forum's Global Competitiveness Report (World Economic Forum, 2020) (2023), Pakistan ranks poorly in human capital indicators such as education quality, labor force skills, and talent retention. The Global Talent Competitiveness Index (INSEAD, 2022) places Pakistan at 121 out of 133 countries. These rankings reflect the widening gap between infrastructural expansion and workforce development, a disconnect that undermines national growth potential.

METHODS

This study employed a mixed-methods approach to analyze the imbalance between infrastructure investment and human capital development in Pakistan. Quantitative data was extracted from national and international databases such as the Pakistan Bureau of Statistics, UNESCO, World Bank, IMF, and UNDP (Pakistan Bureau of Statistics, 2022; UNESCO, 2023; World Bank, 2022; IMF, 2023). Indicators analyzed include public spending on education and health, labor force participation, skilled migration, and project expenditures on infrastructure.

A qualitative review of policy documents, government white papers, and academic research was conducted to identify patterns, strategic priorities, and gaps in policy implementation. The study was grounded in Human Capital Theory (Becker, 1964), which postulates that investment in education and skills leads to higher productivity and economic output. This was supplemented by endogenous growth models that emphasize innovation and human resources as key to long-term growth. Pakistan's development model was also compared with similar emerging economies to evaluate trends and best practices in human capital investment.

RESULTS

Disproportionate Public Investment

Public spending on education remains below 2% of GDP (UNESCO, 2023; WHO, 2022), and healthcare spending is under 1.2%, both far below international standards (UNESCO, 2023; WHO, 2023). In contrast, infrastructure spending has surged. The CPEC project alone accounted for over \$62 billion in commitments (Government of Pakistan, 2022). Less than 5% of infrastructure budgets are allocated for training, capacity building, or local hiring initiatives (Government of Pakistan, Planning Commission, 2022).

Talent Migration and Workforce Gaps

Over 750,000 skilled professionals emigrated from Pakistan in 2022 (Bureau of Emigration, 2023). There is a shortage of over 200,000 trained healthcare workers and 50,000 IT professionals (WHO, 2022; Pakistan Software Export Board, 2022). Pakistani students studying abroad often do not return due to lack of research infrastructure and employment opportunities.

Economic Underperformance

The IMF (2023) projects that human capital constraints reduce Pakistan's GDP growth (IMF, 2023) by approximately 1.5% annually. Industrial zones built under infrastructure projects remain underutilized due to lack of skilled local labor. Surveys of businesses indicate difficulty in hiring qualified workers as a major obstacle to growth.

DISCUSSION

Pakistan's development model exhibits a critical imbalance between the visible, short-term gains from infrastructure investment and the less tangible but crucial long-term benefits of human capital development. Without a skilled and healthy workforce, roads and bridges alone cannot deliver prosperity.

In the short term, this imbalance is leading to rising unemployment among graduates due to a mismatch between education and labor market demands. The country is becoming increasingly dependent on foreign technical staff to operate and maintain advanced infrastructure. Additionally, regional disparities are widening, with vast differences in access to quality education and training opportunities across provinces (UNESCO, 2023).

The long-term risks are even more serious. Pakistan faces structural unemployment and the expansion of the informal economy. The continued exodus of talented professionals, or brain drain, is weakening institutional capacity in key sectors like healthcare

and technology. Over time, these trends may erode public trust in the state's ability to foster inclusive growth, contributing to greater social and political instability.

To address these challenges, Pakistan must implement a series of strategic reforms. First, national priorities should be rebalanced by increasing education spending to at least 4% of GDP and health to 3%, aligning with international benchmarks. This effort must be supported by stronger governance in both sectors. Second, human capital development should be integrated into infrastructure planning by incorporating local training programs, technology transfer, and employment quotas to empower local communities.

Third, technical and vocational education and training (TVET) systems should be expanded and modernized in collaboration with industry partners. These reforms should include not only skills training, but also certification, career counseling, and entrepreneurship support. Fourth, to retain skilled professionals, Pakistan must introduce incentive mechanisms such as tax breaks, research grants, and affordable housing, along with public sector reforms that offer meaningful career progression. Lastly, both government and the private sector should invest in research and innovation ecosystems. Establishing centers of excellence in areas such as information technology, biotechnology, and green energy (The Future of IT Industry in Pakistan, 2024) can drive applied research, foster innovation, and support commercialization through stronger academia-industry collaboration.

CONCLUSION

Pakistan's pursuit of economic development must not be reduced to concrete and steel. The future of the nation depends equally, if not more, on investments in its people. Infrastructure can only catalyze growth if supported by a robust, skilled, and innovative workforce. Without such a workforce,

even the most ambitious infrastructure projects risk becoming underutilized or failing altogether.

The country's demographic composition, with a large proportion of youth, presents an unprecedented opportunity to harness a dynamic labor force. However, this potential remains largely untapped due to chronic underinvestment (World Bank, 2022) in education, health, and skills development. Human capital development should be seen not as a competing priority to infrastructure but as its essential complement.

Furthermore, the risks of inaction are profound. Persistent underdevelopment of human capital will perpetuate inequality, hinder innovation, and erode institutional resilience. It will continue to drive the emigration of the brightest minds, depriving Pakistan of the very individuals it needs to build a thriving, self-reliant economy.

A comprehensive and inclusive development strategy that places human capital at its core is urgently required. This strategy must go beyond slogans and manifestos; it must be reflected in the national budget, educational reform, public-private partnerships, and governance structures. Only then can Pakistan transition from infrastructure-led growth to human-centered development that is resilient, inclusive, and sustainable.

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