Chapter 8
Sustainable Infrastructures: A New Infrastructure Investment Strategy

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ABSTRACT

Infrastructure investments can have long term consequences for the economy and environment of a country. Some notable public infrastructure projects include energy, transportation, water, and waste disposal systems. There are strong financial, environmental, and social change drivers that are forcing immediate changes. We need to rethink our infrastructure investments and develop sustainable, resilient, and affordable infrastructure systems for vital services of our society. These systems will be able to support the healthy and prosperous communities in future. The objective of this chapter is to review the current state of sustainable infrastructures and provide suggestions to policy makers responsible for infrastructure development how to develop sustainable infrastructures.

INTRODUCTION

Infrastructure is essential for economic development and poverty reduction. To date, both developed and developing countries have been slow in expanding infrastructure access. Most of the time infrastructure is dominated by public sector and is often mismanaged. Private participation is important for infrastructure expansion. The flows of capital in the form of private participation in infrastructure (PPI) amounts has increased especially in developing world (World Bank, 2016b)

Infrastructure investments can have long term consequences for economy and environment of a country. Some notable public infrastructure projects include Energy, transportation, water, and waste disposal systems. There are strong financial, environmental, and social change drivers that are forcing immediate changes. We need to rethink our infrastructure investments and develop sustainable, resilient, and affordable infrastructures for critical services of our society. Extensive capital investments are needed to modernize the infrastructure for future society needs. It is estimated that around $6 trillion would be needed in global infrastructure investments during next two decades just to make sure that infrastructures are able to support the GDP growth. This investment requirement does not include the investments required for climate improvements and decrease greenhouse gases (Dobbs et al., 2015).

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These infrastructure investments will be important for long-term well-being of the society and sustainability. Design of much of the existing infrastructures and the various types of activities (such as personal and commercial activities) they support have resulted in significant degradation of the environment. The infrastructure investment is not usually available especially in cases where the infrastructures have become very old and the demand they are fulfilling has increased many fold. These infrastructure deficits have long-term implications for national and global economy. According to a study (ASCE, 2011), the investment needed to fix the drinking and wastewater infrastructures in US alone would need $80 billion more than the estimated investment by 2020. The resulting deficit in infrastructure could result in an increased for economy of $ 206 billion (Roth, 2015).

This deficit of resources shows that the infrastructure managers will have a tough task in hand to ensure reliable operations of the existing aging infrastructures. The general public may appear insensitive to the urgency of this situation but infrastructure professionals have not only started to recognize the seriousness of the situation but also thinking about the remedies. They realize that innovative and creative approaches are the need of the time to inspire the required investment and generate public support. It is important given that infrastructure represents a crucial intergenerational legacy. It is a generation's long-term investment that shapes their choices of look, feel, and functionality of the built environment. The immediate infrastructure choices we make today will decide whether we achieve or distort our future vision of built environment.

**INFRASTRUCTURE MATTERS**

Infrastructure choices matter for economic growth, poverty reduction, and environmental sustainability.

**Infrastructure and Growth**

Modern economies cannot function without infrastructure. However, more infrastructure may not necessarily cause more growth. The effect of infrastructure may also vary as changes in the economy influence firms' ability to take advantage of it. Infrastructure can affect growth through many channels and is likely to affect the costs of investment adjustment, the durability of private capital, and both demand for and supply of health and education services (Agénor & Moreno-Dodson, 2006). Both infrastructure quantity and quality are significant influences on growth (Calderón & Servén, 2010), a doubling of infrastructure capital raises GDP by roughly 10 percent (Easterly & Servén, 2003).

**Infrastructure and Poverty Reduction**

The implications of limited access or low quality infrastructure are substantial (Fay et al. 2005). Limited infrastructure access can impact the poor’s productivity. Electricity access positively impacts educational outcome and access to reliable transportation determines access to job and markets to sell goods. Increased infrastructure quantity and quality reduces inequality (Calderón & Servén, 2010).

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