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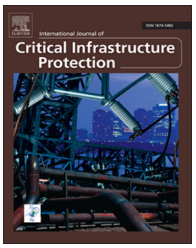

Infrastructure financing and development: A bibliometric review

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ARTICLE INFO

Article history:
Received 4 October 2015
Received in revised form
27 July 2016
Accepted 16 November 2016
Available online 18 December 2016

Keywords:
Infrastructure
Role of Infrastructure
Economic Growth
Poverty Reduction
Infrastructure Financing
Public-Private Partnerships
Foreign Direct Investment

ABSTRACT

This paper conducts a comprehensive review of the literature published between 1989 and 2015 on infrastructure and related issues. The articles are classified and presented on the basis of publication source, publication year, country of origin, research methodology and focus area. The review reveals that most of the articles on infrastructure and related issues were published during the period 2010 through 2012. Furthermore, most studies are empirical in nature and the majority of the studies focus on infrastructure financing. Another key finding is that most of the studies deemed public–private partnerships to be the preferred source of infrastructure financing. The review offers a better understanding of infrastructure and related issues, and the position of existing research. The review also highlights the areas that are relatively less explored. Academicians, researchers and policy makers may use these observations as guidelines to conduct further investigations of infrastructure and related issues.

1. Introduction

The physical structures and networks that deliver the requisite services to various sectors and communities and facilitate the overall development of a nation are collectively referred to as infrastructure [124]. Broadly, infrastructure includes water supply, sewage, housing, roads and bridges, ports, power, airports, railways, urban services, communications, oil and gas production, and mining. Interestingly, Grimsey and Lewis [52] assert that there need not be a particular definition for the term "infrastructure" because it can be easily recognized and identified.

Infrastructure is the backbone of all economic activity. Strong linkages have been reported between improved infrastructure and the rising economy of a country: a 1% increase in the stock of infrastructure is associated with a 1% increase in GDP across all countries [144]. Several studies have noted that infrastructure greatly affects national economic growth and is a major factor that contributes to overall economic development [15,56,124]. Infrastructure services not only assist economic development, but also support agricultural and regional development, and help reduce poverty [5,19,72,95,96,98]. Infrastructure services are vitally important to surviving in a modern society and maintaining high living standards. Basic functions of modern society rely on infrastructure, without which essential services such as high quality education, health facilities, transportation systems, high-speed telecommunications services and proper sanitation facilities would not exist [146]. Improved infrastructure helps remove barriers such as poverty, unemployment, regional imbalances, poor livelihood, illiteracy and poor health, all of which negatively impact national development.

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http://dx.doi.org/10.1016/j.ijcip.2016.11.005
1874-5482/

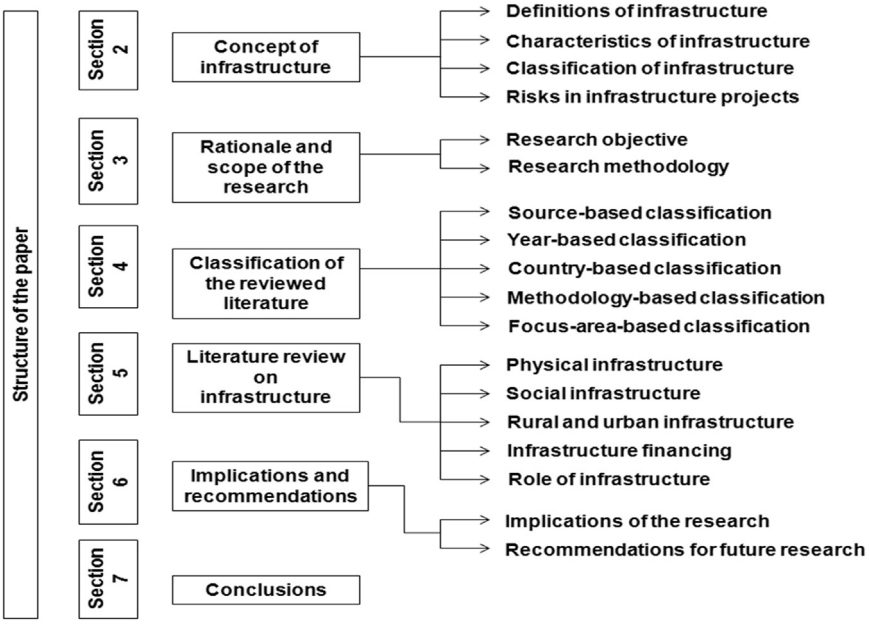

Fig. 1 – Organization of the research.

However, high-quality infrastructure needs enormous funds for construction, maintenance, operations and overall development. Some decades ago, governments were the only investors in the infrastructure sector, but government investment alone proved to be inadequate for infrastructure development. It was only after 1991 that many countries allowed private sector investments in their infrastructure sectors [2,52,123,124,129]. Private financing not only provides the required funds, but it also brings expertise, innovation, modern technologies and effective strategies that reduce the risks associated with infrastructure projects. While there are many private sources of finance, most studies consider public–private partnerships to be the best mechanism for infrastructure development [35,52,65,67,128].

Given the importance of infrastructure and finance for infrastructure development, these subjects have received much research attention around the world. Infrastructure, its nature and types, its role in the overall development of nations, and sources of finance and their importance for infrastructure development are some of the topics that have been studied by researchers.

While most studies on infrastructure and related issues are empirical in nature, some literature reviews have been conducted as well. Unfortunately, no attempts have been made to classify the research literature on infrastructure and related issues. A classification would provide valuable insights into the status of research in the domain. It would give structured information on publication venues, publication trends over the years, countries that have contributed the most to the literature, areas in which more (and less) studies have been conducted and areas (and contexts) that need more research attention.

This research seeks to fill the void by presenting a comprehensive review of 149 articles published from 1989 through 2015. The research, which is divided into six sections (Sections 2 – 7), as shown in Fig. 1, classifies the studies based on source, publication year, country, research methodology and focus area. Brief descriptions of the issues related to infrastructure (as provided by the reviewed studies) are also presented. Additionally, the areas that have received relatively less research attention and need more study are highlighted. These observations provide valuable insights and suggest directions for future research. Such an attempt has not been made before; this underscores the original contribution of this work to the body of literature in the field.

2. Concept of infrastructure

This section presents definitions of infrastructure as provided by several authors based on traits, types and risks in infrastructure projects.

2.1. *Definitions of infrastructure*

Although infrastructure is a topic that is widely discussed, a standard definition of infrastructure does not exist. Grimsey and Lewis [52] say that infrastructure is easier to identify than describe. The World Development Report [144] considers infrastructure as an “umbrella” for several activities. After reviewing myriad opinions and definitions given by authors, economists and planners, it can be concluded that infrastructure broadly covers roads, bridges, tunnels, railways, harbors, airports, tramways, subways, irrigation networks, dams and canals, water pipelines, water purification and treatment plants, potable water supply, power lines, power plants, power distribution networks, oil and gas pipelines, sanitation and sewage facilities, health and housing services, urban services, communications and telecommunications networks [102,125].