

Chapter 9

An Outlook on Use of Roller-Compacted Concrete Roads in Rural Development Areas: A Logistics Perspective

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ABSTRACT

It is known that when the logistics sector is effectively integrated, it enables sustainable growth of rural development. Improving transport networks may increase trade and support economic growth by enabling faster transport of goods and services. The effectiveness of roller compacted concrete roads in rural development areas has been researched. Their durability, low maintenance costs, and environmental sustainability advantages may contribute to economic revitalization in rural areas. The study analyses the impacts of roller compacted concrete (RCC) applications on rural development across Turkey and discusses the advantages and strategic use of this technology. In the specific case of Izmir, the integration of RCC into rural development strategies and its potential contributions to the logistics sector are discussed, and recommendations are presented for increasing the competitiveness of the region and achieving sustainable development goals.

INTRODUCTION

The advantages and disadvantages of **R**oller **C**ompacted **C**oncrete (RCC) roads have a structure that interacts with many different fields and issues. These types of materials have multidimensional and layered effects on many different fields such as economy, trade, transport and logistics. For this reason, while discussing the literature, it is not only considered as a type of road material. Relationship between Rural Development and Logistics Sector, Rural Logistics and Transport Infrastructure, Effects of Road

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Superstructure in Rural Areas, characteristics of RCC and advantages and disadvantages of RCC are also discussed under different sub-headings.

This study analyses in detail the rapid spread of RCC across Turkey, researching the potential regional advantages and disadvantages of this innovative infrastructure solution. It assesses the impacts of this technology from a broad perspective, considering the country-wide adoption rates and preferences in specific locations in a comprehensive comparison with conventional asphalt roads. With a particular focus on the infrastructure needs of rural village roads and roads between production parcels in rural areas, the study considers how RCC preferences may play a role in potential improvements to road structure in these areas. In this context, the possible consequences and impacts of the choice of RCC are discussed from both technical and economic perspectives.

Background and Literature

Rural Development and the Logistics Sector stand out as two key factors that complement each other today. Rural development has now become the key to economic growth and social welfare not only within the borders of villages and small towns, but also in large geographical areas (Eleventh Development Plan, 2019). Maximizing this potential should be strengthened not only by focusing on traditional sectors, but also by the impact of the logistics sector. Logistics is a critical element that enables the effective transport and management of goods and services along the supply chain (Acar and Ateş, 2011). Logistics for rural development plays a critical role by speeding up the processes from production to consumption and increasing efficiency. This ensures that agricultural products produced in rural areas are quickly transported to markets, which gives farmers access to a wider customer base. The marketing and distribution processes of agricultural products, handicrafts and other local products produced in line with the objective of supporting rural development are among the cornerstones of rural economic revitalization. At this point, logistics facilitates the access of local producers to a wider customer base and offers them the opportunity to integrate into sustainable markets by ensuring that these products reach consumers quickly and safely (Kayalı et al., 2020). At the same time, rural development projects often support agriculture and logistics ensures the rapid delivery of agricultural equipment and supplies to rural areas. Logistics plays a critical role in increasing the productivity of the agricultural sector and supporting sustainable agricultural practices (Rural Development Plan, 2014). Furthermore, integrating logistics infrastructure into rural development can increase job opportunities in these areas. Logistics makes significant contributions to infrastructure development in rural areas, supporting more efficient marketing and distribution of products produced in rural areas through effective planning and management of roads, storage facilities and transport systems (Agriculture Forestry Council, 2023). This trigger sustainable growth of the local economy. The logistics sector may generate employment for local business owners and employees by hosting a number of sub-sectors such as warehouse management, transport and distribution (Karcz, 2014). Logistics contributes significantly to infrastructure development in rural areas, supporting more efficient marketing and distribution of products produced in rural areas through effective planning and management of roads, storage facilities and transport systems (Grishchenko et al., 2016). Logistics offers a global competitive advantage to rural entrepreneurs by providing rapid access of rural products to wider markets. Logistics enables rural products to reach global markets in an accelerated manner, which makes it possible for local economies to play a more effective role in the international arena (Oke and Malts, 2020). Moreover, the establishment of logistics centers in rural areas facilitates the storage, aggregation and distribution of products, making logistics processes more efficient and ef-

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