

EFFECT OF SOCIAL COSTS OF CARBON ON THE ECONOMIC VIABILITY OF MULTIMODAL FREIGHT INFRASTRUCTURE IN LOW-AND MIDDLE-INCOME COUNTRIES

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Summary: Many LMICs are characterized with substantial population growth that necessitates rapid urbanization but struggle with political will and limited resources required to deliver essential transport infrastructure that meets this growing demand. These challenges are exacerbated by the increasing pressure to reduce the environmental impacts caused by a road dominated transportation sector that is one of the biggest emitters of carbon worldwide. Carbon pricing has been thoroughly studied to address the market inefficiencies towards the externalities associated with the movement of people and goods. In the field of multimodal freight (MMF) optimisation, it becomes critical to improve decision making around investments that are usually of large scale, and where sustainable modes may be disadvantaged due to their higher costs. However, the mechanism is not free from debate. This study seeks to examine whether social costs of carbon (SCC) could influence further investment decision of a MMF network, using a mathematical model for estimating SCCs of both HIC and LMICs, taking GDP, emission factor and discount rates into consideration. Findings shows that incorporating SCC in a MMF infrastructure network yields a trade-off solution: the absence of SCC in calculations, lowers the costs which catalyse urbanisation, but leads to higher emission as experience in LMICs. This impact is exacerbated in HICs even with a lower SCCs value. Regardless of higher initial cost of network with greater sustainability potential, this study will support LMICs in integrating SCC in investment decisions, which stand as an urgent matter.