Chapter 20
Political Economy of the Green Innovations in the Construction Industry

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ABSTRACT

Green innovations are important in enhancing sustainability performance of the industries and of their outputs. They can influence the carbon emissions, energy efficiency of the industries affecting global green trade, and energy policies. Construction industry is one of the main industries contributing to the global economy and sustainable development. It has, however, bigger environmental footprint than majority of the other industries. Green innovations can contribute to the reduction in the environmental footprint of the construction industry. For this reason, green innovation in the construction industry needs to be supported by the effective policies. This chapter aims to introduce and investigate the political economy of the green innovations in the construction industry. This chapter emphasizes that the effectiveness of the green innovations in the construction industry can be fostered by effective political economy and strategies.

INTRODUCTION

Climate change and humanity's environmental footprints challenge survival and welfare of the earth. Humanity's environmental footprint needs to be reduced to enable the nature to restore and regenerate itself. Human-beings tend to consider themselves to be superior to other living creatures failing to observe the ethical behaviour of animals. Animals do not exploit resources beyond their needs. For example, they stop hunting in case they have hunted to feed themselves. Human-beings, on the other hand, tend to exploit resources without respecting nature, and future generations. Ethics is respecting each other, the nature and the next generations of all species. It can be defined as "*… a system of moral principles and a branch of philosophy which defines what is good for individuals and society…*" (BBC website,

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2018). Sustainability ethics needs to be integrated in the production and consumption processes in all industries. All industries need to respect nature, future generations and biodiversity in their investment strategies and in their supply.

Global construction industry contributes to the global economy. Global construction industry contributes to the social sustainability through employment opportunities, even for less educated workforce, increasing the welfare of the people as well as through supplying the sheltering and accommodation needs of the people. Construction industry, however, has adverse environmental impacts throughout the construction/production processes as well as the entire lifecycle of their outputs (e.g. constructions, buildings). Construction industry is material, water, and energy intensive. The magnitude and size of its environmental footprint can be better understood considering its outputs' embodied water, embodied carbon and embodied energy. Construction process, starting from raw material extraction, is energy and water intensive. Construction processes and lifecycle of its outputs have carbon footprint especially due to the energy required for the material production and construction processes as well as due to the transportation and mismanaged construction phase (e.g. due to errors in construction causing wasted materials). Furthermore, operation phase of the buildings has environmental footprint especially due to heating and cooling needs of the occupants as well as water consumed by the occupants. Even in the post-occupation phase, in the demolition phase, the buildings have their environmental footprint especially due to the landfill wastes. Sustainability performance of the construction industry needs to be enhanced as it influences global welfare, living conditions, and climate adversely. There have been various efforts (e.g. green or sustainable building assessment tools) in reducing environmental footprint of the construction industry. These efforts have not been effective to cope with the climate change problem which is being observed in an accelerated way. For this reason, effective strategies and efficient technologies for reducing environmental footprint of the construction industry are needed.

Innovation is an important pillar of the effective strategies and efficient technologies needed for reducing the environmental footstep of the construction industry. All innovation processes start with inventions. Innovations are inventions especially at the product, material and production levels that have been reached to the market and customer. Innovation can be at different levels. As Schumpeter ([1911] 1934: 66) identified, the innovations can be related with production process, product, materials/resources, markets and organization forms (Ziemnowicz, 2013: 1172). Innovation can result in introduction of a new product and/or a new process to the market. All innovation processes start with an invention process. Innovation can be achieved through successful inventions which can reach to their customers. Not all inventions can be transformed into innovations. Feasibility and investment return rates are among the main factors influencing inventions' success. Inventions can be transformed into innovations if they are feasible and if the investment return rate is fast. Invention and innovation capability is what differentiates humanity from the animals and what makes human-beings superior to other living creatures. Innovation can change humanity's perception of the degree of limitedness of the resources as well as increase in the effectiveness and efficiency of resource usage (Sertyesilisik, 2018b). Innovation can lead to dematerialization which can enable reduction in perceived limitedness of the resources. For example, even if people living 3000 years ago were experiencing resource scarcity problem, if they could have a chance for using today's technology, they would probably not have experienced this problem (Sertyesilisik, 2018b). Hence, the main problem with respect to the scarcity of the resources is the technology level (Sertyesilisik, 2018b). For this reason, innovation plays an important role for enhancing sustainability performance of the humanity and for reducing humanity's environmental footprint (Sertyesilisik, 2016a).

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