

# Chapter 3

## Modeling the Role of Government, Firm, and Civil Society for Environmental Sustainability

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### ABSTRACT

*The objective of this article is to design a game theory-based model to outline the role of the government, firm and civil society for environmental sustainability. The study used the dynamic game theory of complete information. Based upon the equilibrium analysis, the study highlights that when the punishment for non-compliance with environmental responsibility is smaller, the role of civil society would be higher for environmental sustainability. On the other hand, when the environmental responsibility cost is higher, then the role of a government is also higher for the implementation of environmental responsibility and to ensure the punishment. However, the authors found from model analysis that if the cost is low, the probability of firm to fulfill environmental responsibility is higher. In real life, the high cost of environmental responsibility is the main reason that the firm does not fulfill environmental responsibility. Under the high cost, the firm often has the phenomenon of bribery to the government and other means to avoid environmental responsibility. This article is a valuable policy guide for policy makers to cope with global environmental challenges.*

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## **INTRODUCTION**

Creating sustainable futures, countries need to emphasize on multiple initiatives including the reduction in greenhouse gas emissions, protecting a natural environment and focusing on human development (Sassi, 2016). Energy production and environmental issues have to be considered within the context of socio economic sustainability that enables and provides support for positive development of countries, communities and individuals (Epstein & Buhovac, 2014; Roseland, 2000). In the whole scenario of environmental sustainability, the communities have a main role. However, communities cannot be forced to adopt environmental friendly life style. But, they need to be offered an environmentally viable alternative to their current lifestyle. The goal of environmental sustainability cannot be achieved without simultaneously considering the quality of life.

Globally, in the context of developing countries, the living standards are very low as compare to developed countries (Poudel, 2016). However, in the context of developing country it is difficult to manage the environmental sustainability along with the quality of life. Currently, developing countries are facing environmental challenges due to an imbalance in the economic and social development of recent years (Qureshi, 2010). The major cities face haphazard, unplanned expansion due to the shift of the rural population toward urban areas that has worsen the situation (Waseem et al., 2014). The municipal authorities in developing countries also have limited resources; the haphazard urbanization is the core reason of deterioration of natural resources (Qureshi, 2010). Moreover, Pakistan a developing country is facing a severe energy shortage since last two decades similar to other developing countries of the world (Khalil & Zaidi, 2014; Valasai et al., 2017; Zameer & Wang, 2018). Presently, to overcome an energy shortage, the government has taken initiatives to install coal-based power plants (Massarrat Abid & Ashfaq, 2015; Edenhofer, Steckel, Jakob, & Bertram, 2018). On one end coal-based power plants will help to overcome the energy shortage in the country. On the other hand, it is harmful to the environment (Coutinho & Butt, 2014). At a time when developed nations are shifting their energy sources from coal to renewable and environmental friendly energy production, the initiative of Pakistani government to install coal power plants in the country is strange enough. No doubt, energy is an essential element for the quality of life and economic development. However, it's the responsibility of the government to ensure the availability of cheap, reliable and environmental friendly energy in the country.

Furthermore, the industrial sector is one of the growing sectors worldwide. As a result of industrial sector growth, environmental issues have evolved world-wide (Eliana Andréa Severo, de Guimarães, Dorion, & Nodari, 2015). However, in that perspective, the environmental degradation in any country can harm the overall

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