

Chapter 14

A Quantitative Analysis of the Impact of Renewable Energy Deployment on Sustainability: The Turkish Case

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ABSTRACT

Renewable energy sources have a large potential to contribute the sustainable development as environmentally and socioeconomically. However, the existing literature includes theoretical framework in general and there is a lack of both comprehensive theoretical and empirical framework on the relationship between sustainable development and RE technologies. This paper aims to theoretically synthesise the literature on renewable energy technologies and sustainable development for Turkey, and then classify the results by broad categories. After all, the present paper uses conceptual and quantitative analysis, which reviews each concept with conceptual framework and evaluates data with quantitative method. From this point of view, this paper attempts to make a contribution by developing a conceptual framework which allows a wide-ranging analysis of the impact of renewable energy on sustainability and which can be empirically applied to classify these benefits in Turkey.

INTRODUCTION

It is usually stated that renewable energy (RE) sources have a large potential to contribute to the sustainable development with diversification of energy supply, enriched sustainable development opportunities, discover of a domestic industry, and have a positive influence on social cohesion (Kaya & Kilic, 2015). In other words, RE creates several public advantages such as environmental development, enlarged fuel diversity, decline of energy price volatility effects on the economy, national economic security, rise

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in economic productivity, and more efficient production procedures for GDP (Benli, 2013). They are considered an effective means for Turkey to pursue energy independence and to stimulate economic growth. This study approach will assess Turkey's RE technologies in terms of sustainability, represented in variables such as e.g., income, capital, and labor. Turkey was selected a case country because of contextual factors such as industrial institutions, RE energy consumption trends, as well as environmental and social standards. This research will shed light on the association between sustainable development and RE outcomes, the present paper develops a conceptual and methodological framework previously developed to understand the structural factors affecting the sustainable development based on RE technologies in Turkey and proposes a test of the framework empirically. The goal of the paper is to provide significant insights regarding the developing a conceptual and methodological framework previously to RE technologies in Turkey.

An emerging body of literature has investigated the contribution of RE sources to sustainability as empirically (Del Rio & Burguillo, 2009; Reddy, Uitto, Frans, & Matin, 2006). Another stream of the literature has scrutinized the aspects of the impact of RE deployment on local sustainability such as employment creation (Hillebrand, Buttermann, Behringer, & Bleuel, 2006). The renewable literature generally treats the impact of RE deployment on sustainability in conceptual framework context (Robert, 2000; Jabareen, 2008; Del Rio & Burguillo, 2008; Musango & Brent, 2011). For instance, Robert (2000) and Jabareen (2008) investigate sustainable development within the framework a new conceptual model. They used a conceptual model to investigate various concepts and issues affecting sustainable development and the relationship between frameworks and different concepts. Jabareen (2008) point out multidisciplinary literature on sustainable development, which identifies patterns and similarities within the literature, and then sustainable development integrates the outlines to different categories and concepts. The results also showed that the conceptual analysis identifies several concepts that are synthesized the theoretical framework of sustainable development and the frameworks are relevant constitutional principles for sustainable development (Robert, 2000; Jabareen, 2008).

Del Rio and Burguillo (2008) emphasis socioeconomic impacts of RE deployment on sustainability and they developed an amalgamated theoretical framework which lets a widespread analysis of the influence of RE on local sustainability, while Musango and Brent (2011) focus on the development of a framework which includes a technology assessment approach within the wider scope of renewable technology development for sustainability. These papers have shown that renewable policies have a positive effect on sustainability, which also have several local benefits. That is, RE polices can make a contribution on local sustainability as RE policy have obvious positive synergies on sustainability.

However, there is a lack of both comprehensive theoretical and empirical framework on the linkage between sustainable development and RE technologies in Turkey. This chapter aims to empirically analyze the sustainability influences of RE deployment by seeing a combined and comprehensive theoretical approach. This paper intends to fill this gap by incorporating value-sharing views on the form of RE technologies and sustainable development with analyzing the literature and quantitative data. A sustainable development perspective framework based on the literature developed with assessing literature review and an empirical analysis undertaken to test this framework. That is, the present manuscript builds upon current knowledge of RE technologies, develops a new conceptual framework to guide sustainability and tests the model with quantitative method. The research question that is addressed in this study is as follows: *How does evaluation of RE deployment impact on sustainability?*

This paper is organized as follows: Section 2 will discuss a brief literature review and an assessment of related studies used to understand RE sources. In section 3, the empirical study is presented. The

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