Abstract
Pakistan is experiencing a serious energy crisis as a result of its over reliance on imported gas and oil as well as the rapid depletion of its natural resources. Therefore, it is imperative to investigate renewable alternatives, even though a developing nation may face difficulties with their availability and technological viability. Fortunately, Pakistan's agricultural potential provide a chance to produce energy for the purposes of power and transportation. Assessment of feedstock availability and processing technology is necessary to provide a steady and sustainable energy supply. The evaluation of economically viable biomass feedstocks for the production of bioenergy and their export potential was the main objective of this study. The main technique used to achieve particular goals was the Product Space Model. The findings showed that Pakistan has a wealth of biomass resources that can be used to produce energy. Among the biowastes analyzed, cotton stalks had the largest potential for energy at 246,174 MW. At 691 MW, Poultry waste, on the other hand, had the lowest potential for energy generation. PRODY values were greater for soya bean cake, goat manure, food waste, mustard stalk and wheat husk. They can be exported after their own energy demands are met and have a substantial economic potential. On the other hand, the potential income for groundnut shell, sheep manure and cotton stalks rice husk and poultry waste are lower. Utilizing bio-wastes with lesser earning potential in domestic energy producing facilities yields greater benefits. Additionally, it found biomass feedstocks that may be exported and boost Pakistan's economy. Other Product Space Model indicators need to be investigated further in order to give a more comprehensive picture of the outlook for biomass and bioenergy exports.