A Dynamic Study on Ecological Disaster, Government Regulation and Renewable Resource

Pu-yan Nie*, Peng Sun
Institute of Industrial Economics, Jinan University, Guangzhou, 510632, China

Bill Z. Yang
Department of Finance and Economics, Georgia Southern University
Statesboro, GA 30460-8152 USA

This paper develops a dynamic oligopolistic model to investigate equilibrium outcomes for renewable resource markets under different property rights regimes. With different underlying assumptions from those in previous works, we find that different property rights regimes in renewable-resource markets yield very different equilibria. Under the private property rights, the valve point increases with the natural growth rate, productivity, number of the firms, and marginal costs. Under the common property rights, "the tragedy of the commons" inescapably occurs with endogenous pricing in a multiple-firm framework. It suggests how to avoid ecological disaster by implementing public policies such as clarifying property rights, altering the number of manufacturers, and introducing certain subsidies or taxes.

Keywords: renewable resources, ecological disaster, dynamic oligopoly, property rights, government regulation.