Carbon Neutrality and Green Growth in Cambodia: Quantitative Policy Modelling of Economic and Environmental Impacts

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Abstract: Addressing climate change and biodiversity loss highlights the need to incorporate environmental considerations into policy and economic decision-making. However, policies adopted to promote green growth and carbon neutrality typically lack a quantitative assessment of their capacity to achieve the Paris Agreement Targets. It is often unclear to what extent economic growth relies on increasing greenhouse gas emissions and natural resource depletion. In this study, we examine Cambodia, a country experiencing rapid economic growth alongside accelerated deforestation. We propose an analytical framework to evaluate the country's carbon reduction strategy in the forestry sector and investigate the growth-emission-depletion nexus associated with it. To achieve this, we computed the Social Accounting Matrix including Environmental Accounts for Cambodia, consisting of 94 accounts that track monetary transactions and physical changes in emissions, waste, and natural resources. We integrate our model with life cycle impact assessment indicators and environmental themes to measure the effect on human health. We demonstrate that green growth policies sustain economic growth but fail to meet 2050 Paris targets and the emission reduction pathway envisioned in the forestry sector. Moreover, the decoupling of economic growth from greenhouse gas emissions is weak, with evidence suggesting an increasing coupling between GDP growth and emissions. Thus, we posit that bolder actions are needed to reduce emissions consistently with the long-term carbon neutrality strategy. This research also bridges the gap in environmental statistics and supports informed decision-making for a more sustainable future by demonstrating the feasibility of using quantitative tools in data-limited contexts.

Keywords: Quantitative policy modelling, Social accounting matrix, Valuation of environmental effects, Environmental accounting, Life cycle impact assessment, Cambodia.