

云南山地碳汇造林投入产出效率探究

——基于 DEA-Tobit 模型的腾冲市 380 农户实证分析*

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摘 要: 目的】发展林业碳汇是实现林业生态价值的重要手段。测算林业碳汇开发综合效率对促进林业资源的合理配置、实现林业高质量转型发展具有重要意义。考虑市场交易实现的碳汇生态价值补偿, 将碳汇收益纳入林业产出中, 全面分析农户碳汇林投入产出效率变动趋势。【方法】基于云南省腾冲市清洁发展机制小规模造林再造林项目 380 农户数据, 运用超效率 DEA 和 Tobit 模型对区域农户投入产出效率进行测度和影响因素的检验。【结果】农户碳汇林投入产出效率处于明显非有效但易提升阶段。效率呈波段式上升态势, 且空间上存在异质性, 项目区农户生产效率呈现西部、南部优于东部和北部的区域分布格局, 农户间投入产出效率两极分化明显。在投入转化过程中, 农户的技术、投资和政策障碍影响了投入产出效率的提升; 转化产出过程中, 林地种植条件、农户采伐申请情况和市场条件与农户碳汇林的投入产出效率大小显著相关。【结论】农户碳汇林投入产出效率尚未达到有效水平, 效率损失由农户生产要素投入结构不匹配、政府支持力度不足等原因造成, 现阶段坚持扩大投入规模仍是农户提高效益的最优选择。因此, 应进一步优化林业碳汇相关政策, 提高农户持续参与碳汇造林意愿, 鼓励农户通过优化林业资源配置获得更高的投入产出效率, 从而实现生态发展和农民增收双赢。

关键词: 山地; 碳汇造林; 投入产出; DEA-Tobit 模型; 云南省

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Exploring the Input-Output Efficiency of Carbon Sequestration in Yunnan Mountainous Areas

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Abstract: The development of forestry carbon sinks is an important means of realizing the ecological value of forestry. Measuring the comprehensive efficiency of forestry carbon sink development is of great significance in promoting the rational allocation of forestry resources and realizing high-quality forestry transformation and development. Considering the compensation of ecological value of carbon sinks realized by market transactions, we included the income from carbon sinks in forestry output and comprehensively analyzed the trend of input and output efficiency of farmers' carbon sink forests. Based on the data of 380 farm households in Tengchong City, Yunnan Province under the Clean Development Mechanism (CDM) small-scale afforestation and reforestation project, the input-output efficiency of regional farm households was measured by using super-efficiency DEA. The study found that the input-output efficiency of farmers' carbon sink forests is in the stage of obvious non-efficiency but easy to improve. The efficiency shows a wave-like rising trend, and there is spatial heterogeneity, the production efficiency of farmers in the project area shows a regional distribution pattern that the west and south are better than the east and north, and the polarization of input and output efficiency among farmers is obvious, and at this st

age, insisting on the expansion of the input scale is still the optimal choice for farmers to improve their efficiency. Therefore, we should further optimize the policies related to forestry carbon sinks, increase the willingness of farmers to participate in carbon sink afforestation, and encourage farmers to obtain higher input-output efficiency by optimizing the allocation of forestry resources, so as to achieve a win-win situation for both ecological development and farmers' income.

Key words: mountain; carbon sequestration afforestation; input-output; DEA model; Yunnan Province