

# 中国三北防护林工程生态—经济—社会效应评价及其时空演变

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**摘要:**【目的】研究中国三北防护林工程生态—经济—社会效应评价及其时空演变,为推动三北防护林工程高质量发展,改善三北地区生态面貌提供参考。【方法】以三北防护林工程第一、二阶段覆盖区域的数据作为研究对象,采用改进的 CRITIC 赋权法、Dagum 基尼系数分解法、Kernel 密度估计方法和障碍因子诊断模型,测算三北防护林工程“生态-经济-社会”综合效应,进而全面揭示其时空演进特征。【结果】1) 样本考察期内,三北防护林工程全区及各区域“生态—经济—社会”综合效应均呈上升趋势,但各区域及省域间存在不平衡,华北和东北地区的综合效应及其增长率均高于其他地区。2) 三北防护林工程综合效应总体差异呈现下降态势,区域内差异贡献率变化比较平稳,区域间差异有所下降,超变密度贡献率有所上升。3) 三北防护林工程综合效应不断增强,但全区存在绝对差异扩大趋势,需要注重区域协调均衡发展。4) 三北防护林工程“生态—经济—社会”综合效应影响最大的前 5 位障碍因子随时间变化而变化,三大发展维度对三北防护林工程全区经济—社会—生态协同发展的障碍度具有明显差异,其中社会发展的阻碍程度呈上升趋势。【结论】三北防护林工程的“生态—经济—社会”综合效应有明显增强,应坚持树立系统观念,加强与国家重大战略匹配研究;加强政策引导和科技创新,推动生态工程全域高质量发展;充分考虑区域异质性问题,精准施策,靶向发力。

**关键词:** 三北防护林工程; 生态—经济—社会效应; 区域差异; 分布动态演进

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## Evaluation of ecological-economic-social effects of the Three-north shelterbelt project in China

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**Abstract:** 【Objective】 This study aims to investigate the evaluation of the ecological-economic-social effects of the Three -north shelterbelt project and its spatial and temporal evolution, providing a scientific basis for promoting the high-quality development of the Three -north shelterbelt project. 【Method】 Taking the data of the areas covered by the first and second phases of the Three-North Sheltering Forest Project as the research object, we adopts the CRITIC assignment method, Dagum's Gini coefficient decomposition method and Kernel density estimation method to measure the comprehensive "ecological-economic-social" effects of the three-north shelterbelt project, and then comprehensively reveals its spatial-temporal evolution characteristics. 【Result】 1) During the sample period, the comprehensive "ecological-economic- social" effects of the three-north shelterbelt project in the whole region and the three regions showed a rising trend, but there were differences among regions and provinces. The comprehensive effects and their growth rates in North China and Northeast China being higher than in other regions. 2) The overall difference of the comprehensive effect of the three-north shelterbelt project showed an

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decreasing trend. The contribution rates of the regional differences were relatively stable; the regional differences were decreasing; and the contribution rate of hypervariable density was increasing. 3) The absolute difference of the comprehensive effect of the three-north shelterbelt project showed an expanding trend, and it is necessary to focus on regionally coordinated and balanced development. 4) The top five most influential barriers to the comprehensive "ecological-economic-social" effects of the three-north shelterbelt project changed over time. There were significant differences in the obstacles to the cooperative development in the three dimensions of ecological, economic, and social development, among which social development had upward trend. 【Conclusion】 The comprehensive "ecological-economic-social" effects of the three-north shelterbelt project T have been significantly enhanced. Accordingly, this study put forward some policy suggestions, such as and adhering to the systematic concept strengthening research on matching with major national strategies; strengthening policy guidance and technological innovation to promote the high-quality development of ecological engineering; and taking full account of the problem of regional heterogeneity for precise policymaking and targeting.

**Key words:** three-north shelterbelt project; ecological-economic-social effects; regional differences; dynamic evolution of distribution.