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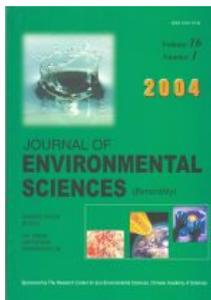
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**Hydrological eco-service of rubber plantations in Hainan Island and its effect on local economic development**

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**Abstract**

The impacts of economic forest on global environmental change (GEC) are one of the hot issues in environmental study. Based on the 3-year observation data and 40-year climate data, GEC and analysis of the hydrological dynamic characteristics of rubber plantations and estimate of the water balance in the rubber plantations in Hainan Island were made. The results showed that the rainfall intercepted by the canopy of the plantations accounted for 11.45% of the annual rainfall, the total runoff for 23.71%, the total evaporation and transpiration for 63.24%, the soil moisture storage for 1.6%. Analysis of the 40-year rainfall data in the 19 counties of Hainan Island during 1951-1990 showed that the large-scale substitution of the natural vegetation with the rubber plantations had no significant effect on the local rainfall in Hainan Island. The main reasons are (1) 80% of the rainfall in Hainan is brought by typhoons; (2) the proportion of 11.6% rubber plantations in total forest coverage in Hainan is not enough to influence the local rainfall in Hainan Island; and (3) although the rubber plantation is artificial vegetation, it has the similar function to the tropical rain forest. Analysis of the total water resource and total GDP of Hainan in 1997 showed that the economic benefit resulted from the water resource was 1.0 RMB Yuan/m<sup>3</sup>. The value of hydrological of the rubber plantation in Hainan was 113.9 million RMB Yuan/a when compared with the tropical rain forest. The paper reaches conclusion that the hydrological eco-service function of rubber plantation has been enhanced after transformed from natural vegetation, which includes the natural service and powerful social service.

**Keywords**

eco-service, rubber plantation, hydrological function, Hainan Island

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