

# A Quantitative Study on Environmental Costs of Mountain Forest Cutting Operation

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**Abstract:** In the forest harvesting cost accounting, it is not only need to consider cutting cost of labor, but should also consider environmental costs, thus to compensate the negative impacts of forest harvesting to economical benefits and ecological benefits. In this paper, the environment cost of cutting operating were evaluated based on the data of tracking investigation of natural forest selective cutting plots. The plots were set up in DaYuan Forest Logging and Regeneration Station located in Jianou County, Fujian Province. The experimental stands were harvested by selective cutting of different intensities (low intensity of 13.0% in volume, medium intensity of 29.1%, high intensity of 45.8%, over high intensity of 67.1%) in November, 1996. The uncutting and clear cutting plots were set as controls. In July 2006, the regeneration investigation was conducted again, forest litters were collected and soil sections were examined in every plot as well. Thus environmental costs of logging operations were evaluated quantitatively from the conversed values of water and soil conservation, carbon sequestration and oxygen releasing. The results show that environmental cost of low intensity selective cutting is the least on ¥1.7 Yuan/m<sup>3</sup>, while that of medium and high intensity cutting were 5.1 Yuan/m<sup>3</sup>, 12.2 times of that of low intensity. Over high intensity selective ranks the highest, which is 27.6 Yuan/m<sup>3</sup>, and is 16.2 times of that of low intensity selective cutting. Due to its more timber volume harvesting, the cost of clear cutting is lower than that of over high selective, which is 14.9 times of that of low intensity. The findings are helpful to understanding forestry production benefit.

**Key words:** cutting intensity, environmental cost, ecological benefits, quantitative analysis

## 封面照片说明: 藏东南多依冰川与冰湖

西藏东南部的岗日嘎布山是青藏高原南部边缘受西南季风影响最强的一条山脉, 由于降水(雪)丰沛, 也是青藏高原冰川覆盖率最高的山脉之一, 山的北面是雅鲁藏布江的支流帕隆藏布江。多依弄巴位于岗日嘎布山西段的北坡, 流向自南向北, 汇入帕隆藏布江上游的然乌湖。多依冰川和冰湖发育在多依弄巴的上游, 冰湖面积 0.334 km<sup>2</sup>, 原有多条冰川与冰湖相连, 现仅有一条冰川直接与冰湖相连。经将多依弄巴 2005/2006年的航片与 1980年代的地形图比较, 20多年来, 多依冰湖面积在缩小, 且变化量较大, 面积减小了 0.023 km<sup>2</sup>。究其原因, 在于冰川退缩, 使补给冰湖的水量减少。照片清楚地反映了冰川退缩遗留下的大量冰碛物堆积在湖岸边及其附近, 显示出环境变化(主要是气温升高)对冰川和冰湖影响强烈。

(山水)