生态学报 2006 26 (2006(01)): 291～296 ISSN: 1004-616x CN: 44-1063/R

问题讨论

中国天然林保护工程的固碳能力估算

胡会峰,刘国华*

中国科学院生态环境研究中心 系统生态重点实验室，北京 100085

收稿日期 2005-1-11 修回日期 2005-11-30 网络版发布日期: 2006-1-25

摘要 大气中CO_2浓度的升高作为引起全球气候变化最主要的驱动力已经得到广泛的认同。为此，2005年2月16号生效的《京都议定书》明确提出了植树造林、再造林是一条行之有效的减缓全球气候变化的重要措施。我国作为世界上人工林面积最大的国家，实施的一系列林业政策和工程，对大气中CO_2的减排起到了重要作用。以天然林保护工程为例，利用我国第4次森林资源清查资料和林业统计年鉴，依据估算森林碳储量的材积源——生物量方法对该工程实施5a来(1998～2002)的固碳能力进行初步研究，以期为我国的国际气候和外交谈判提供理论依据和数据佐证。研究结果表明，天然林保护工程实施5a来，工程区累计造林302.6 104hm^2、新增人工林累计固C21.32 Tg (1 Tg=1012 g)，其中，东北、长江上游、黄河中上游3个地区分别累计固碳6.39、12.59、2.34 Tg。另外，天然林保护工程实施后，5a内累计减少木材产量964.98 104m^3，累计减少22.75 Tg的碳释放。总体而言，天然林保护工程实施5a来累计固碳44.07 Tg，平均年际固碳8.81 Tg/a，相当于我国每年CO2排放量的1.2%。

关键词 天然林保护工程；固碳能力；人工林；累计碳储量；中国

分类号 Q945.11,Q948.1, S718.5

Carbon sequestration of China's National Natural Forest Protection Project

HU Hui-Feng, LIU Guo-Hua*

Key Laboratory of Systems Ecology, Research Center for Eco-Environmental Sciences, Chinese Academy of Sciences, Beijing 100085, China

Abstract Rising atmospheric carbon dioxide concentration is one of major driving factors for the climate change. In order to reduce the negative effect of the climate change, the Kyoto Protocol, which came into force in Feb 16, 2005, drew the conclusion that reforestation and afforestation were cost-effective means to mitigate global warming. As the largest plantation countries in the world, China has implemented a series of important policies and nationwide afforestation and reforestation programs since the 1970s.

As one of six major forest projects in China pushed by National Forestry Bureau, National Natural Forest Protection Project (NNFPP), launched in 1998 in 12 provinces, could not only improve local environmental conditions and eliminate local forest deterioration, but also play an important role in increasing China's forest carbon sequestration through increasing the area of plantation and reducing the timber production. To accurately estimate the carbon sequestration of the NNFPP and provide basic data for China's diplomatically international climate treaties, we estimated the carbon sequestration of this project by using the volume-biomass method and China's forest inventory database (1989～1993) and National Forestry Statistics from 1998 to 2002. The results showed that the area of reforestation and afforestation in this project had increased to 302.61 10 4 hm2 at the end of 2002 and the carbon storage of the NNFPP was 21.32 Tg over the period of 1998～2002. The increase of carbon sequestration from reducing the timber production was 22.75 Tg. In total, the storage of carbon sequestration was 44.07 Tg, equal to about 1.2% of total national industrial CO_2 emission during this period. For different regions and subprojects, Nature Forest Protection Project of the Northeastern China, upper reach of the Yangtze River and middle reach of the Yellow River have led an increase of 76.15, 160.09, and 66.38 104 hm^2 at the e

nd of 2002 in the area of reforestation and afforestation, respectively, which accounted for 2 5.2%, 52.9% and 21.9% of total area of this project. These three major regions and subproject s have accumulated carbon of 6.39, 12.60, and 2.34 Tg C, which consisted of 30.0%, 59.1% an d 10.9% of total accumulated carbon, re spectively.

Key words National Natural Forest Protection Project _ carbon sequestration _ afforestation _ reforestation _ carbon storage _ China

DOI

通讯作者 刘国华 ghliu@mail.rcees.ac.cn