杨 飞,杨世琦,诸云强,王卷乐.中国近30年畜禽养殖量及其耕地氮污染负荷分析[J].农业工程学报,2013,29(5):1-11

中国近30年畜禽养殖量及其耕地氮污染负荷分析

Analysis on livestock and poultry production and nitrogen pollution load of cultivated land during last 30 years in China

投稿时间： 2012-05-31 最后修改时间： 2012-10-17

中文关键词：氮,污染,粪,畜禽养殖,年平均增长率

英文关键词:nitrogen pollution manures livestock and poultry average annual growth rate

基金项目:国家环保部公益性重大项目（201009017-04）；中国博士后基金（07Z7602CZ1）

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中文摘要:

为准确掌握近年来中国畜禽养殖发展的区域差异及畜禽粪便对环境的污染威胁，该研究利用年平均增长率方法，揭示畜禽养殖量及其氮污染的增长率的区域差异和时变化规律，分析耕地的畜禽污染负荷。结果表明，近些年中国畜禽养殖业发展迅速，各地区的猪、羊、家禽养殖量的年平均增长率都普遍较高，增幅甚至超过12%；牛的年平均增长率的区域差异较大。畜禽养殖发展基本可分为3个阶段：稳步发展阶段（1980－1995年），全面发展阶段（1996－2006年），现代化发展阶段（2007年-至今）。华北、华中、华南、西南地区畜禽氮污染产生量都较大，华北和东北各省的年平均增长率相对较高，其中河南、四川、山东三省的畜禽养殖的增幅较快、养殖量大、耕地的氮污染负荷较重。全国平均单位耕地面积的畜禽氮污染负荷达138.13 kg/hm2，其中四川等6省市已达202.98 kg/hm2以上。该研究为全国和各省区农业发展规划畜禽养殖结构调整提供参考。

英文摘要:

In recent decades, China's livestock and poultry industry developed rapidly, and their wastes have become an important pollution source, and made a serious threat to China's environment. Due to the significant differences in natural conditions and economic development level in different provinces or regions, the scale and speed of livestock and poultry production show a large regional differences. Based on the statistical data of major livestock and poultry in recent 30 years of main provinces in China, we studied the spatial heterogeneity and temperal changes of livestock and poultry production and their annual growth rate, and further analzed their nitrogen pollution load per cultivated land area. The studied results show that, in recent years, China's livestock and poultry industry have developed rapidly, especially in the north and northeastern of China. The average annual growth rate of pigs, sheep and poultry generally increased greatly all over the regions, which were even more than 12%. Relatively, the regional differences of the average annual growth of cattle or sheep exist in China, the North and Northeast China show the most obvious growth. During the last 30 years, the livestock and poultry development process can basically be divided into three stages: the steady development stage (1980-1995), the comprehensive development stage (1996-2006), the mordern development stage (2007-present). On the whole, the nitrogen excreted by the livestock and poultry are mostly distributed in north, middle, south, and southwestern of China, especially in Henan, Sichuan and Shandong provinces. These three provinces showed the largest growth rate, breeding production and nitrogen excretion of livestock and poultry. However, at present, the nitrogen pollution for the unit cultivated land area in the middle, south and southwestern of China are the most, the farmland and water resource in these regions are facing the most serious pollution risk. In 2009, the average nitrogen load in unit cultivated land area in China were more than 138.13 kg/hm2. And for the six provinces including Sichuan, Beijing, Guizhou, Guangxi, Yunnan and Guangdong, they were above 202.98 kg/hm2, which have exceeded the cordon of 170 kg/hm2 regulated in the European Union policy. What is more, in most of other provinces of China, the nitrogen load in unit cultivated land area are being fast close to the cordon. Therefore, to avoid the cultivated land and water environment polluted by livestock and poultry manure, it is very necessary and urgent to control and manage the livestock and poultry production with the strong measures and means, and deal with the animals manure timely and effectively. This investigation can provide scientific support to the provinces on planing agriculture development and adjusting livestock and animals breeding structu

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