



Home | Journal Papers | About CNKI | User Service | FAQ | Contact Us | 中文

Full-Text Search :

《Chinese Journal of Eco-Agriculture》2011-02

[Add to Favorite](#) [Get Latest Update](#)

Ecosystem services of wheat-maize cropland systems in the North China Plain

XIAO Yu1,XIE Gao-Di1,AN Kai1,LIU Chun-Lan2,CHEN Cao-Cao2(1.Institute of Geographical Sciences and Natural Resources Research,Chinese Academy of Sciences,Beijing 100101,China;2.Beijing Municipal Research Institute of Environmental Protection,Beijing 100037,China)

Field investigations were conducted at Luancheng Agro-Ecosystem Experimental Station of Chinese Academy of Science in Hebei Province for the period from 2006 to 2007.The field data were then used to evaluate ecosystem services of wheat-maize croplands in the North China Plain.Ecosystem services analyzed in the study included primary products,gas regulation,soil organic matter(SOM) accumulation,water regulation and nitrogen transformation.The results showed that primary products from croplands accounted for 5.04~5.71 t·hm⁻²·a⁻¹ of wheat grain,6.69~8.24 t·hm⁻²·a⁻¹ of maize grain,8.58~9.72 t·hm⁻²·a⁻¹ of wheat straw and 6.97~8.58 t·hm⁻²·a⁻¹ of maize straw.As for cropland gas regulation,O₂ and N₂O emissions were 24.99~28.64 t·hm⁻²·a⁻¹ and 0.72~1.13 kg·hm⁻²·a⁻¹,whereas CO₂ and CH₄ assimilations were 34.23~39.22 t·hm⁻²·a⁻¹ and 3.39~5.70 kg·hm⁻²·a⁻¹,respectively.While cropland SOM accumulation was calculated at 1.13~2.39 t·hm⁻²·a⁻¹,that of water consumption was 2 890~3 830 m³·hm⁻²·a⁻¹.Soil nitrogen content dropped considerably at the rate of-107.73~5.33 kg(N)·hm⁻²·a⁻¹ after one crop rotation.Total economic value of cropland ecosystem services was estimated at 5.48×10⁴~6.25×10⁴ Yuan·hm⁻²·a⁻¹,which was three times the value of food production.Based on the results,effects of nitrogen fertilizer on the welfare of cropland ecosystem services was complicated.Nitrogen application led to economic loss due to increasing nitrogen transformation, simultaneously increased economic value of primary production,gas regulation,CO₂ fixation,and O₂ releasing.Most ecosystem services studies have focused on the positive effects of ecosystems on human welfare.But a balanced and reasonable approach was to analyze both the positive and negative effects of cropland ecosystem services on human welfare.

[Key Words] : Cropland ecosystem Wheat-maize cropland Ecosystem service Positive effect Negative effect North China Plain

[Fund] : 国家自然科学基金项目(30770410 31070384); 中国科学院地理科学与资源研究所自主部署创新项目(200905010)资助

[CateGory Index] : S181



Download(CAJ format)



Download(PDF format)

CAJViewer7.0 supports all the CNKI file formats; AdobeReader only supports the PDF format.

[Citations]

Chinese Journal Full-text Database

10 Hits

- LI Xiao-xin-(1,2),HU Chun-sheng-1,ZHANG Yu-ming-1,DONG Wen-xu-1,OUYANG Zhi-yun-2(1.Center for Agricultural Resources Research,Institute of Genetic and Developmental Biology,CAS,Shijiazhuang,Hebei 050021,China;2.Research Center for Eco-Environmental Sciences,CAS,Beijing 100085,China);**Losses of nitrate-nitrogen from a wheat-Corn rotation in north China**[J];Agricultural Research in the Arid Areas;2006-06
- Zeng Jianghai et al.(Institute of Agricultural Modernization,Chinese Academy of Sciences,Shijiazhuang 050021),Song Wenzhi et al.(Research Center for Eco-Environmental Sciences, Chinese Academy of Sciences,Beijing 100085);**Flux of N₂O Emission from the Fields in a Wheat and Maize Rotation System**.[J];CHINESE JOURNAL OF ENVIRONMENTAL SCIENCE;1995-01
- Qi Yuchun et al(Institute of Geographical Sciences and Natural Resources Research,CAS,BEIJING 100101);**Methane Fluxes of Typical Agricultural Soil in the North China Plain**.[J];Rural Eco-environment;2002-03
- HUANG Bin1, WANG Jing-guo1, GONG Yuan-shi1, Karl Stahr2, YANG Qian1 (1. College of Resources and Environmental Science, China Agriculture University, Beijing 100094, China; 2. Institute of Soil Science and Land Evaluation, Hohenheim University (310), D-70593, Stuttgart, Germany);**Soil Respiration and Carbon Balance in Winter Wheat and Summer Maize Fields**[J];Journal of Agro-Environment Science;2006-01
- XIE Hua-Lin (School of Resource Science, Beijing Normal University, Beijing 100875,China).;**Preliminary researches on the functional evaluation of rural landscape**[J];Acta Ecologica Sinica;2004-09
- Chen Yuanquan, Gao Wangsheng* Regional Agriculture R&D Center, College of Agronomy and Biotechnology, China Agriculture University, Beijing 100094, China;**Green accounting for agriculture production based on the value of agroecosystem services: a case study of Ansai County**[J];Acta Ecologica Sinica;2007-01
- YANG Zhi-xin1,2, ZHENG Da-wei1*, FENG Sheng-dong2 (1.College of Resources and Environment, Agricultural University of Hebei, Baoding 071001, China; 2.College of Resources and Environment, China Agricultural University, Beijing 100094, China);**Value evaluation of negative external effect in Beijing City farmland production**[J];China Environmental Science;2007-01
- Chen Suying and Hu Chun-sheng (Institute of Agricultural Modernization ,CAS,Shijiazhuang 050021);**Soil respiration rate of farmland ecosystem in Taihang Piedmont**.[J];1997-02
- XIE Gao-Di,XIAO Yu,ZHEN Lin,LU Chun-Xia(Institute of Geographical Sciences and Natural Resources Research,Chinese Academy of Sciences,Beijing 100101,China);**Study on ecosystem services value of food production in China**[J];Chinese Journal of Eco-Agriculture;2005-03
- XIAO Yu XIE GaoDi (Institute of Geographic Sciences and Natural Resources Research,CAS,Beijing 100101,China);**Comprehensive Valuation of the Ecosystem Services of Rice Paddies in Shanghai**[J];Resources Science;2009-01

[Co-citations]

Chinese Journal Full-text Database

10 Hits

- SUN Shi-wei (Hengshui University,Hengshui,Hebei 053000);**Study on the Nitrate Nitrogen Content in the Groundwater of Wheat-corn Rotation Region in Hebei Plain**[J];Journal of Anhui Agricultural Sciences;2007-35
- WENG You-zhi et al(College of Horticulture,Nanjing Agriculture University,Nanjing,Jiangsu 210095);**Analysis and Review of the Rural Landscape Planning in China**[J];Journal of Anhui Agricultural Sciences;2008-03

- SU Xian-long et al (Economics and Management College of Northwest Scientific and Technological University,Yangling,Shaanxi 712100);**Analysis on the Environmental Cost of Farmland Soil Pollution in China**[J];Journal of Anhui Agricultural Sciences;2008-10
- 3
- LEI Zheng-yu et al (Hubei Vocational College of Ecological Engineering,Wuhan,Hubei 430200);**Study on the Plant Flora in Shangshehu Wetland Nature Reserve**[J];Journal of Anhui Agricultural Sciences;2008-31
- 4
- DU Peng et al(Guangzhou Institute of Geochemistry,Chinese Academy,Guangzhou,Guangdong 510640);**Economic Value Assessment of Forest Ecosystem Service Function in Jiangmen of Guangdong Province from 2001 to 2006**[J];Journal of Anhui Agricultural Sciences;2009-16
- 5
- HAN Peng-fei et al (College of Resources and Environmental Sciences,Nanjing Agricultural University,Nanjing Jiangsu 210095);**Effects of Different Fertilizer Applications on the Emission of Methane and Nitrous Oxide from Paddy Field and Its Mitigation Measures of Emission**[J];Journal of Anhui Agricultural Sciences;2009-17
- 6
- ZHU Ya-li et al(Central South University of Forestry & Technology,Changsha,Hunan 410004);**Dynamic Assessment on Eco-efficiency Loss Caused by Forestic Harmful Plants**[J];Journal of Anhui Agricultural Sciences;2009-19
- 7
- LIU Ju-mei et al(College of Resources and Environmental Sciences,Lanzhou University,Lanzhou,Gansu 730000);**Study on the Ecological Environment Changes and Farmland Loss Problem in the Construction of Industrial Park**[J];Journal of Anhui Agricultural Sciences;2009-19
- 8
- LIU Xue-Cong 1, 2, LI Yi-Ming 1**1. Institute of Zoology, Chinese Academy of Sciences, Beijing 100080,China2. Graduate School of Chinese Academy of Sciences, Beijing 100039,China;**Extinction-prone attributes of terrestrial mammals in China**[J];Acta Zoologica Sinica;2005-04
- 9
- Hong Mianmian,Wang Feifeng(Institution of Environmental Science,Fujian Normal University,Fuzhou 350007,China);**Study on the Ecological Footprint of Acid Deposition Pollution — — Taking Fujian Province as a Case**[J];Environmental Science and Management;2009-03
- 10
- China Proceedings of conference Full-text Database 10 Hits
- 1 Jinwei Quyan Yingkou meteorological bureau 115001;**East Asia in the past 15 years and changes in atmospheric concentrations of greenhouse gases features trends**[A];[C];2006
- 2 Qin Xiaobo,Li Yu'e1,Liu Keying2,Wan Yunfan1 (1 Institute of Agro-Environment and Sustainable Development,Chinese Academy of Agricultural Sciences Beijing 100081,China;2 Soil and Fertilizer Inst.of Hunan,Changsha 410125,China);**Methane and nitrous oxide emission from paddy field under different fertilization treatment**[A];[C];2007
- 3 Ding Hong (Biotechnology Center, Fujian Academy of Agricultural Sciences, Fuzhou 35003);**NITRIFICATION-DENITRIFICATION LOSSES OF FERTILIZER NITROGEN AND N2O EMISSION FROM SOIL IN AGROECOSYSTEM**[A];[C];2000
- 4 Cai shouhua-1,Hu Jinji-1,Cao Cuibao-2,Zhan Wanlin-2,Jin Dianguo-2 (1.College of Water Science and Engineering,Yangzhou University,Yangzhou 225009 Jiangsu,China;2.The Experimental Station of Water and Soil Conservation of Xuyu County,Xuyu 211700 Jiangsu,China);**Assessment on Ecosystem Services Value of Laojunshan Small Watershed**[A];[C];2009
- 5 He Yue (School of Liberal Arts and Law,Tianjin University,Tianjin 300072,China);**Legislative Suggestions Regarding the Biological Invasion of China**[A];[C];2009
- 6 SU Dan-1,CHEN Ke-1,ZHU Ye-ping-2,CHEN Yan-2 (1.Forestry College of Shenyang Agricultural University,Shenyang 110161; 2.Laotudingzi Nature Reserve of Liaoning Benxi,Benxi 117200);**Assessment of Ecosystem Services Benefit for Laotudingzi Nature Reserve**[A];[C];2008
- 7 ZHANG Ting-hua LIU Qing-lin (China Agricultural University,Beijing 10003);**Study on Plant Diversity in the Green Space of Urban Areas**[A];[C];2009
- 8 Xu Zaifu (Xishuangbanna Tropical Botanical Garden, the Chinese Academy of Sciences Mengla, Yunnan 666303);**ETHNIC FOREST CULTURE AND EFFECTIVE MANAGEMENT OF BIODIVERSITY_A CASE STUDY OF XISHUANGBANNA**[A];[C];1998
- 9 Zhang Jianwei (The Law School of Henan University, Kaifeng 475001);**THE EXISTING STATE OF LEGISLATION,LEGISLATIVE PROBLEMS AND LEGISLATIVE COUNTERMEASURES ABOUT THE BIOLOGICAL DIVERSITY PROTECTION IN CHINA**[A];[C];1998
- 10 Lu Qingguang (The Chinese Academy of Agricultural Sciences, Beijing 100081);**INTRODUCTION OF INVASION-ECOLOGY OF EXOTIC SPECIES**[A];[C];1998

[Secondary Citations]

- Chinese Journal Full-text Database 10 Hits
- 1 Peng Jinghua(The Agriculture Environment Protection Research Institute,Shanghai Academy of Agricultural Sciences,Shanghai,201106)Qian Yongqin(The Animal Husbandry and Veterinary Research Institute,Shanghai Academy of Agricultural Sciences,Shanghai,200030);**THE SELF-POLLUTION AND ITS CONTROL COUNTERMEASURE IN AGRICULTURE PKDUCTION OF SHANGHAI SUBURBS**[J];PESOURCES AND ENUIRONMENT IN THE YANGTZA VALLEY;1994-02
- 2 GENG Yuanbo, QI Yuchun, DONG Yunshe (Institute of Geographical Sciences and Natural Resources Research, CAS, Beijing 100101, China);**Review about the Carbon Cycle Researches in Grassland Ecosystem**[J];Progress In Geography;2004-03
- 3 YANG Xue-Ming, ZHANG Xiao-Ping, FANG Hua-Jun (Northeast Institute of Geography and Agricultural Ecology,CAS, Changchun Jilin 130012);**Importance of Agricultural Soil Sequestering Carbon to Offsetting Global Warming**[J];Scientia Geographica Sinica;2003-01
- 4 Jing Guihe (Department of Geography, Northeast Normal University);**ECOEVALUATION AND ECODEVICE OF LAND**[J];Acta Geographica Sinica;1986-01
- 5 WANG Qinxue 1 , WATANABE Masataka 1 , HAYASHI Seiji 1 , MURAKAMI Shogo 1 , OUYANG Zhu 2 , LI Yan 3 , LI Yingnian 4 , WANG Kelin 5 (1. National Institute for Environmental Studies, Tsukuba,305-8506, Japan;2. Institute of Geographic Sciences and Natural Resources Research, CAS, Beijing 100101, China;3. Xinjiang Institute of Ecology and Geography, CAS, Urumqi 830011, China;4. Northwest Plateau Institute of Biology, CAS, Xining 810008, China;5. Institute of Subtropical Agricultural Ecology, CAS, Changsha 410125, China);**Monitoring and Simulation of Water,Heat and CO₂ Fluxes in Various Terrestrial Ecosystems**[J];Acta Geographica Sinica;2004-01
- 6 LI Jing-(1,2),LIU Shu-Hua-(1,2*),MAO Yu-Hao-(1,2),ZHANG Cheng-Yi-2, LIU Li-Chao-3,LIANG Fu-Ming-(1,2),XIN Guo-Jun-1,WANG Jian-Hua-11 Group of Atmosphere Boundary Layer Physics and Atmospheric Environment,Department of Atmospheric Sciences,the School of Physics,Peking University,Beijing 100871,China2 Laboratory of Climate Research,National Climatic Center,China Meteorological Administration,Beijing 100081,China3 Institute of Cold and Arid Regions Environmental and Engineering,Chinese Academy of Sciences,Lanzhou 730000,China;**Characteristics of CO₂ flux and concentration in different ecosystems**[J];Chinese Journal of Geophysics;2006-05
- 7 Li Jing, Wang Mingxing, Wang Yuesi, Huang Yao, Zheng Xunhua, and Xu Xin (State Key Laboratory of Atmospheric Boundary Layer Physics and Atmospheric Chemistry , Institute of Atmospheric Physics , Chinese Academy of Sciences , Beijing 100083);**Advance of Researches on Greenhouse Gases Emission from Chinese Agricultural Ecosystem**[J];Chinese Journal of Atmospheric Sciences;2003-04
- Zheng Xunhua, Wang Mingxing, Wang Yuesi, Shen Renxing, Shangguan Xingjian (Institute of Atmospheric

- 8 Physics, Chinese Academy of Sciences, Beijing 100029) J. Heyer, M. Kogge, H. Papen (Fraunhofer Institute for Atmospheric Environmental Resea;**CH 4 and N 2O Emissions from Rice Paddy Fields in Southeast China**[J];SCIENTIA ATMOSPHERICA SINICA;1997-02
- 9 ZHANG Dong-qiu~1,2, SHI Pei-li~1, ZHANG Xian-zhou~1(1.Institute of Geographical Sciences and Natural Resources Research, Beijing 100101, China;2.Graduate School of Chinese Academic of Science, Beijing 100039, China);**SOME ADVANCE IN THE MAIN FACTORS CONTROLLING SOIL RESPIRATION**[J];Advance in Earth Sciences;2005-07
- 10 HUANG Miao-fen (Research Center for Remote Sensing and GIS, Dept. Geography, Beijing Normal University & Beijing Key Laboratory for Remote Sensing of Environment and Digital Cities, Beijing 100875 China);**Advance of Research on Surface Flux**[J];Arid Land Geography;2003-02

©2006 Tsinghua Tongfang Knowledge Network Technology Co., Ltd.(Beijing)(TTKN) All rights reserved

