

《中国农业发展战略研究》专题快报

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【动态资讯】

1. Prairie strips transform farmland conservation

【EurekaAlert!】 Modern agriculture's large monoculture fields grow a lot of corn and soybeans, planted annually. The outputs from row crops can be measured both in dollars paid in the market and also in non-market costs, known as externalities. Soil, nutrients, groundwater, pollinators, wildlife diversity, and habitat (among other things) can be lost when crop yields are maximized. Now it appears that prairie strips have an extraordinary power to change this pattern. A prairie strip is much what it sounds like: a strip of diverse herbaceous vegetation running through a farm's row crops. In the American Midwest, chances are the soil that now supports crops was once covered in prairie before cultivation. Prairie plants are a mixture of native grasses, wildflowers, and other stiff-stemmed plants. They have deep roots that draw water and nutrients from far below the surface. They are perennials, returning to grow each spring.

链接:

https://www.eurekaalert.org/pub_releases/2019-01/aso-pst012919.php

2. Cattle urine's planet-warming power can be curtailed with land restoration

【EurekaAlert!】 When cow urine falls on degraded land, it releases far more nitrous oxide -- a potent greenhouse gas -- than when absorbed by healthy pasture; the findings show additional benefits of landscape restoration and conservation. The exceptional climate-altering capabilities of cattle are mainly due to methane, which they blast into the atmosphere during their daily digestive routine. Cattle urine is a lesser-known climate offender. It produces nitrous oxide (N₂O), which has warming power far greater than that of

carbon dioxide (CO₂), the main driver of global warming. A study conducted by the International Center for Tropical Agriculture (CIAT) and partners shows that these N₂O emissions can be significantly curbed by healthy cattle pastures. For the study, researchers collected urine from cattle at research sites in five countries across Latin America and the Caribbean. They spilled these 500 mL samples on paired cattle fields classified as degraded or healthy, which was determined by vegetation coverage. In six of the seven test sites, degraded pastures emitted significantly more N₂O - sometimes up to three times as much. The results were published January 29 in Scientific Reports, an open-access journal by the publishers of Nature.

链接:

https://www.eurekalert.org/pub_releases/2019-01/icft-cup012419.php

3. Weather at key growth stages predicts Midwest corn yield and grain quality, study says

【EurekAlert!】 URBANA, Ill. - Corn is planted on approximately 90 million acres across the United States every year. With all that data, it takes months after harvest for government agencies to analyze total yield and grain quality. Scientists are working to shorten that timeline, making predictions for end-of-season yield by mid-season. However, fewer researchers have tackled predictions of grain quality, especially on large scales. A new University of Illinois study starts to fill that gap. The study, published in Agronomy, uses a newly developed algorithm to predict both end-of-season yield and grain composition - the proportion of starch, oil, and protein in the kernel - by analyzing weather patterns during three important stages in corn development. Importantly, the predictions apply to the entire Midwest corn crop in the United States, regardless of corn genotypes or production practices.

链接:

https://www.eurekalert.org/pub_releases/2019-01/uoi-wak012919.php

4. 黑龙江省秸秆年综合利用率超过65%

【中华人民共和国农业农村部】 这个冬季，海伦市百祥镇百义村380户村民家家都用上了省料、省钱又干净的生物质燃料民用小锅炉。为鼓励村民使用生物质燃料，村里还给村民补贴。村民们说，比以前烧煤取暖做饭，一个冬季每家至少能省500元钱。而海伦市只是黑龙江省秸秆综合利用的一个缩影。2018年全省秸秆综合利用量超过7200万吨，综合利用率超过65%，新方式层出不穷，秸秆综合利用产业正在扩大。2018年，黑龙江

省把推进秸秆综合利用作为打赢污染防治攻坚战的重要战役，大力推广普及秸秆综合利用肥料化、燃料化、基料化、饲料化、原料化“五化”利用模式。在哈尔滨市、绥化市和大庆的肇州、肇源县开展“两市两县”秸秆综合利用三年行动，下拨“两市两县”专项扶持资金7.37亿元，财政债券13.75亿元。出台了一系列高含金量的补贴政策，目标是利用三年时间彻底解决秸秆综合利用问题。记者从省农业农村厅了解到，2018年全省秸秆还田面积大幅增加，超过9000万亩；肥料化利用超过4700万吨；秸秆离田面积超过6200万亩，同比增加1500多万亩；秸秆固化压块站现已开工986个，已完工345个；户用生物质炉具已安装超过3万台，全省燃料化利用1470多万吨；饲料化利用超过1000万吨；秸秆收储站点达到2700多个，收储能力明显提升；全省基料化利用秸秆超过20万吨，同比增加10万吨。

链接:

http://www.moa.gov.cn/xw/qg/201901/t20190128_6170773.htm

5. 专家学者献计献策 推动地膜污染治理

【中华人民共和国农业农村部】本网讯 近日，地膜覆盖及残留污染防治研讨会在京召开。会议研究讨论了我国地膜覆盖技术应用及发展趋势、高强度地膜与机械化回收机具应用、生物降解地膜应用及安全性评估、国外农膜管理措施及法规建设等，为推进地膜污染治理提出了战略性建议。有关专家院士、国家发展改革委、科技部、生态环境部及农业农村部有关同志参加会议。与会专家指出，地膜覆盖技术显著提高了农业生产力，为保障农产品有效供给做出了重大贡献，但由于缺乏回收措施、回收主体责任不明等，导致局部地区残膜污染较为严重，已成为制约农业绿色发展的突出环境问题。为加大残膜污染防治力度，完善地膜回收处理机制，中国工程院启动了地膜覆盖及残留污染防治战略研究咨询项目，以期提出政策引导、科技支撑、依法管控、多措并举的综合治理道路的现实路径。与会专家建议，治理地膜残留污染，要完善顶层设计，建立系统性综合性解决方案，要分类施策，针对不同区域不同作物提出地膜污染治理的策略。一是建议加快制定农膜使用和地膜残留污染综合治理相关法律法规。严格地膜生产、流通、使用的准入要求，建立全程监管体系，明确各主体责任。二是建议加大对合理用地膜和有效回收残膜的政策支持力度，统筹用好农业补贴资金存量与增量，设立残膜污染综合治理补贴专项资金，调整补贴方向和范围，在重点覆膜区域创设区域性的绿色补贴政策。三是建议加强地膜残留污染综合治理科技研发及创新平台建设。重点在残膜机械化捡拾和全生物降解地膜应用技术上取得突破，联合建立新型产品和技术示范集成基地，为治理地膜污染提供有效保障。

链接:

http://www.moa.gov.cn/xw/zwdt/201901/t20190124_6170686.htm

6. 河南畜禽粪污综合利用率达到75%

【中华人民共和国农业农村部】近日，记者从河南省政府新闻办获悉，河南省2018年有力促进畜禽养殖废弃物处理和资源化利用，河南省已配套畜禽粪污处理利用设施的规模养殖场达14092家，占河南省畜禽规模养殖场总数的88%，引导98万散养户“退出庭院、退出村庄、退出散养”，实现畜禽粪污综合利用率达到75%。2018年，河南省狠抓项目示范，加大政策支持，创新模式机制，强力推进畜禽粪污处理利用基础设施建设，大力发展生态、绿色畜牧业，圆满完成了各项目标任务。其中，规模养殖场粪污处理利用设施配套率超过预定目标任务6个百分点，畜禽粪污综合利用率超过预定目标任务7个百分点。同时，开封市尉氏县、焦作市温县、驻马店市的正阳县、泌阳县等20个新建或改造升级病死畜禽无害化处理场或处理体系建设任务全部完成。截至目前，河南省累计建设粪肥储存场496万平方米、粪水贮存池2255万立方米、有机肥厂272个，铺设沼液还田管网833万米，创建生态畜牧业示范市6个、示范县18个，32个畜牧大县开展了畜禽粪污资源化利用整县推进行动，探索出了专业化公司“分散收集集中处理”、合作组织“统一清运有偿服务”、家庭牧场“就地就近配套消纳”等一批废弃物资源化利用模式，畜禽废弃物资源化处理利用能力不断增强，初步构建了种养结合、农牧循环、绿色发展的现代畜牧业新格局。

链接:

http://www.moa.gov.cn/xw/qg/201901/t20190123_6170573.htm

7. 中央农办、农业农村部等8部门联合部署推动农村“厕所革命”

【中华人民共和国农业农村部】本网讯 近日，中央农办、农业农村部、国家卫生健康委、住房城乡建设部、文化和旅游部、国家发展改革委、财政部、生态环境部等8部委联合印发了《关于推进农村“厕所革命”专项行动的指导意见》。《意见》指出，要按照“有序推进、整体提升、建管并重、长效运行”的基本思路，先试点示范、后面上推广、再整体提升，推动农村厕所建设标准化、管理规范、运维市场化、监督社会化，引导农民群众养成良好如厕和卫生习惯，切实增强农民群众的获得感和幸福感。《意见》提出，到2020年，东部地区、中西部城市近郊区等有基础、有条件的地区，基本完成农村户用厕所无害化改造，厕所粪污基本得到处理或资源化利用，管护长效机制初步建立；中西部有较好基础、基本具备条件的地区，卫生厕所普及率达到85%左右，达到卫生厕所基本规范，贮粪池不渗不漏、及时清掏；地处偏远、经济欠发达等地区，卫生厕所普及率逐步提高，实现如厕环境干净整洁的基本要求。到2022年，东部地区、中西部城市近郊区厕所粪污得到有效处理或资源化利用，管护长效机制普遍建立。地处偏远、经济欠发达等其他地区，卫生厕所普及率显著提升，厕所粪污无害化处理或资源化利用率逐

步提高，管护长效机制初步建立。

链接:

http://www.moa.gov.cn/xw/zwdt/201901/t20190122_6170498.htm

8. 农村人居环境整治持续推进

【经济日报】本报北京1月21日讯 记者乔金亮报道：中央农办、农业农村部等18部委日前联合印发《农村人居环境整治村庄清洁行动方案》。在21日举行的深入推进农村人居环境整治视频会议上，农业农村部副部长余欣荣表示，要在全国农村以“村村户户搞清洁、干干净净迎春节”为主题，广泛开展村庄清洁行动，努力打好今年农村人居环境整治第一战。截至1月16日，共有24个省（区、市）已启动或即将组织实施符合本地实际的村庄清洁行动。村庄清洁行动以影响农村人居环境的突出问题为重点，动员广大农民群众广泛参与、集中整治，着力解决村庄环境“脏乱差”问题，突出“三清一改”，实现村庄内垃圾不乱堆乱放，污水乱泼乱倒现象明显减少，粪污无明显暴露，杂物堆放整齐，房前屋后干净整洁，村民清洁卫生文明意识提高。所谓“三清一改”，包括清理农村生活垃圾，清理村内塘沟，清理农业生产废弃物，改变影响农村人居环境的不良习惯。《方案》印发后，财政部、发展改革委、农业农村部积极筹措资金，支持农村人居环境整治。部分地方进一步完善支持政策，加大对农村人居环境整治的支持力度。广东2019年省级财政预算将投入97亿元专项用于全域启动村庄清洁行动，同时要求各市、县、镇安排配套资金。内蒙古计划拿出20.4亿元对农村“厕所革命”进行专项补贴。上海探索创新项目审批、资金拨付和运行管理等机制。

链接:

http://paper.ce.cn/jjrb/html/2019-01/22/content_382262.htm

9. Climate Change Harming Agriculture, India's Wheat Production Could Fall By 23%:

Ministry

【AgroNews】The effects of climate change and increasing pollution cause direct harm not just to the public, but also to the health of agricultural crops. The ministry of agriculture has said in its written response to a parliamentary committee that crops such as paddy, wheat, maize, sorghum, mustard, potato, cotton and coconut are likely to be adversely affected by climate change. The ministry told the parliamentary committee headed by veteran BJP leader Murli Manohar Joshi that wheat production will decrease by 6-23% by 2050 if effective steps are not taken in a timely manner. Wheat production could decrease by 6,000 kilos for every 1°C increase in temperature. The ministry also told the committee that

by 2050, the production of maize could fall by 18%. But if appropriate steps are taken, its production could actually be increased by 21%. Production of paddy could fall by 4-6% by 2020 due to climate change. But with the right intervention, paddy production could also be increased by 17-20%.

链接:

<http://news.agropages.com/News/NewsDetail---28904.htm>

10. Responsible innovation key to smart farming

【AgroNews】 Responsible innovation that considers the wider impacts on society is key to smart farming, according to academics at the University of East Anglia (UEA). Agriculture is undergoing a technology revolution supported by policy-makers around the world. While smart technologies will play an important role in achieving improved productivity and greater eco-efficiency, critics have suggested that consideration of the social impacts is being side-lined. In a new journal article, Dr David Rose and Dr Jason Chilvers, from UEA's School of Environmental Sciences, argue that the concept of responsible innovation should underpin the so-called fourth agricultural revolution, ensuring that innovations also provide social benefits and address potentially negative side-effects. Each of the previous revolutions was radical at the time - the first representing a transition from hunting and gathering to settled agriculture, the second relating to the British Agricultural Revolution in the 18th century, and the third to post-war productivity increases associated with mechanisation and the Green Revolution in the developing world.

链接:

<http://news.agropages.com/News/NewsDetail---28806.htm>

【文献速递】

1. Ammonia and nitrous oxide emissions from a field Ultisol amended with tithonia green manure, urea, and biochar

作者: Bernard Fungo; Johannes Lehmann; Karsten Kalbitz, et al.

文献源: Biology and Fertility of Soils, 2019

摘要: Short-term mitigation of ammonia (NH₃) and nitrous oxide (N₂O) emissions by biochar soil amendments has been reported, but limited knowledge of the mechanisms, particularly those associated with long term changes, remain relatively unknown. In order to investigate potential mechanisms and residual effect of biochar on NH₃ and N₂O emission, a 3-year field

trial was set up on an Ultisol in western Kenya with a three-replicate full factorial treatment structure. The factors investigated include the following: biochar (from eucalyptus wood, pyrolyzed at 550°C, applied once before the start of the experiment at either 0 or 2.5 t ha⁻¹); tithonia green manure applied at the start of each season at either 0, 2.5, or 5.0 t ha⁻¹; mineral nitrogen (N) (as urea applied each season at either 0 or 120 kg N ha⁻¹). NH₃ as well as N₂O emission and water-filled pore space (WFPS) were monitored throughout the 3 years. In the third year, soil mineral nitrogen (exchangeable NH₄⁺ and NO₃⁻) contents were measured. Biochar reduced cumulative emissions of NH₃ and N₂O by 47±5 and 22%±3, respectively, over the 3 years. Over the 3 years, the effect size of biochar was reduced by 53 and 59% for NH₃ and N₂O, respectively, indicating that the residual effect of biochar on NH₃ and N₂O persists at least up to 3 years under field conditions. Tithonia and urea additions increased both gas emissions by 13-68% compared to the control. Combination of the three amendments reduced cumulative NH₃ emissions by 18±3%, but had no effect on cumulative N₂O. Our results show that biochar can influence emissions of NH₃ and N₂O longer than most previous studies have reported but is not explained by N dynamics. Other mechanisms such as direct interactions with oxidized biochar surfaces could be more likely to account for the residual effect of biochar on NH₃ and N₂O in agricultural soils.

链接:

http://agri.ckcest.cn/file1/M00/06/5E/Csgk0FXT7nKAM4h8ABlnpH_dpIE496.pdf

2. Spatial variations in soil-water carrying capacity of three typical revegetation species on the Loess Plateau, China

作者: Xiaoxu Jia; Mingan Shao; Dongxue Yu, et al.

文献源: Agriculture, Ecosystems and Environment, 2019

摘要: Re-vegetation is a necessary control measure of soil erosion in the Loess Plateau. However, excessive re-vegetation can aggravate soil water shortage, which can in turn threaten the health and services of restored ecosystems. An optimal plant cover or biomass (i.e., soil-water carrying capacity for vegetation, SWCCV) is important for regional water balance, soil protection and vegetation sustainability. The objective of this study was to determine the spatial distribution of SWCCV for three non-native tree (*Robinia pseudoacacia*), shrub (*Caragana korshinskii*) and grass (*Medicago sativa*) species used in the re-vegetation of the Loess Plateau. The dynamics of actual evapotranspiration (AET), net primary productivity (NPP) and leaf area index (LAI) were simulated using a modified Biome-BGC

(Bio-Geochemical Cycles) model. Soil and physiological parameters required by the model were validated using field-observed AET for the three plant species at six sites in the study area. The validated model was used to simulate the dynamics of AET, NPP and LAI for the three plant species at 243 representative sites in the study area for the period 1961-2014. The results show that spatial distributions of mean AET, NPP and LAI generally increased from northwest to southeast, much the same as mean annual precipitation (MAP) gradient. In terms of maximum LAI, the ranges of optimal plant cover were 1.13-1.5 for *R. pseudoacacia*, 1.02-1.4 for *C. korshinskii* and 0.73-1.0 for *M. sativa*. The corresponding SWCCV, expressed as NPP were 202.4616.5, 83.7201.7 and 56.3253.0 g C m⁻² yr⁻¹. MAP, mean annual temperature, soil texture and elevation were the main variables driving SWCCV under the plant species; explaining over 86% of the spatial variations in mean NPP in the study area. Further re-vegetation therefore needs careful reconsideration under the prevailing climatic, soil and topographic conditions. The results of the study provide a re-vegetation threshold to guide future re-vegetation activities and to ensure a sustainable eco-hydrological environment in the Loess Plateau.

链接:

<http://agri.ckcest.cn/file1/M00/06/5E/Csgk0FxT7yGAaU9iACS0pBtKQ8U876.pdf>

3. Quantitative evaluation and optimized utilization of water resources-water environment carrying capacity based on nature-based solutions

作者: Jian Zhang; Chunling Zhang; Wanli Shi, et al.

文献源: Journal of Hydrology,2019

摘要: The water resources-water environment carrying capacity (WR-WECC) is an important indicator for judging the regional macro-control ability of water resources. The nature-based solutions (NBS) concept is related closely to sustainability, harmonious and green development, resources rational exploitation, coupled human and environment, and ecological protection priority. Participatory water management has necessitated the formation of village water resources committees and/or village environmental committees; while in the case of water management, a participatory approach has resulted in the formation of community water association, domestic water committees, cooperative societies, and various water user groups. The WR-WECC evaluation goal is to find the most appropriate water resources development and utilization to maximize benefits and system efficiency while minimizing costs and trade-offs. To realize the development and utilization

of water resources, water ecological conservation, and water environment protection in Yuetang District, we constructed a dynamic evaluation index system including water resources, water environment and water ecological characteristics, applying the principal component analysis (PCA) method to evaluate the temporal scale variation tendency of WR-WECC, and explore a deep-seated reason based on NBS. The WR-WECC evaluation index system covered 16 indexes belonging to three subsystems of water resource, socioeconomic, and eco-environmental systems. We used Statistical Product and Service Solutions (SPSS) 19.0 software and adopted the improved PCA to integrate the urban economic-social-ecological development of the Xiangjiang (a tributary of the Yangtze River) River Basin. We applied the evaluation index system to analyse the trend variability of WR-WECC of Yuetang District from 2005 to 2015 based on NBS. The WR-WECC of Yuetang District was affected mainly by the urban sewage treatment rate, the water use amount per ten thousand Yuan gross domestic product (GDP), and per capita water resources. In addition to minor fluctuations in 2007 and 2011, the WR-WECC in Yuetang District was generally on the rise year by year and was related to socioeconomic development level, regional water environment comprehensive management, and awareness of water ecological protection. The WR-WECC of the Yuetang District in 2013-2015 was in a Class I (excellent) condition. The temporal variations analysis based on NBS was proposed through a combination of economic-social-ecological values provided by nature-based development and utilization patterns. Based on the relationship among regional water resources, economic society, and eco-environment protection, the paper supplied a WR-WECC improvement strategy that was suitable for the development and utilization of water resources in a water-rich area in south China.

链接:

<http://agri.ckcest.cn/file1/M00/06/5E/Csgk0Fxt7DOAY1FVAB39KTEtDvl433.pdf>

4. Detection of land use/cover change in Egyptian Nile Delta using remote sensing

作者: M.H. Elagouz; S.M. Abou-Shleel; A.A. Belal, et al.

文献源: The Egyptian Journal of Remote Sensing and Space Sciences, 2019

摘要: The present study aims to assess the changes of different land use/land cover classes for Nile Delta of Egypt during the period from 1987 to 2015, to evaluate the impact of land cover change and urban sprawl, before, during and after the 25th of January 2011 using remote sensing and GIS techniques, as a result to unplanned urban sprawl which was done

by people during the lack of general security of Egyptian revolution. The results indicated that there was a regular trend characterized in most classes and that the change in different land use/land cover classes ranged between increase and decrease areas. A continuous increase in agricultural, urban, fish farms and natural vegetation areas and a continuous decrease in water bodies and sand areas were detected in the studied area. The agricultural area recorded the highest increase during the period from 1987 to 2000 (305296.1 ha) while it increased by 170578.1 ha, during the period from 2000 to 2015. However, in urban area, the highest increase was recorded during the period from 2000 to 2015 followed by the period 1987-2000 with mean values of 97940.8 and 53112.6 ha, respectively. The analysis of the results showed that most of Egyptian Delta governorates have been significantly affected by the different classes of land use/land cover change due to agriculture activities, urban growth as a result of human activities dynamic impact.

链接:

<http://agri.ckcest.cn/file1/M00/06/5E/Csgk0Fxt4tCAZ3bIABSbHgwNBrs145.pdf>

5. Reconsideration of the methodology for estimation of land population carrying capacity in Shanghai metropolis

作者: Yishao Shi; Shouzheng Shi; Hefeng Wang

文献源: Science of the Total Environment,2019

摘要: How to estimate the urban land carrying capacity (ULCC)? Based on our previous research, this paper made improvements in two aspects: One is to subdivide land use types from four subspaces to seven subspaces (i.e. urban construction, industrial development, agricultural production, rural living, green ecological, other ecological and other subspaces), so as to distinguish more detailed the urban functional and spatial heterogeneities; the other is to reconstructing evaluation index system and estimate both maximum and appropriate population carrying capacities. The results demonstrate as follows:① There is a significant difference between the population capacities in different types of subspaces. The urban construction and industrial development subspaces are the main carrier of population and economy. The agricultural production and rural living subspaces have low population capacities. The ecological protection and other subspaces have only a very low share of load. ② The appropriate and maximum population capacities of Shanghai metropolis are estimated to be approximately 2023 million persons and 2730 million persons, respectively, in 2009. There were 22.1028 million permanent residents of Shanghai

in 2009, approaching the limit of the appropriate population capacity but lower than the limit of the maximum population capacity. ③ The methodology for estimation of maximum and appropriate ULCC in this paper not only gives the quantitative range, but also can provide the basis for growth control of urban population.

链接:

<http://agri.ckcest.cn/file1/M00/06/5E/Csgk0FxT61CANv4RAEf-JkUitG575.pdf>

6. Comprehensive evaluation and scenario simulation for the water resources carrying capacity in Xi'an city, China

作者: Zhaoyang Yang; Jinxi Song; Dandong Cheng, et al.

文献源: Journal of Environmental Management,2019

摘要: The quantity and quality of water resources are of great importance in maintaining urban socio-economic development. Accordingly, substantial research has been conducted on the concept of the water resources carrying capacity (WRCC). In this study, analytic hierarchy process (AHP) and system dynamics (SD) models were combined to construct a multi-criteria evaluation system of the WRCC and a socio-economic/water resources SD model for Xi'an. The developmental trends of the society, economy, water supply/demand, and wastewater discharge were obtained from 2015 to 2020 using five scenarios designed for distinct purposes; these scenarios and trends were comprehensively evaluated using a combination of qualitative and quantitative analyses. The results indicated that the WRCC (0.32 in 2020) in Xi'an will shift from a normal to a poor state if the current social development pattern is maintained; therefore, we conclude that the socio-economic development of Xi'an is unsustainable. However, under a comprehensive scheme, the WRCC index (0.64 in 2020) will increase by 48% compared with the WRCC index under a business-as-usual scenario. Further, some practical suggestions, including the promotion of industrial reforms and the improvement of water-use efficiency and recycling policies, were provided for improving the regional WRCC.

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http://agri.ckcest.cn/file1/M00/06/5E/Csgk0FxT6ruAKr1bACGU2SI_mvW227.pdf

7. Assessing China's agricultural water use efficiency in a green-blue water perspective: A study based on data envelopment analysis

作者: Qingling Geng; Qingfu Ren; Rachael H. Nolan, et al.

文献源: Ecological Indicators,2019

摘要: Uneven water resources and growing food demand due to an increasing population bring challenges to China. One important mechanism to address these challenges is to enhance water use efficiency (WUE). This requires information on current efficiencies in water use for agricultural production. In this study, we provide a benchmarking tool to assess relative agricultural WUE in 31 provinces in China during 2003-2013. Data Envelopment Analysis (DEA) was used with both green-blue water and blue-only scenarios. Results show that China's agricultural WUE has improved evidently after 2008. Overall technical efficiency (TE) and the pure technical efficiency (PTE) in China based on the green-blue scenario are relatively high, with the average potential increase less than 10% (8% and 4%, respectively). However, there is a larger potential for blue water use efficiency (14% and 7% respectively). The PTE in Northern China (NC) is higher than that in Southern China (SC) while the TE in NC is lower under green-blue scenario. Moreover, the TE and PTE in NC are lower than that in SC under blue-only scenario. These results indicate that green water management techniques in NC are superior to SC but the scale efficiency (SE) in NC is lower. There are four provinces where the efficiency values are on the frontier in four cases, i.e. two scenarios (green-blue and blue-only) and two assumptions in DEA, but fourteen provinces where the efficiency values are not on the frontier in any case and most of them were located in SC. Our results also suggest that improving SE can substantially contribute to national WUE, but exploring the solutions to enhance blue water use efficiency in China is also a key task in the future works. The research results have important implications for China and different provinces to improve agricultural WUE by water policies and management.

链接:

http://agri.ckcest.cn/file1/M00/06/5E/Csgk0Fxt5BmAGCM6ABJL-DWMq_k146.pdf

8. Integrated modeling framework for evaluating and predicting the water resources carrying capacity in a continental river basin of Northwest China

作者: Lei Wu; Xiaoling Su; Xiaoyi Ma, et al.

文献源: Journal of Cleaner Production,2019

摘要: Although water is the material basis of human being survival and development, it exhibits inhomogeneity in time and space, which makes it difficult to accurately evaluate the supply and consumption relationship of water resources and its carrying capacity in arid

regions. An innovative integrated modeling framework was proposed to dynamically evaluate and predict the water balance and water resources carrying capacity in a continental river basin of Northwest China by coupling the Soil and Water Assessment Tool (SWAT), water resources supply and consumption model, Principal Component Analysis (PCA) and Fuzzy Comprehensive Evaluation (FCE). The following results were obtained: i) the integrated methodology between the SWAT distributed hydrological model and the water resources evaluation model is an important tool for predicting the regional water resources carrying capacity, which has dynamic, advanced, comprehensive and systematic features; ii) from 2000 to 2007, the available water resources in the Heihe River Basin were almost all in the state of shortage, although the water shortage rate decreased gradually and changed from 35% in 2006 to -0.49% in 2007, with 2001 exhibiting the most serious drought period (maximum water shortage rate of 62.77%); iii) the water resources carrying capacity in the upper reaches of Heihe River Basin from 2010 to 2015 showed an overall increasing trend; iv) the pressure risk on the water resources carrying capacity in the upper reaches of Heihe River Basin from 2015 to 2025 indicates gradual and specific changes, with good results observed in 2015, moderate results observed in 2020, and relatively poor results observed in 2025; and v) collaborative and sustainable water resources management strategies are recommended from four dimensions, water resources amount, water environment capacity, water spaces and water dynamics. The results may provide insights for guiding the optimal scheme design of water resources allocation in a continental river basin with arid regions.

链接:

<http://agri.ckcest.cn/file1/M00/06/5E/Csgk0FXT8-iAJlwABkAXGqKhDM223.pdf>

9. Green growth and structural change in Chinese agricultural sector during 1997–2014

作者: Zhiyang Shen; Tomas Baležentis; Xueli Chen, et al.

文献源: China Economic Review, 2019

摘要: Green growth has become a new direction for Chinese economic development in the 21st century. Indeed, sustainable agricultural development is particularly important in China due to limits on resources and the presence of the largest population in the world. In this paper, we propose a novel decomposition of the overall inefficiency into three components of technical, mix, and scale effects at aggregate level by allowing for desirable and undesirable outputs in a non-parametric framework. We empirically investigate economic and environmental performance associated with resource misallocation (represented by

input/output mix) in Chinese agricultural sector across the 31 provinces over the period 1997-2014. Our results show that average overall inefficiency in Chinese agricultural sector is 9.13% during the sample period, which suggests there exists a 7.94% possible improvement for gross output value and 1.19% potential reduction for carbon emission. Moreover, we find inefficiency is mainly due to the mix effect that requires an improvement in reallocation of inputs and this may be related to the ongoing supply side structural reforms in China. We also present a dual model of by-production technology for shadow price analysis and report upward trended carbon abatement costs in Chinese agriculture.

链接:

<http://agri.ckcest.cn/file1/M00/06/5E/Csgk0FXT5MGAEvs6AAAtAF5FnxQA768.pdf>

10. Is urban agriculture urban green space? A comparison of policy arrangements for urban green space and urban agriculture in Santiago de Chile

作者: Maria Contesse; Bas J.M. van Vliet; Jennifer Lenhart

文献源: Land Use Policy,2019

摘要: Urban green spaces are crucial for citizens' wellbeing. Nonetheless, many Latin American cities struggle to provide sufficient and equitable green space distribution for their citizens. By looking at the Chilean capital Santiago as an example, this paper examines whether the growing urban agriculture movement provides a feasible opportunity to increase public urban green space access. It does so by using the policy arrangement approach to analyse change and stability in two policy domains: urban green space planning and urban agriculture. The paper investigates urban green spaces and urban agriculture and the role of practitioners, urban planners and policymakers. The analysis found opportunities for urban agriculture to facilitate the expansion of urban green spaces in Santiago if policy mechanisms enable private or public spaces to be maintained by citizen organizations. Such mechanisms may, however, encounter resistance from public agencies, as it is unresolved who is involved and who benefits from urban agriculture. The paper concludes that urban agriculture is an opportunity for urban greening in Santiago, although changes are needed in how green areas are planned and conceived. Additionally, urban agriculture should not be understood as a substitute for parks but as a complementary form of green space provision with a distinctive value.

链接:

<http://agri.ckcest.cn/file1/M00/06/5E/Csgk0FXT44KABas7ACiXPog-dak928.pdf>

【研究报告】

1. Negative Emissions Technologies and Reliable Sequestration: A Research Agenda (2018)

发布源: The National Academy of Sciences, Engineering, and Medicine

发布时间: 2018-06-01

摘要: In 2015, the National Academies published Climate Intervention: Carbon Dioxide Removal and Reliable Sequestration, which described and initially assessed NETs and sequestration technologies. This report acknowledged the relative paucity of research on NETs and recommended development of a research agenda that covers all aspects of NETs from fundamental science to full-scale deployment. To address this need, the National Academies convened the Committee on Developing a Research Agenda for Carbon Dioxide Removal and Sequestration to assess the benefits, risks, and “sustainable scale potential” for NETs and sequestration and to define the essential components of a research and development program, including its estimated costs and potential impact (Box S.1). The full Statement of Task is presented in Box 1.3. The committee held a series of public workshops and meetings to inform its deliberations and the writing of this report.

链接:

<http://agri.ckcest.cn/file1/M00/06/5E/Csgk0FxT8LGABEsHANjCamXWcA822.pdf>

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