

## 《中国农业发展战略研究》专题快报

2019年第19期（总第35期）

中国工程科技知识中心农业分中心

中国农业科学院农业信息研究所

2019年10月5日

### 【动态资讯】

#### 1. 大理州：全面治理农业面源污染

【中华人民共和国农业农村部】近年来，大理白族自治州建立生态补偿机制，在大理市、洱源县实施了“三禁四推”工作：禁止销售使用含氮磷化肥、推行有机肥替代，禁止销售使用高毒高残留农药、推行病虫害绿色防控，禁止种植以大蒜为主的大水大肥农作物，推行农作物绿色生态种植、推行畜禽标准化及渔业生态健康养殖，努力把洱海流域建设成国家农业绿色发展先行区，云南省打造世界一流“绿色食品牌”示范区。大理市、洱源县以优化空间布局为龙头，全力打造规模化主导产业；以实施‘三禁四推’为抓手，全力推进绿色生态转型发展；以资源化利用水平为切入点，着力推进畜牧业平稳健康发展；以培育新型农业经营主体为重点，加快推进适度规模经营；以创建名牌为突破口，着力提升农产品加工营销水平；以发展休闲农业为载体，着力推进一二三产业融合发展。2018年洱海流域大蒜种植面积比上年减少了10.18万亩，实施生态化种植20.54万亩，禁养区46家畜禽规模养殖场全部完成关停或搬迁，洱海流域内每年16万吨畜禽粪便得到资源化利用，农业面源污染防治取得实质性突破。目前，洱海流域的“三禁四推”工作正在强力推进，已经与45座冷库、75户经营户、40632户农户签订了承诺书，加快推进流域范围内全面禁种大蒜工作。同时，实施水稻、烤烟等绿色生态种植18.3万亩、“水稻+”稻渔综合种养示范6300亩，发展水果、中药材等多年生作物5.75万亩，新增流转土地9500亩。

链接:

<http://agri.ckcest.cn/file1/M00/0E/CA/Csgk0F2QXhOAUsvDAAR9SKkdQRc890.pdf>

#### 2. 数字乡村推动农业农村高质量发展

【中华人民共和国农业农村部】今年5月，中共中央办公厅、国务院办公厅印发了《数字乡村发展战略纲要》，纲要明确提出，数字乡村建设既是乡村振兴的战略方向，也是建设数字中国的重要内容。作为整建制国家现代农业示范区、全国首批整体推进农业农

村信息化示范基地，鹤壁市高度重视数字乡村建设，以“产业数字化、数字产业化”为导向，探索建设了“农田数字化、园区数字化、村庄数字化、政务数字化、数字产业化”等五大实践模式，不断促进着农村一二三产融合发展，助力农业“弯道超车”，改变农村面貌，为乡村振兴提供强劲动力。近年来，该市大力实施“数字农田”工程，在高标准农田项目区建成了“市有平台、县有中心、乡有信息站、田有采集点”覆盖全域的信息网络，并在全市81个粮油绿色高质高效创建示范片实现“双覆盖”，62个站点安装物联采集仪器，布设仪器2400台。同时，该市高效利用星陆双基遥感农田信息协同反演技术等现代信息技术应用，自动收集环境要素、农艺参数等并实时传输、智能分析、及时发布，做到农田生态环境、苗情、灾情的可视化、数据化处理，把预警信号、防范措施及时传递到农业生产一线，进一步提升了粮食生产现代化水平。据初步统计，通过实施“数字农田”等工程，鹤壁市小麦、玉米平均亩产分别增加36公斤、71公斤，化肥和农药利用率提高6%，每年每亩节约人工、化肥、排灌等成本133元，新增效益359元，在实现农业绿色发展的同时，促进了粮油增产、农业增效和农民增收。

链接:

<http://agri.ckcest.cn/file1/M00/0E/CA/Csgk0F2QXjyAE0KdAAImYKd-gtY060.pdf>

### 3. Artificial Intelligence in agriculture and environmental management

**【AgroNews】** Climate change affects our environment in many different ways: crop failure, river shipping being hampered due to low water, floods and storm damage in the cities are only a few examples of the factors that have been increasingly affected our lives in recent years. Researchers at Ruhr-Universität Bochum (RUB) are developing digital applications intended to make it easier for various actors to better cope with weather events in the future. Dr. Benjamin Mewes and Dr. Henning Oppel from the Institute of Engineering Hydrology and Water Resource Management are deploying Artificial Intelligence in their joint project “Okeanos”. While Benjamin Mewes focuses on irrigated agriculture, Henning Oppel is figuring out how to better predict flood events. Farmers could save a lot of water. Agriculture is the largest consumer of fresh water globally. “Most of the time, farmers employ their expertise and experience to decide when and how to water their soil,” says Mewes. However, this results in hundreds of thousands litres of this valuable resource being wasted. This could be remedied by a computer software that provides a recommendation for action based on all the important factors for irrigation or better still, controls the irrigation systems itself.

链接:

<http://agri.ckcest.cn/file1/M00/0E/CA/Csgk0F2QXaWAEuaZAALDvLQtUNE263.pdf>

#### 4. 遥感作“天眼” 农业更智慧

【中华人民共和国农业农村部】通过分析农作物遥感影像数据，可精准客观获取农作物种植面积、分布情况、农业灾害情况等，并可以预测作物产量，如同为农业生产装上了一双“科技眼”。在郑州举办的中国卫星导航与位置服务第八届年会暨中国北斗应用大会上，记者现场见证了河南省农业遥感监测技术的“神奇”之处。指导农业种植、保障粮食安全的“千里眼”。点开河南省农业遥感信息三维展示系统，省农科院农经信息所农业遥感研究室主任王来刚向记者一一展示：“这是我省秋季作物种植分布情况，这是示范区茶叶和大蒜种植分布情况……”屏幕上，各种作物的种植面积及结构一目了然，不仅可为政府决策提供参考，同时还可提前预测市场供给、指引相关商家在农产品收购上合理布置人力物力。以旱灾监测为例，过去需要大量人员带着土壤墒情检测仪一个点一个点采集数据，再层层上报，效率低、成本高，各种人为因素也会影响数据的客观性。农业遥感监测技术效率高、范围大，实现了灾情监测数据的精准客观，可供农业决策部门及时作出反应，为制定抗旱救灾措施提供信息支持。同时，将遥感监测技术应用到农业保险中，可提高农业承保和理赔精度与效率，为农民尽快获得保险定损赔偿提供帮助。

链接:

<http://agri.ckcest.cn/file1/M00/0E/CA/Csgk0F2QXfOAcKI8AARgdU7OkHA700.pdf>

#### 5. Study: Climate change could cause drought in wheat-growing areas

【EurekAlert!】In a new study, researchers found that unless steps are taken to mitigate climate change, up to 60 percent of current wheat-growing areas worldwide could see simultaneous, severe and prolonged droughts by the end of the century. Wheat is the world's largest rain-fed crop in terms of harvested area and supplies about 20 percent of all calories consumed by humans. The risk of widespread drought in wheat production areas is four times the level scientists see today, said Song Feng, associate professor of geosciences and the second author on the study published in the journal Science Advances. Such droughts would be a shock to the food production system. Given present-day weather patterns, severe drought could affect up to 15 percent of current wheat-growing areas, the study states. Researchers found that even if global warming is held to 2 degrees Celsius above pre-industrial levels, the target of the Paris Agreement, up to 30 percent of global wheat production areas could see simultaneous drought.

链接:

<http://agri.ckcest.cn/file1/M00/0E/CA/Csgk0F2QYXiAYozMAAKjkvdo7ss259.pdf>

## 6. 莱西市围绕“三减一变” 促进农业绿色发展

【中华人民共和国农业农村部】近年来，莱西市围绕质量兴农、绿色兴农战略，以农业供给侧结构性改革为主线、绿色发展为导向，坚持标本兼治，深入推进化肥农药使用量零增长行动，创新循环农业发展模式，全面治理农业面源污染，推动农业绿色发展，助力乡村振兴和美丽乡村建设。肥药双减，实现质量和效益同步提升。一是着力降低化肥施用量。大力推广减肥增效技术，以果树、设施蔬菜栽培集中区域为重点，实施水肥一体化技术，通过配套滴灌设施，加大复合肥、水溶性肥料、缓释肥施用比例，实现施肥和灌溉同步进行、一体化管理，显著提高肥料利用率。二是着力推进农药减量行动。推广绿色防控技术，依托全国果菜茶病虫害全程绿色防控苹果试点县优势，建设农作物病虫害绿色防控示范区12个，辐射带动36万亩农作物应用病虫害绿色防控技术，绿色防控覆盖率达到16%。减少污染，推进耕地保护与质量提升。一是开展地膜污染防治，有效控制源头污染。二是实施农药包装物回收，着力减少二次污染。变废为宝，打造资源化综合利用新业态。一是推进畜禽粪污资源化利用。重点实施国家畜禽粪污资源化利用整县推进项目，通过建设3处大型沼气工程、4处畜禽粪污资源化利用中心、1处粪尿处理中心、1套畜禽粪污综合收储运体系，全面提高畜禽粪污综合利用率。二是促进秸秆全量利用。大力推广秸秆肥料化、原料化、饲料化利用，引导使用装有切碎、打捆装置的收获机械，推广机械深耕加秸秆精细化粉碎混埋还田、秸秆快速腐熟、机械化青贮饲料、秸秆微生物发酵等技术，实现秸秆直接还田和回收利用。据了解，全市小麦秸秆机械化还田面积达到95%以上，农作物秸秆综合利用率达到94%。

链接:

<http://agri.ckcest.cn/file1/M00/0E/CA/Csgk0F2QXcmAAkwFAAvnO5Z113o464.pdf>

## 7. Soap from straw -- Scientists develop eco friendly ingredient from agricultural waste

【EurekAlert!】A scientist has discovered a way of using one of the world's most abundant natural resources as a replacement for manmade chemicals in soaps and thousands of other household products. An innovative research project, published this month and led by the University of Portsmouth, has demonstrated that bails of rice straw could create a 'biosurfactant', providing an alternative non-toxic ingredient in the production of a vast variety of products that normally include synthetic materials which are often petroleum based. The biotechnology project set out to solve one of the planet's most pressing environmental problems, looking for a way of reducing the amount of manmade chemicals in everyday life. It has been co-supervised by the University of Portsmouth's Centre for Enzyme Innovation, working in conjunction with Amity University in India and the Indian

Institute of Technology. The study was looking for a natural replacement for chemical surfactants, a main active ingredient in the production of cleaning products, medicine, sunscreen, make-up and insecticides. The surfactant holds oil and water together, helping to lower the surface tension of a liquid, aiding the cleaning power and penetration of the product. Scientists behind the research believe the use of biosurfactants created from rice straw or other agricultural waste could have a positive ecological effect in a number of ways.

链接:

<http://agri.ckcest.cn/file1/M00/0E/CA/Csgk0F2QZfWAUetJAAIjfUy5bs8408.pdf>

#### **8. EOS launches satellite monitoring technology, promises to boost farm efficiency 20%**

**【AgroNews】** EOS Earth Observing System, the leading retailer for remote sensing satellite data has launched its digital agri platform - EOS Crop Monitoring - for the North American market. It combines AI, satellite vegetation images and weather data to deliver comprehensive information on any farmlands. Depending on territorial layout of the landbank, the cost advantage of this technology together with the entire suite of precision agriculture can vary between 5-20%. The platform enables farmers, insurers, traders and other subject matter experts to use satellite imagery for the benefit of their business. "Agriculture has never been easy, but the farming conditions are becoming more and more complicated. The global resources are stretched while the population is growing. This is why implementing technology-based solutions is crucially important. We want to help agri entrepreneurs from all around the world to achieve better results by wasting less, getting more, and becoming more sustainable in general. Basically, we suggest a set of tools to benefit everyone - the user, the consumer and the planet," - says Alexander Sakal, CSO of EOS Crop Monitoring.

链接:

<http://agri.ckcest.cn/file1/M00/0E/CA/Csgk0F2QXXCAdDmFAAJUycutW8k250.pdf>

#### **9. Reduce, reuse, recycle: the future of phosphorus**

**【Crop Science Society of America】** When Hennig Brandt discovered the element phosphorus in 1669, it was a mistake. He was really looking for gold. But his mistake was a very important scientific discovery. What Brandt couldn't have realized was the importance of phosphorus to the future of farming. Phosphorus is one of the necessary ingredients for



healthy crop growth and yields. When farms were smaller and self-sufficient, farmers harvested their crops, and nutrients rarely left the farm. The family or animals consumed the food, and the farmer could spread manure from their animals onto the soil to rebuild nutrients. This was a fairly closed-loop phosphorus cycle. There is an urgent need to increase phosphorus use efficiency in agroecosystems, There are many chemical, physical and biological processes that affect the availability of phosphorus to crops.

链接:

<http://agri.ckcest.cn/file1/M00/0E/CA/Csgk0F2QXGqACoq1AAUzglSvYIM961.pdf>

## 10. 土地经营权入股试点已扩大到14省100多个县

【中华人民共和国农业农村部】9月11日，从在四川省崇州市举行的土地经营权入股发展农业产业化经营试点交流活动上获悉，土地经营权入股试点取得阶段性成效，已由2015年的7省7县扩大到14省100多个县。土地经营权入股让企业获得了长期稳定的生产经营要素，让农民分享到了更多的产业链增值收益，有效地促进了一二三产业融合发展。据介绍，土地经营权入股是促进农村一、二、三产业融合发展，带动农民脱贫致富的重要渠道，是党中央、国务院确定的农村改革重要任务之一。按照党中央、国务院关于深化农村改革和乡村产业振兴的总体部署，各地积极推进土地经营权入股试点工作，取得阶段性成效。农业农村部要求，要以全面深化农村改革为契机，以促进产业融合发展为引领，以解决实际困难和挑战为抓手，稳妥推进土地经营权入股试点工作，促进乡村产业融合发展。重点是抓链条延伸，促业态融合；抓制度保障，促主体融合；抓平台载体，促要素融合；抓机制创新，促利益融合。要深入贯彻落实《国务院关于促进乡村产业振兴的指导意见》，强化试点探索，强化部门协调，强化宣传引导，争取更大范围、更深程度地开展土地经营权入股试点探索。

链接:

<http://agri.ckcest.cn/file1/M00/0E/CA/Csgk0F2QXriAA83LAANK2Qu2JEI983.pdf>

## 【文献速递】

### 1. Applications of rice husk ash as green and sustainable biomass

作者: Hossein Moayedi; Babak Aghel; Mu'azu Mohammed Abdullahi, et al.

文献源: Journal of Cleaner Production, 2019

摘要: Research on agricultural wastes management, as a natural resource material, is state of the art and desirable subject in many engineering subcategories. The benefits include ease of access and implementation, affordability and environmental friendliness. Optimal

use of agricultural wastes has always been a concern for humans, and the utilization of them for various purposes is an efficient way of environmental management. Among bio-waste ashes, some of them such as rice husk ash has a high pozzolanic content that stems from their abundant silica concentration. The significantly low reaction time and the high utilization of these materials, when compared to traditional mechanical methods, has generated interest from researchers. The present paper surveys the experimental studies of biomass waste ash as a pozzolanic additive for engineering applications. This paper initially provides some essential background information includes agricultural waste ash preparation procedures and its composition, then reviews the various physical and chemical pretreatment methods. Finally, the paper explores the potential application of rice husk ash as green and sustainable material in various industries.

链接:

[http://agri.ckcest.cn/file1/M00/0E/CA/Csgk0F2QPv2ACAFvAA\\_TunMD3jI325.pdf](http://agri.ckcest.cn/file1/M00/0E/CA/Csgk0F2QPv2ACAFvAA_TunMD3jI325.pdf)

## **2. Incorporation of natural waste from agricultural and aquacultural farming as supplementary materials with green concrete: A review**

作者: Salmabanu Luhar; Ta-Wui Cheng; Ismail Luhar

文献源: Composites Part B ,2019

摘要: The principal objective of this review manuscript is to reassess the studies on the incorporation of emerging natural wastes from agricultural farming (NWAGF) and natural wastes from aquacultural farming (NWAQF) as supplementary material in the development of diverse green concretes. Intending to dispose off or at least prevent these types of wastes from converting to heaps of health hazards, the systematic consumption of them is essential. This paper reviews applications of some of the natural wastes of agriculture farming obtained from Bamboo; Corn or Maize; Barley; Wheat; Olive; Bananas or Plantains; Elephant grass; Sisal; and Date or Date Palm, as well as of aquaculture farming achieved from Oyster and Mussel along with Periwinkle shells to utilize it as partial replacement of aggregates or binder in green concrete. Thus, systematic applications of these wastes will not only facilitate to preserve restricted natural resources of accustomed aggregates of concrete but also lend a hand to solve the predicaments of landfilling and health hazards owing to its disposal in open spaces. Replacement of OPC by these wastes escorts to mitigate CO<sub>2</sub> emissions into the atmosphere which, in turn, provides relief to global warming. This paper also reviews the effect of the said wastes on the workability, strength

and durability performance of the green concrete. The principal findings of this review revealed that NWAGF and NWAQF as supplementary materials could be successfully incorporated through partial replacement of OPC or fine or coarse aggregates in producing green concrete mixtures facilitating to protect environments from contaminations. Nonetheless, a momentous inevitability is experienced to comprehend it more appositely. The best verdict of this review paper state that even though the addition of NWAGF and NWAQF in green concrete demonstrated some of the attributes inauspiciously, but suitable treatment techniques and proper selection of these supplementary materials would unquestionably smooth the progress of the production of green concrete with enhanced performances. Novel updated data to know a variety of NWAGF and NWAQF are essential for the incorporation of apposite supplementary materials to develop environmental friendly sustainable green concrete that not merely conserve the severe degradation of restricted natural resources but also shield from the pessimistic impact on environments, air, groundwater, soils, etc.

链接:

<http://agri.ckcest.cn/file1/M00/0E/CA/Csgk0F2QPZuAUIYoAFLVcsVU2N0395.pdf>

### **3. Ecological intensification of agriculture in drylands**

作者: Pablo García-Palacios; María Remedios Alarcón; José Luis Tenorio, et al.

文献源: Journal of Arid Environments,2019

摘要: Drylands, which represent the world largest biome and support approximately 38% of the global human population, offer harsh climate and poor soil for agriculture. These environmental conditions are expected to get even harsher with climate change, challenging the potential to close the yield gap in these areas. In this short review, we focus on ecological intensification, which aims to replace external agricultural inputs (e.g. inorganic fertilizer) with farming practices optimizing ecosystem services beneficial for crop yield. We first highlight important management goals for dryland agriculture sustainability, then identify two practices of ecological intensification (conservation agriculture and intercropping) that can help to meet such goals, and finally propose guidelines for future research. The temporal stability of crop yield and its nutritional diversity, besides total yield, are key components of crop production in dryland agriculture. Conservation agriculture and intercropping seem adequate to foster crop yield in drylands, via increased soil carbon accumulation, water and nitrogen retention, if they are adapted to the particular climatic and socioeconomic conditions found in these areas. Yield stability is not affected by



conservation agriculture, and there are not enough studies conducted in drylands to evaluate the stabilizing role of intercropping. To move this field forward in dryland areas, we propose multifunctional approaches integrating trade-offs between crop yield and ecosystem services, long-term studies addressing the independent contribution of the different conservation agriculture components, and identification of crop mixtures with an optimal distribution of plant functional traits.

链接:

<http://agri.ckcest.cn/file1/M00/0E/CA/Csgk0F2QPI2AW-SyAAyBf5H4yrQ180.pdf>

#### 4. Quantification of the ecosystem carrying capacity on China's Loess Plateau

作者: Wei Liang; Bojie Fu; Shuai Wang, et al.

文献源: Ecological Indicators,2019

摘要: Revegetation, especially afforestation, has served as an important tool for controlling desertification. However, revegetation in water-limited regions will inevitably reduce the water available for socio-economic systems, which is poorly considered in decision-making on sustainable ecosystem management. This paper proposed a framework to determine the threshold of vegetation productivity (i.e., ecosystem carrying capacity), corresponding to available water resources for ecosystems (i.e., annual precipitation minus water demand for socioeconomic systems) on the Loess Plateau. The average annual ecosystem carrying capacity (ECC) during 1982—2012 is  $577 \pm 124 \text{ g C m}^{-2} \text{ yr}^{-1}$ , with spatial gradients increasing from northwest to southeast. Vegetation in rocky mountain areas has the largest value of  $833 \pm 200 \text{ g C m}^{-2} \text{ yr}^{-1}$ . Factorial analysis suggests that changes in precipitation and human water use contributed to 55% and 45% of the multi-decadal changes in regional ECC, respectively. Meanwhile, due to revegetation, 26 counties on the Loess Plateau, mainly in the southeast and eastern parts, have exceeded the ECC threshold during the study period. An additional 138 counties have a high potential for water competition between the ecosystems and socio-economic systems. At the regional scale, there are 9 years (~30% of the study period) during which the ECC threshold has been exceeded, especially after 1997. Considering the climate change in the future and the growing demand for water in socioeconomic systems, the corresponding ECC threshold will increase by 636%. We believe that these findings can provide reference for policy-makers to make decisions towards ecosystem sustainability while meeting human needs for water resources.

链接:

[http://agri.ckcest.cn/file1/M00/0E/CA/Csgk0F2QQDCAbZDxAH\\_pNXHJITA510.pdf](http://agri.ckcest.cn/file1/M00/0E/CA/Csgk0F2QQDCAbZDxAH_pNXHJITA510.pdf)

## 5. 安徽省农业绿色发展水平动态预测及路径研究

作者: 靖培星; 赵伟峰; 郑谦, 等

文献源: 中国农业资源与区划,2019

摘要: [目的]在农业供给侧结构性改革背景下,农业绿色发展是必然要求。安徽省作为农业大省,研究其农业绿色发展水平和演化规律具有重要借鉴意义。[方法]为科学测度安徽省农业绿色发展水平并研究其动态发展路径,构建了安徽省农业绿色发展评价指标体系,以2015年度为初始年进行了评价。将动态规划理论拓展到区间直觉模糊集,利用区间直觉模糊集的可能度函数、得分函数和互补判断矩阵建立了区间直觉模糊动态规划模型,融和安徽省农业委员会"十三五"工作重点,对其农业绿色发展水平进行了动态预测并给出了最优发展路径。[结果]通过模型计算,到2020年,安徽省农业绿色发展水平最优状态为"中等",未来5年的工作重点依次为:第一年应该加大高标准农田建设、中间两年应加大农业科技装备投入,后两年应该注意产业结构调整的同时,继续加大农业科技装备投入。[结论]建立的评价指标体系能客观反映安徽省农业绿色发展水平,区间直觉模糊动态规划模型能够对安徽省农业绿色发展路径提供科学指导和建议。

链接:

<http://agri.ckcest.cn/file1/M00/0E/CA/Csgk0F2QQ66ADokzAAOrsKpcuKQ707.pdf>

## 6. 中国农村绿色发展水平的时空差异及驱动因素分析

作者: 余威震; 罗小锋; 薛龙飞, 等

文献源: 中国农业大学学报,2019

摘要: 为探讨中国农村绿色发展水平的时空差异与驱动因素,从生产、生活、生态3个维度构建指标体系,在测算出各地区2005—2014年农村绿色发展水平的基础上,运用Dagum基尼系数法分析其时空差异,并构建计量经济模型探讨其影响因素。结果显示:1)中国农村绿色发展水平整体较好且处于上升趋势,其中东部>中部>西部>东北;2)中国农村绿色发展水平总体差距不断扩大,东部与西部的区域内差距相对较大,而总体差距主要来自于区域间差异;3)中国农村绿色发展水平与人均GDP、城镇化水平、农业科技水平以及农户投资能力显著正相关;各区域农村绿色发展的驱动因素同中存异,人均GDP对东部和西部、城镇化水平则对中部和东北均有显著促进作用,但城镇化水平和生态保护社会投资对西部农村绿色发展产生显著负向影响。

链接:

<http://agri.ckcest.cn/file1/M00/0E/CA/Csgk0F2QQx6AS4tLAAbhloidAaU567.pdf>

## 7. 水资源承载力预警研究进展

作者: 金菊良; 陈梦璐; 郦建强, 等

文献源: 水科学进展,2019

摘要: 针对水资源承载力预警方法的研究,通过揭示水资源-社会经济-生态环境复合系统间各要素的相互作用机制,可有效地对水资源承载力的突发和异常状况进行事前行为评价和预警,是资源环境承载能力预警研究的关键组成部分。为此,借鉴有关学科领域对预警系统现有的研究成果,立足于水资源承载力预警系统的概念和机制,从诊断、预测、评价和调控方面对水资源承载力预警的主要方法进行综述,并提出水资源承载力预警未来研究重点和主要发展方面的建议,包括:(1)进一步完善水资源承载力预警系统的概念界定;(2)构建水资源承载力预警指标体系;(3)深入水资源承载力预警系统的整体研究;(4)重视实现水资源承载力预警动态性预测;(5)进一步加强水资源承载力调控措施方面的研究。

链接:

<http://agri.ckcest.cn/file1/M00/0E/CA/Csgk0F2QQYGAeeseAAel90pYTKo454.pdf>

## 8. 西藏自治区水土资源承载力监测预警研究

作者: 高洁; 刘玉洁; 封志明, 等

文献源: 资源科学,2019

摘要: 水土资源是自然资源的重要组成部分,其对经济社会发展的承载能力是衡量人地关系协调程度和区域可持续发展水平的重要标尺。开展水土资源承载力监测预警研究,可以为有效调控区域资源环境压力提供科技支撑。本文以西藏自治区为例,首先兼顾资源、环境和生态属性,构建包括水资源、水环境、生产性用地及生态用地在内的区域水土资源承载力监测预警指标体系,然后基于国际、国家、行业标准、规定或相关研究结果,率定不同指标的关键阈值,进而从高到低依次划分出红色、橙色、黄色三个预警等级,在此基础上选取2005—2014年作为研究时段,利用层次分析法和专家打分法确定指标权重,对构建的西藏自治区水土资源承载力监测预警指标体系进行实证分析。研究发现:水功能区水质达标率、人均粮食产量、人均耕地面积和草地退化程度等指标的变化对区域水土资源承载力影响较为明显,需加强应对和调控措施;区域水土资源综合承载力10年间呈上升趋势,由橙色预警区间降至蓝色预警区间,西藏自治区水土资源承载状况有所好转。

链接:

<http://agri.ckcest.cn/file1/M00/0E/CA/Csgk0F2QQf6AVTPVAEIVcn-iDq8535.pdf>

## 9. 区域资源环境综合承载力研究进展与展望

作者：吕一河；傅微；李婷，等

文献源：地理科学进展,2019

摘要：区域资源环境综合承载力是人地关系和谐和可持续发展的重要基础,也是自然地理综合研究的前沿及热点内容。近年来,区域资源环境综合承载力研究取得了长足进展,体现在:(1)建立了综合、广泛的评价指标体系;(2)资源环境综合承载力与人地关系的调适;(3)综合研究方法的应用;(4)对资源环境综合承载力的时空动态研究的关注及尝试。目前,资源环境综合承载力研究应用于国土空间开发、产业规划、灾后重建、资源环境监测及预警等领域。未来仍需完善指标体系的构建、研究尺度及动态变化等方面加强研究,以此深化综合自然地理理论及实践研究,为区域资源、社会和生态环境可持续性研究提供支撑。

链接:

<http://agri.ckcest.cn/file1/M00/0E/CA/Csgk0F2QQneAMQo7ABNCqmp6nng759.pdf>

## 10. The flexible application of carrying capacity in ecology

作者：Eric J. Chapman; Carrie J. Byron

文献源：Global Ecology and Conservation,2019

摘要：Carrying capacity encompasses a broad collection of approaches used to better understand biotic interactions in ecosystems and is often applied with no explicit regard to its historical origin. In this paper, we reviewed the primary literature to examine how carrying capacity is applied in ecology. We focused our review on ecosystem studies—studies that frame their results at the ecosystem level—published after the 1950s and highlight emerging trends of this concept. We found that while carrying capacity offers some underlying commonalities, a wide range of definitions and approaches hinders a unified framework to better understand biotic ecosystem interactions. Not surprisingly, these studies most often use K—the number of individuals that the environment “can support” in a given area—to define carrying capacity, despite considerable ambiguity and uncertainty in this approach. Furthermore, the studies that we reviewed spanned several levels of ecological organization: molecules to communities and up to landscapes. To add further complexity, it is not clear whether carrying capacity was intended as a dynamic concept subject to temporal variability as it was often applied in the reviewed studies. We found that carrying capacity is most often applied to studies in conservation biology, rangeland and wildlife management, aquaculture, and fisheries biology. We explore

ecosystem level responses to implications of “carrying capacity” overshoot and discuss proposed mechanisms that govern ecosystem carrying capacity. We discuss the usefulness of the concept and end with suggestions to improve carrying capacity's general application in ecosystem studies.

链接:

<http://agri.ckcest.cn/file1/M00/0E/CA/Csgk0F2QQPKADI9XAAbdIXqoQAg768.pdf>

## 【研究报告】

### 1. Improving Land and Water Management

发布源: Water Resources Institute

发布时间: 2013-10-15

摘要: The world's food production systems face enormous challenges. Millions of farmers in developing countries are struggling to feed their families as they contend with land degradation, land use pressures, and climate change. Many smallholder farmers must deal with low and unpredictable crop yields and incomes, as well as chronic food insecurity. These challenges are particularly acute in Sub-Saharan Africa's drylands, where land degradation, depleted soil fertility, water stress, and high costs for fertilizers contribute to low crop yields and associated poverty and hunger. Farmers and scientists have identified a wide range of land and water management practices that can address land degradation and increase long-term agricultural productivity. The benefits of these improved land and water management practices to farmers and rural economies include higher crop yields, increased supplies of other valuable goods such as firewood and fodder, increased income and employment opportunities, and increased resilience to climate change. These benefits occur because these improved land and water management practices: Increase soil organic matter; Improve soil structure; Reduce soil erosion; Increase water filtration; Increase efficiency of water use; Replenish soil nutrients; Increase the efficiency of nutrient uptake.

链接:

<http://agri.ckcest.cn/file1/M00/00/01/Csgk0V14qWqAYPpKADSqncD4B6M249.pdf>

---

主编: 赵瑞雪

地址: 北京市海淀区中关村南大街12号

电话: 010-82105217

本期编辑: 郑建华

邮编: 100081

邮件地址: [agri@ckcest.cn](mailto:agri@ckcest.cn)