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农业与资源环境信息工程专题

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中国农业科学院农业信息研究所
联系人：孔令博
联系电话： 010-82106786
邮箱：agri@ckcest.cn
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学术文献

1．The Research Data Alliance Interest Group on Agricultural Data: Supporting a Global Community of Practice（农业数据研究数据联盟利益小组：支持全球实践社区）

简介： Efforts to address equity and inclusion in agricultural data infrastructures face numerous challenges. People and networks are widely distributed geographically. This means some solutions to data problems may arise regionally and independently, yet many people are not easily able to engage with their distant colleagues to learn about them or collaborate. In general, constraints on funding for such projects are often national rather than international, and travel funding is not equally distributed. Finally, the breadth of activity means interdisciplinary communication is important but difficult and hard to sustain. Addressing these challenges, the Research Data Alliance (RDA) has been a home for the Interest Group on Agricultural Data (IGAD) since 2013. In 2021, IGAD became the first example of a new type of RDA group a Community of Practice. A future goal is to use this community of practice to put good regional or national work into practice via inclusive collaborations. This chapter reflects on the lessons learnt from the IGAD community of practice in its attempts to include new voices around the world.

来源： Towards Responsible Plant Data Linkage: Data Challenges for Agricultural Research and Development

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全文链接: http://agri.ckcest.cn/file1/M00/10/14/CsgkOGNjfX2ABSc6AAO7yGdJXFE180.pdf

2．Factors that influence the use of climate information services for agriculture: A systematic review（影响农业气候信息服务使用的因素：系统综述）

简介： The use of climate information services (CIS) is widely considered as a key adaptation strategy for the agriculture sector in dealing with the challenges posed by climate variability and climate change. Although there are several examples of CIS programs with varying degrees of success in promoting the use of CIS in the agriculture sector, barriers to its successful use by agricultural decision makers still exist. Through a systematic review structure, this paper synthesizes the wealth of recent literature on climate information services to identify the common factors that influence the use of CIS by farmers and agriculture practitioners. The synthesis identified 22 factors, which were discussed under three (3) thematic areas, socio-cultural and demographic issues; programming mechanism; and institutional support and resource allocation for communities. Participation and engagement were the most readily identified in the literature synthesis and was found to be a key enabler to the use of CIS for agriculture decision making. Other distinguishing factors were related to trust in and credibility of CIS and CIS providers; and multi-modal communication channels; timely delivery of CIS. Key barriers to the use of CIS included gender inequality; lack of resources and poor infrastructure; and lack of trust in CIS and CIS providers. The factors identified in this review can be used by climate information providers as a guide to ensure the successful utilization of CIS information products and programs by farmers and other agriculture

practitioners.
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3．Integrating remote sensing, irrigation suitability and statistical data for irrigated cropland mapping over mainland China（整合遥感、灌溉适宜性和统计数据，绘制中国大陆灌溉农田地图）

简介：Knowledge of irrigation location and extent is essential for irrigation-water use estimation and water resource management. However, it remains a great challenge to map irrigated areas at large spatial scales due to the great variation in climate, geography, and agricultural practices, as well as the lack of sufficient ground truth data. This study proposed a novel approach to develop the first 250-m irrigated cropland map in mainland China (CIrrMap250) by integrating remote sensing, irrigation suitability, and irrigated area statistics. We assessed the performance of CIrrMap250 and compared it with three irrigation maps (i.e., EVI-map, NDVI-map, GI-map) generated using the threshold-based classification method and four other existing maps, including GMIA2005 (Siebert et al., 2005), GIAM2000 (Thenkabail et al., 2009), Zhu-map (Zhu et al., 2014), and Meier-map (Meier et al., 2018). Results indicate that CIrrMap250 and all other maps capture well the intensively irrigated areas such as the North China Plain and Northwest China, as well as many large-scale irrigation districts. However, all maps except CIrrMap250 tend to underestimate irrigated cropland in river valleys while overestimating irrigated cropland in the mountainous areas, as illustrated by the field-surveyed irrigation districts, due to the neglect of the mixed grid effects. Compared to other irrigation maps, CIrrMap250 exhibits a better agreement with the reference points, achieving improvements in Kappa coefficient and overall accuracy by 8% up to about 2 times. The irrigated area estimates of CIrrMap250 are very close to the statistical data due to their usage in generating the training pool. Further analysis indicates CIrrMap250 has a greater proportion of irrigated cropland at lower elevations, on smaller slopes, and near water bodies than the other maps. There is large uncertainty in irrigation ratio estimates due to the varying cropland area from multiple sources. This study demonstrates the effectiveness of the new irrigation mapping method and highlights the great potential of combining irrigation suitability with remote sensing and statistical data to improve the accuracy of large-scale irrigated cropland mapping.
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科技图书

1．AI for Good and the SDGs（人工智能与可持续发展目标）

简介：In 2015, 193 nations came together to agree Agenda 2030: 17 goals ranging from the elimination of poverty to the building of partnerships to achieve those goals. The spirit of the UN Sustainable Development Goals (SDGs) is to leave no one behind. Artificial intelligence (AI) has a

great potential to assist in reaching the SDGs. For instance, using algorithms on new and vast agricultural data sets can improve the efficiency of agriculture practices and thereby contribute to SDG 1, “Zero hunger”. However, the high energy consumption, computational resources and levels of expertise required for AI can exacerbate existing inequalities. At the same time, potentially useful AI applications such as seasonal climate forecasting have led to the accelerated laying off of workers in Peru and credit denial to poor farmers in Zimbabwe and Brazil. If AI for Good is to be truly realised, AI’s potential to worsen inequality, to overexploit resources, to be undertaken through “helicopter research” and to focus on SDG issues relevant mainly to high-income countries must be overcome, ideally in close collaboration and engagement with potential beneficiaries in resource-limited settings.

来源： Ethics of Artificial Intelligence

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2．Governing agricultural data: Challenges and recommendations（管理农业数据：挑战和建议）

简介： The biomedical domain has shown that in silico analyses over vast data pools enhances the speed and scale of scientific innovation. This can hold true in agricultural research and guide similar multi-stakeholder action in service of global food security as well (Streich et al. Curr Opin Biotechnol 61:217225. Retrieved from https://doi.org/10.1016/j.copbio.2020.01.010, 2020). However, entrenched research culture and data and standards governance issues to enable data interoperability and ease of reuse continue to be roadblocks in the agricultural research for development sector. Effective operationalization of the FAIR Data Principles towards Findable, Accessible, Interoperable, and Reusable data requires that agricultural researchers accept that their responsibilities in a digital age include the stewardship of data assets to assure long-term preservation, access and reuse. The development and adoption of common agricultural data standards are key to assuring good stewardship, but face several challenges, including limited awareness about standards compliance; lagging data science capacity; emphasis on data collection rather than reuse; and limited fund allocation for data and standards management. Community-based hurdles around the development and governance of standards and fostering their adoption also abound. This chapter discusses challenges and possible solutions to making FAIR agricultural data assets the norm rather than the exception to catalyze a much-needed revolution towards “translational agriculture”.

来源： IFPRI

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