2024-1367 IJOI
https://www.ijoi-online.org/

International Journal of Organizational Innovation

AN INVESTIGATION AND RESEARCH OF CHINA'S AGRICULTURAL SUPPLY- SIDE REFORM BY APPLYING BIBLIOMETRIC ANALYSIS ON CNKI'S DATA MINING

Che-Chang Chang
Department of International Business of Guangzhou Huashang College,
Guangdong 51300, China
1794298328@qq.com

Yaling Chen
Shenzhen Middle School, Shenzhen, Guangdong 51800, China
dun2113@163.com

Abstract

In the age of the digital economy, leveraging digital information to drive industrial expansion has become paramount. Since 1999, China has progressively integrated the digital economy into its growth strategy, significantly advancing in many domains. However, integrating big data to revolutionize its agricultural sector has yet to catch up with other digital innovations. Despite many studies focusing on e-commerce and platform development, the application of big data in the agricultural supply side still needs to be explored. This research seeks to bridge this knowledge gap through the Mapping and trending method, meticulously analyzing a curated selection of articles from CNKI, China's premier academic platform, spanning 2000 to 2022. Central to our investigation is the transformative power of big data in forming agricultural clusters. Through an integrative approach encompassing induction, comprehensive synthesis, and profound analysis, we shed light on innovative techniques to enhance agricultural product quality,

customizing them based on their unique characteristics. Our research is paving the way for China's more sustainable and tech-driven agricultural future.

Keywords: digital economy, data mining, agriculture

Introduction

Tapscott (1996) point concept of the digital economy emerged when American entrepreneurs light on the transformative capacity of e-commerce, anchored firmly on Internet technology. This term, "digital economy," embodies a spectrum of meanings. At its most basic, it pertains to digital industrialization, encompassing sectors like electronic and communication equipment manufacturing within the broader umbrella of the tertiary information industry. Entrepreneurship's innovation spirit emerges as a crucial mechanism driving energy efficiency in the digital domain. It also shows that the digital economy has bolstered energy efficiency (Wang & Shao, 2023). Transformational Role of the Digital Economy: The digital economy is revolutionizing human productivity and lifestyles, emerging as a pivotal catalyst for energy technology transformation and the optimization of the energy consumption structure(Zeng, Xu, Zhao, Li, 2023). Xin, Fan, Mbanyele, et al. (2023) The digital economy based on the Internet of Things, big data, and arti ficial intelligence is experiencing explosive growth in China. In a broader scope, it refers to the digital transformation across all sectors, where constant collection, interpretation, and analysis of economic activity data play a pivotal role in shaping future societal and national trajectories. Two primary research trajectories delineate the study of the digital economy. The first adopts a technological lens, emphasizing the Internet's intrinsic technical attributes. This perspective posits that the progression of technology, particularly the Internet, is inextricably linked to economic growth. The second trajectory, however, pivots towards the practical implications of Internet technologies, probing deeply into the intrinsic mechanisms that govern them and how these mechanisms influence the evolution of industrial structures.(Akberdina, Strielkowski, Linder, Kashirin, & Shmeleva, 2023; Wang, Zeng, & Jiang, 2022).

From a consumer perspective, e-commerce has recalibrated consump-

tion patterns and purchasing behaviors. These Internet technologies augment product quality, minimizing production overheads and reducing environmental footprint, steering enterprises towards modernization(Zhang, Zhang, Bo, Haque M, Liu, 2023)

However, our research narrows its focus towards the agricultural sector, particularly the supply-side transformation underpinned by the digital economy. Employing a methodological approach rooted in secondary data analysis, we meticulously sifted through scholarly articles on CNKI spanning 2000 to 2022. We aimed to distill the essence of Chinese expert discourses on the confluence of the digital economy, agriculture, and transformative practices. This study uses bibliometric to analyze the digital economy, and its research purposes have the following four points.

1. It is understanding the Digital Evolution: To investigate the chronological progression of integrating the digital economy into China's growth strategy since 1999 and its current impact on the agricultural sector.
2. Exploring Agricultural Clusters: To delve deep into the role of big data in forming efficient and productive agricultural clusters, which can enhance both productivity and quality.
3. Bibliometric Insight: To conduct a bibliometric analysis of relevant articles from CNKI from 2000 to 2022, aiming to highlight the trends, patterns, and critical areas of focus in digital agricultural research.
4. Policy Recommendations: Based on the insights gained from the CNKI database, propose policy recommendations that can facilitate the faster integration of big data and digital tools into China's agricultural sector, ensuring its sustained growth and global competitiveness.

Literature Review

The Tragedy of the Commons: Implications for Agricultural Economy

In 1968, the Science journal featured a seminal article by American human ecologist Garrett James Hardin titled The Tragedy of the Commons. Hardin's discourse centered on the challenges inherent in managing shared resources, commonly called commons. He posited that the intrinsic nature of these shared resources propels individuals towards maximizing their immediate gains, often to the detriment of the collective.

Expanding on this notion, when each herder, driven by the motivation to optimize individual yield, increases their livestock count, they inadvertently introduce a dual-edged predicament.

While the herdsman benefits entirely from adding each animal, the community grapples with the negative externalities, namely overgrazing and elevated carbon dioxide emissions, further exacerbating environmental and climatic concerns. This dynamic may mirror the philosophical construct of the "prisoner's dilemma," underscoring a fundamental tension in resource management: pursuing immediate individual advantages might undermine long-term communal well-being (Martono & Mizuno, 2023; Brosnan & Wilson, 2023).

Agriculture and Climate Change

Agriculture's relationship with climate change is intricately detailed in the IPPC report, highlighting the complex interplay of various sources and impacts of greenhouse gas emissions. The Agriculture, Forestry, and Other Land Use (AFOLU) sector is a significant contributor to global Greenhouse gases (GHG) emissions, with the agriculture sector in Thailand being responsible for 21.9% of the country's net GHG emissions in 2013. Pradhan (2019) Agriculture, Forestry, and Other Land Use (AFOLU) sector is a significant contributor to global Greenhouse gases (GHG) emissions, with the agriculture sector in Thailand being responsible for 21.9% of the country's net GHG emissions in 2013. Svensson et al.(2021) Agriculture, forestry, and other land use (AFOLU) represent 22% of global greenhouse gas emissions. Underscoring the pivotal role of agriculture in influencing climate change dynamics.

Further complicating the picture is the mix of direct and indirect agricultural emissions. While agriculture results in emissions of three primary greenhouse gases—carbon dioxide, methane, and nitrous oxide—its impact has evolved. Since the dawn of the 21st century, emissions stemming from changes in forest land use have declined. In contrast, those arising from agriculture, especially crop and livestock operations, have risen. A key contributor is methane, produced during the digestion process of ruminant livestock and released from stored manure and organic waste. Concurrently, nitrous oxide emissions mainly arise when fields are treated with nitrogen-based fertilizers, be they organic or

mineral. Beyond these direct emissions lies a broader context: the modern food supply chain. The IPPC report delineates that the AFOLU category excludes emissions generated during this chain's pre-production or post-production phases. Such emissions, which find their origins in sectors like industry, energy production, and transportation, include activities like fertilizer production, fossil fuel use for powering farm machinery, and post-production operations that span transportation to retail sales. Each of these stages incrementally adds to the total greenhouse gas concentrations. (Mir, Park, Purohit, & Kim, 2020).

However, it is also essential to recognize the variability in these emissions across different regions. While the AFOLU category might contribute to a third of global emissions, this figure is far from uniform. Depending on the structure and specificities of their local supply chains, various regions can display different contributions to the global greenhouse gas output. This intricate web of interactions emphasizes the need for a holistic approach to understanding agriculture's multifaceted relationship with climate change.

Climate Effects on Agricultural Productivity

Climate change has a profound influence on agricultural production and the very fabric of global ecosystems. One of the cornerstones of global sustenance, crops - be they food, fiber, or energy - operate within specific growth parameters. While a moderate rise in temperatures might boost some crops in certain regions, there is a threshold beyond which detrimental impacts become inevitable. Too high a temperature and inadequate water and nutrient availability could diminish crop yields (Li et al., 2011; Angula & Kaundjua, 2016).

The changing climate presents challenges in temperature alterations and the increased frequency of extreme weather phenomena, such as floods and droughts, which have deleterious effects on crops. Regions witnessing diminishing rainfalls yet higher average temperatures will predominantly grapple with drought-induced challenges. Nevertheless, the climate's influence does not stop at temperature and rainfall. Elevated carbon dioxide levels and warmer and more humid conditions create conducive environments for various pests, weeds, and diseases. Combined with plummeting rainfalls and scorching

temperatures, these adversities can create zones where traditional farming becomes untenable (Singh et al ., 2018).

Reside et. Al. (2014), the livestock industry is also in the crosshairs of climate change. With heatwaves predicted to become commonplace, livestock faces direct threats from the heat itself and a potential surge in disease prevalence, with moisture-loving pathogens thriving in wetter climates. The ability of grasslands and rangeland to support grazing might also diminish, as could the forage capabilities of other systems. The ramifications for aquatic life are no less severe. In many low-income nations, fisheries and aquaculture stand as the primary protein sources for the masses. However, these ecosystems are under duress from overfishing, habitat loss, and pollution. Climate change threatens to magnify these challenges (Paukert et al.,2019).

Sturrock (2012) climate change and human activities are threatening the health of forests and urban green spaces, leading to increased prevalence and severity of tree diseases. Forests also serve as lifelines for rural communities. Beyond employment, they are biodiversity hotspots supplying food, medicine, fuel, and critical ecosystem services. However, the escalating changes in climate patterns could decimate forests. Such changes could induce a loss of crucial species, yield reduction, and intensify disturbances like storms in vast forested regions. As the climate continues its unprecedented shift, the interconnected tapestry of our planet's ecosystems hangs in the balance.

Implications of Climate Variability on Global Socio-Economics

The intricate relationship between climate change and global economic structures has become increasingly prominent. Within this nexus, rural economies, predominantly reliant on agriculture, are experiencing heightened vulnerabilities because of the multifaceted impacts of climatic variabilities (Witmer et al.,2012).

Recent observations suggest that as climate unpredictability intensifies, there is a commensurate increase in the severity and frequency of natural disasters. An ancillary effect is apparent in the agricultural supply chains; diminished yields invariably escalate commodity prices. In this dynamic, the economically marginalized populations, who allocate a more

significant fraction of their income towards food, find themselves disproportionately burdened (Hallegatte, Fay, & Barbier, 2018).

Considering these challenges, the role of digital innovations and their transformative potential may not be understated. A systematic analysis of academic publications in CNKI from 2000 to 2022 offers enlightening perspectives on this front. This corpus of research, predominantly authored by Chinese scholars, delves into the intersections of the digital economy with agriculture and broader economic frameworks. The overarching narrative suggests that a strategic incorporation of digital tools could be pivotal for agricultural revitalization and broader economic reforms, potentially offering pathways to mitigate some economic challenges precipitated by climate variabilities.

Research Methods

Breuer, Schaer, & Tunger (2022) bibliometrics uses statistics to analyze academic publishing trends. Bibliometrics and information retrieval prioritize relevance—the strong correlations between explicit information retrieval judgments and implicit bibliometric signals. His study used a bibliometric analysis as the primary research method. Bibliometrics involves quantitatively assessing academic publications to discern patterns, trends, and thematic concentrations within a field of study. They would not have cited it if they did not find it relevant. Both relevant decisions and signals stem from a shared cognitive process that assessors and citers experience, as highlighted by Garfield (1996, 1998).

Balz (2021) defined Bibliometrics as a quantitative discipline, characterizing text communication through mathematical and statistical methods. We can broadly bifurcate its primary functions into descriptive and evaluative aspects. Descriptive bibliometrics seeks to quantify productivity, typically by enumerating publications such as papers, books, and journals. Evaluative bibliometrics leverages citations to assess the reach and influence of scholarly literature. The core strength of bibliometrics lies in its ability to quantify terminological shifts, explain literature distribution for specific topics, and discern the pivotal journals either citing or being cited within a discipline. This analytical approach enables scholars to chart the evolution of research themes, gauge prevailing meth-

odologies, and expect the future trajectory of academic disciplines (Kokol, Blažun Vošner, & Završnik, 2021).

This study adopted a bibliometric framework and a secondary data collection approach to analyze academic discourse within the digital economy and big data domain. We mined data from two prominent Chinese academic databases, CNKI (China National Knowledge Infrastructure) and CSSCI (Chinese Social Sciences Citation Index). These databases were selected to retrieve publications centered on themes of the digital economy, the synergy between the digital economy and agriculture, and the interface of the digital economy and transformation from 2000 to 2022.

This systematic categorization enabled a deeper understanding of the research landscape's prevailing trends and main narratives. It began with statistical assessments of the publication trends over time, then moved to a qualitative exploration of the primary themes, methodologies, and findings presented in these papers. The ultimate aim was to provide a cohesive overview of the current academic discourse in the domain, explicitly focusing on employing the digital economy in driving supply-side transformations and agricultural reforms in China. We also give Definitions of Terms of agriculture below.

Data Analysis Results

Zhang, Peng, & Wang (2022) comprehensive exploration of the global digital economy research trends, a study drawing from the Web of Science database, identified distinct evolutionary phases in digital economy studies. It categorizes these as the Embryonic phase, which spanned from 1996 to 2008, followed by the Development phase from 2009 to 2016, and last, the Acceleration phase, beginning from 2016 onwards. Notably, these trends align closely with the trajectories observed in our research, which used the CNKI database. This parallelism highlights the consistency in research patterns across diverse academic platforms and emphasizes the global progression of the digital economy discourse.

Based on data from the CNKI database, the number of articles related to the digital economy was consistent, with fewer than 50 articles published annually from 2000 to 2015. However, there was a significant surge starting in 2016. The numbers grew from 212 articles in 2017

Definition of Terms

Agriculture	In a broad sense, the production structure of agriculture includes crop farming, forestry, animal husbandry, fishery, and their related sidelines.
Big data	Big data refers to large scale data collections that encompass acquisition, storage, management, and analysis, meaning it is greatly beyond the capabilities of traditional database software and tools. Big data has four characteristics, massive data scale, fast data flow, diverse data types, and low value density.
Digital economy	The identification, selection, filtering, storage, use, and guidance of big data (digital knowledge and information) can realize the rapid optimization of resource allocation and regeneration, as well as the economic form of high-quality economic development.
Trending and mapping	Trending refers to the visual descriptions of the relevant trends affecting the system around a given topic. Developing a trend map can help a team deepen its understanding of a problem through researching related history, identifying key external factors, and tracking changes in social and cultural norms.

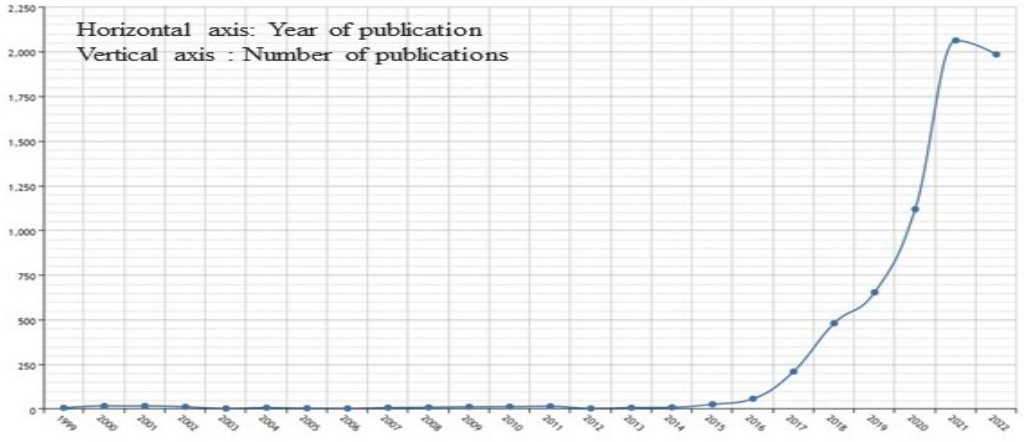

Figure 1. Annual Distribution of Papers Related to the Digital Economy in the CNKI Database

Table 1. The Number of Papers and the Number of Citations on the Digital Economy Related to Agriculture from 2010 to 2022

Year	Number of Papers in CNKI	Number of Citations	Number of Papers in CSSCI	Number of Citations
2010	1	0	0	0
2011	0	0	0	0
2012	0	0	0	0
2013	0	0	0	0
2014	0	0	0	0
2015	1	2	0	0
2016	0	0	0	0
2017	0	0	0	0
2018	3	5	0	0
2019	9	103	3	58
2020	24	338	2	125
2021	76	222	8	43
2022	82	19	15	5

to 480 in 2018, 653 in 2019, 1,103 in 2020, and reaching a peak of 2,007 in 2021 before slightly decreasing to 1,903 in 2022. Despite this rapid growth in digital economy research, only a tiny fraction, 2.39% to be exact, focused on agricultural economics. The figures provided also highlight the number of times other works cited these articles.

Zhao et al. (2022) Knowledge networks, rooted in disciplines like management and information science, help identify critical field trends by examining literature. This method offers researchers unique insights. As shown in the figure below, in the late 1990s, the world noticed how computers and the internet could change our economy. This was the start of what we call the "digital economy." It is like our regular economy but heavily influenced by digital technology.

This study draws a research-related network map based on relevant literature. By 2001, factories and manufacturers, the backbone of any country's economy, were already using more computerized tools. By 2014, it was about more than just adding computers to factories. Entire industries were transforming to include digital tools in everything they did. Researchers have been keen to study these changes. In 2007, researchers looked into how efficiently resources were used

in the new digital landscape, especially in countryside areas. By 2018, many studies tried to give real-world evidence of these shifts. It also shows how digital change affected the global business chains where products get made and sold.

Interestingly, even rural areas, which many think could be more tech-savvy, blended traditional ways with new digital methods. This trend made experts, by 2020 discuss the value of digital tools and services, like the way we think of physical assets in business. There was a need for rules or policies to guide these significant shifts. By 2014, leaders realized they had to plan out how to blend the digital world with our economy best. In short, from 1999 to 2020, our world started mixing digital tools into every business corner. It showed the concept below.

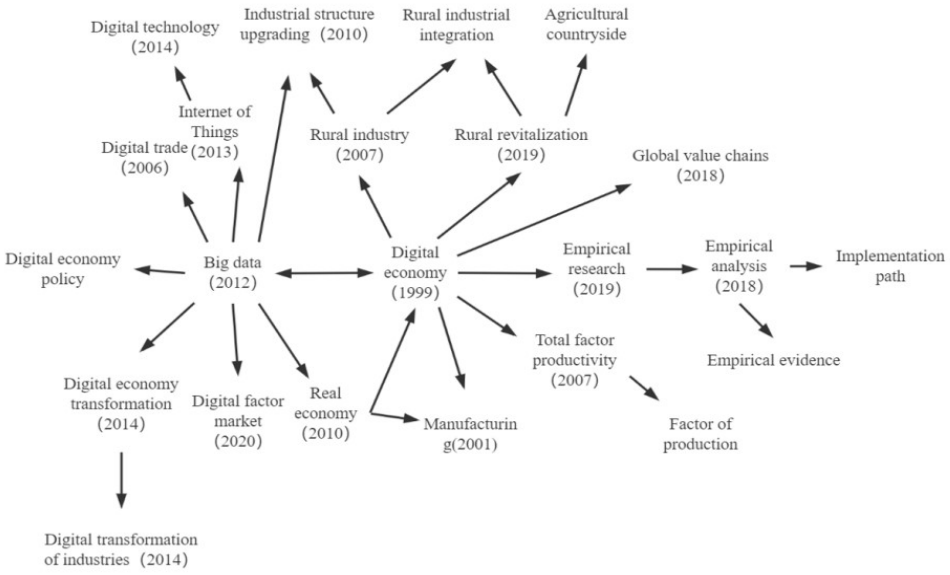

Figure 2. Trend chart of literature related to digital economic agriculture.

Results Interpretation and Synthesis

(1) A scrutiny of papers on the digital economy within CNKI indicates that those focusing on the nexus between the digital economy and agriculture comprise a scant 2.39%. A closer examination of the category exploring the transformation of the digital agricultural economy might reveal even fewer papers.

Predominantly, research gravitates toward demand, emphasizing platform creation, e-commerce dynamics, and novel media marketing strategies.

(2) Delving deeper: Over the past decade, the CSSCI database listed 1,088 papers centered on the digital economy. A minor fraction of these papers veers toward the trajectory of the agricultural digital economy. Topics homing in on the technological elevation and metamorphosis of the agricultural economy are sparse. The essence of digital agricultural transformation lies in its indispensability for the sustainable growth of eco-friendly agriculture. Leveraging online data analytics and historical records can help orchestrate a conducive ecological milieu for crops. This precision agriculture stresses crop vitality and scales down inputs and associated expenditures, catalyzing efficient, high-yield farming. The digital reformation in agriculture stresses the symmetry between agricultural product supply and demand, enhancing production digitalization and market fluidity. This facilitates informed decision-making, refining processing efficiency, and surmounting the challenges of information opacity and asymmetry.

(3) The study's analytical mapping underscores a delayed initiation of significant data-driven agricultural research in China. When juxtaposed with global trends, the dearth of empirical studies on the pragmatic application of agricultural supply-side structural reforms becomes evident. It is imperative that research pivots towards addressing agricultural productivity challenges, streamlining production methodologies, and implementing selective strategies for optimal production. The overarching objective is dual-fold: ensuring a robust agricultural sector and elevating the livelihood of farmers. Aligning national objectives with farmers' aspirations is paramount. Only by transforming agriculture into a lucrative sector can rural landscapes evolve into vibrant, sustainable habitats.

Based on previous research, we propose the following four propositions.

1. China's exploration of digital agriculture remains in its nascent stages.
2. China's agricultural transformation predominantly leans towards addressing the demand side in the digital economic context.
3. Integrating the digital economy into China's agricultural supply-side enhancements is an evolving process.
4. Concrete examples of China's sup-

ply-side reforms in agriculture within the realm of the digital economy are yet to be prominently showcased.

Conclusions and Discussion

China's ongoing journey towards revitalizing its primary industries via extensive data mining showcases its commitment to sustainable and tech-driven agriculture. Although the agricultural sector might not be the leading contributor to the nation's GDP, its profound significance cannot be understated. Supporting the sustenance of 1.4 billion people undeniably serves as the backbone of China's industrial economy.

As we venture further into this age of digitization, it is imperative to harness and cluster the vast array of digital resources at our disposal. This not only aids in enhancing product quality but also in mitigating challenges, be it the unpredictability of rainy seasons leading to rush harvesting or the perennial threat posed by pests.

The contemporary era calls for a reimagining of the agricultural industry. This includes re-establishing a cohesive agricultural industry chain and introducing a universal platform that promotes information-sharing. Such initiatives facilitate the dissemination of agricultural best practices and uphold the ethos that every village in China brings its unique value, encapsulated in the idea that "every village has its own characteristics."

However, above all, the path forward lies in holistic collaboration. By unifying resources, mobilizing finances, and bridging talents across both the agricultural and commercial sectors, China can set the stage for a modern agricultural renaissance. This renaissance, underpinned by advanced information technologies and collaborative efforts, should encapsulate the entire agricultural spectrum – from agriculture, fishery, and husbandry to crop farming. The collective propulsion of new-age agricultural practices, bolstered by supply and marketing cooperatives, family farms, and small rural households, ensures that Chinese agriculture's future is sustainable but also innovative and prosperous. China's agricultural sector stands on the brink of a transformation powered by digital agricultural science and technology. Integrating big data mining and modern digital tools promises enhanced efficiency, optimized resource allocation,

and reduced uncertainties in this domain. We propose the following actionable recommendations for practical application.

Practical Advice

China's agricultural sector is a precipice of digital transformation, as it integrates the potency of digital agricultural science and technology. The fusion of extensive data mining with contemporary digital tools offers a new vision for the country's agriculture, marrying efficiency with reduced uncertainties. By infusing traditional agricultural methodologies with the precision and accuracy of digital tools, there is potential to recalibrate practices. For instance, integrating big data analytics can reshape farming schedules, factoring in climate variabilities. At the same time, the Internet of Things (IoT) offers proactive measures against pests and diseases through comprehensive monitoring systems.

The potential for harmonizing production with sales, particularly in a country as vast and diverse as China, is significant. With insights from big data, the challenges of rushed planting decisions and information asymmetry can be mitigated. As businesses tap into data platforms, they can promptly adjust to market demands, reflecting a symbiotic relationship between agricultural supply and market needs. The emergence of a digital agricultural framework brings stakeholders from financiers to cooperatives onto a shared platform, emphasizing division of labor and scale management. On the logistics and quality assurance front, the focus should be on creating digitally enhanced warehousing solutions near primary production hubs. By leveraging advanced traceability tools like QR codes and blockchain, the integrity of the supply chain is assured, bolstering consumer trust and ensuring transparency. With these strategic moves, China can redefine global agricultural practices, driving sustainability and growth.

Acknowledgement

This research was fully supported by the following project funds which we thank for. And the authors would take all responsibility for this paper.
Project Number: 2021HSXK05
Project Name: Guangzhou Huashang College (as a key school leave of the key discipline project for International Business Dept.)

References

Akberdina, V., Strielkowski, W., Linder, N., Kashirin, S., & Shmeleva, L. (2023). Information technology and digital sufficiency for building the sustainable circular economy. Energies, 16(3), 1399. https://doi.org/10.3390/en16031399

Angula, M. N., & Kaundjua, M. B. (2016). The changing climate and human vulnerability in north- central Namibia. Jamba, 8(2), 200. https://doi.org/10.4102/jamba.v8i2.200

Balz, T. (2022). Scientometric full-text analysis of papers published in remote sensing between 2009 and 2021. Remote Sensing, 14(17), 4285. https://doi.org/10.3390/rs14174285

Breuer, T., Schaer, P., & Tunger, D. (2022). Relevance assessments, bibliometrics, and altmetrics: A quantitative study on PubMed and arXiv. Scientometrics, 127(5), 2455-2478.

Brosnan, S., & Wilson, B. (2023). Comparative economics: How studying other primates helps us better understand the evolution of our own economic decision-making. Philosophical Transactions of the Royal Society B: Biological Sciences, 378. https://doi.org/10.1098/rstb.2021.0497

Garfield, E. (1996). When to cite. The Library Quarterly: Information, Community, Policy, 66(4), 449-458. University of Chicago Press.

Garfield, E. (1998). Random thoughts on citationology: Its theory and practice. Scientometrics, 43(1), 69–76.

Hallegatte, S., Fay, M., & Barbier, E. (2018). Poverty and climate change: Introduction. Environment and Development Economics, 23(3), 217-233. https://doi.org/10.1017/S1355770X18000141

Kokol, P., Blažun Vošner, H., & Završnik, J. (2021). Application of bibliometrics in medicine: A historical bibliometrics analysis.

Health Info Libr J, 38(2), 125-138. https://doi.org/10.1111/hir.12295

Li, Y., Conway, D., Xiong, W., Gao, Q., Wu, Y., Wan, Y., & Zhang, S. (2011). Effects of climate variability and change on Chinese agriculture: A review. Climate Research, 50, 83-102. https://doi.org/10.3354/cr01038

Mir, K.A., Park, C., Purohit, P., & Kim, S. (2020). Comparative analysis of greenhouse gas emission inventory for Pakistan: Part I energy and industrial processes and product use. Advances in Climate Change Research. https://doi.org/10.1016/j.accre.2020.05.002

Pradhan, B.B., Chaichaloempreecha, A. & Limmeechokchai, B. (2019). GHG mitigation in agriculture, forestry and other land use (AFOLU) sector in Thailand. Carbon Balance Manage, 14(3). https://doi.org/10.1186/s13021-019-0119-7

Reside, A. E., Welbergen, J. A., Phillips, B. L., Wardell-Johnson, G. W., Keppel, G., Ferrier, S., ... & VanDerWal, J. (2014). Characteristics of climate change refugia for Australian biodiversity. Austral Ecology, 39(8), 887-897.

Rongying Zhao, Danyang Li, Mingkun Wei & Xinlai Li (2022). The contents and methods of knowledge network from the perspective of bibliometrics. Technology Analysis & Strategic Management, 34(3), 245-257. https://doi.org/10.1080/09537325.2021.1894329

Singh, N., Mall, R., Sonkar, G., Singh, K.K., & Gupta, A. (2018). Evaluation of RegCM4 climate model for assessment of climate change impact on crop production. Mausam, 69, 387-398. https://doi.org/10.54302/mausam.v69i3.328

Sturrock, R.N. (2012). Climate change and forest diseases: Using today's knowledge to address future challenges. Forest Systems, 21. https://doi.org/10.5424/fs/2012212-02230

Svensson, J., Waisman, H., Vogt-Schilb, A., Bataille, C., Aubert, P.-M.,

Jaramilo-Gil, M., Angulo-Paniagua, J., Arguello, R., Bravo, G., Buira, D., Collado Duran, N., De La Torre Ugarte, D., Delgado, R., Lallana, F., Quiros-Tortos, J., Soria, R., Tovilla, J., & Villamar, D. (2021). A low GHG development pathway design framework for agriculture, forestry and land use. Energy Strategy Reviews, 37. https://doi.org/10.1016/j.esr.2021.100683

Tapscott, D. (1996). The digital economy: Promise and peril in the age of networked intelligence. McGraw-Hill Int'l Enterprises.

Wang, J. W., Zeng, J. H., & Jiang, Z. H. (2022). Exploration of the construction mode and application of big data service platform in the digital economy. Applications of Decision Science in Management, ICDSM 2022, 260, 493-501. https://doi.org/10.1007/978-981-19-2768-3_47

Wang, L., & Shao, J. (2023). Digital economy, entrepreneurship and energy efficiency. Energy, 269(C). https://doi.org/10.1016/j.energy.2023.119876