

Bibliometric analysis of China's high standard farmland construction research based on CNKI

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ABSTRACT

Carrying out the construction of high-standard farmland is an important way to implement the principle of "storing grain in the land and storing grain in the technology", and it is an important practice to implement General Secretary Xi Jinping's principle of food security. The construction of high-standard farmland can speed up the modernization of agriculture, help urbanization development, and realize the efficient use of arable land, scientific management, and guarantee the increase of farmers' incomes. The construction of high-standard farmland is beneficial to the country and the people. Using CNKI database publication year, institutions, authors, publications, journals, cited frequency, keywords and other elements, we systematically sorted out the overview of the research field of high-standard farmland construction in China from 1996 to 2024, and comprehensively analyzed the research dynamics and hotspots in this field. The results show that: at present, China's high standard farmland construction research mainly focuses on the theoretical policy, implementation effect and engineering technology; the organization with the most publications in this field is the newspaper, and the two documents with the highest total citation frequency are Research on the Construction Standards and Models of High-standard Farmland in Chongqing Municipality and Construction Standards of High-standard Farmland, respectively, and Comprehensive Agricultural Development of China is the periodical that publishes the most related documents; in the future, the research hotspots will gradually tend to be zoning construction and high standard farmland construction. The research hotspot gradually tends to zoning construction, ecological construction and other aspects, need to accelerate the research of scientific research institutions on this aspect of the research and key technology integration.

KEYWORDS

High-standard farmland construction; Bibliometric analysis; CNKI; Research hotspots

1. INTRODUCTION

Arable land is the lifeblood of food production, we should adhere to Xi Jinping's thought of socialism with Chinese characteristics in the new era as a guide, study and implement the spirit of General Secretary Xi Jinping's important speeches at the Central Rural Work Conference, resolutely guard the 1.8 billion mu of arable land red line, and gradually build all the permanent basic farmland into high-standard farmland [1]. The construction of high-standard farmland is an important way to implement the "hide food in the land, hide food in technology", attaches great importance to the construction of

high-standard farmland, consolidate the foundation of agricultural production, to ensure national food security is an important task at this stage [2]. By the end of 2022, the country has built a total of 1 billion mu of high-standard farmland, stable guarantee of more than 1 trillion pounds of food production capacity, 1.918 billion mu of arable land more than half of the high-standard farmland, to improve food production capacity has played an important role [3]. Fully understand the situation of China's high-standard farmland construction, for figuring out the effectiveness of the current farmland construction after the institutional reform to play a role in the implementation of the policy has a reference role.

Bibliometric analysis is a branch of library and intelligence research that uses mathematical and statistical methods to quantitatively describe, evaluate and predict the academic status and development trends [4], through the search of the target topic, obtain a large number of relevant literature, and analyze and compare the literature, aiming to understand and grasp the dynamics of relevant scientific research in the field and the current status of the research and development trends [5]. CNKI is the largest and continuously updated CNKI is the largest and continuously updated literature database in China, which can retrieve a large number of literature types [6]. In this paper, CNKI is chosen as the data source, and bibliometric analysis is used to analyze the current status and development trend of research on high-standard farmland construction in China from 1996 to 2024, and systematically sort out the development of research on high-standard farmland construction from the year of publication, institutions, authors, the number of publications, journals, cited frequency, keywords and other elements, with the aim of providing the direction and ideas for China's high-standard farmland construction and research.

2. DATA SOURCE AND RESEARCH METHOD

Taking “high-standard farmland construction” as the theme, CNKI was used as the search source, the publication period was from January 1, 1996 to April 1, 2024, the source category was all the literature, the search time was April 10, 2024, and a total of 2,508 pieces of literature were obtained. Using the statistical function of CNKI, we counted the indexes of publication year, literature source, author, institution, and literature type of papers in the research field of high-standard farmland construction in China, and used Excel to summarize the data and make a comparative analysis of the indexes to explore the academic development in the research field of high-standard farmland construction in China.

3. RESULTS AND DISCUSSION

3.1. Trend Analysis Of Inter-Annual Quantity Of Literature

Changes in the interannual quantity of literature effectively reflect the development history of the field, the adjustment of national policies and the attention of scholars. CNKI included a total of 2508 pieces of literature related to the construction of high-standard farmland from 1996 to 2024, and the interannual publication of papers is shown in Fig.1, which shows that China's research on the construction of high-standard farmland has gone through three phases: the number of relevant literature in the 13-year period of 1996-2008 totaled 6 pieces, and Jiangsu region began to propose the construction of high-standard farmland, and the research mainly focused on measures, funds and so on. The number of a total of 6, Jiangsu region began to put forward the construction of high-standard farmland, research is mainly focused on measures, funding and other aspects, for example, since 1995, Suzhou City, Suzhou City, to take a typical first, classified guidance, the overall approach to promote the implementation of the ditch, ditch, field, forest and road planning, gates, stations, bridges, culverts, embankments, comprehensive support, floods, waterlogging, droughts, droughts, stains, tide, comprehensive management, remediation of the environment, land reclamation and water

conservancy construction Together, to increase the construction of high-standard tons of grain fields, to the standardization of water conservancy to promote the construction of rural modernization [7]; Pizhou City in 1995 began to open up a wide range of channels, raise funds, mobilize the strength of the whole society, the establishment of high-standard farmland construction of special funds, set off a farmland construction climax, to create a new situation of high-standard farmland construction [8]. In 2000, the mountainous areas of western Hunan began to gradually develop high-standard farmland construction In 2000, the mountainous areas of western Hunan began to gradually develop the construction of high-standard farmland, changing the quantity type of land and soil into the quality type of mountains, water, fields, forests, roads, scientific planning, comprehensive management under the premise of high-standard construction, changing the construction of a single farmland for the construction of farmland and ancillary facilities, changing the experience of the soil method of building fields for the construction of engineering measures; changing the traditional crude development and utilization of technology for the promotion of “balanced fertilization”, “crop rotation set seed”, “rain-saving irrigation” and other modern intensive integrated agricultural production technology [9]; after 2003, Wuhan, Hainan, Zhejiang, Changshu, Linhai, Hebei, Shanxi, Yunnan and other places have introduced corresponding measures to protect food security, protection of arable land [10]. Food security, protection of arable land [10]; in 2007, Anhui and other places closely around the improvement of farmland infrastructure, construction of high-standard farmland, enhance the comprehensive production capacity of agriculture, to ensure national food security and other central tasks, pioneering and innovative, enterprising, launched a series of new initiatives, the implementation of key development system, promote structural adjustment, land transfer, the introduction of good seeds, the promotion of technology, integration of agricultural funds, and achieved good results [11]. Good results [11]; in 2008, Fujian Province, the establishment of high-standard farmland construction joint conference system to ensure that the province's integration of funds to organize the land construction of high-standard farmland work smoothly [12], Guizhou Province, to strengthen the construction of agricultural infrastructure, do a good job of ecological, water conservancy, land and agrotechnology articles, focus on consolidating the foundation of agriculture, improve agricultural production conditions, and do a good job of the “Ecological articles”, to declare the implementation of the ‘national modern forestry demonstration city’ as an opportunity to effectively grasp the construction of forestry projects [13]; to 2009, the national scope of more attention to the construction of high-standard farmland, the number of related literature during the 11 years from 2009 to 2019 gradually increased, totaling 381 articles. increased, totaling 381 articles. In the new situation, the country's determination to continue to promote comprehensive agricultural development can not be shaken, to increase capital investment, focus on improving the comprehensive production capacity of food and agriculture, funding arrangements to focus on the construction of high-standard farmland, the layout of the project to focus on the main grain-producing areas, to promote the stable development of agriculture and farmers to sustainably increase their income, and to maintain a stable and relatively rapid economic and social development to make a new contribution [14]. Provinces, cities, counties (districts) quickly set off to create a high standard farmland boom: Sichuan Province, with the “re-creation of a Chengdu Plain” put forward, the construction of high-standard farmland in full speed, into the development of the “fast lane”, the construction of high-standard farmland results are beginning to show [15]; Cangzhou City, adjusted to change the traditional irrigation mode, take the “well + pit pond” supporting mode, not only expand the watering area, but also improve the utilization rate of water resources [16]; Gansu Province, the field into a square, trees into forests, roads connected, canals connected to the pattern of construction of high-standard farmland has been formed [17]; Guizhou Province, the establishment of the construction of high standard farmland Demonstration counties, as a way to promote resource integration and accelerate the construction of high-standard farmland in the province [18]; in the construction process, scholars have studied the standardization of high-standard farmland, and local standards and industry standards have been introduced in various places, and by 2014, the state promulgated the “General Principles for the Construction of High-standard Farmland” (GB/T30600-

2014) [19], which provides overall guidance for the construction of high-standard farmland. It provides overall guidance and requires all relevant departments and localities to standardize and promote the construction of high-standard farmland, and to do a good job of articulating and coordinating the upper and lower levels of various departments and statistics of the same caliber, so as to guarantee the effective implementation of the construction of high-standard farmland; After 2015, localities have successively introduced corresponding policies to accelerate the construction of high-standard farmland according to local conditions, and the relevant research is mostly focused on policy, funding, design, planning, etc. [20], and after 2017, it is mostly focused on the status quo of high-standard farmland, effectiveness and dilemmas [21-24]; 2020 to April 2024, less than five years of China's high-standard farmland construction research field The number of papers increased significantly, a total of 1941; after 2020, the study mainly focuses on the development trend of high-standard farmland construction under the perspective of ecological civilization construction, optimization of the construction mode to speed up the construction of high-standard farmland and further capacity enhancement after completion [25].

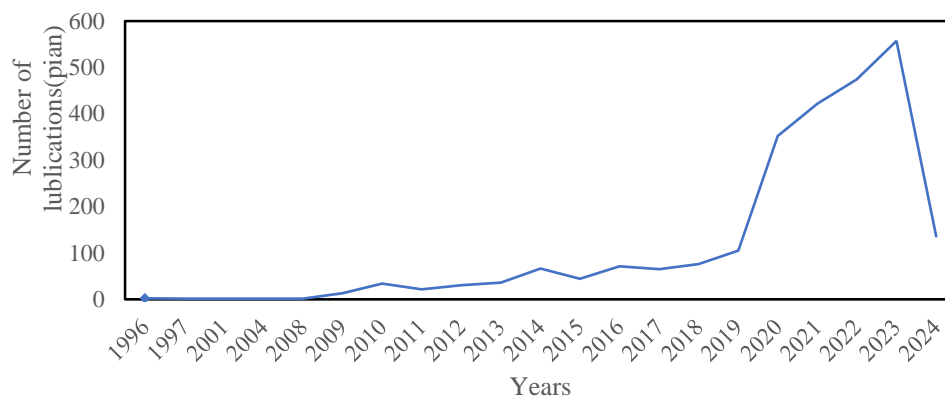


Figure 1. The trend of the number of papers published in the study of high-standard farmland construction in China

3.2. Analysis Of Major Research Institutions

Analyzing research institutions can reflect the distribution of scientific research capacity and influence in the field. As can be seen from the top 20 organizations in the literature volume of China's high standard farmland construction research (Figure 2), the largest volume of literature is the Farmers' Daily Newspaper and the China Agricultural Network, with a total of 118 publications, followed by the Department of Farmland Construction Management of the Ministry of Agriculture and Rural Development, the Shaanxi Land Engineering and Construction Group, Guizhou Daily Newspaper, etc., with 73.8% of the national enterprises and institutions and the public service departments, and 26.2% of the colleges and universities, which indicates that China's High-standard farmland construction research is mainly concentrated in the government and enterprises and public institutions, while colleges and universities and research institutes are less in comparison. By checking the specific content and citation frequency of each paper, the average number of citations is relatively high in colleges and universities. The literature of policy, construction, construction category is mainly concentrated in the government and enterprises and institutions, while the literature of the nature of high standard farmland construction research is mainly concentrated in colleges and universities, and the overall scientific research atmosphere in colleges and universities is strong, and the level of power is higher.

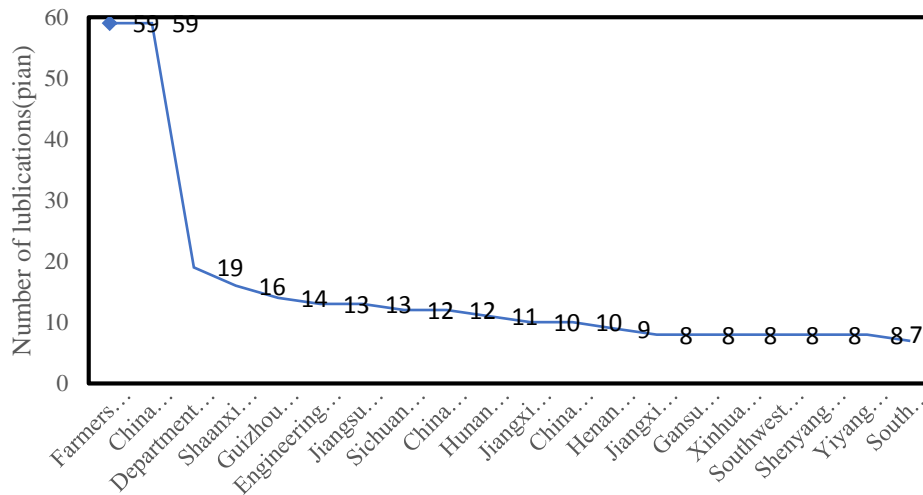


Figure 2. The top 20 research institutions in China in terms of total literature on high-standard farmland construction

3.3. Analysis Of Highly Cited Literature

Highly cited literature can reflect the influence of the literature, and the higher the citation frequency, the more influential the literature is [26]. Table 1 shows the 20 documents with the highest total citation frequency in the CNKI database, among which, the two documents with the highest total citation frequency are Research on High-standard Farmland Construction Standards and Models in Chongqing Municipality and High-standard Farmland Construction Standards, and the 20 documents are basically the review-type documents written by experts and scholars in the field, and the main content focuses on the interpretation of the policy of high-standard farmland construction and discussion of the practice [27] (Figure 3), reflecting the research hotspots in the field of high-standard farmland construction from the side.

Table 1. Literature with top 20 total citations in the research field of high standard farmland construction in China

No.	Title	Author	Journal	Citation Frequency
1	Research on Construction Standards and Models of High-standard Farmland in Chongqing	Jia Lijuan	Master's Thesis, Southwest University	65
2	High-standard farmland construction standards	/	China Standard	52
3	Theoretical framework and model selection of high standard farmland construction	Zeng Fusheng	Hunan Forum	44
4	Evaluation of comprehensive benefits of high standard farmland construction projects in the Yellow and Huaihai Sea and the region	Wang Xiaoqing et al.	Journal of Agricultural Engineering	44
5	Practices and Thoughts on High-standard Farmland Construction	Zhao Qi et al.	Agricultural Development and Equipment	42
6	Study on Regional Delineation and Site Selection of High-standard Farmland Construction Project Area	Sun Xi et al.	Journal of Agricultural Machinery	42
7	A Review of Research Methods on Suitability Evaluation, Benefit Evaluation and Analysis of Influencing Factors of High-standard Farmland Construction	Wang Xiaoqing et al.	China Agronomy Bulletin	42
8	Analysis of high standard farmland construction status based on land improvement monitoring and supervision system	Fei Jianbo et al.	Journal of Agricultural Engineering	40
9	Grain yield increase effect of high standard farmland construction policy	Hu Xinyan et al.	Journal of South China Agricultural University (Social Science Edition)	39
10	Research on construction conditions and development mode of township high-standard farmland in the context of rural revitalization	Li Yilong et al.	Journal of Southwest University (Social Sciences)	38
11	Zoning method of high standard farmland construction based on ecological service function enhancement	Liu Chunfang et al.	Journal of Agricultural Engineering	37
12	Research on construction and monitoring of high-standard farmland based on comprehensive quality of arable land	Song Wen et al.	China University of Geosciences	37
13	Research on construction of high standard farmland based on ecological security and food security	Wang Ke et al.	Journal of Ecology and Rural Environment	35
14	Progress of High-standard Farmland Construction in China and Suggestions for Policy Improvement: Comparing China's Agricultural Modernization Goal and Lessons Learned from the United States, Germany, and Japan	Han Yang et al.	Rural Economy	37
15	Farmland Construction Practices in Japan and South Korea and the Implications for China's High-standard Farmland Construction	Fang Linna et al.	Agricultural Resources and Zoning in China	31
16	Research on the construction of supervision mechanism for the whole process of high-standard farmland construction	Shi Nuo et al.	Journal of China Agricultural University	30
17	A Review of Research on Construction of High-standard Farmland	Bi Fangying et al.	Anhui Agricultural Science	28
18	Performance Evaluation of High-standard Farmland Construction in Sichuan Province	Xiong Bingyao et al.	Population, Resources and Environment of China	28
19	Evaluation of the suitability of high standard farmland construction under the perspective of ecological civilization construction	Chen Lin et al.	Soil	28
20	Selection of priority areas for high standard farmland construction based on TOPSIS and hotspot analysis	Zhao Dongling et al.	Journal of Agricultural Machinery	27

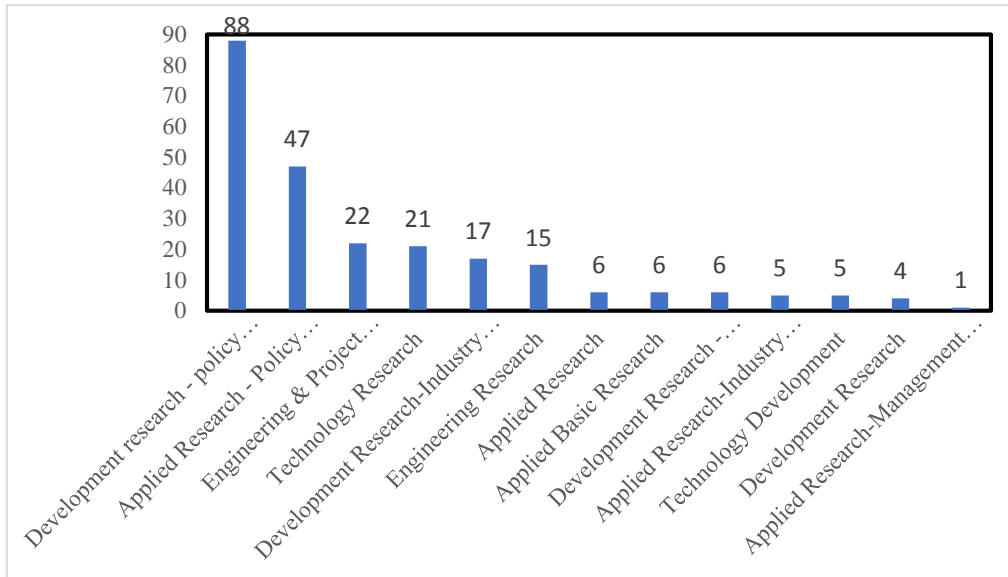


Figure 3. Hierarchical distribution of research on high-standard farmland construction in China

3.4. Analysis Of Main Authors

The analysis of the main authors can show the institutions of the distribution of experts in China, which helps to strengthen academic exchange and cooperation [28]. Table 2 is the top 10 authors of the high standard farmland construction research in China, totaling 56 articles, accounting for 2.2% of the total sample of articles. Among them, the newspaper has the largest number of publications, a total of 23 articles, but the total citation frequency is 0 times, mainly for the interpretation of the policy and the completion of high-standard farmland after the interview reports; followed by civil servants accounted for a larger proportion of the publications, but the citation frequency is not much, mostly related to the local policy interpretation, engineering and construction, etc.; and the authors of the literature of the total citation frequency is usually from the universities and scientific research institutes, which is the Ministry of Natural Resources, Land Rectification Center Uyu Wenju and Sun Xuetao of Shandong Academy of Social Sciences have been cited 75 times in total, which shows that the researchers of these research institutes and universities have played an important role in promoting and leading the development of the research on the construction of high-standard farmland in China.

Table 2. The top 10 authors of research publications on high-standard farmland construction in China

No	Author	Institution	Total Literature/Pian	Citation Frequency
1	Li Chuanjun	Farmers' Daily	11	0
2	Yan Bo	Bazhong Daily	7	0
3	Deng Yuejie	Guizhou Daily	5	0
4	Sun Xuetao	Shandong Academy of Social Sciences	5	35
5	Luo Shanping	Taihe County Agricultural and Rural Bureau, Jiangxi Province	5	1
6	Yun Wenju	Land Reorganization Center, Ministry of Natural Resources	4	40
7	Zhou Tong	Engineering Construction Service Center, Ministry of Agriculture and Rural Development	4	16
8	Zhang Yu	Weihai Bureau of Agriculture and Rural Development	4	13
9	Fu Chuanhao	Taihe County Agricultural and Rural Bureau, Jiangxi Province	4	1
10	Ma Xiulong	Hehai University	4	0

3.5. Analysis Of Main Source Journals

Analyzing the main publications of the papers related to the research field of high-standard farmland construction can guide the direction of readers' submission and reading [29]. Figure 4 shows the journals or magazines that are most involved in the research of high-standard farmland construction in China, and the statistics can be obtained that the top 20 journals issued a total of 900 articles, accounting for 35.9% of the total sample literature. China Comprehensive Agricultural Development is the journal that publishes the most relevant literature, with a total of 472 articles, accounting for 52.4%; China Comprehensive Agricultural Development is a monthly magazine founded by the Institute of Agricultural Resources and Agricultural Zoning of the Chinese Academy of Agricultural Sciences, which mainly publishes articles on economic and management sciences; however, the journal's total citation frequency and per-piece average citation frequency are low.

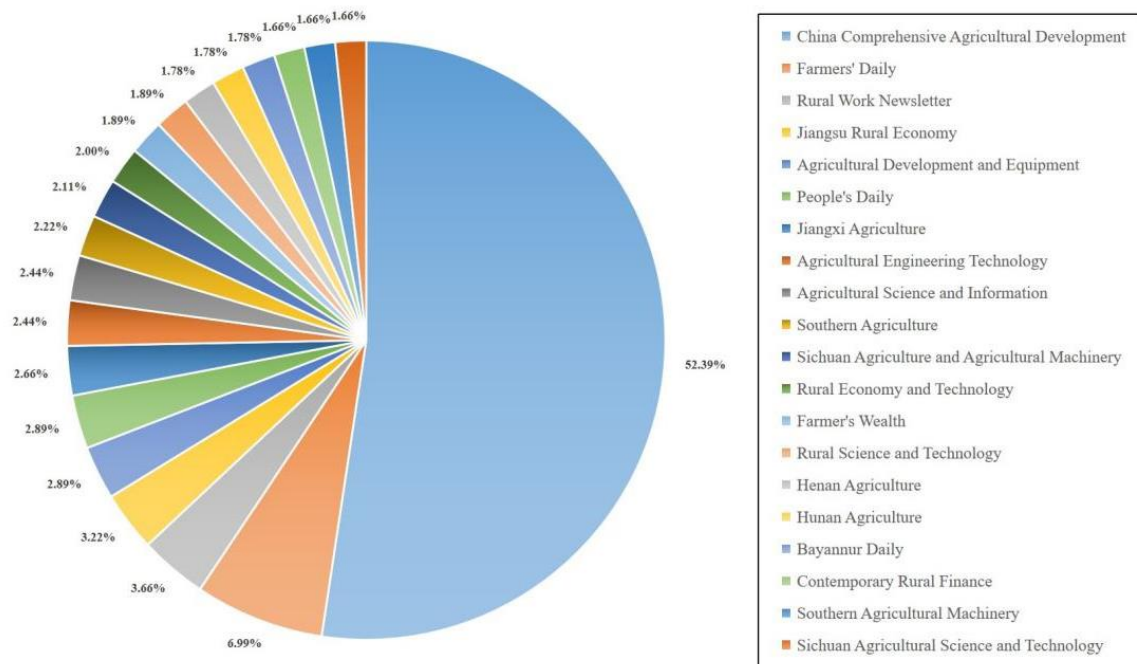


Figure 4. Top 20 journals with the highest number of articles on high standard farmland construction research in China

4. SUMMARY

(1) China's high-standard farmland construction research field in recent years in the rapid development stage, but there are shortcomings, such as policy research, construction, but the construction process of the scientific problems remain to be colleges and universities and research institutes to study in-depth, high-standard farmland after the construction of the problem of care and capacity enhancement still need to be strengthened.

(2) China's high standard farmland construction research in the field of the largest number of documents issued by the newspaper, the total citation frequency of the two most cited documents were “Chongqing City, high-standard farmland construction standards and model research” and “high-standard farmland construction standards”, “China's Comprehensive Agricultural Development” is the publication of the largest number of related documents. From the above, it can be seen that China's high standard farmland construction research is mainly concentrated in the government and enterprises and institutions, while universities and research institutes are less, the average number of citations of universities is relatively more. Policies, construction, construction literature is mainly concentrated in the government and enterprises and institutions, while the high standard farmland construction research nature of the literature is mainly concentrated in colleges and universities, the overall scientific research atmosphere in colleges and universities, the power level is higher. The hotspots of the research on the construction of high-standard farmland in China are mainly concentrated in the direction of policy interpretation, engineering construction, technology development and so on.

(3) In the current development of high-standard farmland construction boom, we also see a lot of problems, at present, most areas of high-standard farmland construction there is a “non-food” problem, the lack of planning and coordination of the project site selection, high-standard farmland standards are not high enough, etc. Therefore, it is necessary to adopt a comprehensive planning and coordination of high-standard farmland construction. Problems such as, therefore, through integrated planning, increase investment, strengthen the model, science and technology to lead a series of

measures to promote integration, strong development, increase the effectiveness of the high standard farmland out of a road in line with the local reality of the construction of high standard farmland.

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