Study on the Practice of Digital Countryside under the Goal of Agricultural Power-based on Yubei District Digital Intelligence and Technology Village as an Example

Yanlan Yang

School of Finance and Economics, Chongqing Three Gorges University, Chongqing 404100, China

Abstract: The goal of a strong agricultural country is an important strategic plan for China to comprehensively promote rural revitalization and modernization of agriculture and rural areas. As one of the first national digital countryside pilot areas, Yubei District in Chongqing Municipality actively promotes the high-quality development of rural industries. This paper adopts the case study method to explore in depth the intelligence and precision of agricultural production, to accelerate the construction of digital countryside. Through the implementation of the seed industry revitalization action, the establishment of the country's first hilly mountainous digital intelligent unmanned orchard, and the improvement of the smart governance platform and digital management system and other practical achievements. Sound digitalization of rural public services, such as smart pensions and telemedicine services, improves the quality of life of rural residents. This study not only helps to deepen the understanding of Yubei District's digital intelligence and technological rural practices, but also provides useful lessons and references for other regions to promote agricultural modernization.

Keywords: digital agriculture; high-quality development; chongqing municipality; agricultural science and technology; agricultural intelligence

1. Introduction

Guided by the goal of a strong agricultural country, Yubei District has conducted in-depth research on digital intelligence and scientific and technological rural practices. With a digital management platform for smart villages as the core, the region has realized the intelligence, precision, and efficiency of rural production through the main line of "smart perception - smart diagnosis - smart decision-making". Yubei District is rich in natural resources, but also faces the challenge of agricultural development in hilly and mountainous areas. Traditional farming methods in hilly and mountainous areas often face low levels of mechanization and intelligence, as well as difficult and costly management, resulting in poor economic benefits for agricultural products. In the 2023 Digital Village Pilot Final Evaluation Report, Yubei District achieved 6th place in the national ranking and 1st place in the western region. Taking the national digital village construction as a hand, Yubei District has made efforts to promote the transformation of traditional agriculture to digital agriculture, and explored a new way of digital agriculture development in hilly and mountainous areas that can be replicated and popularized. [2]

2. Development Status Yubei District Digital Intelligence and Science and Technology Countryside Continues to Deepen

2.1 Digital Intelligence and Technology Rural Policy Support

The Yubei government has issued a series of policies to encourage and support enterprises and scientific research institutions to participate in the construction of digital villages, and reward and support enterprises and institutions that have achieved remarkable results in the fields of rural digital infrastructure and agricultural informatization, to promote the formation of a favorable atmosphere for the construction of digital villages. For example, during the "14th Five-Year Plan" period, Yubei District plans to invest 28 billion yuan in digital village construction, focusing on the implementation of key projects in the areas of rural digital infrastructure, construction of public digital platforms, digital development of rural industries, and digitalization of rural governance. [1]

2.2 Modern information technology promotes the intelligent transformation of villages.

Yubei District has made significant progress in digital infrastructure construction. Through initiatives such as the deployment of rural 5G base stations, the construction of Internet towns, and the realization of full coverage of fiber optics,

4G communication networks, and broadcasting and television networks in key rural human settlements gathering areas, the majority of farmers have become more convenient to use the Internet to reach out to the Internet, and can share countryside food, beautiful scenery, and daily life without leaving their homes. [In addition, Yubei District has accelerated the coverage and popularization of 5G base stations and fiber-optic networks, as well as digitally transformed and upgraded traditional infrastructure, further strengthening the "digital base" of rural infrastructure.

2.3 Digital Intelligent Countryside in Hilly Mountainous Areas

Yubei Agricultural Hi-Tech Zone takes science and technology as the lead, takes the hilly and mountainous Digital Intelligent Countryside as the construction theme, takes the hilly and mountainous high-efficiency specialty crops as the leading industry, relies on scientific and technological empowerment to explore the effective path of modernizing high-efficiency villages and specialty villages under the characteristic conditions of "hilly and mountainous", and creates the "One Belt, One Road It aims to create an advanced rural science and technology innovation zone at the junction of "Belt and Road" and Yangtze River Economic Belt, a leading rural revitalization zone in the western hilly and mountainous areas, and a demonstration zone of modern high-efficiency and featured villages in the economic circle of Chengdu-Chongqing region.

2.4 Digital Countryside Helps Elderly Services

Aiming at the late start of socialized pension services in rural areas and the lagging behind in facilities and technology, Yubei District has innovatively launched the solution of "aging renovation + mutual pension services + intelligent pension services". Through the implementation of "Internet+Medical, Pension, and Social Security", a three-in-one intelligent healthcare system has been constructed, and a remote diagnosis and treatment network has been set up to cover all rural grassroots medical institutions. At present, Yubei District has carried out remote consultation in rural areas, issued a large number of electronic social security cards, activated a wide range of electronic vouchers for the New Farmers' Cooperative, and reached a 100% utilization rate of electronic medical records in village and township health agencies. [3]

3. Unmanned orchard management platform for hilly and mountainous areas in Qinglong Village, Dasheng Township

The unmanned orchard management platform in Qinglong Village, Dasheng Town, is a comprehensive, high-tech orchard management solution. The platform is structured in a "1+4" mode, where "1" refers to a data center and "4" represents four major functions, including orchard environment monitoring, precise management, remote monitoring, and intelligent agricultural machinery. The main features of the platform include the full range of data.

The main features of the platform include full coverage of data, all-weather environmental monitoring, precise management, and fully automated farm machinery collaboration. By constructing plot-level 3D digital maps, the platform converges and integrates 3D model data, environmental data, crop physiological data, plot attribute data, and intelligent agricultural machinery data, thus realizing three-dimensional and precise management of the orchard.

In terms of environmental monitoring, the platform relies on satellite remote sensing, drones, the Internet of Things, and other sky-land multi-source collaborative monitoring technology to intelligently identify and monitor the orchard's spatial environment, soil environment, and pests and diseases, and to realize a 24-hour comprehensive perception of the growing environment. This provides a stable and reliable decision-making basis for the precise management and care of the orchard.

The platform also utilizes intelligent sensing, pattern recognition, automatic obstacle avoidance, and other technologies, combined with three-dimensional accurate digital maps, to efficiently collaborate with unmanned target spraying robots, unmanned weeding robots, unmanned picking robots, and other intelligent agricultural machinery, to achieve interoperability of agricultural machinery data, operational planning, unified scheduling, to carry out wide-range, high-precision and high-efficiency autonomous operations. [4]

The implementation of the platform not only improves the production, and management efficiency of the orchard, but also realizes the transformation of orchard management from "know how to plant fruit trees" to "wise planting fruit trees". Through the construction of a digital unmanned orchard, the orchard has achieved significant results in saving water resources, fertilizer usage, process management costs, etc., while the resource utilization rate and labor productivity have also been greatly improved.

4. Conclusion

Yubei District is actively exploring paths for the deep integration of digital technology with rural production and life. Through measures such as implementing land remediation according to local conditions and promoting digital unmanned orchards in hilly and mountainous areas, Yubei District has transformed fragmented and separated plots of land with different

plot sizes into modernized and high-standard farmland, which has greatly improved soil quality and farming conditions. These innovative practices have not only improved the efficiency of agricultural production, but also provided strong support for the overall revitalization of the countryside.

References

[1] Deng Li. Chongqing Yubei District: solidly promoting the construction of digital countryside[N]. Farmers' Daily, 2023-01-03(004). DOI:10.28603/n.cnki.nnmrb.2023.000028.
[2] Zhang Qi, Guan Yun, Jiang Tingting, et al. Ma Chengquan, Vice Mayor of Yubei District, Chongqing Municipality: Promoting the Transformation of Traditional Agriculture to Digital Agriculture[J]. Contemporary Guizhou,2023,(23):32-33.
[3] Wu Lu Mu. How "smart" is the countryside here[N]. Economic Daily News,2023-03-15(009). DOI:10.28425/n.cnki.njjrb.2023.001777.
[4] Li Tai, Yu Yan. Accelerating the high-quality development of digital countryside in the new period[J]. Macroeconomic Management,2024,(01):45-54. DOI:10.19709/j.cnki.11-3199/f.2024.01.009.
[5] Zhu Mengying. Science and technology help "intelligent spring plowing"[N]. China Agricultural Mechanization Herald, 2022-02-28(007). DOI:10.28115/n.cnki.ncnjh.2022.000126.
[6] Zhang Zhenyu. New Quality Productivity Enabling Digital Village Construction: Transformation Logic and Implementation Path[J]. Academic Exchange,2024,(01):93-107.