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The Path and Exploration of Meteorological Science Popularization Under the Background of Rural Revitalization

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Abstract

In recent years, the integration of emerging technologies and traditional fields has led to significant progress in various sectors, including the meteorological department. In the context of rural revitalization, innovative approaches are crucial to address multiple challenges and unleashing the potential of rural communities. Among these methods, meteorological science popularization is a promising way to improve the resilience, sustainability and social and economic development in rural areas. This paper will explore the path and exploration of meteorological science under the background of rural revitalization. Through structural analysis, we will examine the theoretical basis, practical application and policy implications of incorporating meteorological science into rural revitalization work.

Keywords

Rural revitalization; meteorological knowledge; popular science.

1. Introduction

Meteorological science popularization includes the dissemination of weather-and climate-related knowledge, technologies, and services to diverse audiences, including rural communities. The core of meteorological science popularization is providing individuals and communities with the information and tools needed to understand, mitigate, and adapt to weather-related risks and opportunities. Drawing on the interdisciplinary perspectives of meteorology, communication research, and rural development, the approach highlights the importance of accessible, relevant, and actionable meteorological information for rural stakeholders.

Meteorological science popularization is an important means to improve the scientific quality of farmers, enhance the ability of rural meteorological disaster prevention, and promote the sustainable development of agriculture. Under the background of rural revitalization, the meteorological science popularization work is facing new opportunities and challenges. On the one hand, with the rapid development of rural economy and the continuous improvement of farmers 'living standards, farmers' demand for meteorological information is more and more diversified and personalized, which puts forward higher requirements for meteorological science popularization. On the other hand, the meteorological science popularization resources in rural areas are relatively scarce, and the meteorological science popularization personnel team is insufficient, and the means and methods of meteorological science popularization need to be innovated urgently. Therefore, strengthening the meteorological science and improving the quality of meteorological science has become an urgent problem to be solved under the background of rural revitalization.

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2. The Current Situation of Meteorological Science Popularization in Rural Revitalization

The current situation of meteorological science popularization in rural areas is affected by many factors, and there are some problems and challenges, but some progress has also been made. The following are some current characteristics of meteorological science popularization in rural areas:

1. Uneven dissemination of meteorological information: Due to the limitations of infrastructure and technology, the dissemination of meteorological information in rural areas is not uniform. Some remote areas may not be able to receive the latest weather forecasts and early warning information in time.

2. Limited meteorological science popularization resources: Compared with urban areas, the meteorological science popularization resources in rural areas are relatively scarce, including popular science materials, equipment and professional talents.

3. The level of meteorological knowledge of farmers is uneven: the level of meteorology is generally low, and their ability to prevent and respond to meteorological disasters is limited, which affects the effect of meteorological science popularization.

4. Single way of meteorological science popularization: traditional methods such as wall charts and brochures are still dominant in rural areas and lack interactivity and interest, making it difficult to attract the attention and interest of farmers.

5. Insufficient ability to respond to meteorological disasters: Although meteorological science popularization has improved farmers 'understanding of meteorological disasters to a certain extent, farmers' ability to prevent and mitigate meteorological disasters is still weak in the actual response process.

6. Gradually establishment of policy support and cooperation mechanism: With the implementation of the rural revitalization strategy, the government has gradually paid more attention to meteorological science popularization, policy support and capital investment have increased, and the cross-departmental cooperation mechanism has been gradually established.

7. The application of new technologies is gradually increasing: the popularization of new technologies such as the Internet, smart phones and social media has provided new communication channels and methods for meteorological science popularization, making meteorological information more convenient to reach farmers.

Generally speaking, meteorological science popularization still faces many challenges in rural areas, but with the progress of technology and policy support, the work of meteorological science popularization is gradually improving, providing farmers with more timely, accurate and useful meteorological information.

3. Practice of Meteorological Science Popularization to Promote Rural Revitalization and Development

Meteorological science plays a key role in rural revitalization by informing decision-making, increasing productivity, and fostering resilience in agriculture and rural livelihoods. The postdoctoral scholar's study highlights the importance of meteorological knowledge and services in addressing climate change, extreme weather events, and natural disasters, which pose significant challenges to rural communities. By promoting weather knowledge, early warning systems, and climate intelligence practices, meteorological science can help rural stakeholders reduce risk, optimize resource allocation, and improve adaptation, thus contributing to sustainable development outcomes.[1]

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In order to effectively integrate meteorological science into the rural revitalization work, we must explore and implement various ways and strategies. The postdoctoral scholar has identified several key pathways, including:

1. Community participation: Involve rural communities in the co-production and dissemination of meteorological knowledge and services, and use local knowledge, practices and networks to improve relevance and penetration.

Figure 1. Rural Students Receiving Meteorological Science Popularization

2. Capacity building: To build the ability of interested rural meteorologists, including farmers, extension workers and staff of relevant government departments, to interpret, utilize and apply meteorological information in the decision-making process.

Figure 2. Meteorological Information Officer Receiving Meteorological Science Popularization Training

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3. Technological innovation: Using mobile applications, agro-weather sensors and remote sensing technologies to provide real-time, site-specific weather forecast and consultation to rural users.[2]

Figure 3. Students in urban areas receiving advanced meteorological instrument science popularization

4. Partnership development: Promote cooperation between the weather bureau, research institutions, civil society organizations and other departments to jointly create and provide tailored meteorological services and solutions for different environments.

By using these approaches, meteorological science can effectively bridge the gap between scientific knowledge and rural practice, and realize informed decision-making, risk management and sustainable development in rural areas.

4. Promote Meteorological Science and Promote the Exploration of Rural Revitalization

In the context of rural revitalization, due to the increasing recognition of the importance of weather and climate information for rural development, the exploration of meteorological science popularization is growing momentum. The postdoctoral scholar's research reveals innovative initiatives and best practices in this area, highlighting successes and challenges. A notable example is the establishment of weather observation networks and agrometeorological stations in rural areas to provide localized weather data and forecasts to farmers and agricultural stakeholders. Through participatory approaches and stakeholder engagement, these initiatives improve farmers' access to timely and accurate weather information, enabling them to make informed decisions about planting, irrigation, and pest management.[3]

In addition, digital technologies such as mobile apps and SMS-based weather alert systems are being deployed to disseminate weather forecasts and consultations to rural users to overcome barriers to distance, literacy and infrastructure. These technological innovations have the potential to improve rural communities' resilience to climate-related risks and improve agricultural productivity and livelihoods.[4]

However, the effective implementation and sustainability of meteorological science popularization activities in rural China still faces challenges. These include inadequate infrastructure and resources, limited institutional capacity, and socioeconomic disparities

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between rural populations. Furthermore, ensuring the relevance, accuracy, and reliability of meteorological information in different rural settings also presents ongoing challenges.[5]

5. Outlook and Suggestions

In view of these challenges and opportunities, the researchers of this project have proposed policy inspirations and suggestions for using meteorological science as the driving force of rural revitalization in China:

1. Infrastructure construction: Priority investment in meteorological infrastructure, including meteorological observation networks, agricultural meteorological stations and information and communication technology infrastructure, to improve the availability and accessibility of weather and climate information in rural areas.

2. Capacity building and development of grassroots meteorologists: Develop training programs and capacity-building initiatives for rural stakeholders, including farmers, extension workers, and local officials, to improve their understanding of meteorological science and its applications in agricultural and rural development.

3. Promote multi-sectoral communication and partnership: Promote partnerships and cooperation between meteorological agencies, research institutions, civil society organizations and actors in the private sector to jointly create and provide tailored meteorological services and solutions for rural communities.

Through the three policy suggestions, China can make use of the reform potential of meteorological science to promote rural revitalization, enhance disaster resistance ability, and promote the sustainable development of rural areas.

6. Conclusion

As an indispensable part of China's rural revitalization, meteorological science popularization has great prospects, providing valuable insights, tools and solutions for coping with weather-related risks and improving agricultural and rural livelihoods. Meteorological science popularization plays a vital role in rural revitalization. Through meteorological science popularization, farmers can better understand and use meteorological information, improve agricultural production efficiency and economic benefits, and promote the development of rural economy. First of all, meteorological science can improve farmers' meteorological awareness and scientific quality. Farmers are the main labor force of agricultural production, and their sensitivity to weather changes and their ability to respond to meteorological changes directly affect the stability and benefit of agricultural production. Through meteorological science popularization, farmers can learn meteorological knowledge, understand the impact of meteorological changes on agricultural production, and improve the ability to prevent and respond to meteorological disasters, so as to reduce the impact of natural disasters on agricultural production. Secondly, meteorological science popularization can help farmers to arrange agricultural production reasonably. Agricultural production is greatly affected by meteorological conditions. Through meteorological science popularization, farmers can timely obtain weather forecast and climate prediction information, and reasonably arrange planting time, crop layout and agricultural production activities according to meteorological conditions, so as to improve agricultural production efficiency and yield. In addition, meteorological science popularization can also promote the optimization and adjustment of rural industrial structure. Through meteorological science popularization, farmers can understand the climate characteristics of different regions and suitable crops, adjust the planting structure according to the market demand and meteorological conditions, develop appropriate agricultural industries, and improve the market competitiveness and added value of agricultural products.

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Meteorological science popularization can also promote the promotion of farmers' awareness of sustainable development. Meteorological science can not only provide meteorological information, can also transfer knowledge to farmers of environmental protection, climate change, guide farmers to take sustainable agricultural production mode, reduce the damage to the environment, promote the sustainable development of agriculture, promote the sustainable development of farmers consciousness, meteorological science for rural revitalization provides important support and service. Therefore, it is one of the important measures to further strengthen the work of meteorological science popularization and improve the quality of meteorological science popularization.

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