How to Effectively Construct a County-Level Village-to-Village Emergency Broadcasting System Postprint

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Abstract

China is characterized by its vast territory, dense population, and status as a major agricultural nation. In the event of natural disasters and other emergencies, the absence of a robust early warning mechanism can readily inflict substantial economic losses and casualties upon the general populace. Consequently, China has been vigorously promoting and establishing the Village-to-Village Emergency Broadcasting System in recent years. The system's efficient, secure, and timely warning capabilities hold significant importance for natural disaster prevention and the advancement of national disaster relief and mitigation initiatives. This paper presents an analytical study on the effective construction of the Village-to-Village Emergency Broadcasting System from a county-level perspective, aiming to facilitate its extensive promotion and application.

Full Text

Preamble

Title: How to Build an Effective County-Level Emergency Broadcast System for Rural Villages

Abstract: China has a vast territory with a dense population and is a major agricultural country. When natural disasters or other emergencies occur, the lack of a robust early warning mechanism can easily cause economic losses and casualties among the people. In recent years, China has been vigorously promoting and constructing the "Village-to-Village Sound" emergency broadcast system. Its efficient, safe, and timely early warning functions are of great significance for preventing natural disasters and advancing disaster prevention and mitigation efforts. This paper analyzes and studies how to build an effective county-level emergency broadcast system from a county-level perspective, hoping to promote the large-scale promotion and application of such systems.

Keywords: Village-to-Village Sound; Emergency Broadcast System; Emergency Mechanism

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Overall, China currently lacks a sound emergency response mechanism for frequently occurring emergencies, especially in rural areas where contingency plans are particularly inadequate, leaving broadcast media at a loss when facing such incidents or natural disasters.

China is one of the countries most affected by natural disasters globally. Simultaneously, China is undergoing social transformation, with increasingly intense social contradictions and market competition, and various social conflicts frequently erupt, posing grave threats to people's lives and property. Moreover, in vast rural areas, low literacy levels prevent residents from obtaining relevant external information in a timely manner, making it impossible for them to prepare for disaster prevention and mitigation in advance, resulting in heavy losses. Therefore, establishing an emergency broadcast mechanism in rural areas is extremely urgent. To address this issue, China has proposed to comprehensively promote the construction of the Village-to-Village Sound emergency broadcast system project, which has made significant contributions to emergency reporting and disaster information dissemination in rural areas.

1.1 Lagging Disaster Prevention and Relief Reporting Concepts

Currently, domestic news media are not yet mature in disaster early warning reporting. Most disaster coverage that the public hears is post-disaster notification type, focusing primarily on disaster losses, relief policies, and post-disaster reconstruction. Although these reports have some early warning effect on potential secondary disasters, their overall impact is limited. To date, only a dozen or so radio stations in China have launched dedicated emergency broadcast frequencies, and broadcast programs specifically aimed at disaster prevention and emergency response are even rarer, with only a handful currently retrievable. Although the country has vigorously promoted the construction of Village-to-Village Sound emergency broadcast projects in recent years, increasing county-level broadcasting efforts to publicize disaster prevention and relief knowledge among villagers, relying solely on broadcasting relevant notices and documents makes it difficult for rural residents to achieve good listening results.

1.2 Unsound Disaster Early Warning System

China has already formulated a staggering number of emergency plans. By 2012, governments and relevant departments at all levels had developed over five million contingency plans for various situations. However, this does not mean that China's emergency plan system is relatively complete and robust. Most of these plans are highly principled and lack specificity and foresight. Yet emergencies exhibit great variability and randomness, making it difficult for these contingency plans to effectively handle unexpected incidents.

1.3 Low Effective Coverage of Rural Broadcasting

In recent years, China has frequently experienced various disasters, but in most affected areas, broadcast coverage can only reach prefecture-level cities. In some places where broadcast signals are available, many households lack radios, preventing the general public from obtaining external information promptly. Although the Village-to-Village Sound project has achieved initial success, survey results show that very few counties and cities nationwide have completed the emergency broadcast "Village-to-Village Sound" project, especially in remote areas. Reception equipment in some regions also has problems, resulting in poor listening quality.

2.1 System Function Introduction

The Village-to-Village Sound rural emergency broadcast system has evolved into a relatively well-developed and technologically mature broadcasting system, encompassing scientific and technological achievements in broadcasting, communications, and other fields. The system simultaneously features traditional broadcasting, emergency information release, and addressable functions, and can conduct emergency voice calls or broadcasts according to corresponding administrative jurisdictions.

First, the Village-to-Village Sound emergency broadcast system has an automatic broadcast function, but to achieve this, we must pre-configure the system to ensure that county, township, and village-level systems can automatically control and broadcast according to preset programs. Generally, frontends at different levels must relay self-produced programs based on the principle of time-based broadcasting. Meanwhile, the frontends of the Village-to-Village Sound emergency broadcast system can also automatically broadcast programs according to pre-set procedures, while receiving terminals can automatically power on and play according to scheduled times.

Second, the addressable function. The addressable function means that county-level and township-level frontends can perform encoding, volume adjustment, and other operations on broadcast receiving terminals within their respective administrative jurisdictions according to regional divisions. The addressable function also includes the ability to control all receiving terminals of the emergency broadcast system within the jurisdiction. This function can accurately locate

the jurisdiction of emergency broadcasts, control the on/off status of system receiving terminals within the jurisdiction, and promptly broadcast traditional and emergency information.

2.2 System Architecture

The application logic structure of the Village-to-Village Sound emergency broadcast system is relatively simple, mainly composed of FM modulators, addressable encoding controllers, and addressable broadcast terminals. The primary function of the addressable encoding controller is to control and encode all equipment in the system, with equipment volume adjustment and power on/off control commands being relayed and output here. The remote telephone monitoring equipment's main role is to restrict incoming calls, record calls, and display caller ID. The FM modulator's function is to broadcast signals and local audio sources.

2.3 Receiving Terminals

Currently, the receiving terminals used in the Village-to-Village Sound emergency broadcast system are generally implemented through coaxial cable sharing. This type of terminal has functions such as receiving remote addressable instructions to achieve terminal frequency switching and power on/off control. Additionally, it has both logical addressing and physical address functions, where the physical address cannot be modified, but the logical address can be remotely modified online. It also features lightning protection, overcurrent, and overvoltage protection functions, and can receive dual high frequencies from 87 to 108MHz. It can also be divided into multiple levels according to different needs, effectively meeting service requirements.

3.1.1 Standardized Construction

Strictly construct the Village-to-Village Sound emergency broadcast system according to relevant national and industry requirements and technical standards. Both system design and construction must consider actual usage needs and the actual situation of scientific and technological development to facilitate future system updates and upgrades and reduce investment. Additionally, constructing the Village-to-Village Sound rural emergency broadcast system must consider post-construction operational costs, plan scientifically and rationally, and achieve both functional and economic benefits.

3.1.2 Reliability and Safety

When constructing county-level Village-to-Village Sound emergency broadcast systems, we must ensure that the completed system equipment can operate safely and reliably. This requires us to formulate a relatively complete safety management plan to ensure the safety of construction personnel and system

equipment. Simultaneously, we should select appropriate technologies to improve system operational safety and reliability. For example, the mature FM-SCA FM technology is typically used for broadcasting signal transmission, while FSK technology with excellent anti-interference performance is often used for addressable encoding. Specific technology applications should combine the actual construction situation to select the most cost-effective technical combination solutions.

3.1.3 Economic Practicality

When designing and constructing county-level Village-to-Village Sound emergency broadcast systems, attention must be paid to simple structure, convenient maintenance, and using uniform specifications for equipment to reduce construction and operational costs. System equipment installation should be adapted to the specific environment and should simultaneously meet requirements for price, quality, and functionality. During installation, pay attention to system debugging to ensure it can fully perform its emergency functions during critical times.

3.2 Resource Integration to Improve County-Level Disaster Prevention and Mitigation Defense Systems

The Village-to-Village Sound emergency broadcast platform has advantages such as wide release range and fast information dissemination. To improve county-level emergency mechanisms and build a sound social early warning system, we can consider integrating the release port of the Village-to-Village Sound emergency broadcast platform with the emergency warning information release platform and one-click release platform to reduce message editing time and effectively improve release efficiency. Since meteorological departments, earthquake bureaus, and other relevant departments do not have the advantages of the Village-to-Village Sound system in terms of information release scope, we must consider resource integration to effectively connect these departments and platforms with the Village-to-Village Sound emergency platform, enabling the public to obtain relevant information promptly and reduce economic losses and casualties caused by disasters. For example, integrating air defense early warning with flood control, unifying emergency broadcasting with social early warning, and building a relatively complete social early warning system in rural areas to form an emergency mechanism with complete functions, sensitive response, and efficient operation. This not only fully utilizes the functions of the Village-to-Village Sound emergency broadcast but also greatly increases the coverage of emergency broadcasting. Once a disaster occurs, information release can be ensured through aerial coverage while ground rescue and evacuation work proceed in an orderly manner, giving rural residents the opportunity to prepare for prevention, significantly reducing economic losses with remarkable results.

3.3 Improving the Comprehensive Quality of Emergency Broadcast System Staff

We must strive to improve the comprehensive quality of staff at county and township-level radio stations. When emergencies occur, staff should be able to use the Village-to-Village Sound emergency broadcast system to transmit early warning signals to the people at the first moment, while informing them of response methods. During the event development process, they should continuously update the latest situation. After the disaster, they should analyze and store relevant information about the disaster through the emergency broadcast system to identify better response measures for similar disasters in the future. Simultaneously, pay attention to improving public crisis awareness, updating emergency broadcast reporting concepts, and strengthening staff knowledge of scientifically responding to natural disasters.

4. Conclusion

In summary, the Village-to-Village Sound emergency broadcast platform has advantages such as wide news and information release range, fast information dissemination speed, strong targeting, and multiple publicity functions. It plays an important role in responding to regional emergencies and mass incidents. It is not only an important component of improving China's radio and television public service system but also a reliable platform for effectively responding to natural disasters and emergencies in rural areas, as well as a grassroots livelihood project that China is vigorously constructing. Therefore, we must accelerate the construction of Village-to-Village Sound emergency broadcast systems to promote the building of a harmonious socialist society and new rural areas.

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Note: Figure translations are in progress. See original paper for figures.