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Exploration and Thinking on Improving the Construction of Emergency Support System by Sichuan Provincial Special (Patrol) Police—Taking Earthquake Disaster as an Example

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Abstract: Sichuan Province has long been characterized by frequent and intense seismic activity. Currently, earthquake prediction remains a significant scientific challenge worldwide. As the first line of rescue forces, public security special (patrol) police face a challenging situation in disaster relief. Through research and analysis of the special (patrol) police detachments of public security bureaus in various cities (prefectures), it is found that there are widespread issues such as insufficient professional equipment, lack of specialized personnel, inadequate logistical support, unclear division of responsibilities, and difficulties in implementing emergency plans. The author will propose suggestions on talent development, police dog training, drone deployment, equipment reserves, high-altitude adaptability training, and the construction of emergency logistics support systems, providing reference for the development of emergency support systems for public security special (patrol) police.

1. Introduction

There are two major seismic belts on Earth: the Pacific Ring of Fire and the Himalayan-Mediterranean Seismic Belt. Sichuan is located on the Himalayan-Mediterranean Seismic Belt, where seismic activity is both dense and intense. From the "5·12" Wenchuan Earthquake to the "4·20" Lushan Earthquake, from the "8·8" Jiuzhaigou Earthquake to the "6·1" Lushan Earthquake, and then to the "9·5" Luding Earthquake, these earthquakes all occurred in high mountain and plateau regions. Conducting earthquake disaster relief in such environments poses greater challenges to rescue teams and demands higher scientific standards for rescue operations. During the Wenchuan Earthquake, following the unified instructions of the Ministry of Public Security's Frontline Command for Earthquake Relief, over 3,000 special police officers were dispatched from major cities across the country to the frontlines of earthquake relief efforts, where we could see the presence of special (patrol) police everywhere. On March 6, 2023, the Sichuan Provincial Public Security Department's Special Police Corps issued a document titled "Notice on Conducting Research on the Construction of Emergency Support Systems," which emphasized the responsibilities of special patrol police units, identified current emergency scenarios and potential

future challenges, and proposed suggestions for improving the construction of emergency support systems for special (patrol) police in Sichuan.

2. Overview and future trend of Sichuan earthquake

The earthquake disaster in Sichuan is widely distributed, mainly concentrated in the western part of Sichuan, such as Maocounty, Songpan and Lixian in the upper reaches of Minjiang River in northwest Sichuan, Kangding, Luhe and Daofu in the west, Xichang, Yanyuan and Huili in the southwest, and a small number of places in eastern and southern Sichuan.

2.1 Distribution of major seismic zones in Sichuan Province

The Freshwater River Seismic Belt starts from Garze County, passing through Luhuo, Daofu, Kangding, and other counties, ending in the southern part of Luding County, all within the territory of Garze Prefecture; the Anning River-Zemu River Seismic Belt begins in Shimian County to the north, heading south through Mianning County and Xichang City, then turning southeastward, passing through Puge County and Ningnan County, stopping at Qiaojia County in Yunnan Province, mainly located within Liangshan Yi Autonomous Prefecture; the Jinsha River Seismic Belt is within Garze Prefecture, running along the east side of the Jinsha River, starting from Dege County to the north, passing through Baiyu and Batang counties to the south, ending at Derong County, extending in a north-south direction; the Songpan-Jiaochang Seismic Belt is mainly within Aba Prefecture, including Jiuzhaigou, Songpan, Pingwu counties, and Jiaochang in Mao County; the Longmenshan Seismic Belt starts from Qingchuan County, passing through Beichuan, Mao County, Mianzhu, Wenchuan, Dujiangyan, Dayi, Baoxing, and other counties and cities, ending near Luding County, extending in a northeast-southwest direction, roughly consistent with the Longmen Mountains; the Litang Seismic Belt is mainly within Litang County of Garze Prefecture; the Muli-Yanyuan Seismic Zone is within Muli County and Yanyuan County of Liangshan Yi Autonomous Prefecture [1]. The seismic belts are primarily concentrated in the three autonomous prefectures of Aba, Garze, and Liangshan, mostly in high-altitude areas, forming a "Y" -shaped distribution pattern.

2.2 Sichuan earthquake data analysis

According to the Sichuan Earthquake Catalogue, from 26 BC to the end of 2022, Sichuan Province experienced 317 earthquakes of magnitude 5 or higher, including 63 at 6.0-6.9, 21 at 7.0-7.9, and 1 at 8.0-8.9. In the past year, according to statistics from the China Earthquake Administration, Sichuan experienced 89 earthquakes of magnitude 3-5 and 8 earthquakes of magnitude 5-7; the largest of which was a 6.8-magnitude earthquake that struck Luding County, Ganzi Prefecture (north latitude29.59°, east longitude102.08°) at 12:52 on September 5, 2022, with a focal depth of 16 kilometers. The data shows that Sichuan ranks second in the number of earthquakes of magnitude 3 or higher.

2.3 The earthquake in Sichuan Province caused complex secondary disasters

Sichuan Province is a major hydropower province, with hydropower accounting for nearly 80% of total electricity generation. Large hydropower stations are mainly distributed along the Jinsha River, Yalong River, Dadu River, Min River, and Jialing River, primarily concentrated in Garze Prefecture, Liangshan Yi Autonomous Prefecture, and Aba Prefecture. These areas are also prone to earthquakes, mostly located in mountainous regions. Once an earthquake occurs, it can easily trigger severe landslides, rockfalls, and debris flows, as well as floods caused by barrier lakes, with unimaginable consequences.

2.4 The future earthquake trend in Sichuan Province

After the "9.5" Luding earthquake, experts stated that a magnitude 6.8 earthquake is not the maximum possible earthquake in the area, and the disaster it caused is far from being the most severe one we might encounter in the future. We should regard the 6.8 magnitude Luding earthquake in Sichuan as a stern warning from nature. Adhering to the principle of bottom-line thinking, we must rigorously guard against the risks of major earthquakes and catastrophic disasters, especially the threats posed by large-scale landslides and basin-wide floods triggered by major earthquakes [2].

3. Analysis of problems and causes of police (patrol) in rescue during earthquake disaster

Earthquake emergency rescue is a comprehensive and complex system, including disaster verification, rescue, medical rescue, resettlement of the masses, transportation support, material support, communication support, hidden danger investigation, public security and stability maintenance, epidemic prevention and control, etc.[3]

3.1 Lack of professional equipment and low rescue efficiency

Special (patrol) police operate the "135" rapid response mechanism on a regular basis, typically forming the first echelon of rescue forces at the epicenter during each earthquake relief operation. However, due to the lack of specialized equipment, they often find themselves at a loss, unable to accurately assess the disaster situation on-site, unable to promptly identify trapped civilians, and unable to swiftly provide the latest updates to the command center. Currently, special (patrol) police rely on calls for help from trapped civilians to locate victims, using tools like shovels and safety ropes, and mostly resorting to manual rescue efforts. This results in special (patrol) police failing to leverage their maximum advantages during the critical 72-hour "golden rescue period."

3.2 Lack of professional personnel and difficulty in rescue

Public security special (patrol) police are the professional law enforcement forces of public security organs that respond quickly and tackle tough challenges. They undertake various "dangerous, difficult, perilous, and heavy" law enforcement tasks, primarily including handling terrorist incidents, serious criminal cases, riots and disturbances; dealing with large-scale public disturbances and other major public security events; managing highly confrontational mass incidents; ensuring the safety of major events; performing specific patrol duties; and providing emergency assistance to people in distress... Therefore, most special (patrol) police detachments overlook earthquake preparedness

Emergency rescue skills training and knowledge reserves, especially in areas with low earthquake disaster probabilities, are particularly scarce. When an earthquake occurs and special (patrol) police need to go to the front line for rescue operations, they lack sufficient knowledge about earthquakes, such as basic risk assessment and response measures during aftershocks. They also have insufficient knowledge of basic rescue techniques, including simple wound care, basic injury assessment, and how to correctly move casualties. Due to a lack of relevant knowledge, they cannot perform accurate search and rescue or timely judgment, which not only hinders the effective conduct of rescue work but can even pose certain obstacles.

3.3 The division of functions of departments is unclear, and the initial rescue work is chaotic

On the front lines of rescue operations, due to the focus on specific areas by various departments, there is a lack of overall coordination and unity. This has led to each department operating

independently in the early stages of rescue efforts. As the first line of defense, police (patrol) forces immediately launched on-site rescue operations upon arriving at the disaster area. Faced with a massive volume of rescue work, tasks overlap across departments, and there is no direct connection between upper and lower levels. Departments cannot quickly organize their work processes, resulting in a situation where "everyone is doing something, but nothing is done well."

3.4 The construction of the logistics emergency support system is not complete and the support is not timely

In routine duty and preparation for combat, logistics work is regular and has clear plans. However, in emergencies, due to the uncertain factors of time, location, and on-site environment during sudden incidents, logistics work often fails to proceed according to the original plan. Currently, the emergency support work of special (patrol) police logistics has become formalized, lacking practical integrated training and failing to effectively integrate with actual work, thus failing to fully grasp the difficulties and characteristics of the job; in terms of material reserves, there is a lack of specificity, leading to difficulties in personnel organization and material supply, reducing work efficiency; in theoretical research, there is a lack of depth, making it impossible to ensure the feasibility and scientific nature of emergency support plans, and there is a lack of comprehensive planning in urgent tasks, resulting in untimely support and inability to provide necessary support in practical work.

3.5 The emergency plan has been formulated, but it is difficult to implement

The rational formulation of emergency plans can significantly enhance the efficiency of earthquake rescue operations. Special (patrol) police detachments in various cities (prefectures) have developed corresponding earthquake emergency plans based on local geographical conditions and population density. However, these plans are overly generalized, lacking detailed specifics for specific issues. When emergencies strike, problems such as inadequate professional personnel allocation, insufficient equipment, and poor departmental coordination arise. In the end, only temporary "plans" can be made, leading to rescue forces failing to perform at their best.

4. Countermeasures and suggestions for special (patrol) police rescue in earthquake disasters

4.1 Improve equipment and standardize rescue operations

Based on the special nature, danger, and professionalism of rescue work, it is essential to establish construction standards and equip with specialized equipment to further standardize rescue operations. In earthquake disaster relief, various life detection devices such as audio life detectors, video life detectors, radar life detectors, light-based life detectors, and thermal imagers, along with detection, demolition, lifting, communication, and lighting equipment, all play a significant role. Special (patrol) police cannot be fully equipped like professional emergency departments, but they should have the most basic yet crucial and frequently used rescue equipment. Upon arriving at the disaster area, special (patrol) police immediately launch rescue efforts, with the most basic tool being the radar life detector. Toothless saws and power chainsaws, commonly used in earthquake rescue, are also essential. Since rescues typically take place in collapsed independent or mixed structures, demolition equipment is very necessary. Municipal (prefectural) special (patrol) police detachments that have the conditions can establish demolition equipment engineering laboratories and encourage team members to explore new functions of existing equipment, creatively applying them to earthquake rescue operations.

4.2 Build a team of professional personnel and improve the rescue quality of team members

4.2.1 Professional basic theoretical knowledge training, online and offline coverage

The Provincial Special Police Corps can collaborate with educational institutions to offer specialized training courses on the foundational theories of earthquake-related topics for special (patrol) police officers. These courses will adopt both online and offline formats to ensure comprehensive coverage of professional basic theoretical knowledge. The training content may include the causes of earthquakes, secondary disasters caused by earthquakes, how to save oneself and others during aftershocks, and more. In addition, basic risk assessment and on-site first aid skills required during rescue operations should also be included in the training scope to prevent secondary injuries. For example, whether a partially collapsed building poses a collapse risk, the possibility of landslides when crossing dangerous sections, and how to provide on-site medical treatment for trapped individuals. This will help team members understand the principles of dispatching rescue teams, handling methods, procedures, key points of action, and precautions, clarifying the procedures for earthquake disaster response and having a theoretical understanding of what to do in various situations.

4.2.2 Special technical and tactical training to improve the rescue level of players

By adopting the approach of "going out and bringing in," we strengthen communication and learning among departments, enabling team members to master the performance and usage methods of basic earthquake rescue equipment. The Provincial Department's Special Police Corps invites outstanding emergency rescue experts from within the province to provide theoretical knowledge lectures and conduct simulation scenario demonstrations, organizing selected team members for training at the department's combat training base. In the special (patrol) police detachments of municipal (prefectural) public security bureaus, excellent local fire brigade instructors can be invited to provide concentrated lectures and demonstrations on essential rescue techniques. Team members can also be organized to visit fire brigades to exchange and learn about the use of facilities, basic skills, and training subjects. On the basis of existing field drills, simulated earthquake drills can be conducted to further enhance the team's rescue capabilities. After an earthquake occurs, in addition to urgently searching for trapped civilians, conducting security patrols, and maintaining order in disaster areas, it is also necessary to properly settle displaced people. Efficiently setting up tents is a fundamental skill that every special (patrol) police officer should possess.

4.2.3 Promote plateau adaptation training and enhance rescue forces

Due to the frequent earthquakes in western Sichuan Plateau, which is part of the eastern edge of the Snow-capped Plateau and the Hengduan Mountains, with an altitude ranging from 4,000 to 4,500 meters, rescue operations are challenging and require high physical fitness from rescuers. The western parts of Aba Prefecture, Garze Prefecture, and Liangshan Prefecture all belong to the western Sichuan Plateau. In addition to the special (patrol) police forces of these three prefectures, other municipal public security special (patrol) police forces should be sent to these three prefectures for high-altitude acclimatization training to enhance their wilderness survival skills, laying a solid foundation for future earthquake disaster relief work in high-altitude and cold regions.

4.2.4 Strengthen the construction of UAV teams to provide support for command and communication

Rapidly obtaining information on building damage in disaster areas can provide crucial support for command decision-making, loss assessment, victim resettlement, and intensity evaluation. Remote sensing technology, especially the low-altitude drone remote sensing technology that has

developed rapidly in recent years, offers significant support for the rapid investigation of building damage [4]. The timeliness of earthquake emergency response is highly critical, and special (patrol) police, as the first-line reinforcements, should leverage their advantages to provide firsthand data for rescue operations. Additionally, after an earthquake, communication systems are often damaged, leading to poor connectivity and loss of contact with the outside world. This prevents rescuers from promptly understanding the actual situation, making it difficult to quickly develop effective rescue plans. In contrast, drone emergency communication equipment has fewer restrictions, covers a wide area, is highly flexible, and extremely safe, allowing for timely rescue missions after an earthquake [5]. Therefore, strengthening the drone team is a critical step in building the earthquake disaster emergency support system for special (patrol) police in cities (prefectures).

4.2.5 A police dog search team was set up to point the way for the rescue

Currently, police dogs are widely used in the duties of special (patrol) police, handling emergencies, counter-terrorism and stability maintenance, as well as rescue operations in disasters such as earthquakes, playing a role that cannot be replaced by humans or other advanced equipment. In the earthquake rescue efforts in Wenchuan, Sichuan, and Yushu, Qinghai, search dogs have played an irreplaceable role alongside human and instrument assistance. To better assist in rescue missions, we must introduce police dogs - search dogs into the rescue operations. Search dogs are agile and nimble, capable of moving freely, suitable for confined spaces, with accurate sense of smell, and can be remotely controlled and directed, especially sensitive to sounds like cries for help, banging on walls, and moaning from the victims [6]. Currently, each city (prefecture) public security bureau has established a highly skilled police dog search team.

4.3 Establish an emergency plan system that is coordinated and interconnected

Due to differences in geographical conditions and cultural factors, earthquake emergency response plans also need to vary significantly. The extent of disaster losses is not only proportional to the magnitude of the earthquake but is also closely related to local geological and topographical conditions, population density, building structures, and other basic information. Different regions should formulate different response levels based on their specific circumstances. How rescue teams reasonably allocate tasks and efficiently complete rescue work with high quality is crucial, and this aspect should be reflected in the earthquake emergency response plan. Public Security Bureaus (Patrol) Brigades of various cities (prefectures) should strengthen joint drills with local emergency management departments, improving the emergency response systems of all departments during these drills, clarifying functional divisions, so that when an earthquake disaster occurs, they can serve as first-tier rescue forces and coordinate effectively at the earliest possible time.

4.4 We will improve the publicity positions of special (patrol) police and tell their stories well

Publicity work is a long-term and complex task. In the era of new media and WeChat, effective publicity can unite police forces and gather strength, providing a safety guarantee for the long-term healthy development of public security. During earthquake relief efforts, the role of publicity cannot be underestimated. Publicity warriors "respond to alerts and fight alongside them," capturing every moment of the rescue efforts with their cameras from the first time and first perspective, telling real stories of earthquake relief to organizations and the people. In the Luding "9 5" earthquake, touching stories such as the "flying capture of Luding Bridge" rescue and the "24 brave warriors on an isolated island" have been widely cared for by people across the country. This is both a response from special (patrol) police to the nationwide concern for disaster-stricken areas and a way for the people to express gratitude for the special (patrol) police fighting on the front lines. It is a two-way sentiment, the best means of communication between police and civilians, where publicity warriors

inform through media and the public responds through attention. Publicity units of the special (patrol) police brigades in various cities (prefectures) should "hold the gun and the pen," considering the special nature of earthquake relief publicity, improving the publicity platforms for special (patrol) police. Each city (prefecture) should identify publicity talents within their special (patrol) police teams and enhance exchanges and learning through the platform provided by the provincial special police corps, allowing cities (prefectures) with good publicity to share and exchange experiences.

4.5 Improve the logistics emergency support system and give full play to its maximum efficiency

Troops have not yet moved, but provisions must go first. Earthquake disasters are characterized by suddenness and uncertainty. Once a disaster strikes, rescue personnel must act swiftly. If support is inadequate, it can delay rescue efforts, severely impacting the outcome. Today, logistics is no longer confined to behind-the-scenes work; it has shifted from "rear support" to "frontline support," providing more effective and reliable combat support. In peacetime, there is a focus on drills for emergency logistics support plans, envisioning the most challenging and complex scenarios to revise and improve these plans. During wartime, logistics personnel are deployed to the front lines, promptly grasping the battlefield situation and understanding actual needs, thus better serving their mission.

5. Conclusion

At the National Public Security Work Conference, the General Secretary pointed out that efforts should be made to forge a public security force with iron-clad ideals and beliefs, iron-clad sense of responsibility, iron-clad skills, and iron-clad discipline and conduct. Standing at the new starting point of a new journey and facing the new challenges of a new era, as the "sharp edge" of public security organs, the Special (Patrol) Police must ensure they "train for whatever they do and make up for whatever they lack," systematically and proactively building the public security emergency support system to safeguard people's lives and property and promote social stability and development.

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