

Approach on safeguard mechanism of emergency supplies

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Abstract: Unexpected events require a lot of emergency supplies, such as severe natural disasters, public health emergencies, public safety incidents and military conflict. Materials for emergency and war constraints play a key role in the success or failure. In this paper, the collection and purchasing, storage and management, transportation and distribution of emergency supplies as three aspects of the safeguard mechanism has been studied and some practical proposals mechanism were put forward, the result suggests which can improve the efficiency of emergency supplies safeguard greatly.

Keywords: Emergency Logistics , Emergency Supplies , Safeguard Mechanism, Emergency Preplan

1. Introduction

Serious natural disaster, sudden public health incident, public security incident, and military conflict not only cause huge loss of lives and property of the people, and will affect social stability, even endanger state security, such as earthquake, snow and freeze drought disaster, flood, ore difficult, SARS, avian influenza, H1N1, food poisoning. These sudden public events need lots of emergency supplies, in order to solve the injured treatment or processing of the deceased and burial and anti-epidemic, post-disaster reconstruction, resumption of production, restore order, reduce the affected area, personnel loss, avoid disaster further expansion, so as to produce a huge emergency logistics needs(Wang, Jiang, & Wang,2007).

Mei-Shiang Chang et al aimed to develop a decision-making tool that can be used by government agencies in planning for flood emergency logistics(Chang, Tseng and Chen,2007). Jiu-Biing Sheu presents a hybrid fuzzy clustering-

optimization approach to the operation of emergency logistics co-distribution responding to the urgent relief demands in the crucial rescue period(Sheu, 2007). Oded Berman et al. present a novel methodology to determine the optimal design of a specialized team network so as to maximize its ability to respond to such incidents in a region(Berman, Verter and Kara, 2007). Jiuh-Biing Sheu presents a dynamic relief-demand management model for emergency logistics operations under imperfect information conditions in large-scale natural disasters(Sheu,2010). Yuan Yuan and Dingwei Wang presented two mathematical models for path selection in emergency logistics management considering more actual factors in time of disaster(Yuan and Wang, 2009). Aharon Ben-Tal et al. proposes a methodology to generate a robust logistics plan that can mitigate demand uncertainty in humanitarian relief supply chains(Ben-Tal et al,2010).

Zhang Xiaohua et al. discussed the emergency supplies management from the angle of emergency logistics(Zhang,2009), Liu Zhihua and JiangYuHong studied on the supplies of emergency logistics management(Liu,2008; Jiang, Yan and Ou, 2007), Liu Zongxi and Tong Shenghai studied on the expanding the army supplies emergency purchasing function and emergency supplies of reserve and management through the analysis of Wenchuan earthquake respectively(Tong and Li,2008; Liu and Zhang,2008). Emergency supplies play a key role constraints to the success or failure in the emergency logistics, emergency logistics level are directly related to the effectiveness of various unexpected events to control, minimize the loss as far as possible, avoid disaster expanding, thus study the safeguard mechanism of emergency supplies has far-reaching significance. This paper discussed the safeguard mechanism of emergency supplies from the collecting and procurement of emergency supplies, reserve and management of emergency supplies, transportation and distribution of emergency supplies respectively.

2. Formulate Emergency Material Safeguard Plans

At the norms and guidance of National Emergency Preplans for General Public Emergencies promulgated by Chinese State Council, aiming at various possible public emergencies, formulate emergency logistics safeguard plans, guide the organization action of logistics safeguard activities as precaution and handling emergencies. Through constructing the emergency logistics system, mobilization can be made rapidly in public emergencies of handling process, rapid expansion materials demand can be satisfied in the early stage of incident, so as to link up national emergency logistics system to keep overall supply,

ensure follow-up continued supply of materials uninterrupted, and thus minimize damage, protect public property and life safety, safeguarding national security and social stability. Emergency supplies management process is shown in figure 1, when sudden incident happens, according to existing reserves materials, materials can mobilize used, as well as the relevant security resources situation, the emergency logistics channel circumstance, carry out comprehensive analysis and consideration, draft the scientific, rational, feasible emergency logistics safeguard solution plan.

3. Collecting and Purchasing Mechanism of Emergency Supplies

Collecting of emergency supplies are the foundation and guarantee of emergency logistics, good raise work can assure the superiority of material safeguard level and realization of emergency logistics targets. The basic requirements of emergency supplies collecting are timely fast, cheap, complete varieties, the full amount applicable. Emergency supplies procurement are usually at a disaster rescue or war mobilization of emergency, complete the urgent task of purchasing activities, not only time requires urgently , but also emergency supplies purchase quantity usually are quite large, and not consider economic returns.

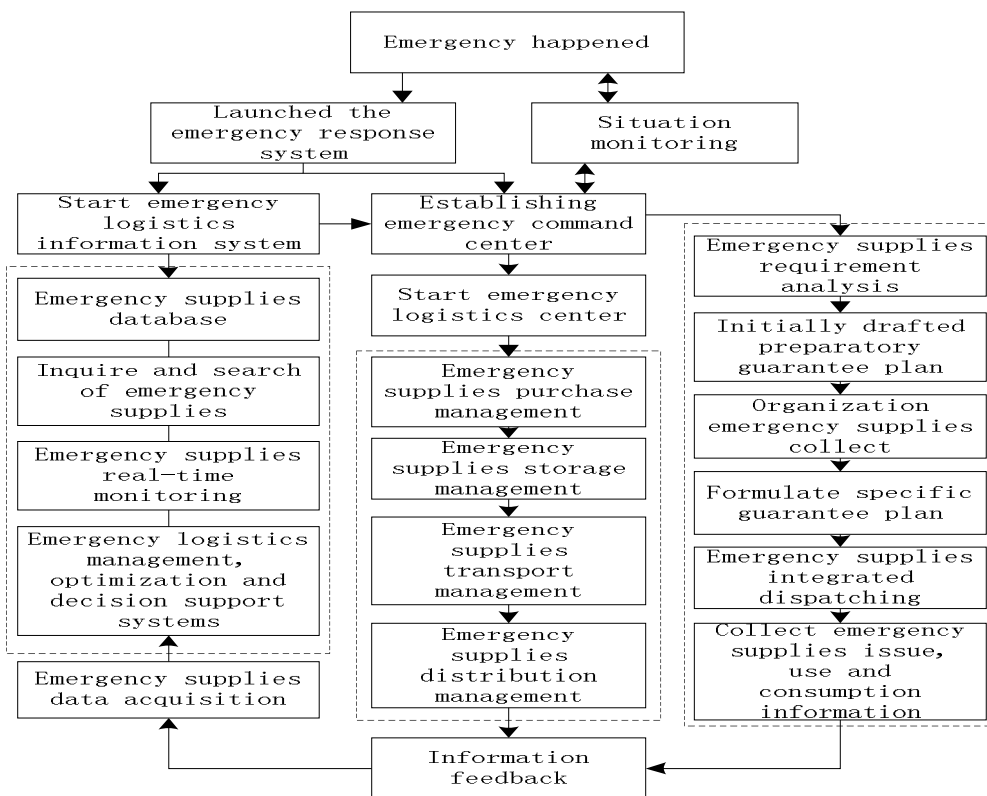


Fig. 1: Management process of Emergency supplies

3.1 Combining a Peacetime Purchasing Mode

Materials procurement and reserves should be made at peacetime for a rainy day with. Emergency materials purchase is a regular and basic work; the purchaser should improve procurement benefit and guarantee efficiency. Material purchasing couldn't passively wait for task issued, must adhere to emergency supplies demand for the goal, understand emergency supplies demand information actively, through management analysis emergency supplies requirements and guarantees emergency materials supply.

When an emergency situation occurs, material purchasing system not only to guarantee emergency personnel needed supplies and engineering equipment, but also to set the living materials needed of emergencies regional people for emergency purchasing task, to procure in recent region if emergency supplies supply is in shortages, or make urgent procurement in the national scope if required are in serious shortage.

3.2 Formulate Rational Purchasing Plan, Standardize Sourcing

The procurement should be in accordance with the Chinese government

procurement law, the budget law, the invitation and submission of bids law of Chinese, the government procurement regulatory measures and other related government procurement regulation for basic standards. According to the Notice on Further Strengthening the Emergency Supplies Reserves for Disaster Affairs issued by the Ministry of Civil, formulate corresponding purchasing plan, carries out standard purchase.

3.3 Strengthen Material Supplier Management, Improve Market-Controlling Ability

Material purchasing system should strengthen market supplier management, use market mechanism to system forms, build a mutual benefit strategic cooperation relations with key supplier, and emphasize to materials supplier, only cooperate with each other, two interests can be safeguard, eventually safeguard their interests, so ensure stability of supplies.

The management to supplier should emphasize incentive compatibility, through the optimization design of the purchase contract, supplier preferential incentive methods, such as tax cuts, honours, conferment of business opportunities and benefits compensation etc. This also makes the supplier willing to guarantee emergency needs priority consciously in no external force conditions. At the same time, relevant laws and regulations also should be passed and published to restrict the supplier's behavior, ensure supplier can strictly according to the performance agreement whether in redundancy or shortage, not be droved by immediate interests, first guarantee emergency supplies need, comprehensively promotes material resource control ability to market of material purchasing system(Wang et al,2007).

3.4 Expropriate at Emergency, Then Compensate

According to the Property Law and Emergency Response Law of PRC, the realty or chattel of individuals or units may be expropriated if the rescue and relief in urgent need, pursuant to the provisions of the law, the authority and procedure of institutions, corresponding compensation shall be made, requisition or damaged or lost after being used, These provisions provide a legal basis for government disposal of emergency expropriation. In an incident cases, some emergency equipment and materials are needed urgently, if purchasing the need for a long time, can expropriate nearest emergency first, and finally to compensate way.

4. Emergency Supplies Storage and Management Mechanism

Aiming at the common various public accident and natural disasters, the governments of all regions shall establish emergency handling materials reserve mechanism, in order to have enough materials reserve, ensure supply can meet all emergency timely and efficiently when public events occur, reduce the damage caused by various emergencies to the minimum. Because a lot of effective materials reserves can greatly compress the time intervals from the disaster relief to complete, reduce procurement and transportation work, greatly decrease the relevant costs.

4.1 Perfect Emergency Supplies Reserve System

At present the Ministry of Civil Affairs has established the central emergency supplies repertory in Harbin, Shenyang, Tianjin, Zhengzhou, Hefei, Wuhan, Changsha, Nanning, Chengdu and Xian, etc. Central relief supplies repertory will increased from 10 to 24 in future planning, Local government at all levels should also construct disaster relief emergency supplies reserves network system cover entire province or autonomous region, prefecture or city, county and key township, form auto-merging materials reserve system from the central to local.

4.2 Perfect Reserves Management System of Emergency Supplies

In emergency supplies management aspect, relief reserves management must be strengthened with high sense of responsibility. The management should be made with the quality and quantity guaranteed, completes the purchase of goods supply, inventory, custody, and maintenance. According to the principle of classification management, scientific management, reasonable storage, in specification and process monitoring, introduce modern management means, manage the relief goods reasonably. Strictly abide the relevant systems and procedures, completes the management of relief goods, strengthen management, perfect inspection use examination and approval procedures, takes strict precautions against accidents corruption and misappropriate happens.

4.3 Reserved By State, Army And Folk Common

Some strategic products related with people's livelihood should be reserved by state government, such as grain, oil plants, etc. Some supplies having relations of military function should be reserved by Army, such as firearms, ammunition and transportation equipment etc. Some generality of materials can be reserved in folk, such as clothes, necessities, etc. Civil-military general materials should

be reserved at the society, market and the enterprise products, that means hidden abound people, to some timeliness strong emergency supplies, coping participation in social material circulation, so can add fresh blood regularly, ensure certain scale inventory. The arising inventory cost can be subsidized by national finance or local government. If emergency relief materials expired, it will cause disaster assistance response delay even fail.

4.4 Diversify Emergency Supplies Reserves

Emergency supplies can divide many classes based on the usage, such as protective appliances, life-saving kind, life support class, rescue carrier class, temporary accommodation class, pollution clean class, power fuel class, engineering equipment class, equipment tools, lighting equipment class, communication broadcasting class, transportation engineering materials, etc. All varieties of emergency supplies all need to reserve a certain amount and scale, in order to meet the need of emergency logistics. Some unconventional emergency logistics equipment must also equipped with, such as faster elimination of diesel locomotives plays an irreplaceable role in early 2008 campaign against the snow and freeze disaster, and the traditional wireless radios become effective communication equipment in severe conditions coping with the single 2008 Wenchuan Earthquake communication interrupt.

In addition, emergency supplies can be stored partly according to different geography, climate conditions, and disasters with special characteristics. If the flood often occurs in this area, then reserve some charge boat, life buoy, rubber boat, and water life-saving equipment, etc. In earthquake and mud-rock flow prone regions, need reserve some excavator, blower, life-saving stretcher, search and mining equipment for buried personnel life-saving. While in snow-hit areas, some quilts, tents and other supplies need to reserve.

5. Transportation and Distribution Mechanism of Emergency Supplies

The transportation and distribution of emergency supplies flatten out the distance space between materials and user and make emergency logistics easy to achieve. In order to timely and efficient meet the material request of emergency rescue activities, various transportation means and transportation forces required to cooperate, so as to break through the bottlenecks of emergency supplies supply.

5.1 Transportation Mode Safeguard At Diversification

In an emergency situation, the material goods need to flow quickly and effectively. It is not important to save transportation cost in choosing the transport way economically, which is the key to effectively compress transportation time of emergency supplies. Choose the right means of transportation based on the value of the goods, the quantity and the conditions of transport request, can call various transportation means include highway, railway, aviation, water etc, try to achieve direct transport and combined transport, in order to meet the need of emergency response.

5.2 Transportation Forces Assumed by Military and Civilian

The transportation forces can assumed in civil-military integration way to guarantee emergency supplies can quickly reach required location, and the government should give awards and subsidies to folk transport strength. As in the 1991 Gulf war, American troops have mobilized 38 airlines, dozens of shipping companies, seven states of the railway departments and hundreds of transportation companies to meet military supplies of demand and supply.

The distribution of emergency supplies should combine actual transport forces and integrate the existing social resources, unite the logistic enterprise with high reputation and reasonable price to coordinate distribute. In addition, depend on the supply chain and network already set up by large logistics enterprise to organize emergency items transportation. Last, strengthen linkage of army and folk, if large-scale emergency happen, can contact relief rescue matters with the army, use military transport equipment, military transport dedicated routes and related facilities, to realize the quick delivery emergency supplies.

5.3 Opened up Green Channel for Emergency Supplies Transportation

In order to guarantee the emergency supplies delivery smoothly, in major disaster relief period, establish emergency relief regional and national Green Channel mechanisms, namely establish and opening one or multiple emergency safeguard special passageway, when necessary, give right of priority to emergency supplies, which can effectively simplified operation cycle and improve transport speed, so as to improve the efficiency of emergency logistics, shorten the operation time of emergency logistics, minimize the losses of lives and property. For example, simplify the procedure and customs inspection and quarantine, give priority to transportation etc. If time permits, adopt related auxiliary or optimization measures to reduce logistics cost, give civil emergency

supplies the same priority treatment as the military supplies, so as to ensure the smooth emergency logistics with high-efficient operation.

5.4 Supported with Information System

Establish the information of system emergency supplies and emergency transport, using modern logistics technology, such as RFID technology, bar code technology, Geography Information System, Global Positioning System, GSM infinite transmission technology, and visual technology etc, monitoring the process of emergency supplies in real-time, grasps the newest trends. Emergency logistics information system can also provide optimization model for emergency supplies scheduling, transportation, and distribution, provide the intellectual support for command organs decision, so that emergency supplies can be transported to the demand side in the shortest time with the fastest speed and the safest way. The information system of emergency supplies is shown in figure 2.

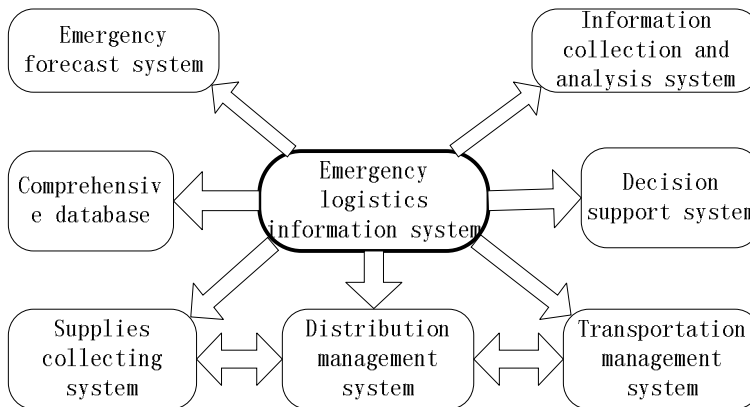


Fig 2: Information System of Emergency supplies

6. Conclusion

supplies safeguard is vital for the emergency logistics under emergencies, it should based on the whole visual controllable information network, use modern logistics advanced technology and equipment, intelligence engineering, and the working mechanism for support, construct the national emergency logistics system with Chinese characteristics including logistics command scheduling, supplies collecting, material transportation, material storage, material distribution at an organic whole, each link join with smooth cohesion and work efficiently, provide the strong safeguard of emergency logistics for state. The proposals used in the safeguard of emergency supplies can improve the

efficiency of transportation and delivery of supplies greatly. As to the relevant safeguard mechanism of emergency supplies and purchase, reserve and management, transportation and distribution, with the emergency logistics theory developing and perfecting, emergency supplies safeguard will be more convenient and perfect.

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