

# ABOUT FORESTRY FIRE PROTECTION SYSTEM AND COUNTERMEASURES IN CHINA

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## Abstract

In order to improve forest fire prediction and fighting, we are not only absorbing advanced forest fire management abroad, but the more important to build Chinese forest fire system, which combine with Chinese characteristics. Forest fire is one of natural disasters. But the government is just generally calling on and the masses is not enough to use a usual modern science technology and science management to build a complete system---forest fire system, which can prevent and control forest fire effectively, preserve nature and sustain natural ecology balance. The primary thinking, forest fire system contains two systems and ten subsystems. Two systems are administration management strategy and scientific technology (scientists) strategy.

Forest fire is the disaster of forest. According to the data, there are about ten million mu forest burned each year. Since 1949, there have been about 15 million mu. Thus, it is a very important subject to prevent forest fire and protect forest for us. At present, all of the world are accelerating their speed to realize modern fire management, of course, every country has its characteristics, such as forestry, economy and forest fire etc.

In Northern America, economy power is strong with their modern industry. These countries have built national forest forecast system, national supervising net and aerial-ground fast control fire troop. By applying hi-technology into forest fire management, such as remote sensing and computer, they have developed the level of forest fire management.

All of countries in Northern America make progress in preventing fire by seedling and advanced road net. These resulted in having controlled the happening of forest fire, so these areas became less forest fire occurring field.

Australia is one of the countries where fires happen more often with high density forest fire. According to its characteristics, Australia has used planned burning to prevent forest fire enlarging. Other methods they used are aerial diagnosing and chess-dot diagnosing which are large area planned burning to control big fires.

China has large area of land, but forest source is very limited, population is crowded and economy is backward. Especially, the frequency of forest fire occurring is so high, its base of forest fire preventing and controlling is poor. In order to improve these aspects, we should not only absorb advanced forest fire management abroad, but the more important to build Chinese forest fire system, which combine with Chinese characteristics. However, what is the Chinese forest fire system? According to the experiences of our country and the rules of dealing with natural disaster in the world, I give some ideas about Chinese forest fire system.

Forest fire is one of the natural disasters in the world, there is a famous formulation to prevent natural disaster(MAB): "government+scientists (scientific technology)+people". It has been well proved by practical experiences that depending on the lead of government, arousing the masses to act and using scientific approaches is the most effective method for forest fire protection. But it is enough for the government to generally call on and the masses to use a usual method to prevent and control forest fire, we must grasp the most modern scientific technology and scientific management to build a complete system---forest fire protection system, which can prevent and control forest fire effectively, thinking is that forest fire system should contain two systems and ten subsystems. Two systems are administration management (government+masses) strategy and scientific technology (scientists) strategy.

## **1.Administration management (government+ masses) strategy**

It is the main component of forest fire protection, which includes different layers of administration of forest fire preventing and controlling, such as commanding office, adjustment, propagation, computer management and forest fire survey and ascertain.

### 1.2 Legal management subsystem

It includes the Rules of Forest Fire Protection for every province, the rules about forest fire supervision and forest fire incident review, rules about forest fire statistics and forest fire inventory, and manage rules for forest fire preventing and air controlling as well as forest polices and special troops.

### 1.3 Fire fighters subsystem

It includes special and nonspecial troop of every province and region, the forest polices in northeast and Innmongolia, aerial planes and masses.

### 1.4 Forest fire research subsystem

It includes forest fire principle, the strategy of forest fire developing and forest fire equipment of our country. Of course, it is especially important to improve forest fire controlling in south and north, as well as to study characters of forest fire.

### 1.5 Commander training subsystem

It includes classes for commander and troop training academy (the center of every province, region, forest police school etc.), as well as special forest fire preventing and controlling technology training.

## **2.Scientific technology (scientists) strategy**

### 2.1 Forest fire preventing subsystem

It includes cleaning and burning fuel in forest, sides of forestry, sides of road, and grassland; changing original forest and forest supplementary. planting biological preventing area:

cleaning and burning brush in forestry and replanting tree on time; managing new planting tree effectively and reducing grass fuel in forest; training special fungi and accelerating decomposition of fuel in forestry.

## 2.2 Fire engineer subsystem

It includes forest fire examine station and forest police station according to the regular of fire preventing; building the tower of forest fire watching and seasonal watching; building fire preventing road and area; building the station of forest fire meteorology, aerial station, fuel station etc.

## 2.3 Forest fire forecasting and forest fire watching subsystem

It includes specifying fire danger degree, dividing fire area and important fire area, forecasting fire weather, using national and local satellite watching forest fire; driving plane to watch far area etc.

## 2.4 Fire preventing communication subsystem

The communication net, such as wireline and nonwireline, satellite, moving communicating etc., will be used to direct three-class communication net, which include nation to provinces, province to counties and county to countryside, town, fire preventing station, tower watching and so on.

## 2.5 Fire controlling method subsystem

It includes grasping the law of forest fire occurring and spread, using the strategy of fire controlling, making the forecasting rule of forest fire controlling and leading people to control forest fire and cleaning residential forest fire controlling, fire bombing controlling, fire against fire and man caused rainfall etc.

How to build forest fire preventing subsystem? According to our actual situation, we ought to take the following steps.

### (1) Improve the role of government to prevent fire

Forest fire preventing is a social and popular work. If this work was not all society supported and people joined, we could not do well. Society support and people participating must have government supporting and government concerning. In recent years in our country, one successful experience is having established four class leader rule (that is province, region, county and countryside), realized target manage and praise associate with punishment. This is an effective method to strengthen the role of government and resist natural disaster. According to the thought of building forest fire preventing system, our law about the system is not complete, we need to improve our law.

### (2) Insist the main role of forest management in forest fire preventing and controlling system

Forest management is to proceed fire preventing with forest management. In detail, it is to adjust the quantity of fuel in forestry and improve the environment for plant to grow

continuously, as well as accelerate wood growing and enlarge the capability of forest fire resistance, so it is necessary for government to design fire protecting equipment in the same time with manufacture when they establish the rule of forest management, such as set up fire resisting plant, fire preventing line, road, river and so on. Forest fire preventing management is an important basic work, we must do this work well.

### (3) Pay attention to improve the quality of fire fighting troops

Forest fire preventing and controlling is to control forest fire, depending on advanced tools and organization, and to preserve forest resources. So it consists of controversy two sides of human and fire around forestry, with human the major side. Either management strategy system or scientific technology measure is operated by human. As natural elements, forestry and fire have their own natural laws and behaviour, as human has its behaviour as social element. The method and tool for preventing and controlling forest fire owns more modern advantages of science and hi-technology. All of these is necessary for forest fire fighters to do research and realize them, and to finish preventing and controlling task. To build forest fire protection system, we must strengthen protection troop at first, such as to train students in college, improve the cultural level of troop, in order to meet the need for protection system building.

### (4) Enlarge protection system using system engineering

Because the forest fire protection is an integrate system, which is accumulative, relative, objective and adjustable to environment, we can say it is a complex and dynamic system engineering with many elements. It is very necessary to study and use the theory and method of system engineering for system building. Complex structure means that preventing and controlling system contains administration management strategy, scientific technology system and ten subsystems. Many elements implies many kinds of energy and substance, concerning many kinds of subjects and affected by society, human, nature and meteorology etc. The dynamics implies the law of forest resource in large area. Forest fire is a changing element under natural climate and environment influence, so it has different characters of behaviour. Of course, social environment and human influence are not fixed elements. To this system engineering with complex structure, many elements and dynamic diversity, we must depend on the modern sciences of system, message and controlling and so on, through analysis, judgement and conclusion, combining with natural data, thinking and manage, to build the fire protection system in each county, region and province. Gradually, we could finish the forest fire protection system of our country, in order to protect the forest resources of our country from large damage.

### (5) Enhance propagation, improve knowledge and get support from society

As we know, forest fire contains many elements, with uncertainty and heavy damage, it affects the stability of society, ecological environment and people's property directly, so the fire protection needs support to get success. Building fire protection system should be accomplished through cooperating between relative sides in society. In order to get support from society we must reach common knowledge, take all chances and effective method to propagate the importance, social nature, popularity, long period and difficulty of forest fire protection. To do so, government should pay much more attention to the forest fire, change prejudice, improve people's knowledge about forest fire and do best to fulfil the difficult

work of forest fire protection.