

# **PRELIMINARY STUDY ON THE CAUSES OF 1998 LARGE SCALE FOREST FIRES IN THE SOUTHERN PART OF THE RUSSIAN FAR EAST**

**Masanobu Yamane<sup>1</sup>**

## **INTRODUCTION**

The Russian Far East (RFE) has long been regarded by the central government in Moscow as a timber resource base. As a result, forest resources have been exploited for timber, especially the most accessible locations with valuable resources (Newell & Wilson, 1996; Kakizawa, 1998a). After the collapse of the Soviet Union, the exploitation of timber resources accelerated and valuable forests, including mature coniferous and hardwood broad-leaved forests, have been decreasing both in area and volume (Kakizawa, 1998a; 1998b). Extensive harvesting targeting the valuable resources expanded the affected area to remote forests and frequent forest fires added to this recent condition (The World Bank, 1997; Kakizawa, 1998a).

Undoubtedly recent forest loss and degradation through logging and forest fires have a close connection with political, social and economic factors inside and outside of Russia. However there few studies have clarified these underlying causes of deforestation (UC) and their mutual relationships.

In this article, I will try to classify the elements of underlying causes in the RFE and analyze the concrete relationships of each element to the forest fires of 1998 in the RFE through recent studies.

## **UC ELEMENTS IN THE CIS/RFE**

As a regional meeting of the NGO-UC Initiative of the IFF (Inter-governmental Forum on Forests), a meeting was held for the Commonwealth of Independent States (CIS) at Krasnoyarsk, Sakha, on 29<sup>th</sup> June 1998. In the meeting, poverty was recognized as the most important cause of modern forest loss and degradation in the country. Poverty has become serious through unstable economic conditions as well as a transition to a market economy after the collapse of the Soviet Union. Critical socio-economic conditions also contributed a 'relative poverty' which is based on the avarice of Russians who are aiming eagerly at power and wealth, and such behavioral patterns are another main cause of forest degradation (Laletin, 1998). Political factors such as changeable policies and short-term leadership to pursue quick shortsighted results are also recognized as common underlying causes of deforestation in Russia (Laletin, 1998).

In a case study of the Sikhote-Alin region of the RFE (Lebedev et al., 1998), legislative and administrative shortcomings for sustainable forest management/use were exposed, and market pressures, which have a strong connection with the Asian economy, and low citizen consciousness of the problem were also recognized as critical socio-economic causes (Table 1). Our preliminary research in Khabarovsk showed that legislative and administrative shortcomings as well as structural defects of the wood industry (Sheingauz, 1998a) were main underlying causes of deforestation in the RFE.

## **CATASTROPHIC FOREST FIRES OF 1998 IN THE RFE**

We selected forest fires of 1998 as material for discussion in order to show the mutual connection between forest loss/degradation and underlying causes of deforestation such as legal systems, administrative and socio-economic aspects.

Before discussion this paper describes the basic data and information of the forest fires of 1998 on the basis of the UN Mission Report (UNDAC, 1998).

Many areas in Russia suffer from forest fires every year but the forest fires of 1998, which occurred in Khabarovsk Krai and Sakhalin Oblast, were the worst since the forest fires of 1954 and 1976. The fires started in the middle of May 1998 and continued for five months, before being fully extinguished at the end of October 1998 (Sheingauz, 1998b). The damage included 2.2018 million hectares of burnt area and resulted in damage of 1.5633 million hectares of dense forests. The fires matched the scale of the huge forest fires of 1997/1998 in Indonesia and the Amazon. Around 15 million cubic meters were lost in Russia, more than three years of

---

<sup>1</sup> Research Fellow of IGES, 1560-39 Kamiyamaguchi, Hayama, Kanagawa 240-0198, Japan  
Phone +81-468-55-3835 Facsimile: +81-468-55-3809, E-mail: yamane@iges.or.jp

timber production in Khabarovsk Krai (one of the most important timber-producing areas in Russia).

Ecological and economic damage is estimated at 4.6 billion rubles (207.2 million US dollars)(Kolomytesv & Sheshokov, 1999). Thus, this disaster has brought enormous damage to the local economy and forest industry of the RFE and it is feared that the economic crisis in the area will become more critical as a result.

The fires, caused extensive destruction of various forest-based resources on land traditionally used by indigenous people in the RFE, affecting timber or non-timber products, hunting and game stock representing their food base (UNDAC, 1998). It is likely that over 1 million people have been affected over a significant period of time by smoke and carbon monoxide (CO)(UNDAC, 1998). In addition, the possibility of an influence on the global climate, contribution to global warming and implications for abnormal weather in neighboring China was also pointed out (UNDAC, 1998). The smoke from forest fires of 1997/1998 in Indonesia generated a large amount of chemicals that destroyed the ozone layer; the same impacts probably occurred as a result of the forest fires in the RFE. The fires have largely destroyed bio-diversity in the RFE, which is referred to as the richest area in the northern hemisphere for bio-diversity. Two sites registered under the Ramsar Convention as wetlands of international importance and two *zapovedniks* (protected nature reserves) are located within the affected area (UNDAC,1998).

## **FACTORS AFFECTING THE FOREST FIRES OF 1998 IN THE RFE**

### **1. Natural Causes**

As natural causes of the 1998 forest fires, there are two main factors: local forest conditions in the RFE, and abnormal weather conditions in 1998. The official Russian classification of fire risk divides all forest area into 5 classes by coefficient of risk. Of the total area 41.5 percent of the forest area in Khabarovsk has been classed “very high” or “high” risk (Sheingauz, 1998b). In neighboring Primorskiy Krai, more than two-thirds of the territory is concentrated in the “middle” class and less than 1 percent in the extreme classes (“very high” and “low”) (Sheingauz, 1998b). Thus, the forests in Khabarovskiy Krai can be evaluated as having a rather high potential for forest fires.

The other major natural cause of the forest fires was extreme dryness in 1998. In Khabarovskiy Krai, after the spring (end of May) a serious lack of humidity had become evident. Compared with usual summer monsoons, only 15 to 25 percent of average precipitation fell between June and August. September and the first half of October were also dry (Sheingauz, 1998b). Such weather conditions in 1998 led to a high potential for forest fires in the RFE.

### **2. Weakened Forest Control System**

The natural conditions mentioned above were the key factors in the expansion of the forest fires of 1998. The deterioration of fire control systems was another.

The system of forest fire control in Russia has a strong structure and was systematically designed. It is a part of the Forest Service and is divided along two vertical lines. The first vertical line is the Forest Guard, which is the main pillar of the Forest Service. It consists mainly of staff of the federal government, the *krai* directorates and *leskhozes* (forestry enterprises). Fire control is a part of their daily responsibility. The second vertical line is the special fire control service, which consists of a chain of bases for which fire control is their main duty. The aircraft-based fire control system has played an important role for monitoring and early fire-fighting in the RFE, which has huge remote and mountainous areas (Sheingauz, 1998b).

The federal government budget mainly finances the costs of fire control, construction of forest roads, water reservoirs and fire barriers, laying of mineral strips on ground, purchasing of equipment, salaries for staff, and rent of aircraft.

The legislative basis of forest fire control is also well prepared, including the Forest Code of the federation and federal or local acts(Sheingauz, 1998b).

After the collapse of the Soviet Union, however, the fire control system has weakened remarkably. This change was caused by a substantial decrease in the budget from the federal government for the fire control system due to the unfavorable economic condition in Russia.

The budget for air-based systems and ground-based systems for fire-fighting from 1991 to 1996 were relatively stable at 129 to 168 million rubles and 5 and 15 million rubles respectively. However, since the

consumer price index reached 248,733 points in 1996 from 100 in 1992 (World Bank, 1997), the financial base was seriously inadequate for maintaining ground fire control systems. For this reason, Khabarovskiy Krai has begun to cover a portion of the budget for fire control since 1997 (Sheingauz, 1998b). A combination of inadequate staffing of regional authorities by the central government, inability of regional authorities to clear year-end debts resulting from this situation, and late release of annual budgets in time for effective fire control measures to be put in place prior to the fire season were fundamental causes of the fires (UNDAC, 1998).

This recent financial situation led to serious shortages of recourse for fire control systems and a remarkable deterioration of the original function of fire control systems, effective fire monitoring and quick fire-fighting. The biggest effect was a cut-back of air-based monitoring. This curtailment caused by steep rise of rent costs for aircraft and fuel price. The capacities for ground monitoring also declined. Equipment for fire-fighting as well as fuel for large machinery, such as bulldozers and trucks, were becoming difficult to purchase, and a shortage of living essentials and wage delays for the staff were also becoming critical.

In conclusion, the weakened forest control system due to the critical financial conditions might be the biggest cause of the large-scale forest fires of 1998. There is a high possibility that frequency of large-scale forest fires such as the fire of 1998 will increase noticeably because the situation will not improve for some time.

### **3. Increase of Small Fires in Forest Area**

Increase of small fires in the forests was another cause of the fires of 1998. It is said that 15-30 percent of all recent fires in the RFE were of natural causes, whereas 70-85 percent were by human activities. Of the more than 500 fires of 1998 it is estimated that 80 percent were started by human activity.

Industrialization of logging has introduced many machines that cause flames and sparks in the forest, and the recent increase of intensive/ineffective logging tended to prompt such fires more than before.

The supply of daily essentials in remote areas has declined owing to the recent serious economic conditions. It is for this reason that people in remote areas visited forests more frequently than before seeking daily needs such as firewood, mushrooms, edible wild plants, berries and animals to hunt. Recent motorization also brought citizens, who know nothing about forest fires, into forest areas more than before, and their careless handling of cigarettes and fires have become the main human cause of fire (Sheingauz, 1998b).

In addition to those factors, the lack of concern and careless behavior by citizens caused the fires (Sheingauz, 1998b). There is a common conviction of citizens that the RFE has abundant forests, and that the fires will not damage them significantly. Such beliefs have declined after the year of catastrophic fires but two to three years later the previous attitude towards fire may be restored (Sheingauz, 1998b).

### **4. Increase of Logging Site**

Unmanaged and inefficient harvesting systems were recognized as an important problem for forest resource use in the RFE (Kakizawa, 1998a; 1998b). Only thick and valuable wood species such as pines and hardwood broad-leaf trees were harvested and thin and invaluable trees were left behind (Kakizawa, 1998a). An investigation in Khabarovskiy Krai showed that 30 percent of the cut volume was left at the logging site, and 60 percent lost during the process of harvesting in the worst cases (Sheingauz et al., 1998a).

The recent economic crisis of the Asian region and Russia caused a decrease of income from timber harvests, and this change led to remarkable increases of intensive and inefficient logging (Sheingauz, 1998a ; Kakizawa, 1998a). Those operations violated rules of forest management, but controls against violations were not effective because of recent chronic financial restrictions and understaffed local structures. Extensive logging and so-called sanitary thinning are actively conducted in the local forest management administrations, *leskhozes*, with the aims of acquiring a large amount of money to cover the finance shortfalls (Kakizawa, 1998b).

Consequently, large amounts of slash are being left on the logged sites, with high risks for combustion and expansion of fire. The increase of such logging sites, together with the increase of small fires in forests, area as mentioned above, were major factors in the forest fires of 1998.

### **5. No Management on Burnt Area**

In the RFE, natural regeneration is a major forms of reforestation of logging sites and burnt area, and artificial reforestation is not common (Sheingauz et al., 1989 ; Kakizawa, 1988b). Generally speaking, burnt

areas regenerate well in the area. However, soft hardwood forests consisting of birch and poplar naturally dominate in the early stages and it takes more than a hundred years to establish coniferous or mixed forests with hardwood broad-leaf species. Repeated forest fires also make the land unproductive.

Regarding financial aspects of reforestation, the forest service allocated a budget for artificial regeneration and nursing within the expense for forest management by nature, and current tight finances prompted reductions in these funds (Kakizawa, 1988b).

Forest management of damaged areas and current forest management policy can be recognized as direct causes of forest loss and degradation.

## 6. Causative Chain of 1998 Forest Fires in the RFE

To this point this paper has presented that the unstable political conditions in Russia, economic crisis inside and outside the country, and inadequate forest policies/institutions as the root causes of the forest fires of 1998 in the RFE (Fig. 3.). Each root cause is mutually connected to increase “forest fire area” and “high risk logging sites”, amplifying the “weak fire control system”, and causing frequent forests fire on a large scale. The forest management policy, which mainly depends on natural regeneration, might also be a main root cause of forest loss and degradation.

## CONCLUSION

Through the analysis of the causative chain for forest fires in the RFE, this paper has indicated that legal and administrative systems for forest management, as well as socio-economic aspects in the RFE, were strongly connected with the large scale forest fires in 1998. This finding might suggest that the development of a comprehensive approach is essential, covering improvements of finances for forest management. Many studies pointed to such an approach (World Bank, 1997). As mentioned above, if the probability of large-scale forest fires continues without any change, acceleration of forest loss and degradation can be expected. Effective fire control should be taken as soon as possible. Foreign support should be considered as an option.

This analysis did not examine the validity of the relations among factors or the extent of their inter-relatedness. Another opportunity is needed to clarify these aspects through statistical analysis, interviews and surveys.

## REFERENCES

- Kakizawa, H. (1998a) “Kyokuto· Habarofusku Chihou ni okeru Shinrin-Segyou, Shinrin-Kanri”. Gaizai Sanchi Kankyo Bunseki Tyousa Jigyuu Houkokusho, Nihon Mokuzai Josho Center, 219-244.
- Kakizawa, H. (1998b) “Rosia Kyokuto no Shinrin Kanri”. Mokuzai Josho, 1998, March, 7-16.
- Kolomytsev, V. M. & Sheshukov, M.A. (1999) “What did fire illuminate in Khabarovskiy Krai? “ Forest Newspaper. 1999, 15, January. (Rus)
- Lebedev, A., Kyalunziga, I. and Primorsk, P.S. (1998), Major reasons of deforestation and degradation of forests in the Sikhote-Alin region.
- Laletin, A. (1998) EXECUTIVE SUMMARY of the CIS regional workshop, Underlying causes of deforestation and forest degradation in the CIS countries.
- Moussa, J. and Verlome, H.J.H. (in printing) Addressing the underlying causes of deforestation and forest degradation, highlights and selected actions. Biodiversity Action Network, Washington, DC.
- Newell, J. and Wilson, E. (1996) The Russian Far East: Foreign direct investment and environmental destruction, *The Ecologist*, 26(2), 68-72.
- Sheingauz, A. et al (1989) Forest resource in Far East Russia. Economic Research Institute, Russian Academy of Science, Far Eastern Division (Russian)
- Sheingauz, A. (1998) Underlying Causes of Deforestation and Forest Degradation in Far East Russia, IGES FC Background Paper
- Sheingauz, A. (1998) Forest fires in Primorskiy and Khabarovskiy kraia, their causes and consequences, IGES FC Background Paper
- The World Bank (1997) Russia: forest policy during transition, The World Bank, pp279
- UNDAC (1998) Forest fires on the Island of Sakhalin and the Khabarovsk Krai, UNDAC mission report, UN Office for the Coordination of Humanitarian Affairs (OCHA) 6

Table 1. UC elements identified through CIS Regional Meeting of IFF-UC Process

Area	Category	U C
Russia	Social Causes	<ul style="list-style-type: none"> <li>- Poverty</li> <li>- Behavioral pattern pursuing power and wealth</li> </ul>
	Political Causes	<ul style="list-style-type: none"> <li>- Changeable policies and short-term leadership</li> </ul>
	Economic Causes	<ul style="list-style-type: none"> <li>- Unstable economic condition</li> </ul>
Sikhote-Alin region	Institutional Causes Legislative and administrative shortcomings  Violations of forestry rules	<ul style="list-style-type: none"> <li>- Defects of legislation and governmental strategy based on an old-fashioned methodology of forest evaluation and a lack of forest research institutions</li> <li>- Inappropriately issued logging concessions</li> <li>- Absence of EIA procedures in the process of forest leasing</li> <li>- Economic failure of former <i>lespromkhozes</i></li> <li>- Different regulations and sizes of water protection zones provided for under forest use legislation</li> <li>- Commercial secrecy for export operation and timber prices</li> <li>- Absence of an environmentally reasonable federal strategy for forest use</li> <li>- Access of small private forest users to full logging rights, and the absence of any real control of their activities</li> <li>- Failure of the system of fire control</li> <li>- Government opposition to regional efforts to ban protected timber species</li> <li>- Permanent violation of logging technology in former times</li> <li>- Continuing rejection of traditional, sustainable forms of forest use, normal for indigenous peoples</li> <li>- Industrial logging under the label of salvage, intermediate activity and maintenance</li> <li>- Delivery of logging licenses for species depending on the priority of market demand, to the detriment of forest sustainability</li> <li>- Purchase of illegal licenses and other documents with bribes</li> <li>- Logging without any licenses</li> <li>- Passing on of logging rights to other loggers</li> </ul>
	Violations of customs and financial rules	<ul style="list-style-type: none"> <li>- Fabricated list of timber sorting and prices in comparison to real consignments</li> <li>- Intentional padding of volume</li> <li>- Rampages of signing of fictitious contracts without reforestation</li> <li>- Export of more timber than is provided for contract</li> </ul>
	Economic Causes	<ul style="list-style-type: none"> <li>- Strong influence from Asian market</li> <li>- Absence of a new non-timber forest products market</li> </ul>
	Social Causes	<ul style="list-style-type: none"> <li>- Low citizen consciousness of the problem</li> <li>- Weak NGO contribution</li> </ul>

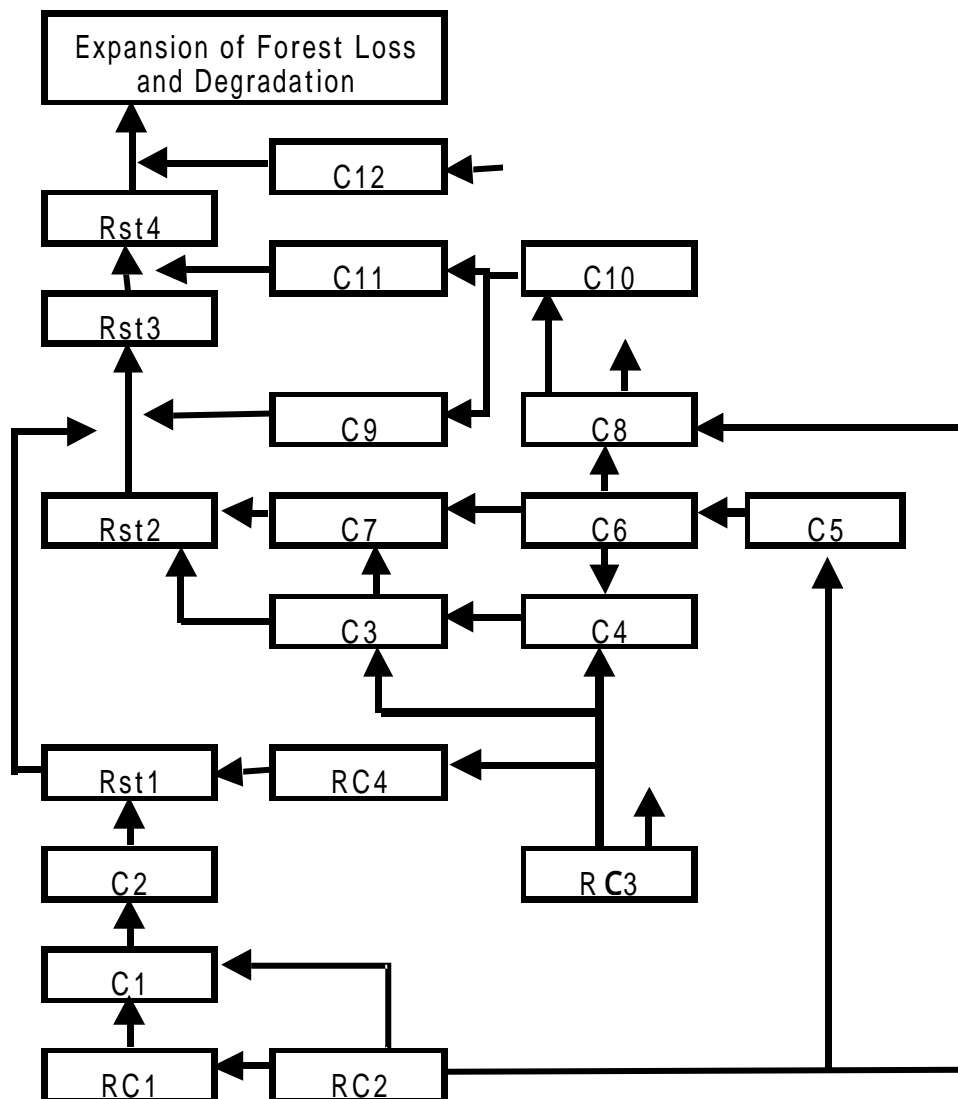


Figure.2. UC Elements and mutual relationships for forest fire of 1998 in the RFE

Events	Underlying Causes	Root Causes
<p>Rst1: Increase of Fire</p> <p>Rst2: Increase of High Risk Forest</p> <p>Rst3: Increase of the Forest Fire</p> <p>Rst4: Increase of Large Scale Forest Fire</p>	<p>C1: Increase of Poverty</p> <p>C2: Increase of Trespass to Forest</p> <p>C3: Inappropriate Harvesting Measures</p> <p>C4: Increase of Violation for Rules</p> <p>C5: Decrease of Timber Export</p> <p>C6: Fall of Logging Income</p> <p>C7: Increase of Illegal Cutting Volume</p> <p>C8: Curtailment of Budget</p> <p>C9: Deterioration of Fire Monitoring</p> <p>C10: Weakened Forest Fire Control</p> <p>C12: Low Artificial Reforestation</p> <p>C11: Deterioration of Fire fighting System</p>	<p>RC1: Political disorder</p> <p>RC2: Economic crisis</p> <p>RC3: Defects of Policy and Institutions</p> <p>RC4: Low citizen Consciousness</p> <p>RC5: Decrease of High-value Resources</p>