

Japan is one of the representative forest disturbances. Fires cause not only the fatal destruction of the vegetation and bio-community, but also they deteriorate the function of environmental conservation of forests, and eventually bring about the secondary disaster in which the environment of lower reaches be changed for the worse. Most of the forest fires caused in Japan are man-made, and the incidents tend to appear concentrating in the early spring when frequencies of artificial fire control and access to the forest areas are higher. Early spring is also the time when the air is rather dry and the litter for fuel accumulates. Forest fires occur approximately 5000 times annually and destroy 2000-5000 ha of the forest areas in Japan. In the Seto Inland Sea region of the southwestern Japan, the Japanese red pine forest is widely distributed and dominated as the regenerated forest by human activities in which include fires. Plants are at the initial growing stage and aboveground parts are yet to grow, thus the affect of fires to the undergrowth vegetation is little in comparison with the case of *Pinus densiflora*. Therefore, revegetation process after the fires is facilitated promptly. It shows a cyclic regeneration of the pine forest by fire.

Under this regime, three important questions concerning forest disturbances are, 1) Which component of the forest ecosystem is directly affected? 2) How does it affect the subsequent succession? and 3) How long does a disturbance have effect; would it be acute or chronic? Fire disturbances were classified into two processes: primary and secondary.

According to the changes of micro-climate, erosion processes and community dynamics, the process of secondary succession was divided into four stages: primary disturbance, degrading, recovering, and regenerated pine stages.

Reforestation works, especially terrace planting works, affected this successional pattern and species composition of post-fire vegetation. Twelve years after reforestation, the woody biomass in natural-slope-planted sites was larger than that of the terrace-planted sites. Though the vegetation recovery at the natural-slope-planted sites was progressed by both planted species and naturally recovered species, the recovery at the terrace-planted sites was mainly progressed by the planted species. The amount of eroded soil at the natural-slope-planted sites was less than that of the terrace-planted sites and the abandoned sites. There was no significant difference of the eroded soil amount between the terrace-planted sites and abandoned sites.

This paper discusses the post-fire recovery process, reforestation works and forest management at the post-fire stand.

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Forest Fires in Indonesia: Their Causes, Impacts and Management

Soedarsono Riswan

Indonesian Institute of Sciences, Indonesia

Fire is an important environmental factor in many terrestrial ecosystems. Fire can act as a destructive agent and

is also accepted as a necessary tool for the management of many natural areas. Most of the forest fires in the tropical areas are caused by human being.

Forest fires have become a significant part of Indonesias tropical rain forest landscapes in the past 18 years. Before this time it was generally thought that tropical evergreen forests were not susceptible to large-scale fires and that they were not a major factor in the fate of tropical forests compared to logging.

However, this view changed rapidly after 1982 when fires affected up to 4.5 million hectares forests, including primary and secondary forests. More recently, in 1997-1998, up to 10 million hectares of forest and non-forest land were affected by fire in Kalimantan and Sumatra.

This paper will focus on the cause, impact and the problem, and progress on the management of forest fires in Indonesia during in the past of two decades.