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## **Management issue of the small scale forestry management entities after introduction the high-performance forestry machinery in the wake of a disaster**

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In Japan, forestry machines called high performance forestry machinery are widespread and the ratio of log production by work systems that utilize high-performance forestry machinery accounts for 70% of the total log production. However, high performance forestry machinery is generally expensive, and after purchasing the machinery, it is necessary to produce a certain amount of logs to pay the machine cost. The introduction of machines changes the quality of management and is a risk, especially for small scale forestry management entities. 90% of high performance forestry machinery is owned by companies or forestry owners' cooperatives.

On the other hand, there are cases where forestry management entities introduce the high performance forestry machinery in the wake of a disaster. In the landslide disaster caused by the torrential rain that occurred in the northern Kyushu region in 2017 (Northern Kyushu Torrential Rainfall), there was a forestry management entity that introduced a new machine by using the subsidy of the restoration support project. The background of the machine introduction is that machines would be useful for recovery in the event of a disaster, and that subsidies reduced the cost of introducing machines. It is thought that the introduction of machines has significantly changed the management method of small scale forestry management entities, but it has not been clarified what kind of impact it actually had.

In this study, we investigated the changes in management before and after the introduction of machinery for small scale forestry management entities that were damaged by Northern Kyushu Torrential Rainfall and introduced forestry machinery, and clarified the impact of the introduction of machinery on the management. In addition, we considered the role of forestry machinery in disaster countermeasures and how the government can provide support.

**Keywords:** torrential rain, high performance forestry machinery, driftwood disaster, machine investment, machine cost