Effect of sediment trap by check dam on ^{137}Cs transport from forest catchment to downstream

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Introduction and Method

In March 2011, a substantial amount of ^{137}Cs was released and dispersed in forested areas in Fukushima Prefecture, Japan. Understanding the transport of ^{137}Cs from forested areas to downstream is important for evaluating the long-term effects of ^{137}Cs on the environment and human health. The objective of this study was to evaluate the effect of a ^{137}Cs trap in a check dam on ^{137}Cs transport from a forested catchment. This study was conducted at a reservoir-type check dam, which was not full, installed at a forested catchment at Date City, Fukushima Prefecture. We observed spatial variation of the ^{137}Cs concentration in dam sediment and estimated ^{137}Cs storage by the check dam.

Result and Discussion

In the reservoir at the dam, the ^{137}Cs concentration was significantly higher than in forest soil. Moreover, ^{137}Cs storage in litter at the dam was higher than in the forest floor. The amount of stored ^{137}Cs was estimated as more than 30 MBq and was 10% to 20% of the annual ^{137}Cs discharge by suspended solid and dissolved form. These results indicate that a reservoir-type check dam has a role in ^{137}Cs capture and immobilization, and the effect of the sediment and litter trap on the check dam reservoir is not negligible for estimating ^{137}Cs discharge from forest to downstream.