

**Suspended Substance (SS) Elimination System Using Salt Addition to Soil Erosion
Particles Transferred from Upland Field**

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Summary

Soil erosion particles from upland fields are making serious problems of environmental degradation. The developing countries are producing many upland fields by deforestation which causes to debase the quality of river water. Water turbidity comes from the soil erosion which carries various kinds of chemical compounds and ions. In Japan also many erosion hazards occur by heavy storms and upland reclamation because volcanic ash soil of which fine particles convey many adsorbed chemical substances. The water quality degradation of rivers and lakes by soil erosion is affecting fishery downstream. Effective countermeasures are wanted on the condition of low cost, long life and less maintenance labor.

(a) Field experiment of underground drainage system :The drain pipes are set 45cm under the ground covered by sandy loam soil. The measurement of the SS value difference between states before and after the drainage during a period (33hours) was done to calculate the effects using the total amount of SS difference against total volume of water through the underground drain pipe. From this field experiment, we can see that the elimination effect of SS values is $1/4$ in ratio (input / output) including sedimentation effect of settling basin before underground drainage pipes.

(b) The chemical effects of salt (NaCl) addition: The maximum effect of elimination is obtained when NaCl makes 0.05 in mol- concentration against water. The settling time needs 20min. to get the effect of at least $1/2$ in ratio (initial SS/final SS).

We can expect that the total effects of the under drainage pipe and the salt addition altogether make at least $1/8$ in the ratio between initial and final value of SS.

A Japanese standard of water quality for irrigation should not be exceed 100ppm in SS value irrigation. Therefore no problem will happen if a river has its capacity to dilute the drain water less than 100ppm. in SS value. The concentration of Sodium Chloride should be diluted to less than $1/6$ on account of the water quality for irrigation.