

Quantification of Soil Erosion using Pb-210 in Krasiew Basin

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Abstract:

Krasiew Reservoir, situated in Krasiew Basin, Supan Buri Province, central part of Thailand, is an earthen dam to store water for irrigation. Recently, decreasing of storing capacity of Krasiew Reservoir was reported. High erosion of surface soil in surrounding area including sedimentation rate in reservoir are expected. To support sustainable management of Krasiew Reservoir, the FRN technique has been introduced to investigate sedimentation and erosion of surface soil influence its capacity.

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A couple surface soil layers were collected from 3 and 2 sites of cultivation and non-cultivation area respectively. Gamma spectrometry with HPGe detector was used to analyze ²¹⁰Pb and ¹³⁷Cs in a cm depths of soil layers. Unsupported ²¹⁰Pb was calculated then models of mass balance and exponential were applied for cultivated and non-cultivated sampling soil cores respectively.

Results of this study suggest that cultivation is perhaps a main cause of erosion of surface soil in this area. Therefore, decreasing of erosion from agricultural activity is necessary to decrease the sedimentation in Krasiew Reservoir and to manage sustainable using of water for irrigation.

Key words:

Soil erosion, ²¹⁰Pb technique, Krasiew reservoir