

**GROUNDWATER CONTAMINATION AROUND
PADDY TERRACES IN BADULLA; SPECIAL
FOCUS ON NUTRIENTS AND TRACER ELEMENT
MOBILITY**

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by

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Abstract

Groundwater can become contaminated when rain water or surface water contact with contaminated soil while infiltrated into the ground and can also contaminated when fertilizer/pesticide soak down through the soil or rock into groundwater. Nutrient and tracer element mobility and magnitude of groundwater contamination due to pesticide/fertilizer use in paddy terrace in Badulla, Sri Lanka was studied during January to May 2014. The study area is located in latitude and longitude of 6.98°, 81.05° and paddy terraces are in Rabukpotha area. Forty water samples were collected both well and surface waters from each two different stages of paddy cultivation, such as before cultivation and after fertization. Eighty water samples were analyzed for 24 chemical parameters (temperature, pH, Eh, turbidity, NO_3^- , PO_4^{3-} , SO_4^{2-} , CO_3^{2-} , HCO_3^- , Cl^- , NH_4^+ , Na, K, Mg, Ca, Cu, Pb, Zn, Mn, Fe, Rb, Li, Sr, Cs).

The average pH, turbidity conductivity and ORP were present 7.5, 4.47, 0.90 and -22.80 respectively. The water was under reducing environment in several locations. The results could be concluded that the application of N, P, K fertilizers in paddy terraces has a direct impact on the concentration of elements in groundwater. Excessive application of fertilizers to soils contributes to contamination of groundwater around paddy terraces. Some of the elements are (Cl^- , Fe, NO_3^- , Mn, NH_4^+ , Zn, Sr) leach to groundwater with highly usage of artificial fertilizer.

Samples which are collected from near the paddy terrace present higher nutrients and tracer elements concentration beyond others. There is significant different between before and after cultivation. With the terrace arrangement, tracer elements and nutrients are enriched in low land areas as compared with other areas.

Fe and Zn have moderate positive relationship. After the cultivation, Fe concentration is higher than Zn concentration. Fe is high mobilizing than Zn. Higher Cu concentration is found after cultivation. Cu is leached slightly faster than Zn.