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## NITROGEN CYCLING AND REMOVAL EFFICIENCY IN A RICE FIELD

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### ABSTRACT

The major sources and sinks of nitrogen (N) were calculated during the rice growth cycle in a lowland paddy field in Japan in order to better understand contamination of surface and groundwater. Deposited nitrogen totalized  $106 \text{ kg ha}^{-1}$ , entering the field primarily through fertilizers and irrigation waters. Nitrogen outputs represented  $93 \text{ kg ha}^{-1}$ , most of it removed when crops were harvested. Excess nitrogen ( $13 \text{ kg ha}^{-1}$ ) was assumed to be stored in soils. The distribution of nitrogen concentrations clearly correlated with agricultural land use patterns. The nitrogen cycle was affected by the unique characteristics of submerged soils and involved complex transformations, mostly governed by the activity of microorganisms. Although there were some considerable losses as infiltration and surface runoff, the mass balance calculations showed that the paddy field was a nutrient sink within the region. Nitrogen assimilation capacity was higher than similar systems, and remained invariable during all the recorded period. The results demonstrate the importance of using a mass balance approach to evaluate the effects of agricultural production on water quality, and to assess how to reduce negative impacts through improved management strategies.

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**Reference:** Gallardo, A.H., and N. Tase; *Nitrogen Cycling and Removal Efficiency in a Rice Field*, *Journal of Environmental Hydrology*, Vol. 10, Paper 7, October 2002.

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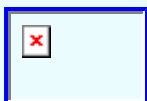
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