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| Abstract |  |
| Nitrogen (N) budgets are a valuable tool for improving N efficiency because they assess the size and interactions of various N pools, as well as their gains from the atmosphere and losses to the environment. To understand the impact of changes in management practice upon a farming system, it is necessary to increase the complexity of the N budgets to include N flows. Therefore, a project was undertaken in lowland irrigated systems of Bangladesh to study the N budgets of Boro rice grown under ecological and conventional farming systems in four locations (Dhamrai, Daulatpur, Gabtali and Shibgonj) in Bangladesh in 2007 and 2008. The N budget focuses on the total-N inputs and losses of the entire system. The budgets were negative for both farming systems in both years. Overall, ecological farming system produced a less negative balance in both years (−6 to −36 kg N ha−1 in 2007 and −76 to −160 kg N ha−1 in 2008) than the conventional farming system (−28 to −80 kg N ha−1 in 2007 and −91 to −157 kg N ha−1 in 2008). Nitrogen balance studies highlighted losses of mineral N (26–53 kg N ha−1) which accumulated prior to irrigation and also losses due to N removal (13–28 kg N ha−1) by weeds. Beneficial impacts of ecological farming on N balances were observed due to the elimination of fertiliser N loss (30–133 kg N ha−1). The difference between conventional and ecological management reflects the high losses of fertiliser N under conventional management. These fertiliser N losses reflect the low agronomic efficiency of N fertiliser. An understanding of various N losses and their consequences is important to provide a basis for developing efficient N management strategies in boro rice. These N budgets can be used to improve or design new technologies that tackle soil fertility management problems and also can help improve the financial performance of the farmers. Soil N budgets will continue to challenge agricultural scientists by slowly revealing fundamental principles. By understanding these principles and the factors influencing them, basic and applied scientists will have a stronger foundation for improving N use efficiency and concurrently reducing N losses to the environment. | |

**Please specify which Sustainable Development Goal (SDG) (s) falls under your research:**

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| Goal 1 | No Poverty | Goal 2 | Zero Hunger |
| Goal 3 | Good Health and Well-Being | Goal 4 | Quality Education |
| Goal 5 | Gender Equality | Goal 6 | Clean Water and Sanitation |
| Goal 7 | Affordable and Clean Energy | Goal 8 | Decent Work and Economic Growth |
| Goal 9 | Industry, Innovation and Infrastructure | Goal 10 | Reduced Inequalities |
| Goal 11 | Sustainable Cities and Communities | Goal 12 | Responsible Consumption and Production |
| Goal 13 | Climate Action | Goal 14 | Life below Water |
| **Goal 15** | **Life on Land** | Goal 16 | Peace, Justice and Strong Institutions |
| Goal 17 | Partnerships for the Goals |  |  |