Phosphorus flow in the watershed of Miyun Reservoir in Beijing

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Based on Material Flow Analysis, the phosphorus cycle in the watershed of the primary source water area for Beijing—the watershed of Miyun Reservoir— was studied. Phosphorus (P) input and output of four sub-systems (planting, animal husbandry, population and a simple sub-system representing all other inputs and outputs), the metabolic efficiency of the whole system, and the affecting factors of pollution load are discussed. Chemical products, which mainly are fertilizers, feed additives, and pesticides, are the main sources of P input to the watershed, accounting for 52.9 % of total imported P amount. The P input of the system to the environment is 2868.44 t, among which 76.5 % of system phosphorus enters the water body directly. The animal husbandry sub-system is the largest contributor of P load in water, which exports 82 % of the total P output. The planting sub-system contributes 9.4% of the total P load. The overall structure of the system is asynergic in one-way and open state. The P cycle in the planting system is deficient, but in the animal husbandry system has a surplus with regional and uneven characteristics. Excreta from livestock and humans has not been effectively reused and recycled, 40.9% excreta went directly into water, resulting P accumulation in water and further serious waste of resources and extensive environmental impact. The water pollution loads of different counties are related closely with their urbanization rates.

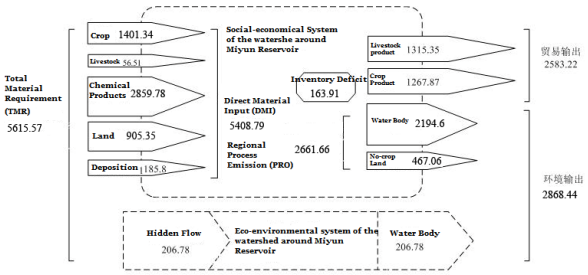

Fig.1 Structure map of P metabolism in the upstream watershed of Miyun Reservoir (t/a)

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[1] Wang *et al* (2009). *Acta Scientiae Circumstantiae*, **29** (7): 1549-1560.