

Variation in nutrient load and human activity for last 3 decades in Takaya river catchment, western Japan

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In recent years, with human activities, such as population growth and agriculture, nutrient load have been in watersheds increasing. And, eutrophication has occurred in coastal area. The objective of this research is to confirm long term variation in nutrient load, and the effect of human activities on the river water quality at Ashida River basin where is the most contaminated river, in western Japan. The database about river runoff and water quality at Ashida River basin is compiled for long term by Ministry of Land Infrastructure and Transport [M.L.I.T.] exists on. We analyzed using the database of the M.L.I.T.

In addition, stream flow discharge and water quality were measured three times at Takaya River which is the most contaminated branch in the Ashida River basin. Nutrient concentration, nitrogen stable isotopes of nitrate, and concentrations of major inorganic ions were analyzed.

In this basin, the estuary barrage was built, in order to withdraw water for industrial use. After that, water quality at the reservoir degraded, such as eutrophication.

The average concentrations of $\text{NH}_4\text{-N}$, $\text{NO}_3\text{-N}$ and Organic-N are 1.6 mg/L, 0.9 mg/L, and 1.1 mg/L, respectively. Especially $\text{NH}_4\text{-N}$ is high concentration during winter season, sometimes it rises up over 8.0 mg/L suddenly. Because Takaya River has significant population growth; the sewage treatment rate is low.

$\text{NH}_4\text{-N}$ concentration increased with the population growth. Delta N of nitrate were around 8 per mil. These results indicated that the nitrogen was originated from domestic waste water, and the contribution rate increased.

Orthophosphate ion was observed to be 0.7 mg/L until the late 1970s, but suddenly decreased to 0.2 mg/L after 1980 because of the regulation by the law, and built diversion weir for agriculture on main stream. And dissolved phosphorus and phosphorus particles was less than 0.8, especially it decreased by the ratio of flashfloods invents.

In conclusion, Takaya River is increase $\text{NH}_4\text{-N}$ concentration which originated from domestic waste water, with population growth from the 1980s. And, conformation of nutrient and phosphorus is change through the diversion weir.