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“Resilience of agricultural systems against crises”

Study on Driving Factors for Water Pollution in China

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Abstract

Since 1970s, the N and P eutrophication of major Chinese lakes and water systems has worsened. Investigation revealed that non-point source pollution from agriculture and rural regions is the leading source of water pollution. The contribution of non-point source pollutants from fertilisation of crop land, rural animal husbandry and untreated sewage of transition regions between rural and urban areas is much greater than that of point-source of domestical and industrial wastes in urban areas with developed wastewater pipe nets. Since the 1980s, the acreage of vegetables, fruits and flowers has increased by 4.4 times. Due to high profit, it is common use to apply very high rates of N and P fertilisers on these crops. The average fertiliser application rate is 569–2000 kg (pure nutrient) per ha on a single crop, about 10 times more than applied on grain crops. The increasing vegetable area with high fertiliser input is one of the biggest problems for eutrophication of water bodies in watersheds. At the same time, animal units in rural regions tend to develop towards a very high concentration of animals in certain townships. N and P amounts from animal husbandry in such concentrated regions has reached very high levels, as much as 1721 kg N and 639 kg P₂O₅ per hectare agricultural land area, far more than the acceptance capacity of soil for these nutrients. In almost all of the important watersheds in China, non-point source N- and P-discharge to aquatic ecosystems from animal husbandry is becoming a crucial pollution source. Fast expansion of new city zones without wastewater pipe nets in transition regions between rural and urban areas make such zones the main non-point source for pollution. Although the non-point source pollution is already serious in the country, the growing influence of certain factors will lead to an even worse situation in the early 21 century. The non-point source pollution from agriculture and rural areas will become one of the biggest challenges for a sustainable development of China.

Keywords: Eutrophication, non-point source pollution, nitrate pollution