



Promotion of organic rice farming in the drinking water source areas in Shanghai

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Located in the western suburbs of Shanghai, Dianshan Lake is the source of the Huangpu River and also an important drinking water source of Shanghai. In order to protect the lake, any industries and livestock breeding around the lake were forbidden since the early history. However, the non-point source pollution from agriculture around the lake still poses threat to the lake water environment. It was estimated that the annual total input of nitrogen fertilizer through the conventional rice growing season is 270 - 300 kg N ha⁻¹ around Dianshan Lake. According to our annual monitoring of water quality of Dianshan Lake, the concentrations of ammonia nitrogen, total nitrogen and total phosphorus of the four water inlets of the lake were 0.53 mg L⁻¹, 2.35 mg L⁻¹ and 0.14 mg L⁻¹ on average, respectively, and those in the center of the lake were 0.37 mg L⁻¹, 2.2 mg L⁻¹ and 0.13 mg L⁻¹ on average, respectively. In general, Dianshan Lake was under eutrophical condition, with high contents of nutrients. The water quality of the four inlets was significantly worse than that in the center, suggesting that the excessive contents of nutrients in Dianshan Lake was mainly inputted from outside sources, which was certainly related to agricultural non-point source pollution around the lake. According to our investigations, there were 5975 ha paddy fields in the six towns surrounding Dianshan Lake in 2016. It was estimated that the amounts of N and P₂O₅ applied in the conventional rice fields around Dianshan Lake were 2.01 × 10⁶ kg a⁻¹ and 4.59 × 10⁵ kg a⁻¹ on annual average, respectively, and those discharged into the lake attained 0.99 × 10⁴ kg a⁻¹ and 0.23 × 10⁴ kg a⁻¹ on annual average, respectively. The promotion of the organic rice farming without applying any chemical fertilizers and pesticide around the lake would reduce the input amounts of N and P₂O₅ into the lake by 75.8% and 95.2%, respectively. This would also prevent the hazards from non-point pollution of pesticides on lake water.

Keywords: Dianshan Lake, Conventional rice farming, Agricultural non-point source pollution, Organic rice farming