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CAUSAL ANALYSIS ON THE SPECIFIED PAROXYSMAL WATER POLLUTION INCIDENTS IN THE HUAI RIVER BASIN, CHINA

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Abstract

In the Huai River Basin, pollutant masses are frequently concentrated into dams and sluices, which are subsequently discharged anddestroying the downstream ecology and environment. This phenomenon has been termed the specified paroxysmal water pollution incident (SPWPI), which has attracted worldwide attention as a large-scale water pollution problem. Studies of the formation mechanism of SPWPIs have become an urgent topic for fundamental research in water pollution prevention and control. In this paper, five serious SPWPIs (in 1989, 1994, 1995, 2000 and 2004) are selected to investigate the variation of meteorology, hydrology, water quality, pollution source (ammonium and chemical oxygen demand) and operation of dams and sluices during the period of events occurring in the middle and lower regions of Shaying River. The results show that the specific water pollution incident always occurred during the first flood period before the flood season (June-September). The elevated emissions of pollutants, increased dam construction and irrational regulations cause the accumulation of pollutants upstream of the dam, and directly induce the incidents. Moreover, the first heavy precipitation before the flood season is an important factor, which will directly trigger the flood discharge from dams and sluices with high concentrations of pollutants from upstream to downstream. The pollution will be further aggravated if no rain falls in the main stream of Huai River and southern mountainous region at the same time. This research is expected to identify the causes of the deterioration of water environments and provide scientific and technological support to prevent the paroxysmal water pollution incidents. It is also intended to guide the implementation of water pollution controls and ecological restoration in the Huai River Basin.

Key words: causal analysis, Huai River Basin, operation of dams or sluices, specified paroxysmal water pollution incident (SPWPI)

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