



ECONOMY AND ENVIRONMENT PROGRAM
FOR SOUTHEAST ASIA

POLICY BRIEF

CUTTING THE COSTS OF CLEANUP:
THE CASE FOR TRADABLE DISCHARGE
PERMITS IN THE UPPER NANPAN RIVER,
CHINA

Water pollution is one of China's most pressing environmental issues, but a recent economic study in Yunnan province has found that in certain cases market forces can be harnessed to effectively drive river clean-up.

The study looked at the feasibility of allowing industries along the heavily-polluted upper Nanpan River, Yunnan to trade permits for discharging waste into the watercourse. It found that such a tradable discharge permit (TDP) approach would be an efficient way of controlling pollution in the river and would also substantially reduce costs by providing flexibility to polluters.

The study was done in light of the failure of the current non-tradable permits system and against the background of the Yunnan provincial government's resolve to carry out comprehensive water pollution control. It was undertaken by Wendong Tao and Weimin Yang from the Yunnan Institute of Environmental Sciences and Bo Zhou from the Yunnan Environmental Protection Bureau.

In the early 1990's, as economic development in the region accelerated, so pollution in the upper Nanpan river rose and it became impossible to meet water quality objectives by enforcing existing national discharge standards. In an attempt to deal with the problem, an environmental management system, including a non-tradable permits system for water pollution, was developed. Unfortunately, this approach has proved ineffective.

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The upper Nanpan river is now heavily polluted. Its main stream, which stretches across Qujing city and three towns, is 122 km long and is designated as water for industrial and agricultural use. However, the instream water quality is unsuitable for any use whatsoever. About 30 state-owned industrial enterprises discharge a massive amount of waste water into the river. These include companies from a diverse range of industrial sectors including chemical, textile, paper making and brewing firms. In addition municipal waste waters are directly discharged into the upper Nanpan without treatment.

Since Qujing City is one of the major development zones in Yunnan province, water pollution prevention and control can only become an ever more significant challenge. In light of the advantages of the TDP approach in theory, the EEPSEA researchers decided to investigate its suitability under real-world conditions in the Nanpan river.

TDP schemes establish a market for the buying and selling of allowances to pollute. Under such a scheme a company is allowed to avoid upgrading its pollution technology to meet permit limits if it pays for equivalent (or greater) reductions at one or more pollution sources within a designated trading area. This allows companies to pay for reductions at sites where they can be achieved at the lowest cost. In this way TDP schemes aim to put in place economic incentives which achieve pollution reduction targets in the most cost-effective manner. Moreover TDP schemes provide incentives for companies to take additional steps to further reduce pollution discharges - unlike traditional 'command and control' approaches.

Through an extensive survey of international experience, the Yunnan research team analyzed the theory and practice of effluent trading and highlighted the factors which allow such an approach to work. Using research reports, environmental impact statements, government guidelines and the like, the researchers then evaluated the applicability of a practical TDP system to the upper Nanpan river area. They then worked out an approximation for the actual reduction in costs the individual polluters involved in the study would face.

The results show that in, general, conditions are right for a successful TDP trading program for the upper Nanpan river catchment. Because the water body is a discrete area and point sources contribute significantly to water pollution it is relatively easy to identify which companies and municipal businesses could be involved in a TDP scheme. Sufficient information exists on all the potential participants and it is clear that there are large difference in pollution reduction costs amongst these dischargers - from CNY88.6/kgCOD/day to CNY7393.3/kgCOD/day - making trading a practical and attractive proposition. Indeed, the research indicates that there is the potential for one case of trading between industrial participants, several trades between the Qujing municipal source and industrial sources and one case of trade between the two municipal sources. Moreover there is already a well-established institutional structure which supports and could manage such a scheme.



The potential direct cost-saving benefit to the participants in a TDP scheme can be worked out by calculating the difference between the total cost if each discharger is required to achieve its discharge permit limits without trading and the total cost if trading is allowed. In the case of the businesses along the Nanpan, the researchers calculated that they would gain an annual cost-saving of CNY2.4 million or 1.8 percent of the total annual cost of attaining the COD TRT without trading.

The researchers therefore recommend that a TDP scheme be established for the upper Nanpan river. In particular, this should be a point/point source trading system for chemical oxygen demand (COD) and 5-day biological oxygen demand (BOD5). Participants would include both existing and new point sources. The researchers propose that the scheme is initiated with a pilot program in a trading zone in the vicinity of Xiping town and the Qujing urban center.

The main barrier to success is the lack of efficient compliance incentives and enforcement mechanisms in the area. One of the necessary conditions for a successful TDP program is that China's integrated water discharge standards must be met and the researchers underline the need for some form of direct regulation to support the TDP mechanism.

To ensure success the researchers recommend a number of follow-up actions that must be taken to address the issues of compliance monitoring and program management. They also highlight the need for the importance of minimizing the administrative and transaction costs imposed on dischargers and regulatory agencies.

Given the pressing nature of the pollution problem facing the upper Nanpan, it is hoped that this research may serve as the basis for the design of a workable TDP system in Yunnan and a stimulus for similar work elsewhere.

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Note: 8.28 CNY = 1 USD

The full text of this study is available as an EEPSEA Research Report:
Tradable Discharge Permits System for Water Pollution of the Upper Nanpan River, China -
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