

**Evaluation of ecosystem services by paddy fields under different irrigation management in Taihu Lake region of China**

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**S**tatement of the Problem: Irrigation mode is an important factor in regulating ecosystem services from croplands. However, there are no studies on the effects of rice irrigation mode practiced on the ecosystem service value (ESV) of paddy fields. Methodology & Theoretical Orientation: Thus, we present the results of a field experiment study of ecosystem services and their economic values provided by paddy fields under different irrigation modes in Taihu Lake region of China. Conclusion & Significance: The results showed that nine kinds of rice paddy ecosystem services were clearly affected by irrigation mode of rice. Compared to traditional flooding irrigation (FI), controlled irrigation (CI) led to more than half reduction of irrigation water input while maintaining high rice yield. The positive ESV of CI paddy fields were reduced by 10.00% due to the reduction of air temperature, groundwater conservation and soil organic matter accumulation values. Meanwhile, application of water-saving irrigation also reduced negative ESV of paddy fields by 38.20% compared to FI treatment. CI management significant reduced the negative ESV of agricultural non-point source pollution and water resource depletion by 61.27% and 25.47%. In summary, total ESV of CI paddies were  $43.41 \times 10^3$  CNY ha<sup>-1</sup>, reduced on average by 3.43% compared to FI fields. According to the results of this study, 4.85 billion m<sup>3</sup> of irrigation water will be saved and 1.83 billion CNY of ecosystem service value provided by gas exchange in paddy field will be increased in the event of a comprehensive promotion of rice water-saving irrigation in the Taihu Lake region of China. Our results suggest that CI can increase the ESV of paddy fields while drastically reducing irrigation water input and ensuring the crop yields.

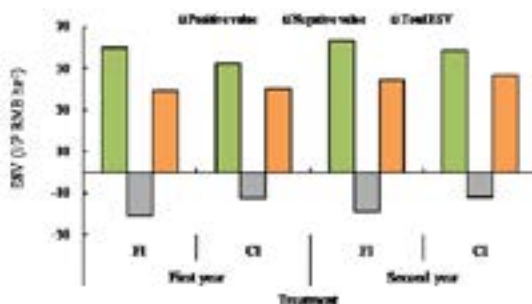


Figure1: ESV of paddy fields under different water managements

**Recent Publications**

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service value during the last three decades (1980-2014). *Journal of Integrative Agriculture*. 16(1), 76-84.

4. Natuhara Y (2013) Ecosystem services by paddy fields as substitutes of natural wetlands in Japan. *Ecological Engineering*. 56, 97-106.
5. Shao Y, Chen Z, Xiao HY, et al (2019) Integrating environmental parameters and economic benefits to analyze the ecological agriculture (EA) application in the mountain rice paddy system of Chongqing, China. *Environmental Science Europe*. 31:22.

### **Biography**

Shihong Yang received his PhD from Hohai University in 2011. Since 2011, he has been a faculty member as a Postdoctor (2011-2013), Associate Professor (2013-now) in Hohai University. His interests include water-saving irrigation technologies and their environmental effect. He has published >50 peer-reviewed journal and conference papers. He received a first prize of national science and technology progress awards, five provincial or ministerial science and technology progress awards, and several individual awards. As the PI, he has received >12 governmental funds.

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