

Accepted Manuscript

Analyzing virtual water pollution transfer embodied in economic activities based on Gray Water Footprint: A case study

Hui Li, Zhifeng Yang, Gengyuan Liu, Marco Casazza, Xinan Yin



PII: S0959-6526(17)31098-3

DOI: [10.1016/j.jclepro.2017.05.155](https://doi.org/10.1016/j.jclepro.2017.05.155)

Reference: JCLP 9695

To appear in: *Journal of Cleaner Production*

Received Date: 12 January 2017

Revised Date: 17 March 2017

Accepted Date: 25 May 2017

Please cite this article as: Li H, Yang Z, Liu G, Casazza M, Yin X, Analyzing virtual water pollution transfer embodied in economic activities based on Gray Water Footprint: A case study, *Journal of Cleaner Production* (2017), doi: 10.1016/j.jclepro.2017.05.155.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

1 Analyzing virtual water pollution transfer embodied in economic 2 activities based on Gray Water Footprint: A case study

3 Hui Li¹, Zhifeng Yang^{1,2,*}, Gengyuan Liu^{1,2,*}, Marco Casazza³, Xinan Yin¹

4 ¹ State Key Joint Laboratory of Environment Simulation and Pollution Control, School of Environment, Beijing
5 Normal University, Beijing 100875, China

6 ² Beijing Engineering Research Center for Watershed Environmental Restoration & Integrated Ecological
7 Regulation, Beijing 100875, China

8 ³ University of Naples 'Parthenope', Department of Science and Technology, Centro Direzionale, Isola C4, 80143,
9 Naples, Italy

10

11 Abstract

12 Water pollution can be transferred either through natural water bodies or, indirectly, through
13 economic activities. The former is a physical transfer, which has been extensively investigated and
14 just used for controlling pollution of transboundary river basin. The latter is a virtual transfer, as
15 shown by some studies, where it is demonstrated that the quantity of pollutants embodied in
16 economic activities is much larger and worthy attention. However, understanding the mechanisms
17 of virtual water pollution transfer through economic activities and relating them to domestic water
18 resources remains a challenge. This study approaches this subject focusing on the use of the Gray
19 Water Footprint (GWF) to account for the virtual water pollution. Based on natural background
20 concentration, GWF is defined as the essential quantity of fresh water in order to assimilate the
21 load of pollutants discharged into water. GWF reflects the impact of water pollution on the
22 available quantity of water resources. GWF assessment has been tested quantifying and tracking
23 Beijing's water pollutants emission flows embodied in economic activities. Based also on an
24 Economic Input-Output Life Cycle assessment, we found that: 1) the material exchange between
25 economic sectors cause the water pollution transferred virtually from down-stream industry to
26 up-stream industry. For example, food and tobacco sector transfers $23.28 \times 10^7 \text{ m}^3$ virtual water
27 pollution to the agriculture sector. Consequently, the sectors which receive intermediate products

* Corresponding author:

E-mail address: zfyang@bnu.edu.cn (Z.F. YANG); liugengyuan@bnu.edu.cn (G.Y. LIU)

متن کامل مقاله

دریافت فوری ←

ISIArticles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات