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WOGUO NONGCHANPIN MAOYI YU
NONGYE HUANJING XIAOYING YANJIU

我国农产品贸易与 农业环境效应研究

马进 著

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上架建议：经济·学术专著

ISBN 978-7-5196-0604-6



9 787519 606046 >

定价：49.00元

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图书在版编目 (CIP) 数据

我国农产品贸易与农业环境效应研究 / 马进著. —
北京: 经济日报出版社, 2019. 9

ISBN 978-7-5196-0604-6

I. ①我… II. ①马… III. ①农产品贸易—国际贸易
—研究—中国 IV. ①F752.652

中国版本图书馆 CIP 数据核字 (2019) 第 206555 号

我国农产品贸易与农业环境效应研究

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责任校对	薛银涛
出版发行	经济日报出版社
社 址	北京市西城区白纸坊东街 2 号 A 座综合楼 710
邮政编码	100054
电 话	010-63567683 (编辑部) 010-63538621 63567692 (发行部)
网 址	www.edpbook.com.cn
E-mail	edpbook@sina.com
经 销	全国新华书店
印 刷	北京建宏印刷有限公司
开 本	710×1000 毫米 1/16
印 张	12.625
字 数	182 千字
版 次	2019 年 9 月第一版
印 次	2019 年 9 月第一次印刷
书 号	ISBN 978-7-5196-0604-6
定 价	49.00 元

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中文摘要

加入世界贸易组织十多年来，我国已成为全球主要的农产品出口国和进口国，农产品贸易的发展为提高农民收益、巩固农业基础地位和维护政治经济安全发挥了至关重要的作用。但是随着农业现代化建设的飞速发展和农产品贸易开放程度的不断提高，我国农业生产呈现出高投入、高能耗、高污染的态势，引发了地下水污染、水体富营养化、土壤结构破坏、农产品安全质量不合格等一系列农业环境问题。在农产品贸易自由化呼声越来越高，农业面源污染问题日益凸显的今天，关于我国农产品贸易与农业环境效应的研究具有重大的理论意义和实际意义。

本书在回顾和梳理贸易与环境相关文献的基础上，对农产品贸易与农业环境效应进行了理论分析、实证检验和政策研究。理论分析主要是从根本上阐述农产品贸易与农业环境的作用机制，理论上剖析农产品贸易对农业环境可能产生的正面及负面作用，并对贸易开放背景下的农业环境政策和贸易政策进行分析。实证检验主要分为两部分：一是通过时间序列分析，考察我国农产品贸易与农业环境在现实中的长期均衡关系、短期动态关系和因果关系；二是利用省级面板数据，比较研究我国东、中、西三大地区的农产品贸易环境效应。此外，在全球化和可持续发展观的背景下，

着重考察我国农产品贸易与农业环境的协调发展情况。最后对研究结果进行总结归纳，有针对性地提出促进农产品贸易和农业环境协调发展的对策建议。

理论分析部分通过建立开放经济条件下的农产品贸易环境一般均衡模型发现：农业环境污染排放水平受农业生产规模、生产结构、技术水平、贸易壁垒、世界市场价格、消费者人口和真实人均收入等因素的影响；农产品贸易开放程度的提高可以通过规模效应、结构效应、技术效应、收入效应和外部效应对农业环境产生影响。以上效应的正负性取决于现实生活中的集体和个体行为以及国家能否结合自身情况采取合理有效的贸易和环境政策。

通过对开放贸易条件下，农业环境政策和贸易政策的分析发现：在采用固定农业环境质量管理标准限制的情况下，贸易开放会使污染密集型农产品进口国的农业环境改善，污染密集型农产品出口国的农业环境污染加剧；如果实施固定农业排污权或污染配额等政策，贸易开放对农业环境的影响可以忽略不计；如果采用最优农业污染税或最优农业排污权等弹性农业环境政策，贸易开放使污染密集型产品进口国的农业环境得到改善，而对于污染密集型产品出口国来说，环境的改善或恶化取决于该国农民收入对农业环境污染损失的弹性大小；从长期来看，合理的农业绿色壁垒可能产生技术模仿替代效应，从而对发展中国家环境技术进步产生激励作用；以环保为名，通过绿色壁垒对发展中国家实施贸易限制，会给技术水平较低的农产品出口企业带来诸多不利影响；农业绿色补贴的合理利用可以帮助企业克服进口国的环境标准限值，实现农业污染外部效应的内在化。

从时间序列分析结果来看，我国农产品贸易与农业环境在长期和短期

均存在一定的均衡关系和双向动态影响。尽管我国农业环境对农产品贸易的影响程度和解释力逊色于贸易对环境的影响程度，但从总体分析结果来看，农业环境对农产品贸易存在一个反向调节的趋势，即环境改善会提高农民收入并促进贸易发展，而环境污染会降低收入并抑制贸易发展。我国目前仍然欠缺一个包含环境的有效市场机制和价格调节手段，所以很难实现农业环境对农产品贸易的良性反调节作用，常常出现对环境先破坏再补救的恶性循环模式。

基于我国省级面板数据的农产品贸易环境效应分析发现：我国农产品贸易环境效应中的规模效应为负，技术效应为正，规模效应占主导地位；结构效应为负；化肥、农药和农膜的直接贸易效应均为正；农业环境污染受农产品贸易诱发的 ERE 和 KLE 的双重影响，ERE 会增加我国的农业污染，KLE 会减少农业污染。实证结果证实了污染天堂假设和资源禀赋假设在我国农业环境中的存在。分地区环境效应估计结果基本与理论预期和全国数据结果相符。通过地区间的横向比较发现，东、中、西部地区的环境效应差异较大，地域特征明显。在贸易诱发的结构效应方面：东部地区 KLE 显著，中部地区 ERE 显著，西部地区根据污染指标的不同呈现多样化的特点。

通过对我国农产品贸易与农业环境之间的协调程度进行评估发现，在正确的政策指导和健康的经济环境下，农产品贸易和农业环境可以达到一个相互促进的良性发展状态。从农产品贸易指标和农业环境指标的整体变动来看，两者都处在持续增长的状态，总体势头较好，整体协调度较高但存在阶段性波动。2010 年以后，协调系数和动静态协调度均出现明显下降趋势，农产品贸易的发展速度高于农业环境的改善速度，且差距逐年拉大，两者处于短时间“顾此失彼”导致的周期性协调度下降阶段。2012 年

到2013年农业环境指标约为零增长，静态协调度下降幅度较大。由此可见，若一味刺激农产品贸易而忽略农业环境保护工作，必将造成环境治理的停滞不前甚至生态环境的恶化，反过来阻碍农业经济的发展。

关键词：农产品贸易开放；农业环境；贸易环境效应；一般均衡分析；协调度

ABSTRACT

Over the past years since WTO accession, China has become the world's leading agricultural exporting country and importing country. The development of agricultural trade has played a crucial role in improving farmers' income, consolidating the fundamental position of agriculture and maintaining the political and economic security. However, with the rapid development of agricultural modernization and the continuous improvement on the trade openness, the agricultural production in China has showed a high-input, high-energy-consumption and high-pollution trend, which has led to a series of agri-environmental issues, such as groundwater pollution, eutrophication, soil structure damage and unqualified agricultural products. As the demands for trade liberalization increase and the problems of agricultural non-point source pollution become more serious, the study on effect between agricultural trade and environment in China has great theoretical and practical significance.

On the basis of the review of the literature related to agricultural trade and environment issues, this paper theoretically and empirically analyzes the effect between agricultural trade and environment, and related policies combined with

China's current situation. Theoretical analysis mainly elaborates the fundamental mechanism of agricultural trade on environment, theoretically investigates both positive and negative effects of trade on the environment that may arise, and analyzes the agricultural environmental policy and trade policy under the background of trade openness. The empirical study is divided into two parts: the first part uses the time series model to analyze the long-term equilibrium relationship, short-term dynamic relationship and causal relationship between agricultural trade and agricultural environment in China in reality; the second part uses provincial panel data to give a comparative study on agricultural trade-environmental effect in eastern, central and western China. In addition, under the background of globalization and the concept of sustainable development, this paper also focuses on the coupling relationship between agricultural trade and environment in China. The last part summarizes the paper conclusions and put forward policy suggestions to promote the coordinated development of agricultural trade and environment.

In the chapter of theoretical analysis, through the establishment of an agricultural trade-environment general equilibrium model under an open economy, we find that agricultural pollution is influenced by agricultural production scale, production structure, technology, trade barriers, world market price, consumer population and real per capita income level. Agricultural trade openness can affect agricultural environment through scale effect, composition effect, technique effect, income effect and external effects. The above effects could be positive or negative on the environment, which depends on the individual and collective behavior in real life and whether the governments are able to adopt the reasonable

and effective policies combined with their own situation.

In the case of fixed agriculture environmental standards, agricultural trade openness would improve the environment of the country which imports “dirty agricultural products”, and harm the environment of the country which exports “dirty agricultural products”. Regarding the fixed agricultural emission permits or quota, the impact of trade openness on agricultural environment could be basically negligible. In terms of the flexible agricultural environmental policies, agricultural trade openness would improve the environment of the country which imports “dirty products”; regarding the country which exports “dirty products”, the result would depend on the elasticity of farmers’ income level to agricultural pollution damage. In the long run, reasonable agricultural green barriers may have the technique substitution and imitation effect, and have an incentive impact on the environmental technology of developing countries. However, in the name of environmental protection to impose trade restrictions on developing countries by the green barriers would bring negative effects to the agricultural export enterprises with lower technique. In this case, the rational utilization of the green subsidies could help these agricultural enterprises overcome the limits of environmental quality standards set up by the importing country, and achieve the interiorization of the agricultural pollution external effect.

From the results of time series analysis, we find there are long-term equilibrium relationship, short-term dynamic relationship and two-way causal influence between agricultural trade and agricultural environment in China. Although the explanation of agricultural environment to trade is not as good as trade to environment, from the overall results of the analysis, there is a reverse regulatory

trend of agriculture environment to foreign trade; better environment will increase farmers' income level and improve the development of agricultural trade, while worse environmental pollution will have a negative impact on income level and trade development. China is still short of an effective market mechanism and price adjustment means with environment. Thus, it is difficult for environment to play a role in trade. There is a vicious circle pattern usually happening that damage the environment first and remedy it then.

Based on the analysis of agricultural trade – environment effect in China by region we find: the scale effect is negative, the technique effect is positive, the scale effect dominates the technique effect; the composition effect is negative; the direct trade effects of fertilizer, pesticide and agricultural film are all positive; agricultural environmental pollution is also affected by the trade – induced ERE and KLE, the ERE increases agricultural pollution, while the KLE decreases agricultural pollution. The empirical results confirm the exist of pollution haven hypothesis and factor endowment hypothesis in China's agricultural environment. The results of regional effects are basically consistent with the theoretical expectations and the results of the whole national effects. The horizontal comparison among the regions indicates the environmental effects of the eastern, central and western region are quite different and have obvious area features. In terms of the trade – induced composition effects: the KLE is significant in the eastern region, the ERE is significant in the central region, the results of the western region depend on different pollution indicators.

The research on the coupling relationship between agricultural trade and environment illustrates that agricultural trade and environment can reach an opti-

imum development state and promote each other under the valid policies and healthy economic conditions. The indicators of agricultural trade and environment both increase constantly, and the overall momentum is good. The coupling degrees in recent years are relatively high but there are periodic fluctuations. The coupling coefficient, static degree and dynamic degree all have a clear downward trend after 2010. The growth rate of foreign trade is higher than the improvement rate of environment, and the gap is widening year by year. The coupling relationship is in the short – term cyclical downturn period caused by “catch one and lose another” . The environment indicators approximately have a zero growth from 2012 to 2013, and the static coupling degree decreases greatly. It follows that if we stimulate the development of agricultural trade blindly and ignore the agricultural environmental protection, these behaviors will inevitably lead to the stagnation of environmental governance or even the deterioration of environment, and in turn impede the development of agricultural economy.

Keywords: Agricultural Trade Openness; Agricultural Environment; Computable General Equilibrium Analysis; Trade – Environment Effect; Coupling Relationship

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