Reducing Agricultural Pollution Through Urban Policy: Evidence from China's New Urbanization Initiative

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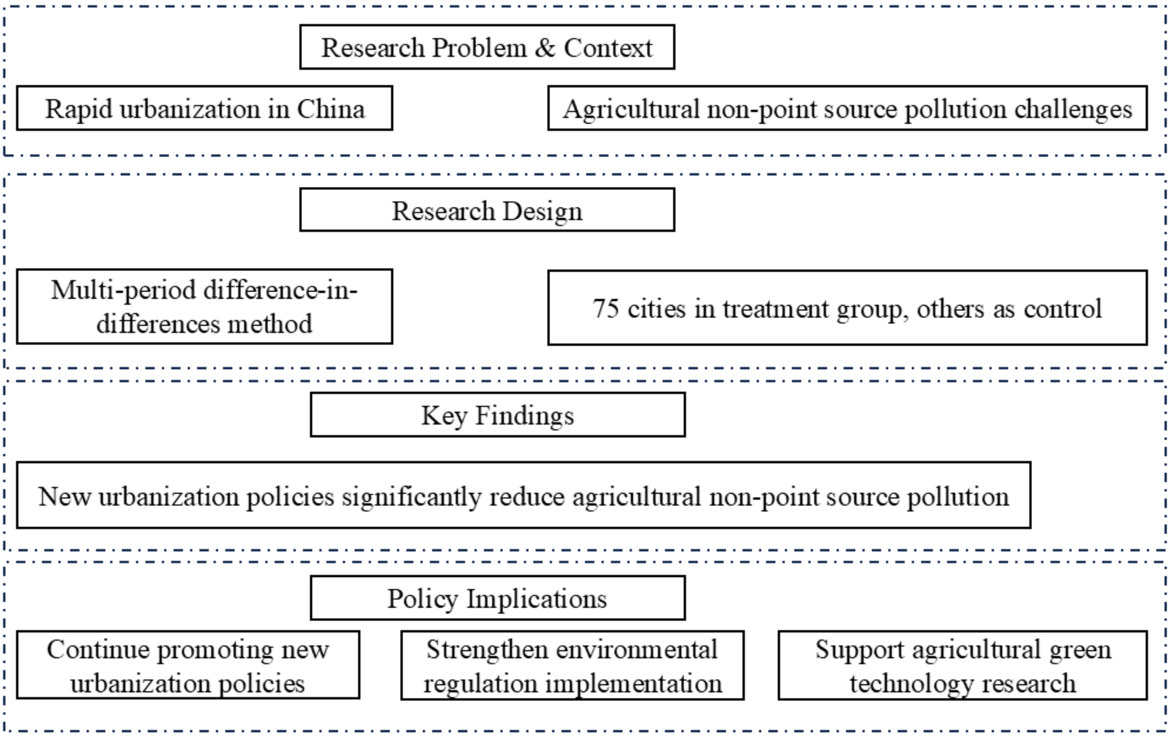
Graphical abstract



ABSTRACT

The rapid urbanization in China has led to severe agricultural non-point source pollution, threatening sustainable development. This study investigates the impact of new urbanization policies on controlling agricultural non-point source pollution and explores the underlying mechanisms. Utilizing panel data from 159 Chinese prefecture-level cities (2007-2020) and employing a multi-period difference-in-differences method, we find that new urbanization policies significantly reduce agricultural non-point source pollution, particularly in eastern regions and larger cities. Our analysis reveals that strengthened environmental regulations and advancements in agricultural green technologies are crucial pathways through which these policies influence pollution control. This research contributes to the understanding of policy effectiveness in addressing environmental challenges associated with urbanization and provides evidence-based recommendations for sustainable urban-rural development in China.

Keywords: Agricultural non-point source pollution; New urbanization; Policy effectiveness; Environmental regulation; Agricultural technological progress; Sustainable development

1. Introduction

The accelerating pace of urbanization in China, with the urbanization rate surging from 17.92% in 1978 to 65.22% in 2022, has brought unprecedented challenges to the agricultural ecological environment (Bui & Nguyen, 2023; Liu et al., 2015). Among these challenges, agricultural non-point source pollution has emerged as a critical issue, threatening food security, environmental health, and sustainable development (Luo et al., 2023; Xu et al., 2022). The Second National Pollution Source Census of China reveals alarming levels of chemical oxygen demand (COD), total nitrogen (TN), and total phosphorus (TP) emissions from agricultural sources, highlighting the urgency of addressing this problem (Chang et al., 2022; Wu et al., 2020; Zhou & Geng, 2021).

In response to these challenges, the Chinese government has introduced the concept of "new urbanization," emphasizing a people-centered approach, ecological civilization, and cultural inheritance (Li et al., 2016; Peng et al., 2021). This policy shift aims to achieve harmonious coexistence between economic growth and environmental protection. However, while the importance of new urbanization policies is widely acknowledged, research on their specific effects on agricultural non-point source pollution control remains limited.

Existing literature has primarily focused on the general impacts of urbanization on environmental quality (Li et al., 2018), leaving a significant gap in understanding the mechanisms through which new urbanization policies influence agricultural pollution control. Moreover, there is a lack of comprehensive analysis on the heterogeneous effects of these policies across different economic regions and city scales.

Given these research gaps, several critical questions emerge:

1. How do new urbanization policies specifically impact the control of agricultural non-point source pollution?

2. What is the extent of heterogeneity in the impact of these policies across different economic regions and city scales?

3. Through what mechanisms do new urbanization policies influence agricultural non-point source pollution control, particularly in terms of environmental regulations and agricultural green technology advancement?

4. How can we effectively evaluate and quantify these impacts and mechanisms?

To address these pressing questions, our study aims to:

1. Systematically evaluate the effectiveness of new urbanization policies on controlling agricultural non-point source pollution.

2. Investigate the heterogeneity of policy impacts across different economic regions and city scales.

3. Explore the roles of environmental regulations and agricultural green technology advancement as potential mechanisms of policy influence.

4. Provide evidence-based recommendations for enhancing the governance of agricultural non-point source pollution within the framework of new urbanization.

By employing a multi-period difference-in-differences method and utilizing panel data from 159 prefecture-level cities in China from 2007 to 2020, this research provides a nuanced understanding of the relationship between new urbanization policies and agricultural pollution control. Our findings contribute to the existing literature by offering empirical evidence on policy effectiveness and revealing the underlying mechanisms of impact. Furthermore, this study provides valuable insights for policymakers, supporting the formulation of targeted strategies to enhance agricultural non-point source pollution governance within the framework of new urbanization.

Through this comprehensive analysis, we aim to bridge the gap between urbanization policies and environmental outcomes, offering both theoretical contributions to the field of urban-rural sustainable development and practical guidance for policy implementation in the context of China's modernization and rural revitalization strategy.

2. Materials and Methods

2.1. Measurement Methods

The academic community employs various methods to estimate agricultural non-point source pollution, including water quality and quantity-related methods, output coefficient methods and their modifications, nutrient balance methods, and mathematical model prediction methods. However, these methods typically require substantial field data and are primarily suitable for small-scale non-point source pollution estimation (Chen et al., 2019; Hong & Li, 2000; Li, 2000; Liu et al., 2020; Liu et al., 2021; Momm et al., 2019). Given this, this study adopts the unit survey method proposed by Lai (2004), which calculates pollutant emissions by identifying pollution sources, recognizing pollution-producing units, and accounting for pollutant emissions based on the attributes of the accounting unit and regional characteristics (Lai et al., 2004). Chen (2006) further analyzed intensity coefficients, resource utilization coefficients, and loss coefficients on this basis, calculating the production, emission, and emission intensity of COD, TN, and TP pollution from agriculture and rural areas in various cities in China, and analyzed their spatial distribution characteristics (Chen et al., 2006). The unit survey assessment method is widely applied to estimate COD, TN, and TP over larger agricultural non-point source pollution areas.

2.2. Measurement Steps

(1) Identification of Pollutant Source Types: This study selects fertilizers as the main type of agricultural non-point source pollution, based on data availability and the contribution of fertilizers to agricultural non-point source pollution.

(2) Identification of Pollution Units: The pure quantities of nitrogen fertilizer, phosphate fertilizer, and compound fertilizer are selected as pollution units for fertilizer application pollution, and the pollution indicators accounted for are the total nitrogen (TN) and total phosphorus (TP) of fertilizer surface source pollution, as shown in Table 1.

Table 1. Pollution Units for Fertilizer Surface Source Pollution

Category	Unit	Survey Indicator
Fertilizer	Nitrogen fertilizer Phosphate fertilizer	Application quantity (Ten thousand tons)

Compound fertilizer

(3) Determination of Pollution Unit Production and Discharge Coefficients: The fertilizer discharge coefficient equals the pollutant production coefficient multiplied by the fertilizer loss rate. In this study, the proportions of nitrogen, phosphorus, and potassium nutrients in each fertilizer are set at 1:1:1, with specific coefficients referenced in Table 2. The fertilizer loss rates are determined based on the compilation results by Shi (2016) (Shi et al., 2016), as shown in Table 3.

Table 2. Production Coefficients of Various Fertilizers

Unit	TN Production Coefficient	TP Production Coefficient
Nitrogen fertilizer	1	0
Phosphate fertilizer	0	0.44
Compound fertilizer	0.33	0.15

Table 3. Fertilizer Loss Rates in China

Region	Loss Rate (%)	
	Nitrogen Fertilizer	Phosphate Fertilizer
Jiangsu, Beijing	30	7
Tianjin, Guangdong, Zhejiang, Shanghai	30	4
Hubei, Fujian, Shandong	20	7
Hebei, Shaanxi, Liaoning, Yunnan, Ningxia, Hunan, Jilin, Inner Mongolia, Guizhou	20	4
Henan, Heilongjiang	10	7
Anhui, Hainan, Xinjiang, Shanxi, Guangxi, Gansu, Sichuan, Jiangxi, Chongqing, Qinghai, Tibet	10	4

(4) Calculation of Emissions and Emission Intensity: Based on the above steps, this study estimates the emission coefficients of fertilizer surface source pollution for each province, and calculates the

emission quantity of fertilizer surface source pollutants accordingly. Specifically, as shown in the following formula:

$$TANSP = \sum TANSP_{ij} = \sum C_{ij} \times \delta_i = \sum T_i \times \lambda_{ij} \times \delta_i \tag{1}$$

Equation (1) states that TANSP represents the total emission quantity of fertilizer surface source pollution, $TANSP_{ij}$ represents the quantity of the jth pollutant produced by unit i and lost into water bodies, namely pollutant loss or emission quantity; C_{ij} represents the quantity of the jth pollutant produced by unit i and potentially causing non-point source pollution to the water environment, also known as pollutant production or generation quantity; T_i represents the index statistical quantity of unit i; λ_{ij} represents the production coefficient of pollutant j in unit i; δ_i represents the loss rate of the ith type of fertilizer.

2.3. Research Design

2.3.1. Model Specification

This study employs a difference-in-differences model for empirical analysis to evaluate the impact of the new urbanization policy on the control of agricultural non-point source pollution. The research sample includes 159 prefecture-level cities in China, among which 75 cities designated as new urbanization pilot cities are treated as the treatment group, while the remaining cities serve as the control group. Considering the differences in policy implementation years, this study adopts a multi-period difference-in-differences method to identify the average treatment effect by constructing the policy dummy variable NUP (Clair & Cook, 2015; Kang et al., 2023).

$$TANSP_{i,t} = \beta_0 + \beta_1 \mathrm{NUP}_{\ it} + \beta_2 \ \mathrm{Controls}_{i,t} + \mu_i + \gamma_t + \varepsilon_{it} \tag{2}$$

Where the dependent variable $TANSP_{i,t}$ represents the total emission quantity of agricultural non-point source pollution, the core explanatory variable NUP $_{it}$ reflects whether the city is a pilot city for the new urbanization policy after implementation. If city i implements the policy in year t, the value is 1, otherwise, it is 0. μ_i represents time fixed effects; γ_t represents city fixed effects; ε_{it} represents the error term.

2.2.2. Variable Selection and Definition

In this study, the dependent variable of interest is the total emission quantity of agricultural non-point source pollution, denoted as TANSP. To investigate the impact of the new urbanization policy (NUP) on agricultural non-point source pollution, we use NUP as the primary explanatory variable, where NUP is a binary indicator variable representing cities that have implemented the new urbanization policy (value of 1) and cities that have not (value of 0).

To control for other factors that may influence the emission quantity of agricultural non-point source pollution, we introduce the following control variables: (1) Crop structure (CS): Reflecting the proportion of different crop planting areas, measuring the diversity and concentration of crop planting, which may affect fertilizer usage and pollutant emissions (Huang et al., 2022; Li & Shang, 2023). (2) Fertilizer application technology level (FATL): Measuring the technical efficiency of fertilizer usage in agricultural production, reflecting the degree of technological progress in fertilizer usage, which is related to reasonable fertilizer usage and reduction of pollutant emissions (Wu & Ge, 2019). (3) Rural labor migration (RLM): Represented by the natural logarithm of the number of employed persons in rural primary industries, reflecting the degree of rural labor migration to non-agricultural industries, which may affect agricultural production methods and fertilizer usage. (4) Industrial structure (IS): Measured by the ratio of value added of the primary industry to the sum of value added of the secondary and tertiary industries, reflecting the level of modernization of regional economic structure, which is related to the green transformation of agriculture and pollution control capabilities (Han et al., 2023; Wang et al., 2023). (5) Prosperity level (LOA): Measured by the ratio of total agricultural output value to total crop sown area, reflecting the economic level of rural residents, which is related to the sustainability of agricultural production and environmental quality. In addition, in the mechanism analysis section, we introduce mechanism variables: Environmental regulation (ER) and Agricultural Green Technology Progress (NGTFP). To measure the level of environmental regulation, we use the entropy method to calculate the comprehensive index of environmental regulation (Xu et al., 2022; Xu et al., 2023); and drawing from the research results of Wu (2018) (Wu & Song, 2018), we use the SBM model and GML index to measure agricultural green total factor productivity, to gauge agricultural green technological progress. Through the introduction of these variables, this study aims to more accurately assess the impact of the new urbanization policy on the control of agricultural non-point source pollution while controlling for other potential confounding factors.

2.2.3. Data Description

The data used in this chapter are panel data from 159 prefecture-level cities in China from 2007 to 2020. The data sources include the respective provincial (rural) statistical yearbooks, national economic and social development statistical bulletins, "China Urban Statistical Yearbook," and "China Regional Economic Statistical Yearbook."

3. Results

3.1. Exploratory Data Analysis

In the exploratory data analysis of this study, we first conducted descriptive statistics on the panel data of 159 prefecture-level cities in China from 2007 to 2020. Table 4 shows that the mean of total emission quantity of agricultural non-point source pollution (TANSP) is 1.774, with a standard deviation (SD) of 1.969, indicating a certain degree of variability in agricultural non-point source pollution emissions among cities during the study period. The mean of crop structure (CS) is 4.718, with a standard deviation of 12.362, a minimum of 0.190, and a maximum of 253.051, reflecting the diversity of crop planting patterns in different regions. The mean of fertilizer application technology level (FATL) is 0.191, with a standard deviation of 0.131, indicating relatively small differences in fertilizer usage efficiency among cities. The mean of rural labor migration (RLM) is 4.023, with a standard deviation of 1.063, possibly indicating a common trend of rural labor migration to non-agricultural industries. The mean of industrial structure (IS) is 0.151, with a standard deviation of 0.115, a minimum of 0.001, and a maximum of 0.750, indicating the level of modernization of regional economic structure. The mean of prosperity level (LOA) is 0.299, with a standard deviation of 0.534, possibly related to the sustainability of agricultural production and environmental quality. These descriptive statistical results provide the basis for our subsequent empirical analysis and help us understand the potential impact of the new urbanization policy on the control of agricultural non-point source pollution.

Table 4. Descriptive Analysis

Variable	Mean	SD	Min	Max
TANSP	1.774	1.969	0.002	12.968
CS	4.718	12.362	0.190	253.051
FATL	0.191	0.131	0.003	1.246
RLM	4.023	1.063	-4.086	5.887
IS	0.151	0.115	0.001	0.750
LOA	0.299	0.534	0.034	9.492

3.2. Parallel Trends Test

In this study, to evaluate the impact of the new urbanization policy (NUP) on agricultural non-point source pollution (TANSP), we employed the event analysis method and constructed the following regression model:

$$TANSP_{i,t} = \alpha + \sum_{t=-9}^{5} \beta_t \text{ Policy }_i \times \text{ Year }_t + \gamma \text{ Controls}_{i,t} + \mu_i + \gamma_t + \varepsilon_{it} \tag{3}$$

Where β_t represents the differential coefficient between the treatment group (cities implementing the new urbanization policy) and the control group (cities not implementing the policy) in specific years. The meanings of other variables are the same as in Model (2). The policy was first implemented in 2015, and we used the year before policy implementation as the base year to test the parallel trend assumption of policy effects. Figure 1 presents the results of the parallel trends test.

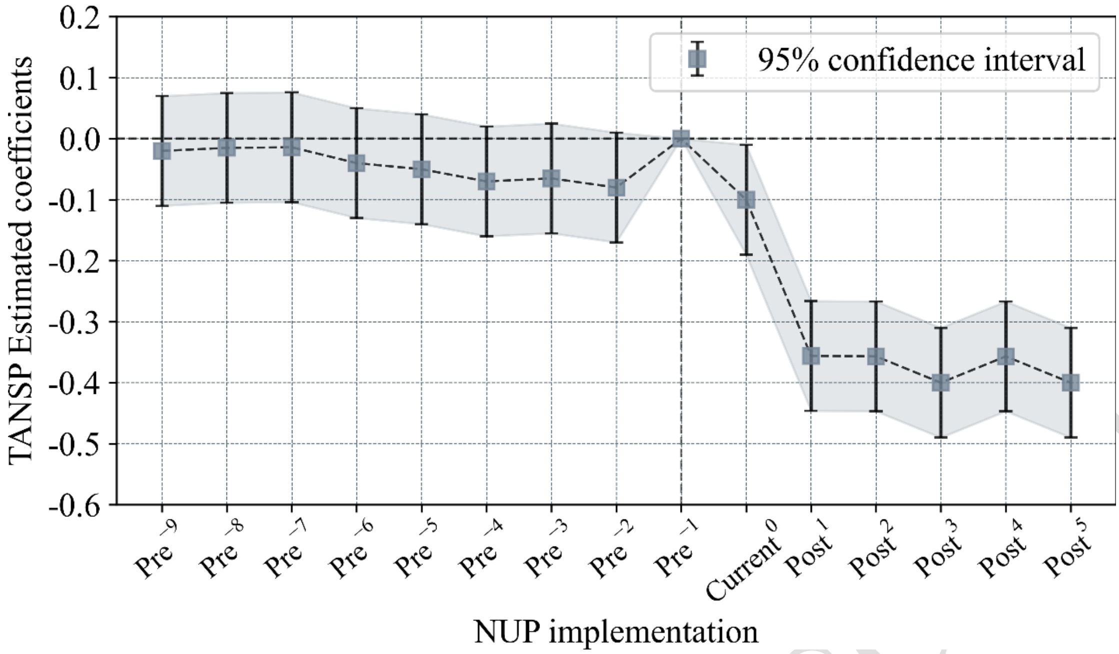


Figure 1. Parallel Trends Test

According to the analysis of Figure 1, we observed that before the implementation of the new urbanization policy, there was no significant difference in agricultural non-point source pollution emissions (TANSP) between the treatment group and the control group. This indicates that before policy implementation, there was no systematic difference between the two groups of cities in terms of agricultural non-point source pollution performance, thus validating the parallel trend assumption of the model. This result provides a reliable basis for subsequent event analysis, ensuring that we can accurately assess the effect of the new urbanization policy on the control of agricultural non-point source pollution.

3.3. Baseline Regression

Table 5 presents the empirical analysis results of the baseline model constructed using the multi-period difference-in-differences method in this study. In column (1), the regression results including only the policy dummy variable NUP show that the new urbanization policy (NUP) has a significant negative impact on agricultural non-point source pollution (TANSP), with an estimated coefficient of -0.116, significant at the 5% level. This indicates that the implementation of the new urbanization policy has played a positive role in reducing agricultural non-point source pollution.

In column (2), the regression results after introducing control variables show that even after controlling for other influencing factors, the coefficient estimate of NUP remains slightly changed but still significant at the 5% level, with a value of -0.119. This further confirms the effectiveness of the new urbanization policy in suppressing agricultural non-point source pollution. The new urbanization policy, by promoting the optimization and upgrading of industrial structure, technological progress, and the implementation of stricter environmental regulations, helps to reduce the use of fertilizers in agricultural production, thereby lowering agricultural non-point source pollution.

Although the new urbanization may lead to exacerbating rural population aging and thus potentially increase the use of chemicals such as fertilizers, empirical analysis shows that the positive effect of the new urbanization policy on reducing agricultural non-point source pollution far outweighs its potential negative impacts. As a national strategy, the new urbanization policy is of great significance for improving ecological environment quality and accelerating agricultural modernization.

Table 5. Baseline Model

Variable	**(1)** **TANSP**	**(2)** **TANSP**
NUP	-0.116**	–0.119**
	(0.055)	(0.051)
Controls	No	Yes
City	Yes	Yes
Year	Yes	Yes
Observation	2226	2226
Adj_R^2	0.133	0.203

Note: *, **, and *** indicate significant at the 10%, 5%, and 1% levels, respectively, and values in parentheses are cluster robust standard errors.

3.4. Placebo Test

To verify the robustness of the inhibitory effect of the new urbanization policy on agricultural non-point source pollution and to exclude interference from other potential unobservable factors, this study conducted a placebo test. The testing process is as follows: we randomly selected 75 cities from all sample cities, designated them as the simulated treatment group for the new urbanization policy, and randomly assigned a policy implementation year. Subsequently, we created a pseudo-policy dummy variable for these cities and conducted regression analysis using this new sample set. This process was repeated 500 times to generate 500 estimated coefficients for the pseudo new urbanization policy (NUP). We compared these pseudo-estimates with the actual NUP coefficients, and the result distribution is shown in Figure 2.

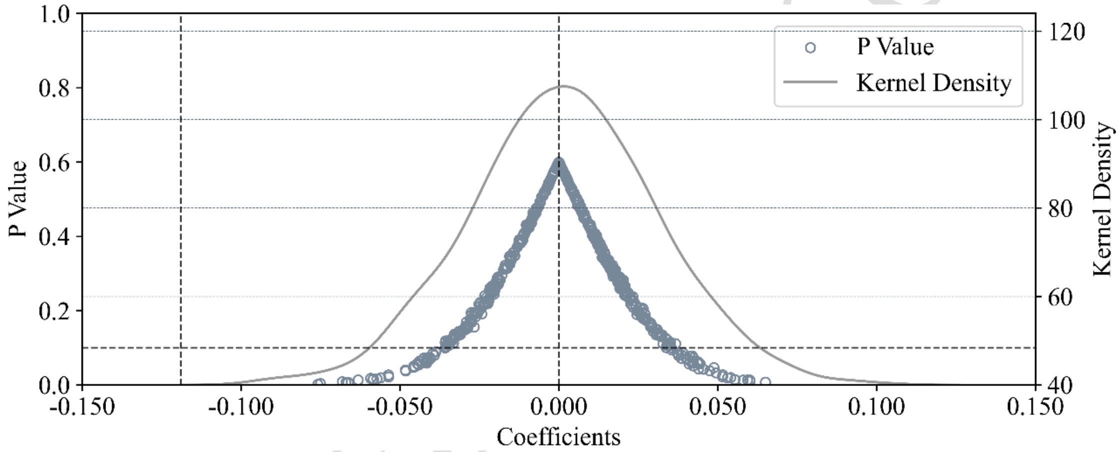


Figure 2. Placebo Test

Figure 2 shows that the estimated coefficients of the pseudo-policy dummy variable are mainly concentrated around 0, and most of them are not significant at the 10% level. This finding indicates that the empirical analysis results of this study are robust, implying that the inhibitory effect of the new urbanization policy on agricultural non-point source pollution is unlikely to be influenced by other unobserved factors. This further confirms the actual effectiveness of the new urbanization policy in reducing agricultural non-point source pollution.

4. Discussion

4.1. Heterogeneity Analysis

Previous analyses have confirmed the positive effect of the new urbanization policy on the control of agricultural non-point source pollution. However, does this effect vary under different conditions?

Particularly, as the new urbanization pilot policy is a widely implemented measure, would its effect on reducing agricultural non-point source pollution vary due to differences in economic regions and urban scale? To delve into this issue, this study will analyze the heterogeneity of the effect of the new urbanization policy on the control of agricultural non-point source pollution from two dimensions: economic regions and urban scale.

4.1.1. Economic Regional Heterogeneity

Considering the widespread implementation of the new urbanization policy nationwide, covering the eastern, central, and western regions, this study divides the sample cities into three regions: eastern, central, and western, and conducts regression analysis to examine the effect of the new urbanization policy on agricultural non-point source pollution in different regions. Table 6 shows that the effect of the new urbanization policy (NUP) in the eastern region on controlling agricultural non-point source pollution is significant, while the effect in the central and western regions is not significant. This indicates that the new urbanization policy is more effective in the eastern region, possibly because the eastern region has advantages in economic strength, human capital, and technological foundation, enabling pollution reduction through technological progress. Moreover, the higher per capita income level in the eastern region may prioritize quality improvement in urbanization, thereby achieving more effective pollution control in agricultural non-point sources.

Table 6. Economic Regional Heterogeneity

Variable	**(1)** **Eastern Region** **TANSP**	**(2)** **Central Region** **TANSP**	**(3)** **Western Region** **TANSP**
NUP	-0.315***	–0.016	0.028
	(0.088)	(0.066)	(0.062)
Controls	Yes	Yes	Yes
City	Yes	Yes	Yes
Year	Yes	Yes	Yes

Observation	868	882	476
Adj_R^2	0.314	0.333	0.292

4.1.2. Heterogeneity of Urban Scale

Cities of different sizes exhibit differences in market demand, research capabilities, and talent aggregation, which may affect the effectiveness of the new urbanization policy in controlling agricultural non-point source pollution. This study categorizes cities into large-scale, medium-scale, and small-scale cities based on the proportion of urban population and analyzes the governance effect of the new urbanization policy in cities of different sizes. The results in Table 7 indicate that the new urbanization policy significantly reduces agricultural non-point source pollution emissions in large-scale cities, while the effect is not significant in medium-scale and small-scale cities. This could be because large-scale cities have higher industrial agglomeration and environmental governance capabilities, enabling them to more effectively handle pollutants and improve environmental governance efficiency. Therefore, large-scale cities exhibit greater effects in environmental improvement.

Table 7. Heterogeneity of Urban Scale

Variable	**(1)** **Large-scale** **TANSP**	**(2)** **Medium-scale** **TANSP**	**(3)** **Small-scale** **TANSP**
NUP	-0.219**	–0.033	-0.034
	(0.088)	(0.066)	(0.088)
Controls	Yes	Yes	Yes
City	Yes	Yes	Yes
Year	Yes	Yes	Yes
Observation	714	798	714
Adj_R^2	0.314	0.179	0.224

4.2. Mechanism Exploration

To gain deeper insights into how the new urbanization policy affects agricultural non-point source pollution, we explore environmental regulation and agricultural green technological progress as potential mediating mechanisms. Table 8 presents the relevant estimation results.

In the first column, the coefficient of the new urbanization policy (NUP) is 0.067, significant at the 1% level, indicating that the new urbanization policy significantly enhances the strength of environmental regulation. However, the results in the second column show that the increase in environmental regulation intensity (ER) exacerbates agricultural non-point source pollution emissions, with a coefficient of -1.388, also significant at the 1% level. This suggests that environmental regulation plays a mediating role between the new urbanization policy and agricultural non-point source pollution, but policy implementation may indirectly increase pollution by strengthening environmental regulation. This could be due to the imperfect market mechanisms, high costs of environmental regulation, and limited level of technological progress in many cities, making it difficult for them to quickly transition from traditional high-emission production methods during the new urbanization process.

Furthermore, we examine the mediating mechanism of agricultural green technological progress (NGTFP). The results in the third column of Table 8 show that the new urbanization policy has a significant positive impact on agricultural green total factor productivity, indicating that policy implementation promotes the greening of agricultural technology. The results in the fourth column reveal that the coefficient of NGTFP is -2.850, significant at the 1% level, indicating that the advancement of agricultural green technology significantly reduces agricultural non-point source pollution. This suggests that agricultural green technological progress plays a positive mediating role in the process of the new urbanization policy affecting agricultural non-point source pollution. The new urbanization not only accelerates the research, development, and application of production, environmental protection, and energy-saving technologies in enterprises, enhancing the front-end governance capability of pollution but also, through technological progress, strengthens systematic management capability for pollution data, thereby improving the efficiency of back-end pollution governance.

Table 8. Pathway Impact Channels

Variable	**(1)** **ER**	**(2)** **TANSP**	(3) **NGTFP**	(4) **TANSP**
NUP	0.067***	–0.026***	0.040**	–0.005
	(0.012)	(0.009)	(0.017)	(0.067)
ER		1.388***		
		(0.402)		
NGTFP				–2.850***
				(0.820)
Controls	Yes	Yes	Yes	Yes
City	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
Observation	2226	2226	2226	2226
Adj_R^2	0.149	0.142	0.315	0.222

5. Conclusion

This study analyzed panel data from 159 prefecture-level cities in China from 2007 to 2020 to explore the impact of the new urbanization policy on the governance of agricultural non-point source pollution and its underlying mechanisms. The results indicate that the new urbanization policy has a significant inhibitory effect on agricultural non-point source pollution, especially in the eastern region and large cities. Furthermore, the strengthening of environmental regulation and the advancement of agricultural green technology are identified as key pathways through which the new urbanization policy influences agricultural non-point source pollution. In heterogeneous analysis, we found regional and urban scale differences in the effects of the new urbanization policy. The policy's effect is more significant in the eastern region, likely due to its stronger economic strength, technological foundation, and per capita income. Regarding urban scale, the new urbanization policy's governance effect on agricultural non-point source pollution is more significant in large cities, possibly because of their advantages in industrial agglomeration and environmental governance capacity. Mechanism analysis further reveals that the new urbanization policy reduces agricultural non-point source pollution by promoting environmental regulation and the advancement of agricultural green technology. Although the strengthening of environmental regulation may exacerbate pollution in the short term, the long-term advancement of agricultural green technology can effectively alleviate pollution issues. The new urbanization policy enhances the sustainability of agricultural production and promotes agricultural modernization by driving technological progress and implementing environmental regulation.

Based on these findings, this paper proposes the following policy recommendations: Firstly, continue to promote the new urbanization policy, especially in the eastern region and large cities, to leverage its positive role in agricultural non-point source pollution governance. Secondly, strengthen environmental regulation to ensure its effective reduction of pollution levels during implementation. At the same time, increase support for research and application of agricultural green technology to promote the green transformation of agricultural production methods. Additionally, policymakers should consider regional differences and formulate differentiated environmental regulation policies to adapt to the actual conditions in different regions.

In summary, the new urbanization policy is an important means to promote the governance of agricultural non-point source pollution, but its effectiveness is influenced by various factors. Future research should further explore the specific mechanisms of the new urbanization policy under different conditions and how to optimize its effectiveness in governing agricultural non-point source pollution through policy adjustments. Through these efforts, we can expect to achieve agricultural sustainable development while promoting the implementation of the Chinese-style modernization and rural revitalization strategies.

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