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Mechanism and Countermeasures for Action of Scientific and Technological Innovation on Integration of Industrialization and Urbanization

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Abstract In the current process of deepening reform in China, industrial structure upgrading, economic structural transformation and new urbanization are important tasks to promote social and economic development, and technological innovation has gradually become the primary driving force for industrial upgrading, economic transformation and the realization of new urbanization. The article analyzed the action mechanism of scientific and technological innovation on the integration of industrialization and urbanization through qualitative and quantitative methods, found out the prominent problems faced by Henan through the empirical analysis of relevant data of Henan Province, and then proposed the integrated development path driven by scientific and technological innovation.

Key words Technological innovation, Integration of industrialization and urbanization, Coupling coordination degree, New urbanization

1 Introduction

The integration of industrialization and urbanization means the integration of industrial development and urban functions. It mainly refers to the harmonious development of city and industry in economy, society and space. Industrialization involves various industries, but it mainly refers to the secondary and tertiary industries. Urbanization means the achievement of urban life functions. The integration of industrialization and urbanization is to realize the effective interaction between industrialization and urbanization. Fundamentally speaking, the integration of industrialization and urbanization is the need of realizing macro equilibrium. Industry is the supply side of economy, while urbanization constitutes the demand side of the economy. Only the balanced and coordinated development of the two can make the macro-economy balanced, and only in this way can economic and social development be realized.

To realize the new urbanization, we should deal with the relationship between industrial development and population agglomeration. Population agglomeration needs the support of industrial development. Not all industries can achieve population agglomeration. In the development process of some cities and towns, although a large number of industrial enterprises have been introduced, there is no effective integration of industrialization and urbanization. This is due to the fact that many regions have no congenital advantages. In the process of industrialization, the object level of attracting investment is limited; people will not hesitate to

introduce some processing and manufacturing industries with low technology content and high energy consumption; the labor force absorbed is mainly migrant workers in the surrounding areas, whose income is limited, and it is impossible to form a strong consumer market. Although there are industries and jobs on the surface, there is no prosperous tertiary industry and the resulting urban economic prosperity, there is no perfect mechanism for retaining talents and there is no soft environment suitable for talents to live in. In the end, there will be no real urbanization. Research shows that the effects of high-tech industry and low-tech industry on urbanization are different. Under the background of China's economic restructuring, upgrading of industrial structure and innovation driven strategy, industrialization and urbanization without scientific and technological support are not feasible. Only industrialization under the guidance of scientific and technological innovation can realize the future development of urbanization and the successful integration of industrialization and urbanization.

On the issues of science and technology, urbanization and industrial development, foreign related research is earlier. Starting from the Lewis model, Chenery and Sycquin pointed out the interaction between urbanization and industrialization on the basis of scientific and technological progress. It is believed that urbanization is the inevitable result of the interaction of various manifestations, and scientific and technological innovation promotes industrialization, and the transfer of surplus labor force to cities and towns. Barton believes that there is an inevitable relationship between urbanization and industrialization and scientific and technological innovation, and industrialization and scientific and technological progress are the foundation of urbanization, and they play an important role in promoting the development of urbanization. Wright analyzed the incompatibility between modern city and human desire and life based on the theory of broad acre city. It was

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an anti-democratic mechanism and thought that modern city should be abolished, and based on the theory of small towns, the coordinated development of industrialization, urbanization and scientific and technological innovation should be established^[1]. The domestic research mainly focuses on the relationship between science and technology and urbanization, the relationship between science and technology and industrial development, and the integration of industrialization and urbanization^[2]. There are few studies on the integration of industrialization and urbanization. The conclusion is fragmentary and superficial. The current practice is not summarized enough. There is also a lack of in-depth and systematic basic theoretical research. Moreover, there are few systematic studies on the combination of science and technology, industrial development and urbanization. This paper analyzes the action mechanism of scientific and technological innovation on the integration of industrialization and urbanization from the qualitative and quantitative aspects.

2 Theoretical framework of the action mechanism between scientific and technological innovation and integration of industrialization and urbanization

Scientific and technological innovation, industrial development and urbanization promote each other. The mechanism of ac-

tion of the three is shown in Fig. 1. Taking scientific and technological innovation as the guide to lead the integrated development of industrialization and urbanization conforms to the concept of coordinated development of "four modernizations". The coordinated development of "four modernizations" refers to the coordinated development and mutual promotion of industrialization, informatization, urbanization and agricultural modernization. Urbanization, as the demand side of the market and the provider of various production factors, is the basis and support for the realization of industrialization and agricultural modernization^[3]; informatization is technology, and is supported by scientific and technological innovation, and it provides strong support and advanced scientific and technological means for the development of other three modernizations, and improves production and living efficiency. On the one hand, scientific and technological innovation can provide new business models, new industries and new markets for the industry, and bring about agricultural modernization. On the other hand, it can create new demands, effective management of ecological environment, intelligent urban management and spatial planning, *etc.*, leading us to the direction of low pollution, low energy consumption and ecological environment while developing economy, so as to realize the balance and prosperity of industry and town.

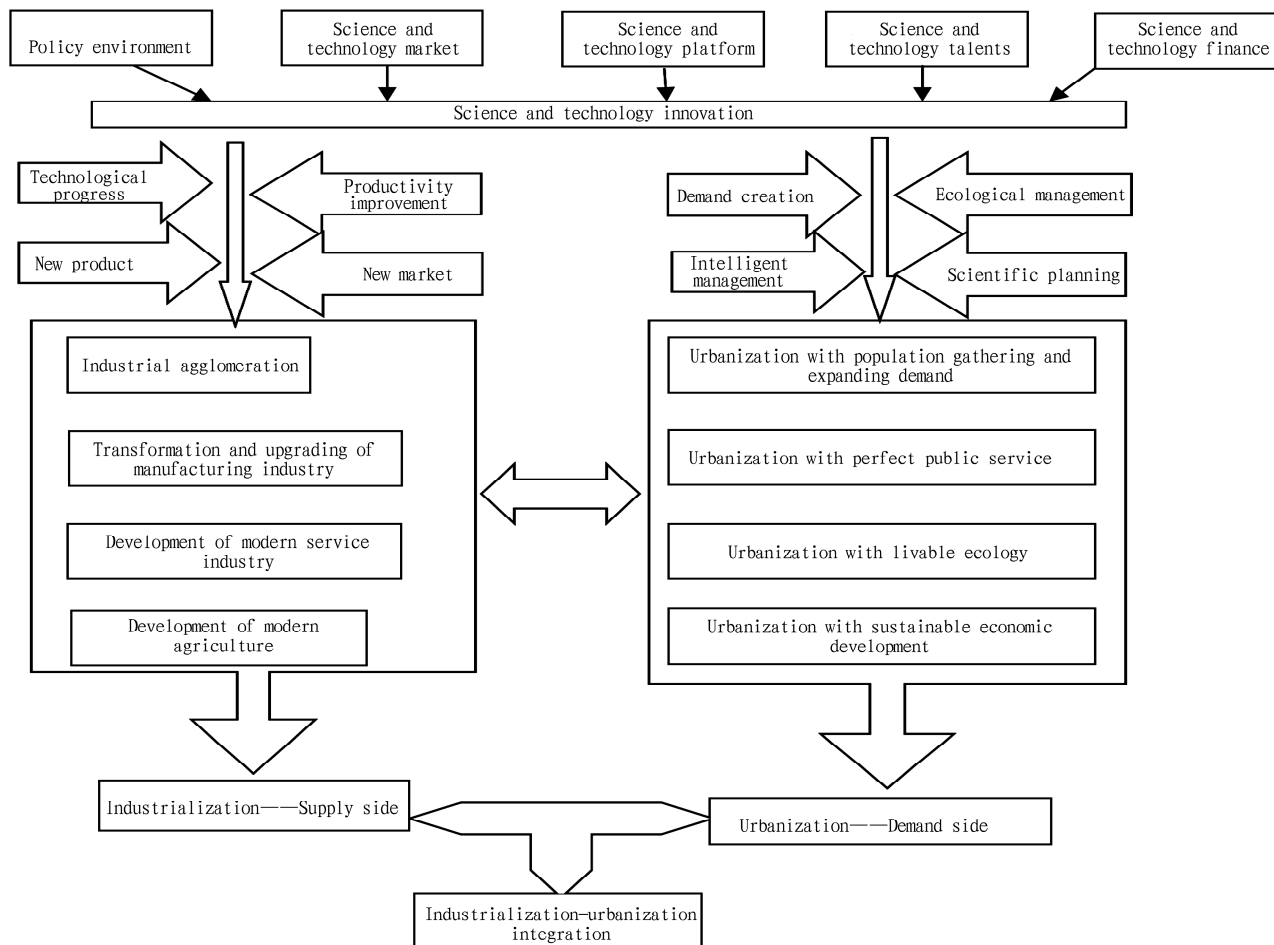


Fig. 1 Action mechanism of industrialization, urbanization and scientific and technological innovation

3 Empirical study on the influence of scientific and technological development on the integration of industrialization and urbanization

Henan Province, as a province with large population in Central China, has a difficult task in the industrial transformation and development and new urbanization. After investigation and research on the industrialization-urbanization integration practices in Henan Province, it is found that some places equate urbanization with "real estate". High-rise buildings and squares have been built, but there is no industrial development and no people gathering. It is land urbanization that replaces the real urbanization, neglecting the industrial prosperity. This will inevitably lead to the problems that the population is unable to get employment and the towns can't thrive. At the same time, traditional industries are facing transformation and upgrading, and the development trend of emerging industries gradually appears. The deepening of scientific and technological innovation is bringing profound and rich changes to the development of cities and towns. Through measurement and investigations on the industrialization-urbanization integration degree and its coupling coordination degree and correlation with scientific and technological innovation level in Henan Province from 2000 to 2018, the action mechanism between science and technology development and industrialization-urbanization integration is further studied in this article.

3.1 Theory of coupling coordination degree model The coupling coordination degree was used to measure the relationship between the science and technology development and the integration of industrialization and urbanization in Henan Province. In the coupling coordination model, the coupling degree reflects the degree of coordination between systems or between elements within certain system, and coordination degree is a measure of the degree of harmony and consistency, which reflects the order of elements. This paper proposes to establish the index system and model of coupling coordination degree to measure the degree of interaction, influence and coordinated development between the two systems (the development level of science and technology and the development level of industrialization-urbanization integration), that is, the coupling coordination degree between science and technology and industrialization-urbanization integration.

3.2 Coupling coordination degree model

3.2.1 Coordination degree between the level of science and technology development and the level of integrated development of industrialization and urbanization. K and Du represent the level of science and technology development and the level of industrialization-urbanization integration in Henan Province.

The measurement of the level of science and technology development is based on three indicators: enterprise's science and technology investment, government's science and technology investment and patent authorization amount in Henan Province from 2000 to 2018. After dimensionless, the weights of the three indicators were assigned with the factor analysis method using SPSS17.0 software. The first principal component coefficient was taken, and the weight of corresponding indicator was obtained by unitization. The index k of the level of science and technology development was obtained by calculating the comprehensive score.

3.2.2 Coupling degree between the level of science and technology development and the level of integrated development of industrialization and urbanization. The coupling degree function was used for the calculation of coupling degree. The variables u_i ($i = 1, 2, 3, \dots, m$) and u_j ($j = 1, 2, 3, \dots, n$) represent different systems, respectively. The coupling degree model of interaction between systems was calculated by the following formula:

$$c_m = \sqrt{\frac{u_1 u_2 \cdots u_m}{\prod (u_i + u_j)}}$$

On this basis, the coupling degree model of the level of science and technology development and the level of industrialization-urbanization integration development could be defined as follows:

$$C = \sqrt{\frac{K \times Du}{(K + Du)(K + Du)}}$$

In the formula, the closer to 1 the C , the greater the coupling between the science and technology development and the industrialization-urbanization integration; the closer to 0 the C , the weaker the coupling between the two, indicating the correlation between the two is smaller and weaker.

3.2.3 Coupling coordination degree model between the level of science and technology development and the level of integrated development of industrialization and urbanization. The formula for coupling coordination degree is as follows:

$$D = (C \times T)^\theta \quad (T = \alpha K + \beta Du)$$

where D represents the coupling coordination degree; C is the coupling degree; T is the comprehensive evaluation index of the level of science and technology development and the level of industrialization-urbanization integration, reflecting the overall coordination degree of the two; and α , β and θ are undetermined coefficients. The value of θ is assigned as 0.5 according to usual practice; and α and β reflect the weight of scientific and technological innovation and industrialization-urbanization integration in the comprehensive evaluation index. In view of the same importance of the both to economic development, α and β were both taken as 0.5.

3.2.4 Determination of the integrated development level (Du) of industrialization and urbanization. The level of integration of industrialization and urbanization is measured by the coupling coordination degree. The industrialization index was assigned as the proportion of the secondary and tertiary industries in Henan Province from 2000 to 2018, and the urbanization development index was assigned as the urbanization rate of the same year^[4]. The calculation model is the same as the above method. The calculated integration degree of industrialization and urbanization was regarded as the comprehensive evaluation index of Du after dimensionless, and it was substituted into the formula to calculate the coupling coordination degree between the development level of science and technology and the development level of industrialization-urbanization integration (Table 1).

3.3 Calculation results and evaluation of coupling coordination degree The value of coupling coordination degree D is between 0 and 1. When $D = 0$, the coupling coordination degree is very low, and there is no relationship between systems or elements. When $0 < D \leq 0.3$, the relationship between the development of science and technology and the integration of industrialization and urbanization is in an unacceptable range of low coupling

coordination. For example, during the period from 2007 to 2010, affected by the whole macroeconomic level, financial risks were intensified, and the role of science and technology investment in promoting industrial development and urbanization was not significant. When $0.3 < D \leq 0.5$, it is the barely acceptable range for medium coupling coordination, and it indicates that the development has gradually entered a period of healthy and benign stage. Since 2010, the mode of economic growth began to change to high quality due to the moderate adjustment and control of national macro policies. In the case of unsustainable export and investment, innovation driven has become the key force to promote economic growth. Under the guidance of the national innovation driven strategy, science and technology investment, innovation and entrepreneurship have become a good growth trend, and the role of promoting industrialization and urbanization gradually appears. When $0.5 < D \leq 0.8$, the two gradually enter the running-in stage, and enter the benign coupling stage and acceptable stage. Since 2012,

the coordinated development of science and technology and industrialization-urbanization integration has entered a benign operation, and the contribution of science and technology in the coordinated promotion of industrialization and urbanization has begun to show. When $0.8 < D < 1$, it is high-quality coupling coordination stage. For example, since 2015, the level of industrialization-urbanization integration in Henan Province has been continuously improved, and science and technology development and industrialization-urbanization integration complement each other and promote each other. When $D = 1$, the value of coupling coordination degree is the largest, and the external or internal elements of the system achieve good resonance coupling, which is the future development goal to continue to increase the ability of scientific and technological innovation, enhance the leading ability of science and technology, and better promote the development of industrialization-urbanization integration.

Table 1 Performance of coupling coordination indicators between science and technology development and industrialization-urbanization integration from 2000 to 2018

Year	Industrialization-urbanization integration	Science and technology development level	Coupling degree	Comprehensive evaluation index	Coupling coordination degree
2000	0.459 705 479	1.062 27	0.486 450 132	1.381 770	0.819 854 986
2001	0.466 735 811	1.046 90	0.491 780 797	1.277 600	0.792 653 232
2002	0.474 661 068	1.028 22	0.496 785 338	1.159 490	0.758 958 254
2003	0.486 721 605	0.986 91	0.499 951 223	0.973 315	0.697 574 387
2004	0.491 434 236	0.931 11	0.499 181 641	0.880 740	0.663 060 509
2005	0.501 577 023	0.813 79	0.490 726 513	0.682 880	0.578 884 549
2006	0.512 217 648	0.616 27	0.456 772 842	0.438 085	0.447 331 343
2007	0.520 507 478	0.408 38	0.260 827 886	0.220 370	0.239 747 036
2008	0.526 840 397	0.182 01	0.496 055 699	0.161 735	0.283 248 245
2009	0.533 729 402	0.110 47	0.433 290 527	0.220 515	0.309 106 876
2010	0.537 650 028	0.111 95	0.402 602 006	0.275 060	0.332 775 762
2011	0.545 438 302	0.339 92	0.474 615 368	0.495 930	0.485 155 645
2012	0.551 859 445	0.763 54	0.499 587 411	0.795 865	0.630 558 590
2013	0.556 677 192	0.949 03	0.499 991 089	0.954 730	0.690 909 902
2014	0.561 711 853	1.183 30	0.499 655 610	1.140 960	0.755 041 101
2015	0.567 571 829	1.624 95	0.495 970 010	1.442 210	0.845 749 909
2016	0.573 631 909	1.992 69	0.493 077 420	1.709 250	0.918 037 352
2017	0.578 541 235	2.387 78	0.502 072 503	1.687 430	0.923 877 844
2018	0.582 476 733	2.768 43	0.543 526 480	1.696 782	0.935 563 132

3.4 Correlation analysis between industrialization-urbanization integration degree and science and technology development level

In order to better measure the promotion effect of science and technology development level on the integration level of industrialization and urbanization in Henan Province, a regression model with lag period was adopted, in which the dependent variable is the integration degree of industrialization and urbanization (Du) and the independent variable is the level of science and technology development (K). Because urbanization is continuous and stable, the variables with a lag period were included in the model as independent variables to affect the next period. Because of the time lag of scientific and technological innovation, especially the time limit problem of scientific and technological achievements transformation, the lag phase was also included in the model as independent variable. The results of regression analysis were analyzed by using Eviews12.0 software (Table 2).

The results show that there is a high correlation between the development of science and technology and the integration of industrialization and urbanization in Henan Province. Moreover, with the continuous promotion of scientific and technological innovation, the scientific and technological innovation achievements of the previous period also play a significant role in the current industrialization-urbanization integration development, and the preliminary construction foundation of industrialization-urbanization integration will inevitably play a sustained supporting role in the current industrialization-urbanization integration degree. Therefore, increasing scientific and technological innovation will certainly be conducive to the coordinated promotion of industrialization and urbanization in Henan Province. We must inject science and technology into all aspects of social development as the first production factor, increase investment in science and technology, strengthen the role of science and technology, and let science and technology

lead the healthy development of industrialization-urbanization integration in Henan Province.

Table 2 Results of regression analysis

Dependent Variable: <i>Du</i>				
Method: Least Squares				
Included observations: 18 after adjustments				
Variable	Coefficient	Std. Error	<i>t</i> -Statistic	Prob.
<i>C</i>	0.154 355	0.059 520	2.593 341	0.023 500
<i>K</i>	0.776 780	0.135 866	5.717 248	0.000 100
<i>K</i> (-1)	0.829 927	0.169 588	4.893 775	0.000 400
<i>Du</i> (-1)	0.780 305	0.098 101	7.954 068	0.000 000
<i>R</i> -squared	0.953 460	Mean dependent var		0.785 502
Adjusted <i>R</i> -squared	0.941 825	Durbin-Watson stat		1.602 718
<i>F</i> -statistic	81.947 47	Prob(<i>F</i> -statistic)		0.000 000

4 Main problems in promoting the integration of industrialization and urbanization in Henan Province

4.1 Industrial support capacity is weak and the industrial structure is unreasonable Industrial support is the driving force to promote urbanization and realize the integration of urban and rural areas. If there is no industry as the driving force, it will be difficult to achieve urbanization. Either the development of secondary and tertiary industries in cities and towns, or the industrialization of agriculture is the driving force of urbanization. However, there are still some problems in Henan Province as a whole, such as the industrial structure is not optimized enough, the industrial development power is insufficient, and the cultivation of characteristic and advantageous industries is not enough. From the perspective of industrial structure, the proportion of the primary and secondary industries in Henan is higher than that of entire China, while the proportion of the tertiary industry is far behind that of the whole country. In terms of the internal structure of the secondary industry, Henan is a multi-resource city, and a large proportion of the secondary industry is resource-based industry or heavy industry, while the proportion of light manufacturing industry and high value-added manufacturing industry is not high. These low-proportion industries in Henan Province are exactly the most able to stimulate employment. If the level of modern service industry is not high, the service function and quality of the city will also be affected, thus restricting the integration and coordinated development of urbanization and industrialization.

4.2 The development advantages of small towns are not strong, and the effect of in-situ and nearby urbanization is not ideal The economic development of counties in Henan Province is generally not high, and the number of successful characteristic towns is very small. Especially under the restriction of local interests of administrative divisions, their own development ability is limited, the industrial dispersion and aggregation ability is insufficient, and there is a lack of characteristics, leading to the restriction of county development and the marginalization of county development. There is only real estate, but most of them are empty. The attraction to industries and population is not enough, making urbanization of farmers nearby impossible. In addition to the lack of characteristics and attraction, imperfect public infrastructure and lagging supporting level also hinder the diffusion of indus-

try and technology from large and medium-sized cities to small towns.

4.3 The mode of urban development is single, the content of science and technology is insufficient, and the function is not perfect The urbanization led by the government tends to lay particular stress on infrastructure construction and investment attraction, and the sustainability of industrial development is insufficient. There are even a large number of low-level constructions. For example, the factory buildings built do not meet the requirements of enterprises, which is not conducive to the long-term development of cities and towns. Although undertaking industrial transfer can bring about the development of industries related to urban expansion, the improvement of commercial and service industry as the connotation of urbanization is subject to the local economic development level and independent innovation ability. And if the employees who come here can't live and work in peace and contentment, the income of large-scale grass-roots workers is difficult to be the main force to stimulate consumption. Relying on the investment of large-scale key projects and the expansion of urban construction, the urban development lacks a complete industrial chain and balanced development of three industries, and there is no income of the people and local consumption as the support, so the economic development is unsustainable. Moreover, the transfer of a large number of manufacturing industries with low technology content will also bring severe resource and environmental problems. Some polluting enterprises that can't be established in big cities can settle in small towns, and this further worsens the environment of small towns. What's more, the central cities have low management level, insufficient scientific planning and insufficient information technology, which lead to environmental and traffic problems, restricting the smooth development of urbanization.

4.4 The planning at all levels of the province is not unified and coordinated The balanced development mechanism of coordinated development of large, medium and small cities in Henan Province has not yet formed, and there is a lack of an overall regional coordinated development plan. The function of the central city is far from enough. There is no strong impetus to the development of urban agglomerations. The echelon between cities has not formed a reasonable development pattern. Second and third tier cities are not attractive to the floating population. In addition, the county-level cities and towns have not escaped the decline. The rapid development of urbanization in Henan Province is also the result of large-scale urban expansion. However, the rapid construction of urban infrastructure does not mean the prosperity of urban industry. Especially if industrialization is not enough, the prosperity of the tertiary industry, which is overhead on the industry, will also be insufficient and unsustainable. Taking Zhengzhou as an example, the proportion of the tertiary industry is higher than that of the secondary industry, and the housing price has also increased rapidly, which makes the rural floating population have limited ability to settle in the big city. A single city has not planned its industrial layout and main positioning from the perspective of industrial division and coordination. Even among cities, counties and districts, there is a competition situation of resources and funds.

From the above problems, we can see that the development

process of the integration of industrialization and urbanization in Henan Province lags behind. The fundamental problem is the lack of scientific and technological innovation, which makes the sustainable development ability of the industries insufficient, the economic vitality insufficient, the level of urban construction not high, the development of the tertiary industry not sufficient, and the ability to absorb labor force insufficient, so the level of urbanization lags behind. The industrialization and urbanization that has no guidance of science and technology and is promoted by traditional extensive development model are difficult to achieve benign and sustainable development. Through scientific and technological innovation, some enterprises and industries have formed innovative development advantages to lead the local economic development, and then the siphon effect will be formed, which will bring about population agglomeration. So, in the future, urbanization is bound to make big cities develop more intensively. This is the inevitable result of labor force agglomeration formed by technological advantages. However, after the development of big cities has reached a certain stage, with the increasing of knowledge spillover effect, the labor force gradually flows to the surrounding cities, thus entering the counter urbanization. The development of large cities and central cities in Henan Province is far from reaching a high level of agglomeration. Therefore, the success of new urbanization in Henan Province must rely on scientific and technological innovation. Through industrial transformation and upgrading, the driving role of small and medium-sized cities and towns is enhanced, to achieve sustainable and comprehensive urbanization.

5 Suggestions on promoting the integration of industrialization and urbanization in Henan Province with scientific and technological innovation

China must take a new road of industrialization and urbanization supported by technological innovation, and the path of green and low carbon development. Without the support of technological progress, the whole industrial transformation, economic transformation and sustainable development as well as urbanization are difficult to sustain, and it is also difficult to overcome the middle-income trap. Traditional, high energy consumption, low value-added industries can't achieve all kinds of production factors, especially high-quality talents, and can't promote the level and quality of urbanization. So, a successful development model of industrialization-urbanization integration needs to be sustainable and independent of factor input, and coordinated with the ecological environment. It is the development path of industrialization-urbanization integration driven by scientific and technological innovation.

Therefore, in the process of promoting the integration of industrialization and urbanization in Henan Province, science and technology must be injected into all aspects of social development as the first factor of production to let scientific and technological innovation play a role in traditional agriculture, traditional industry, urban planning, urban development and construction, government services, public services, ecological energy conservation and other aspects. The integration of industrialization and urbanization is promoted using science and technology as a catalyst, finally realizing the urbanization of ecological livability, people's happiness

and people-oriented^[5]. The specific suggestions are as follows.

5.1 Increasing the leading role of scientific and technological innovation in the industry Taking the industrial agglomeration area as an example, we should pay more attention to guiding and cultivating science and technology-based industries as superior industries and pillar industries, fully guarantee its sustainable development ability, make full use of the advantages of high concentration of production factors, concentrate resources and advantages, and encourage and promote scientific and technological innovation. Enterprises are the main force in scientific and technological innovation, and are also the biggest beneficiary. Therefore, we should vigorously encourage and support the scientific and technological innovation activities of enterprises, formulate incentive policies and encouraging enterprises to participate more in the transformation of scientific and technological achievements, promoting the progress of industrialization with the progress of science and technology, and realizing the upgrading and leaping development of industries in Henan.

5.2 Strengthening the construction of science and technology service platform and doing a good job in scientific and technological innovation service Science and technology service platform is a good service promotion function of scientific and technological personnel service, science and technology project docking, inter departmental cooperation, and achievement transformation, but many similar platforms are superficial, and they doesn't really work. The construction and operation of science and technology service platform are various. For example, we can make the best use of the talents and technological advantages of colleges and universities. We should actively advocate the cooperation between universities, relevant scientific research institutions and local enterprises in Henan, to construct the mode of industry-university-research platform. The government should also build a series of professional service platforms such as public technology service platform and testing center through multiple channels, so as to form a fertile land for technology cultivation in the whole area. In addition, it should innovate the supporting system of science and technology finance and mobilize the participation of multiple subjects.

5.3 Vigorously promoting the revitalization of the city through science and education, and providing support for science and technology and talents with education High quality development of industry and new urbanization need the support of science and technology and related talents. Taking the development of agricultural modernization as an example, the lack of agricultural science and technology talents is a serious problem. Agricultural production needs a new type of peasant team, and need to improve the scientific and cultural quality of farmers and rural residents, land management capacity, agricultural production capacity, and machinery and automation operation capacity. For those who are willing to leave the countryside and leave the land, we should strengthen the training of their vocational skills to improve the possibility of settling down in cities and towns. The quality of people is improved through education and training, and people are armed with science and technology, thereby promoting employment and urbanization.

5.4 Continuing to strengthen the development concept of industrialization-urbanization integration

Whether to develop industries or promote urbanization, we should always implement the concept of integrated development, and consider problems in isolation. For example, when building industrial agglomeration areas, various industrial parks, logistics parks, port areas, *etc.*, we should take all the surrounding living facilities into consideration, and build convenient transportation, living, shopping and other supporting facilities. This is an important carrier for the integrated development of industrialization and urbanization, and a supporting system for improving industrial development. Similarly, industrial planning should be taken into account when building new urban areas and merging villages and towns. Considering the income sources of residents, we should do a good job in economic support^[6]. In addition, we should also consider a unified public service system.

5.5 Strengthening regional industrial innovation cooperation

At present, a major trend of regional economic development is regional coordinated development, giving play to the resonance effect of urban agglomeration and economic circle^[7]. The current industrial development, urbanization process and quality improvement of Henan Province should also rely on the overall strategy and pursue the maximum utility of regional resources. So, we should make the best use of resources by strengthening regional innovation cooperation, to promote the maximum benefit of scientific and technological elements. For example, through collaborative innovation with multi-agent participation, various elements are integrated, and the external factors of science and technolo-

gy development can be fully released. Regional industries cooperate with each other to form a good chain of innovation interests, so as to promote the common development of regional industries and realize the common promotion of urbanization.

References

- [1] WEI JL, SHAO JG. On industry and urban integration research[J]. *Special Zone Economy*, 2014, 32(2): 81–82. (in Chinese).
- [2] YU L. Research on science and technology support system of new urbanization[J]. *Science & Technology Progress and Policy*, 2014, 31(12): 46–47. (in Chinese).
- [3] PAN JY, WU JY. The formation mechanism and realization path of industry-city integration development model; Based on the perspective of improving the quality of urbanization[J]. *Jiangnan Tribune*, 2016, 59(11): 23. (in Chinese).
- [4] SONG JS, ZHANG PF, XING JJ, *et al.* Research the interactive development of new-type industrialization and new-type urbanization in the context of industrialization-urbanization integration in China[J]. *Science & Technology Progress and Policy*, 2016, 33(9): 5–6. (in Chinese).
- [5] ZHENG YJ. The countermeasure analysis for integration of industry and urbanism[J]. *Journal of Henan Mechanical and Electrical Engineering College*, 2013, 21(6): 35–36. (in Chinese).
- [6] WANG JM, LUO L, NIU JJ. Coordinated development strategy of industry-city integration in Henan Province based on the goal of new urbanization[J]. *Science & Technology Economy Market*, 2016, 32(1): 34. (in Chinese).
- [7] CHEN YJ, ZHANG TH. Evaluation and synergetic strategies of "city-industry integration" in Jing-Jin-Ji urban agglomeration[J]. *Hebei Academic Journal*, 2016, 36(9): 138–139. (in Chinese).

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4 Suggestions on speeding up the consumption of dairy products of rural residents

4.1 Paying attention to the demand of rural residents for dairy products and strengthening research and development

With the development of rural economy and the promotion of modernization, the process of rural urbanization is accelerating. We should pay attention to the consumption potential of rural residents and fully consider the huge growth space of rural dairy market. We should strengthen the research and development of products in the rural dairy market, produce dairy products suitable for rural residents, actively open up the rural dairy market, and release the potential purchasing power of rural residents.

4.2 Paying attention to shaping the good image of dairy enterprises and building up the purchasing confidence of rural residents

Consumers' loyalty to branded dairy products is due to their high degree of trust. If a dairy company has a good corporate image, consumers will increase the purchase of dairy products of this brand. As the state has successively issued policies such as *Outline of the Plan for the Rectification and Revitalization of the Dairy Industry*, *Regulations on the Supervision and Administration of Dairy Quality and Safety*, and *National Dairy Development Plan*, the dairy market has gradually stabilized and consumers begin to restore confidence in the safe consumption of dairy products.

4.3 Disseminating knowledge related to dairy products through multiple channels to make up for the lack of awareness of rural residents

The channel for rural residents to obtain

dairy information is less convenient than that for urban residents. The government can make use of lectures, television and the Internet to actively carry out lectures on the nutritional value and safety of dairy products, gradually cultivate the consumption habits of rural residents, and guide rural residents to increase their consumption of dairy products. At the same time, in the pre-production link of dairy products, the government should ensure the safety of milk sources of dairy products, control the quality of feed, and ensure the quality and safety of inputs. In the production process, it is necessary to control the amount of food additives, preservatives and other additives. In the post-production link, it is necessary to strengthen the after-sales service of dairy enterprises and strengthen supervision and management.

References

- [1] YANG Q, PEI L, WEI XM. Study on the influencing factors of safety supervision in Chinese dairy products; Based on principal component factor analysis and binomial Logistic regression[J]. *Journal of Nanjing University of Technology (Social Science Edition)*, 2019, 18(3): 90–101. (in Chinese).
- [2] CHEN X, WU HF. Investigation and research on consumers' purchasing behavior of dairy products[J]. *China Circulation Economy*, 2019, 2197(1): 24–25. (in Chinese).
- [3] YAO X. Study on the influence factors for urban consumers to buy dairy products at supermarkets; Taking Chengdu for example[D]. Ya'an: Sichuan Agricultural University, 2010. (in Chinese).