Strategies to Boost Rural Consumption in China: Insights from Hebei Province

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ABSTRACT In recent years, the Chinese government has increasingly emphasized rural economic development, and rural consumption has become a key issue in expanding domestic demand. Although multiple policy documents have promoted rural consumption upgrading, the overall consumption level in Hebei Province remains relatively low, and its growth still faces structural constraints. This paper analyzes the current situation of rural consumption in Hebei Province from four aspects: rural residents' disposable income, consumption expenditure, consumption environment, and consumption patterns. It further constructs a framework of influencing factors and identifies key constraints through hierarchical analysis, including local economic development level, rural social security system, social security level, agricultural insurance system, and rural logistics system. The study finds that income stability, logistics infrastructure, consumer rights protection, and rural service systems play important roles in shaping rural consumption capacity. Corresponding countermeasures are proposed, including diversifying income sources, improving rural logistics, strengthening social security, optimizing the consumption environment, and enhancing rural market governance. The study provides policy reference for promoting sustainable rural consumption growth in Hebei Province.

INDEX TERMS rural consumption, hebei province, consumption environment, rural logistics, consumption upgrading

I. INTRODUCTION

THE Chinese government is paying increasing attention to the rural economy, with rural consumption becoming a focal point of national concern. Numerous policy documents have addressed the issue of rural consumption levels. The No. 1 Central Document of 2021 proposed to comprehensively promote rural consumption, specifically emphasizing the need to make substantial efforts in rural logistics, rural e-commerce, rural residents' consumption upgrading, and rural tourism. Within this framework, the shift from functional to quality-oriented apparel has become a significant marker of rural consumption upgrading. This provides insights into addressing the bottlenecks constraining rural consumption, which will guide rural consumption toward more convenient, digital, and high-quality development directions, thereby promoting quality improvement and upgrading of rural consumption[1]. The 14th Five-Year Plan (2022) emphasized that the consumption potential in rural areas plays a significant role in expanding China's domestic demand, proposing multi-pronged approaches to stimulate new consumption demands. This includes broadening farmers' income channels through rural wealth-creation industries, supporting emerging business models, and optimizing consumption environments to further expand rural consumption and elevate rural consumption levels[2]. In July 2023, the document Measures on Restoring and Expanding Consumption was promulgated, articulating a key guiding principle: invigorating rural market vitality[3]. This will be achieved by actively delivering green products to townships, improving rural e-commerce and express delivery logistics networks, facilitating the entry of high-quality rural commodities into urban markets, and vigorously promoting rural tourism development – all aimed at upgrading rural consumption standards.

As a traditional agricultural province, Hebei's rural consumption significantly impacts its economy. A key indicator of rural consumption levels is rural retail sales of consumer goods. The current low rural consumption level in Hebei manifests in the substantial urban-rural retail gap. As shown in Table 1, Hebei's total retail sales reached 1,436.47 billion yuan in 2016, with urban areas accounting for 1,105.57 billion yuan – 774.67 billion yuan higher than rural areas. In 2022, the province's total retail sales amounted to 1,372.0 billion yuan, with urban consumption at 1,173.13 billion yuan exceeding rural consumption by 874.25 billion yuan, indicating persistent urban-rural disparity. The COVID-19 pandemic in 2020 accelerated the decline of rural retail sales, which plummeted to 1988.8 billion yuan in 2022, revealing substantial potential for rural consumption upgrading.

TABLE 1. Urban-Rural Retail Sales of Consumer Goods in Hebei Province (2016-2022)

Data (in billion yuan)	2022	2021	2020	2019	2018	2017	2016
Total retail sales of consumer goods(in billion yuan)	13720	13510	12705	12986	16837	15908	14364.7
Urban Total Retail Sales of Consumer Goods(in billion yuan)	11731	11481	10425	10183	12660	12324	11055.7
Rural Total Retail Sales of Consumer Goods(in billion yuan)	1988.8	2028.7	2280.1	2802	3877.3	3583.3	3309

II. ANALYSIS OF CURRENT STATUS AND CHALLENGES IN RURAL CONSUMPTION LEVELS IN CHINA'S HEBEI PROVINCE

Hebei Province in China, a populous province with over 70 million permanent residents, has a rural population exceeding 28 million, accounting for 38% of its total population – demonstrating a significant rural demographic presence.

A. DISPOSABLE INCOME AND CONSUMPTION EXPENDITURE OF RURAL PERMANENT RESIDENTS IN HEBEI PROVINCE

According to data from the Hebei Province Bureau of Statistics, the disposable income and consumption expenditure of rural residents in Hebei Province have shown synchronized year-on-year growth over the past five years[4], as illustrated in Figure 1 below:

2018: Rural per capita income reached 14,000 yuan, marking an 8.9% increase from the previous year, while per capita consumption expenditure stood at 11,400 yuan, up 8.0%.

2019: Rural per capita income rose to 15,400 yuan, with consumption expenditure climbing to 12,400 yuan.

2020: Average rural income increased to 16,500 yuan (7.1% year-on-year growth), while consumption expenditure grew to 12,644 yuan, a 2.2% increase.

2021: Income surged to 18,200 yuan (10.4% growth), accompanied by a striking 21.7% leap in consumption expenditure to 15,400 yuan.

2022: Despite pandemic challenges, rural per capita income further grew to 19,400 yuan (6.5% growth), supported by consumption-boosting policies that stabilized markets, resulting in 16,300 yuan in per capita consumption (5.7% growth).

Q3 2023: Rural residents achieved a per capita disposable income of 15,600 yuan (7.04% year-on-year increase), with consumption expenditure reaching 12,300 yuan (5.34% growth), of which third-quarter spending hit a historic high.(Source: National Bureau of Statistics).

B. RURAL CONSUMPTION ENVIRONMENT IN CHINA'S HEBEI PROVINCE

The rural consumer market environment refers to the impact of market efficiency and market order on the consumption process of rural consumers during various commodity transactions in rural areas. It encompasses three aspects: the quality of goods in the rural consumer market, the legal system of the rural market, and the supervision by regulatory authorities[5]. On September 5, 2023, the Hebei Provincial Consumer Council released a survey report on rural consumer satisfaction across the province[6]. The report indicated that most rural residents were satisfied with the consumption environment, while also pointing out uneven development in the construction of rural consumption environments. Regarding the quality of goods in the rural consumer market, the analysis focused on quality levels and after-sales guarantees, with survey scores of 78.16 and 79.40, respectively. For the legal system of the rural market, the survey examined consumer education and the right to know in consumption, with scores of 77.18 and 75.43, respectively. As for the supervision by regulatory authorities, the survey looked into price levels and rights protection, with scores of 76.49 and 65.64, respectively. Among the third-level indicators, the scores for the results of complaint and reporting handling, the efficiency of complaint and reporting handling, and complaint and reporting channels were relatively low, all below 70 points, reflecting that there are still weak links in rural consumer rights protection work.

C. RURAL CONSUMPTION PATTERNS IN CHINA'S HEBEI PROVINCE, CHINA

Rural consumption patterns refer to the purchasing and consumption methods adopted by rural residents to fulfill their daily needs[7]. In recent years, consumption patterns in rural Hebei Province have undergone continuous changes. The following analysis focuses on three key stages: product selection, payment methods, and distribution processes.

1) Product Payment Methods

The main purchasing channels for rural residents in terms of commodity selection include market shopping, household self-sufficiency, rural e-commerce, village-level cooperatives, and county town shopping[8]. In recent years, various physical retail formats such as large supermarkets, specialty stores, and furniture centers have flourished in rural towns of Hebei Province. With the development of the internet economy, diverse commodities have become available on online platforms, further expanding rural residents' range of product choices. The emerging shopping method of online purchasing has gained popularity among younger rural residents.

2) Product Selection Methods

The payment methods in rural Hebei Province have transitioned from cash-based transactions to mobile payments. In recent years, the popularity, coverage, and service depth of mobile payments in rural Hebei have been continuously increasing. Various physical stores, including dining establishments, supermarkets of all sizes, beauty salons, and others, now support mobile payments. This method offers advantages such as convenience, simplicity, elimination of the need for change, reduced payment errors, and high efficiency. However, the adoption of new payment methods

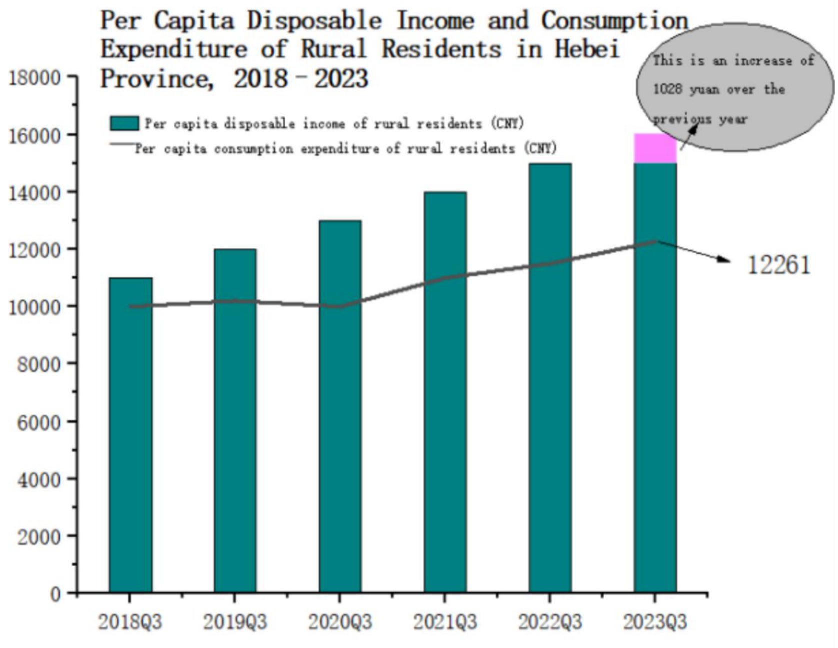

FIGURE 1. Per Capita Disposable Income and Consumption Expenditure of Rural Residents in Hebei Province

in rural areas remains primarily concentrated among young and middle-aged groups, whereas urban mobile payment usage spans young, middle-aged, and elderly populations. In terms of application scope, rural usage is mostly limited to daily consumer purchases, while urban areas see broader adoption, including convenient mobile payment services for utilities such as natural gas and water bills. By comparison, the user base and scope of mobile payment applications in rural areas remain relatively narrow.

It is important to acknowledge that while mobile payments offer significant advantages in terms of convenience and efficiency, the rapid proliferation of digital payment methods has outpaced the development of corresponding consumer protection mechanisms. As noted in Section 2.2, regulatory authorities' performance in rights protection scored the lowest (65.64) among all surveyed indicators, with complaint handling channels and efficiency also scoring below 70 points. This creates a notable paradox: while mobile payments are increasingly prevalent in rural areas, the institutional safeguards to protect consumers from potential risks associated with digital transactions remain underdeveloped. This imbalance poses several challenges. First, rural consumers, particularly elderly residents who are less familiar with digital technologies, may face heightened vulnerability to fraud, unauthorized transactions, and payment disputes without adequate recourse mechanisms. Second, the limited effectiveness of complaint and reporting channels means that consumers experiencing issues with mobile payments may lack accessible pathways for redress, potentially eroding trust in digital financial services over time. To address this tension between digital payment promotion and consumer protection, a multi-pronged approach is necessary. Regulatory frameworks must evolve in tandem with payment innovations, incorporating specific provisions for digital transaction oversight, enhanced dispute resolution mechanisms, and targeted consumer education programs. Additionally, financial institutions and payment service providers should be mandated to implement robust security protocols and transparent grievance procedures, ensuring that the benefits of mobile payments do not come at the expense of consumer rights protection.

3) Product Delivery Methods

Recently, Hebei Province has prioritized the implementation of its "Digital Economy Empowers Agricultural Growth" initiative, further advancing efforts to expand express delivery services into villages and promoting the "Internet Plus"-supported online sales network for agricultural products. These measures have significantly boosted rural e-commerce, contributing to increased farmer incomes and progress in multiple sectors. Currently, Hebei hosts 284 distinctive Taobao towns and 734 Taobao villages, ranking third and fifth nationwide, respectively. According to the Hebei Province E-commerce Development Plan for the 14th Five-Year Period, the total online retail sales in rural areas of Hebei are projected to reach 161 billion yuan by 2025. Beyond e-commerce platforms and Taobao villages, the physical infrastructure underlying rural logistics systems plays a critical role in enabling efficient product delivery and consumption in rural Hebei. Road infrastructure development has made significant strides in recent years. By the end of 2022, Hebei Province had achieved 178,000 kilometers of rural roads, with administrative village road access reaching 100% and the proportion of villages with hardened (paved) roads reaching 98.6%. However, challenges persist in the quality and maintenance of rural road networks, particularly in remote mountainous areas where narrow roads and inadequate maintenance hinder the efficient movement of goods. The "last-mile" connectivity problem remains acute, as many natural villages still lack direct access to all-weather roads, forcing reliance on temporary or seasonal routes that impede consistent logistics operations.

Cold chain logistics infrastructure represents another critical yet underdeveloped component of rural logistics systems. As of 2023, Hebei Province possessed approximately 4.2 million cubic meters of cold storage capacity, with rural areas accounting for less than 30% of this total. The distribution of cold storage facilities is heavily concentrated in urban centers and major agricultural production zones, leaving vast rural areas underserved. This infrastructure gap has profound implications for rural consumption patterns. First, the limited cold chain capacity restricts the availability of fresh produce, dairy products, and frozen foods in rural markets, constraining dietary diversity and nutritional outcomes for rural residents. Second, inadequate cold storage facilities contribute to significant post-harvest losses for agricultural products, estimated at 15-20% for fruits and vegetables in Hebei, which reduces farmer incomes and raises consumer prices. Third, the absence of reliable cold chain logistics discourages investment in high-value agricultural products and limits the development of rural e-commerce for perishable goods. Addressing these infrastructure deficits requires coordinated investment in rural road upgrades, expansion of cold storage networks, and integration of physical logistics infrastructure with digital platforms to create a comprehensive rural consumption ecosystem.

III. FACTORS INFLUENCING RURAL CONSUMPTION LEVELS IN HEBEI PROVINCE, CHINA

A. INFLUENCE FRAMEWORK FOR RURAL CONSUMPTION LEVELS

The consumption level in rural areas is influenced by multiple factors, which are interconnected and interact with each other. This paper constructs a framework of influencing factors for rural consumption levels from four aspects: rural residents' income, consumption concepts, consumption environment, and social security. The framework includes 4 primary factors and 15 secondary factors, as detailed in Table 2.

TABLE 2. Framework of Influencing Factors on Rural Consumption

Primary Factors	Secondary Factors	Code
Residents' Income	Disposable Income Level	C_1
	Income Source Stability	C_2
	Local Economic Development Level	C_3
Consumption Concepts	Consumption Structure Hierarchy	C_4
	Consumption Patterns	C_5
	Savings and Investment Awareness	C_6
Consumption Environment	Rural Logistics System	C_7
	Rural Consumption Scenarios	C_8
	Rural Consumer Market Service System	C_9
	Rural Consumer Market Regulatory System	C_{10}
Social Security	Rural Social Security System	C_{11}
	The level of rural social security	C_{12}
	Agricultural insurance system	C_{13}

B. ANALYSIS MODEL FOR FACTORS INFLUENCING RURAL CONSUMPTION

1) Determine Causal Relationships Among Influencing Factors

Within the framework of influencing factors for rural consumption development (as shown in Table 1), for any two factors, if C_i influences C_j, it is assigned $a_{ij} = 1$; otherwise, it is assigned $a_{ij} = 0$, this yields the adjacency matrix [9], presented in Table 3.

TABLE 3. Adjacency Matrix of Influencing Factors on Rural Consumption

a_{ij}	C_1	C_2	C_3	C_4	C_5	C_6	C_7	C_8	C_9	C_{10}	C_{11}	C_{12}	C_{13}
C1	1	1		1	1	1							
C2	1	1		1	1	1							
C3	1	1	1	1			1	1			1	1	1
C4				1	1	1		1					
C5				1	1	1		1					
C6				1	1	1							
C7	1	1		1	1		1	1	1				
C8								1	1	1			
C9								1	1	1			
C10								1	1	1			
C11	1	1	1	1		1		1			1	1	1
C12	1	1	1	1		1		1			1	1	1
C13	1	1	1			1			1				

2) Determine and Adjust the Reachability Matrix

For the adjacency matrix established in Table 3, Boolean algebraic operations are applied through successive self-multiplications until the product no longer changes at a certain power. The stabilized product is the reachability matrix. The number of "1" elements in each row of the reachability matrix is counted, and the rows are rearranged from bottom to top in descending order of these counts, with corresponding column adjustments from right to left. The adjusted reachability matrix shows a decreasing number of "1" elements from bottom to top. Subsequently, starting from the bottom row and rightmost column, the largest-order principal minor matrix with an identity submatrix is identified sequentially, each corresponding to a distinct level (hierarchy). The adjusted reachability matrix is partitioned into 5 levels (hierarchies) from bottom to top, though the detailed process is omitted here.

3) Establish a Hierarchical Structural Model

In the adjusted reachability matrix, identify all pairs of influencing factors corresponding to “1” elements. Draw arrowed lines sequentially from lower-level to upper-level factors to represent their influence relationships. Once all “1” elements are mapped with arrows, the hierarchical structure model is derived, as illustrated in Figure 2. The factors at the bottom layer of the diagram constitute the key influencing factors.

4) Identify Key Influencing Factors for Rural Consumption Development

The “means-end analysis” method was employed to identify key influencing factors[10]. Starting from any factor and taking the top-level factor as the endpoint, paths from the starting factor to the top-level factor were traced along the direction of the arrows. The number of paths originating from each factor to the endpoint was systematically examined. The average number of paths across all factors was calculated, and factors associated with a path count exceeding the average by 20% were selected as the key influencing factors for rural consumption. Through this path-counting analysis, the critical factors identified for rural consumption in Hebei Province include: the local economic development level, rural social security system, rural social security level, agricultural insurance system, and rural logistics system. These core factors directly influence rural residents’ disposable income levels and income source stability, thereby shaping surface-level determinants such as consumption structure hierarchy, consumption patterns, savings and investment awareness, rural consumption scenarios, and the service and regulatory systems of the rural consumer market.

IV. STRATEGIES AND RECOMMENDATIONS TO ENHANCE RURAL CONSUMPTION LEVELS IN HEBEI PROVINCE, CHINA

A. DIVERSIFY FARMERS’ INCOME SOURCES AND ELEVATE ECONOMIC EARNINGS

1) Strengthen the Three Rural Policies for Sustainable Farmer Income Growth

Agricultural Development: We must proactively promote the transformation of farming practices toward modernized models, while revitalizing regional agricultural economies by leveraging local conditions. This involves creating and promoting distinctive brand identities for local specialties and establishing value communication mechanisms for these brands. For instance, Guanzhuang Village in Jiashizhuang Town, Gaocheng District, Hebei Province, has popularized its unique cucumber cultivation techniques; Maqiu Village takes pride in its exclusive cultivation of “Crown Pears”; and Zhao County has established a renowned brand for its rare “Snowflake Pears.” Through such efforts, agricultural products are no longer confined to rural areas but can be marketed nationwide, significantly boosting farmers’ incomes.

Rural Development: Efforts should focus on accelerating the development of emerging rural service industries, nurturing and enhancing locally distinctive sectors such as rural homestays, culinary culture, and tourism activities tailored to regional characteristics. Each village possesses unique cultural and industrial traits that must be highlighted. For example, Gaocheng District in Hebei Province boasts diverse tourism resources, including the Guoyu Hot Spring Resort, Taixi Historical Site, Zhuanghuotou Ancient Temple Ruins, the Memorial Site of the Plum Blossom Tragedy, the Sanqiu Anti-Japanese War Tunnel Relics, and the Shijiazhuang Modern Agricultural Sightseeing Park. These attractions serve as foundations for driving the growth of related service industries.

Farmer Support: Improve pro-farmer policies by leveraging government funding to provide training in planting, breeding, and other skills, thereby enhancing farmers’ competencies. Additionally, support entrepreneurial initiatives among farmers, optimize agricultural production structures, and diversify income streams. Only by securing stable income levels for rural residents can we effectively elevate rural consumption levels.

2) Advance Rural Financial Services for Improved Investment Gains

To enhance the financial returns of rural residents, financial institutions should design tailored wealth management products that align with their financial psychology and characteristics, while intensifying promotional efforts to improve their understanding of these products.[11,12] Governments should focus on elevating the quality and skills of rural residents, gradually cultivating a financial mindset through subtle guidance. Rural residents themselves should seek diverse avenues to increase their wealth, develop financial awareness, and leverage relevant policies from governments and financial institutions to obtain property-based income.

3) Improve the Rural Social Security System to Unleash Farmers’ Consumption Potential

To address the retirement living conditions of rural residents, it is imperative to establish a more comprehensive elderly care and welfare system to improve their quality of life and alleviate financial pressures. Efforts should focus on implementing meticulous elderly care service programs, extending coverage of pension security services to remote towns and villages, and ensuring equitable distribution of elderly welfare facilities —such as nursing homes and care centers—across all regions. This approach will optimize the allocation of rural resources and maximize the potential of elderly care institutions.

Specifically, to strengthen the rural social security system, the following measures should be implemented:

(1) Gradually raise the basic pension benefits for rural residents, with a target of reaching 60% of the rural minimum living standard by 2025, thereby providing more substantial income security for elderly rural populations.

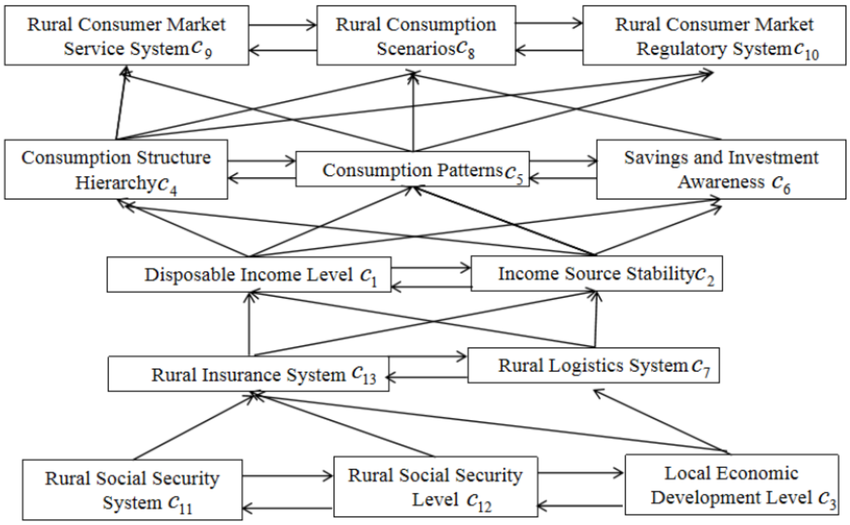

FIGURE 2. Rural Consumption Influencing Factors: Hierarchical Model

(2) Expand the coverage of the New Rural Cooperative Medical Scheme (NRCMS) to include outpatient services for chronic diseases, which represent a significant financial burden for rural households, and reduce the out-of-pocket payment ratio for major illnesses from the current 40-50% to below 30%.

(3) Establish a tiered medical assistance system that provides additional support for low-income rural families, ensuring that medical expenses do not push vulnerable households into poverty.

(4) Develop community-based elderly care services in rural areas, including home care support, day care centers, and nursing facilities, to address the growing needs of an aging rural population.

(5) Implement targeted subsidies for rural residents to participate in social insurance programs, particularly for disadvantaged groups such as disabled individuals, elderly living alone, and households below the poverty line, ensuring universal coverage without financial barriers. Simultaneously, in-depth reforms must be carried out in key areas of the social welfare structure, including pension security, healthcare services, tax policies, financial assistance, and insurance mechanisms. These reforms aim to minimize the financial burden on rural residents, stimulate their intrinsic consumption capacity, and eliminate the need for excessive precautionary savings. By doing so, residents will be empowered to allocate more resources toward current consumption needs, ensuring they can consume confidently and sustainably without anxiety over future expenses.

B. ADVANCE THE RURAL REVITALIZATION STRATEGY TO OPTIMIZE RURAL CONSUMPTION ENVIRONMENTS

1) Support the "One Village, One Product" Initiative to Drive Farmers' Prosperity and Income Growth

Sustained and healthy economic development serves as both a prerequisite for increasing rural residents' per capita disposable income and a critical pathway to boosting their consumption expenditure. The rural revitalization strategy has played a proactive role in elevating rural consumption levels[13]. Hebei Province should base its efforts on local rural realities, advancing economic growth through context-specific conditions and a people-centered approach. This involves continuously enhancing the professionalism, standardization, scalability, industrialization, and organizational capacity of agricultural practices. Rapidly establish new economic development models with distinctive local features, such as:

"Single-Town-Single-Product" or "Single-Village-Single-Specialty" models (e.g., Gaocheng's renowned Gong Mian [palace noodles], Lianzhou Town's celebrated Gong Jiu [palace liquor], Jiashizhuang Town's premium Winter Jujubes, Crown Pears [Gong Li], and Tuntou Village's iconic Gong Deng [palace lanterns]).

"Multi-Town Joint Production" or "Multi-Village Collaborative Specialties" frameworks to amplify regional synergies. Government agencies must implement technical guidance programs to elevate the technological value, quality, and market tier of agricultural products. This will drive the optimization and upgrading of industrial structures, create competitive branded products, and improve market penetration rates. Such comprehensive measures will advance the implementation of the rural revitalization strategy and steadily enhance farmers' consumption capacity.

2) Continuously Optimize the Consumer Market to Stimulate Rural Consumption Vitality

Implement a Comprehensive Regional Coordination Strategy to Refine Rural Planning and Policies in Hebei Province
Prioritize addressing deficiencies in rural commercial infrastructure through coordinated planning and policy measures. The development of commercial facilities not only enhances the aesthetic and functional quality of rural communities but

also significantly improves convenience for farmers in daily travel, leisure, and essential services.

Accelerate Government Functional Transformation and Improve the Business Environment Streamline administrative processes, expand tax and fee reduction policies for enterprises, and prudently develop labor-intensive industries. These efforts aim to attract more job opportunities, ensure sufficient employment for rural residents, and steadily increase their income and consumption levels.

Establish a Robust Rural Market Supervision Mechanism to Regulate and Purify Consumer Markets Integrate market supervision resources to strengthen regulatory capacity in Hebei's rural consumer markets.[14,15] Crack down on illegal activities such as producing/selling counterfeit and substandard products, price fraud, false advertising, and coercive transactions. Concurrently, optimize the rural consumption environment by:

Enhancing Complaint Channels: Implement a pre-compensation system for consumer damages and launch online dispute resolution platforms.

Strengthening Collaborative Oversight: Foster joint efforts among market regulators, consumer associations, and related agencies to standardize online market supervision and evaluations, ensuring a fair and orderly e-commerce ecosystem.

3) Enhance the Utilization of Rural Consumer Credit to Drive Consumption Expansion

Focus on Core Areas for Rural Consumption Upgrading and Strengthen Financial Support Accurately grasp the interconnections between rural market consumption, rural revitalization, and domestic demand expansion. [16] Following the trend of rising purchasing power in modern rural areas, commercial banks should prioritize financial support in four key domains:

Rural Housing Renovation Loans: Continue issuing loans tied to rural housing upgrades. Residential consumption has long been central to rural household expenditures. Banks must actively address funding needs for rural homestead construction, home renovations, and relocation of high-risk households.

Enhanced Financial Services for New Energy Vehicles (NEVs): With the ongoing "vehicles to the countryside" initiative, rural vehicle ownership surged by over 11 million units in 2022. However, NEVs accounted for only 4% of total rural vehicle sales. Commercial banks should innovate auto loan products and actively participate in NEV promotion campaigns to unlock rural NEV consumption potential.

Cultural Tourism and Specialty Consumption Financing: Cultural tourism consumption, characterized by its extensive supply chains, broad economic ripple effects, and strong multiplier impact, has become a pivotal "engine" for rural growth. Since 2023, rural cultural tourism consumption has risen rapidly. Banks should conduct forward-looking analyses and support rural tourism industries by addressing both supply and demand dynamics to further stimulate market vitality.

Design Tailored Financial Products for Diverse Stakeholders: Develop innovative financial products and services tailored to the unique needs of farmers, rural entrepreneurs, and small business owners. Implement market segmentation and customized solutions to enhance the precision and accessibility of consumer credit.

Targeted Financial Solutions: While rural vendors and SMEs urgently require loans for production and operations, their demand for consumer credit remains limited. Yet, these groups are pivotal drivers of rural consumption upgrading, increasingly seeking diversified, refined, and personalized consumption experiences. Banks should design scenario-specific products for healthcare, children's education, leisure travel, and other contexts. Hybrid products combining business and housing credit could holistically meet entrepreneurial financing needs.

Strengthen Multi-Stakeholder Collaboration and Policy Alignment: Leverage national and local policies aimed at improving market supply, upgrading key consumption sectors, building smart tech-driven consumption systems, enhancing purchasing power, and streamlining consumption processes. Foster cross-sector collaboration to create a robust rural financial ecosystem.

Rural Credit System Development: Actively participate in government-led rural credit system initiatives. Expand credit data collection channels, improve intelligent data processing, and lay the groundwork for broader financial service coverage.

Optimized Financial Service Frameworks: Align with policy trends to pre-design supportive financial service plans. Continuously refine existing tools and strategies to amplify policy effectiveness in rural consumption support.

Financial Literacy Programs: Utilize commercial banks' branch networks and human resources to collaborate with local governments in disseminating financial knowledge. Educate rural residents on rational consumption planning and smart financial decision-making to ensure sustainable growth in rural financial consumption.

4) Strengthen the Agricultural Insurance System to Mitigate Production Risks and Stabilize Rural Incomes

The agricultural insurance system, identified as a key influencing factor in Section 3.2.4, plays a crucial role in stabilizing rural household incomes and reducing precautionary savings. Currently, agricultural insurance coverage in Hebei Province remains limited, with penetration rates below 40% for major crops and even lower coverage for livestock and specialty agricultural products. To address this gap and enhance rural consumption capacity, the following strategies should be implemented:

First, expand the scope and coverage of agricultural insurance products. Beyond traditional crop insurance for wheat, corn, and cotton, new products should be developed to cover high-value agricultural commodities such as vegetables, fruits, and medicinal herbs that are increasingly important to Hebei's agricultural economy. Weather indexbased insurance and revenue protection insurance should be introduced to provide more comprehensive risk coverage that aligns with farmers' actual needs. The government should subsidize premium rates for small-scale farmers, with subsidy ratios increased from the current 50-60% to 70-80% to make insurance products more affordable and accessible.

Second, strengthen the institutional framework for agricultural insurance operations. This includes establishing dedicated agricultural insurance service networks in rural townships and villages to improve accessibility, developing standardized claims processing procedures to ensure timely compensation payments, and creating a catastrophe risk reserve fund to enhance the industry's capacity to respond to large-scale natural disasters. Regulatory oversight should be enhanced to prevent unfair claim denials and ensure that insurance companies fulfill their obligations to policyholders.

Third, integrate agricultural insurance with other support programs. Linkages should be established between agricultural insurance participation and access to agricultural credit, with insured farmers receiving preferential loan terms and interest rate subsidies. Additionally, agricultural insurance should be coordinated with disaster relief programs to create a comprehensive risk management system that protects rural livelihoods and stabilizes farm incomes, thereby reducing the need for precautionary savings and enabling higher consumption levels among rural households.

C. STRENGTHEN RURAL MODERNIZATION AND TRANSFORM RURAL CONSUMPTION PATTERNS

1) Improve Rural Commercial Facilities to Unleash Rural Consumption Potential

To enhance the development of commercial facilities in rural areas of Hebei Province, it is essential to expand consumer choice options for rural residents and promote the upgrading of rural consumption patterns. We can advance the establishment of rural commercial centers to diversify product categories, introduce higher-quality goods, and strengthen service capabilities for neighboring communities. This will address the increasingly complex demands of rural residents in shopping, leisure, and entertainment. Simultaneously, efforts should focus on modernizing traditional rural outlets in Hebei, such as family-run shops or community convenience stores that provide daily necessities, agricultural supplies, online shopping assistance, telecommunications services, financial services, postal and parcel delivery, and agricultural consulting. These outlets should be transformed into new-generation rural convenience stores, aiming to streamline daily life for rural populations while aligning with their aspirations for elevated consumption standards.

2) Enhance Mobile Payment Adoption to Boost Farmers' Consumption Efficiency

Payment methods continue to innovate, transitioning from cash to mobile payments and now to facial recognition payments. Rural areas must keep pace with this wave of payment innovation to drive the upgrading of consumption patterns and ultimately elevate rural consumption levels. To address existing challenges in payment methods within rural Hebei Province, the following measures are essential:

Education & Guidance: For rural consumers unfamiliar with online payments, targeted educational programs should be launched to popularize knowledge of new payment methods and provide step-by-step operational guidance through workshops or tutorials.

Expansion of Mobile Payment Services: Further explore and expand convenient mobile payment applications for rural public utilities, such as water, electricity, and gas bills, broadening their scope of use to enhance accessibility and practicality.

Promotion of Healthy Financial Habits: Strengthen efforts to guide rural residents toward rational consumption concepts. Emphasize that installment payment services and online lending platforms often encourage excessive credit consumption, which requires cautious management to avoid financial risks.

By implementing these strategies, rural Hebei can better integrate into the digital economy, foster sustainable consumption growth, and ensure that payment innovations contribute positively to long-term rural development.

3) Strengthen the Rural Logistics System and Establish a "Micro-Circulation" Network Between Urban and Rural Areas

The Hebei Provincial Government and its subordinate rural administrative units must ensure the effective advancement of infrastructure development in the rural logistics sector. Modern technologies should be integrated to upgrade the rural logistics system, particularly optimizing the "last-mile" delivery network of agricultural logistics. A series of village-level logistics service points should be established and modernized through diverse platforms such as comprehensive service centers of rural supply and marketing cooperatives, multifunctional convenience stores, family-run shops, postal service stations, and e-commerce service hubs. These efforts aim to create multifunctional, multi-purpose nodes within a fully integrated logistics network, achieving comprehensive coverage across all villages.

To address the physical infrastructure gaps identified in Section 2.3.3, specific measures should be prioritized:

(1) Accelerate the upgrading of rural road networks in remote and mountainous areas, with a focus on widening narrow roads, improving road surfaces, and ensuring year-round accessibility to all natural villages.

(2) Expand cold chain logistics infrastructure in rural areas through public-private partnerships, with targets to increase rural cold storage capacity by 50% by 2027 and establish cold chain distribution centers in all county-level administrative regions.

(3) Integrate physical infrastructure development with digital logistics platforms to enable real-time tracking, route optimization, and efficient resource allocation.

(4) Provide subsidies for logistics enterprises to extend services to remote villages, ensuring that delivery costs do not become a barrier to rural consumption.

Leveraging the robust foundation of rural postal services, innovative models such as postal-express cooperation should be extended. Encouraging partnerships between logistics companies and the establishment of village-based service points will reduce labor costs, enhance efficiency, and eliminate bottlenecks in the "last-mile" delivery of packages to rural areas. Logistics enterprises must fully utilize information technologies like big data and cloud computing to strengthen interconnections, scientifically plan service network layouts, and optimize delivery routes, thereby further improving distribution efficiency.

Through coordinated efforts by the government and logistics enterprises, Hebei's rural logistics system will be consolidated, reducing delivery costs while boosting efficiency. This integration will ensure universal access to logistics services in every village, drive the quality and modernization of rural logistics, and safeguard the upgrading of rural consumption patterns in Hebei Province.

V. CONCLUSION

This paper systematically analyzes the current status, challenges, and influencing factors of rural consumption levels in Hebei Province, China, and proposes targeted strategies for improvement. The study finds that rural consumption levels in Hebei remain relatively low, with pronounced urban-rural consumption disparities. Issues such as underdeveloped consumption environments, outdated consumption patterns, and insufficient infrastructure persist. This underscores the need to improve the accessibility of high-quality consumer goods, including modern apparel, in rural areas. Key factors significantly impacting consumption levels include rural residents' disposable income levels, consumption attitudes, social security systems, and rural infrastructure development. Despite recent growth in rural incomes and consumption expenditures, consumption potential remains underutilized, particularly in terms of consumption upgrading and environmental optimization.

To address these challenges, the paper offers the following recommendations:

Diversify Income Sources and Boost Disposable Income: Promote agricultural modernization, develop rural specialty industries, and enhance vocational training to expand income streams for farmers.

Optimize Rural Financial Services: Innovate financial products (e.g., microloans, insurance) to increase farmers' financial returns and strengthen their consumption capacity.

Upgrade Rural Consumption Environments: Strengthen market regulation, improve rural logistics systems, and diversify consumption scenarios (e.g., e-commerce hubs, cultural tourism).

Modernize Consumption Patterns: Facilitate digital payment adoption and enhance payment convenience to drive consumption modernization.

Strengthen Social Security Systems: Improve rural pension, health-care, and agricultural insurance coverage to alleviate financial anxieties and unlock consumption potential. In conclusion, elevating rural consumption levels in Hebei Province is a critical pathway for advancing rural revitalization and achieving sustainable economic development. By implementing comprehensive measures to refine consumption ecosystems, especially by optimizing the supply of quality products, Hebei can not only fulfill rural residents' aspirations for a better quality of life but also provide robust support for high-quality economic development across the province and the nation.

AUTHOR CONTRIBUTIONS

Conceptualization – Han H., Zhang X.; methodology – Han H., Zhang X.; formal analysis – Zhang X., Zhang T.; investigation – Han H., Zhang W. ; writing-original draft preparation – Han H., Zhang X., Zhang T.; writing-review and editing – Li Z., Zhang W.; visualization – Zhang T.; supervision – Li Z.

All authors have read and agreed to the published version of the manuscript.

CONFLICTS OF INTEREST

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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REFERENCES

[1] Y. Lu, Y. Zhou, P. Liu, et al., "A study on the influence of the income structure on the consumption structure of rural residents in China," Sustainability, vol. 14, no. 16, Art. no. 10380, 2022, doi: 10.3390/su141610380.

[2] Y. Kang, "The State Council Information Office Held a Press Conference on the Operation of the Chinese Economy in 2022,", [Online]. Available: http://www.gov.cn/xinwen/2023-01/17/content_5737627.htm (accessed on 20 March 2023).

[3] X. Wei, F. Jiang, Y. Chen, et al., "Towards green development: the role of intelligent manufacturing in promoting corporate environmental performance," Energy Economics, vol. 131, Art. no. 107375, 2024, doi: 10.1016/j.eneco.2024.107375 Hebei Provincial Bureau of Statistics & Hebei Survey Office of the National Bureau of Statistics. 2022 Statistical.

[4] Bulletin on the National Economic and Social Development of Hebei Province, "Hebei Daily," 2023-03-03(008), doi: 10.28326/n.cnki.nhbrb.2023.001372.
[5] Mahmudul H. A. Z., Taniguchi K., & Ishida. The impact of farmers' education on income in Bangladesh. Journal of the Japanese Society of Agricultural Technology Management, "2004; 11(1):13-21,", doi: 10.20809/seisan.11.1_13.
[6] China Consumer News. Rural consumption environment generally satisfactory. China Consumer Network. 2023. https://www.ccn.com.cn/Content/2023/09-06/1607106008.html
[7] T. Xu, "Income diversification and rural consumption—evidence from Chinese provincial panel data," Sustainability, vol. 9, no. 6, pp. 1014, 2017, doi: 10.3390/su9061014.
[8] X. Fu, "Digital payment and the popularization of e-commerce in rural China," China Economic Review, vol. 79, Art. no. 101987, 2023, doi: 10.1016/j.chieco.2023.101987.
[9] Q. Zhou, "Research on the impact of digital economy on rural consumption upgrading: Evidence from China family panel studies," Technological and Economic Development of Economy, vol. 29, no. 5, pp. 1461-1476, 2023, doi: 10.3846/ tede.2023.19511.
[10] P. Su, X. Jiang, C. Yang, et al., "Insufficient consumption demand of Chinese urban residents: an explanation of the consumption structure effect from income distribution change," Sustainability, vol. 11, no. 4, pp. 984, 2019, doi: 10.3390/ su11040984.
[11] Y. Shi and B. Yang, "Study on the impact of green digital finance on low-carbon transition of energy consumption structure under multidimensional perspective-empirical evidence from China," Energy Strategy Reviews, vol. 54, Art. no. 101445, 2024, doi: 10.1016/j.esr.2024.101445.
[12] S. Yi, Y. Qi, Y. Ya, et al., "The impact of China's digital inclusive financial development gap on the optimization of rural consumption structure," Plos one, vol. 19, no. 8, Art. no. e0308412, 2024, doi: 10.1371/journal.pone.0308412.
[13] L. Meng, D. Hairong, C. Shuo, et al., "Study on influencing factors of millet product consumption behavior of residents in Hebei province-based on the perspective of planned behavior theory," IOP Conference Series: Earth and Environmental Science, vol. 792, no. 1, Art. no. 012004, 2021, doi: 10.1088/1755-1315/792/1/012004.
[14] A. Jia, X. Yun, X. Zheng, et al., "Towards sustainable rural revitalization: A multidimensional evaluation of rural vitality in China's traditional villages," Sustainability, vol. 16, no. 13, pp. 5408, 2024, doi: 10.3390/su1613540.
[15] M. Hong and W. Zhang, "Industrial structure upgrading, urbanization and urban-rural income disparity: Evidence from China," Applied Economics Letters, vol. 28, no. 15, pp. 1321-1326, 2021, doi: 10.1080/13504851.2020.1813244.
[16] P. Zhou, "An empirical study on the impact of income sources of urban residents on consumption in China," Advances in Operation Research and Production Management, vol. 2, pp. 28-35, 2024, doi: 10.54254/3029-0880/2/2024014