

Green insurance empowers high-quality development: A Literature Review

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Abstract:

Green insurance plays a positive role not only in strengthening environmental risk management, aiding the development of green industries, and facilitating the application of new green technologies, but also in enhancing environmental and ecological protection. It can continuously raise public and societal awareness of green and environmental protection, guide the allocation of social resources, and support the green and low-carbon development of the economy and society. This paper reviews the literature on whether and how green insurance can empower high-quality development. The paper organizes domestic and international practices related to green insurance, summarizes the characteristics of three main international models and other typical developments of green insurance in China. It also focuses on the preliminary formation of the green insurance system in Huzhou City, Zhejiang Province, the combination of government and effective market, and the development status of multiple types of insurance. It summarizes the challenges faced, such as the imperfect professional service system and insufficient innovation, and finally proposes policy recommendations for the further development of green insurance, including the establishment and improvement of institutional systems and industry standards, and the effective enhancement of the marketization of insurance products.

Keywords: Green Insurance; Domestic and International; High-Quality Development; Huzhou City.

1. Introduction

The Central Financial Work Conference of China held in November 2023 included green finance as one of the five major articles in the development of finance, with green insurance emerging as a significant financial instrument to achieve this goal [1]. Green insurance refers to the collective economic activities of the insurance industry in providing risk protection and financial support in areas such as environmental resource protection and social governance, the operation of green industries, and green living consumption [2].

In recent years, the development of green insurance has accelerated both domestically and internationally, with an increasingly broad range of service areas and content. The 2023 Social Responsibility Report of China Insurance Industry indicates that 66 institutions established ESG management systems in 2023, accounting for half of the surveyed companies. The innovation and practice of green insurance products and services are becoming more diverse, with green insurance premiums reaching 229.8 billion yuan in 2023, accounting for 4.5% of the industry's total premiums; providing insurance coverage of 709

trillion yuan. Green insurance in China has evolved from voluntary insurance to mandatory insurance for some enterprises, with pilot work carried out in some provinces and cities and then implemented nationwide. Governments at all levels have been aiding the development of green insurance, and social environmental awareness is continuously strengthening.

To investigate whether green insurance can empower high-quality development and how it can do so, this paper first reviews the international development experience of green insurance, roughly summarizing it into three models: mandatory insurance model, hybrid insurance model, and voluntary insurance model. Then, an analysis of the current state of domestic green insurance development reveals that in recent years, the policy support for green insurance has been strengthened, the market size has continued to expand, and the supply of insurance products has gradually enriched. Currently, regions such as Chongqing, the Pearl River Delta area of Guangzhou, and Quzhou in Zhejiang Province have become advanced representatives in the development of green insurance. Among them, Huzhou City in Zhejiang Province has formed the influential Huzhou Model, becoming a typical example of green in-

insurance development. By analyzing the current state and challenges faced by green insurance in Huzhou City, this paper proposes countermeasures and suggestions for the further development of green insurance. As China's economy progresses towards high-quality development, it continuously generates rich demands for green finance. Only by accelerating the pace of innovation in green insurance products and services can we continuously meet the needs of economic and social development and speed up the cultivation and enhancement of our own core competitiveness.

2. International Experience in the Development of Green Insurance

Green insurance originated in developed industrialized nations, and through continuous exploration, relatively mature experiences have been formed abroad, mainly including the mandatory insurance model, the hybrid insurance model, and the voluntary insurance model [3].

Taking the most typical environmental pollution liability insurance as an example, as shown in Table 1.

Table 1. Models of Environmental Pollution Liability Insurance Abroad

Model	Representing Country	Main Features
Hybrid Insurance	Germany, Italy, etc.	A combination of compulsory liability insurance with financial assurance or guarantees; Compulsory environmental liability insurance for facilities with significant environmental pollution risks; Requiring financial assurance from government and financial institutions or environmental risk guarantees from related commercial and industrial enterprises, such as trust funds, letter of credit insurance guarantees, etc.
Combination of Voluntary and Compulsory Insurance	France, UK, etc.	Primarily based on voluntary insurance by enterprises, supplemented by compulsory insurance as required by law, except for situations where the law explicitly stipulates compulsory insurance
Compulsory Liability Insurance	USA, Sweden, Finland, etc.	Through national legislation or the establishment of systems, it clearly defines the industries, insurance subjects, and compensation scope for compulsory environmental liability insurance

The relatively complete and mature green insurance value chain currently in practice abroad includes processes such as Product development, marketing and sales, Risk management, Underwriting, Operations, and claims management [4]. This systematic approach ensures efficiency and quality, thereby increasing the willingness of enterprises to insure their operations.

3. Current Status of Green Insurance Development in China

Since 2021, China has been focusing on promoting the construction of green financial reform and innovation pilot zones in six provinces (regions) and nine areas, gaining successful experiences such as the Ningbo Model, Huzhou Model, and Quzhou Model.

In September 2017, the introduction of the Chongqing Green Financial Development Plan (2017-2020) marked the official launch of Chongqing's efforts to build a green financial service system, which includes green insurance. Since then, multiple policies have been introduced to

further clarify the main responsibilities of all parties and ensure the effective implementation of various policies. Currently, there are 76 financial institutions in Chongqing that have established green financial development plans, 68 have set up green finance-related management systems, and more than 20 have established specialized departments or characteristic branches for green finance, showing a positive development trend.

Green insurance is an important component of the green finance in the Guangdong-Hong Kong-Macao Greater Bay Area and has achieved significant development results in recent years. Among them, Shenzhen has made particularly notable breakthroughs in the legislative and product innovation levels. In July 2018, Shenzhen took the lead in implementing compulsory environmental pollution liability insurance.

Guangzhou's green financial reform and innovation pilot zone has not only vigorously promoted traditional green insurance products such as environmental pollution liability insurance and safety production liability insurance

but also innovatively piloted new types of green insurance products such as green product food safety liability insurance, green agriculture insurance plus, and the nation’s first pharmaceutical replacement liability insurance.

In Fujian Province, the innovative development of Fujian forest meteorological index insurance supports local forestry development and carbon sequestration and enhancement efforts. By strengthening in-depth cooperation with carbon trading markets and high-energy-consuming enterprises across various regions, they have innovatively developed low carbon project machinery damage carbon trading loss insurance, exploring to provide carbon loss protection for various enterprises involved in carbon trading.

In Jiangsu Province, in January 2023, the first green ecological environment rescue liability insurance policy was signed to protect the ecological construction of Taihu Ecological Island. In February, Wuxi City issued the first water quality worry-free insurance in the field of water ecology, providing insurance products and services for three rivers: Yuxianggang, Zhongxiangbang, and Xiawangbang. Green insurance aids in the green development of industries and promotes low-carbon transformation. Data shows that in 2023, green insurance business premium income reached 229.8 billion yuan, accounting for 4.5% of the total industry premium, with a cumulative insurance guarantee amount as high as 709 trillion yuan. Green insurance, with its dual characteristics of investment and financing as well as risk protection, should fully play its role in loss compensation and risk reduction on the liability side, assisting in the comprehensive transformation of the social economy. Green insurance has unique advantages in addressing environmental pollution and climate change, energy conservation and emission reduction, supporting enterprise capital operations, and resolving social risks [5]. It leverages the risk-spreading role of insurance, its financial intermediation function, and its social management functions to guide sustainable economic development [6]. Innovations in green insurance can give back to local economies, achieving green, specialized, and refined

local industries [7]. Green insurance also plays a significant role in enhancing public and societal environmental awareness, guiding the flow of social resources, focusing on conservation and intensive use, and promoting green industrial development. It is an important means of constructing China’s green financial system, implementing China’s overall ecological civilization strategy, promoting high-quality development, and achieving the dual-carbon goals [8].

4. Current Status of Green Insurance Practice in Huzhou City

In July 2017, the Overall Plan for the Construction of Green Financial Reform and Innovation Pilot Zones in Huzhou City and Quzhou City, Zhejiang Province was introduced. As the birthplace of the concept that green mountains and clear waters are as valuable as mountains of gold and silver and a national green financial reform and innovation pilot zone, Huzhou City, Zhejiang Province, has formed the influential Huzhou Model, becoming a paragon of green insurance development. However, due to factors such as the relatively late start of green insurance and insufficient innovation efforts, the development of green insurance in Huzhou City still faces some challenges. Therefore, based on the current practice of green insurance in Huzhou City and drawing on advanced experiences, it is particularly important to further leverage the role of green insurance in empowering high-quality development.

4.1 Successful Experiences

4.1.1 Policy and legal aspects

In June 2017, Huzhou City was approved as one of the first batch of national green financial reform and innovation pilot zones. Since then, multiple policies and regulations have been introduced to continuously promote the development of green insurance. Some of the policy and regulatory documents issued by Huzhou City regarding green insurance are shown in Table 2.

Table 2. Some Policy and Regulatory Documents on Green Insurance After Huzhou City Became a Green Financial Reform and Innovation Pilot Zone

Year	Document Name	Main Content and Significance
2017	“Overall Plan for the Construction of Green Financial Reform and Innovation Pilot Zones in Huzhou City and Quzhou City, Zhejiang Province”	It clarifies the overall requirements, main tasks, and safeguard measures for the development of green insurance in the locality
2018	“Huzhou Municipal People’s Government’s Implementation Opinions on Environmental Pollution Liability Insurance Work”	The establishment of the “Huzhou Model” which combines “insurance + service + regulation + credit.”

2019	“Technical Specification for Environmental Pollution Liability Insurance Risk Assessment”	The first municipal-level local standard for “green insurance” in the nation
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The current green insurance system in Huzhou City is characterized by the following features: First, central legislation and local regulations are implemented in tandem; second, general environmental legislation is complemented by special regulations on green insurance; third, the legislative level has been elevated, with several normative documents being upgraded to formal laws and regulations.

4.1.2 The aspect of Development model

The government combines with an effective market, focusing on establishing mechanisms and formulating policies, while leaving the green financial products and services to market entities. For example, comprehensive forest insurance, through government subsidies to leverage financial institutions to bear market risks, provides multi-level and multi-angle protection for the Anji bamboo industry, enhancing the ability of bamboo farmers to withstand market risks. In 2018, Huzhou City’s Anji County launched a pilot project for bamboo price index insurance, allowing more than 7,000 acres of abandoned bamboo forests to resume normal operations, and by 2022, it had provided risk protection for 145,000 acres of bamboo forests. This greatly ensures the income from bamboo planting, enhances the enthusiasm of bamboo farmers, and effectively empowers the development of green finance. Yucun Village in Anji County has developed a comprehensive insurance plan and risk protection for a zero-carbon rural area with green mountains and clear waters, providing a package of insurance solutions and risk protection from all aspects of mountains, waters, forests, farmlands, lakes, and grasslands, helping enterprises to reduce risks and assisting the government in efficient supervision.

4.1.3 Product and service level

A diverse range of insurance types emerge according to local conditions, and the depth and breadth of green insurance development have been expanded.

In terms of livestock insurance, Huzhou City innovatively linked pig insurance with harmless treatment, and the “pig insurance and harmless treatment” linkage model, Guanghu sheep breeding insurance, and others have gradually expanded their influence and have been promoted to poultry, freshwater fish, and other insurance varieties [9].

In terms of crop insurance, as early as 2015, Anji County of Huzhou City pioneered the Anji white tea meteorological low-temperature index insurance, where insurance companies provide compensation to tea farmers according to different meteorological indices, greatly recouping the

economic losses of farmers and enhancing the risk resistance of the Anji white tea industry [10].

4.2 Existing Problems

4.2.1 Lagging development of professional service system

Technicality is a prominent feature of green insurance [11]. At present, there is a lack of professional service organizations and personnel in China, which lacks sufficient market competitiveness and service supply capacity, affecting the efficiency and quality of professional services. This situation is particularly evident in fourth-tier cities like Huzhou, even restricting the professional development of green financial services.

4.2.2 Imperfect development model

China’s current incentive and restraint system for environmental protection is not sound, with unclear definitions of the main bodies and responsibilities for environmental protection, and environmental costs have obvious externalities, leading to weak willingness of enterprises to insure green insurance [12]. Although Huzhou City has supplemented with new methods such as subsidy models, which to some extent alleviate the problem of insufficient enthusiasm for enterprise insurance, it has not formed a complete set of methods and cannot fundamentally solve the problem.

4.2.3 Insufficient innovation

Compared with other green financial initiatives, green insurance started relatively late, and various industry entities generally have problems such as product homogenization, single protection forms, weak targeting, and lack of development momentum. Their products and services lack systematic solutions for the complexity of environmental pollution problems [12].

4.3 Policy Recommendations

4.3.1 Establish and improve the institutional system and industry standards

The government should accelerate the legislative process in the field of green insurance and establish a strict reward and punishment mechanism for green development, making the external environmental costs explicit [13]. At the implementation level, an information disclosure mechanism and evaluation standard system for environmental issues should be established to effectively supervise and assess environmental pollution behaviors [8]. At

the industry level, efforts should be made to promote the definition of green insurance standards, establish effective environmental risk analysis models, and truly enhance the underwriting service capabilities of insurance companies.

4.3.2 Effectively enhance the marketization of insurance products

On the one hand, governments and relevant departments should strengthen policy guidance to motivate insurance companies to engage in green insurance. On the other hand, it is necessary to manage the relationship between government and market, encouraging the insurance industry to create more value for businesses in related product and service areas, catering to the actual needs of market entities for green insurance [14].

4.3.3 Innovate and enrich the supply of insurance products and services

Drawing on domestic and international green insurance development experiences, efforts should be made to vigorously develop various innovative insurance types and effectively enhance the effective supply of green insurance. In terms of services, fully utilize internet innovation technologies such as big data, cloud computing, and artificial intelligence to accelerate the transformation of green insurance business models, provide technical support for environmental risk management, and truly improve the professionalism and scientific level of green insurance [15].

4.3.4 Improve the development model and utilize the special role of insurance in promoting green development

Incentivize businesses to increase green cost investments, advocate the development of green living habits, and provide protection for green development. Utilize the financing and credit-enhancing functions of insurance to provide low-cost financing services for green industries, promoting the rapid development of green industries [16].

5. Conclusion

This study aims to explore the effectiveness of green insurance in promoting high-quality economic growth and analyze the ways to achieve it. The article first reviews the international development course of green insurance and summarizes its main development models into three types: compulsory insurance, hybrid insurance, and voluntary insurance. Then, the article deeply analyzes the current situation of domestic green insurance and finds that there have been significant advancements in policy support, market expansion, and product diversification in recent years. It particularly points out that Chongqing, the Pearl

River Delta area of Guangzhou, and Quzhou City in Zhejiang Province have achieved remarkable success in the field of green insurance, among which the “Huzhou Model” in Huzhou City, Zhejiang Province, stands out as an industry benchmark. The article also conducts an in-depth analysis of the development status of green insurance in Huzhou City and the challenges it faces, and puts forward development recommendations such as establishing and improving the institutional system and industry standards, effectively enhancing the marketization of insurance products, and innovating and enriching the supply of insurance products and services. Finally, the article emphasizes that in the process of China’s economic transformation towards high-quality development, the demand for green finance is growing. The green insurance industry must accelerate its pace of innovation to meet the needs of socio-economic development and enhance its core competitiveness.

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