

## INCREASING EFFICIENCY IN TOURISM ENTERPRISES THROUGH “GREEN” INNOVATIVE PROJECTS

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**Abstract.** Green innovation is important in increasing the sustainability of the tourism industry and its products. They can influence carbon emissions, the energy efficiency of industries affecting global green trade, and energy policy. Bridging this gap is critical, as determining how best to manage tourism businesses' green innovation strategies is becoming increasingly important for businesses today hoping to achieve and maintain sustainable performance advantages. This paper presents useful theoretical results not only for increasing financial performance through green innovation products, but also for effective management.

**Key words:** financial efficiency, green innovation, green product innovation, green process innovation, green service innovation.

**Introduction.** Sustainable development is an important topic of the twenty-first century, and green innovation is an important driving force for achieving sustainable development. With the continuous popularization of the concept of sustainable development and green environmental protection, green innovation has become an important direction for the development of tourism enterprises. Green innovation efficiency measures the degree to which enterprises develop innovations that optimize the use of natural resources and reduce environmental damage, impact, and degradation. As a strategy, green innovation offers great opportunities to meet customer demands while preserving the ecosystem. Customers around the world are increasingly seeking to purchase environmentally friendly or green products and services. The "green" label offers a real incentive for enterprises to continuously innovate, create new market opportunities, and meet new consumer demands, thereby creating and increasing customer capital.

Understanding the mechanism of action and the law of evolution of green innovation efficiency will help to support the high-quality growth of the regional economy. Green innovation efficiency is an important indicator for measuring the amount of green development in the region. The study of green innovation efficiency currently focuses on two areas: measurement methods and analysis of influencing factors. On the one hand, there are two main approaches to measuring green innovation efficiency: the data collection analysis approach and the stochastic frontier approach[1]. On the other hand, scholars have studied how environmental regulations, high-speed rail construction, the Internet, and technological innovation affect green innovation efficiency. For example, the "Porter hypothesis" states that environmental regulations may initially increase costs for enterprises, but eventually lead to cost reduction and product quality improvement, which ultimately increases competitive advantage and green innovation potential.

**Literature review.** Many authors recognize the importance of green innovative products in achieving competitive advantage and corporate efficiency. There are many definitions of green innovative products in the literature.

If we look at the definition of Ariffin et al., it refers to a product that is designed to reduce the use of natural resources and can be recycled[2]. Another definition found shows it as a product related to decisions and actions aimed at protecting or benefiting from the natural environment by saving energy and resources and reducing pollution and waste[3]. As can be seen, the two definitions are very similar, since environmental protection is the main function of

green products. Therefore, a green innovative product (GIP) and service are products that result from efforts to integrate environmental practices at each stage of production.

Another scholar, Chang[4], explains how environmental factors (e.g., material use, energy consumption, environmental impact) are considered by marketers in the green innovation process, as products are modified and created with a certain quality, thus reducing the negative environmental impacts throughout the life cycle of the product.

Kam-Sing Wong[5] considers the success of a new green product as a variable in his model and measures it along three dimensions. First, the extent to which the product meets the environmental requirements to qualify as a green product. Second, its financial performance, and third, the overall perception of the product's success.

The authors' research showed that there is a significant relationship between green process innovation and new green product success, as well as between green product innovation and new green product success.

**Analysis and results.** Green innovation is crucial for the development of green innovative products (GIP). Green innovation shows a hierarchical structure in the industry, where the results show that product innovation and processes are important and interesting phenomena, and allow companies to better anticipate changes in consumer preferences. Aligning green product innovation initiatives with consumer values, thus allowing industries that engage in rapid innovation driven by market demand, to gain a competitive advantage[6].

Companies can offer and communicate the environmental benefits and perceived product values of GIP to customers to differentiate GIP from conventional products. As Chan et al.[7] explain, consumers need to know that consuming GIP has advantages over conventional products; Traditionally, the assessment of product efficiency and environmental impact does not take into account the output produced as a result of consumption, resulting in a deterioration of environmental performance, but with GDP consumption, environmental performance improves and costs are reduced.

Green innovation work is generally divided into two types. The first describes green innovation as a capability of a firm[8], and the second defines green innovation as an environmental practice of an organization. When it comes to organizational practices, green innovation is defined as "hardware or software innovation related to green products or processes"; green innovation includes management practices and technological advances that enhance environmental and organizational performance and provide firms with a competitive advantage. Other researchers suggest that green innovation consists of unique or modified systems, processes, products, and practices that provide environmental benefits and support the sustainability of firms[9]. Specifically, green innovation can be divided into three parts: green product innovation, green process innovation, and green service innovation.

Green product innovation involves innovations in product design to reduce the environmental impact during production, use, and disposal at the end of a product's life cycle. It focuses on the use and recycling of environmentally friendly materials to reduce material waste and energy during the production process. Compared with traditional product innovation, green product innovation is an innovation carried out by companies to meet environmental changes and customer demands by reducing excessive consumption of raw materials and energy without endangering the health and safety of consumers. This innovation focuses on environmental issues, emphasizes corporate environmental responsibility, and attaches importance to the use and disposal of products, including energy conservation, pollution prevention, waste recycling, toxicity reduction, and environmental design. Green product innovation satisfies consumers' environmental protection needs, helps firms develop new markets, makes it difficult for other firms to copy products, and maintains product competitiveness. Successful green product

innovation can not only improve resource efficiency, but also enable firms to achieve competitive advantage.

Green process innovation has been widely recognized by governments, scientific research organizations and social groups. One of the most important elements of green innovation and a clear requirement for the implementation of green product innovation, green process innovation emphasizes the innovation of the production process by using approaches such as the introduction of advanced green processes, green production equipment and green recycling methods to minimize the environmental burden. Compared with traditional innovation, green process innovation plays an indispensable role in improving environmental quality by reducing environmental pollution and energy and raw material consumption. This innovation integrates the environmental needs of stakeholders into the production design by reducing product production costs and making products comply with environmental protection regulations.

Green service innovation includes elements such as green invention, environmental service portfolio, environmental service delivery, and environmental service design. Unlike other service innovations, green service innovation focuses on environmental social responsibility and customer experience. It is a unique service that is not easily replicated by competitors, primarily considering the environmental impact of the services provided by companies. In the process of green service innovation, a company repackages new products and services with an environmental focus, promises environmentally friendly sales practices and after-sales services, and actively helps companies achieve sustainable development goals. Companies gain competitive advantage by promoting green service innovation activities such as green services, green design, and clean production. They can also raise the entry barriers for competitors through green service innovation.

Based on the above analysis, green product innovation, green process innovation, and green service innovation are inevitable trends in future development. They can bring great benefits to enterprises, but there are also challenges and opportunities. Enterprises need to invest a lot of resources and equipment and a certain amount of money to recycle waste to implement green innovation. The production cost of green products is much higher than that of similar non-green products, the profit margin is significantly reduced, and the price competitiveness of products is not high, all of which have a negative impact on the improvement of the market performance of the firm and create difficulties[10]. A review of previous studies on the impact of green innovation on enterprise performance shows that there are different views in science on whether green innovation strategies can have a positive impact on enterprise performance.

With the increasing contradiction between environmental protection and economic development, more and more enterprises hope to overcome the challenges and improve their performance through green innovation. In this regard, we recognize the urgency of integrating our understanding of important green innovations by delimiting specific types of green innovations and, most importantly, identifying and studying how specific types of green innovations contribute to enterprise performance. In recent decades, environmental concerns, strict regulations, the proliferation of international environmental protection conventions, and the increasing awareness of consumers about the environment have led enterprises to develop environmental-related strategies and policies. Green innovation performance is measured in terms of environmental management and sustainable practices to assess the extent to which enterprises comply with their environmental protection obligations.

To implement environmental protection regulations, enterprises develop new processes, products, technologies, and management strategies aimed at improving efficiency.

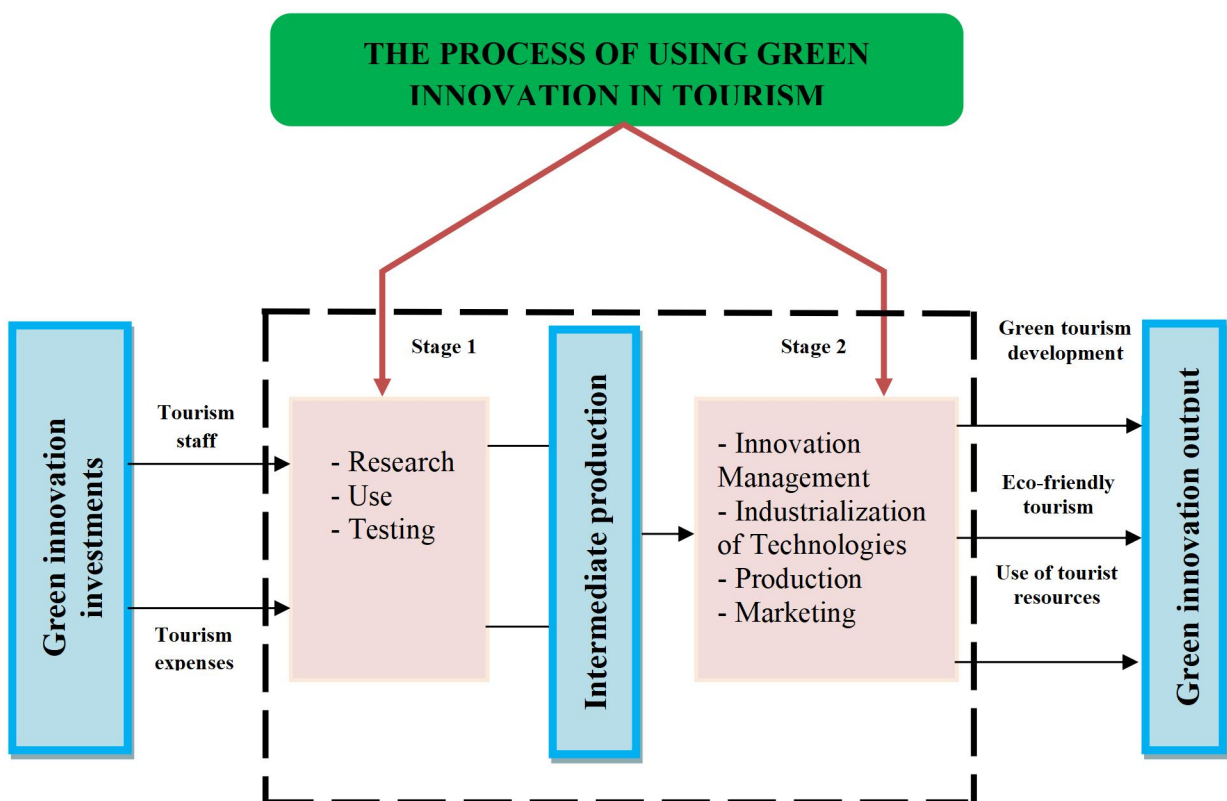
We adopt Chen et al.'s definition of green innovation as "Hardware or software innovation related to green products or processes, including innovations in technologies related to energy

conservation, pollution prevention, waste recycling, green product design, or corporate environmental management."

The change conceptualizes green innovation as a specific type of innovation that allows a company to enhance its corporate image, develop new markets, and expand its competitive advantage while meeting stakeholders' environmental demands. Similarly, Leenders and Chandra confirm that green innovation includes product or process innovations related to technological developments for pollution prevention, recycling, waste management, energy conservation, and environmentally friendly design. Such innovations reduce the environmental footprint of organizations by involving significant changes in corporate strategy, product design methods, production processes, resource use, and waste management practices. We focus on the effectiveness of green innovation to capture the results of green innovation efforts of enterprises.

Innovation involves the invention and application of new or novel ideas about products, services or processes. Nowadays, many enterprises are forced to adopt proactive strategies that address the increasing importance of environmental issues. Enterprises need to use external and internal ideas to create successful green innovation processes and products. Accordingly, the starting point of many green innovations can be ideas and suggestions from a partner. As mentioned above, green innovation or eco-innovation is defined as an innovation that, for the purposes of this project, leads to a reduction in environmental impact or optimizes the use of resources throughout the life cycle of the relevant activity. It is also noted that green innovation has the ability to seek more radical improvements than traditional forms of innovation.

Most importantly for tourism and other service-oriented industries, innovation to improve environmental performance is not only about new technologies. Non-technological innovations are increasingly playing a role in the transition to a green economy. For example, the introduction of environmental management systems and new business models, changes in marketing and organizational methods, as well as innovations in social and institutional structures. Governments should support such innovations and consider whether their mainstream policies are sufficiently supportive of such innovations.



**Figure 1. Schematic of the green innovation process of the tourism industry in a two-stage perspective<sup>1</sup>**

From a two-stage perspective, the green innovation process of the tourism industry can be divided into a green research and development process and a green achievement conversion process. According to the green concept, green tourism research and development refers to the process of producing tourism patents and other scientific and technological products through the research, exploitation and testing period by investing tourism research personnel and expenses. The goals of green tourism achievement conversion are to convert scientific and technological achievements such as tourism patents into economic and environmental benefits, that is, to realize green development through a series of processes such as management innovation, technological industrialization, production and marketing, and to achieve green development and sustainable resource utilization in tourism. The green innovation process of the tourism industry in the two-stage perspective is shown in Figure 1.

According to the characteristics of the two stages of green R&D and tourism green achievement conversion analyzed in Figure 1 and the characteristics of the tourism industry, this study selected input-output indicators from three aspects: innovation input, scientific and technological products, and economic and environmental products to measure the efficiency of the conversion of green R&D and achievements of the tourism industry. The process of selecting a specific indicator was as follows:

In the innovation input, the enterprise personnel and expenses are the main indicators for measuring innovation investment. Accordingly, the full-time equivalent of tourism research personnel was selected as the human input indicator. Tourism research expenditure was selected as the financial indicator (R&D expenditure has a cumulative effect, and the sustainable inventory method was adopted to normalize tourism research expenditure to the stock index). In addition, since tourism is a labor-intensive industry, green innovation requires high-quality employees, so the input of material resources (for example, training platforms for employees) should also be taken into account. As an indicator of the material input of green innovation activities in tourism, the number of HEIs with a tourism education program can be selected.

Scientific and technological output. The number of patent grants and patent applications is usually used to measure the scientific and technological output of a stage. Since some patents, even if they are not ultimately granted, can still bring certain economic and social benefits and reflect the social environment of innovative activities, the number of tourism patent applications is selected here as an indicator of scientific and technological output.

Economic and environmental output. The total revenue of the tourism industry can reflect the economic output from tourism, and is therefore selected here as an indicator of the economic output of green tourism innovation activities. In order to comprehensively measure the environmental pressure of tourism development, the entropy method was used to combine the interrelated waste water, sulfur dioxide, smoke (dust), and carbon dioxide emissions as an indicator of environmental production.

Green innovation performance measures the extent to which organizations develop innovations that reduce or eliminate environmental damage, impact, and degradation while optimizing the use of natural resources.

Based on a comprehensive literature review, it presents a comprehensive set of consumer behaviors in the consumption and purchase or repeat purchase of innovative green products. It is considered as a basis for consensus among such stakeholders; government, industry and

<sup>1</sup> Author's development

individuals about consumer behaviors in purchasing or repeat purchase when creating innovative products. Therefore, consumer environmental satisfaction and attitude are invaluable sources in shaping purchasing behaviors. Furthermore, it is concluded that consumer satisfaction and attitude towards the environment are important in determining the behavior of innovative green products. It seems that consumers' environmental behaviors play an important role as mediators between satisfaction and purchase or repeat purchase.

**Conclusion.** The relatively low innovative activity of the tourism business in the environmental sphere in our country is explained by the lack of objective conditions for such activity among small business entities, which make up the dominant share in the tourism services market, and the weak support of innovative development by state and private institutions, which makes the problem of finding ways to improve the system of stimulating "green" innovations urgent. Solving this problem determines the relevance of further research into the content of individual blocks of the mechanism, their internal structure and logic of construction. It is important to identify the factors and conditions for their effective functioning, as well as the algorithm of interaction of blocks and tools included in them to ensure the achievement of goals.

In the process of forming the concept of ecological innovations, the concept of eco-innovation is also developing under the influence of new challenges of ecosystems. The development of sustainability theory and other complementary economic and social theories as a result of appropriate changes in the environmental needs of society and deepening of knowledge, which requires adequate changes in the mechanism for managing innovative activities.

Modern research on the practical eco-innovative activities of tourism industry entities in different countries shows that at present, an important motivating factor for small and medium-sized enterprises is the lifestyle and internal beliefs of entrepreneurs. Business managers, in turn, are formed by the level of development of the system of environmental education and training, national formal and informal institutions of ecological transformation of the economic system. The regulatory influence of the state in the tourism system is not so significant, since, unlike the industrial sector, they are not rigid. In such conditions, the effectiveness of state activity is determined by its ability to ensure the priority of environmental goals in the implementation of its management, including incentive functions.

The process of implementing innovations in tourism usually occurs through the application of targeted changes in the system. This, in turn, leads to the fact that the introduction of one innovation leads to the occurrence of many innovative changes in the system as a whole.

It is necessary to establish international scientific and technological exchange to ensure success in the green transformation, to develop the growth and legislative framework, to develop methods for its creation and stimulation of the state market, to research and introduce existing products, to establish reserves. As a practical conclusion based on the results of the study, it should be noted that a mixed strategy is most optimal for the "green" sector, as it allows the industry to diversify the development of innovative "green" developments. The creation of an index of "green" investment activity of our state will allow us to solve the problem of the lack of "green" tools for its assessment.

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