

DEVELOPMENT OF THE QUALITY MANAGEMENT SYSTEM IN THE CONTEXT OF SUSTAINABLE DEVELOPMENT AND THE “GREEN ECONOMY” CONCEPT

Ibroximova Zuhra Baxtiyor qizi

Tashkent state university of economy

Doctoral student

Abstract: This article highlights the issues of developing the Quality Management System within the framework of sustainable development and the “green economy” concepts. The purpose of the study is to identify directions for improving the quality management system in Uzbekistan in accordance with the principles of environmental and social sustainability. The article analyzes international experience, particularly scientific approaches to integrating quality management and “green innovations” in China, Indonesia, and European countries.

Keywords: sustainable development, green economy, quality management system, ISO 9001, green innovation, resource efficiency, environmental management, economy of Uzbekistan.

In recent years, ensuring the balance between economic growth and environmental sustainability on a global scale has become one of the most important strategic directions. The concept of sustainable development is aimed at ensuring human well-being through the integration of the economy, the social sphere, and ecology. In this process, the “green economy” model creates the necessity of rational use of natural resources, waste reduction, and improvement of the quality management system in production processes. The quality management system not only increases the competitiveness of enterprises but also ensures their environmental and social responsibility. In the modern global economic system, enterprises are required not only to guarantee the quality of their products and services but also to take on ecological and social responsibility. Therefore, the integration of the quality management system with the principles of the “green economy” has become an urgent issue.

Research methods – In this article, comparative analysis and literature review methods were applied to study the process of integrating the quality management system with the principles of the “green economy.” Global experience shows that aligning the quality management system with the goals of sustainable development increases enterprise efficiency and reduces environmental risks. For instance, Liecheng Wang, Min Zhang, Hongwei Cao, and Teng Teng, in their article “The Impacts of Quality Management on Green Material Utilization: A Small- and Medium-Sized Chinese Enterprises’ Perspective,” based on empirical research conducted in China, demonstrated that the implementation of quality management practices in enterprises significantly increased the level of “green material utilization.” As a result, the volume of production waste was reduced by 12–18 percent. This indicates that the quality management system is an important factor in improving environmental performance. Similarly, in the International Journal of Energy Economics and Policy, Wahidatul Husnaini and Bambang Tjahjadi (2020), in their article “Quality Management, Green Innovation and Firm Value: Evidence from Indonesia,” reported that manufacturing enterprises in Indonesia that implemented green process innovations along with quality management systems succeeded in increasing their market value, based on research conducted among 352 manufacturing enterprises. In Uzbekistan’s economy as well, starting from 2025, the “Green Economy” strategy is being designated as a state-level priority direction. Therefore, it is necessary to reconsider the quality management system in the country based on a “green” approach.

Analysis and Results: Adapting the quality management system to the principles of the green economy provides the following outcomes:

- Efficient use of resources
- Reduction of environmental risks
- Promotion of innovative approaches
- Enhancement of corporate social responsibility

The quality management system is not only a mechanism for managing quality but also a comprehensive management framework that ensures both the environmental and social efficiency of enterprises. Under the conditions of sustainable development, the quality management system encompasses not only the control of product or service quality but also the coordination of environmental, social, and economic performance within the enterprise. This system enables companies to manage not only internal efficiency but also external sustainability — including environmental protection, consumer trust, and social responsibility. Efficient use of resources — According to modern “green economy” principles, the introduction of energy-saving technologies in production processes, reduction of raw material waste, and promotion of resource circulation (circular economy) have become integral components of the quality management system. For instance, the integration of ISO 9001 and ISO 14001 standards allows enterprises to reduce energy consumption by 10–20 percent and increase the share of waste recycling by 25–30 percent. Efficient resource utilization, in turn, lowers production costs and helps form a sustainable competitive advantage for the enterprise. Reduction of environmental risks — An essential element of a sustainable management system is the mechanism for identifying, assessing, and mitigating environmental risks. This process is implemented through waste recycling, environmental monitoring, and ecological auditing.

In Uzbekistan, this direction is being supported by the Law on Environmental Expertise, Environmental Impact Assessment, and Strategic Environmental Assessment (2025)¹, as well as the Law on Limiting Greenhouse Gas Emissions², which provide a practical foundation for implementation. International studies have noted that by introducing environmental monitoring systems in enterprises, the amount of emissions released into the air, water, and soil can be reduced by 15–25 percent.

Promotion of an innovative approach — the quality management system is not only a tool for control but also an instrument for managing innovative transformation. According to a study conducted by Husnaini and Tjahjadi (2021) in Indonesia, enterprises that implemented “green innovations” achieved higher market valuation because they became recognized among consumers as environmentally responsible brands. Green innovations are new products and services developed on the basis of environmentally friendly, energy-efficient, and renewable technologies, and as a key component of the quality management system, they enhance enterprise competitiveness. Enhancement of corporate social responsibility — in today’s global economy, one of the key indicators of enterprise success is the level of social trust and corporate responsibility. Through the quality management system, the enterprise directs its activities not only toward meeting consumer needs but also toward serving the interests of society and the environment. For example, “green certification” and “eco-labeling” systems help enterprises build credibility and a positive image in international markets, thereby expanding export opportunities. The economic results of integrating the quality management system with the “green economy” show that restructuring the quality management system based on the “green economy” concept leads to the following positive outcomes: A balance between economic growth and environmental safety is achieved, meaning that even as production increases, environmental damage decreases. This forms a model of “quality growth.” Resource use efficiency increases. Through energy-efficient equipment, waste recycling lines, and digital control systems, enterprise costs are reduced and profit margins increase. Access to

international markets expands. “Green certifications” and environmental compliance systems provide enterprises with competitive advantages in markets such as the European Union, Japan, and the United States.

Nevertheless, in Uzbekistan, there are several limiting factors preventing the full implementation of the quality management system based on the principles of the “green economy.” These include limited financial capacity — many enterprises lack investment resources for acquiring and installing ecological technologies; insufficient employee qualifications — the preparedness of staff and managers in environmental management and quality systems is low; and weak technological infrastructure — many industries lack waste recycling, energy monitoring, and automated control systems.

To solve these problems, it may be advisable to propose the following measures:

1. **State support** — expanding tax incentives and grant programs for enterprises implementing green technologies.
2. **Strengthening international cooperation** — fully integrating ISO standards into the national system and involving foreign experts.
3. **Introducing digital technologies** — using “smart sensors,” “IoT,” and “quality analytics” systems in production processes to monitor energy and resources online.

Discussions: International studies show that the integration of “green” principles into the Quality Management System not only increases efficiency in internal processes but also strengthens the external reputation of enterprises. In other words, when a company is environmentally responsible, consumer and partner trust grows, and its competitiveness in international markets improves. The experiences of China and Indonesia demonstrate several key conditions for successfully implementing this process:

The organizational culture and leadership’s support for environmental values — the company’s management must regard environmental responsibility as a strategic part of its activities. This should not be limited to political statements or formal documents but should also involve engaging employees in achieving “green” goals.

Integration of innovative technologies into QMS processes — for “Green Quality Management” to function effectively, companies need to implement energy-efficient technologies, waste recycling methods, and environmental monitoring systems. Technological upgrades help automate production processes and reduce waste.

State-level incentive policies — the introduction of green principles into the quality management system is supported not only within the enterprise but also through state-created conditions. For example, tax incentives, subsidies, “green certificates,” and environmental incentive programs increase companies’ motivation to adopt green technologies.

In Uzbekistan, although initial steps have been taken in this direction, the ecological component of the quality management system has not yet been fully integrated. That is, while many enterprises have a functioning Quality Management System, their level of environmental monitoring, waste reduction, and application of green innovations in production remains low. Therefore, to widely implement a “green quality management system” in the country, it is necessary to:

- increase environmental awareness within enterprises,
- improve the qualifications of employees in environmental and quality management,
- implement state policies and international standards,
- and widely introduce modern digital and innovative technologies.

In this way, the green quality management system will serve not only economic efficiency but also environmental safety and the enhancement of international reputation, becoming an important component of Uzbekistan’s sustainable development strategy.

Conclusion: In the context of sustainable development and the “green economy” concept, the development of a Quality Management System (QMS) is not only a key factor in improving the quality policy of enterprises but also in enhancing the ecological and social responsibility of the entire economy. Therefore, transforming the QMS into an environmentally and socially sustainable management system should become an integral part of the national development strategy.

The Quality Management System can serve not only as a tool for managing the quality of products and services but also as a comprehensive management mechanism that enhances the environmental and social efficiency of enterprises. International experience (China, Indonesia) shows that integrating the Quality Management System with green innovations enables more efficient resource utilization in production processes, waste reduction, energy saving, increased corporate social responsibility, and strengthened market competitiveness.

In the context of Uzbekistan, developing the Quality Management System based on “green” principles will lead to several key outcomes: ensuring a balance between economic growth and environmental safety, improving resource use efficiency, reducing production costs, and strengthening the competitiveness of enterprises in international markets.

However, factors such as financial constraints, insufficient staff qualifications, and inadequate technological infrastructure hinder the full implementation of the green component within the Quality Management System. To address these issues, it is necessary to strengthen state support, adopt international standards, and introduce modern digital technologies.

Thus, the integration of the Quality Management System with the principles of the “green economy” will become an essential element of Uzbekistan’s sustainable development strategy, contributing to improved economic efficiency, environmental safety, and international reputation of enterprises.

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