Optimization of Employee Mixed Incentive System From the Perspective of Social Sustainable Development

Chen Yu[1]*, Liu Ziqi[2], Satyvaldieva Baktygul Abduraimovna[1], Qin Meng[3,4],QI Hongwei[5]

[1]Kyrgyz National University named after Jusup Balasagyn, Frunze Street 547, Bishkek 720033，Kyrgyzstan

[2]School of Business of Belarusian State University,Belarus,Minsk, Oboynaya Street 7,220004, Belarus

[3]Kyrgyz State University named after I. Arabayev, 51 Razzakova Str., Bishkek 720026, Kyrgyzstan

[4]Bingtuan Xingxin Vocational and Technical,45, Binyou Road, Tongun Street, Economic and Technological Development Zone (Touhan District), Urumqi City, Xinjiang Uygur Autonomous Region, 830074,China

[5]Department of English Language and Translation, Institute of Modern Languages and International Studies, M.K. Ammosov North-Eastern Federal University; Yakutsk, Russian Federation

KEYWORDS	**ABSTRACT**
Sustainable development; *Multiple incentives;* *Industry 5.0;* *Human resource management*	Under the dual background of the global promotion of the United Nations Sustainable Development Goals (SDGs) and the technological innovation of Industry 5.0, the mixed incentive system for employees of enterprises needs to be adapted to the sustainable development of society. Based on comprehensive research and analysis, this paper preliminarily sorted out the gaps in the research on the synergy effect of incentive mechanism and sustainable development, constructed an employee incentive optimization framework with target docking, multiple incentives, technical support and institutional guarantee, and put forward specific optimization paths. It aims to solve the problems of disconnection between enterprise incentive system and sustainable development and single form, and provide practical reference for improving employee enthusiasm and promoting enterprise to fulfill social responsibility.

INTRODUCTION

The 17 Sustainable Development Goals (SDGs)[1], established by the United Nations in 2015, have become the overarching framework for global development, covering the three basic dimensions of economic growth, environmental resilience and social equity. As the core implementation subject, the human resource management mode of enterprises directly affects the promotion effect of SDGs.

Fu & Zhang (2024) pointed out that the current global SDGs implementation is faced with challenges such as regional imbalance and insufficient enterprise participation, while employee motivation, as the core link of human resource management, generally has problems such as disconnection from sustainable goals and single form, which restricts enterprises' contribution to SDGs [2]. Horvat et al. (2024) emphasized that Industry 5.0 promoted deep complementarity between human capabilities and emerging technologies, providing important technical support for incentivizing institutional innovation [3]. Gechbaia et al. (2024) proved through empirical research that the deep integration of human resource management and SDGs needs the support of multiple incentive mechanisms [4].Raman et al. (2024) reveals significant research gaps in collaborative studies of incentive mechanisms and sustainable development, particularly in the integration of digital technologies with human-centric approaches [5]. Therefore,

based on the perspective of social sustainable development, constructing an appropriate employee mixed incentive optimization framework has become a key issue to address the dilemma of enterprise sustainable development.

1. Theoretical Framework and Model Construction

1.1. Core Theoretical Basis

① SDGs orientation theory: SDGs emphasize the coordinated development of economy, society and environment, and provide multiple value guidance for the setting of incentive goals [6].

② Industry 5.0 technology enabling theory: Industry 5.0, which emphasizes human-centric manufacturing and collaboration between humans and machines, provides new opportunities for incentive system innovation. The integration of artificial intelligence, big data and other technologies provide the possibility for the precision of incentives, which can realize the intelligentization of employee needs identification, contribution quantification and scheme optimization [7]. Syncframe (2025) also pointed out in its Industry 5.0 guidelines that the core of Industry 5.0 lies in the synergy between humans and machines, which provides a fundamental direction for the technological transformation of incentive mechanisms [8].

③ Multi-dimensional incentive theory: The integration of material and non-material, short-term and long-term incentives can better meet the multiple needs of employees and stimulate behaviors related to sustainable development [9].

1.2. Optimization Framework Model

Based on the above theoretical basis and current enterprise needs for aligning incentive systems with sustainable development goals, this paper constructs an employee hybrid incentive optimization framework integrating target docking, multiple incentives, technical assistance and institutional guarantee. Core tasks and specific measures of each dimension are shown in Figure 1:

Framework dimension	Core Task	Concrete measure
Docking of targets	To achieve the alignment between enterprise incentive goals and the SDGs.	The sustainable development goals are translated into specific incentive indicators that employees can understand and implement, such as green innovation contribution awards, environmental protection performance scores, and social responsibility participation indicators.
Multiple incentives	To meet the multi-level and diverse needs of employees.	The combined incentive mode of material incentive and non-material incentive, short-term incentive and long-term incentive is constructed to take into account the material return and spiritual needs of employees, immediate incentive and long-term development
Technical assistance	To enhance the accuracy and fairness of incentives.	Big data technology is used to analyze the job characteristics and demand preferences of employees, and AI model is used to quantify the contribution of employees to sustainable development, so as to avoid single incentive.
Institutional guarantee	Break down the barriers and ensure that the incentives are implemented and effective.	Embed the incentive mechanism into the whole process of human resource management such as recruitment, training, assessment and promotion, integrate internal resources and external cooperation forces, and establish a long-term implementation mechanism.

Fig.1. Core Contents of the Employee Mixed Incentive Optimization Framework

Source: This framework is based on SDGS-oriented theory, Industry 5.0 technology enabling theory and multi-dimensional incentive theory, combined with relevant research [6][7][9].

Through the integration of goal, form and technology, the optimization framework not only ensures that the incentive mechanism is consistent with the sustainable development goals, but also improves the identity of employees and the efficiency of system operation.

1.3. Framework Implementation Guidelines

To ensure the effective implementation of the employee mixed incentive optimization framework, several key guidelines should be followed. First, the framework should be adapted to the specific context of each enterprise, considering industry characteristics, organizational culture, and employee demographics. Işık et al. (2024) found in their study of SDGs in the United States that policy effects vary due to differences in economic structure and social environment, indicating that incentive system design must be contextually appropriate [10]. Second, stakeholder engagement is crucial, including leadership commitment, employee participation, and external partnerships with sustainability organizations. Third, a phased implementation approach is recommended, starting with pilot programs in specific departments before full-scale deployment. Finally, continuous monitoring and evaluation mechanisms should be established to track the effectiveness of the incentive system and make necessary adjustments based on performance metrics and feedback. The specific flow chart is shown in Figure 2:
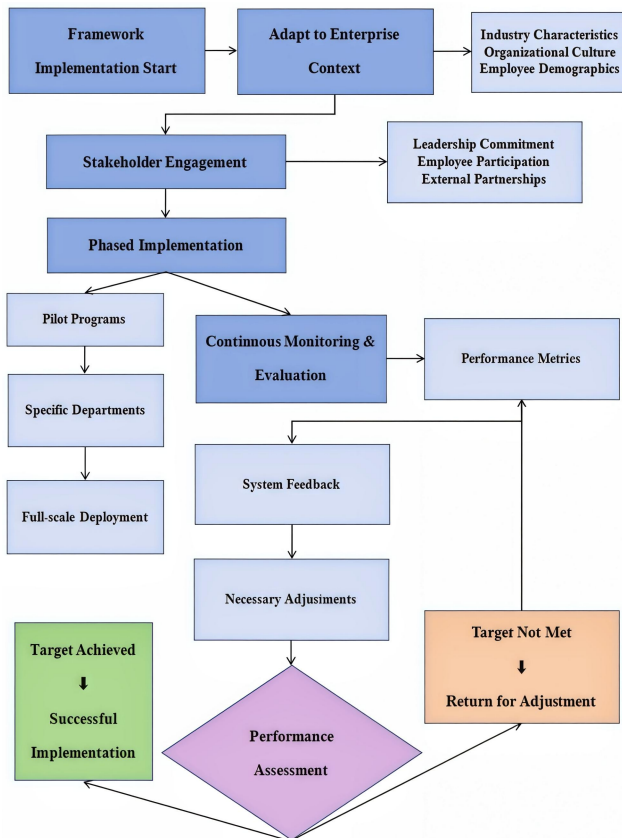
Fig.2. Framework Implementation Guidelines Flowchart

2. Analysis and Discussion

2.1. Shortcomings of the Sustainable Development Adaptation of the Current Incentive System

From the perspective of current practice, the current corporate incentive system has obvious deficiencies in the process of adapting to the SDGs. There are four dilemmas in the enterprise incentive system when connecting with the sustainable development goals (SDGs).

1) Misaligned objectives, where incentive targets diverge from sustainable development goals, prioritising short-term financial performance over long-term sustainability metrics. This leads management to prioritise quarterly profits in decision-making while adopting a cautious wait-and-see approach towards investments in long-term initiatives such as green R&D and social impact programmes [2].

2) Structural uniformity, with excessive reliance on remuneration and bonuses. Incentives such as training and recognition awards remain superficial. Employees often focus solely on metrics directly linked to bonuses to secure

rewards, neglecting sustainability requirements. Non-financial incentives lack systematic design and effective implementation, failing to foster intrinsic commitment and active participation towards sustainability goals [4].

3) Lack of technology, failure to achieve data-driven precise incentive with the help of Industry 5.0, enterprise HRIS and production, supply chain and community impact data are not connected, resulting in the lack of real-time and accurate data support when evaluating employees' sustainable contribution, and delayed reward decision. It missed the best opportunity to strengthen employees' green behavior in a timely manner [3].

4) Weak coordination, where incentive mechanisms are disconnected from HR processes and fail to integrate external resources. Lack of synergy between modules hinders the effective internalisation and transmission of green expertise and sustainable practices. Furthermore, collaborations with external stakeholders such as suppliers, universities, and communities cannot generate synergistic momentum for sustainable development due to absent incentives, thereby increasing supply chain compliance risks and operational costs [5].

2.2. Practical Application Path of the Framework

The framework's practical application proceeds hierarchically across goals, design, technology, and systems，As shown in Figure 3:

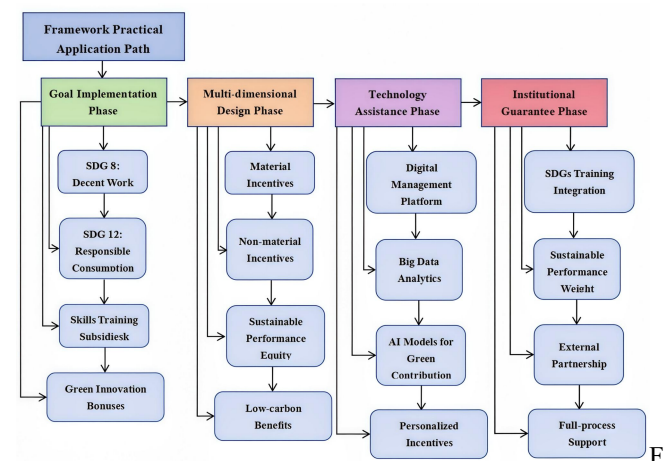

ig.3. Four-Phase Implementation Framework

• Goal Implementation Phase

For goal implementation, translate UN SDGs such as SDG 8 (Decent Work) and SDG 12 (Responsible Consumption) into

perceptible, actionable employee incentive indicators (such as skills training subsidies, green innovation bonuses) to align with global sustainability agendas [1].

• Multi-dimensional Design Phase

For multi-dimensional design, expand material incentives with sustainable performance equity and low-carbon benefits, and link non-material incentives (like sustainable contribution certification) to promotion to meet diverse employee needs and guide sustainable behaviors [9].

• Technology Assistance Phase

For technology assistance, to build a digital management platform, use big data to analyze employees' work needs and preferences, use artificial intelligence model to quantify green contribution, avoid single incentive measures, so as to improve accuracy [7].

• Institutional Guarantee Phase

For institutional guarantees, integrate SDGs-related content into training, weight sustainable contributions heavily in performance evaluations, and collaborate with external public welfare organizations to provide full-process support [6].

2.3.Framework Values and Limitations

The core value of the framework is to realize the dual adaptation of incentive system, SDGs and industry 5.0 technology, and balance enterprise efficiency and social value [2]. Specifically, the framework must integrate incentives, SDGs and technology into a closed-loop system, ensuring that green practices, social impact and business outcomes are simultaneously considered in decision-making. This approach addresses capital markets' demand for ESG traceability while providing employees with immediate, visible proof of personal contribution. Consequently, it transforms the traditional trade-off between efficiency and responsibility into synergistic gains. However, in the implementation process, there are significant differences between the process industry and the digital service industry in terms of emission benchmarks, resource density and stakeholder needs, which may distort business decisions if the uniform weight standard is directly applied. The edge computing, iot devices and data governance platforms required by Industry 5.0 require high initial investment for smes and are difficult to replicate the deployment path of large enterprises in the short term. Small and medium-sized enterprises face greater cost pressure when adopting new

technologies [11][12].Future research needs to design low-cost, modularizable and subscription-based technology solutions to lower the adoption threshold for smes. The dynamic weight adjustment mechanism based on annual review is established to allow enterprises to flexibly revise the index weight according to policy changes and their own development stages, so as to ensure the operability and sustainability of the framework in multiple situations.

2.4.Future Research Directions

Future research should undertake longitudinal studies to assess the long-term effectiveness of sustainability-oriented incentive mechanisms and their impact on employee behaviour and organisational performance. Cross-cultural research should examine how differing national and cultural contexts influence the framework's implementation outcomes. Empirical validation through case studies and field experiments would provide stronger evidence for the framework's practical value. Integrating blockchain technology to enhance transparency and employing gamification design to boost employee engagement represent areas warranting deeper future exploration. Finally, the cost-benefit analysis study on the implementation of Industry 5.0 technology incentive system for smes will provide valuable reference for practitioners.

Conclusion

Social sustainable development requires enterprises to break through the limitations of traditional incentive models and build a new employee incentive system that is compatible with sustainable development goals. The four integrated optimization frameworks of goal docking, multiple incentives, technical assistance and institutional guarantee proposed in this paper provide realistic incentive optimization ideas for enterprises. Through the implementation of this framework, enterprises can realize the deep integration of employee incentives and SDGs, effectively stimulate employees' behaviors related to sustainable development, and improve the accuracy and efficiency of incentives with the help of Industry 5.0 technology, so as to promote the transformation of human resource management mode from efficiency oriented to sustainable value oriented.

In the future, enterprises need to refine the index design based on their own reality, strengthen cross-department

collaboration and technology application adaptation, promote the transformation of incentive system from efficiency-oriented to sustainable value-oriented, and contribute to the comprehensive realization of SDGs.

REFERENCES

1. United Nations. (2025). The 17 goals | Sustainable development. https://sdgs.un.org/goals

2. Fu, B., & Zhang, J. (2024). Progress and challenges of Sustainable Development Goals (SDGs) in the world and in China. Bulletin of Chinese Academy of Sciences, 39(5), 804–808. https://bulletinofcas.researchcommons.org/journal/vol39/iss5/2/

3. Horvat, D., Jäger, A., & Lerch, C. M. (2024). Fostering innovation by complementing human competences and emerging technologies: An industry 5.0 perspective. International Journal of Production Research, 63(3), 1126–1149. https://doi.org/10.1080/00207543.2024.2372009

4. Gechbaia, B., Goletiani, K., Abashidze, G., & Nasaraia, Z. (2024). The role of human resources management in achieving sustainable development goals in the company. Business Management/Biznes Upravlenie, 4. https://www.ceeol.com/search/article-detail?id=1293608

5. Raman, R., Lathabai, H., Pattnaik, D., et al. (2024). Research contribution of bibliometric studies related to sustainable development goals and sustainability. Discover Sustainability, 5, 7. https://doi.org/10.1007/s43621-024-00182-w

6. Sorooshian, S. (2024). The sustainable development goals of the United Nations: A comparative midterm research review. Journal of Cleaner Production, 453, 142272. https://doi.org/10.1016/j.jclepro.2024.142272

7. Zavrazhnyi, K., Kulyk, A., Viacheslav, V., Sokolov, M., & Antunes de Abreu, O. (2024). Formation of strategic directions for the use of artificial intelligence in the enterprise to achieve the goals of sustainable development. Financial and Credit Activity: Problems of Theory and Practice, 5(58), 470–483. https://doi.org/10.55643/fcaptp.5.58.2024.4448

8. Syncframe. (2025, September 19). Industry 5.0: Guidelines for syncing the present with the future of humanity and sustainability. https://syncframe.org/i5/

9. Brewster, C., & Brookes, M. (2024). Sustainable development goals and new approaches to HRM: Why HRM specialists will not reach the sustainable development goals and why it matters. German Journal of Human Resource Management, 38(2), 183–201. https://doi.org/10.1177/23970022241229037

10. Işık, C., Ongan, S., Ozdemir, D., Yan, J., & Demir, O. (2024). The sustainable development goals: Theory and holistic evidence from the USA. Gondwana Research, 132, 259–274. https://doi.org/10.1016/j.gr.2024.04.014

11. Gharaei, A., Amjadian, A., Amjadian, A., Shavandi, A., Hashemi, A., Taher, M., & Mohamadi, N. (2023). An integrated lot-sizing policy for the inventory management of constrained multi-level supply chains: null-space method. International Journal of Systems Science: Operations & Logistics, 10(1). https://doi.org/10.1080/23302674.2022.2083254

12. Gharaei, A., Hoseini Shekarabi, S. A., & Karimi, M. (2023). Optimal lot-sizing of an integrated EPQ model with partial backorders and re-workable products: an outer approximation. International Journal of Systems Science: Operations & Logistics, 10(1). https://doi.org/10.1080/23302674.2021.2015007