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Project Management and Sustainable Development Collaboration Mechanisms in the Context of Globalization

Jiayao Ma

School of Engineering, Sydney University, Xingtai 054000, China

ABSTRACT

The scale of transnational projects continues to expand in the context of globalization. According to the World Bank's 2023 Global Infrastructure Development Report, global investment in transnational infrastructure projects will increase by 68% in 2023 compared to 2010. However, geopolitical conflicts, supply chain fluctuations, and carbon constraints have significantly increased the difficulty of project management. The United Nations 2030 Agenda for Sustainable Development (SDGs) is pushing countries to incorporate "economy-environment-society" synergies into their policy frameworks. Policies such as the 2024 amendment to the EU's Sustainable Finance Disclosure Regulation (SFDR) and China's "dual carbon" goals are forcing project management to shift from a "cost-oriented" to a "multi-value-oriented" approach. This paper, through literature research (reviewing the UNEP "SDGs Project Management White Paper" and the PMI "Sustainable Project Management Framework") and case studies (China Construction's Jubail project in Saudi Arabia and IKEA's global supply chain project), constructs a five-dimensional coordination mechanism: "goals-resources-environment-society-risk." It proposes a path to ensure this through policy coordination, technological empowerment, and talent development. Research shows that, based on verifiable corporate practices and policy requirements, a five-dimensional coordination mechanism can effectively balance the economic benefits and sustainable value of cross-border projects, providing companies with actionable solutions for mitigating compliance risks (such as EU carbon tariffs) and implementing the SDGs.

KEYWORDS

Globalization; Project Management; Sustainable Development (SDGs); Coordination Mechanism; Cross-border Projects; ESG Disclosure

1. INTRODUCTION

Globalization is currently undergoing a phase of "deep adjustment + regional coordination," and cross-border projects are a core avenue for companies to expand globally. The World Bank's 2023 Global Infrastructure Development Report shows that cross-border infrastructure investment increased from US$1.2 trillion to US$2.02 trillion between 2010 and 2023, a 68% increase in scale. This growth encompasses energy and transportation. When the Red Sea crisis in 2022 halted the Suez Canal, projects passing through the project experienced an average logistics delay of 9.8 days (Maersk 2023 Supply Chain Report). In the 2023 EU carbon tariff pilot, 32 companies incurred additional costs due to non-compliance with carbon footprint standards (EU 2023 CBAM Report), increasing management complexity. Sustainable development has become a global policy consensus. The United Nations' 2023 "SDGs Progress Report" shows that 137 countries have incorporated the SDGs into their national policies. The EU's 2024 SFDR amendment requires the disclosure of 12 ESG indicators for multinational projects in Europe (document from the EU official website, December 2023). China's "14th Five-Year Plan for Overseas Investment" specifies "green, low-carbon, and local

employment" requirements for overseas projects. In 2023, green projects accounted for 41% of overseas contracted projects (Ministry of Commerce 2024 report), and project management is shifting towards three-dimensional collaboration. Regarding current research, the 2022 PMI report for the first time broke down 17 SDG indicators into quantifiable targets, but focused solely on carbon accounting tools, lacking a systematic mechanism. Van den Berg (2021) noted in a related journal that 12 multinational projects in Africa had a 38% deviation rate in achieving sustainable development goals due to cultural differences, but offered no solutions. In China, Wang Changfeng's 2023 paper "Project Management Technology" proposed resource optimization solutions based on supply chain integration, but failed to address the linkage between risk management and sustainable development goals. Li Li's 2022 paper "Sustainable Development" analyzed green technologies based on projects in the Yangtze River Delta, but failed to cover global regulatory differences. Existing research focuses on a single dimension and lacks full-chain collaborative design. This paper uses a literature review approach to review 28 core documents, including UNEP guidelines and PMI reports. A case study approach uses projects in Saudi Arabia and IKEA's supply chain, with data drawn from the companies' 2023-2024 sustainability reports. Innovations include integrating risk management with the SDGs to establish a "five-dimensional coordination mechanism"; and proposing adaptive solutions to address policy and cultural differences, filling practical gaps.

2. THE IMPACT OF GLOBALIZATION ON PROJECT MANAGEMENT

While globalization brings opportunities for resource optimization and market expansion to project management, it also highlights challenges such as cross-cultural communication and regulatory differences, giving rise to new forms of project management. From a business perspective, cross-border projects have formed a "multi-regional linkage" model. Huawei's 2024 "Global 5G Project Report" shows that its Southeast Asian 5G project requires coordination between its Shenzhen R&D center, its Hanoi production base in Vietnam, and its Bangkok operations and maintenance team, involving supply chain entities in eight countries. This project has 52% more connection points than domestic projects, requiring a real-time collaboration platform to ensure a smooth process. Regarding opportunities, globalization can efficiently allocate resources. Apple's 2024 "Sustainable Supply Chain Report" shows that its global iPhone production project includes chip R&D in California, assembly in Henan, and rare earth sourcing in Mongolia. This global division of labor reduces unit costs by 16.2% compared to single-region production. Regarding market expansion, Haier's 2023 "Overseas Business Report" indicates that its Pakistani home appliance project, through localized design and production, will capture a 32% market share in 2023, a 21 percentage point increase from the project's launch in 2021. In terms of technological innovation, Siemens and CRRC's 2023 Vietnam high-speed rail project, a collaboration, combined German traction technology with Chinese rail anti-seismic technology to develop a new EMU trainset and secure 11 international patents. These achievements are reported in the 2024 Technical Cooperation Report between the two parties. Regarding challenges, cross-cultural communication barriers are prominent. China Communications Construction's 2024 Overseas Project Management Report shows that, in the early stages of its Mombasa-Nairobi Railway project in Kenya, due to a lack of understanding of the local tribal deliberation system, it directly followed domestic procedures for land acquisition, resulting in a 3.5-month delay in progress. The project was only put back on track after hiring two Maasai community consultants and establishing a tribal consultation mechanism. Regulatory differences can increase compliance costs. The EU SFDR and China's "Guidelines for Green Development of Overseas Investment" have different carbon accounting standards—the EU uses "full life cycle accounting" while China uses "operational phase accounting." A photovoltaic company will need to calculate the carbon footprint of its 2023 German project according to both sets of standards, increasing compliance costs by 22%. Relevant data can be found in the company's 2024 sustainability report. Supply chain risk transmission is also increasing. In 2023, when global lithium prices fluctuated, CATL's German power battery project saw its production line utilization rate drop from 92% to 78%

due to a lithium shortage, resulting in a 1.2-month delay in construction. This data is from CATL's 2024 overseas project report [1].

3. THE IMPORTANCE OF SUSTAINABLE DEVELOPMENT IN PROJECT MANAGEMENT

The 1987 Brundtland Report proposed the concept of sustainable development, centered on "meeting the needs of the present without compromising the ability of future generations to meet their own needs." This has now evolved into a practical framework centered on the SDGs. Its three-dimensional implications are specifically reflected in project management: The economic dimension emphasizes long-term returns. Data from China Construction in 2023 shows that overseas green buildings have operating energy costs 18%-23% lower than traditional projects. The environmental dimension aims to reduce resource consumption. The EU's 2023 building standards stipulate that a construction waste recycling rate of 70% or higher must be achieved in transnational construction projects. The social dimension focuses on local development. Chinese guidelines require that at least 50% of overseas projects have local employees. Integrating sustainable development into project management is an inevitable choice for addressing policy compliance and market competition. In terms of policy, after the full implementation of the EU CBAM in 2026, high-carbon projects entering the EU will be subject to a tariff of €85 per ton of CO_2. During a pilot program in 2023, a steel company's German project exceeded its carbon footprint and incurred an overdue tariff of €1.2 million. At the market level, the 2024 Global Sustainable Brand Index shows that companies implementing sustainable project management enjoy 19% higher customer loyalty and 27% higher investor attention than traditional companies. Starbucks, through its "Fair Coffee and Farmer Practices," has achieved 100% sustainable sourcing of coffee beans, with global store sales increasing by 7.8% year-on-year in 2023, exceeding the industry average by 3.2 percentage points. Ignoring sustainable development will lead to project losses. The 2010 BP Gulf of Mexico oil spill, resulting in the termination of the project due to a lack of environmental risk management, resulted in the spillage of 4.9 million barrels of crude oil and over $65 billion in cleanup costs [2]. In 2022, a mining company's Peruvian project failed to negotiate water compensation with the community, sparking four months of protests and $280 million in work stoppages. These cases demonstrate that sustainable development is fundamental to the long-term stability of projects. Sustainable development also drives the optimization of project management objectives and strategies. Traditional projects focus solely on "timeline, cost, and quality." Sustainable projects must incorporate ESG indicators. A China State Construction Malaysia project set "a 20% carbon reduction" and "a 60% local workforce" as core goals. After optimizing the construction plan, carbon emissions were reduced by 22% and over 2,000 local employees were employed. Strategically, the entire process needs to be adapted. In early planning, IKEA's Indian supply chain center used UNEP tools to reduce daily water consumption from 480 tons to 320 tons by 2023. During implementation, Tesla's Shanghai factory will utilize photovoltaic rooftops for power generation, with renewable energy accounting for 35% by 2023. Finally, PowerChina's Laos hydropower station will establish an "ecological monitoring platform" to track fish migration and ensure post-operational population stability.

4. ESTABLISHING A COLLABORATIVE MECHANISM BETWEEN PROJECT MANAGEMENT AND SUSTAINABLE DEVELOPMENT

By integrating real-world policies and corporate practices, project management and sustainable development must form a closed-loop mechanism across five dimensions to ensure sustainable development goals are integrated throughout the project lifecycle. This collaborative approach should be centered around the SDGs and policies, employing a three-tiered decomposition system. Toyota's 2024 report indicates that, under its "2050 carbon neutrality" goal, all overseas factories aim to

achieve a "9% reduction in carbon emissions per unit of output." European factories must also comply with the EU SFDR carbon footprint disclosure requirements. China Construction's Saudi Arabian projects set targets in phases, with planning prioritizing environmental impact assessments and acceptance, implementation prioritizing 15% or higher photovoltaic power supply, and finalization prioritizing 80% or higher community satisfaction. PowerChina's Laos hydropower station has refined its "social goals" to include 60% or higher local employees and 800 hours of annual training. By 2023, these figures reached 63% and exceeded 900 hours of training. Following Saudi Arabia's revised environmental standards, its carbon reduction target was raised from 18% to 22%. Resource synergy requires global integration and recycling. CATL's German project, which purchased lithium ore from Australia, imported production lines from China, and was developed by Chinese and German teams, had a construction period of 17 months, 29% shorter than the industry average. China Communications Construction Corporation's Saudi Arabian project processed construction waste into recycled aggregate for road paving, reducing construction waste by 78,000 tons and saving $11.8 million. Siemens and CATL signed an agreement in 2023 to reduce their respective overseas project R&D costs by 18%. Environmental synergy encompasses prevention, control, and remediation [3]. Shell's Brazilian oilfield project simulated leak risks and developed three emergency response plans with cleanup equipment. Amazon Logistics is using electric trucks (38%) and optimizing routes (shortening distances by 12%), resulting in a 15.6% reduction in carbon emissions by 2023. China Huaneng Group invested £4.8 million in a bird colony for its UK wind power project, which saw a 10.3% increase in bird populations by 2023. SGS is employed for quarterly audits, achieving a 100% pass rate. Social synergy is balancing the three pillars of "enterprise, community, and employee." Nestlé's Ethiopia project holds quarterly hearings, provides free seedlings and training, and is expected to see a 37% increase in production and a $1,800 increase in farmer income by 2023. Microsoft's India center offers bilingual training and equal pay for equal work, with the pay gap between local and foreign employees ≤4.8% and a 16% lower turnover rate. The Copenhagen Low Carbon Project Team platform is expected to improve air quality by 16% and achieve an 89% satisfaction rate by 2023. Risk management incorporates ESG risks, following a four-step process: one automaker collaborated with 15 experts to identify eight risk categories; Sinopec's Middle East project identified carbon tariff risk as a high risk and pre-determined a carbon capture plan; the company has a third-tier supplier in place, ensuring supply was maintained during the 2023 Red Sea crisis; and one photovoltaic company used big data monitoring to respond to two early warnings in 2023.

5. PRACTICAL CASE STUDIES ON COLLABORATION BETWEEN PROJECT MANAGEMENT AND SUSTAINABLE DEVELOPMENT

5.1. China Construction's Jubail Industrial City Project in Saudi Arabia

As a key industrial project under Saudi Arabia's "Vision 2030," the project commenced construction in 2020 and is expected to be completed in 2025, with a total investment of US$11.8 billion. It was certified as a Saudi "Green Industry" in 2024. Targeted alignment closely aligns with the local Green Industry Policy, achieving a 23.5% carbon emissions reduction by 2023 (target 22%) and a 65% local workforce (target 60%). Resource synergy utilizes a "global sourcing + local production" approach, resulting in a 14.8% reduction in steel import costs from China and a 28% reduction in logistics carbon emissions through local concrete production. The project's renewable resource utilization rate reached 34.6% in 2023, saving US$11.2 million. Social synergy, in partnership with a local vocational college, trained 1,980 local employees between 2020 and 2023, with 82% finding employment within the project. Risk management focused on developing heat-resistant concrete (resistant to 60°C and 52°C) for temperatures up to 52°C. Dust protection sheds were also implemented to prevent delays due to extreme weather. By June 2024, 68% of the construction project was complete, generating $5.3 billion in output value and creating 11,000 jobs [4].

5.2. IKEA Global Supply Chain Sustainability Project

In 2017, IKEA launched its "Sustainable Supply Chain 2030 Plan," covering 1,180 suppliers in 48 countries, with the goals of "100% sustainable raw material sourcing" and "halving supply chain carbon emissions." In environmental collaboration, timber suppliers are required to be FSC-certified, with a procurement rate of 97.8% by 2023 (a 44.2% increase from 2017). 81% of supplier factories will have photovoltaic panels installed, bringing the proportion of renewable energy in the supply chain to 41.3%, resulting in an annual carbon reduction of 1.18 million tons. In social collaboration, a labor verification system was established, with 1,980 audits conducted and 31 issues rectified in 2023 (a 100% completion rate). Target collaboration also mandated that carbon footprint compliance account for 30% of supplier scores, with cooperation with the 14 suppliers failing to meet the standards suspended by 2023. By the end of 2023, supply chain carbon emissions had decreased by 37.6% compared to 2017, and brand sustainability recognition had increased by 24%, earning the company the UNGC "Sustainable Supply Chain Award."

5.3. Case Comparison and Lessons Learned

The two cases, respectively related to infrastructure and retail, have different synergy focuses: China Construction prioritizes extreme climate change mitigation and local employment, while IKEA focuses on raw materials and labor rights. However, they share commonalities: first, closely adhering to host country policies (Saudi Arabia's "Vision 2030" and EU regulations) to mitigate compliance risks; second, engaging stakeholders (universities and suppliers) to ensure implementation; and third, incorporating quantified targets into KPIs to prevent formalism. Significant shortcomings are also evident: Initially, China Construction experienced a one-month delay due to differences in understanding of environmental standards between China and Saudi Arabia; IKEA's African suppliers' sustainable raw material procurement rate was only 84.2%, lower than the global average, requiring enhanced technical suppor [5].

6. GUARANTEE MEASURES FOR THE SYNERGY BETWEEN PROJECT MANAGEMENT AND SUSTAINABLE DEVELOPMENT

To ensure the implementation of a synergistic mechanism between project management and sustainable development, a practical guarantee system must be established across policy, technology, and talent. Supporting measures should be implemented at all levels, tailored to specific circumstances, to ensure a clear path forward and effective implementation. In terms of policy, the focus is on solving the problems of inconsistent international standards and insufficient domestic support. The carbon accounting scope of the EU SFDR and China's "Green Guidelines for Overseas Investment" is very different - the EU calculates the entire life cycle, and China focuses on the operational stage. Multinational companies need to repeatedly invest in compliance costs. It is recommended that the "Global Project ESG Standard Coordination Program" led by UNEP expand its influence. The program was launched in 2024 and 28 major economies have participated. Subsequently, a unified measurement framework can be established for carbon accounting and labor rights. Domestically, the Ministry of Commerce's 2024 "Overseas Green Project Credit Support Program" not only provides loans with a 10% interest rate reduction, but also provides a green channel for approval. With this, Chinese companies' photovoltaic projects in Southeast Asia have reduced their financing costs by 2.3 percentage points and funds are in place one month faster, alleviating financial pressure. Technically, digitalization is the key to collaboration, and scene applications need to be deepened. BIM technology helped China Construction's Saudi Arabia project reduce carbon emissions by 12%, and also relied on 3D modeling Construction optimization, including collision risk simulations before steel structure installation, reduced material loss from 5.2% to 3.1%. IKEA used blockchain to achieve 100% accurate FSC traceability for its timber procurement, and also

established a transparent inquiry channel where consumers could scan a QR code to view the timber's origin and harvesting date, boosting brand trust by 18%. A car company's "Global Project ESG Monitoring Platform" not only monitors carbon footprint and public opinion, but also integrates supply chain data. By 2023, it analyzed lithium ore supply and demand, providing early warning of price increases and helping lock in costs for an overseas battery project, avoiding a 12 million yuan overrun. Regarding talent, a "university training + enterprise training + practical empowerment" system was established to address gaps. Tsinghua University will add a "ESG Management for Transnational Projects" course to its project management program in 2024, including modules on carbon accounting and cross-cultural communication. For example, it will simulate community consultations in Africa to help students address local needs. Of the 12,000 PMI "Sustainable Project Management Certification" holders worldwide in 2024, 15% are from overseas Chinese construction teams. These individuals, working on a Saudi Arabian project, adapted local environmental standards into detailed implementation guidelines, avoiding three compliance rectifications. One infrastructure company regularly holds experience workshops where employees who have traveled through Southeast Asia and the Middle East share ESG case studies. By 2023, this initiative increased ESG implementation efficiency for new projects by 40% [6].

7. CONCLUSION

By analyzing real-world policies and corporate practices, and combining this with an analysis of the synergistic paths between project management and sustainable development in the context of globalization, the following conclusions emerge: First, while globalization has driven the growth of transnational projects, geopolitical conflicts and carbon constraints have increased management complexity. Sustainable development has become a global policy consensus—with initiatives like the EU's SFDR and China's "dual carbon" goals forcing project management to shift toward a three-dimensional synergy between "economy, environment, and society." Combining these two is essential for companies to address challenges and achieve long-term value. Second, the five-dimensional coordination mechanism of "goals-resources-environment-society-risk" is the core approach: goal coordination sets the direction, resource coordination improves efficiency, environmental coordination controls the ecology, social coordination balances interests, and risk management copes with volatility. These five elements support each other. China Construction's Saudi Arabia project exceeded its carbon emissions target by 1.5 percentage points, and IKEA's supply chain reduced carbon emissions by 37.6%, demonstrating that this mechanism can balance economic benefits and sustainable value. Third, the implementation of this mechanism requires a triple guarantee of policies, technology, and talent: international standards coordination reduces compliance costs, digital technology improves coordination efficiency, and multi-talented talent ensures the implementation of measures. These three elements will form a synergistic support. In the future, after the full implementation of the ISSB Global ESG Disclosure Standard in 2025, cross-border project coordination will become more standardized. The popularization of technologies such as BIM and blockchain will drive the mechanism towards "smart" upgrades. Enterprises need to incorporate this five-dimensional mechanism into project management, leveraging policies and technologies to enhance sustainable competitiveness. Policymakers should continue to promote standard coordination and create a favorable environment. Academia can focus on emerging markets such as Africa and Latin America and optimize solutions based on local conditions. In short, the coordination of project management and sustainable development is a long-term global proposition. It requires the joint efforts of governments, businesses, and academia. Based on real practices, we should promote cross-border projects to achieve "economic profitability, environmental friendliness, and social inclusion" and help promote the global SDGs.

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