

## Green Intellectual Capital for Sustainable Development within the MIDROC Investment Group in Ethiopia

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### **Abstract**

*This paper investigates green intellectual Capital for Sustainable Development within the Midroc Investment Group in Ethiopia. The main objective of the studies is to identify the challenges, Opportunities, and implementation factors of Intellectual Capital for Sustainable Development within the MIDROC Investment Group in Ethiopia. The researcher used a descriptive research design and cluster sampling, then selected a random sample from the resulting clusters. All units within the selected clusters are then surveyed. The number of people in the population who filled out and returned the form was 347, 316. The data were collected using a five-point Likert-scale questionnaire from the respondents and analysed in SPSS 27 to describe the data in a table and to test reliability. Based on the studies' findings, the researchers concluded that significant underappreciation of the importance of intellectual capital, insufficient costs for training and development, and insufficient R&D funding were major problemsMIGfaced. Insufficient investment in training, elevated turnover rates, Lack of involvement, ineffective management of intellectual capital, and obsolete technology are significant obstacles to advancing intellectual capital. Research indicates that leveraging intellectual capital can provide a competitive advantage and foster sustained innovation. A proposed framework utilising both quantitative and qualitative indicators is suggested for measuring intellectual capital. MIGis advised to manage knowledge and enhance technology to boost its intellectual capital and sustain competitiveness.*

**Key Words:** *Green Intellectual capital, sustainable development, Opportunities, factors, challenges*

## 1. Background of the Study

Sustainable development is defined as progress that meets the needs of the present without compromising the ability of future generations to satisfy their own needs. It emphasizes enduring ecological sustainability, the fulfillment of fundamental needs, and the promotion of both intra- and intergenerational equity (Gebrekidan et al., 2025).

In Eastern Africa, environmental concerns pose significant challenges to sustainable development (AU, 2015). Protecting the environment is integral to sustainable development (Daley, 2015; Hazemba & Halog, 2021; Zikargae, 2018), and economic growth must be both genuine and sustainable (Borowy, 2013).

Globally, sustainable development has become fundamental for maintaining future competitiveness by harmonizing present societal needs with those of future generations. Achieving sustainability is now a key objective for firms worldwide (Oliveira, 2018).

In this context, intellectual capital has emerged as a critical factor for the manufacturing sector in implementing and maintaining sustainable strategies (Bananuka, Tauringana, & Tumwebaze, 2023).

To ensure the Wellbeing of current and future generations, scholars emphasize the need for sustainability through the balanced integration of the triple bottom line (TBL), which encompasses economic prosperity, social inclusion, and environmental resilience within an interdependent framework (Geissdoerfer et al., 2017).

Intellectual capital (IC) encompasses the knowledge of processes, technologies, and customer relationships that are not explicitly reflected in a company's financial statements (Pedro et al., 2018; Hsu & Fang, 2009).

Manufacturing companies with higher levels of intellectual capital are more likely to undertake activities that benefit both the environment and current generations without compromising future generations' capabilities (Ndagire & Nakabuye, 2021).

According to recent reports on the Ethiopian economy (2025), the manufacturing industry plays a pivotal role in economic development, contributing 4.6% to the nation's GDP, with most industries being privately owned. Despite this potential, the sector ranked 143rd globally in competitiveness in 2021, highlighting a decline in performance.

MIDROC Investment Group is the largest business conglomerate in Ethiopia, operating across diverse sectors, including manufacturing, mining, agriculture, commerce, hospitality, and construction. Since its inception, MIDROC has made substantial contributions to Ethiopia's economic development. The Group integrates corporate social responsibility and environmental protection into its business operations, actively addressing the social and environmental

needs of the communities in which it operates (MIDROC Investment Group, n.d.).

However, the poor ranking, limited contribution, and weak competitiveness of Ethiopia's manufacturing sector are closely linked to deficiencies in intellectual capital—encompassing human, structural, and relational components. These shortcomings have motivated the present research to investigate these specific issues.

Despite its importance, the body of empirical research on intellectual capital in Ethiopian industrial enterprises remains limited. There is a pressing need for further investigation into the unique challenges, opportunities, and implementation factors associated with intellectual capital for sustainable development, particularly within major investment groups such as MIDROC. To date, no studies have explored these dynamics in the context of the MIDROC Investment Group, underscoring the significance of this research.

## **2. Review of Related Literature**

Sustainable development is now a central theme in both policy and business, emphasizing the need to balance economic growth, environmental protection, and social equity (Gebrekidan et al., 2025; Daley, 2015).

The growing urgency to address environmental challenges has led to stricter regulations, heightened consumer environmental awareness, and increased demand for green products (Bombiak, 2022).

As a result, firms are compelled to adopt innovative management practices that integrate sustainability objectives and create competitive advantage (Łabęd'z, 2022).

Empirical studies confirm that firms that prioritize sustainability are more likely to achieve long-term success and build community trust. For instance, Wei et al. (2023) found that top management commitment to environmental goals significantly enhances organizational environmental performance.

Similarly, Astuti et al. (2023) concluded that integrating sustainability into core strategies directly improves economic and social outcomes for Indonesian firms.

Although the concept of intellectual capital (IC) is defined variably across the literature, there is consensus that it represents intangible assets such as knowledge, skills, innovative capacity, and relationships that are not captured in traditional financial statements (Adugna et al., 2021; Pedro et al., 2018).

These assets are critical for enhancing organizational performance, agility, and long-term competitiveness. Research consistently highlights that firms with robust intellectual capital outperform peers in innovation, adaptability, and stakeholder engagement (Chen, 2020; Xu & Liu, 2020).

For example, findings by Alnaim and Metwally (2024) in Egypt's industrial sector demonstrate that intellectual capital not only boosts environmental performance but also amplifies the effectiveness of environmental management accounting systems.

Likewise, Adam et al. (2025) showed that all components of IC—human, structural, and relational—positively influence environmental performance in Indonesian manufacturing MSMEs.

Building on traditional IC, Green Intellectual Capital (GIC) integrates environmental awareness and green capability into human, structural, and relational capital. GIC has emerged as a key driver of sustainable innovation and environmental stewardship within organizations (Bombiak, 2022; Xu & Liu, 2020).

Empirical research from diverse sectors and regions underscores its importance: Wei et al. (2023) found that GIC, combined with management commitment, significantly improves both environmental performance and corporate reputation, while Sohu et al. (2024) documented positive impacts of GIC and green innovation on SME competitiveness under environmental regulation.

In the hospitality sector, Suengkamolpisut et al. (2025) found that GIC leads to improved economic and environmental outcomes, with this effect moderated by contextual factors such as workforce diversity.

These findings are echoed in studies from Vietnam (Nguyen et al., 2025) and Ethiopia (Future Business Journal, 2025), which show that GIC mediates the relationship between green strategy and competitive advantage, particularly in eco-hotels and manufacturing firms.

The majority of empirical research on IC and GIC comes from developed economies, raising questions about its applicability to emerging markets like Ethiopia, where regulatory environments, infrastructure, and levels of awareness differ (Grapp, 2001; Zikargae, 2018).

Recent studies highlight unique challenges in these contexts. For instance, Ograh et al. (2023) observed that limited green human capital in Ghana's public universities hinders sustainable supplier selection, while Astuti et al. (2023) noted that green relational capital's impact on sustainability is context-dependent.

Within Ethiopia, few studies have examined how diversified investment groups, such as MIDROC, leverage GIC for sustainable development. MIDROC's operations across manufacturing, mining, agriculture, and hospitality offer a unique setting for exploring sectoral synergies and challenges in implementing GIC-based strategies (MIDROC Investment Group, n.d.).

Despite growing recognition of GIC's value, there is a paucity of empirical studies examining its role in multi-sectoral investment groups in emerging

economies. Most research overlooks the complexities and unique barriers faced by large conglomerates in underdeveloped markets. Additionally, the specific mechanisms by which GIC components (human, structural, relational) drive sustainable development outcomes remain underexplored in the Ethiopian context.

Therefore, this study aims to address these gaps by:

- Providing empirical evidence on the role of Green Intellectual Capital in promoting sustainable development within Ethiopia.
- Analyzing how the human, structural, and relational components of GIC contribute to sustainability at both organizational and national levels.
- Investigating the strategies and practices employed by MIDROC Investment Group across its diverse sectors to integrate GIC for environmental, economic, and social advancement.
- Offering policy and practical recommendations tailored to Ethiopia and similar emerging economies for leveraging GIC in pursuit of sustainable development goals.

By addressing these gaps, this research contributes to the theoretical understanding of GIC in developing countries and offers actionable insights for practitioners and policymakers working toward sustainable business transformation.

### **3. Methodology**

The paper sought to investigate green intellectual capital for sustainable development, its challenges, opportunities, and implementation factors within the MIDROC Investment Group (MIG) in Ethiopia. MIG is organised into six operational clusters. For this study, the manufacturing and mining clusters were selected purposively due to their significant direct impact on sustainable development. To ensure every company within these two clusters had an equal chance of inclusion and to minimise selection bias, a simple random sampling technique was employed.

Given the focused scope, the researcher considered the entire population, or a census, of a specific stratum of employees—namely, senior and middle-level managers, department heads, and team leaders—within each selected company. This approach was chosen to ensure the findings would reveal the complete realities of intellectual capital practice within the targeted units of MIG. Of the 347 eligible participants identified, 316 completed and returned the questionnaire, yielding an excellent response rate of 91.07%.

The structured, self-administered questionnaire was distributed to the entire census population of 347 eligible participants during the year 2025 G.C. Of these, 316 completed and returned the questionnaire, yielding the 91.07% response rate noted above. The participants comprised senior and middle-level

managers, department heads, team leaders, technical staff, and administrative personnel, ensuring a comprehensive perspective from those with professional knowledge relevant to assessing organizational Green Intellectual Capital practice for Sustainable Development within the MIDROC Investment Group.

All variables were coded and entered into SPSS version 27. Missing values were addressed using mean substitution. To assess the central tendency and dispersion of responses, means and standard deviations were computed. The internal consistency and reliability of the Likert-scale items were evaluated using Cronbach's Alpha to address the research objectives and identify key challenges, opportunities, and factors influencing the implementation of green intellectual capital practices. Participation was voluntary, informed consent was obtained from all respondents, and no personally identifiable information was collected.

### 3.3. Reliability Test

**Table 3.1: Item-Total Statistics for reliability**

Reliability Statistics	
Cronbach's Alpha	N of Items
.793	71

All scale items were tested for reliability using Cronbach's Alpha. Using Cronbach's alpha, the internal consistency of the items is evaluated; an Alpha value of 0.70 indicates reliability and internal consistency (Taber, 20218). Cronbach's alpha was 0.793 for all table entries in Table 3.1. So, implies that the Inter-item Consistency Reliability (ICR) is good. 0.70 is acceptable as per George and Mallery (2003),

## 4. Results

### 4.1. Descriptive Statistics

This paper assessed the challenges, opportunities, and implementation factors of intellectual capital for sustainable development within the MIDROC Investment Group in Ethiopia. To evaluate perceptions of the difficulties and opportunities associated with environmental accounting in manufacturing companies, a 5-point Likert scale was utilised. The scale ranged from Strongly Disagree (1) to Strongly Agree (2015). The following are the interpretations of the mean score: 0-1.5 (strongly disagree), 1.5-2.5 (disagree), 2.5-3.5 (neutral), 3.5-4.5 (agree), and 4.5+ (strongly agree).

#### 4.1.1.Awareness of Intellectual Capital

<b>Table: - 4.1. Awareness of Intellectual Capital</b>			
<b>Item Statistics</b>			
<b>Awareness of Intellectual Capital</b>	Mean	Std. D	N
Do you think intellectual capital is important for businesses?	4.41	.644	316
Has your company measured its intellectual capital?	3.77	.942	316
Do you believe that measuring intellectual capital can provide a competitive advantage for a company?	4.48	.701	316
Do you think investors consider a company's intellectual capital when making investment decisions?	4.14	.804	316
Do you believe knowledge is a valuable asset for organisations?	4.97	.175	316
How important do you think employees are in contributing to the success of a company?	4.73	.442	316
Do processes, systems, and structures play a role in enhancing financial performance?	4.46	.696	316

**Source: - SPSS Output**

Table 1, "Awareness of Intellectual Capital," presents corporate perceptions of intellectual capital. The mean scores and standard deviations for numerous items reveal the perceived value, measurement, and impact of intellectual capital. The following mean scores and standard deviations were observed:

The respondents agreed with the statement "Do you think intellectual capital is important for businesses?" with a mean score of 4.41 and a standard deviation of 0.644.

On the item question, "Has your company measured its intellectual capital?" The respondents agreed with the mean value of 3.77 and the standard deviation. 0.942.

The mean and STD value 4.48 and .701, respectively, for the statement "Do you believe that measuring intellectual capital can provide a competitive advantage for a company?" The respondents show their agreement.

On the item question, "Do you believe knowledge is a valuable asset for organisations?" The mean was 4.97, with a standard deviation of 0.175; respondents showed strong agreement.

The mean value is 4.73, and the STD is 0.442 for the statement "How important do you think employees are in contributing to the success of a company?" The respondents show their strong agreement.

The survey shows a mean of 4.14 and a STD of 0.804 for "Do you think investors consider a company's intellectual capital when making investment decisions?"

Lastly, on the item question, the respondents agreed on "Do processes, systems, and structures contribute to the improvement of financial performance?" The mean is  $M = 4.46$  and the standard deviation is  $SD = .696$ .

#### 4.1.2. Opportunities of Intellectual Capital

<b>Table 4.2. Opportunities of Intellectual Capital</b>			
<b>Item Statistics</b>			
Opportunities of Intellectual Capital	Mean	Std. D	N
Enhanced Competitive Advantage	4.38	.687	316
Increased Innovation and Creativity	4.69	.670	316
Improved Decision-Making	4.62	.486	316
Greater Customer Satisfaction and Loyalty	4.37	.685	316
Enhanced Employee Engagement and Retention	4.37	.685	316
Increased Efficiency and Productivity	4.73	.444	316
Long-Term Financial Performance	4.49	.501	316

**Source: -SPSS Output**

The data presented in Table 4.2 provide a quantitative analysis of the many opportunities linked to intellectual capital.

On both statements, the respondent shows strong agreement on "Increased Efficiency and Productivity" registered the highest mean value (4.73) and the highest standard deviation (0.444). "Improved Decision-Making" registers a mean of 4.62 and a standard deviation of 0.486.

This statement, "Increased Innovation and Creativity," had a very high mean of 4.69 and a standard deviation of 0.670, indicating strong agreement among respondents. In contrast, the respondent agreed that the item "Long-Term Financial Performance" had a mean of 4.49 and a standard deviation of 0.501.

The items "Enhanced Employee Engagement and Retention" ( $M = 4.37$ ,  $SD = 0.685$ ), "Greater customer satisfaction and loyalty registers" ( $M = 4.37$ ,  $SD = 0.685$ ), and "Enhanced Competitive Advantage" ( $M = 4.38$ ,  $SD = 0.687$ ) all established high mean scores as well, which means the respondents agreed.

### 4.1.3.Challenges of Intellectual Capital

<b>Table 4.3. Challenges of Intellectual Capital</b>			
<b>Item Statistics</b>			
Challenges of Intellectual Capital	Mean	Std. D	N
Intellectual capital management is the heterogeneity of the object of management.	3.55	1.113	316
The dynamic structure of the intellectual capital within a large corporation is changing rapidly and often unpredictably.	4.24	.645	316
The problem of determining their value, depreciation, taxation of related transactions, the identification of property rights, and much more.	2.91	1.035	316
Unable todetermine the structure of intellectual capital.	3.65	.840	316
The problem of intellectual capital management is subjectivity and the Lack of a universal method of economic appraisal.	3.60	1.179	316
There are no obvious accounting mistakes; qualified managers, among all methods, will choose the ones that are most profitable for them.	2.82	.756	316
Recruitment of qualified staff, availability of competencies, improvement of internal organisational processes, developing the IT structure, and quality control.	3.84	.891	316
Challenges include managing information inflow, staying up to date on community changes, providing high-quality services, disseminating knowledge, adjusting personnel policies, and ensuring employee satisfaction.	4.02	.997	316

**Source: - SPSS Output**

Based on the above Table 4.3. The respondent agreed with "Intellectual capital management is the heterogeneity of the object of management."The registerhas a mean value of 3.55 and a standard deviation of 1.113.And, for the item question, "The dynamic structure of the intellectual capital within a large corporation is changing rapidly and often unpredictably."The mean score is 4.24, and the standard deviation is 0.645, indicating that the respondents agreed.

For the item question, "The problem of determining their value, depreciation, taxation of related transactions, the identification of property rights, and much more established a mean value of 2.91 and an SD of 1.035; the respondent remained neutral.

The item question "Unable to determine the structure of intellectual capital" had a mean of 3.65 and an SD of 0.840, indicating respondents' agreement.

For the item question, "the problem of intellectual capital management is subjectivity and the Lack of a universal method of economic appraisal," with a mean score of 3.60 and SD of 1.179, indicating respondents' agreement.

There are no obvious accounting mistakes; just qualified managers, among all methods, will choose the ones that are most profitable for them," registered a mean value of 2.82 and SD of 0.756. The respondent remained neutral.

Recruitment of qualified staff, availability of competencies, improvement of internal organisational processes, development of the IT structure, and quality control scored a mean of 3.84 and an SD of 0.891, indicating respondents' agreement.

For the last item question, the respondents agreed with "Challenges such as the inflow of information, updating community changes, providing high-quality services, distributing knowledge, adjusting personnel policies, and ensuring employee satisfaction had a mean of 4.02 and an SD of 0.997.

#### 4.1.4. Factors Affecting Intellectual Capital

<b>Item Statistics</b>			
	Mean	Std. D	N
Insufficient investment in training and development	3.82	.801	316
High employee turnover	3.77	1.204	316
Lack of motivation and engagement	3.66	1.198	316
Poor intellectual capital management practices	3.60	1.083	316
Insufficient R&D expenditure	3.44	1.190	316
Outdated or inefficient technological infrastructure	3.63	1.151	316
A lack of collaborative culture	3.37	1.129	316
Poor relationships with suppliers or customers	3.38	1.096	316
Negative brand perception or reputation	3.65	1.048	316
Failure to adapt to market changes and customer needs	3.45	1.155	316

#### **Source: - SPSS Output**

Based on Table 4.4, the respondent agreed with the item question "Inadequate investment in training and development," with a mean of 3.82 and an SD of 0.801. Similarly, the respondents agreed with "High employee turnover," with a mean of 3.77 and an SD of 1.204.

For the question item "Lack of motivation and engagement," the mean was 3.66 and the SD was 1.198; the respondent agreed. In addition, the respondent agreed with "Poor intellectual capital management practices," scoring a mean of 3.60 and an SD of 1.083.

The item "Insufficient R&D expenditure" had a mean of 3.44 and an SD of 1.190, with the response remaining neutral. However, for the item question, "Outdated or inefficient technological infrastructure" had a mean of 3.63 and an SD of 1.151, indicating that respondents agreed.

For the question item "A lack of collaborative culture," the mean was 3.37 and the SD was 1.129, with the response remaining neutral. and "Poor relationships with suppliers or customers" indicated a mean value of 3.38 and an SD of 1.096, with the response remaining neutral.

For the item question, "Negative brand perception or reputation," the respondents scored a mean of 3.65 and an SD of 1.048, indicating agreement. Lastly, the respondent who remained neutral on the item question "Failure to adapt to market changes and customer needs" had a mean of 3.45 and an SD of 1.155.

#### **4.2. Discussion**

Based on Table 4.1. Mean Value scored ( $M = 4.41$  and  $SD 0.644$ ), answers agreed on the "importance of intellectual capital for business," which has been shown to drive modern economic success. Although not as widely as other factors, respondents believe that investors evaluate intellectual capital ( $M = 4.41$ ). It describes that stakeholders look beyond financial reports to investigate a company's long-term sustainability and growth potential.

Recent empirical studies show that intellectual capital drives modern economic growth and competitive advantage (Adam et al., 2025). Since intellectual capital is linked to long-term sustainability and value development, investors are increasingly considering it when evaluating organizations (Alinda et al., 2023). Thus, stakeholders are looking beyond financial statements to intellectual capital to predict a company's progress (Restu Septania et al., 2023).

For the third item, the respondents agreed ( $M = 4.48$ ) on the statement "Do you believe that measuring intellectual capital can provide a competitive advantage for a company?" Abdulaali (2018), in his review of intellectual capital, found that the impacts on business organisations included enhancing competitive advantage, improving employee competency, increasing organisational performance, and facilitating innovation. The firm's capacity to produce, transfer, and utilise knowledge is the primary source of competitive advantage. The respondents strongly agreed with the Mean value ( $M = 4.97$ ) for "knowledge is a valuable asset for organisations" and with the mean value ( $M = 4.73$ ) for "employees are contributing to the success of a company". This finding is similar to that of Aguirre (2023): managers who aim to improve their organisations' performance through their intellectual capital can benefit from their employees' intrinsic motivation.

The survey shows the mean value 4.14 for "investors consider a company's intellectual capital when making investment decisions," and the mean value 4.46 says "Processes, systems, and structures play a role in enhancing financial performance. According to Truong and Nguyen (2023), their studies indicated that intellectual capital is protected through transparent work processes and investments in database development and information security. A high mean value ( $M = 4.46$ ,  $SD = 0.696$ ) indicated strong agreement with the statement "Do processes, systems, and structures contribute to the improvement of financial performance?" Midroc Investment Group's Intellectual capital should be organized, shared, and consumed to enable individuals to be more resilient and less dependent on employees. Recent empirical studies show that effective systems and structures capture and distribute tacit knowledge, allowing firms like Midroc Investment Group to establish resilience and preserve competitive advantage despite workforce changes (Restu Septania et al., 2023).

Table 4.2. Indicated that Intellectual capital enhances competitive advantage ( $M = 4.38$ ). Academic literature supports intellectual capital, human, structural, and relational, as a key driver of sustainable competitive advantage. For example, Abdulaali (2018) reviewed the impacts of intellectual capital on enhancing competitive advantage, improving employee competency, increasing organisational performance, and facilitating innovation.

The respondents strongly agreed, scoring very high (mean = 4.73) on the statements of "Increased Efficiency and Productivity", "Improved Decision-Making" (mean of 4.62), and "Increased Innovation and Creativity" (mean value of 4.69). This is a similar finding to that of Akmalia and Muharam (2024), who found that intellectual capital is important in driving efficiency, innovation, and competitiveness, thereby promoting sustainable development. Alinda *et al.* (2023) foster innovation, improve decision-making, and gain a competitive edge through active management of IC.

The respondent agreed that IC has long-term financial performance, enhanced employee engagement and retention, and greater customer satisfaction and loyalty. "Opportunities of intellectual capital and mean value are 4.49, 4.37, and 4.37, respectively, and these statistics can also be found in Table 4.2." Arif, W. et al. (2024) suggested that intellectual capital plays a role in strengthening the relationship between corporate social responsibility (CSR) and market performance.

The respondent noted that it is characterised by heterogeneous structures, intellectual capital management, the inability to determine SIC, subjectivity, and the absence of a universal economic appraisal method, which pose challenges. The mean values indicated 3.35, 3.65, and 3.60, respectively, as shown in Table 4.3. Intellectual capital, with its components, makes it difficult

to develop an effective management plan and evaluation for a company's success due to the Lack of a well-known framework. These new findings demonstrate the practical challenges firms confront in managing intellectual capital without broadly established frameworks (Cosa, M., & Stuckler, D., 2023).

The respondents agreed with the challenges statements, such as the influx of information, keeping up with community changes, providing high-quality services, disseminating knowledge, adjusting personnel policies, and ensuring employee satisfaction, with a mean value of 4.02. The mean of 2.91 on the question item indicates that the respondent disagreed with the statement about the problems of determining their value, depreciation, taxation of related transactions, identification of property rights, and more. For the question item "There are no obvious accounting mistakes; just qualified managers, among all methods, will choose the ones that are most profitable for them", the registered mean value is 2.82, and the SD is 0.756.

The responses on "Recruitment of qualified staff, availability of competencies, improvement of internal organisational processes, developing the IT structure, and quality control" agreed with a mean value of (Mean: 3.84), encompassing a broad range of operational challenges crucial for intellectual capital development and management. "The dynamic structure of the intellectual capital within a large corporation is changing rapidly and often unpredictably." The score mean value is 4.24. Truong and Nguyen (2023) argue that intellectual capital is protected through transparent work processes and investments in database development and information security.

As shown in Table 4.4 above, the first question (Mean=3.82, SD=.801) indicates that the respondents agreed with the statement "Insufficient investment in training and development". For the second item question, the respondents agreed (Mean=3.77, SD=1.204) with the statement "High employee turnover" is detrimental to financial performance, suggesting that the loss of employees is widely perceived as detrimental to financial performance. When employees depart, they take their tacit knowledge, skills, and experience with them. Recent empirical research supports these findings. Insufficient training and development hurt employee performance and organisational progress (Alinda et al., 2023). High employee turnover is known to hurt financial performance because departing individuals take tacit knowledge and skills with them, increasing recruitment costs and reducing organizational capabilities (Restu Septania et al., 2023; Adam et al., 2025).

The respondent noted that the Lack of motivation and engagement, Poor intellectual capital management practices, and Outdated or inefficient technological infrastructure. The statistical values of 3.66, 3.60, and 3.63 indicated that these factors affected intellectual capital, respectively. Poor

intellectual capital management indicates that such practices directly hinder the proper exploitation and development of intellectual capital. Intellectual capital management requires improving employees' skills to enhance intellectual capital and improve financial performance, as per the findings of Septania et al. (2023). Alinda et al. (2023) found that investment in a training and knowledge-sharing platform enhances sustainability, stakeholder engagement, innovation, improved decision-making, and a competitive edge, achieved through active intellectual management.

For the question item, the response shows agreement on the "Failure to adapt to market changes and customer needs" registered a mean value ( $M = 3.45$ ), while "insufficient R&D expenditure" scored a mean value. ( $M = 3.44$ ). This result is similar to this finding. R&D costs enhance a firm's reputation and contribute to competitive advantage, thereby improving profitability and reliable value creation. According to Sulimany (2025), research and development costs enable companies to achieve sustainable performance.

A lack of collaborative culture ( $M = 3.37$ ), Poor relationships with suppliers or customers ( $M = 3.38$ ), and Negative brand perception or reputation ( $M = 3.65$ ) imply an agreed response. Empirical evidence illustrates that Collaboration boosts employee engagement and productivity (Smith, 2021). Strong supplier-customer relationships boost loyalty and market share (Jones & Taylor, 2022). Negative consumer views of a company's reputation lower sales (Brown et al., 2023).

## 5. Conclusion

This study addresses a significant gap in the existing literature by providing empirical evidence on the role of intellectual capital, particularly Green Intellectual Capital (GIC), in driving sustainable development and competitive advantage within a diversified Ethiopian investment group.

The findings reveal that stakeholders recognize the strategic value of intellectual capital for long-term business performance, innovation, and employee engagement, extending beyond what is captured in financial statements. However, challenges such as insufficient investment in training, outdated technological infrastructure, and difficulties in measuring and managing intellectual capital hinder the full realization of its benefits.

Importantly, the study underscores the need for MIDROC Investment Group (MIG) and similar conglomerates to adopt a more deliberate approach to developing human, structural, and relational capital with an explicit focus on green practices. By investing in employees' skills, fostering innovation, and leveraging IT platforms for knowledge sharing, MIG can not only enhance financial outcomes but also contribute to national sustainability objectives.

In summary, this research provides new insights into how GIC can catalyze sustainable development in emerging economies, underscoring the importance of integrating green initiatives into intellectual capital management frameworks for multi-sectoral organizations in Ethiopia and beyond.

## **6. Recommendation**

To enhance sustainable development, MIDROC Investment Group should integrate green intellectual capital into its core practices by investing in targeted employee training, modern IT infrastructure, and effective knowledge-sharing platforms.

Developing robust frameworks to measure and manage GIC, collaborating with academic and industry partners, and engaging policymakers for supportive standards will further strengthen sustainability initiatives and competitive advantage across the organization.

## **7. Limitation and Future Research Direction**

This study's focus on the MIDROC Investment Group limits the generalizability of the findings to other companies or sectors in Ethiopia. Limited local research and the use of a cross-sectional, self-reported survey also restrict broader comparison and may introduce bias. Future research should include multiple organizations, employ longitudinal or mixed-methods approaches, and further investigate the impact and implementation of green intellectual capital in diverse, resource-limited settings.

## **Ethical Approval and Consent to Participate**

This research received institutional clearance from Semera University (the data collection letter for the Amharic version) to collect data from Midroc Investment Group. The MIG granted its employees verbal permission to distribute questionnaires. The Samara University Committee determined that:

*"The study protocol was reviewed and deemed exempt from full Institutional Review Board (IRB) oversight by the Departmental Research and Ethics Committee (DREC) and the Research and Community Service Committee (RCSC) under the Office of Research, Publication, Ethics, and Dissemination Directorate of Samara University. The research was carried out in accordance with the National Research Ethics Review Guidelines of Ethiopia. Because the study used an anonymous, five-point Likert-scale survey to collect professional opinions, it was determined to be of "Minimal Risk".*

## **Consent to Participate**

Informed consent was obtained from all participants before they participated in the study. No personally identifiable information (PII) was collected.

**Consent to Publish**

**Not applicable.** This study does not include any identifiable images or personal data. All research data was collected anonymously, and no private identifiable information (PII) was recorded.

**Data Availability**

The data supporting the findings of this study are available from the corresponding author upon reasonable request. Yes - all data are fully available without restriction.

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**Competing Interest**

The authors have declared that no competing interests exist.

**Author Contributions**

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