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ABSTRACT – SOMMARIO

The construction sector in Ethiopia is an important contributor to the national transformation but has been impacted by a VUCA environment characterized by currency devaluations, supply chain disruptions, and post-conflict recovery challenges. Despite high investment, the sector faces a human capital gap driven by rigid leadership and a failure to foster psychological safety. The objective of this paper is to present a systematic review that synthesizes recent research on leadership competency and applied workforce upskilling to create a resilient industry in today's evolving Ethiopian construction sector. Following the PRISMA 2020 protocol, a systematic search of 326 records was completed, yielding 14 eligible records.There is a clear transition to adaptive leadership grounded in emotional intelligence (EI), crisis communications, and strategic foresight. This requires "leadership agility" - the combination of cognitive flexibility and emotional stability required to navigate institutional complexity and interpret ambiguous crisis signals. At the workforce level, a significant implementation gap exists within the national skill development system. There is a critical need to develop digital literacy (BIM) and green construction competencies to remain globally competitive. Through data synthesis, it was found that the evolution of managerial skills under high complexity directly implies the acquisition of "soft skills"—specifically conflict resolution and work ethics capabilities—alongside "Human Capital Agility." This synthesis underscores the urgent imperative that the workforce at all levels must be equipped to adapt in real time to severe macroeconomic market shocks.The findings indicate that human capital (specifically endogenic factors like managerial attitudes and cognitive capacity) is the critical factor determining construction resilience in Ethiopia. Strategic recommendations include mandating a Ministry of construction "Adaptive Leadership" certification program for Grade-1 to Grade-3 contractors, establishing a national construction skills council, implementing a competency-based training model to close the industry linkage gap, subsidizing digitization and green HRM practices and transitioning employers from a cost-minimization mindset to treating workers as strategic assets. These structural supports, including the establishment of an "upskilling insurance" fund for bridge training, are crucial for protecting the labour market from the volatility of the construction cycle.

Il settore delle costruzioni in Etiopia è un importante contributore alla trasformazione nazionale, ma è stato influenzato da un ambiente

VUCA caratterizzato da svalute, interruzioni della catena di approvvigionamento e sfide di ripresa post-conflitto. Nonostante gli elevati investimenti, il settore si trova ad affrontare un divario di capitale umano dovuto a una leadership rigida e al fallimento nel promuovere la sicurezza psicologica. L'obiettivo di questo articolo è presentare una revisione sistematica che sintetizzi ricerche recenti sulla competenza di leadership e sull'applicazione delle competenze della forza lavoro per creare un'industria resiliente nell'attuale settore edile etiope, in evoluzione. Seguendo il protocollo PRISMA 2020, è stata completata una ricerca sistematica di 326 registri, che ha prodotto 14 record idonei.C'è una chiara transizione verso una leadership adattiva basata sull'intelligenza emotiva (IE), la comunicazione di crisi e la lungimiranza strategica. Questo richiede "agilità di leadership" - la combinazione di flessibilità cognitiva e stabilità emotiva necessaria per affrontare la complessità istituzionale e interpretare segnali ambigui di crisi. A livello della forza lavoro, esiste un significativo divario nell'implementazione all'interno del sistema nazionale di sviluppo delle competenze. È fondamentale sviluppare competenze di alfabetizzazione digitale (BIM) e di costruzione verde per rimanere competitivi a livello globale. Attraverso la sintesi dei dati, è stato scoperto che l'evoluzione delle competenze manageriali ad alta complessità implica direttamente l'acquisizione di "soft skills"—in particolare capacità di risoluzione dei conflitti ed etica del lavoro—insieme all'"Agilità del Capitale Umano". Questa sintesi sottolinea l'imperativo urgente che la forza lavoro a tutti i livelli debba essere attrezzata per adattarsi in tempo reale a gravi shock macroeconomici di mercato. I risultati indicano che il capitale umano (in particolare fattori endogeni come atteggiamenti manageriali e capacità cognitiva) è il fattore critico che determina la resilienza costruttiva in Etiopia. Le raccomandazioni strategiche includono l'imposizione di un programma di certificazione "Leadership Adattiva" dal Ministero delle Costruzioni per appaltatori di grado 1 a 3, l'istituzione di un consiglio nazionale per le competenze edilizie, l'implementazione di un modello di formazione basato sulle competenze per colmare il divario di collegamento con l'industria, il sovvenzionamento alla digitalizzazione e alle pratiche di HRM verdi e la transizione dei datori di lavoro da una mentalità di minimizzazione dei costi a un trattamento dei lavoratori come risorse strategiche. Questi supporti strutturali, inclusa l'istituzione di un fondo di "assicurazione per l'aggiornamento delle competenze" per la formazione sui ponti, sono fondamentali per proteggere il mercato del lavoro dalla volatilità del ciclo costruttivo.

Keywords: Ethiopian Construction Industry, VUCA, Human Capital, Adaptive Leadership, Skill Portability, Workforce upskilling, Project Resilience

1 – Introduction

1.1 – *The Macro-Economic Significance of the Ethiopian CONSTRUCTION Sector*

The construction sector in Ethiopia is responsible for driving national transformation physically and economically. In recent years, Ethiopia has been allocating large percentages of its GDP toward developing infrastructure, which demonstrates its commitment to transitioning from low income to lower middle-income status as an industrialized country. As noted by Bekele and Mahesh (2024), however, this growth of the sector is often limited due to "endogenous factors" such as the capabilities of small and medium-sized construction contractors. These contractors are challenged to meet the same standards of quality and productivity as larger contractors. Although there are tangible results of the work being done in the form of roadways, dams, and high rise structures, it can be argued that the human capital reserves required to support them are weak (Kebede *et al*., 2024). Global management research has noted that human and intellectual capital acting as a structure buffers to absorb shocks from large-scale environmental changes is dependent upon their ability to adapt to changing conditions (Giancotti & Mauro, 2020).

Currently, the construction sector is undergoing a major transition. Following several years of growth, the industry must balance the need for post-conflict rebuilding efforts with competing globally.

According to Desta and Msengana (2025), while previously the successful implementation of the country's infrastructure goals was contingent upon funding, today the success of goals is also contingent upon the resilience of project management and execution systems.

1.2 – *Defining the VUCA Landscape in Ethiopia*

The current worldwide business environment is commonly depicted using the four dimensions of VUCA: Volatility, Uncertainty, Complexity, and Ambiguity. These dimensions are far from being theoretical constructs for the Ethiopian case; they are a reality for most businesses every day.

a – *Volatility*: The construction sector has experienced large and frequent changes in prices due to disruptions in global supply chains and local currency devaluation. Belay *et al*. (2021) argue that this level of volatility necessitates a "Crisis Management" paradigm to become standard practice rather than an intermittent need. As further supported by Desta *et al*. (2025) , the ability of an organization to maintain functional resiliency during these economic shifts is no longer optional but a core requirement for project survival in the Ethiopian context.

b – *Uncertainty*: The political and social uncertainty resulted for the infrastructure development process to require the highest form of "strategic foresight," as argued by Zarghami & Zwikael (2022), so that long-term investments can be protected from short-term instability.

c – *Complexity*: The involvement of foreign investors (from both Global North countries and China), alongside local laws , creates a legally and operationally complex framework for all parties involved. Syamsir *et al*. (2025) observe that it will require people and culture leadership that can balance and align different stakeholders' expectations to successfully manage multi-party contracts.

d – *Ambiguity*: The ambiguity surrounding how the labor market will evolve in response to rapid technology adoption is the current issue. Kebede *et al*. (2024) note that there exists ambiguity around "employability," since the relationship between formal education and training and the specific needs of each industry continues to remain undefined.

1.3 – *The Human Capital Crisis: Leadership and competency*

It appears that the construction sector in Ethiopia is the primary mechanism to achieve national transformation. However, this potential remains unrealized because of a gaps in implementation, caused by the continued volatility, uncertainty, complexity and ambiguity (VUCA) of its work environment. Although there has historically been a focus on developing the theoretical underpinnings of engineering practice, most large-scale project failures in the country can be attributed to a failure of the operational or practical components of those projects. In their research, Desta & Msengana (2025) stated that success of national infrastructural objectives would depend on the ability of national project management systems to provide resilience.

Historically, the construction industry has placed greater importance on the technical skills of engineers than in developing the managerial and leadership abilities of its personnel. Traditionally, Magallanes *et al*.(2021)) said that bureaucratic leadership styles have existed in Ethiopia. They are not adaptable or flexible enough to succeed in today’s fast-changing VUCA environment. This vulnerability was identified by other researchers, examining SMEs who demonstrated how relationship capital(i.e value built up through an organization’s networks, partnerships, and connections) ; emotional intelligence; and non-technical psychological hardiness were the most important factors associated with successful business survival in times of economic crisis (Principale *et al*., 2025, Bekele & Mahesh, 2024).Recently Syamsir *et al*. (2025) suggested “Leadership Agility” as an effective way to measure the development of a new generation of construction sector leaders who will be able to operate effectively in today’s changing VUCA environment. Leadership agility is defined as moving away from traditional command and control leadership style, to more participatory and collaborative leadership styles.

There is also a growing need for increasing the competency of project managers on conducting risk assessment. The authors, Bitane & Uge (2020), further stated that risk assessments in Ethiopian construction projects are usually conducted only when problems have occurred; whereas it is very important for successfully managing risks in the VUCA environment to be able to identify disturbances which may become project failures in advance. Desta *et al*. (2025), therefore, indicated that self-confidence and taking risks were the most important behavioral characteristics of successfully managed projects in volatile and unpredictable environments. Thus if sufficient numbers of experienced construction industry leaders do not exist who can take action based on data in uncertain conditions, then the construction industry will suffer delays.

A human capital deficit has been affecting the construction sector in Ethiopia since it lacks multidimensional labourers. Since the workers in the Ethiopian construction industry are a valuable resource, they should be regarded as assets rather than simply as tools. A human-centered perspective will be necessary to navigate the increasingly complicated nature of the construction business in 2026, according to Sibhatu *et al*. (2025).There appears to be a large difference in terms of the "brain" of the industry, which includes engineering students who graduate from colleges/universities, and the "hands-on" workforce needed to execute those projects. Addressing this human capital gap requires a synchronized approach to education that integrates both high-level strategy and field-level execution. Much of the ambiguity surrounding the employability of the graduates can be explained by the lack of definition between the education provided by formal educational institutions and the specific skills required by various industries (Kebede *et al*., 2024). The divide between these two groups of people is evident at many different stages of the construction process. Specifically, Mengistu *et al*. (2024) reported that this disparity was most pronounced among construction companies. For example, the undefined roles and limited technical capabilities for planning and executing projects caused significant delays when creating project schedules. At the level of activities in construction companies, learning "what" and "why" is learned while attending school does little to help with understanding how to create your own methods of solving daily problems. In turn, this causes a "rigidity trap" wherein the workforce is unable to adjust to changing infrastructure and technology contexts (Desta *et al*, 2025). Therefore, addressing this issue means revisiting the educational pipeline and emphasizing practical skill development versus pure academic knowledge.

1.4 – *The Human Capital Crisis: Leadership and competency*

The above statement highlights that due to these challenges, a comprehensive shift toward competency-based human capital management is needed to provide the industry with the required "hands" and practical leadership to implement large-scale projects under shifting socio-economic conditions. According to Kebede *et al*., (2024), for this purpose a Work-Integrated Learning (WIL) framework has been proposed across the educational spectrum to ensure that the graduates at all levels are ready for actual construction jobs.

As pointed out by Surikova (2023), upskilling is not just about instructing people how to build; but also "how to build smartly and sustainably" through digital literacy and Green Skills. The workforce that is educated only in highly specialized theoretical concepts relative to some specific type of design cannot physically build it. The workforce does not possess "human capital agility" which enables them to adjust their skill set to reflect the changing demands of the projects they are working on in real time in a VUCA Environment (Sumadireja *et al*., 2025).

According to Abate *et al*. (2026), it is essential for organizations to be agile and resilient during crises. This organizational agility and resilience has been shown to result from workers' abilities to adapt to emerging technologies through competency-based training (CBT) (Alamu, 2026). The Hands-on training approach also enables workers to acquire skills much more quickly than they would be able to through a traditional purely theoretical five-year bachelor's degree. Additionally, the integrated competency model (theory and practice (70/30)) provides the needed strategic flexibility to allow employers to

address the legal and operational issues as described by Syamsir *et al*. (2025). To be successful in today's economy where both currency fluctuations and shifts in global supply chains are occurring at a rapid rate, the construction industry must create functional resiliency and upskill the entire labor hierarchy rapidly.

1.5 – *The Workforce Development Paradox and the Skill Gap*

Ethiopia's applied learning pathways have long been the primary source for providing the larger labor market demands. However, as per Mengistu *et al*. (2024, the governance gap between the strategic goals of the national human capital plan and the operational requirements of private contractors is very large. This is a widespread problem. Kebede *et al*. (2024) note that, in addition to a double- edged skills gap- both advanced technical skills and soft skills-young people entering the workforce must also possess behavioral competencies such as communication, work etiquette, and conflict resolution, as these skills are essential to delivering projects successfully. Mengistu *et al*. (2024) note that the training materials used today are obsolete and fail to reflect modern technologies used in construction.

Building on the governance gap identified above, the vocational and professional development system provides the structural flexibility less common in a traditional five-year university program. Given that living in a time of currency fluctuations and unexpected disruptions in global supply chains , the construction sector needs workers who are able to rapidly upskill using modular formats. As Alamu *et al*. (2026) indicate, competency-based frame works systems provide a model of technical bridging course development, which may be adapted to new products, technologies, and/or new safety procedures within months versus years. Based on Kebede *et al*. (2024), this applied route represents the leading source of workforce upskilling, providing the necessary adaptability to respond to the " volatility " and " uncertainty " associated with the current macroeconomic environment in Ethiopia.

The transitional process of rural youth entering the urban construction industry presents unique socio-economic challenges. Kebede *et al*. (2024) point out that it is necessary for migrating youth to have access to "technical bridging courses" in order to adjust to the high-pressure environment found in main cities' construction sites. Without such intervention, the industry remains dependent on unskilled labour, which negatively impacts productivity and safety.

Consequently, this evaluation prioritizes the "Implementation Gap"—the distance between theoretical design and site execution—as a primary driver of project failure. By focusing on practical human capital development, the industry can foster the resiliency needed to convert complex designs into operational assets within an unstable business environment.

1.6 – *The digital and green frontier*

Ethiopian construction industry will need to address the two emerging challenges of technology and environmental sustainability. Technology has become a necessity; it is mandatory for all building design processes. Building Information Modelling (BIM) is now required. Saka & Chan (2020) identified an enormous "Digital Skill Gap" in Sub - Saharan Africa, noting that site engineers often lacked the ability to use computer-based software such as AI or cloud-based management tools. At the same time, the global transition to sustainability requires a "Green Human Capital" revolution. Sibhatu *et al*. (2025) and the Green Building Council of Ethiopia (2025) are promoting a new competency model that includes energy auditing and sustainable materials management in all construction professional development.

The digital and green frontier is going to require an occupational focus that spans the entire value chain. The technologies of BIM and green materials are commonly treated as elite, office-based skills. However, democratization of "green skills" across all levels of the workforce is essential; otherwise, all the sustainability targets that set at the highest levels will never be implemented on the job site.

However, as Mengistu *et al*. (2024) noted, government regulations and financing changes can create barriers to entry when transitioning from traditional business models to newer technologies without some form of government assistance or structural human capital investment.

The "applied technology paradox" refers to the fact that while both small and medium-sized contractors (SMC's) understand the long-term cost advantages of using Building Information Modelling (BIM) and green technologies, it is difficult for SMCs to establish these new practices due to the high initial costs required to do so. In order to avoid the need for SMCs to enter into the expense of purchasing into proprietary systems, SMCs can immediately make practical use of low-cost, decentralized methods of adoption through making operational adjustments:

a) – *Digital Literacy*: The use of free BIM viewers, smartphone first cloud-based collaboration tools and free software available on already owned smartphones as opposed to highly expensive computer workstations (Saka & Chan, 2020).

b) – *Green Technologies/Skills*: focus trainings on developing workflow-based solutions that reduce waste at the job-site level through lean material optimization; reduce waste on construction sites through locally sourced materials (Bajjou & El Azzouzi, 2024); and obtain local certification rather than obtaining international certification which will be far more expensive.

This strategy builds technical maturity and self-funded resilience without requiring intensive up-front expenditure.

1.7 – *Problem Statement and Rationale for the Review*

Despite the large number of research studies conducted individually on Ethiopian construction, there remains no comprehensive, systematized assessment that bridges the gap between VUCA theory and human capital practice. The construction industry is currently in a "competence vacuum," with older practices failing to meet the needs of modern business while newer practices remain unimplemented at an institutional level. Mengistu *et al*. (2024) suggest "accelerating skills accumulation" within Ethiopia's industrial sectors, but the construction industry does not currently have a clear framework for achieving this objective.

The recognition of applied competency over purely theoretical attainment also indicates the acceptance of what are now "hard" required behavioral skills for projects to survive. Conflict management, ethical behaviour, and team morale are all key components of managing the stakeholders involved in today's complex Ethiopian market-both foreign investors and domestic laws, along with migrant workers in cities. As applied human capital development focuses on developing skills through mentorship it is uniquely positioned to develop these essential traits. The focus on applied skills here represents a way to transition the industry from a rigid command-and-control bureaucracy to the adaptive leadership model; a shift identified by Syamsir *et al*. (2025) as necessary to navigate the VUCA environment and begin the journey from within the first level of the workforce.

Therefore, it is essential that this Systematic Review:

1. Compile all existing research findings related to Leadership Agility and its impact on project outcomes.

2. Evaluate the effectiveness of current workforce upskilling strategies under volatile economic conditions.

3. Determine the competencies required to navigate the VUCA challenges unique to Ethiopia. 4. Evaluate the necessity of "accelerating skills accumulation" through applied, site-level training versus traditional theoretical engineering to develop industry-wide VUCA resilience.

1.8 Objectives and Scope

The purpose of this review is to present a complete evaluation of the 14 selected studies identified using the PRISMA 2020 protocol. These studies were evaluated for their effectiveness within three key areas, namely, adaptive leadership, workforce resilience, and technological integration. The findings from these

studies represent the time period after the pandemic. Therefore, the recommendations developed by this study reflect the current socio-economic situation in Ethiopia.

The results of the studies identified and examined via SEM (Structural Equation Modelling), such as Desta *et al*. (2025), and the qualitative knowledge gleaned from policy briefs such as Mengistu *et al*. (2024), will enable this review to develop a strategic framework to guide policy makers, contractors, and other educational institutions in developing an effective and sustainable human capital system in order to thrive in the VUCA era.

2 – Methods (PRISMA 2020 Steps)

The methods used in this systematic review were managed using the PRISMA 2020 guidelines to provide a transparent, reproducible, and academically rigorous basis for a systematic approach to identifying how human capital development intersects with the dynamic socioeconomic environment of Ethiopia. The systematic process was developed as a way to establish a mapping relationship between human capital development and the construction sector. To accomplish this goal, the study utilized a structured search/selection strategy to filter from an original set of 326 records to a group of 14 peer-reviewed, high-quality articles addressing the themes of leadership and upskilling in the construction sector. According to Desta & Msengana (2025), there is a need for systematic reviews in the Ethiopian context to synthesize the disparate data regarding project resilience. Furthermore, because the PRISMA guidelines have been developed as a framework for conducting systematic reviews, it allowed for identifying those "endogenic factors" that impact contractor competency highlighted by Bekele & Mahesh (2024). A multi-stage process of title/abstract/full-text screening was employed to ensure the inclusion of only peer-reviewed, relevant, contextually based information that would be used for quantitative synthesis.

2.1 – *Eligibility Criteria (PICOS)*

A focus was kept throughout the entire process, of the Review on the Special Challenges presented by the "VUCA" Era in Ethiopia; therefore, specific Inclusion/Exclusion Criteria were defined for each aspect of the study using the Framework of PICOS (Population, Intervention, Context, Outcome, and Study Design) — thereby ensuring the study stayed focused on Human Capital and Managerial Agility, rather than on the general engineering technical aspects of projects.

The *population* comprises professional stakeholders working in the Ethiopian construction industry such as project managers, site engineers, human resource practitioners, and workforce educators. This emphasis is based on evidence that their leadership style directly relates to the success rates of projects being completed in both Addis Ababa and beyond. Therefore, any studies that involve unrelated industries, i.e., healthcare or finance, have been excluded.

Intervention and Exposure: Both intervention and exposure criteria focus on modern approaches for developing human capital -specifically on models for leadership competencies that emphasize adaptive and resilient leadership in crisis - ridden environments -as referenced by Syamsir *et al*. (2025). The scope also includes strategies for applied skill acquisition-as referenced by Kebede *et al*. (2024), and upskilling initiatives -as referenced by Surikova (2023) & Alamu (2026) -to develop soft skills, digital literacy – e.g., building information modelling (BIM)-and strategic foresight in management. Purely technical engineering methods were excluded purely technical -unless they were part of a broader workforce training strategy.

Context: The context is limited to the period of 2020 through 2026 - to capture how the industry responded to the escalating volatility of global economic trends and in Ethiopia. Belay *et al*. (2021), the turn of the decade marked a critical shift toward system-based development in Ethiopia, rendering pre-2020 baseline studies less reflective of current VUCA realities.

Outcomes: The outcomes sought within the literature include improvements in organizational agility, project delivery success and a measurable reduction in the industry - wide skills gap . As reported by Zarghami & Zwikael (2022) these outcomes align with market shock resiliency - as well as labour productivity reports from Mengistu *et al*. (2024)

Study Design: To ensure high academic evidence by the review included only peer - reviewed journal articles, conference papers, and formal case studies, while excluding non - academic sources such as blog posts and news editorials.

2.2 – *Information Sources & Search Strategy*

The retrieval of relevant literature was carried out using a systematic research approach that relied on an initial search mainly undertaken in the Google Scholar database. The time frame for this search was established as being from January 2020 to April 2026. Google Scholar offers access to a large number of journals across the globe and many regionally focused journal articles relevant to the Ethiopian construction industry. To ensure comprehensive global coverage, a combination of advanced Boolean search techniques was used along with the keywords: "Construction Industry," "Ethiopia," "Human Capital," "Leadership competency," "VUCA," and "Workforce upskilling." Using these search terms allowed the reviewer to focus their search on capturing the socioeconomic issues associated with developing countries and the current education reform issues in Ethiopia, which have been identified by Mengistu *et al*. (2024).

2.3 – *Selection Process*

To ensure the highest quality synthesis, the selection process was organized into fouXFr stages as per PRISMA 2020 (Figure 1).

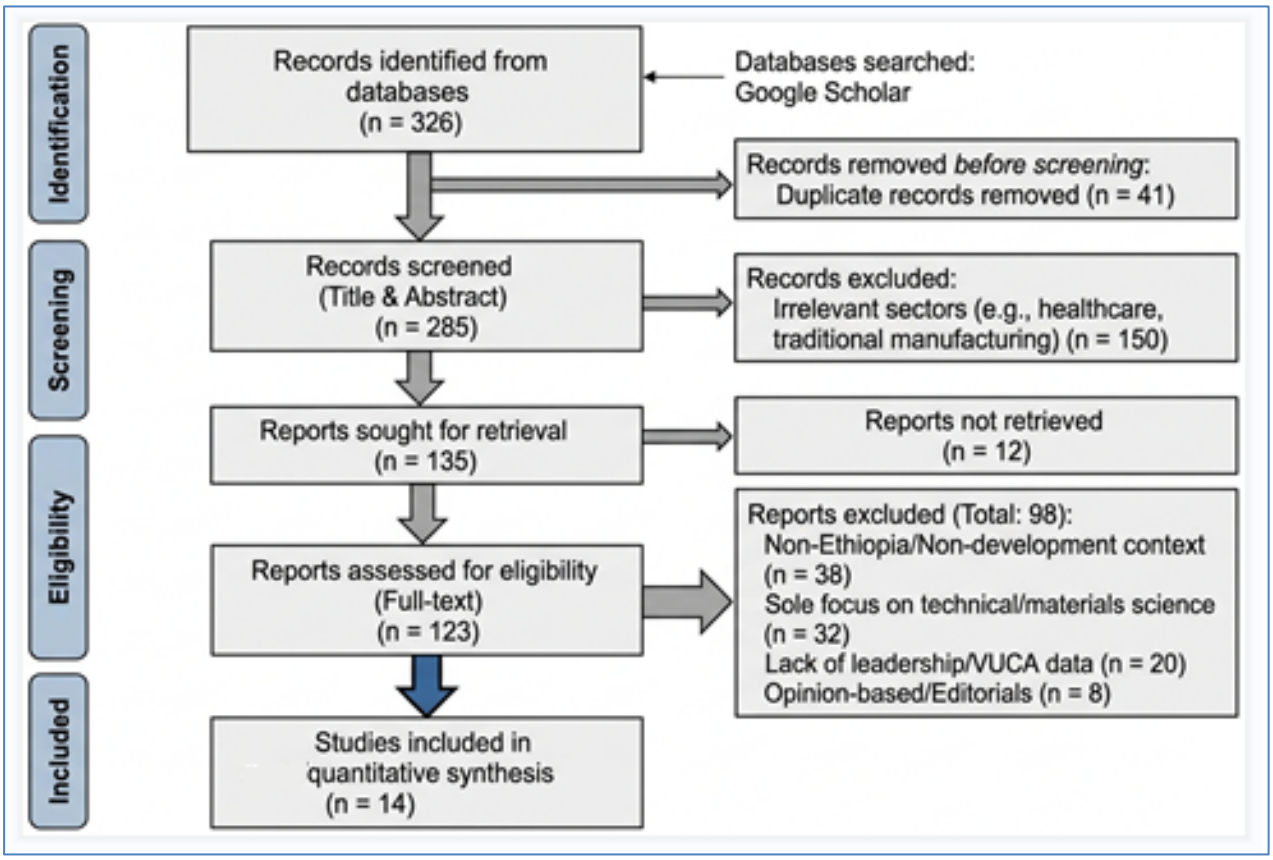

Fig. 1 – PRISMA 2020 Diagram

Stage One, the identification stage, identified a total of 326 records from the databases searched. By removing duplicate records, another 41 records were eliminated. After removing 41 duplicate records, 285 unique documents remained.

Stage two, the researcher then thoroughly reviewed the 285 remaining documents and eliminated an additional 150 documents because they had little to no relevance to the construction industry, or they were related to other areas such as healthcare, finance or retail. Articles outside of the direct built environment were removed with the single exception of manufacturing and hospitality. The primary focus was limited to the Ethiopian Construction Sector; however, high-quality studies of domestic service sectors that are closely related to the construction sector (i.e., manufacturing and hospitality), conducted after the 2020 Macro-Crisis, were retained as a basis for benchmarking cross-sector organizational agility.

Stage Three, the eligibility stage, resulted in a total of 135 full-text reports being requested. A total of 123 of those reports were obtained (i.e 11 reports retrieved) and compared to the defined PICOS criteria. 98 reports were eliminated with supporting justification; specifically, 38 for being located in non-Ethiopian and/or non-development settings, 32 for focus on technical engineering/materials science, 20 reports for lack of data regarding leadership or VUCA competencies, and 8 reports were eliminated for being opinion-based editorials rather than research studies.

Stage Four, of the process, the included stage, identified 14 empirical studies as suitable for synthesis. Those studies provided both the empirical and theoretical basis for the subsequent analysis of human capital within the modern Ethiopian construction industry.

3 – Results: Data Extraction & Synthesis

3.1 – *Synthesis of Leadership Competencies*

The data collected from this systematic review demonstrates a significant movement away from rigid, structured managerial practices and toward more resilient and adaptable leadership models. Pivoting strategies quickly in response to new and unpredictable changes in markets is now a baseline requirement for human capital performance. According to Syamsir *et al*. (2025), bureaucratic styles of leadership suppress creativity and innovation at the job site, while adaptive leaders create a sense of community that fosters creative solutions to problems caused by resource scarcity. The study by Bekele & Mahesh (2024) utilizes structural modelling to show that "endogenic factors, specifically a manager's psychological framing and cognitive capacity, are the best predictors of project success in Ethiopia today. Syamsir *et al*. (2025) also identified cognitive flexibility and emotional resilience as critical components of navigating interdependent complexities utilizing systems thinking.

Additionally, as discussed by Syamsir *et al*. (2025), the definition of leadership in a VUCA world is becoming increasingly characterized by "Leadership Agility" and "Strategic Foresight." These competencies enable project managers to anticipate potential volatility in raw materials, orlabor availability, prior to reaching a tipping point. Agility is defined by Sumadireja *et al*. (2025) as a combination of resilience and responsiveness that helps managers recognize problems in times of high uncertainty. Sumadireja *et al*. (2025) also contend that technical expertise needs to be paired with Emotional Intelligence (EI) and emotional stability ; the leader's emotional stability has a direct impact on the team's capacity to deal with crises. Finally, according to Desta *et al*. (2025), the most effective leadership behaviours in the Ethiopian construction context are inclusive and participatory because they facilitate decentralized decision-making, allowing personnel to respond rapidly to local situations.

The behaviors described above are important to address the current state of socio - political instability and the unpredictable economic environment affecting the industry (Desta, 2025). Overall, the Ethiopian construction industry must modernize by shifting the focus of leadership development from technical supervisory knowledge to behavioral-based competencies necessary for managing crises and active collaboration with stake holders (Abate *et al*., 2026).

3.2 – *Synthesis of Workforce upskilling*

It is clear from the existing body of research that the demand for "Green Skills" and "Digital Literacy" is increasing significantly at every level of the construction labor force. With respect to aligning infrastructure objectives with international standards for sustainability, Sibhatu *et al*. (2025) indicate that the current workforce lacks the necessary specialized competencies for managing energy efficiency in buildings and handling sustainable materials. In addition, this absence of green human resource management (HRM) practices presents a substantial void in national industrial capacity (Sibhatu *et al*., 2025).

Furthermore, while Saka & Chan (2020) identified substantial opportunity for developing BIM competency, they also noted that the lack of such competencies presents a major impediment to achieving the digital transformation needed to eliminate ambiguity within project data. Although the construction is interested in adopting advanced technologies; without simultaneous efforts to upgrade human capital, new technology will continue to be inadequately or ineffectively utilized. Finally, Sumadiereja *et al*. (2025) indicates that 'Human Capital Agility' has transitioned from a desirable trait to an essential component for real-time skill adaptation.

Although the formalization of ccompetency-Based Training (CBT) has been introduced in Ethiopia, a persistent "implementation gap " remains. As argued by Kebede *et al*. (2024) , a misfit exists between academic theory and on real-world projects site requirements. Consequently, graduate employability rates remain low. Additionally, Mengistu *et al*. (2024) , note that training materials often are out dated , thus failing to providethe most recent safety protocols or lean construction methods.

This skill deficit is particularly acute for construction sectors, which lack the managerial expertiseand regulatory navigational skills needed for sustainable growth. Transitioning toward industry-led apprenticeships (Kebede *et al*., 2024) and dual training models will help close these gaps. The incorporation of behavioral skills into the technical curriculum (Kebede *et al*., 2024) equips graduates to address the complexities of modern construction. A complete skill upgrade strategy, which includes cross-training to provide functional elasticity (Alamu *et al*.,2026), is important for providing the organizational resilience needed to survive disruptive events (Rahi *et al*., 2021). Table 1 reveals a distinct temporal trend in sector-specific research. Most research from 2020 – 2026 focused on traditional "Project Management" and "Risk,"and on "Adaptive Leadership" and "Digital Literacy."

Table 1 –Comprehensive Data Extraction Matrix (n=14)

S .no	Author(s) & Year	Research Context	Core Leadership Competencies	Workforce & upskilling Strategy	VUCA Element Addressed
1	Abas (2025)	Project Success Factors	Transformational Leadership; IQ + EQ; Interpersonal Skills	Not addressed	Resilience against failure
2	Abate *et al*. (2026)	Cross-Sector Crisis Benchmark (Hotel Industry)	Agile Leadership; Quick decision-making; Collaboration	Leadership development; Cross-training; Resilience coaching	Volatility, Uncertainty, Complexity, Ambiguity
3	Bekele (2024)	Construction Industry (SMCs)	Managerial competency (Knowledge, Skills, Experience); Influence	Organizational culture; Skill gap identification	Complexity (Endogenic factors)

S .no	Author(s) & Year	Research Context	Core Leadership Competencies	Workforce & upskilling Strategy	VUCA Element Addressed
4	Belay *et al*. (2021)	Infrastructure Project Success	Focus on performance challenges	Not addressed	Volatility (Resource scarcity)
5	Desta etal. (2025)	Construction ector Resilience	Transformational & Participatory; Adaptability; Motivation	Team resilience; Stakeholder collaboration	Socio-political Instability; Uncertainty
6	Sibhatu *et al*. (2025)	Cross-Sector Operations Benchmark (Manufacturing)	Not addressed	Green HRM (GHRM); Sustainable practices	Sustainability gaps
7	He & Wang (2025)	Construction Management	Not addressed	Adaptability in employee behaviors	Uncertainty; Resilience against disturbances
8	Kebede *et al*. (2024)	pplied training & Skill Development	eadership in training institutions	70/30 Practical Training; Industry-led apprenticeships	Ambiguity (Skill mismatch)
9	Mengistu *et al*. (2024)	SMC Structural Capacity Benchmark (MSEs)	Management Skills; Defining responsibilities	Regulatory framework; Technical capacity building	Complexity (Regulatory gaps)
10	Rahi *et al*. (2021)	Project Vulnerability	esilience to cope with disruption	Vulnerability management; Mitigation prep	Uncertainty; Disruptive events
11	Sumadireja (2025)	Construction Management	Resilience; EI; Critical thinking; Problem recognition	Human Capital Agility; Strategic workforce development	Volatility, Uncertainty, Complexity, Ambiguity
12	Syamsir *et al*. (2025)	Organizational Success	Leadership Agility Cognitive, Emotional, Behavioral)	Competency development for innovation	Volatility; Complexity (System thinking)
13	Wang *et al*. (2021)	Megaproject Management	Emotional detachment; Crisis decision-making	Not addressed	Complexity (Institutional); Ambiguity
14	Zarghami & Zwikael (2024)	General Project Resilience	Not addressed	Not addressed	Complexity & Uncertainty in project systems

The transition toward adaptive leadership and digital literacy demonstrates a growing emphasis on building organizational resiliency. Research conducted by Desta *et al*. (2025) demonstrated that the key drivers for navigating social/political and economic instability lie within an organization's leadership

agility. It is evident that the Ethiopian construction industry understands that technical expertise is no longer sufficient to ensure survival in today's complex and volatile business environment.

More recent data from Syamsir *et al*. (2025) and Sumadireja *et al*. (2025) also highlight the essential nature of "Systems Thinking" and "Human Capital Agility" to mitigate the ambiguity due to data scarcity and changing market conditions. Lastly, the consensus among researchers underscores the need for "Industry-Led Apprenticeships" (Kebede *et al*., 2024) to resolve the longstanding ambiguity surrounding the definition of professional standards and competency benchmarks.

4 – Discussion

The VUCA nature of the Ethiopian Construction sector, based on the synthesized results from 14 key research studies, has transitioned from a theoretical concept into an operative disruption and has been predominantly identified as being highly unstable in its volatility and uncertain in its unpredictability.

The volatility is reflected in the extreme economic variability, including fluctuating costs of imported building products due to exchange rate volatility and large-scale devaluations of the local currency as reported by Belay *et al*. (2021). Such volatility demands a systems-based developmental approach. Furthermore, the resource instability can only be effectively managed through a combination of responsive leadership strategies and risk mitigating processes as described by Sumadireja (2025).

The uncertainty reflects the degree of societal and political change occurring in the construction of resilient infrastructure. Specifically, socio-political instability was identified as the major hindrance to successful project delivery by Desta *et al*. (2025) and therefore leadership ability to motivate and support teams through adversity is now a core human capital requirement. To combat the impacts of such disruptive forces, Alamu (2026) identifies a fundamental paradigmatic shift within Ethiopia's national human capital strategy. Such a paradigmatic shift move away from traditional hard technical engineering skills towards developing a holistic skill set that prioritizes cognitive and behavioral agility. The agile skills referred to above by Syamsir *et al*. (2025) include both cognitive flexibility and emotional resilience to successfully navigate the interconnected factors affecting projects.

A pivotal point of this study is the applied technology paradox. "On one hand, there is a tendency to rely on universities for innovative ideas; on the other hand, evidence shows that in a highly dynamic environment context, innovation must be made accessible at the applied workforce level if it is to have a meaningful effect on organizational performance. Specifically, Sibhatu *et al*. (2025) state that the absence of green human resource management (HRM) and the lack of sustainable materials literacy will hinder an organization's ability to implement sustainable practices. To reduce or eliminate the digital and green skills gap for SMCs by lowering the barriers of entry to using new technologies with a cost that is prohibitive to their use by SMCs, new frameworks for worker upskilling will need to emphasize the use of technology at low cost. Training workers in the field how to use free BIM viewer software, lean materials workflow applications and smartphone first cloud collaboration applications on mobile phones they already own, allow them to avoid large one-time expenditures to create new physical workspaces.

Kebede *et al*. (2024) support this perspective, suggesting, this review departs from traditional academic-centered human capital perspectives. The data support the idea that ambiguity surrounding project information--an area identified by Saka & Chan (2020) as a signal of a potential crisis--can be minimized when digital capabilities such as Building Information Modeling (BIM) are embedded within the applied labour force engine as opposed to only being available to senior managers.

In Ethiopia, the university system generally operates as the gateway for theoretical knowledge, while applied pathways develop the practical knowledge necessary for the projects to be successful. However, this human capital engine must first be freed from its current constraints including out dated educational resources and a lack of clarity regarding roles and responsibilities among small and medium-sized enterprises (SMEs) (Mengistu *et al*. ,2024). By focusing on building operational agility, employers can ensure that their top-down strategic vision (Syamsir *et al*., 2025) is matched with bottom-up operational capability.

4.1 – *Leadership Evolution: Beyond Technical Command*

The traditional hierarchical and authoritarian style of command and control is no longer seen as a strength, but rather as a structural weakness in times of rapid disruption. According to Syamsir *et al*. (2025), leadership agility determines whether a developing economy will withstand a macro economic shocks or collapse. The need for flexibility to address "institutional complexity" and to interpret "the ambiguity of crisis signals," is well recognized (Wang *et al*., 2021). The development of agility occurs when leaders leverage EI to enhance capacity. When working with diverse teams, ensuring employee moral under resource constraints. While there are few empirical studies of the construction industry's response to disruption in terms of its crisis-driven behavior or agility; however, Abate *et al*. (2026), who studied the effects of macro-economic shocks on the Ethiopian hospitality sector, demonstrate that the use of agile leadership and coaching can lead to an accelerated recovery of organizations affected by such crises. As this cross-industry benchmarking demonstrates, we find that emotional stability is a necessary condition for team members' survival through disruptions in today's globalized Ethiopian economic environment.

A participative approach to leadership has been demonstrated to be more productive than a rigidly bureaucratic one (Sibhatu *et al*., 2025). This model encourages transparency and pro activity in communication, creating an environment of mutual trust. This inclusive environment fosters rapid site-level decision-making; this is important for minimizing project vulnerability (Rahi *et al*., 2021).

Furthermore, crisis communication is critical to navigating the complexity of modern stakeholder management. Belay *et al*. (2021) show that infrastructure projects in Ethiopia require complex network of stakeholders, including local communities, governmental agencies, and international financiers. Effective relationship building and articulation of a project vision require a leader who can communicate effectively with all parties.

Sumadireja *et al*. (2025) emphasized the need for critical problem-recognition to provide stability to continue operations under uncertain conditions. Thus, according to Desta *et al*. ,2025), project management resilience occurs through the application of "hard" behavioral competencies—such as critical thinking and adaptive decision-making—which allow for strategic pivots when market conditions deviate from original plans. It is clear that maintaining this human capital resilience is critical for navigating the socio-politically unstable economy that exists in the VUCA environment of Ethiopia (Desta *et al*., 2025.

The way in which the need for project leadership has shifted to include emotional intelligence (EI) and crisis communications is a direct response to pressure from a VUCA environment.

4.2 – *Workforce Transformation: Agile upskilling and Industry Alignment*

The national human capital strategy will require a transition from traditional static educational frameworks to an Agile upskilling model; professional development programs will no longer be static but will instead be constantly updated and evolved through direct industry collaboration. According to Sumadireja (2025), this requires an organization's ability to provide its workforce with "Human Capital Agility" so employees can develop real-time applicable skills based on shifting project needs. Currently, a significant gap exists between skills taught and the increasingly digital nature of modern construction sites.

In order to bridge the employability gap, Kebede *et al*. (2024) recommend that industry-led apprenticeships become a permanent fixture of the human capital pipeline. This approach is essential to help alleviate the 'Skills Mismatch' and unemployment observed among technical graduates (Kebede *et al*., 2024). The uncoordinated migration of rural youth to cities without the necessary skills has created serious problems with supply in the workforce and thus will negatively affect both the quality of safety on the construction site and the production of the site. The lack of coordination in urbanizing unskilled rural youth represents an urgency to implement rapid, standardized, institutionalized "technical

bridging courses" that will create a baseline level of basic technical and behavioral competency prior to their deployment onto high-pressured construction sites.

While universities are responsible for developing the "architects of the vision," an applied approach provides the social architect (the skilled worker with knowledge of how to work effectively in today's complex building environment). As stated by Alamu (2026), this will require "cross-training" so that teams are flexible enough to continue operations when disruption occurs. Additionally, Mengistu *et al*. (2024) note that successful construction companies rely upon having clearly defined roles or duties, which cannot be accomplished without hands-on experience and practice.

Through these applied learning pathways, the workforce will learn in real-time how to use the most recent lean construction technologies and safety practices. As noted by Mengistu *et al*. (2024), integrated partnerships are the primary driver of national economic growth. Furthermore, Kebede *et al*. (2024) state that the best way to align training with real-world industry requirements is to move toward a competency-based model.

Surikova (2023) emphasize that upskilling is not merely about instructing individuals "to build," but rather "to build smartly and sustainably." Similarly, Sibhatu *et al*. (2025) suggests that "green HRM" will require some new practices and training for employees on how to create an energy-efficient workplace. Therefore, digital literacy must be developed to manage Building Information Modeling (BIM) processes, and green skills must be cultivated to comply with the emerging global regulations for net-zero standards.

Abate *et al*. (2026) recommended that continued interventions, such as resilience coaching, could enhance employees ability to deal with the increasing ambiguity of a VUCA environment. For the migrating workforce, developing behavioral competencies is as critical as technical skill acquisition to ensure success in highly coordinated, large-scale projects. Overall, a strong, resilient Ethiopian construction industry is one where the workforce is seen as an evolving, adaptive resource.

4.3 – *Synthesis Matrix: Mapping VUCA Challenges to Strategic Human Capital Solutions*

Table 2 illustrates how the previous discussion relates the VUCA problems to specific project level challenges. Additionally, Table 2 provides a structure to relate each volatility dimension to a potential barrier or challenge in the Ethiopian construction industry. For each of these, this table will pair them with a strategy to utilize human capital solutions that were derived from both theory and empirically proven.

Table 2 – Integrated VUCA Framework and Strategic Human Capital Alignment

Identified VUCA Problem Area	Interconnected Operational Impacts	Strategic Human Capital Solution
Rigid & Bureaucratic Leadership Styles	Limitations of site innovation, delayed crisis response, & inflexible command-and-control structural weaknesses.	Encourage adaptive leaders: construction license renewal certification shall focus on "leadership agility", Emotional Intelligence (EI), and systems thinking.
Reactive Risk Management	Gaps in implementation, high vulnerability to market shocks, risk checks only after failure occurs.	Strategic foresight through data-driven decisions: anticipatory risk analysis; critical problem recognition; decision-making at the site-level to execute strategic pivots.

The applied technology paradox	SMCs locked out of tech by upfront capital costs; digital/green skills gaps; tech remains an office luxury.	Low-cost technology democratization and green technology democratization: Utilize mobile first cloud management software. Free BIM viewer software. Lean material workflows: use existing smartphone technology.
The education-industry misfit	Poor training materials, poor graduate employability and a lack of collaborative/soft field skills.	Work-Integrated Learning (WIL): Create a National Construction Skills Council (NCSC). Increase the number of dual (70% practical / 30% theory) CBT apprenticeships that can be run through the contractor's own work site.
Macroeconomic & labor volatility	Disruptions to supply chains, currency devaluation, and high pressure urban sites utilizing unskilled labor at extreme risk due to high levels of risk.	National skills infrastructure: Launch sector social protection funds ("upskilling Insurance"). Run rapid "technical bridging courses" during material-based project pauses

5 – Conclusion and Recommendations

The Author states that future research will concentrate on the development of a systematic framework concerning the digitalisation of the labor force , as well as the development of leaders who can be agile in their responses to the current and ongoing VUCA environment. Based on a systematic analysis of 14 key studies (2020–2026), a strategic recommendation for the Ethiopian construction industry has been identified.

5.1 – *Conclusion*

The Ethiopian construction sector today stands at a critical juncture. The country's need for improved infrastructure continues to be a major national objective; however, it is constrained by a systemic "Human Capital Gap." Studies conducted by Bekele & Mahesh (2024) have established that internal firm capabilities (managerial knowledge, attitudes, and experience) currently play a greater role in determining the project outcomes than external financial variables. The three most concerning problems facing this area include:

A leadership crisis: Management practices that are traditional and rigidly structured are ineffective against volatile currencies and complex global supply chains. A lack of adaptive leadership creates a "rigidity trap", where project managers fail to respond effectively to the VUCA framework (Sibhatu *et al*.,2025). This crisis is typically defined by inability to interpret ambiguous crisis signals (Wang *et al*., 2026).

A persistent skills mismatch: Despite recent reforms, the skills development system still produces graduates with an imbalance between technical and behavioral skills. Kebede *et al*. (2024) explain that this results in a workforce lacking the digital and collaborative competencies required for modern sites. Mengistu *et al*. (2024) assert that this disconnection is further exacerbated by obsolete educational resources .

The competency gap: The human capital crisis in Ethiopia is fundamentally an applied competency gap. Failure to treat adaptive upskilling or applied training as a strategic asset has contributed significantly to the industry's capacity deficit. Sumadireja *et al*. (2025) asserts that "human capital agility" is the only viable solution to the uncertainty and volatility that negatively affecting project management.

Resilience as a core capability: Desta and Msengana (2025) establish that companies failing to incorporate resilience into their human capital strategy may become obsolete because they are unable to adapt to managing volatility and uncertainty. Agile leadership enhances organizational resilience by supporting both an organization's culture and teams' emotional stability (Abate *et al*., 2026).

5.2 – *Strategic Recommendations for Policy-Makers*

In order to address the gaps identified, the following strategic recommendations are developed for both government and industry stakeholders:

A. Developing Adaptive Leadership

For Grade-1 to Grade-3 Contractors in Ethiopia, the Ministry of construction should develop a certification program focused on "Adaptive Leadership" as part of contractor license renewals. Such programs should provide contractors with education regarding emotional intelligence, crisis communication and agile decision-making in addition to standard project management. To effectively support complex megaprojects, Syamsir *et al*. (2025) propose that "systems thinking" be integrated into these programs. Developing adaptive leadership provides organizational flexibility so that leaders can continue operations despite unexpected inflationary changes or resource scarcity (Syamsir *et al*., 2025). Additionally, the integration of both EI and IQ assessment tools is a critical component to achieving long-term project success (Abas, 2023).

B. Closing the "Implementation Gap"

There is a need for establishing a "National Construction Skills Council (NCSC)" comprised of representatives from the applied education institute, private contractors, and professional associations. Policymakers should encourage industry-led dual training models where a significant majority of learning occurs on-site. The key factor in creating links between education and industry is ensuring adaptive upskilling (applied training) reflects the complexity of today's business environment (Kebede *et al*., 2024).Providing tax breaks for businesses that offer structured mentorships to apprentices would result in producing a "site-ready" workforce possessing the behavioural competencies required for modern operations (Kebede *et al*. ,2024).

Creating a linkage between adaptive upskilling and industry requires a paradigmatic shift. Rather than focusing on reducing unemployment, policy makers need to focus on adaptive upskilling as a method of developing national resiliency. This integrated model allows employers to mitigate labor risks associated with market fluctuations while ensuring a constant supply of ready workforce members.

C. Digitization and Sustainability.

National curricula must integrate BIM and green building competencies by 2026, supported by public subsidies to adopt digital management tools. According to Abate *et al*. (2026), enabling SMEs to utilize these types of digital tools reduces complexity and ambiguity , improvestransparency, decreases material waste and aligns with international sustainability construction standards (Sibhatu *et al*. ,2025). Sibhatu *et al*. (2025) further supports the use of "green HRM" practices to provide the labour force with energy efficient construction with the necessary competencies.

D. Protecting labour markets through human capital resilience

As a means of protecting labour markets from economic fluctuations, governments should create sector-specific social protection funds known as "upskilling Insurance" (Alamu *et al*., 2026). In times of economic instability-i.e., when high material costs temporarily stop projects-this fund should support "bridge training. " Bridge training is designed to keep workers employed while they receive upskilling

opportunities; it helps to prevent the loss of experienced employees to other industries during the VUCA cycle (Alamu *et al*., 2026). Mengistu *et al*. (2024) state that structural support is essential to the long-term viability of construction companies in unstable market conditions. Rahi *et al*. (2021) argue that building resilience in non - crisis times builds the capacity to respond to vulnerabilities created by disruptive events.

5.3 – Final Note

The successful implementation of the above-mentioned recommendations will depend upon an essential attitudinal transformation among industry employers. Employers will need to see the Ethiopian construction worker as a potential 'asset' to develop rather than simply as a cost to minimize. As emphasized by Sibhatu *et al*. (2025) only through such a human centric approach will the construction industry be able to successfully navigate the changing complex business environment anticipated for 2026 and beyond. Addressing the "negative perceptions" limiting the workforce development (Mengistu *et al*., 2024) will foster a supportive work culture and promote psychological resilience.

With applied competency central to these changes, Ethiopia can move from a theoretical 'knowledge-based' approach to industrial growth to a concrete 'competence-based' construction industry where the success of each project is built on functional expertise. Kebede *et al*. (2024) support the transition to a "competence-utility" model, noting that the link between educational centers and industry needs is what drives national workforce resilience.

6 – Reference

Abas, I. H. (2023). Project resilience dimensions ranking from Malaysian and international perspectives: A Delphi study. *Journal of Sustainability Science and Management, 18*(11), 19–36.

Abate, Y. A., Ukpabi, D. C., Karjaluoto, H., & Niininen, O. (2026). The role of agile leadership on the resilience of hotels in crisis times. *Anatolia*, 1–19.

Alamu, Y. T. (2026). Mechanics of Bridge Training : Preserving Functional Capacity in Volatile Labor Markets. International journal of human capital studies. *Mechanics*, 2026, 1–3.

Bajjou, M. S. and A. C. (2024). Enhancing environmental sustainability through lean construction principles : an industry- based SEM analysis. Engineering, *Construction and Architectural Management*. https://doi.org/10.1108/ECAM-06-2024-0705.

Bekele, A. A., & Mahesh, G. (2024). Exploring the impact of endogenic factors on the competency of small and medium contractors in the Ethiopian construction industry. *Journal of Construction in Developing Countries, 29*(1), 211–245.

Belay, S., Goedert, J., Woldesenbet, A., & Rokooei, S. (2021). A hybrid Delphi-AHP based analysis of construction project-specific success factors in emerging markets: The case of Ethiopia. *Cogent Engineering, 8*(1), 1891701.

Bitane, B. B., & Uge, B. U. (2020). Towards Sustainable Use of Existing Knowledge to Control Risks in Ethiopian Construction Industry – An Overview. December. https://doi.org/10.5923/j.ijcem.20200901.03

Desta, K. B., & Msengana, L. (2025). Key factors influencing construction project resilience in Ethiopia: A systematic literature review. International Journal of Science, Technology, Engineering and Mathematics, *5*(3), 1–21.

Giancotti, M., & Mauro, M. (2020). Building and improving the resilience of enterprises in a time of crisis: From a systematic scoping review to a new conceptual framework. *Economia Aziendale Online, 11*(3), 307–339. https://doi.org/10.13132/2038-5498/11.3.307-339.

He, Z., Wang, G., Chen, H., Zou, Z., Yan, H., & Liu, L. (2022). Measuring the construction project

resilience from the perspective of employee behaviors. *Buildings, 12*(1), 56.

Kebede, A., Asgedom, A., & Asfaw, A. (2024). Is linking technical and vocational training with industry a bridge to employability? Lessons from a literature review for Ethiopia. *Cogent Education, 11*(1), 2406721.

Magallanes, T., Word, D., Encarnacion, M. J., & Abun, D. (2021). Bureaucratic management style and workplace well-being of the Divine Word Colleges. *International Journal of Research in Business and Social Science, 10*(3), 477–489.

Mengistu, D. G., Ashene, D. A., & Beyene, M. M. (2024). Micro and Small Enterprises' development in the Ethiopian construction industry: The challenges and improvement regulatory framework. *Journal of Construction in Developing Countries, 29*(1), 67–85.

Principale, S., Lombardi, R., & Filocamo, M. R. (2025). Remote work challenges and opportunities: A focus on relational capital in public administration. *Economia Aziendale Online, 16*(1), 279–294. https://doi.org/10.13132/2038-5498/16.1.279-294.

Rahi, K., Bourgault, M., & Preece, C. (2021). Risk and vulnerability management, project agility and resilience: A comparative analysis. *International Journal of Information Systems and Project Management, 9*(4), 5–21. https://doi.org/10.12821/ijispm090401.

Saka, A. B., & Chan, D. W. M. (2020). Adoption and implementation of building information modelling (BIM) in small and medium-sized enterprises (SMEs): a review and conceptualization. *Engineering, Construction and Architectural Management*. https://doi.org/10.1108/ECAM-06-2019-0332.

Sibhatu, H. B., Debela, K. L., & Kero, C. A. (2025). Effects of Green Human Resource Management Practices on Organizational Sustainability Mediated by Employee Engagement: Evidence from Ethiopian Manufacturing Industries. *International Journal of Organizational Leadership*, *14*(1).

Syamsir, S., Saputra, N., & Mulia, R. A. (2025). Leadership agility in a VUCA world: A systematic review, conceptual insights, and research directions. *Cogent Business & Management, 12(*1), 2482022.

Sumadireja, G. C., Dachyar, M., Farizal, F., Ma'aram, A., & Park, J. J. (2025). Identifying key assessment factors for human capital agility and leadership agility. *Sustainability, 17*(9), 3849.

Surikova, S. (2024). Towards the effective professional upskilling of low-skilled employees: Key influencing factors. *Problems of Education in the 21st Century*, *82*(5), 737-757.

Wang, L., Müller, R., Zhu, F., & Yang, X. (2021). Collective mindfulness: The key to organizational resilience in megaprojects. *Project Management Journal, 52*(6), 592–606.

Zarghami, S. A., & Zwikael, O. (2022). Measuring project resilience—Learning from the past to enhance decision making in the face of disruption. *Decision Support Systems, 160*, 113831.