



Cross-Sector Applications of the Theory of Constraints and Their Implications for Tanzania

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ABSTRACT

This study examines the application of the Theory of Constraints (TOC) across different economic sectors and evaluates its implications for improving organizational performance in Tanzania. The study employs a qualitative analytical approach to examine scholarly publications related to the application of TOC across multiple sectors. A total of 30 peer-reviewed articles published between 2015 and 2025 were selected from major academic databases and systematically analyzed to identify patterns, sectoral practices, and performance outcomes associated with TOC implementation. The findings indicate that the application of TOC contributes significantly to improvements in operational efficiency, throughput, and resource utilization across sectors such as manufacturing, healthcare, supply chains, public services, and project management. The analysis shows that organizations applying TOC principles are better able to identify system constraints, prioritize improvement initiatives, and enhance decision-making processes. In addition, the study reveals sectoral differences in the adoption and implementation strategies of TOC, with manufacturing and supply chain sectors demonstrating the most structured application frameworks. From a theoretical perspective, the study contributes to the broader understanding of TOC as a cross-sector management approach capable of improving system performance and organizational effectiveness. Practically, the findings provide insights that may guide policymakers and organizational leaders in Tanzania in adopting TOC-based management strategies to enhance productivity and optimize resource utilization. This study provides an integrated cross-sector perspective on the application of TOC and links global evidence with practical implications for Tanzania's industrial and public sector development.

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ARTICLE INFO

Article History:

Submitted/Received 05 Jan 2025

First Revised 16 Feb 2025

Accepted 12 Apr 2025

First Available online 10 May 2025

Publication Date 01 Jun 2025

Keyword:

Theory of Constraints (TOC),
Operational Efficiency,
Cross-Sector Applications,
Organizational Performance,
Tanzania.

1. INTRODUCTION

Organizations operating in diverse sectors continuously encounter operational constraints that limit their ability to achieve optimal performance (Khamis et al., 2022; Baker et al., 2015; Sumuni, 2019). These constraints may arise from limited resources, inefficient processes, poor coordination, technological limitations, or structural inefficiencies within organizational systems (Fawcett et al., 2017; Puche et al., 2016). Such bottlenecks often reduce productivity, increase operational costs, and weaken overall system performance (Okutmuş and Güner, 2016; Pawar et al., 2016). As a result, organizations increasingly seek management approaches that can systematically identify and address these limitations to improve operational efficiency and competitiveness (Chiarini and Vagnoni, 2017; Chakravorty and Hales, 2020). One of the most influential management philosophies developed to address such challenges is the Theory of Constraints (TOC). The Theory of Constraints was introduced by Eliyahu M. Goldratt in the 1980s as a systematic approach for identifying and managing the most critical limiting factor (constraint) that prevents a system from achieving higher performance (Orouji, 2016). The core principle of TOC is that every system has at least one constraint, and improving the performance of the entire system requires identifying and managing that constraint effectively (Kadhm, 2020). TOC proposes a set of structured steps commonly known as the five focusing steps, which guide organizations in identifying system constraints, exploiting existing capacity, subordinating other processes to the constraint, elevating the constraint, and continuously improving system performance (Orouji, 2016; Chiarini and Vagnoni, 2017). Over the past decades, the Theory of Constraints has been widely applied in various sectors, including manufacturing, healthcare, supply chain management, project management, logistics, and service industries (Puche et al., 2016; Chakravorty and Hales, 2020). In manufacturing systems, TOC has been used to optimize production scheduling, reduce bottlenecks, and increase throughput (Kurniadi and Ryu, 2017; Mulyadi et al., 2024). In healthcare systems, TOC has been applied to improve patient flow management, reduce waiting times, and enhance the utilization of hospital resources (Grida and Zeid, 2018; Mabin et al., 2018; Bacelar-Silva et al., 2020; Cox, 2022). Similarly, in supply chain and logistics management, the theory has helped organizations improve inventory management, coordination among supply chain actors, and delivery reliability (Costas et al., 2015; Puche et al., 2016; Fawcett et al., 2017). Project management has also benefited from TOC through the development of Critical Chain Project Management (CCPM), which aims to reduce project delays and improve resource allocation (Kumaran et al., 2015).

Despite the growing body of literature on the application of TOC in different industries, much of the existing research has been conducted in developed economies (Orue et al., 2021; Pérez-Campdesuñer et al., 2018). Consequently, there remains limited synthesized evidence regarding how cross-sector applications of TOC can inform operational improvement strategies in developing economies (Mntambo et al., 2023). Countries such as Tanzania continue to face multiple operational challenges across sectors, including inefficient supply chains, production bottlenecks in manufacturing industries, limitations in healthcare service delivery, and coordination challenges within agricultural value chains (Nkwabi, 2019; Anderson, 2018; Suleiman, 2023). These constraints often hinder productivity growth and limit the effectiveness of organizational and institutional systems (Ringo et al., 2024; Chengula and Lyakurwa, 2025). Understanding how TOC has been applied in different sectors globally can provide valuable insights for addressing similar operational challenges in Tanzania (Bacelar-Silva et al., 2020; Chakravorty and Hales, 2020). A systematic examination of previous studies may help identify best practices, common implementation strategies, and potential benefits associated with TOC adoption (Puche et al., 2016; Costas et al., 2015). Such insights are particularly important for

policymakers, managers, and researchers seeking to improve sector performance and operational efficiency in developing country contexts (Nimpagaritse et al., 2020). Therefore, this study conducts a comparative literature review of the applications of the Theory of Constraints across multiple sectors using articles published between 2015 and 2025 (Orouji, 2016; Bacelar-Silva et al., 2020). By synthesizing findings from existing studies, the review aims to highlight how TOC contributes to performance improvement in different operational environments and to identify lessons that may be applicable to the Tanzanian context (Mntambo et al., 2023; Pérez-Campdesuñer et al., 2018). In addition, the study seeks to identify research gaps that may guide future empirical investigations on the application of TOC in Tanzania (Nkwabi, 2019). Specifically, the objectives of this study are:

1. To review recent literature on the applications of the Theory of Constraints across various sectors.
2. To compare sectoral outcomes associated with the implementation of TOC.
3. To derive practical implications for improving sector performance in Tanzania based on insights from existing literature.

The Theory of Constraints (TOC) is a management philosophy that focuses on identifying and managing the most critical constraint that limits the performance of a system. According to TOC principles, every system operates under at least one limiting factor that restricts its ability to achieve higher levels of performance. Consequently, organizational improvement should focus on identifying the constraint and systematically managing it to increase throughput and operational efficiency (Orouji, 2016; Kadhm, 2020). The TOC framework emphasizes continuous improvement through a structured process that includes identifying system constraints, exploiting existing capacity, subordinating other activities to the constraint, elevating the constraint, and repeating the process as new constraints emerge (Chiarini and Vagnoni, 2017). A growing body of literature demonstrates that the application of TOC can significantly enhance organizational performance across different sectors. In operations and manufacturing management, TOC has been widely used to improve production scheduling, optimize resource allocation, and reduce operational bottlenecks that limit productivity (Kurniadi and Ryu, 2017; Mulyadi et al., 2024). Studies have shown that focusing managerial attention on the most critical constraint within a production system can increase throughput and improve overall system performance (Pawar et al., 2016). Similarly, research in manufacturing systems highlights that TOC contributes to more efficient process flows by identifying capacity limitations and redesigning operational processes around the constraint (Okutmuş and Güner, 2016). Beyond manufacturing industries, the application of TOC has also expanded into service-oriented sectors such as healthcare, education, and public administration. In healthcare systems, TOC has been applied to improve patient flow management and enhance hospital operational efficiency. Research shows that implementing TOC-based approaches can reduce waiting times, improve the utilization of medical resources, and increase delivery capacity in healthcare facilities (Grida and Zeid, 2018; Mabin et al., 2018). Systematic reviews of healthcare applications further indicate that TOC provides effective tools for managing complex service environments where multiple interdependent processes influence system performance (Bacelar-Silva et al., 2020; Cox, 2022). These findings demonstrate that TOC is not limited to manufacturing environments but can also support improvements in service delivery systems that face operational constraints.

The literature also highlights the growing importance of TOC in supply chain management and logistics systems. Supply chains often experience operational inefficiencies due to poor coordination among actors, limited information sharing, and inventory imbalances. Research suggests that applying TOC principles can improve supply chain coordination by focusing on

critical constraints that affect overall supply chain performance (Puche et al., 2016). Additionally, studies indicate that TOC-based approaches help organizations reduce the bullwhip effect, improve inventory management practices, and strengthen collaboration among supply chain partners (Costas et al., 2015; Fawcett et al., 2017). As global supply chains become increasingly complex, the role of constraint-based management approaches such as TOC has become more relevant for enhancing supply chain resilience and efficiency. In addition to manufacturing, healthcare, and supply chain systems, TOC has also been applied in other sectors such as tourism services, project management, and mining operations. For example, studies in tourism service systems demonstrate that identifying operational constraints within tourism value chains can improve service quality and operational efficiency (Pérez-Campdesuñer et al., 2018). Similarly, research in project management shows that constraint-based approaches such as Critical Chain Project Management (CCPM) can improve project completion rates and reduce delays associated with resource limitations (Kumaran et al., 2015). Evidence from mining operations also indicates that TOC can support performance improvements by addressing capacity limitations within production systems (Mntambo et al., 2023). These diverse applications highlight the flexibility of TOC as a management framework capable of addressing operational challenges across multiple sectors.

Despite the extensive global literature on the application of TOC, many empirical studies have been conducted primarily in developed economies. Consequently, there remains limited synthesized evidence regarding how TOC-based strategies can be applied to address operational constraints in developing country contexts. Developing economies often experience unique institutional, technological, and resource-related challenges that may influence the effectiveness of management frameworks developed in more advanced economic environments (Nimpagaritse et al., 2020). In the case of Tanzania, several sectors continue to experience operational inefficiencies that may be linked to system constraints. Studies on supply chain management in Tanzanian small and medium enterprises highlight the presence of structural bottlenecks related to logistics, infrastructure, and coordination among supply chain actors (Nkwabi, 2019). Similarly, research on agricultural value chains indicates that smallholder producers face multiple production and market constraints that limit their productivity and income potential (Baker et al., 2015). These challenges illustrate the relevance of management frameworks that focus on identifying and managing system constraints. Other sector-specific studies in Tanzania further highlight the presence of operational limitations that affect organizational performance. Research in the manufacturing sector indicates that companies face constraints related to technology adoption, environmental management practices, and resource utilization (Khamis et al., 2022). Similarly, studies examining innovation capabilities and digital transformation among manufacturing SMEs demonstrate that technological and organizational constraints influence export performance and supply chain sustainability (Ringo et al., 2024; Chengula and Lyakurwa, 2025). In the tourism sector, research shows that stronger linkages between tourism and agriculture could improve inclusive economic development, although coordination challenges remain a significant barrier (Anderson, 2018; Suleiman, 2023). These findings suggest that constraint-based management approaches such as TOC may provide valuable insights for improving sector performance in the Tanzanian context. Given these observations, there is a need for a comprehensive synthesis of existing literature that examines how TOC has been applied across different sectors and how these insights may inform operational improvements in developing economies such as Tanzania. While individual studies provide valuable sector-specific findings, a comparative literature review can help identify common patterns, implementation strategies, and performance outcomes associated with TOC adoption. Therefore, this study contributes to

existing literature by synthesizing cross-sector applications of the Theory of Constraints using studies published between 2015 and 2025. By comparing findings from multiple sectors, the review seeks to identify practical lessons that may inform future research and policy interventions aimed at improving operational efficiency and sector performance in Tanzania. In addition, the study highlights research gaps that may guide future empirical investigations on the implementation of TOC within Tanzanian industries and public service systems.

2. METHODS

This study adopts a systematic literature review (SLR) approach to synthesize existing scholarly knowledge on the applications of the Theory of Constraints across different sectors (Orouji, 2016; Bacelar-Silva et al., 2020). A systematic literature review is a rigorous research method that allows researchers to identify, evaluate, and synthesize relevant studies in a transparent and replicable manner. Unlike traditional narrative reviews, systematic reviews follow clearly defined procedures for selecting and analyzing literature to minimize bias and ensure that the conclusions are based on comprehensive evidence from previous research (Bacelar-Silva et al., 2020).

The review process in this study was guided by the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework. The PRISMA approach provides standardized guidelines for conducting systematic reviews, particularly in relation to the identification, screening, eligibility assessment, and inclusion of relevant studies. The use of the PRISMA framework improves transparency in the literature selection process and ensures that the final sample of studies reflects clearly defined inclusion and exclusion criteria. By applying this approach, the present study systematically identifies, and reviews published research examining the application of the Theory of Constraints in various organizational sectors such as manufacturing, healthcare, supply chain management, and service industries (Chiarini and Vagnoni, 2017; Chakravorty and Hales, 2020).

The adoption of a systematic review design is appropriate for this study because the objective is to synthesize existing empirical and conceptual literature rather than collect primary data. Through the systematic identification and comparison of prior studies, the review enables the researcher to examine patterns of TOC implementation, identify common operational challenges addressed by the theory, and highlight potential implications for improving sector performance in developing economies such as Tanzania (Nkwabi, 2019; Khamis et al., 2022).

The literature used in this review was obtained from several widely recognized academic databases that host peer-reviewed scholarly publications. These databases were selected because they provide access to high-quality research articles across multiple disciplines including operations management, supply chain management, healthcare systems, and organizational performance studies (Fawcett et al., 2017; Puche et al., 2016).

The primary databases used for the literature search included Google Scholar, ScienceDirect, SpringerLink, and Emerald Insight. Google Scholar was used as a broad academic search engine that allows access to a wide range of interdisciplinary scholarly sources. ScienceDirect was selected because it hosts numerous journals related to operations management, industrial engineering, and supply chain research. SpringerLink was included due to its extensive collection of academic journals covering business, management, and engineering disciplines. Similarly, Emerald Insight was used because it provides access to well-established journals specializing in management, logistics, and organizational studies. Using multiple databases ensured that the literature search captured a diverse set of studies examining the Theory of Constraints in different organizational contexts. This approach also

helped reduce the risk of missing relevant studies that might only be indexed in specific academic databases. The database search process focused primarily on peer-reviewed journal articles to ensure the academic reliability and credibility of the studies included in the review.

A structured search strategy was employed to identify relevant literature related to the application of the Theory of Constraints. The search process involved the use of specific keywords and keyword combinations that reflect the central concepts addressed in this study. These keywords were entered into the selected databases to retrieve studies examining the application of TOC in different sectors (Costas et al., 2015; Puche et al., 2016). The main keywords used during the search process included “Theory of Constraints,” “TOC applications,” “TOC manufacturing,” “TOC healthcare,” “TOC supply chain,” and “operations improvement using TOC.” These keywords were selected because they capture the major areas where the Theory of Constraints has been widely applied in academic research (Chiarini and Vagnoni, 2017; Chakravorty and Hales, 2020). In addition to single keywords, combinations of keywords were also used to improve the relevance of the search results. For example, search queries such as “Theory of Constraints in manufacturing,” “TOC in healthcare systems,” and “TOC supply chain performance” were used to identify sector-specific studies.

The search process generated many initial results across the selected databases. These results were then screened based on their titles, abstracts, and relevance to the objectives of the study. Studies that explicitly examined the use of the Theory of Constraints in improving operational performance were considered for further evaluation. The screening process helped ensure that only relevant articles were included in the final dataset used for the literature review (Orue et al., 2021; Pawar et al., 2016).

To ensure the relevance and quality of the literature included in this review, a set of inclusion criteria was established prior to the selection of studies. First, the review focused on articles published between 2015 and 2025. This time frame was selected to capture recent developments and contemporary applications of the Theory of Constraints across different sectors (Mulyadi et al., 2024; Mntambo et al., 2023). Limiting the review to this period also ensured that the findings reflect current operational challenges and management practices.

Second, only peer-reviewed journal articles were included in the study. Peer-reviewed publications undergo rigorous academic evaluation prior to publication, which improves the reliability and credibility of the findings reported in these studies. Third, the selected studies were required to examine the application of the Theory of Constraints in organizational or sectoral contexts, such as manufacturing systems, healthcare institutions, supply chains, or service industries (Grida and Zeid, 2018; Cox, 2022). This requirement ensured that the literature included in the review directly addressed the research objectives related to improvement in operational performance. Finally, only articles published in the English language were included in the review. This criterion was applied because English is the dominant language used in international academic publishing and it allowed the researcher to accurately interpret and analyze the findings of the selected studies.

In addition to the inclusion criteria, several exclusion criteria were applied to refine the selection of studies and maintain the quality of the review. First, conference abstracts without full research papers were excluded from the analysis. Although conference presentations may provide preliminary insights, they often lack the detailed methodology and comprehensive analysis required for systematic literature reviews. Second, studies published before the year 2015 were excluded because the objective of the review was to examine recent developments in the application of the Theory of Constraints. Excluding older publications helped ensure that the review reflects current research trends and contemporary operational challenges (Orouji, 2016).

Third, articles that were not directly related to operational performance improvement or the application of the Theory of Constraints were also excluded. For example, studies discussing constraints in a general economic or social context without linking them to TOC-based management approaches were not considered relevant to the objectives of this research. Through the application of these inclusion and exclusion criteria, the study identified a final sample of 30 relevant articles that were considered suitable for analysis. These articles formed the basis for the comparative literature review conducted in the subsequent sections of the study.

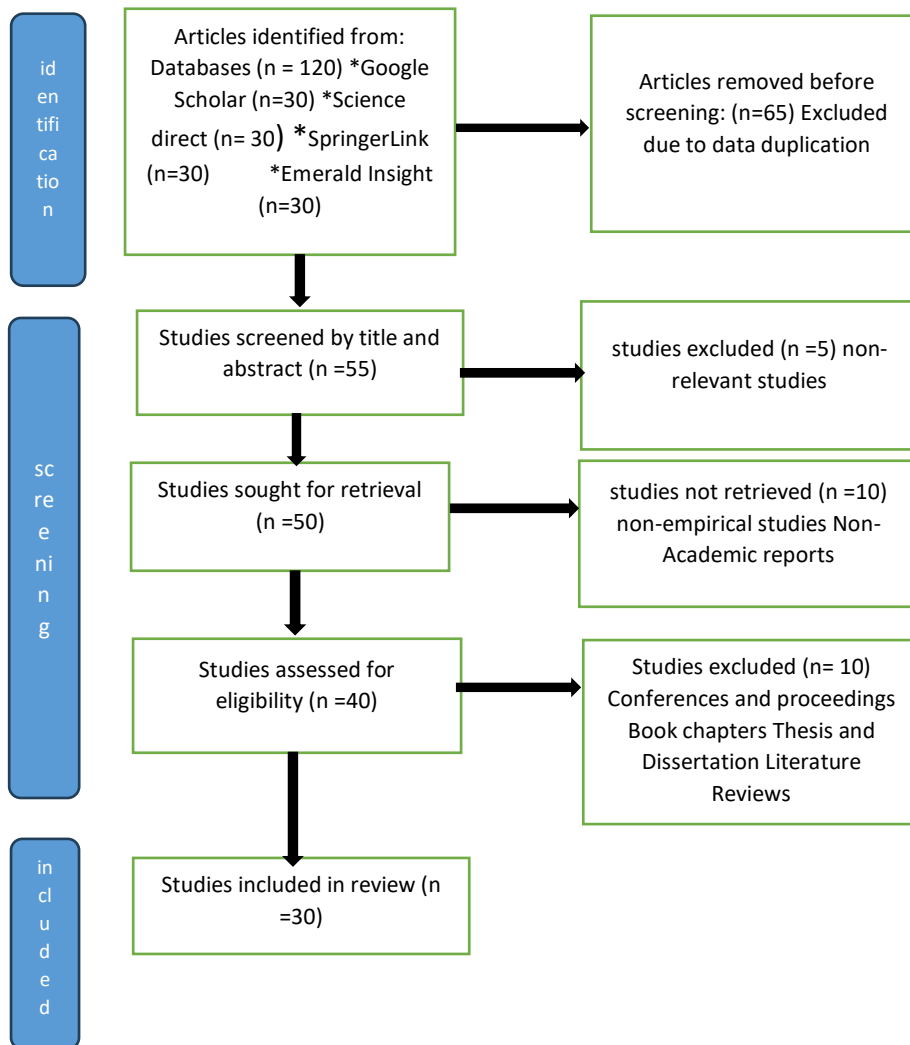


Figure 1. Prisma Flow Chart.

The study followed the PRISMA selection procedure to ensure a transparent and systematic screening of the literature. The initial database search produced 120 articles related to the Theory of Constraints and its applications across different sectors. After the removal of duplicate records and preliminary screening based on titles and abstracts, 55 articles were retained for further evaluation. These remaining studies were then subjected to a detailed eligibility assessment in which the full texts were reviewed against the predefined inclusion and exclusion criteria. Articles that did not clearly address the application of the Theory of Constraints in operational or organizational contexts were excluded at this stage. Following this process, a final sample of 30 peer-reviewed articles met all the selection criteria and were

included in the comparative literature review and subsequent analysis. The figure is shown in **Figure 1**.

3. RESULTS AND DISCUSSION

3.1 Summary of Reviewed Studies

The reviewed studies demonstrate that the Theory of Constraints (TOC) has been widely applied across multiple sectors, with varying objectives and outcomes. The distribution of studies indicates that the manufacturing sector dominates literature, accounting for 10 out of the 30 reviewed articles. In this sector, TOC is primarily applied in production scheduling and bottleneck management, where the focus is on identifying system constraints and improving production flow. Most studies reported increased throughput, improved production efficiency, and better utilization of critical resources. The healthcare sector represents the second largest group with 6 studies. In this context, TOC is commonly used to improve patient flow management and hospital resource allocation. The reviewed articles show that applying TOC principles helps hospitals reduce waiting times, optimize staff utilization, and improve overall service delivery.

In the supply chain sector, 7 studies focused on applications such as inventory management and logistics coordination. These studies highlight how identifying constraints in supply networks can improve coordination between suppliers, manufacturers, and distributors. The main outcomes reported include improved delivery reliability, reduced stock shortages, and better synchronization of supply chain activities. The project management field contributed to 4 studies, mainly focusing on Critical Chain Project Management (CCPM), an extension of TOC principles applied to project environments. These studies demonstrate that applying TOC helps reduce project delays, improve schedule reliability, and manage resource dependencies more effectively. Finally, the public sector accounted for 3 studies, which examined the application of TOC in service delivery optimization and administrative processes. The findings suggest that TOC can enhance operational efficiency, reduce process delays, and improve the performance of government service systems. The table is shown in **Table 1**.

Table 1. Summary of reviewed studies

Sector	Number of Studies	Key Application Areas	Major Outcomes
Manufacturing	10	Production scheduling, bottleneck management	Increased throughput
Healthcare	6	Patient flow, hospital resource allocation	Reduced waiting time
Supply Chain	7	Inventory management, logistics coordination	Improved delivery reliability
Project Management	4	Critical chain project scheduling	Reduced project delays
Public Sector	3	Service delivery optimization	Improved efficiency

Overall, the comparative analysis indicates that although TOC originated in manufacturing environments, its application has expanded significantly into service-based sectors, particularly healthcare and supply chain management, where system constraints strongly affect operational performance.

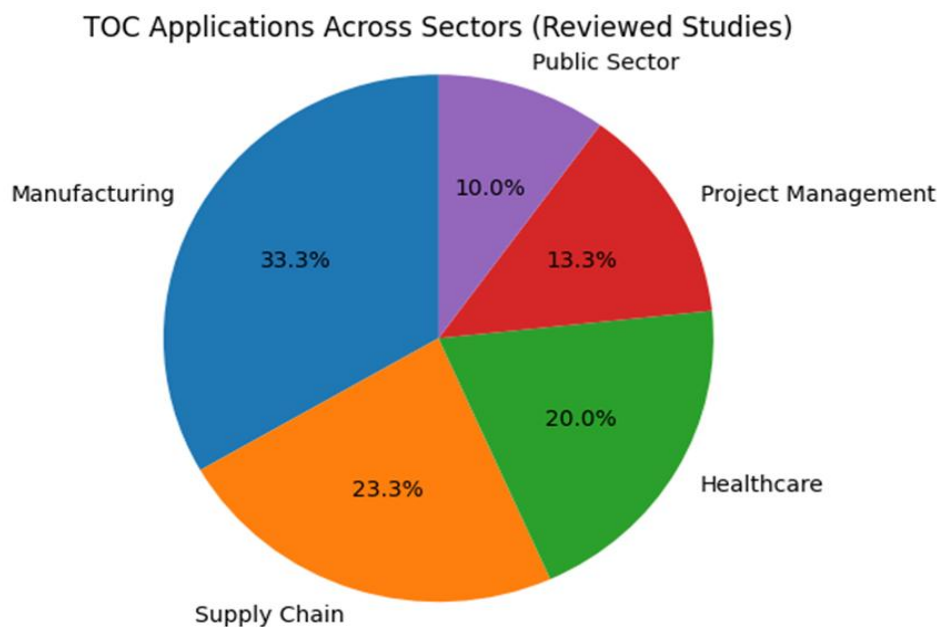


Figure 2. Distribution of Reviewed Studies on Theory of Constraints (TOC) Applications Across Different Sectors.

The pie chart on **Figure 2** illustrates the distribution of reviewed studies across sectors. The manufacturing sector represents the largest share of literature (33.3%), followed by supply chain management (23.3%) and healthcare (20%). Project management accounts for 13.3% of the reviewed studies, while public sector applications represent the smallest proportion (10%). This distribution suggests that the Theory of Constraints has been most extensively applied in industrial and logistics environments compared to other sectors.

3.2 Comparative Analysis

Manufacturing Sector Findings. Studies focusing on the manufacturing sector consistently demonstrate that the application of the Theory of Constraints (TOC) improves operational efficiency by identifying and managing system bottlenecks that limit production performance. Manufacturing systems typically consist of interconnected processes where the overall output of the system is determined by the weakest or most constrained process. Through the TOC approach, organizations can identify these bottlenecks and implement targeted strategies such as improved scheduling, capacity balancing, and workflow optimization to increase production throughput and reduce idle time. Several studies have shown that the systematic application of TOC principles significantly enhances production flow by ensuring that critical resources are utilized more efficiently. For example, research on production systems indicates that managing bottlenecks through TOC improves productivity and minimizes production delays by synchronizing upstream and downstream processes within the manufacturing line (Pawar et al., 2016). Similarly, studies on reconfigurable manufacturing systems demonstrate that TOC-based system design can help organizations restructure production layouts to reduce operational constraints and improve overall manufacturing flexibility (Kurniadi and Ryu, 2017). Furthermore, research examining the implementation of TOC in industrial environments suggests that addressing capacity constraints directly leads to improved operational performance and better resource utilization (Mulyadi et al., 2024). Case studies conducted in different production environments also show that applying TOC principles to make-to-order manufacturing systems enables firms to reduce lead times and enhance production reliability

(Orue et al., 2021). These findings indicate that TOC serves as a practical operational management tool for improving manufacturing productivity and optimizing production systems. In developing economies such as Tanzania, manufacturing firms also face operational constraints related to technological limitations, supply chain disruptions, and resource inefficiencies. Studies focusing on Tanzanian manufacturing SMEs highlight that operational constraints significantly affect production performance and competitiveness in international markets (Ringo et al., 2024). Addressing these challenges through constraint-focused management approaches such as TOC could therefore help manufacturing firms improve efficiency and strengthen industrial performance.

Healthcare Sector Findings. The healthcare sector represents one of the most important areas where the Theory of Constraints has been successfully applied to improve operational efficiency and service delivery. Hospitals and healthcare institutions often experience complex operational challenges related to limited resources, increasing patient demand, and inefficient patient flow. These challenges frequently create bottlenecks in critical departments such as emergency units, diagnostic services, and surgical facilities. TOC provides a systematic approach for identifying these constraints and implementing solutions that improve healthcare system performance.

Research shows that applying TOC principles within healthcare systems can significantly enhance patient flow management and reduce congestion in hospitals. For instance, system dynamics models based on TOC have been used to analyze healthcare service processes and identify operational bottlenecks that contribute to delays in patient treatment (Grida and Zeid, 2018). By focusing on the most constrained resources, healthcare administrators can redesign operational processes in order to increase patient throughput and reduce waiting times. Similarly, empirical studies conducted in hospital environments demonstrate that implementing TOC-based management strategies leads to measurable improvements in resource utilization and service delivery efficiency (Mabin et al., 2018). A systematic review of healthcare applications of TOC also indicates that hospitals adopting this approach experience improvements in service quality, patient flow coordination, and operational decision-making (Bacelar-Silva et al., 2020). These improvements are largely attributed to the ability of TOC to focus managerial attention on critical system constraints that limit healthcare performance. In the context of developing countries, healthcare systems often face additional operational challenges such as limited medical infrastructure, shortage of healthcare professionals, and inadequate information systems. Studies examining healthcare service management in Tanzania highlight the importance of adopting technological and organizational tools that enhance clinical decision-making and patient care processes (Mwogosi and Mambile, 2025). Applying TOC principles in such contexts could therefore support more efficient allocation of limited healthcare resources and improve the overall effectiveness of healthcare delivery systems.

Supply Chain Sector Findings. Supply chain management represents another key area where the Theory of Constraints has been widely applied to improve operational coordination and performance. Modern supply chains consist of interconnected activities including procurement, production, inventory management, and distribution. Inefficiencies within any of these activities can create constraints that disrupt the flow of goods and information across the entire supply chain network. TOC provides a structured approach for identifying these bottlenecks and optimizing supply chain processes. Research indicates that applying TOC principles in supply chains can significantly improve inventory management and logistics coordination. For example, studies examining the dynamics of supply chain systems show that integrating TOC concepts with analytical models helps reduce inefficiencies such as the

bullwhip effect, which occurs when demand variability becomes amplified along the supply chain (Costas et al., 2015). By identifying and managing system constraints, organizations are able to stabilize production and distribution planning processes. In addition, systemic approaches combining TOC with broader supply chain management frameworks have been shown to improve coordination between supply chain partners and enhance overall system performance (Puche et al., 2016). Collaborative supply chain strategies also play a crucial role in addressing operational constraints by improving information sharing and coordination among supply chain actors (Fawcett et al., 2017). These approaches help organizations respond more effectively to changes in market demand and operational disruptions.

Studies focusing on supply chains in developing countries highlight similar challenges. For example, research on Tanzanian SMEs shows that supply chain constraints significantly affect operational performance and business growth (Nkwabi, 2019). Similarly, sector-specific studies on dairy supply chains indicate that inefficiencies in logistics coordination and value chain management limit the sustainability performance of agricultural supply systems in Tanzania (Sumuni, 2019). Applying TOC-based management strategies could therefore help organizations identify key bottlenecks and improve supply chain efficiency.

Project Management Findings. In project management environments, the Theory of Constraints is commonly applied through a methodology known as Critical Chain Project Management (CCPM). CCPM extends traditional project management techniques by focusing on the identification and management of resource constraints that often cause delays in project execution. Unlike conventional project scheduling methods that emphasize task sequencing, CCPM emphasizes the management of critical resources and buffers to ensure that projects are completed on time. Research indicates that the application of TOC principles in project environments significantly improves project scheduling and resource allocation. By identifying the critical chain of dependent activities within a project, managers can allocate resources more efficiently and avoid multitasking that often leads to project delays. Studies on operations performance improvement demonstrate that integrating TOC with other operational management approaches such as Lean can further enhance project execution efficiency (Chakravorty and Hales, 2020). Moreover, constraint-based performance management approaches such as throughput accounting provide useful tools for monitoring project performance and evaluating resource utilization (Kadhm, 2020). These approaches enable organizations to focus on maximizing system throughput rather than simply reducing individual task costs, thereby improving the overall effectiveness of project management practices. The application of TOC in project-oriented sectors has also been explored in various industries including construction, mining, and infrastructure development. Case studies from industrial environments demonstrate that managing operational constraints leads to improved productivity and reduced delays in large-scale project operations (Mntambo et al., 2023). These findings suggest that TOC provides a valuable framework for managing complex projects where resource constraints play a critical role in determining project success.

Public Sector Applications. Although most research on the Theory of Constraints has focused on industrial and commercial sectors, a growing number of studies have explored its application in public sector organizations. Government institutions often face operational constraints related to limited resources, bureaucratic procedures, and increasing demand for public services. These constraints frequently result in inefficiencies in service delivery and administrative processes. Applying TOC principles provides a systematic approach for identifying these constraints and improving organizational performance within public institutions. Research suggests that TOC can be effectively used to improve service delivery processes in sectors such as public healthcare, education, and government administration. For

example, studies examining the application of TOC in large public hospitals demonstrate that addressing resource constraints and improving workflow coordination can significantly enhance service efficiency and reduce operational delays (Mabin et al., 2018). Similar approaches have been applied in higher education systems where TOC is used to improve academic program management and decision-making processes (Kumaran et al., 2015). In service-oriented sectors such as tourism and banking, TOC has also been applied to improve organizational performance by identifying operational bottlenecks and redesigning service delivery processes (Castaño et al., 2019; Pérez-Campdesuñer et al., 2018). These studies indicate that constraint-focused management approaches can be successfully adapted to service environments where efficiency and responsiveness are essential for organizational success. Within the context of developing economies, public sector organizations frequently operate under severe resource limitations. Studies examining economic and service systems in Tanzania highlight the importance of improving institutional coordination and value chain linkages in order to enhance development outcomes (Anderson, 2018). Applying TOC principles in public sector institutions could therefore help governments improve administrative efficiency and deliver public services more effectively. **Table 2** presents a comparative summary of the key findings from the reviewed studies across different sectors, highlighting the primary applications of the Theory of Constraints and the operational improvements reported in the literature.

Table 2. Comparative findings of toc applications across sectors

Sector	Main Application	TOC	Key Performance Improvements	Supporting Literature
Manufacturing	Bottleneck identification and production scheduling	and	Increased throughput, reduced idle time	TOC manufacturing studies (2015–2025)
Healthcare	Patient optimization and resource allocation	flow and	Reduced waiting time and improved hospital efficiency	Healthcare operations studies
Supply Chain	Inventory management and logistics coordination	and	Improved delivery reliability and reduced stock shortages	Supply chain optimization studies
Project Management	Critical Project Management (CCPM)	Chain Management	Reduced project delays and improved resource utilization	Project management literature
Public Sector	Administrative process improvement		Increased service delivery efficiency	Public management studies

Discussion and Research Gap. The findings from the reviewed literature indicate that the Theory of Constraints (TOC) has been widely applied across different organizational sectors to improve operational performance. Across manufacturing, healthcare, supply chain management, and project management environments, the central objective of TOC remains the identification and management of system constraints that limit overall organizational performance. By focusing on the most critical bottlenecks within operational processes, organizations can improve productivity, increase throughput, and enhance service delivery efficiency (Orouji, 2016).

In the manufacturing sector, the reviewed studies consistently demonstrate that TOC contributes to improved production efficiency through better production scheduling, line balancing, and capacity management. Organizations applying TOC principles can identify production bottlenecks and redesign manufacturing processes to increase output and reduce idle time (Pawar et al., 2016; Mulyadi et al., 2024). Additionally, the integration of TOC with other operational improvement methodologies such as Lean has been shown to further enhance operational performance in manufacturing environments (Chiarini and Vagnoni, 2017; Chakravorty and Hales, 2020). These findings confirm that constraint-based management approaches play a critical role in optimizing industrial production systems.

Similarly, studies conducted in healthcare systems demonstrate that TOC can significantly improve patient flow management and resource allocation. Hospitals often face operational constraints related to limited medical resources and increasing patient demand. Applying TOC enables healthcare administrators to identify bottlenecks within treatment processes and redesign operational workflows in order to reduce waiting times and improve service quality (Grida and Zeid, 2018; Bacelar-Silva et al., 2020). Empirical evidence from hospital environments also indicates that TOC-based management practices improve coordination between departments and enhance the overall efficiency of healthcare delivery systems (Mabin et al., 2018; Cox, 2022).

In the supply chain sector, the literature highlights the importance of managing operational constraints to improve logistics coordination and inventory management. Supply chains consist of multiple interconnected activities where inefficiencies in one stage can disrupt the entire system. Studies demonstrate that applying TOC principles helps organizations reduce operational variability, improve distribution planning, and mitigate supply chain disruptions (Costas et al., 2015; Puche et al., 2016). Furthermore, collaborative supply chain practices enhance coordination among supply chain actors and improve overall supply chain performance (Fawcett et al., 2017).

Despite the wide range of applications of TOC across different sectors, the reviewed literature reveals an important research gap in relation to developing economies, particularly in the African context. Most empirical studies on TOC have been conducted in developed countries where industrial systems are relatively advanced and well-structured. Consequently, limited research has explored how TOC can be applied within operational environments characterized by resource constraints, institutional challenges, and infrastructural limitations.

In Tanzania, organizations across sectors such as manufacturing, agriculture, tourism, and small and medium enterprises often face significant operational constraints that limit productivity and competitiveness. Studies examining supply chain performance in Tanzanian SMEs indicate that inefficiencies in logistics coordination and resource management continue to affect business growth (Nkwabi, 2019). Similarly, research focusing on manufacturing enterprises in Tanzania highlights the presence of technological and operational constraints that hinder industrial performance and sustainable production practices (Khamis et al., 2022; Ringo et al., 2024). In addition, sectoral studies on tourism and agricultural value chains in Tanzania demonstrate that structural constraints within supply networks limit the ability of industries to achieve sustainable development outcomes (Anderson, 2018; Suleiman, 2023). These findings suggest that addressing operational constraints remains a critical challenge for organizations operating in the Tanzanian economic environment. However, although these studies acknowledge the existence of operational constraints, relatively few studies have explicitly examined the application of the Theory of Constraints as a management framework for addressing such challenges in Tanzania. As a result, there remains a significant gap in the literature regarding how TOC principles can be adapted and applied to improve operational

performance within Tanzanian organizations. Therefore, this study contributes to the existing body of knowledge by synthesizing current research on TOC applications across different sectors and highlighting its potential relevance for improving operational performance in developing economies such as Tanzania. By examining the lessons derived from international studies, the research provides insights that may guide future empirical investigations on the implementation of constraint-based management approaches within Tanzanian organizational contexts.

Implications for Tanzania. The findings of this comparative literature review provide several important implications for improving operational performance across sectors in Tanzania. Although many of the reviewed studies were conducted in international contexts, their findings offer valuable insights that can guide managers, policymakers, and researchers in addressing operational inefficiencies within Tanzanian organizations.

First, the application of the Theory of Constraints (TOC) offers a systematic approach for identifying and managing operational bottlenecks that commonly affect organizational performance. Many organizations in Tanzania, particularly small and medium enterprises (SMEs), experience limitations related to production capacity, logistics coordination, and inefficient resource utilization. Studies examining Tanzanian supply chains indicate that operational inefficiencies and coordination challenges often reduce competitiveness and limit business growth (Nkwabi, 2019). By applying TOC principles, organizations can identify critical constraints within their operations and implement targeted strategies to improve overall system performance.

Second, the manufacturing sector in Tanzania can benefit significantly from constraint-based operational improvement strategies. Manufacturing firms frequently face production bottlenecks caused by limited technological capacity, inefficient workflow design, and resource shortages. Research on Tanzanian manufacturing enterprises highlights that operational and technological constraints remain key challenges affecting industrial productivity (Khamis et al., 2022; Ringo et al., 2024). Implementing TOC-based production planning and capacity management approaches could help manufacturing firms improve throughput, reduce idle time, and enhance production efficiency.

Third, the application of TOC principles could also improve supply chain coordination in sectors such as agriculture, tourism, and food production. In many developing economies, supply chains are characterized by fragmented coordination among producers, distributors, and service providers. Studies examining agricultural and tourism value chains in Tanzania indicate that weak coordination among stakeholders often limits the ability of sectors to achieve sustainable economic outcomes (Anderson, 2018; Suleiman, 2023). Applying TOC in supply chain management could help organizations identify critical points where delays or inefficiencies occur and redesign processes to improve product flow and distribution efficiency.

Another important implication relates to the healthcare sector. Healthcare systems in developing countries often face operational challenges such as overcrowded facilities, limited resources, and inefficient patient flow management. International studies show that TOC can improve hospital operations by identifying bottlenecks in treatment processes and optimizing resource allocation (Grida and Zeid, 2018; Bacelar-Silva et al., 2020). Such approaches may also be relevant in Tanzanian healthcare facilities where improving service efficiency remains a critical priority.

Furthermore, the findings suggest that policymakers and institutional leaders in Tanzania could benefit from incorporating constraint-based thinking into public sector management and development planning. Public institutions often face bureaucratic inefficiencies and resource limitations that reduce service delivery effectiveness. By adopting management frameworks

that emphasize the identification and resolution of system constraints, public organizations may improve administrative processes and enhance service delivery outcomes.

Finally, the study highlights the need for future empirical research on the application of TOC within Tanzanian organizational contexts. While several studies have examined operational challenges across sectors in Tanzania, relatively few have explicitly applied the Theory of Constraints as an analytical or managerial framework. Therefore, future research could explore how TOC principles can be implemented within Tanzanian industries and evaluate their impact on organizational performance.

4. CONCLUSION

This study conducted a comparative literature review of the applications of the Theory of Constraints across multiple organizational sectors using research published between 2015 and 2025. The objective of the study was to examine how TOC has been applied in different operational environments and to identify lessons that may be relevant for improving sector performance in Tanzania. The findings from the reviewed literature indicate that TOC is widely recognized as an effective management approach for improving organizational performance. Across sectors such as manufacturing, healthcare, supply chain management, project management, and service industries, the application of TOC principles has been associated with improvements in operational efficiency, production throughput, resource utilization, and service delivery outcomes. By focusing on the identification and management of system constraints, organizations are able to optimize operational processes and enhance overall performance (Orouji, 2016). In the manufacturing sector, studies demonstrate that TOC improves production scheduling and helps organizations address bottlenecks that limit production capacity. Similarly, healthcare studies indicate that the application of TOC contributes to improved patient flow management and more efficient use of hospital resources (Bacelar-Silva et al., 2020). In supply chain management, TOC supports better coordination among supply chain actors and improves logistics planning and inventory management (Puche et al., 2016).

Despite the growing body of literature on the application of TOC in different sectors, the review revealed that most empirical studies have been conducted in developed economies. Consequently, there remains limited research examining how TOC can be applied in developing countries where organizations often face unique operational constraints related to infrastructure limitations, resource scarcity, and institutional challenges. In the context of Tanzania, many sectors continue to experience operational inefficiencies that limit productivity and service delivery effectiveness. Previous studies have identified constraints affecting supply chain coordination, manufacturing productivity, and sectoral value chain performance (Nkwabi, 2019; Anderson, 2018). However, limited research has explicitly examined the use of the Theory of Constraints as a management framework for addressing these challenges. Therefore, this study contributes to the literature by synthesizing existing knowledge on cross-sector applications of TOC and highlighting its potential relevance for improving organizational performance in Tanzania. The findings suggest that adopting constraint-based management approaches could help organizations in Tanzania identify critical operational bottlenecks and implement targeted strategies to enhance efficiency and productivity. Future research should focus on conducting empirical studies that examine the implementation of TOC within specific sectors in Tanzania. Such studies would provide deeper insights into the practical challenges and benefits associated with applying constraint-based management approaches in developing economic contexts.

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