Examining military reform efforts and security outcomes in Defence Modernisation in Ethiopia

Abdulkadir Mohammed Seid[1]
Charles Okongo Imbiakha [2]
Mumo Nzau[3]

[1]abdumoha488@gmail.com

[1,2,3]National Defence University Kenya

https://doi.org/10.51867/ajernet.7.3.128

ABSTRACT

This study focused on defence modernisation and national security in Ethiopia, critically analysing the Ethiopian military reform efforts and the security outcomes, and understanding the socio-political and external security environment. The study emphasised the modernisation of military technology, upgrading of military hardware and equipment, intelligence systems, and training programs to enhance the operational effectiveness of the Ethiopian National Defence Force (ENDF). The research was conducted using patterns of theory analysis of Modernisation Theory, Dependency Theory and National Security Theory to explain the relationship between defence modernisation and the security outcomes of the nation. A convergent parallel mixed-methods research design was adopted, where there is a quantitative and qualitative approach. The target population comprised 4,545 ENDF officers, Ministry of Defence officers, defence analysts and international military advisers, of which 368 respondents were selected using stratified random and purposive sampling techniques. SPSS version 27 was used to analyse quantitative data, using descriptive statistics, correlation, regression and Analysis of Variance [ANOVA] analysis, and their qualitative data were analysed thematically. The results showed that defence modernisation has resulted in significant enhancement of Ethiopian counterinsurgency operations, border operations, intelligence collection and operational preparedness. Specifically, 55.4% said that capability in response to insurgencies had improved within ENDF since 2017, and 71.0% indicated that modernisation had increased the security and surveillance capabilities of borders. Correlation and regression analysis also found the most positive effect on national security outcomes to be military technologies ($\beta = 0.398$, $p = 0.000$). The study also revealed significant operational, institutional and policy problems existing during the process of modernisation, such as logistical inefficiencies, excessive delay in bureaucracy, corruption, weak institutional coordination, etc., and overdependence on foreign military suppliers. The study concludes that the defence modernisation has enhanced Ethiopia's capacity for national security, but for it to be sustainable, a combination of military modernisation, socioeconomic stability and political security should be present. It thus recommends better institutional modernisation, better defence coordination and more coordinated defence investments, emphasizing the links with the overall national development agenda and stability.

Keywords: Border Security, Defence Capability, Defence Modernisation, Intelligence and Surveillance, Military Readiness, National Security, Security Challenges, Security Sector Reform.

I. INTRODUCTION

The threat to security has grown more complex and intense with the emergence of new threats worldwide, making defence modernisation an important and imperative aspect of national security strategies for countries around the world. This is forcing modern military institutions to incorporate current technologies, modern battle systems, cyber and intelligence systems, and professional military training to fend off internal and external threats. The U.S. Department of Defense (2023) highlights the growing importance of technological innovation and modernisation for maintaining military readiness and responding to emerging security challenges. These developments indicate that military modernisation is no longer confined to conventional warfare but is instead a multidimensional paradigm based on approaches to multidimensional security capable of tackling hybrid threats, terrorism, cyber warfare, and geopolitical competition in the constantly changing international security context.

As a result, the link between defence modernisation and national security has attracted the attention of academia and policymakers worldwide, given the pivotal role of military capability in the survival and sovereignty of states. In the anarchic international system, 'national interest' and 'political stability' are best served by military force: a position argued by Morgenthau (1948). Similarly, Waltz (1979) states that states always strive to make their armies more powerful because of the uncertainties of the international security structure. Consequently, force restructuring, acquisition of new weapon systems, modernisation of military doctrines, and enhancement of military intelligence capabilities have gained momentum in military modernisation programs in different countries. The New Humanitarian. (2024) attributed the spike in global military spending for 2021-23 to rising geopolitical tensions, inter-state breaches,

and growth in threats from non-state sources. Given these developments, military modernisation has become a necessity for countries that want to retain control of their respective nation-states and influence in their respective regions.

African threats, including persistent insurgencies, terrorism, civil conflicts, border disputes, and political uncertainty in some countries across the continent, have increased the need for defence modernisation. To counter these risks, African countries are investing more in modern military technology, counterterrorism capabilities, intelligence, and rapid-deployment forces. In contrast, the Nigerian military has stepped up its modernisation initiatives in the fight against Boko Haram, acquiring combat aircraft, surveillance technologies, and armoured vehicles (The New Humanitarian, 2024). South Africa has also modernised its defence industry and military technologies despite budget and funding constraints affecting defence sustainability efforts (Matthews & Koh, 2021). Additionally, Egypt has made significant investments in acquiring high-tech fighter jets and missile defence systems and in modernising its navy to bolster its military presence in the region and respond to threats from neighbouring nations (Reuters, 2023). These developments underscore African states' growing awareness that military modernisation is a pre-condition for improving the effectiveness of national security action and bolstering national security in Africa.

The political turmoil in the Horn of Africa has become more complex, as development over the past decade and a half has been defined by interstate tensions, terrorism, ethnic divisions and geopolitical conflicts. Armed insurgencies, transnational terrorism, illegal arms transfers and border disputes are increasingly significant threats in the region. Ethiopia’s large population, military strength and role in regional peacekeeping in the Horn of Africa make it a strategically important country. Despite these diverse internal security concerns in recent years, Addis Standard (2023) reports that Ethiopia remains one of the most salient military players in the region. The country has consistently had one of the largest per capita armed forces in Africa and a history of involvement in peacekeeping missions on the continent under the African Union Mission in Somalia (AMISOM). However, internal conflicts, particularly the Tigray conflict, border disputes with neighbouring states, and the Oromo insurgencies have severely tested the operational capacity and exposed weaknesses in the Ethiopian military structure.

A cruel period of conflict between TPLF and the Ethiopian National Defence Force (ENDF) from 2020 to 2022 highlighted many operational, logistical, and institutional flaws within the ENDF. The war placed significant strain on Ethiopia's military facilities and prompted the government to escalate emergency military spending to sustain fighting costs. The World Bank (2023) noted that the war had forced the government to allocate more funds for emergency military expenditure to keep fighting costs. Faced with new and modern machinery, logistical coordination problems, and poor technological integration and intelligence systems within the military, the war showed little sign of these issues. In addition, the war demonstrated the critical role of advanced warfare technologies like drones, surveillance systems, and spyware in today's security operations. The Ethiopian government then stepped up efforts to modernise its military's capabilities, including the acquisition of drones, armoured vehicles, cyber-surveillance technology, and advanced air defence equipment from countries like the United Arab Emirates, China, and Turkey, according to Addis Standard (2023). The modernisation initiatives were aimed at bolstering operational efficiency and enhancing the nation's security responses to changing security threats.

Defence modernisation in Ethiopia has become increasingly intertwined with other national security issues, including counterinsurgency, territorial integrity, border security and regional stability. Responses to modernise the Army, including technological integration, updated training for military personnel, development of military intelligence and acquisition of modern combat systems, have been given top priority to boost Defence effectiveness. Opiyo (2025) noted that Ethiopia has extensively introduced drone technologies and surveillance systems in its counterinsurgency and peacekeeping missions in conflict zones. In the same vein, Sigatu (2021) claimed that “modernization of military technologies has improved Ethiopia's operational capacity for intelligence gathering, monitoring of its borders and tactical response mechanism.” The reforms are part of the government's national security strategy to create an army that is better prepared for military or armed resistance within the country and better equipped to handle external threats that are impacting the country's security.

However, despite significant modernisation, Ethiopia still faces substantial challenges to military reform and improvements in national security outcomes, stemming from operational, institutional, and policy constraints. A major challenge is the overreliance on foreign military suppliers for defence technologies, equipment maintenance, and technical skills. de Waal and Gebrehiwot Berhe (2024) argue that Ethiopia has increasingly turned to foreign military engagement, particularly with China, Turkey and the UAE, thereby reducing the sustainability of its defence and its defence autonomy over the long term. Because members are dependent upon external suppliers, they are at risk of being affected by geopolitical factors and of facing difficulties when there is a political shift in the region. Moreover, inefficient logistics, slow bureaucratic processes, corruption in the procurement system, and ineffective institutional coordination remain challenges during the implementation of modernisation programs in Ethiopia's defence sector (Regassa, 2022). This institutional restraint undermines the impact of modernisation investments and makes it harder to establish a viable working relationship for the operational integration of capabilities with advanced military technology.

Moreover, considerable policy and financial constraints make military reforms in Ethiopia unsustainable. According to Berisso and Sorsa (2025), military imports and defence spending take up a large share of Ethiopia's national budget, placing fiscal strain on economic growth and the provision of social services. High military spending might also risk undermining the country's long-term security if demands for socioeconomic improvements are not met. According to Raga et al. (2023), excessive defence budgets can create discontent among the people and weaken national stability in countries that focus on military investment rather than the economic welfare and development requirements of citizens. Moreover, Ethiopia's defence modernisation measures tend to be reactive and oriented towards the present security situation, rather than proactive planning based on future contingencies (Berisso & Sorsa, 2025). This policy no longer aligns with institutional readiness and affects the country's effectiveness in facing the emerging panorama of hybridised forms of security threats, including cyber warfare, drone terrorism and asymmetric campaigns.

1.1 Research Objective

This study, therefore, examines defense modernization and national security in Ethiopia by critically analyzing military reform efforts and their security outcomes within the context of the Horn of Africa's evolving geopolitical environment.

II. LITERATURE REVIEW

2.1 Theoretical Review

The three dominant theories, namely Modernization theory, Dependency theory and National security theory, are used to guide this study and to understand the relationship between defence modernisation and national security outcomes in Ethiopia. These theories provide an analytical framework for understanding how military upgrades affect state security, their effectiveness and strategic stability. The interaction of the three theories allows investigation of two aspects, namely technological improvement, institutional dependency and national security preparedness in the Ethiopian defence sector. Waltz (1979) maintained that military strength and strategic readiness remain vital elements of state survival in the international system. Similarly, Morgenthau (1948) states that States always seek military strength to protect sovereignty and territorial integrity. The chosen theories offer a suitable foundation for examining Ethiopian army reforms and what these changes mean for Ethiopia in the Horn of Africa region.

2.1.1 Modernization Theory

Modernisation theory (proposed by (Rostow, 1960; McClelland, 1961) argues that societal and institutional development occurs through technological progress, transformation of the economic structure, and modernisation of state institutions. The theory suggests that countries can gain an advantage by implementing contemporary technologies and advanced systems across their economic, political, and military sectors. Within the framework of defence modernisation, the theory implies that modernising military institutions will be more effective when there is greater integration of modern weapon systems, cyber technologies, monitoring systems, and advanced military training. Ethiopia's armaments, including drones, cyber-surveillance systems, air defence technologies, and modern combat technologies, embody the ideas of Modernisation Theory on how technologies advance and how the nature of warfare changes. Modernisation of military technology has made Ethiopia more effective in peacekeeping and counterinsurgency operations. Rostow (1960), however, points out that for a modernisation process to be sustainable, it needs strong institutions, infrastructure, and skilled personnel, and the presence of these rarely exists in the Ethiopian defence sector.

2.1.2 Prebisch/Frank Dependency Theory

The Prebisch/Frank dependency theory (1959/1967) helps to critically analyse Ethiopia's dependence on foreign military technology and external defence relationships. The theory holds that in many developing countries, advancement is achieved through dependence on advanced nations for technical support, military equipment, and economic policies and assistance, which limits strategic autonomy and the institutional independence of developing countries. Ethiopia centres its modernisation program on military aid from abroad to purchase drones, armoured vehicles, surveillance equipment, and army training programs from countries such as China, Turkey, Russia, and the United Arab Emirates. This dependence leaves Ethiopia vulnerable, given its poor defence production capability and technological self-reliance. Divergent interests, including those of geopolitical powers, will further reduce the state's political power and self-reliance as it leans on too many foreign providers (Frank, 1967). Therefore, in the context of Ethiopia, the relevance of Dependency Theory is evident in the structural constraints faced during defence modernisation and long-term military autonomy processes, as well as in the investments made in armaments. As a result, in Ethiopia, Dependency Theory offers insight into the structural forces that limit efforts to achieve a sustainable defence

modernisation process and long-term military autonomy, even though the country invests in advanced military technologies.

2.1.3 National Security Theory

National Security Theory focuses on the state's role in safeguarding its survival, territorial integrity, and political stability, and in protecting against internal and external dangers. It is closely associated with the realist school of thought, as exemplified by Morgenthau (1948) and Waltz (1979). The theory holds that military capability, strategic capability, and defence modernisation are important means of protecting national interests in an anarchic international system. Ethiopia faces numerous security threats, including insurgency, ethnic conflicts, leasing, terrorism, conflicts with neighbouring countries, and geopolitical issues in the Horn of Africa. Consequently, the Ethiopian government has prioritised modernising its military security capacity by procuring modern technologies, military intelligence systems, and modernising military training within the Ethiopian National Defence Force (ENDF). Modernisation of Ethiopia's army equipment has enhanced capabilities in border security, counterinsurgency activities, and intelligence collection; this has been noted by Sigatu (2021). National Security Theory is hence relevant to this study, given its understanding of how defence modernisation contributes to strengthening the security of the state by enhancing Ethiopia's military efficacy and capability to respond to the new security challenges it faces both nationally and regionally.

2.2 Empirical Review

In modern times, defence modernisation has become synonymous with increased operational efficiency and national security goals, driven by the incorporation of cutting-edge military technologies in today's conflicts. Tepper et al. (2024) explored the importance of cyber and space forces in support of national defence and in improving strategic deterrence. This study used a qualitative case analysis approach and a legal-security framework to examine the effects of cyber and space capabilities on military operations in various states. The results show that cyber defence, satellite surveillance, and digital command systems provide better situational awareness, intelligence, and deterrence against new threats in countries that invest in these capacities. However, the researchers said that enabling digital means at the same time will "open the door" to different levels of cyberattacks and hybrid warfare by other states. The researchers concluded that achieving operational effectiveness requires a balance between technological progress and sufficient cyber resilience to protect national security, which is becoming more important.

Whereas studies have concentrated mainly on cyber capacities, Coetzee and Putter (2025) assessed the role of unmanned aerial systems (UAS) in operational effectiveness during contemporary military operations. Drawing on Realist Theory, the researchers compared the use of drones in several contemporary conflict situations. Their results show that the utilisation of UAS can improve the ability to observe, gather information, and collect accurate intelligence for precision engagement, and can also advance the military's speed and reaction time against insurgent forces and other threats. The study also confirmed that drone technology can mitigate the risk faced by military personnel and improve the speed and accuracy of tactical decision-making. The researchers, however, note that as advanced drone capabilities become commonplace, they could heighten military rivalry and possibly change the current balance of deterrence across the region. The study concluded that UASs have become an essential part of contemporary effective military operations and security.

In Africa, the value of defence modernisation has increasingly been judged by its effectiveness in combating terrorism, insurgency, transnational crime and the destabilisation of the region. Consequently, Debisa (2021) studied the effectiveness of Kenya’s security agencies in dealing with asymmetric threats posed by Al-Shabaab. This study used a mixed-methods approach in accordance with Counterinsurgency Theory, incorporating surveys, interviews and an examination of operational performance. The findings showed that current surveillance processes, intelligence gathering and rapid responses were crucial to security forces’ ability to identify, track and neutralise a terrorist operation. But technology alone was not enough, nor was human intelligence without the help of the people themselves. The researchers noted that defence modernisation work is more effective when coupled with advanced technologies and intelligence-led and community-centred approaches to security.

This finding aligns with observations from other African countries on the broader contribution of defence modernisation to national security. The Tanzania Defence study on the impact of naval modernisation on maritime security in Tanzania was grounded in Neo-Realist Theory and employed a qualitative case study methodology. The results showed that significant investments in patrol vessels, maritime surveillance and coastal monitoring systems have improved maritime domain awareness, mitigated illegal activities at sea and protected strategic economic assets (World Bank, 2023). With better monitoring capabilities, the safeguarding of trade routes and the nation's trade interests has been bolstered. While the Tanzanian maritime environment differs from that of landlocked Ethiopia, it can be inferred that foreign aid in the form of defence modernisation helps national security by giving the country greater capacity to defend its critical national interests.

In a broader continental context, Raga et al. (2023) examined the link between national security outcomes and defence expenditure across selected West African countries. Using a political economy approach and quantitative analysis of defence budgets, the study assessed whether higher defence spending would lead to greater national stability. The results suggest that investment in modern defence capabilities can enhance states' ability to counter armed conflict, organised crime and terrorist threats, provided it is carefully directed to serve national security interests. However, the study noted that increasing a military budget without effectively using troops and the resources allocated within a nation is not a simple route to better security outcomes. The researchers found that defence modernisation is effective, and the only important question is how it is integrated into a broader national security policy that encompasses both security and developmental concerns.

In Ethiopia, defence modernisation has increasingly come under scrutiny for its contribution to tackling complex internal and external security challenges. The New Humanitarian (2024)'s study, which adopts a case study design with Realist Theory as a theoretical underpinning, examines how defence diplomacy and foreign military cooperation can enhance Ethiopia's operational capability. The study identified Ethiopia's military relations with countries such as Türkiye and China and their roles in fortifying the country's military capacity. The results show that contemporary military hardware, intelligence collaboration, and specialised military support have strengthened Ethiopia's ability to address cross-border threats and effectively engage in regional security missions. Moreover, the study found that defence capability enhancement has strengthened Ethiopia's strategic position in the Horn of Africa. The study found that when national security priorities are supplemented by international military cooperation, defence modernisation has a positive impact on operational effectiveness.

In terms of domestic security, Hutto and Patton Rogers (2026) analysed the role of defence modernisation in ensuring internal and external security in Ethiopia. Using Realist Theory and a policy analysis method, the study examined the impact of air defence systems, surveillance technologies, and investments in modern military equipment on Ethiopia's security situation. The results indicated that the country's external deterrence capability has improved significantly as a result of defence force modernisation, enhancing border surveillance, early warning systems, and military preparedness against external aggression. The research also noted that the Ethiopian National Defence Force's capabilities are becoming more effective in the state's operational response to emerging threats and organised armed groups in the contemporary era. The researchers found that while the national level of external defence capabilities is important for improving operational capability, an effective response strength in domestic defence capability can enhance national security outcomes in the context of balanced defence modernisation.

The literature review confirms that operational efficiency and national security benefits are central to defence modernisation, which yields improved surveillance capabilities, intelligence collection, border security, counter-insurgency, deterrence, and military preparedness. In particular, emerging technologies such as cyber systems, space systems, and UASs are seen as key drivers of operational effectiveness in global studies, whereas African studies emphasise the fight against terrorism, safeguarding strategic assets, and the consolidation of regional security. In Ethiopia, few studies have focused on defence diplomacy, partnering with external actors, and security policy. However, the overall effect of defence modernisation on operational effectiveness and broader national security outcomes has been largely overlooked, with limited empirical studies examining whether (and how) dimensions such as intelligence, border security, counter-insurgent force, and strategic deterrence are connected to these outcomes. The current study is motivated by this empirical and contextual gap and aims to ascertain the impact of defence modernisation on operational effectiveness and national security outcomes in Ethiopia.

III. METHODOLOGY

3.1 Research Design

This research used a convergent parallel design, which combines both quantitative and qualitative methods and serves as a means to assess defence modernisation and the resulting implications for national security in Ethiopia. The tools employed were structured questionnaires administered to officers of the Ethiopian National Defence Force (ENDF) and officials of the Ministry of Defence (MOD), and interviews with defence experts and defence policymakers. Two parallel processes were used to collect and analyse the two strands of data, and later, these two streams merged in the interpretations, contributing to more detailed insights into the linkage between defence modernisation and national security outcomes.

3.2 Study Area

The study was conducted with a focus on Ethiopia, specifically Addis Ababa and selected military and defence institutions. Ethiopia's strategic location in the Horn of Africa was a key factor in its selection, as was the country's facing both internal and external security threats. The study area is well-suited to examining defence modernisation because major policies, institutions, military planning and defence modernisation are centralised within the selected

institutions. This geographical and institutional focus also enabled an assessment of the links between modernisation efforts and the outcomes of national security in the context of the Ethiopian security environment.

3.3 Target Population

A total of 4,545 stakeholders and respondents from the Ethiopian National Defence Force, the Ministry of Defence, and defence analysts and international military advisers were targeted in the population. The relevance of these categories was judged on the basis of their direct knowledge, professional experience, and role in defence policy, defence operations, institutional reforms, and institutional modernisation. The population, therefore, provided the relevant basis to explore the implementation of defence modernisation and its perceived impact on Ethiopia's national security.

3.4 Sampling and Sample Size

The Yamane formula (1967), assessed using a 5% Level of Precision, determined the sample size for this study as 368 respondents, with a target population of 4,545 respondents. The sampling techniques were stratified random sampling for military personnel and purposive sampling for defence experts and policymakers, who were selected based on their knowledge and experience with defence modernisation and national security issues in defence institutions. These techniques allowed the study to generate not only quantitative responses that were broadly representative of the population, but also qualitative responses that provided rich information.

3.5 Data Collection Instruments and Procedures

The research used structured questionnaires, an interview guide and document analysis as data collection methods. The questionnaire used a 5-point Likert scale to record respondents' views on defence modernisation and the results for national security, and the interview guide recorded detailed qualitative information on procurement, institutional reform, defence policy implementation and the effectiveness of operational participation in defence modernisation. Relevant defence-related reports, World Bank publications, academic literature and SIPRI publications were used to obtain secondary information. Triangulation of quantitative, qualitative and documentary evidence was achieved through the use of multiple instruments.

3.6 Data Analysis

The data collected were quantitative and were coded and analysed using the Statistical Package for the Social Sciences (SPSS) version 27. The characteristics of the respondents and their responses were summarised using descriptive statistics, and correlation analysis was used to detect associations among variables of defence modernisation and national security outcomes. An additional multiple regression analysis was used to examine the pathway by which the dimensions of modernisation accounted for national security outcomes. Knowledge was analysed thematically from the qualitative interview data to identify themes and patterns on defence modernisation and national security. The quantitative and qualitative results were then combined in the interpretation stage to provide a complete picture of the research questions and objectives set.

3.7 Ethical Considerations

The relevant ethical standards of the research methodology were adhered to. The aim of the study was explained to the respondents, and they agreed to participate in this study by informed and voluntary consent. The confidentiality and privacy of respondents were observed, and the information gathered from participants was used only for academic research. They were also treated with respect, and when necessary, steps were taken to ensure that individual responses would not be needlessly associated with specific respondents. Given the sensitivity of defence and national security information, the study also took appropriate precautions when handling information provided by military personnel, defence officials, and others.

IV. FINDINGS & DISCUSSION

4.1 Findings

4.1.1 ENDF Capability to Respond to Internal Insurgencies Compared to 2017

The study sought to examine ENDF's capability to respond to Internal Insurgencies Compared to 2017, and the results are presented in Table 1.

Table 1
ENDF Capability to Respond to Internal Insurgencies Compared to 2017

Response Category	Frequency	Percentage (%)
Much worse	18	6.0%
Worse	52	17.3%
About the same	64	21.3%
Better	104	34.7%
Much better	62	20.7%
Total	300	100%

Table 1 reveals that the largest number of respondents feel that the capability of ENDF in dealing with internal insurgencies has improved, with 55.4% saying that it performs better or much better than in 2017. In the meantime, 21.3% indicated that there had not been a significant deviation, and 23.3% felt there was a decrease in capability. This implies that even with the commendable progress that has been realized, the improvement has not been equally enjoyed in all regions.

> "*Our response efficiency to insurgencies has been increased compared to the previous year, particularly due to new technologies, although there remain difficulties in inter-regional coordination and consistency*" (Key Informant 6, 15 May 2025).

As Table 1 shows, over 55.4 percent of the respondents confirm the development of enhancements in the counterinsurgency performance of ENDF, which was a positive effect of modernization. Nonetheless, 23.3% of them report lower performance and 21.3% report no change, which indicates that performance is uneven in various operational situations. Alemu (2024) states that it is important not just to rely on military power but on flexibility, coordination, and integration among the locals in order to have a successful counterinsurgency. In the same vein, Akah and Chaggu (2024) point out that institutional coherence and continuity as an aspect of strategy are key to long-term success. Thus, modernization has increased response capacity, but there are structural and operational issues that may limit the effectiveness of modernization.

4.1.2 Largest Security Improvement Due to Modernization

Respondents were asked which domain has seen the largest security improvement due to modernization. The results were as indicated in Table 2.

Table 2
Domain with the Largest Security Improvement Due to Modernization

Response Category	Frequency	Percentage (%)
Counterinsurgency operations	96	32.0%
Border surveillance	72	24.0%
Maritime/regional deterrence	18	6.0%
Cyber resilience	46	15.3%
Intelligence fusion / situational awareness	68	22.7%
Total	**300**	**100%**

Table 2 shows that the greatest security enhancement from modernisation is in counterinsurgency operations, with 32.0% of respondents across the newly modernised contracts. Next come border surveillance (24.0%) and intelligence fusion (22.7%). Cyber resilience accounts for 15.3%, and the lowest is maritime/regional deterrence at 6.0%, indicating the landlocked nature of Ethiopia.

> "*The majority of the advancements we have witnessed are in the field of counterinsurgency and border surveillance, notably using drones and surveillance technologies*" (Key Informant 7, 20 May 2025).

As the indications in Table 2 reveal, the efforts in the context of modernisation have affected counterinsurgency operations the most (32.0%), followed by border surveillance (24.0%) and intelligence capabilities (22.7%). This implies that the defence strategy practised within Ethiopia is mainly concerned with internal and immediate threats along the regional lines. Awdah, (2024) concludes that current military efficacy is increasingly based on intelligence-led operations and accuracy in counterinsurgency settings. On the same note, Sigatu, (2021) points out that technologies like drones improve surveillance and real-time decision-making in asymmetric warfare. Thus, the findings indicate that modernisation in Ethiopia has been coordinated with the most urgent security issues, especially internal conflicts and border control.

4.2 Main Strategic Risk

Respondents were asked "Which is the main strategic risk that could arise from rapid modernization?" and results were as presented in Table 3.

Table 3

Main Strategic Risks Arising from Rapid Defense Modernization

Response Category	Frequency	Percentage (%)
Escalation of the regional arms race	58	19.3%
Neglect of socio-economic priorities	72	24.0%
Internal misuse of technologies	46	15.3%
Overreliance on foreign partners	104	34.7%
Other	20	6.7%
Total	**300**	**100%**

According to Table 3, the principal strategic risk associated with the rapid modernisation of the Defence force is excessive dependence on foreign allies, identified by 34.7% of respondents. This is followed by a lack of attention to socio-economic priorities (24.0%) and the growth of regional arms-races (19.3%). Internal misuse of technology accounts for 15.3%, with other risks making up the minor share (6.7%).

> "*One of the greatest threats we encounter is the over-reliance on foreign firms, such as technology firms, that can impair our long-term strategic autonomy*" (Key Informant 8, 22 May 2025**).**

Results in Table 3 indicate that the greatest perceived strategic risk (34.7% or above) is over-reliance on foreign partners, followed by apprehensions about failing to prioritise socio-economic aspects (24.0% or above). This implies that the process of modernisation not only builds military capabilities but also creates structural vulnerabilities related to reliance on external forces and resource distribution. Asmare Aragaw (2024) estimates that over-dependence on external actors may compromise a state's strategic autonomy and make it susceptible to external interference. In the same line, Berisso and Sorsa (2025) believe that excessive use of military budgets in developing nations can interfere with important socio-economic development. Thus, the findings reveal that a balanced modernisation policy should be practised to ensure both national security and economic stability.

4.2.1 Impact of Defense Modernization on National Security

The study sought to examine the extent to which respondents agreed with the following statements about the impact of defence modernisation on national security. This was followed by structured questions, where 1 represented strongly disagree, 2 represented disagree, 3 represented neutral, 4 represented agree, and 5 represented strongly agree. Results are presented in the table below.

Table 4

Respondents' Agreement on the Impact of Defense Modernization on National Security

Statements	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)	Mean	SD
Modernization has strengthened ENDF's ability to reduce insurgencies	8.0% (24)	12.0% (36)	14.0% (42)	38.0% (114)	28.0% (84)	3.66	1.15
Equipment has enhanced border surveillance and security	6.7% (20)	10.0% (30)	12.3% (37)	42.0% (126)	29.0% (87)	3.76	1.10
Cyber & surveillance improved intelligence capabilities	7.3% (22)	11.0% (33)	13.7% (41)	40.0% (120)	28.0% (84)	3.70	1.13
Modernization increased regional deterrence & influence	9.0% (27)	13.0% (39)	16.0% (48)	37.0% (111)	25.0% (75)	3.56	1.17
Modernization enhanced peacekeeping effectiveness	8.7% (26)	12.7% (38)	15.0% (45)	39.0% (117)	24.6% (74)	3.58	1.16
Modernization reduced internal & external threats	10.0% (30)	14.0% (42)	18.0% (54)	36.0% (108)	22.0% (66)	3.46	1.20
Average	—	—	—	—	—	**3.62**	**1.15**

Table 4 shows that most respondents believe defence modernisation has strengthened national security, particularly through improved border surveillance (71.0%) and intelligence (68.0%). Similarly, 66.0% believe modernisation has increased counter-insurgency operations. However, consensus on overall threat reduction (58.0%) and regional deterrence (62.0%) is slightly lower, indicating some constraints on overall strategic performance.

"Modernisation has enhanced our area of operation, particularly in the field of surveillance and intelligence, yet the effects of the process in fully eliminating threats continue to develop" (Key Informant 9, 25 May 2025).

According to the results in Table 4, strong majorities report improved border security (71.0%), intelligence (68.0%), and counterinsurgency (66.0%), while relatively low agreement on overall threat reduction (58.0%) suggests that modernisation has not yet translated into an overarching enhancement of security. This implies that technological change is enhancing tactical capacity rather than strategic outcomes. As Debisa (2021) postulates, military modernisation increases capability, which does not necessarily lead to security unless it is accompanied by a wider range of strategies. Similarly, Coetzee and Putter (2025) argue that military power can affect national security only when it interacts with political, social, and institutional factors (Carberry, 2021). Hence, the findings suggest that Ethiopia's modernisation has enhanced operational performance but needs additional reforms to sustain security gains.

4.3 Correlation and Regression Analysis

The relationships among the independent variables (military technologies, equipment modernisation, and training programs), the intervening variables (operational, institutional and policy challenges), and the dependent variable (national security outcomes in Ethiopia) were examined using correlation and multiple regression analyses. Correlation analysis was used to assess relationships among the variables, and multiple regression analysis was used to assess the extent to which the independent and intervening variables explain national security outcomes. The analyses provide statistical evidence for the significance of defence modernisation factors and their influence on national security indicators, such as the reduction of insurgencies, border security, counterterrorism capability, and territorial stability.

Table 5

Correlation Matrix

Variables	National Security (Y)	Military Technologies (X_1)	Equipment Upgrades (X_2)	Training Programs (X_3)	Operational, Institutional & Policy Challenges (Z)
National Security (Y)	1.000	0.781**	0.694**	0.655**	-0.602**
Military Technologies (X_1)	0.781**	1.000	0.718**	0.641**	-0.533**
Equipment Upgrades (X_2)	0.694**	0.718**	1.000	0.612**	-0.487**
Training Programs (X_3)	0.655**	0.641**	0.612**	1.000	-0.421**
Operational, Institutional & Policy Challenges (Z)	-0.602**	-0.533**	-0.487**	-0.421**	1.000

Correlation is significant at the 0.01 level (2-tailed).

Table 5 shows that military technologies, equipment upgrades and training programs are positively correlated with national security outcomes in Ethiopia at a high level. The highest positive correlation was found between military technologies and national security ($r = 0.781$, $p < 0.01$); equipment upgrades had a stronger correlation ($r = 0.694$, $p < 0.01$); and training programs had a weaker correlation ($r = 0.655$, $p < 0.01$). This indicates that improved national security outcomes are associated with defence modernisation. On the other hand, logistical constraints, institutional inefficiencies, corruption and policy gaps were found to be negatively related to national security ($r = -0.602$, $p < 0.01$), indicating that national security is negatively influenced by operational, institutional and policy constraints in Ethiopia's defence modernisation process.

4.4 Regression Analysis

The multiple regression analysis method was used to find the joint effect of military technologies, equipment modernization, training and courses, and operational, institutional and policy problems on national security in Ethiopia. The model for regression was given as:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 Z + \epsilon$$

Where:

Y = National Security Outcomes
X_1 = Military Technologies
X_2= Equipment Upgrades
X_3= Training Programs
Z = Operational, Institutional, and Policy Challenges
β_0= Constant
ϵ = Error Term

Table 6

Model Summary

Model	R	R^2	Adjusted R^2	Std. Error of Estimate
1	0.806	0.650	0.645	0.418

The model summary results suggest a strong association between the predictor variables and the national security outcomes. The correlation analysis yields a value of 0.806, indicating a very high positive correlation between the defence modernisation variables and national security. The coefficient of determination ($R^2 = 0.650$) suggests that 65.0% of the variance in national security outcomes is attributable to military technologies, equipment upgrades, training programs, and operational, institutional, and policy challenges. The adjusted R^2 is 0.645, which also indicates the reliability of the model after accounting for the number of predictors. The standard error of the estimate, 0.418, further suggests that the regression equation is a good fit for the data, as there is little prediction error.

Table7

ANOVA Results

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	119.582	4	29.896	171.443	0.000
Residual	64.098	363	0.177		
Total	**183.680**	**367**			

The results of the ANOVA indicate that the regression model is statistically significant. The F-statistic is 171.443, and the significance level is 0.000 ($p<0.05$), indicating that the two independent variables (national security threats and political integration) and the intervening variable (political polarization) have a significant effect on Ethiopia's national security outcomes. This means that factors associated with defence modernisation and institutional problems are significant in shaping Ethiopia's national security performance.

Table 8

Regression Coefficients

Variable	Unstandardized B	Std. Error	Standardized Beta	t	Sig.
(Constant)	0.926	0.203	—	4.562	0.000
Military Technologies (X_1)	0.398	0.055	0.407	7.236	0.000
Equipment Upgrades (X_2)	0.271	0.061	0.253	4.443	0.000
Training Programs (X_3)	0.186	0.049	0.182	3.796	0.000
Operational, Institutional & Policy Challenges (Z)	-0.244	0.058	-0.221	-4.207	0.000

The regression results in Table 8 indicate that military technology, equipment upgrades and military training programmes were statistically significant and positively associated with Ethiopia's national security outcomes, while operational, institutional and policy challenges were statistically significant and negatively associated. The standardised effects of military technologies on national security outcomes were highest for training programmes ($\beta = 0.182$, $p < 0.001$), equipment upgrades ($\beta = 0.253$, $p < 0.001$), and military technologies in general ($\beta = 0.407$, $p < 0.001$). This result aligns with the findings of Sigatu (2021), which show a relationship between the modernisation of military technologies and improvements in Ethiopia's intelligence gathering, border monitoring and tactical response capabilities. In another study, Coetzee and Putter (2025) revealed that technological modernisation is enhancing the military's operational effectiveness and its response to conflicts. The results thus complement Modernisation Theory, which focuses on technology as a key process that enables institutions to enhance their capacities. Although Ethiopia does not have an elected leader in charge, investment in cutting-edge technologies has increased the ENDF's ability to address security challenges.

The highest standardised coefficient indicates that technological capability is the most significant modernisation variable among those analysed, as presented in Table 2. The same result is reflected in the descriptive findings, as the subjects attributed significant improvements to the modernisation of the border, the intelligence system, and counterinsurgency after the modernisation. It also aligns with Berisso and Sorsa's (2025) attention to the rising relevance of intelligence-led operations in the modern fight against insurgency, and with Sigatu's (2021) focus on technologies such as unmanned systems for information collection and asymmetric warfare. From the perspective of National Security Theory (Morgenthau, 1948; Waltz, 1979), states gain power by increasing military strength, thereby enhancing the capacity of states to defend sovereignty, territorial integrity, and national interests. Thus, the regression findings indicate that technological investments have been important for improving military preparedness and the country's ability to meet internal and external security threats in Ethiopia.

Equipment upgrades were an additional positive and significant indicator of the effect ($\beta = 0.253$, $p < 0.001$). This indicates that modernising military equipment plays a significant role in making the service more effective, in ensuring the security of borders, and in strengthening the operational readiness of the ENDF. The result aligns with Sigatu (2021), who linked military technological and equipment modernisation to increased tactical response and border monitoring. It also supports Matthews and Koh (2021), who observed that modern war-fighting techniques improve the efficiency of operations in war situations. Similarly, the positive relationship between training programmes ($\beta = 0.182$, $p < 0.001$) underscores that technological and equipment investments need to be supported by competent people whose skills need to be developed; thus, the benefits of training programmes can be harnessed. The result has confirmed Modernisation Theory, which stresses the importance of institutional and human-capacity development for technological transformation. Therefore, the acquisition of equipment should be coupled with ongoing development of military professionalism to achieve sustainable security outcomes in Ethiopia.

On the other hand, the negative impact of operational, institutional and policy challenges showed a significant relationship with national security outcomes ($\beta = -0.221$, $p < 0.001$). This finding indicates that logistical inefficiencies, bureaucratic delays, corruption, weak coordination, and inconsistencies in instruments reduce the value added from defence modernisation. This result aligns with Opiyo, (2025), who noted that procurement gaps, institutional inauthenticities, and bureaucratic problems are significant challenges to military modernisation in Ethiopia. Also, Akah and Chaggu (2024) highlighted the need for institutional coherence and strategic continuity as a precondition for successful defence modernisation. The finding also confirms or reinforces Dependency Theory, especially Frank's (1967) dependency theory, since greater reliance on external suppliers and technical assistance will reduce strategic autonomy. The regression results show that modernisation has a positive effect on national security; however, the main constraint is whether technological capability, modern equipment and professional training are accompanied by efficient institutions, effective policies, good logistics and reduced external dependence.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

The study analysed military reform and modernisation measures, the modernisation program, and their implications for national security outcomes in Ethiopia in the Horn of Africa region. The results found that Ethiopia has made significant strides in modernisation efforts in the defence sector, including the acquisition of sophisticated military technologies, the modernisation of military equipment, the upgrading of the intelligence management system, and enhancements to the military training regime. These modernisations were driven by growing security threats, including border conflicts, geopolitical tensions, terrorism and insurgencies in the region. The study concluded that many aspects of Ethiopian National Defence Force operations were improved through modernisation, including counterinsurgency operations, intelligence, border monitoring, and preparedness. Therefore, defence modernisation is an integral part of Ethiopia's overall national security strategy, which focuses on strengthening state sovereignty, territorial integrity and regional security. As such, defence modernisation has become meaningful in closing the circle of Ethiopia's national security strategy of strengthening sovereignty, territorial integrity and regional security.

Despite these successes, the research revealed that Ethiopia's defence modernisation endeavour still suffers from numerous issues at the operational, institutional, and policy levels, affecting its sustainability and effectiveness. Logistical inefficiencies, reliance on foreign military supplies, bureaucratic fragmentation, poor institutional coordination, and procurement problems were among the key challenges identified in the operation of modernisation programmes. In addition, over-dependence on external military alliances has limited Ethiopia's strategic manoeuvres and made it more susceptible to external influence in the military field. The research also revealed that any increase in defence budgets would place high demands on national economic resources, which could intensify social and political instability in the country. Accordingly, the study findings have identified a set of solutions for sustainable Defence modernisation in Ethiopia, including the proper allocation of resources and funding to the national assemblies, strengthening the Defence industry, establishing changes in the institutional environment of the security sector, upgrading military personnel skills through professional military training, ensuring coordination of security policies, and establishing peaceful Defence planning mechanisms over the medium and long term.

5.2 Recommendations

The study recommends that the Ethiopian state can promote strategic autonomy in defence modernisation by strengthening its own defence-related industries to reduce dependence on foreign military suppliers and by building a defence production supply chain to support the country during crises. To reduce instances of bureaucratic inefficiency and corruption, there is a need to strengthen institutional coordination, transparency and accountability in the Ministry of Defence's procurement and modernisation processes. There is also a need to invest more in military infrastructure, logistics, cybersecurity, intelligence and continuous training for military personnel to enhance operational efficiency

and readiness. In addition, Ethiopia needs a balanced national security strategy that enables significant investment in military modernisation, coupled with socioeconomic development, political stability and conflict resolution programmes. An increase in regional security cooperation, supported by the African Union and IGAD, is also essential for strengthening regional peace and collective security.

Declaration of Interest

The authors declare that they do not have any known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Funding Declaration

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

REFERENCES

Addis Standard. (2023, March 8). *Ethiopia diversifies arms imports amid security challenges*. https://addisstandard.com/

Akah, A. U., & Chaggu, B. (2024). Towards a long-term peace approach: A phenomenological analysis of contemporary and emerging conflicts. *Intergenerational Justice Review, 10*(2), 32–45.

Alemu, M. G. (2024). Genocide and political destruction in Tigray: The imperative for systemic transformation. *Journal of Governance and Accountability Studies (JGAS), 4*(2), 147–164.

Aragaw, A. B. (2024). Challenges to national unity in Ethiopia: An in-depth analysis from post-1991 to post-2018. *Cogent Social Sciences, 10*(1), 2381815.

Awdah, M. A. A. (2024). Landlocked Ethiopia and the strategic implications of attempting to reach open water. *Journal for Iranian Studies, 8*(19), 103.

Berisso, T., & Sorsa, L. D. (2025). Reassessing national unity in Ethiopia: Strategies for nation building amidst diversity and challenges. *The Journal of Oromo Studies, 29*(2), 24–59.

Carberry, J. M. (2021). *Reducing the acquisition cost of the next fighter jet using automation* [Doctoral dissertation, University of Warwick].

Coetzee, W. S., & Putter, D. (2025). Warfare reimagined: How drones are shaping the African battlespaces. In *Drones in the African battlespaces* (pp. 1–7). Springer Nature Switzerland.

Debisa, N. G. (2021). Security diplomacy as a response to Horn of Africa's security complex: Ethio-US partnership against al-Shabaab. *Cogent Social Sciences, 7*(1), 1893423.

de Waal, A., & Gebrehiwot Berhe, M. (2024). Ethiopia back on the brink: How Abiy's reckless ambition—and Emirati meddling—are fueling chaos in the Horn. *Foreign Affairs*. https://www.foreignaffairs.com/ethiopia/back-brink-abiy-reckless-ambition-emirati-meddling

Frank, A. G. (1967). *Capitalism and underdevelopment in Latin America: Historical studies of Chile and Brazil*. Monthly Review Press.

Hutto, J. W., & Patton Rogers, J. (2026). The drone revolution: Towards a synthesis in the drone debate. *European Journal of International Security, 11*(2), 145–165. https://doi.org/10.1017/eis.2025.10005

Matthews, R., & Koh, C. (2021). The decline of South Africa's defence industry. *Defense & Security Analysis, 37*(3), 251–273.

McClelland, D. C. (1961). *The achieving society*. Free Press.

Morgenthau, H. J. (1948). *Politics among nations: The struggle for power and peace*. Alfred A. Knopf.

Opiyo, K. O. (2025). Unmanned aerial systems (UAS) in modern peacekeeping operations: Applications, challenges, and future directions. *African Journal of Empirical Research, 6*(4), 634–651. https://doi.org/10.51867/ajernet.6.4.57

Raga, S., Lemma, A., & Keane, J. (2023). *The Sahel conflict: Economic & security spillovers on West Africa*. ODI Emerging Analysis.

Regassa, B. T. (2022). *The political economy of industrialization and structural transformation in Ethiopia: A developmental state perspective*. University of Parma Research Repository. https://hdl.handle.net/1889/4680

Reuters. (2023, January 15). *Egypt boosts military spending amid regional tensions*. https://www.reuters.com/world/africa/egypt-boosts-military-spending-amid-regional-tensions-2023-01-15/

Rostow, W. W. (1960). *The stages of economic growth: A non-communist manifesto*. Cambridge University Press.

Sigatu, K. T. (2021). *Military power as a foreign policy instrument: Post-1991 Ethiopian peace support operations in the Horn of Africa* [Doctoral dissertation, University of Public Service]. https://hdi.uni-nke.hu/

Tepper, E., Shackelford, S., Romano, J. B., & Dmitriachev, S. (2024). The sixth warfighting domain? Governing the space-cyber nexus. *Georgia Law Review, 59*, 51.

The New Humanitarian. (2024, March 5). *'Horrific' civilian toll as Ethiopia turns to combat drones*. https://www.thenewhumanitarian.org/feature/2024/03/05/horrific-civilian-toll-ethiopia-combat-drones

U.S. Department of Defense. (2023). *Defense budget overview: Fiscal year 2023*. U.S. Government Publishing Office. https://www.defense.gov/News/Releases/Release/Article/3326875/dod-releases-fiscal-year-2023-budget-proposal/

Waltz, K. N. (1979). *Theory of international politics*. Addison-Wesley.

World Bank. (2023). *Ukraine rapid damage and needs assessment: February 2022–February 2023* (Report No. P180174).

Yamane, T. (1967). *Statistics: An introductory analysis* (2nd ed.). Harper & Row.