

Beyond Forecasting: Reimagining Early Warning Systems amid the Sahel Crisis for Sustainable Africa-EU Peacebuilding

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Abstract

The incessant crisis in the Sahel region has not only revealed the shortcomings of reactive conflict management practices, but also the significance of effective early warning systems (EWS) to sustainable peace in Africa and the European Union (EU). This research paper examines the implication of EWS in preventing conflicts with references to the interdependent security relations between the Sahel and Europe. The specific objectives of this paper are to identify the structural, technological, and political factors that shape the performance of both systems, and to assess their relevance to conflict management in regions such as the Sahel. Based on a comparative study of the African Union (AU) Continental Early Warning System (CEWS) and the European Union (EU) Conflict Early Warning System (CFEWS), the paper reviews how these structural, political, and technological issues undermine the relevance of the early warning systems. The paper, based on recent advances in the field of artificial intelligence and big data analytics, demonstrates the possible ways of enhancing the accuracy of predictions and response systems through technological innovations when they are adequately incorporated. The paper adopts a qualitative comparative case analysis in its methodology, relying on secondary sources, which includes; policy documents, official reports, and scholarly literature. The results indicate that lack of political will, gaps in data and lack of synergy among stakeholders overseeing the systems largely lower the effectiveness of early warning systems in the two regions. The study concludes by recommending a strengthened Africa-EU collaboration, digital technologies, and community-based early warning and response as essential pathways to a long-term prevention of conflicts and stability in the region.

Keywords: Early Warning Systems, African Union (AU) Continental Early Warning System (CEWS), European Union (EU) Conflict Early Warning System (CFEWS), Conflict Prevention, Sahel Crisis and Peacebuilding.

Introduction

Conflict prevention is a fundamental aspect of global security (Ackermann, 2003), most especially in regions prone to political instability, insurgencies, and transnational threats. Among other regions, the African continent has experienced recurrent conflicts driven by ethnic divisions, resource competition, weak governance, and violent extremism, which has overtime led to devastating humanitarian crises. In the midst of this, the European Union

also faces repercussions from international crises primarily affecting the African continent which results in economic breakdowns and terrorist activities and undocumented migration flows. Managing conflicts helps avoid escalation so societies can lower both the economic and human costs at the foundation of conflict. Among other international institutions, the Economic Community of West African States (ECOWAS) has proven that adopting solid preventive measures stabilizes the region by tackling the core issues that lead to instability and brings development (Aning & Salihu, 2025). Strategies such as peaceful mediation, peacebuilding efforts and early warning system have been emphasized by the EU, AU and UN (Chattu et al., 2021). This connotes that if attempts to address the root causes of instability are focused on prevention and policies, it doesn't only aid the reduction of instability but also ensures the region's security and supports economic growth for the future.

In recent times, the West and Central African Sahel region has become the epicentre of instability, due to violent extremism, clashes between different communities and humanitarian disasters. Terrorist attacks in some West African nations like Mali, Burkina Faso, Niger, and Chad have grown increasingly frequent due to Boko Haram along with Islamic State in the Greater Sahara (ISGS) and al-Qaeda-linked factions (Dieng, 2021). Violent conflicts in these areas are fuelled by a combination of factors which include; poor governance, climate change-induced resource scarcity, and the proliferation of armed groups. The instability in the Sahel region creates multiple consequences across national borders by forcing large population movements while aiding weapon smuggling operations which drive migratory routes to North Africa and Europe. Despite several military interventions, every effort to contain the crisis have been largely reactive, with limited success (Dieng, 2019). The persistence of violence unveils the need for robust early warning systems and coordinated preventive strategies to break the cycle of conflict.

Early warning systems (EWS) are vital tools used to identifying, monitoring and managing possible conflicts to avoid escalation. Using data collection, analysis of intelligence and predictive modeling, EWS helps to investigate about instability, like rising political tensions, human rights breaches and major movements of armed groups (Lynam et al., 2023). Through the Continental Early Warning System (CEWS), the AU in Africa closely monitors warning indicators and acts to prevent conflict. Similarly, the EU has a Conflict Early Warning System (CFEWS) that allows it to monitor security issues and work with other countries. EWS face diverse challenges which revolves around political will, data gaps and poor response mechanisms. With advanced technology, enhanced partnership and adequate interventions, these systems can help in preventing further conflicts.

Since security threats are connected in both the African and EU regions, working together is important for preventing conflicts and addressing crises. Over the years, the EU has provided aid to Africa, trained its armies and supported peacekeeping missions there. Support efforts such as the African Peace Facility (APF) and the European Peace Facility (EPF) have helped the EU stabilize areas threatened by conflict (Carbone, 2013).

Without a doubt, for collaboration to be effective, more is needed than financial support; intelligence, plans and a mutual commitment are also important for long-term success. Collaboration between Africa and the EU on early warning systems can help stop security threats from developing further. It is important for this partnership to combat terrorism, human trafficking and organized crime, as these issues are found in both regions. A joint security plan between Africa and the European Union could guide efforts to stop conflicts around the world.

Early warning systems of conflicts have become an important part of international and regional peace and security architecture. While both Africa and the European Union (EU) have designed systems of this kind, although they differ significantly in terms of efficiency and structure.

Objectives

This paper therefore seeks to:

- i. examine the institutional, structural, and political features of Africa's Conflict Early Warning Systems (CEWSs) and the EU's CFEWS.
- ii. analyse the convergent and divergent areas in their approaches to conflict prevention.
- iii. examine the challenges hindering effective Early Warning and Response

Methodology

The methodology used in this study is a qualitative comparative case study analysis approach. The CEWS and CFEWS of the AU and EU are evaluated as two regional systems that identify, track, and intervene in pre-conflict situations. The discussion is grounded in secondary sources, such as peer-reviewed papers, regional reports on security, policy briefs and textbooks. The comparative model dwells upon the structural design, political underpinning, technological resources and operational efficiency. This approach was taken to identify the commonalities and distinctions between the two systems and conclusion on whether they are viable in a conflict-prone area like the Sahel.

Understanding Early Warning Systems in Conflict Prevention

Early Warning Systems (EWSs) are comprehensive systems designed to identify dangers ahead of time and help erase risks of disasters. Waidyanatha (2010) and Murphy et al. (2007) define the main parts of an effective EWS as sensor, detection, decision, broker and response subsystems. When these parts interconnect, details about threats are delivered to police in a smooth, quick flow to keep disruption at a minimum. EWSs assist in lowering disaster risks at different scales, especially across regional, national, and community levels. The main principle of community-based early warning systems (CBEWS) is that local community members take part in collecting, reviewing and sharing significant information at an early stage. This careful method at the local level strengthens early warning because it adapts to each community and uses their cultural knowledge (Macherera & Chimbari,

2016). Using early warning systems to prevent conflicts has become more significant. Through combining intelligence gathering, technology and studying data, it is now much easier to foresee and address likely conflicts. The use of artificial intelligence and big data analytics now allows early warning systems to model outcomes, analyze social sentiments and manage information on conflict situations (Kopanov & Atanasova, 2024). They help monitor changes in political, social and economic aspects that could foretell possible violence or instability. Moreover, AI allows for simulations and forecasting which help stakeholders prevent conflict by reviewing different situations and making quick decisions. Mandokhail (2024) points out that the incorporation of AI in early warning systems improves institutions' ability to act and base decisions on solid information when a country is unstable. In other words, the progress from basic local methods to current AI-driven approaches highlights a stronger focus on preventing conflicts before they emanate. It helps with disaster preparedness; as they are vital tools for maintaining peace and security.

The Sahel Crisis: A Case for Strengthening Early Warning Systems

The Sahel conflict exacerbated due to historical and political reasons but was made worse by the 2011 Libyan civil war and NATO's later intervention (Zhambikov, 2022). Although climate change is frequently listed as a leading factor, experts say it is actually more of an intensifier than a trigger for violence (Mbaye, 2020; Benjaminsen, 2016). The main reasons for the conflict are related to how pastoralist people were ignored by states and longstanding rivalries between Arab-Islamic and Western empires (Benjaminsen, 2016; Diallo, 2021). The early warning systems used in the Sahel have problems that make them less effective in preventing and handling disasters. The main obstacles are problems with the quality of data, limited resources, issues with teamwork, and delays before putting plans into action. Due to the large influence of drought on the Sahel area, it is important to develop good early warning systems to reduce these risks. The systems are still facing problems that need to be corrected to help them improve.

Many of the early warning systems in the Sahel have issues with the quality and availability of data. The inability to obtain reliable and prompt data makes it hard to anticipate and deal with potential crises (Palihapitiya et al., 2024) (Parodi et al., 2024). Lack of human and financial resources limit the ability of early warning systems to operate in the Sahel (Palihapitiya et al., 2024) (Noyes & Yarwood, 2013). Not acting early enough on early signs of risk has made the Sahel region even more dangerous. Quick signs of extremists recruiting members plus conflicts within families and groups caused the authorities to react slowly, fueling strength among extremists. The slow response to emergencies in Mali and Nigeria helped Boko Haram increase in strength and made the situation even more difficult for everyone in the region. The crisis in the Sahel affects European and international stability in many ways. With more displacement, Europe faces greater migration difficulties and direct security concerns because of terrorist networks operating in the Middle East. When the economy is disrupted, it leads to more radicalization, making the violence tougher to stop. Enhancing early warning systems and having effective actions in place are essential

to guaranteeing peace in the Sahel and avoiding unrest spreading to Europe, due to the EU's strategic aims in Africa.

Comparative Analysis: Africa and EU Early Warning Systems

The African Union's Continental Early Warning System (CEWS) and the European Union's Conflict Early Warning System (CFEWS) both focus on preventing and handling conflicts, yet each has its strengths and weaknesses. Despite notable progress, CEWS faces problems such as insufficient staff, reduced cooperation from regional organisations, and political challenges, which makes it hard for the center to address the issues (Noyes & Yarwood, 2013). In contrast, CFEWS relies on advanced data analysis tools but faces issues in using prevention methods, mainly because of problems with the quality of the data and a lack of government willingness (Muggah & Whitlock, 2022). Each system has its strengths, but it also brings both chances and difficulties for Africa and the EU.

The Continental Early Warning System by the African Union is now making significant progress in anticipating and managing conflicts in Africa. Monitoring and analysis have improved significantly in UN missions, allowing them to spot and inform partners earlier about potential conflicts (Noyes & Yarwood, 2013). Furthermore, the African Union established an orderly set of institutions that enables the inclusion of conflict knowledge into its overall peace and security activities, enhancing its preventive diplomacy (Engel, 2018). While these improvements have taken place, CEWS still faces various challenges that reduce its effectiveness. Issues related to personnel and teamwork prevent the AU's organs from cooperating smoothly (Noyes & Yarwood, 2013). Moreover, disputes among member states and worries over national independence commonly stand in the way of speedy actions aimed at preventing disasters (Noyes & Yarwood, 2013). Such restrictions point to the need for ongoing improvements and greater motivation to make the system work better. The European Union's Conflict Early Warning System (CFEWS) perform well, especially due to its innovative use of modern technologies. Making use of machine learning and artificial intelligence, together with detailed data, allows the system to forecast risks more accurately and keep up with new developments (Muggah & Whitlock, 2022). Additionally, the EU is well supported by a detailed system for preventing and addressing conflicts, so that early warning information is included in policy and diplomacy (Horváth, 2024).

However, the effectiveness of the CFEWS is limited by several structural and operational challenges. One of the main problems is that the data used for early warning forecasts may not always be reliable (Muggah & Whitlock, 2022). Often, important actors in the system fail to promptly address warnings because they lack strong political will, which weakens the link between early warning and response (Muggah & Whitlock, 2022). Resolving these issues is key to increasing the EU's abilities in preventing crises within and beyond Europe.

Table 1: Comparative Framework of AU's CEWS and EU's CFEWS

Dimension	AU – Continental Early Warning System (CEWS)	EU – Conflict Early Warning System (CFEWS)
Legal Mandate & Structure	Established under the AU Peace and Security Council (PSC) Protocol, Art. 12; pillar of the African Peace and Security Architecture (APSA). Pan-African remit with REC/RM linkages (African Union, 2008; AU-PAPS)	Operates within the European External Action Service (EEAS) as part of EU's Integrated External Action. (<i>EEAS Guidance Note</i> , 2020)
Data Sources & Tools	Uses Africa Media Monitor and policy situational reports. (<i>Conflict Prevention Booklet</i> , 2018)	Employs quantitative risk scans (Global Conflict Risk Index). (<i>JRC Global Conflict Risk Index</i> , 2019)
Methodology & Analysis	Combines indicator-based monitoring with analyst briefs. (<i>Conflict Prevention Booklet</i> , 2018)	Uses model-generated risk alerts verified by experts. (<i>EEAS Guidance Note</i> , 2020)
Response Linkages	Feeds Peace and Security Council (PSC) and RECs, but limited by enforcement capacity. (<i>IDA Progress Report</i> , 2015)	Informs EU diplomacy and programming, though response timing varies. (<i>EUISS Brief</i> , 2024)
Noted Strengths	Institutional reach across Africa; improved monitoring tools. (<i>Engel</i> , 2022)	Robust analytical infrastructure embedded within integrated conflict analysis and early warning cycles, promoting coherence between risk identification and preventive policy formulation (EUISS, 2024).
Common Limitations	Capacity constraints and coordination lag. (<i>IDA Progress Report</i> , 2015)	Data validation challenges and political response gaps. (<i>EUISS Brief</i> , 2024)
Applied Example: Sahel	Flags Sahel crisis early but slow response necessitated external intervention. (<i>Security Council Report</i> , 2013)	Drawing on conflict analysis and risk assessments, the EU established EUTM Mali under the CSDP (Council of the European Union, 2013), as documented by the EEAS and assessed by SIPRI (EEAS, 2023; SIPRI, 2022).

Comparative Case Illustrations

African Union (AU) – Sahel Case Example

The Continental Early Warning System (CEWS) of the African Union monitored the increased instability in Mali since the 2012 Tuareg uprising through its Situation Room and its regional relay offices. Although warnings had been issued by the Peace Security Council, the response was slow due to political indecisiveness and a low-capacity to deploy troops, and as a result, France launched Operation Serval in 2013. This case reveals both the analytical activity of CEWS and its operational and institutional limitations. This is determined based on the vulnerability of the population and anticipated information

security needs of the population served and its environment (Noyes & Yarwood, 2013; Warner, 2015).

European Union (EU) – Sahel Case Example

In the 2010s, the EU early warning capacity had raised Mali as a high-threat case characterized by governance failure, corruption, and regional instability. These warnings shaped the EU Strategy on Security and Development in the Sahel (2011), which recommended an integrated approach between security, governance, and development. The EU rapidly mobilized mechanisms including the Instrument for Stability (IfS) and subsequently the European Peace Facility (EPF), and introduced CSDP missions like EUTM Mali and supporting regional actors through the G5 Sahel Joint Force. Assessments of EU responses to these crises suggest that their actions were too militaristic and more weight was not placed on political reconciliation. (Council of the EU, 2011; Schmauder; Clingendael Institute, 2020; Venturi, 2018).

Comparative Insight

The Mali crisis shows the potential and the constraints of early warning systems in the AU and the EU. CEWS had a context specific insight, but limited enforcement power, whereas CFEWS could draw on both analytical expertise and institutional capacity of power to transform warnings into practical operations. However, both systems failed to provide enough evidence of successful early warnings that were effectively balanced and inclusive of long-term conflict prevention and governance improvements.

Challenges Hindering Effective Early Warning and Response

Various challenges hinder the effectiveness of early warning systems for conflict and humanitarian crisis. The delay in responding to new crises often stems from governments' reluctance and their desire to maintain sovereignty (Noyes & Yarwood, 2013; Wulf & Debiel, 2010). The lack of collaboration and exchange of information among different groups prevents early warning systems from being effective (Noyes & Yarwood, 2013; Morse, 2007). Financial and technological limitations, which are common in areas with low capacity, cause more issues in this area (Morse, 2007). Another challenge is associated to the slow response systems and too many formal procedures inside these organizations (Wulf & Debiel, 2010). Even though methods for detecting potential risks and the access to information have advanced, these gaps continue to occur (Schrodt and Gerner, 1998; Wulf and Debiel, 2010).

Evidently, the lack of early warning and prompt response system in the regional peace and security framework within Africa has always been a critical issue, especially in fragile situations like Mali. Although the current systems like the Continental Early Warning System (CEWS) in the AU and the Conflict Early Warning System (CFEWS) in the EU have provided better collection of data regarding warnings of violence as well as prediction mechanisms, the systems have not been able to turn the warnings into proactive action.

This limitation largely identified in policy and scholarly discourse, highlights what Clingendael notes the warning-response gap.

In an attempt to bridge this gap, the RISE Model, (Responsive Integrated System for Early-Action), is recommended as a new structure that rethinks the functional interconnection between early warning and early response. In contrast to the emphasis on analysis and less action in previous models, RISE focuses on responsiveness, integration, systemic coordination, and early action as vital pillars. That assists to give a structured path to the harmonization of AU-EU interventions, aligning the continent and regional system to local realities, and ensuring predictive modeling is transformed into preventive and governance-based measures.

The RISE Model thus contributes meaningfully to knowledge by advancing the discussion beyond documenting hindrances to introducing a concrete and adaptable framework that could be used to structure early warning-response systems in fragile states.

Responsive Integrated System for Early Action (RISE Model)

Core Logic

The RISE Model fills the persistent warning–response gap in conflict early warning frameworks. Highlighting that detection is insufficient without integration, responsiveness, and sustainability.

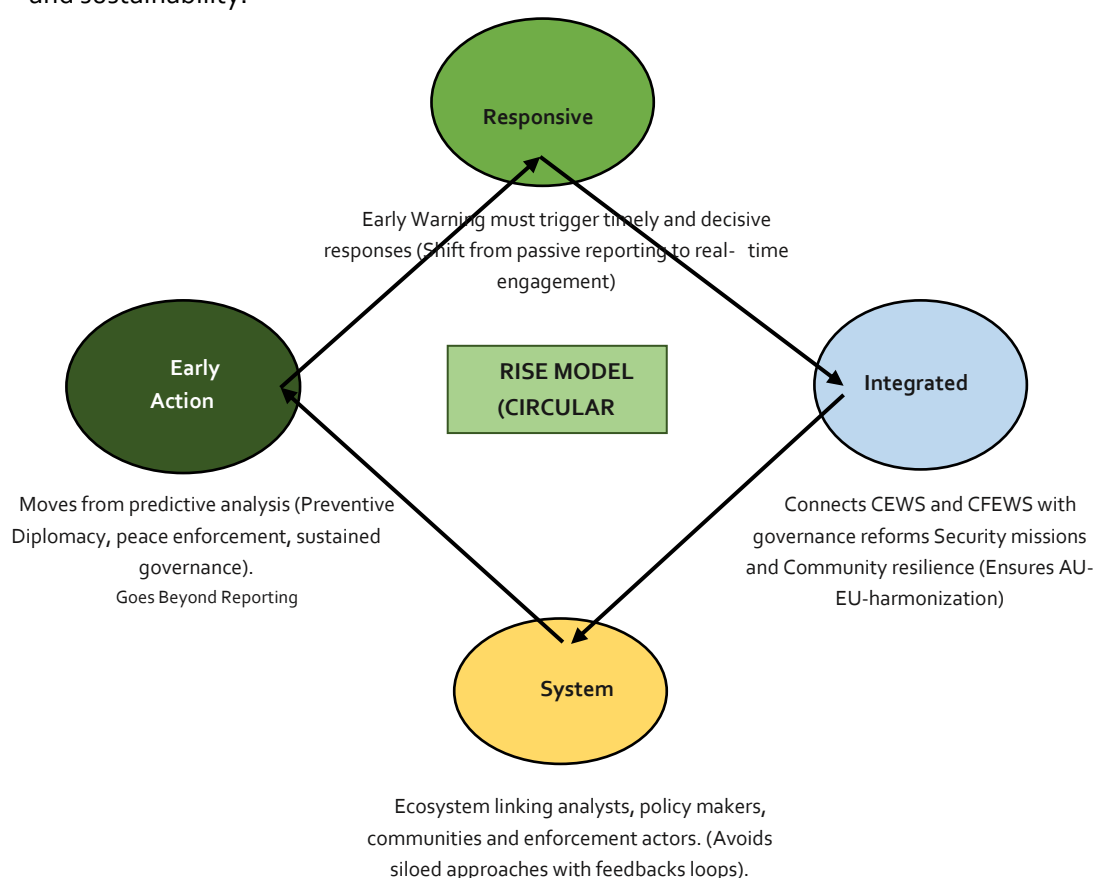


Diagram 1: Rise Model (Developed by the Authors)

The RISE model follows a constant clockwise pattern in which Responsive actions influence Integrated linkages between systems, which then translate into a system of actors and institutions. This system produces Early Action that translates into analysis, diplomacy, enforcement, and governance. This cycle is iterative, returning to Responsiveness to achieve adaptive learning and long-term conflict prevention.

Four Pillars of the RISE Model

The RISE Model is based on four interconnected pillars – Responsive, Integrated, System, and Early Action – that together address the long-standing divides between early warning and early response in African and European security systems.

1. Responsive

The first pillar centers on the principle that the early warning systems should move beyond passive monitoring and reporting to action that is reactive. While the current AU and EU processes can produce high-quality analyses, it can be limited in operational follow-up timing. A responsive framework necessitates institutional agility in that warnings instantly trigger intervention that is contextually based to reduce the risks of escalation.

2. Integrated

The second pillar emphasizes the necessity of integration between levels and actors. It interlinks continental warning systems like CEWS and CFEWS to the wider areas of governance reform, peacekeeping, and community resilience measures. Integration also makes AU-EU cooperation coordinated and non-redundant instead of disjointed and this provides a common strategic direction in prevention and response to conflict.

3. System

The third pillar positions RISE as a designed ecosystem that strategically connects analysts, policymakers, local and traditional communities with enforcement bodies. By breaking the barrier between knowledge production and policy implementation, the model eliminates silo-based practices and creates a feedback loop in which knowledge flows up and down. This systematic process makes it possible ensuring that the early warnings become longer-term strategies of resilience and peacebuilding.

4. Early Action

The fourth pillar goes beyond the predictive analysis but demands a continuum of preventive measures. It recontextualizes the reasoning behind early warning and explicitly links forecasting to preventive diplomacy, peace enforcement, and longer-term governance reform. By so doing, the model makes sure that the early warning does not just end in early reports, but rather translates to early and continuous action addressing both immediate crisis and structural drivers of conflict.

Rethinking Early Warning Systems for Sustainable Peace

Proactive prevention of conflicts depends on the adoption of advanced technology, forming strategic alliances, and working closely with the community. By processing large quantities of data such as satellite imagery, social media trends, and economic statistics, AI and big data can foresee conflicts before they escalate. The use of machine learning makes it easier to identify and address conflicts before they escalate. Africa-EU intelligence-sharing frameworks is a key aspect of this transformation. As security threats affect more than one country, better collaboration between African and European institutions is needed to monitor and address extremism, arms smuggling, and political conflicts. Creating shared intelligence bases and promoting trust among different security agencies will make it easier to share and use information together.

The involvement of people from the community is necessary, as they are likely to detect early signs of conflict before others. Training and supplying technology to civil society groups and local networks can link top-level information with news and experiences from everyday communities. Using this process, early warning systems are better connected to the specific situations on the ground. To make these works easier, additional efforts and stronger alignment of policies are needed. Early warning efforts are threatened by inconsistent funding and poor policies approach. Improved outcomes will occur when sustainable financial support and streamlined policies are promoted by partners on a national, regional, and international level.

Lastly, integrating early warning systems with quick response strategies is very important. Quick responses are necessary for early warnings to be useful. Strengthening institutional capacities for fast diplomatic initiatives and peacekeeping, as well as conflict resolution, enables a swift transition from warning to action, ensuring that early detection translates into sustainable peace.

Conclusion and Policy Recommendations

The conflict in the Sahel region highlights the importance of placing more emphasis on conflict prevention instead of addressing conflict once it begins. Early Warning System (EWS) in the African continent, e.g., CEWS, and the European continent, e.g., CFEWS, have become significant assets in managing security issues. Although the risks can be devastating and institutions and technology have come to the rescue, these processes have yet to perfectly connect risk discovery and prompt reactions.

The unrest in the Sahel highlights a lack of shared data, weak political will and engagement from the region, as well as the result of slow response on global issues for both African and European security. The comparison of CEWS and CFEWS reveals complementary strengths, indicating that, the joint use of the African Union's Continental Early Warning System (CEWS) and the European Union's Conflict Early Warning System (CFEWS) could add value to Africa-EU security relations. With a stronger focus on continental ties in CEWS, and with CFEWS depending on innovation and established policies, both approaches benefit from their differences. However, the obstacles they encounter are the same:

resource constraint, uncoordinated decision-making processes, and a lack of synergy between detection of threats and early response. There is a strong need for both regions to change their approaches to ensuring conflict prevention.

Policy Recommendations

1. Both Africa and the EU should prioritize investing in AI and big data tools which should be tailored to conflict prediction, alongside mechanisms that ensure data quality, verification, and contextual relevance.
2. In a bid to have a sustainable peace in the EU and Africa, it has become imperative to have a dedicated Africa-EU platform for real-time intelligence sharing, this would help to close the operational gap between EWS outputs and coordinated policy responses, especially in transnational conflict zones.
3. Local Communities should be involved in conflict monitoring, since they are usually the first to notice indications of possible violence, they have a significant role to play. Enhancing their involvement in EWS planning and execution will not only guarantee culturally sensitive interventions but also support local efforts to advance lasting peace, and enhance early detection.
4. Towards operational efficiency, Institutions of the AU and EU must have sustainable funding models and consistent policy alignment. Improving personnel capacity, reducing bureaucratic delays in response deployment, and harmonizing mandates are all necessary to achieve this.
5. To maintain long-lasting peace, early warning must be closely related to early action, such as quick response to potential conflict situations. This calls for the development of flexible reaction systems that are triggered by predetermined events.

Limitation and Suggestion for Future Research

This study makes important contributions to understanding AU-EU collaboration in the field of early warning and response; however, the scope is limited by the reference to institutional processes and illustrative case studies. Thus, these boundaries may not fully capture the diversity of local perspectives or the complexity of security challenges in different contexts. Future studies could thus add to knowledge by adopting the RISE Model in case studies with empirical research, comparative studies with other regional alliances and looking at the possibilities of emerging technologies to contribute to the predictive ability of early warning systems.

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