



CEWARN

The Conflict Early Warning and Early Response Mechanism of IGAD

ASSESSMENT OF CEWARN RISK MODEL TO ANTICIPATE CONFLICTS: A CASE OF PASTORAL CROSS-BORDER AREAS IN THE IGAD REGION

SUMMARY OF THE REPORT

INTRODUCTION

The assessment examined whether and the extent to which the CEWARN risk scores calculated from the field Situation Reports (SitReps) in the IGAD region anticipate or warn on the escalation of conflict as observed in subsequent field Incident Reports (IncReps), and their associated human deaths and livestock losses. It also expounds on the data integrity and quality assurance procedures used in the data cleaning and transformations, the study design, analysis procedures, as well as the results of the analysis.

This Summary Report provides highlights on the data quality assurance procedures, findings of the analysis and lessons learned. As a conclusion, CEWAN will propose recommendations and way forward in view of the findings, gaps and challenges identified in study.

A: QUALITY ASSURANCE PROCEDURES

I) Data compilation

- The raw data records reported from the field with no cleaning other than the contemporaneous quality assurance conducted were, **IncRep N = 6,111 SitRep N = 14,323**
- Using the shift procedure, so that each Situation Report is joined with its subsequent time period's incident data to generate lagged data for use in the regression analyses, three aggregated data sets of data were produced i.e. AOR-Months, AOR-Fortnights & AOR-Weeks. Only incidents for AoR-time period in which SitRep had been submitted were considered to be eligible for the study due to missing data. The final record counts assessed in the study were **AOR-Months N = 3,224 IncReps. Close to 50% of data were dropped.**

II) Analysis Predictors

a) **Primary Predictors** (warnings on risk by sector within each AOR). Three primary explanatory or predictor variables, using CEWARN SitReps are used in these analyses. These ratings are calculated into risk scores based on distributions and weights that were calibrated by CEWARN several times over the period of data collection. Social Risk, Political Risk and Economic Risk where 0 – 100, higher is more risk applies for all three.

b) **Other Predictors** include:

Country: the country in which the AOR is located

Number: the sequential number of each report within each AOR to indicate learning / increased proficiency from submitting reports over long periods of time, 1 to 140 and **Density:** of the AORs indicates the likelihood of conflict contagion and indirectly indicates reporting opportunity (based on the population and geographic area) – a positive number ranging from 0.1 to 400.9 people per Square Kilometer.

c) **Outcomes**, calculated as a) **incidence (presence/absence)** i.e. Armed Clashes and Battles Assault, Banditry, Other Crime Raids, Thefts, and Abductions Protest and Turmoil and as **intensity (counts)** (with counts from 0-34); b) **Human Deaths (ALL)**, with counts from 0 to 180 including Women & Children, and c) **Net Livestock Losses**, with counts from 0 to 13316.

Note that the armed clashes and battle incidents as well as the women and children deaths variables were both affected by sparse data and thus most of their results do not reveal statistical significance.

B: DATA ANALYSIS

Data analysis were conducted to determine if CEWARN risk scores matter; specifically, do they warn on the incidence of conflict, and if so, to what extent are the risk scores useful in signaling the magnitude of conflict. Specifically, we tested the following two questions in these analyses: Do CEWARN's SitRep risk ratings anticipate the presence or absence of conflict incidents, human deaths or livestock losses? Do CEWARN's SitRep risk ratings anticipate the magnitude of conflict incidents, human deaths and livestock losses?

The result of the **report is yes, CEWARN risk scores do signal subsequent outcomes – incidents, human deaths, and livestock losses – and these results are statistically significant.**

Both Logit and Probit models were run to determine whether CEWARN risk scores anticipated subsequent incidents, deaths, and losses and the results were similarly positive; thus, only Logit results are presented here.

The regression results for the primary predictors, the risk scores, and the associated incidence of subsequent outcomes as measured by the probabilities of their occurrence are summarized here and discussed further below.

- a) **higher social risk scores** are associated with a high occurrence rate across all three outcomes because the coefficient is positive, and it is statistically significant at the 1% level.
- b) **higher political risk scores** suggest the incidence of any incident and deaths will go down because the coefficient is negative, and this finding too is statistically significant at the 1% level, but political risk does not affect the probability of livestock losses.
- c) **higher economic risk scores** indicate the probability of any incident and livestock losses will go up (the former is significant at 5% level, the latter is at the 1% level), but economic risk scores do not seem to affect the probability of the occurrence of human deaths.

The positive and highly significant association between social risk scores across all three outcomes indicate they are best performing risk measure. In contrast, the negative association between political risk scores and incidents and deaths is puzzling, but consistent and may need further study in the future. Economic sector risk scores present results similar to, though less robust than, the social sector risk scores.

With the results described above from the Any Incident Outcome, the odds ratio of the social risk score is 1.028, so for every unit the social risk rises, it is expected to be accompanied by a 2.83% increase in the odds of any incident occurring, holding all other variables constant.

Note that the population density of each of the reporting areas was also included as an *exposure* variable to account for the different sizes and the possibility of differing conflict contagion effects associated with various densities in the AORs.

It was also noteworthy to mention that some of the stark differences across the countries in the magnitude and direction of their odds ratios are noticed but this is vastly due to the different number of cases across the countries ranging from 68 in Djibouti and 100 in South Sudan and to 1,395 in Kenya. More reliable results may be evident in Ethiopia, Kenya, and Uganda, all of which had a comparable number of observations.

CEWARN's warnings on *the magnitude of incidents, human deaths and livestock losses*

Negative binomial regression was run to determine the extent to which CEWARN risk scores anticipated the subsequent level or magnitude of incidents, deaths, and losses as indicated by monthly counts of submitted reports.

The association of risk scores and the magnitude of subsequent outcomes suggest the following:

- a) higher **social risk scores** are associated with higher levels of reported incidents and deaths, but not with higher livestock losses.
- b) higher **political risk scores** are associated with lower levels of incidents, but higher levels of livestock losses. However, there is no statistically significant relationship between political risk scores and the number of reported deaths.
- c) higher **economic risk scores** are associated with higher levels across all three outcomes, with incidents and deaths.

C: LESSONS LEARNT AND RECOMMENDATIONS

The lessons from this assessment evolve around the **operational challenges** of collecting field data by citizen reporters, and as such they are commonly encountered in all similar field research. They also stem from the **strategic challenges** of developing and sustaining the IGAD-led regional effort to monitor and analyze sensitive information while linking it to timely preventive response initiatives.

- **Infrastructure and human resources at the national level:** The CEWARN early warning (EW) effort was built on a collaborative foundation of civil societies and CEWARN Unit, their respective governments and majorly supported by several donors. Field participants for the data collection were civic and academic leaders contributing a few hours per week for a small stipend. As such, it was the regional office, CEWARN Unit, that provided the orientation, training, and coordination of the field officers as they conducted their field monitoring and reporting. The limited infrastructure and human resources at the national early warning unit offices significantly impacted on the data collection and quality assurance of the data. As mentioned in the data compilation section of this Summary Report, the quality of the data imposed a number of limitations on this assessment.
 - **There is need for Member States to invest more in data collection, reporting and quality assurance by deploying requisite infrastructure and human resources.**
- **Consistency in Reporting:** Most of the data quality issues arise because individual reporters had no reliable backup when they could not report within a given time period. For example, the months of August and December into January are notable for the level of missing data, presumably when reporters took vacations. In addition, the fact that Monitors were sending data from the field on hard copy that was then transmitted via email, post office, fax or buses led to a lot of delays and information loss. Example is the fact that only thirty-five of the forty AORs posted an IncRep-SitRep sequence of two successive months, and another nine AORs had less than ten successive months.

In addition, the handful of puzzling results reveal possible ambiguities in the indicators or their weights, that could be addressed with more regular and extensive training sessions followed by strict enforcement of submission requirements.

- **More targeted and rigorous training and enforcement, and equally rigorous quality assurance protocol needs to be imposed and documented.**
- **Quality Assurance (QA):** It is important to note in this assessment that despite these data challenges, overall results were encouraging. Thus, our recommendation on QA is directed not simply at a more is better; rather it is toward formalization of the QA protocols, along with their automation as appropriate.
 - **QA should be conducted in real-time rather than as a retrospective data cleaning exercise in preparation for assessments, as in the current case. Such a real-time protocol needs to be rigorous in addressing the challenges encountered in this assessment. And for this, building the capacity of Situation Rooms at national offices become critical.**
- **Complexity of the phenomenon being assessed:** The indicator weights used in this assessment were calibrated over the years in exercises conducted by CEWARN. However, the multi-dimensional nature of their scaling included polarity, veracity and comprehensiveness may have undermined the utility of these weights. In retrospect, it could be useful to compare the current results with the same tests run on the unweighted, raw ratings.
 - **Additional assessment to probe these and other issues that arose from this assessment. Refinements of the outcome of this assessment can be done with the existing data but the re-runs are likely to require additional data, new variables, and/or imputation of missing data.**

Limitations of the Assessment

The data, as they are, do reveal a substantial amount of evidence in support of CEWARN's early warning risk scores. However;

- The scope of this assessment did not include the response side of the early warning and response equation; we would be remiss to not address CEWARN's *raison d'être* in this report. **The evidence that CEWARN was able to detect potential conflicts might be seen as success on its early warning component, but on the other hand the outcomes indicate the poor linkage with early response.**
 - **More emphasis and investment in linking early warning with response remains critical to ensure that efforts on early warning bear fruit.**
- Evidence-based decision making requires a scientific approach and this assessment could be greatly improved by regular peer and stakeholder reviews, ideally with the data made accessible to the public, perhaps after an appropriate embargo and the masking of sensitive information.
 - **CEWARN needs to invest more in regular review of the collection, analyses, and results by all stakeholders**

CONCLUSION

In conclusion, the data, as they are, do reveal a substantial amount of evidence in support of CEWARN's early warning risk scores.

This report is very significant to governments, researchers, practitioners, field monitors and policy makers as well as RECs and AU CEWS, who have replicated modified version of the system to do early warning.

The data and the analysis present CEWARN and other interested parties with a unique opportunity to conduct further studies in understanding the nexus and influences of different factors of conflict in a unique transnational context.