Climate Change and African Political Stability: Briefing for the Defense Science Board

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Briefing Overview

- Climate Change and African Political Stability program
- Social Conflict in Africa: A New Dataset and Findings
- Mapping Insecurity in Africa: A New Model of Climate Change Vulnerability
- Upcoming research
Overview

- Five-year program funded by DoD Minerva Initiative
- Collaboration between four universities, led by the Strauss Center at the University of Texas at Austin
- Aims to assess how climate change could make African countries more vulnerable to humanitarian disasters and conflict, and how this could in turn affect African political stability and U.S. security
Research areas

- Climate change and conflict vulnerability
- Government capacity to mitigate climate stress
- Foreign aid for climate change adaptation
Climate change and conflict

- Scholars, policymakers are concerned that climate change, environmental degradation will lead to conflict
- Weak and ambiguous findings with respect to interstate, intrastate war
- Other forms of social conflict may be more likely
  - Interstate wars are rare
  - Insurgency entails significant start-up costs, government is (comparatively) well-armed
  - The state may not be an appropriate target
Conventional, state-centered conflict

- Interstate war
- Intrastate war
- Protests, rioting, communal conflict, government repression, strikes
Different in kind, not necessarily scale

- **Kenya**
  - 2007: marred elections lead to widespread ethnic rioting, 800-1,500 deaths, political compromise
- **Nigeria**
  - 1998: Ife-Modakeke ethnic violence kills 3,000 near Osun
  - 2001-2008: Muslim-Christian religious violence kills >1,200 in Jos
- **DRC**
  - 1999-2003: Ethnic violence between Lendus (agriculturalists) and Hemas (pastoralists) kills at least 8,000 in the Ituri region
- **Event death totals are higher than many civil conflicts**
Different in kind, not necessarily effects

• Massive humanitarian crises
  – Potentially requiring international response

• Creation/signaling of ungoverned space
  – Prominent in failed/fragile states

• Involve countries of strategic interest to USA
  – Kenya, Tanzania
  – West Africa
New data

- Social Conflict in Africa Database (SCAD)
- Data collection, analysis project at University of North Texas
  - Co-PIs: Idean Salehyan, Cullen Hendrix
- Covers 47 African countries, 1990-2009
- Over 6,000 events
  - Protests, riots, strikes, government repression, communal violence, intra-government violence
  - Augments existing data sources on inter-, intrastate war
- Online database, visualization tools expected August 2010, hosted by Strauss Center
Extreme rainfall and social conflict events, 1990-2009
Extreme rainfall and social conflict events, 1990-2009

Social Conflict in Africa
Extreme rainfall and violent events, by country

Social Conflict in Africa

Correlation

Strong
\( r > 0.45 \)

Moderate
\( 0.45 > r > 0.2 \)

Negative
\( r < -0.2 \)
Climate change and the weather-conflict nexus

Multi-model projected patterns of precipitation changes

Figure 3.3. Relative changes in precipitation (in percent) for the period 2080-2099, relative to 1980-1999. Values are multi-model averages based on the SRES A1B scenario for December to February (left) and June to August (right). White areas are where less than 56% of the models agree in the sign of the change and stippled areas are where more than 90% of the models agree in the sign of the change. [WGI Figure 10.9, SPM]
“Tis easy to see, hard to foresee.”

- **GCMs forecast different effects of climate change on rainfall in different regions**
  - Less rainfall in north, south
  - More rainfall in east
- **Forecast that rainfall will be more “clumpy”**
  - More extreme rainfall events
  - Longer droughts
- **Caveat emptor**
  - Forecasts are long term (comparing 2090-2099 to 1990-1999)
Conclusions and recommendations

• Distinct environmental links between nonviolent and violent mobilization
• Past relationship is not constant across the continent
• Case studies should be paired
  – Match cases with similar environmental stressors, dissimilar outcomes
  – Provides leverage on mediators and potential mitigators
• Suggested pairings
  • Zimbabwe-Zambia
  • Kenya-Tanzania
  • Mauritania-Niger
Climate change vulnerability project

- Led by Dr. Joshua Busby, University of Texas at Austin
- Aims to identify which areas are most vulnerable at the most detailed scale possible
- Combines existing data on physical, socio-economic and political insecurities to develop a holistic model of vulnerability
- Uses Geographic Information Systems (GIS) to locate the confluence of these various types of vulnerability
Holistic model of vulnerability

• Physical exposure
  – Drought, Flood, Wildfire, Cyclone surge, Cyclone wind, Low-elevation coastal zones

• Household and community vulnerability
  – Literacy rate, School enrollment, Maternal mortality, Life expectancy, Dietary energy consumption, Drinking water access, Healthcare expenditures, Spending on nurses

• Governance and political violence
  – Government effectiveness, Voice and accountability, Global integration, Volatility in regime, Years since last major change, Political violence

• Population density
Mapping Insecurity in Africa

Composite Vulnerability in Africa

Vulnerability (quintiles)
- lowest
- 
- 
- highest
- unpopulated area

Data Sources: World Bank Governance Indicators; Polity IV Project; Political Regime Characteristics and Transitions; KOF Index of Globalization; Political Instability Task Force Worldwide Atrocities Dataset; World Health Organization; World Development Indicators; Food and Agriculture Organization of the United Nations Food Security Statistics; PreventionWeb; DEM from USGS, G R U M P

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Mapping Insecurity in Africa

Coastal West Africa
Composite Vulnerability

Climatological Disaster Exposure
Household and Community Level Vulnerability
Governance Level and Political Violence Vulnerability
Population Density

Data Sources: World Bank Governance Indicators; Policy IV Project: Political Regime Characteristics and Transitions; KOF Index of Globalization; Political Instability Task Force Worldwide Atrocities Dataset; World Health Organization; World Development Indicators; Food and Agriculture Organization of the United Nations Food Security Statistics; PreventionWeb; DEM from USGS GRUMP

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Mapping Insecurity in Africa

Western Ethiopia

Composite Vulnerability

Climatological Disaster Exposure

Household and Community Level Vulnerability

Governance Level and Political Violence Vulnerability

Population Density

Data Sources: World Bank Governance Indicators; Polity IV Project: Political Regime Characteristics and Transitions; KOF Index of Globalization; Political Instability Task Force Worldwide Atrocities Dataset; World Health Organization; World Development Indicators; Food and Agriculture Organization of the United Nations Food Security Statistics; Provor/ENVIS; DEM from USGS; GRUMP

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Other areas of high vulnerability:

- Tanzania
- Zimbabwe
- Rwanda
- Swaziland
- Mozambique
Next CCAPS research

- Online tools mapping climate change vulnerability and conflict data
- Predictive climate model
- Case studies on constitutional design and conflict management
- Case studies on governance
- Coding and tracking adaptation aid
- Linking climate, conflict, governance and aid