

Agenda



- Operational Problem
- Results
- Technical Approach
- Observations, Impact, & Transition

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➤ Operational Problem

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Sudan Strategic Assessment (SSA)

Operational Problem



- How to assess a complex “state”
 - Lack of borders
 - Many competing interests
 - Representative of many countries in Africa
 - Lack of “analytical” products and vetted data
- Span spectrum of the instruments of national power
 - Emphasis on the Diplomatic, Information, and Economic aspects of DIME and less emphasis on Military aspects
- 180-day proof-of-concept effort conducted for US Central Command
 - March to August 2007
- Greatest challenge: Developing the process while executing it

Operational Objectives of the Study

- Reduce human suffering
- Promote regional peace and stability
- Deny safe haven for international terrorists and criminals



Project Objectives



- Provide customer with actionable recommendations in support of their operational objectives
- Develop methodology, tools, TTPs, and lessons learned for how to integrate and best leverage diverse expertise, data, and models
- Deliver Products in Multiple Formats: Map Human Terrain (MapHT) taxonomic interface, Intellipedia, etc.

Results



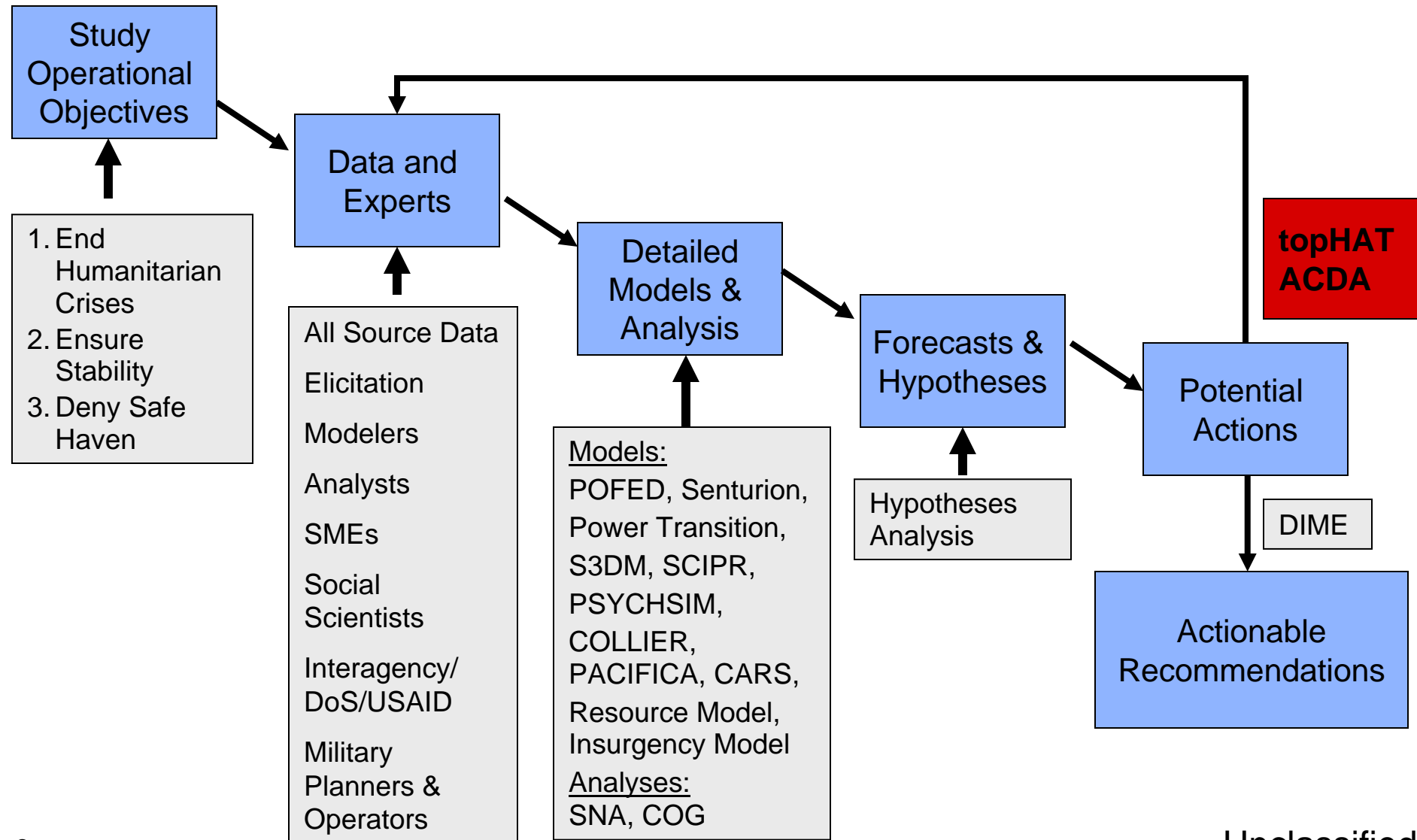
- Developed evidence-based, empirically driven framework for reducing data source bias and increasing understanding of the dynamics of a complex problem
 - Avoid Chalabi effect
 - Avoid 7000 mile screw driver effect
- Developed tools, techniques, and procedures to build a repeatable process
- Provided 17 DIMEs in priority order with the top 6 being recommended actions
 - Encourage GCC pressure on the Government of Sudan (GoS)
 - Encourage wealth sharing with the South
 - Institute a no-fly zone
 - Provide economic assistance to the South
 - Initiate HOA programs to stabilize the region
 - Lift economic sanctions

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Sudan Strategic Assessment Process



Multidisciplinary and Multiorganizational

Project Leadership

Project Guidance: CENTCOM
Project Lead: MITRE
Project Oversight: OSD DDR&E,
JS J39, STRATCOM

IC Support

NSA
NGA
CIA
DIA
OSC

Data Collection, RFI, & Taxonomies Teams

MITRE
IDA
ONR

Social Science Team

Led by ONR, IDA, and LLNL:
University of Indiana Perdue
University of Pennsylvania
University of California, Berkeley
University of Nebraska
Kettering University
Rhode Island College
SOCOM Cultural Advisor
MITRE

Modeling Team

Led by NSI & MITRE:
MIT
Sentia
Active Computing
Evolving Logic
Aptima
USC
NPS
JFCOM Component

~80+ People Actively Engaged Across

~27 Organizations

Analysis Team

LLNL
IDA
NSI
MITRE

DIME Threads Team

Led by
CENTCOM:
SSA Team

Social Science Models Used and Evaluated

Model	Model Type	Model Class	Model Metric	Defining Characteristics
Pacifica (regional/national)	Keyword-Based Text Filter & Categorizer	Qualitative	Political, Economic, Social Indicator Trends	Sets indicators for Sudan hypotheses, scores & graphs trends in text over time
Collier (national)	Econometric (Logit Regressive) Model	Quantitative	Probability Civil War	Model focuses on greed (opportunistic) and grievance (rebellion) hypotheses
POFED (national/sub-national)	Regressive Dynamic System of Equations	Quantitative	Relative Political Capacity (RPC)	Politico-Econometric Macro-Structural model at regional & (sub)national levels
PT Dynamics (national/sub-national)	Dynamic System Eqs. Agent-Based Model	Computational	Likelihood of conflict and conflict intensity	Simulates structural preconditions of interstate conflict residing in notions of power parity and policy dissatisfaction
S3DM (sub-national/group)	State Stability System Dynamics Model	Computational	Violent Dissident Level and Anti-Regime Acts	Non-Linear Dynamics; Feedback Loops; State Capacities & Loads; Tipping Point 5th Order system; >140 Eqs; >100 loops
SCIPR (group/individual)	Socio-Cultural Agent Simulation Model	Qualitative; Computational	Indiv/Group Social Identities, Attitudes	Simulate effect that events have on group opinions, attitudes, identities
PsychSim (group/individual)	POMDP Agent Simulation Model	Qualitative; Computational	Indiv/Group Actions, Beliefs & Behaviors	Models interactions & influence among & between different groups/individuals
Senturion (group/individual)	Game and Decision Theory Models	Qualitative; Computational	Indiv/Group Position and Support for Issues	Simulate stakeholder & decision-maker influence, relationships and negotiations

Forecasts and Hypotheses

Independent Variables

ROOT CAUSES

1. The Government of Sudan [GoS] is perceived as legitimate by its people
2. The GoS is in collusion with the Janjaweed
3. Natural resources are not evenly distributed in Sudan
4. Cultural and ethnic intolerance pervades Sudan
5. Ecological factors are a driving factor in Sudan
6. Forces from outside countries are influencing Sudan
7. The Sudanese people support partition

Dependent Variables

AFFECTS

1. Humanitarian Crisis
2. Instability
3. Safe Haven for Terrorists

Tested for 7 Independent Variables Across 3 Dependent Variables – Total Number of 21 Hypotheses

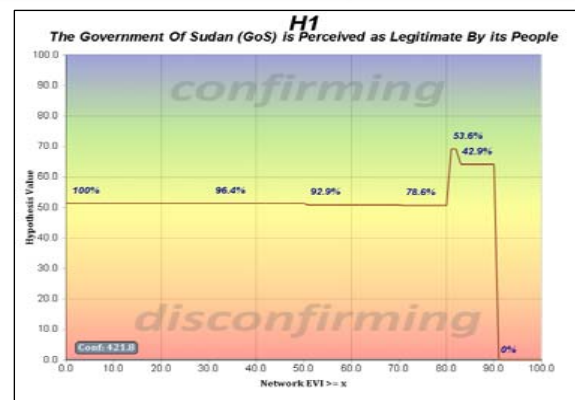
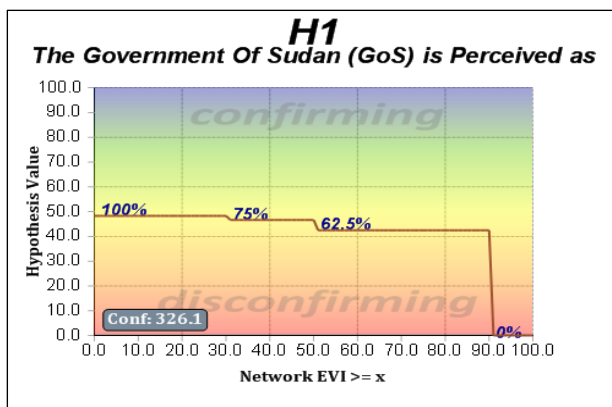
topHAT: Rank Ordering of Hypotheses by Confirming Value

Model Data Only

Hypothesis	Score
The Government Of Sudan (GoS) is in Collusion With the Janjaweed	562.2
Forces From Outside Countries are Influencing Sudan	461.4
Natural Resources are not Evenly Distributed	419.8
Ecological Problems are a Factor in Sudan	366.4
The Government Of Sudan (GoS) is Perceived as Legitimate By its People	326.1
The Sudan People Support Partition	285.4
Cultural and Ethnic Intolerance Pervades Sudan	225.1

Model Data with SME Input

Hypothesis	Score
The Government Of Sudan (GoS) is in Collusion With the Janjaweed	563.6
Natural Resources are not Evenly Distributed	563.5
The Government Of Sudan (GoS) is Perceived as Legitimate By its People	421.8
Ecological Problems are a Factor in Sudan	395
Cultural and Ethnic Intolerance Pervades Sudan	367.5
The Sudan People Support Partition	350.5
Forces From Outside Countries are Influencing Sudan	348.7



From the Rank Ordering of Hypotheses to Abbreviated DIME Actions

1. Deploy a UN-led multinational protection force to take over from the under- resourced AMIS
2. Deploy a hybrid UN-AU multinational protection force ...
3. Deploy a US-led protection force ...
4. Influence debt assistance provided to Sudan by international financial institutions to be dependent on the GoS ceasing atrocities
5. Encourage a major divestment campaign targeting companies that are complicit in the genocide in Darfur
6. Enforce and enhance a set of targeted economic sanctions [
7. Provide economic assistance to Southern Sudan specifically for infrastructure development and investment in human capital
8. Do Nothing
9. Pressure the North to more equitably share resources with the South
10. Support a coup whereby the GoS is taken over by African-centric vs. Islamic-centric leaders
11. Pay the GoS to stop the humanitarian crises in Sudan
12. Institute Programs in the HOA that strengthen and stabilize the area surrounding Sudan
13. Actively remove key GoS/Janjaweed personnel that play a role in the violence in Sudan
14. Unite Darfur rebel groups to develop unity militarily, collective bargaining, diplomatically, and economically
15. Lift US and western sanctions against the GoS, enabling market forces to modify behavior and to provide an influx of Western human rights values
16. Engage GCC countries to politically influence the GoS to take responsibility for the humanitarian crises within its borders
17. Enforce the 2005 UN Security Council Resolution demanding the GoS cease offensive military flights by establishing a "no fly zone"

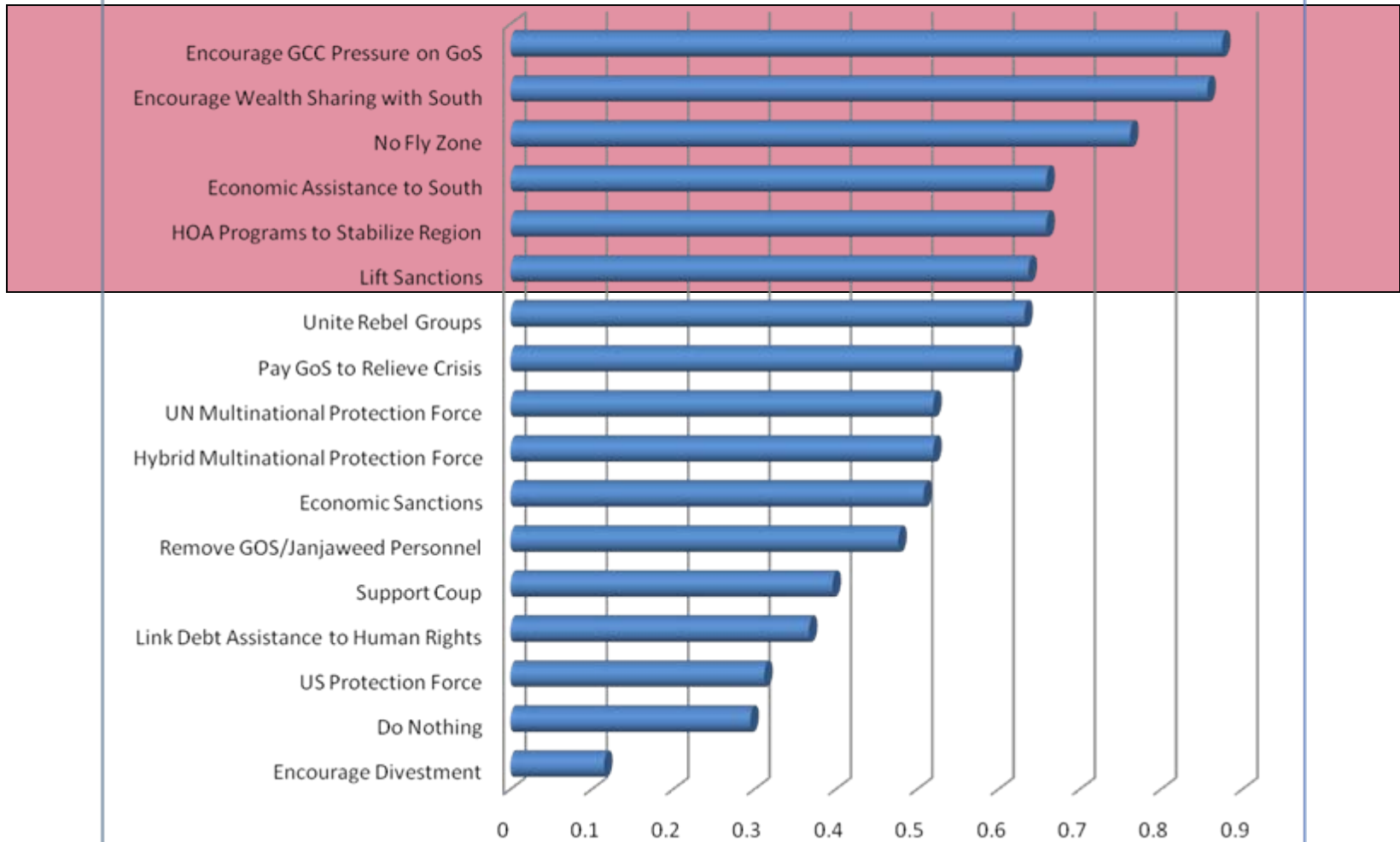
Analysis of DIME Actions: Two Approaches

- CARS Stability/Robustness Analysis
 - Analyze Relative DIME Performance based on least regret
 - Vary all uncertainties through their plausible ranges
 - Determine DIME Thread ranking robust to assumptions (if any)
 - Determine Key assumptions
- Analysis of Competing DIME Actions (ACDA)
 - Identify an ordering of the most-to-least efficacious DIME actions as a function of their merits, as indicated by the study's models
 - Identify the degree to which findings of the models confirm or disconfirm the attractiveness of each DIME action
 - Execute algorithms that locate the optimal DIME action in the set of competing actions and rank them accordingly

Prioritized DIME List

Results from a Confirming View

DIME with the largest score is most confirmed by model findings OR DIME with smallest score is least confirmed by model findings



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- SMA Primer
- Sudan SMA Project
- Sudan SMA Process
- Observations, Impact, & Transition

Observations

- Social science models in conjunction with other analyses are an effective, evolutionary step in the analyst toolkit
 - Provides additional lenses to look at complex problems
- Do not expect pin point prediction
 - Seek to move the decision maker further from unaided intuition
- Execution of Sudan SMA TTPs for other areas may require establishing an interagency assessment group with reach back capability for COCOMs
 - Cadre of experts needed to duplicate process does not readily reside within USG
 - Expect to manage information and experts at multiple classification levels
 - Many models can only be effectively run and interpreted by their considerably expert developers raising resource and classification issues
 - Full-spectrum DIME actions require interagency setting
- Red Team Recommended for COA Development

Impact & Transition

- CENTCOM pursuing a subset of the commercial models plus topHAT/ACDA tools
 - PACOM collaborating with CENTCOM on approach and models
- SMA meetings held with AFRICOM J2 Staff
- Meetings planned with DoS
- Provided a course at SMA Worldwide Conference in November: Introduction to Strategic Assessment of Complex Cultural Environments
 - For operational planners and analysts
- Sudan SMA approach used in SMA effort for STRATCOM on Deterrence of 21st Century Adversaries (LTG Elder)
- Significant role for S&T in developing new models and improving the form and function of current models for use in operational settings
 - Bob Foster (OSD), Peter Brooks (IARPA: PAINT), Sean O'Brien (DARPA), Collin Agee (Army G-2: Map-HT)

Questions?



Backup Slides



Recommended DIME Actions*

Study Operational Objectives: Reduce human suffering; Promote regional peace and stability; Deny safe haven for international terrorists and criminals.

1. **Diplomatic**: Engage GCC countries, primarily Kuwait, Saudi Arabia, and Qatar, to politically influence the GoS to take responsibility for the humanitarian crises within its borders.
 - Influence Kuwait via its critical ties to Sudanese banking.
 - Influence Qatar via its ties to Sudan's oil exploitation.
 - Influence Saudi Arabia using as a lever its interests in maintaining Sudan as an Arab-Islamic country vice a more purely African country.

*Caveated Recommendations – Read Sudan Strategic Assessment Key Findings Report.

*DIME Actions are not optimized for any one single objective but are equal across all three.

Recommended DIME Actions*

2. **Diplomatic, Information, Economic**: Pressure the North to more equitably share resources and wealth with the South (i.e., enforcing the CPA).
 - Encourage the PRC to pressure the GoS using the lever of the Beijing Olympics.
 - Enforce and enhance a set of targeted economic sanctions including travel bans, asset seizures, selected sanctions on the petroleum sector, and sanctioning the off-shore accounts of the regime's commercial entities.
 - Engage the AU to politically influence the GoS to enforce the CPA.
 - Engage the Arab League to politically influence the GoS to enforce the CPA.
 - Launch an anti-corruption campaign in the North and the South.
 - Make public the revenues coming into the North from lucrative oil deals.

3. **Military**: Enforce the 2005 UN Security Council Resolution demanding the GoS cease offensive military flights by establishing a "no fly zone".

Recommended DIME Actions*

4. **Information, Economic**: Provide economic assistance to Southern Sudan specifically for infrastructure development and investment in human capital.
- Institute transparency of financial transactions.
 - Launch an anti-corruption campaign in the South.
 - Provide self-governance training.
 - Launch an information campaign to tell the people of Southern Sudan what the government of South Sudan is doing with the aid.
 - Institute a broad spectrum of training programs designed to train while providing needed infrastructure projects to the region (e.g., wells, roads, buildings, irrigation, etc).
 - Provide training and assistance in stemming desertification in Southern Sudan.

Recommended DIME Actions*

5. **Diplomatic, Information, Military, Economic**: Institute Programs in the HOA that strengthen and stabilize the area surrounding Sudan.
 - Establish a UN peacekeeping mission with a strong civilian protection mandate in Chad and the Central African Republic, aimed at deterring the movement of insurgent armed groups across the borders.
 - Positively influence debt assistance by international financial institutions (e.g., the World Bank and the International Monetary Fund) to the HOA.
 - Provide self-governance training.

6. **Diplomatic, Economic**: Lift US and western sanctions against the GoS, enabling market forces (i.e., competition) to modify behavior and to provide an influx of Western human rights values to the region.