The SPEED Project, Climate Change and Societal Stability

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Outline

• SID Introduction and Overview
  – Parent Project

• Introduction to SPEED Project
  – Social, Political and Economic Event Database Project

• In-depth Overview of SPEED
  – Illustration of Societal Stability Protocol

• Application to the Study of Climate Change
  – Design of an on-going research initiative

• Illustrative Data from Pilot Study
  – Illustrative, not analytic/correlative
SID Components
Original Data Collection Efforts: Three Major Components

SID Project

Comparative Constitutions Project

SPEED Event Analysis

Thematic Projects

Free Trade Project
Central Bank Independence Project
Legal Infrastructures Project
Legislative Capacity Project
National Elections and Regime Project
Media Structure Project
Environmental Quality Project
Agricultural and Natural Resources Production Project
Key Challenges in SPEED: Moving from Texts to Linked Events

- Assembling a global archive of news reports
- Developing an event classification scheme
- Screening and classifying news reports
  - BIN module
- Geo-spatial referencing of event sequences
  - LOCATE module
- Identifying events within relevant news reports
  - EAT module (Event Annotation Tool)
- Extracting key pieces of information
  - Protocol development, testing and training
  - EXTRACT suite of programs
- Linking related events in different articles
  - LINK module
The SPEED Project

SPEED Event Database

Worldwide News Media 1946-Present: 35M Articles/Reports

Historical: 1946-2006
- Foreign Broadcast Information Service (CIA): 8M Reports
- Summary of World Broadcasts (BBC): 8M Reports

Contemporary: 2006-Present
- Cline Web Crawling Service
- 4500+ News Feeds: 11M Articles
- 95% of Global Population Represented

Scanning
Digitization

Report Classification
Event Identification
Integrated Event Database
Event Linking

Monitoring/Downloading
Body Extraction
Information Extraction

Cline Center for Democracy at the University of Illinois
BIN Program

- Designed around SID Information Needs
  - Highly refined event classification scheme
- Based on statistical algorithms
  - Key words, word correlations, semantic structure of text
  - False negative rate of 1% (repeated tests)
LOCATE Module

• Does full text scan, identifies and disambiguates geographic references
• Allows us to identify and segregate articles with relevant events by country automatically
  – Essential for studying climate change and societal stability, as discussed below
EAT Module

• Prototype developed in summer, 2009
• Will identify and annotate key provisions in news text that are relevant to the protocol-specific event ontology
  – Will enhance accuracy by detecting word phrases reporting relevant events
  – Will double efficiency
<table>
<thead>
<tr>
<th>Check</th>
<th>Sentence</th>
<th>Event Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>More than 30 people were killed and 14 were wounded when armed men, believed to be anti-Government guerrillas, opened fire on a passenger bus about 26 miles north of Kampala over the weekend. The Uganda Post said today.</td>
<td>other attacks on humans 1</td>
</tr>
<tr>
<td>2</td>
<td>The attack took place between the villages of Busura and Kalule on a main road leading to the provincial town of Goulu, the newspaper said.</td>
<td>other attacks on humans 1</td>
</tr>
<tr>
<td>3</td>
<td>Two weeks ago a bus was ambushed and seven passengers were killed on the same road.</td>
<td>other attacks on humans 2</td>
</tr>
<tr>
<td>4</td>
<td>In that attack, soldiers traveling on the bus drove off the attackers, killing several.</td>
<td>reactwithconsecnc - counter attacked - other attacks on humans 2</td>
</tr>
<tr>
<td>5</td>
<td>The survivors of the latest attack said they had escaped by hiding under the bus.</td>
<td>executions 1</td>
</tr>
<tr>
<td>6</td>
<td>They said several people had been taken prisoner and tied up and then shot by their captors.</td>
<td>executions 1</td>
</tr>
</tbody>
</table>
EXTRACT Suite of Programs

• Electronic interface between news report and protocol
• Geocoder module
• Calendar module
• List sets
• Proper name module
• Lexicon-based modules
  – Social, religious, insurgent, political, etc.
• Link module
**Title:** Deaths in Riots as Indian State Preps to Vote

**Source:** The Times of India (Feb. 12, 2002)

**Summary:** At least six people were killed today in clashes between Hindus and Muslims in India's northeastern state of Assam, where pre-election violence has so far taken more than 70 lives.

The assayer comes as Prime Minister Indira Gandhi leaves for New Delhi after a three-day campaign for her Congress Party in Assam and neighboring Meghalaya, where elections are due next week. The deaths occurred in the Bech area, 50 miles west of Gauhati, the capital of Assam, and included an Assamese Hindu girl killed in the village of Sannam where Assamese are.

Another incident had raised the overall death toll in pre-election violence to more than 70. Gauhati was virtually paralyzed today by a protest strike, organized by militants to protest Mrs. Gandhi's visit. Hundreds of policemen guarded her as she addressed a crowd estimated at 20,000 at Maligaon, outside Gauhati. Violence set off by the anti-election campaign led to at least 10 deaths on Friday, some caused when the police fired to disperse angry crowds. An explosion damaged a railway track in the Nowong district, east of here. Unit today most of the violence in Assam appeared to have been directed at the Muslim and candidates of political parties. But Muslims fear they could become the target for anti-Muslim rape if they ignore the call by Assamese militants for a boycott of the elections. In Gauhati itself, election posters with Mrs. Gandhi's picture were smeared with black paint or torn up. The election campaign, begun a week ago, has stopped all drilling in Assam but pumping is being maintained by a skeleton staff.
LINK Module

• Links information across articles in archive
• Important for
  – Subsequent updates of event information
  – Understanding event dynamics
6 Die in Riots as Indian State Prepares to Vote

GAUHATI, India, Feb. 12 (Reuters) - At least six people were killed today in clashes between Hindus and Muslims in India's northeastern state of Assam, where pre-election violence has so far taken more than 70 lives. The bloodshed came as Prime Minister Indira Gandhi left here for New Delhi after a three-day campaign for her Congress Party in Assam and neighboring Meghalaya, where elections are also due next week. The deaths occurred in the Bisak area, 50 miles west of Guwahati, the capital of Assam, and included three Assamese Hindus killed in the village of Samaria where Assamese are in the majority, a police official said.

State elections starting Monday are opposed by Assamese groups who are demanding the removal of illegal immigrants, mostly Muslims from Bangladesh, from electoral rolls and their eviction from the state. The police official said hundreds of people armed with axes had burned an attack on Samaria after rumors that Muslims in other parts of the district had been attacked. Riots occurred in three villages and the police said more than 100 houses had been destroyed. The Press Trust of India news agency said today's deaths in the clashes and other incidents had raised the overall death toll in pre-election violence to more than 70. Guwahati was virtually paralyzed today by a protest strike, organized by Muslims to protest Mrs. Gandhi's visit.

Hundreds of policemen guarded her as she addressed a crowd estimated at 20,000 at Mahagun outside Guwahati. Violence set off by the anti-election campaign led to at least 10 deaths on Friday, some caused when the police fired to disperse angry crowds. An explosion damaged a railway track in the Naggar region, east of here. Until today most of the violence in Assam had apparently been directed at the police and at candidates of political parties. But Muslims fear they could become the target during polling if they ignore the call by Assamese militants for a boycott of the elections. In Guwahati itself, election posters with Mrs. Gandhi's picture were smeared with black paint or torn up. The anti-election campaign, begun a week ago, has stopped oil drilling in Assam but pumping is being maintained by a skeleton crew.
Sample Visualization of Linked Events
Overview of Societal Stability Protocol
Societal Stability: Definition and Approach

• Stability refers to domestic tranquility
  – A harmonious, peaceful environment for living
  – Good for what it is and what it does

• Approach to capturing differences in stability over time and space
  – Identify a set of “instability events”
  – Construct comparable intensity measures
  – Create links among them
Instability Event Ontology

• Political Expression Events
• Politically Motivated Attacks
• Destabilizing State Acts
• Mass Movement of People
• Political Power Transfers
• Disasters
Design of Societal Stability Protocol

- **Who**
  - Initiators; Targets/Victims
  - International involvement
- **What**
  - Event type
  - Impacts (people, property, society)
  - Consequences (for initiators)
  - Type of international involvement
  - Reactions (to event)
  - Subsequent events
- **How**
  - Weapon, modes of expression, type of natural force
- **Where**
  - Geo-spatial location, geo-physical setting
- **When**
  - Date
- **Why**
  - Societal context
  - Attributed origins
  - Attributed motivations
Application of SPEED’s Societal Stability Protocol to Climate Change

A Quasi-experimental design
Overview of Approach

• **Objective**
  – To gauge the impact of weather-related events related to climate change on societal stability rigorously
  – Responds to desires expressed yesterday

• **Rationale for focus on stability:**
  – Impact of CC is most likely reflected in small bore events that conditionally lead to major events
  – Responds to void in research noted yesterday by Ole and others

• **Research design**
  – Randomized, quasi-experimental analysis
    • Avoids selecting on dependent variable
    • Provides basis for sound assessment
Source of Information on “Treatment”

• Information on weather-related events
  – Centre for Research on Epidemiology of Disasters

• Criteria for selection of “treatments”
  – Droughts, heat waves, famines, floods, tropical storms
  – Happened between 1980 – 2005
  – 100 people killed or 10,000 people affected

• 1,752 events met the criteria
Design of Pilot Study

• Did a random sample of 100 events
• Used BIN program, LOCATE, and date information to identify all news reports in our global news archive that
  – Contained reports of destabilizing events
  – Transpired within a three-year period surrounding the event
    • 18 months before
    • 18 months after
Plan of Analysis

• We will compare differences in destabilizing events in the 18-month period before and after the weather event
  – Individual measures of instability intensity
    • Demonstrations, attacks, government repression, etc.
  – Aggregate measure of instability intensity?

• We will examine impact on instability of
  – Institutions
  – Contexts
  – Interventions
SPEED’s Societal Stability Protocol

Overview of Pretest Data

CLINE CENTER
FOR DEMOCRACY
Type of Coding (excluding independent events)

Is This a Linked Coding?

No (0) - 67
Yes (1) - 33
Reactions that affect Initiator

Direct Consequences for Initiator?

- No Direct Consequences for Initiator: 45
- Direct Consequences for Initiator: 55
Distribution of Focal Events

Relative Frequency of Event Types

- Political Expression Event: 21
- Politically Motivated Attack: 37
- Destabilizing State Act: 19
- Political Power Reconfiguration: 14
- Mass Movement of People: 1
- Cataclysmic Event: 6
Information on Initiator of Event

Was the Initiator Known?

- Initiator Unknown: 7
- Initiator Suspected: 4
- Initiator Known: 89
Type of Initiator

- Non-Government Initiator: 46
- Government Initiator: 50
- Non-human Stimulus: 4
Median and Range of Initiator #’s

- Political Expression: 275; 1-3,000,000
- Political Attacks: 9; 1-20,000
- Destabilizing State Acts: 2; 1-12,000
- Political Reconfigurations: 1;1-1500
- Mass Movements: 12,000: 300-315,000
Names of Participants

• Names are key for linking events

• Proper Names
  – 18% of Initiators
  – 21% of Targets
  – 17% of Victims

• Groups names
  – 90%+
Distribution of Victim Effects

Effect Specification

- None: 26
- Unspecified Effect: 17
- Health Effect: 3
- Arrested, Constrained, etc.: 10
- Attacked: 7
- Kidnapped: 3
- Injured: 5
- Killed: 29
Societal Context of Event

Type of Societal Context

- On-going violence (war, insurgency, etc.): 19%
- Transitory governance situation: 8%
- On-going societal turmoil: 32%
- Midst of a political movement: 4%
- Penumbra/anniversary of an Event: 13%
- Other: 1%
- No Special Context: 22%
Origins of Destabilizing Events

<table>
<thead>
<tr>
<th>Category</th>
<th>Attributed Origins of the Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Needs</td>
<td>7</td>
</tr>
<tr>
<td>Work Matters</td>
<td>4</td>
</tr>
<tr>
<td>Governance Matters</td>
<td>26</td>
</tr>
<tr>
<td>Military Matters</td>
<td>8</td>
</tr>
<tr>
<td>Social Group Tensions</td>
<td>22</td>
</tr>
<tr>
<td>Political Rights/Ideology</td>
<td>11</td>
</tr>
<tr>
<td>Religion/Culture</td>
<td>2</td>
</tr>
<tr>
<td>Physical Environment</td>
<td>2</td>
</tr>
<tr>
<td>Unclear, Unknown</td>
<td>16</td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
</tr>
</tbody>
</table>