



Developing a ‘Whole of Government’ Approach to Improving the Global Nuclear Detection Architecture

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Background: The Problem of Nuclear Terrorism

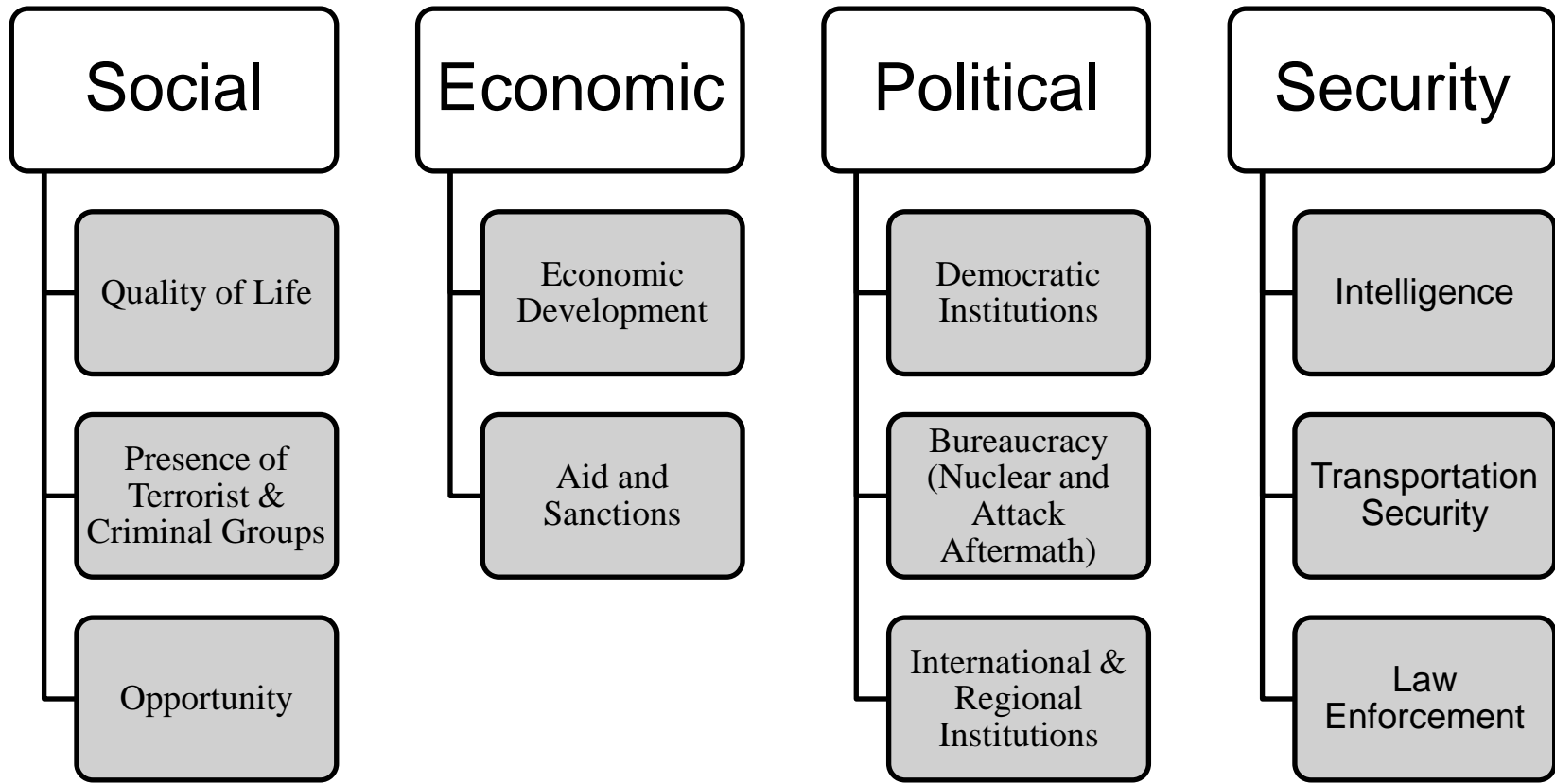
- Nuclear terrorism has been identified as among the defining threats facing the United States
- According to unofficial estimates, the global nuclear inventory includes thousands of weapons and enough HEU and plutonium for hundreds of thousands more
- As of 2008, the ITDB confirmed 1,562 incidents of illicit handling of nuclear weapons; on average, 19 incidents of unauthorized possession or criminal activities a month (30% of cases)
- Theft and loss comprise 65% of the cases



The Question: Holistic Approach to Detection Architecture?

- Given this context, how can the United States best develop an approach for improving the global nuclear detection architecture?
 - Focus on multifaceted areas of prevention and detection, including a focus on social, economic, political, and security conditions
 - Attempt to quantify likelihood of risk or cooperation on a global/regional basis?

Developing Preventative/Reactive Capabilities





Social Capabilities

- Quality of Life
 - Higher quality of life reduces the incentive to commit/condone nuclear terrorism
 - Citizens are satisfied with social conditions
- Presence of Terrorist Groups and Criminal Networks
 - If groups are present: increased access to illicit trafficking networks, incentive to commit nuclear terror, funding for access of materials
 - If groups are absent: harder to join funding/trafficking network without detection
- Opportunity
 - Hope for the future reduces incentives for nuclear crime
 - Higher opportunity reduces the benefits of nuclear terrorism, while increasing the costs



Economic Capabilities

- Development
 - Personal or national wealth may reduce the incentives of committing nuclear crimes
 - Economic development increases the capacity of the state to respond to threats
 - Economic development creates interdependency between states; makes nuclear terrorism more costly and difficult to engage in
- Aid and Sanctions
 - Method for coercing states into compliance with non-proliferation
 - Aid can form alliances, strategic relationships, and serve as a bargaining chip
 - Sanctions can create an incentive for remaining peaceful (between state/state or state/non-state actor)



Political Capabilities

- Democratic Institutions
 - Creates legitimate governance
 - Feedback process between government, security apparatuses and public will
 - Diminishes oppression against national population
- Bureaucracy
 - Nuclear: presence of agencies to regulate nuclear materials, improves standards for proliferation, ensures ability to convert, destroy and reduce rad/nuc materials
- International and Regional Institutions
 - Dense network can constrain actors and apply diplomacy
 - Treaties can ensure non-proliferation and create legal penalties for violation
 - Institutional enmeshment increases trust in the democratic process and diplomacy



Security Capabilities

- Intelligence
 - Ability to analyze, detect, assess and predict potential threats and weaknesses
- Transportation Security
 - Illicit rad/nuc materials will have to be trafficked across countries
 - Development of technology for detection and scanning cargo
 - Monitoring sea and air ports
 - Combating illicit trafficking networks
- Law Enforcement/Military
 - Institutional capacity to locate, detain and convict criminals
 - Assist in combating illicit trafficking networks



Developing an Index of Nuclear Detection Architecture: South America

- Create a quantitative index to analyze risk assessment
- Combine social, economic, political and security factors to assess:
 1. Capability
 2. Threat (intent/ability to use nuclear weapons)
- Data available for Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Paraguay, Peru, Uruguay, Venezuela (all S.A. countries except Guyana, Suriname, Curacao and French Guiana)
- 2009, No missing data



Variable Selection

- **Social:**
 - Life expectancy (years, at birth); Presence of terrorist groups
 - Access to technology: mobile phone users (per 100 people), internet users (per 100 people);
 - Under 5 mortality rate (per 1,000 people)
- **Economic**
 - Log of GDP per capita (Current US\$); GDP growth (Current US\$)
 - Bilateral Aid flows from the United States (Current US\$)
 - Labor force participation rate (% total population 15 years old +)
- **Political**
 - Level of democracy (Polity2 variable); Creation of a Nuclear Regulatory Agency; State Fragility Index
- **Security**
 - Military Spending (% of GDP); Burden of Customs Authority; Quality of Port Procedures
- **Nuclear Capacity**
 - Number of nuclear energy facilities; number of nuclear training/research reactors; yes/no rad/nuc hospital materials



Appendix

- NDA Index: bilateral trade + military expenditure + GDP per capita + GDP growth + labor force participation rate + life expectancy + democracy + rad/nuc agency + state fragility index+ burden of customs authority+ efficiency of port procedures+ mobile phone users + internet users - under 5 mortality rate – presence of terrorist organizations
- All units standardized by standard deviation from the mean
- For graphing : multiplied by one and rescaled to zero
- Nuclear Capacity Index: number of power plants + number of research reactors + yes/no rad/nuc hospitals