The World in 2040

Framework Conditions for New Kinds of Terrorism

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Context, Mapped to STEEP Sectors

Society
- Global Aging
- ...

Technology
- NBIC Convergence
- ...

Economy
- Shift to Asia
- ...

Environment
- Climate Change
- ...

Politics
- International Security
- ...

What are Implications for Terrorism?
Society 2040

- World population in 2040 ca. 9 bn
- Ageing of the global population
- Shrinking population in the West
- 95% of population growth until 2050 in developing countries
- Impact of demographic imbalances
- Increasing migration / New refugee crises
- Increasing impact of cultural differences

Annual Rate of Population Change
Society 2040 – Some Implications

Migration / Refugees
- Destabilization by “Weapons of Mass Migration”?

Missing Girls Phenomenon
- “Bride Gap”: Young men without family perspective – terrorism as an option?

Seniors as Terrorists
- Rapid radicalization of elderly persons?
- Sleepers?
- “Reborn” terrorists?
- Life-end terrorists?
Technology 2040

ICT
• 100,000 times as powerful
• Ambient / Ubiquitous intelligence
• Commodity robotics

Biotech convergence
• Bionic / bioanalogous production
• Designer life forms

Nanotech advances
• Nano- / Functional materials replace “traditional” materials
• Ubiquitous nano

NBIC Convergence
• Applications of neurotech

Atoms + Genes + Bits + Neurons

The century of quantum machines?
Technology 2040 – Some Implications

Filter bubbles and echo spaces
- Self-radicalization
- Conspiracy theories, loss of common basis of trustworthiness

Cyborgization
- Remote control of the brain – Manchurian Candidates
- Remote control of implants …

Arms Race @ Home
- Everybody equipped with 007 technologies
- Drones, robots, security AI
- Security = Toy trains of the 21st century?
- Everybody spying on everybody???
- Biotech hacking …

→ Ample options for home grown terrorists
Industry 4.0 / IoT
- Robotics & AI
- Additive manufacturing
- Circular / closed-loop economy
- Biotechnization of industry

New services
Informal, “dark” economy
New banking / financial system (FinTechs, Blockchain)
Economy 2040 – Some Implications

AI and robots replace jobs
  • New Luddite movement?

Vulnerability of economic infrastructure
  • Cybersecurity
  • In the long run: Biosecurity

Impact of digital money
  • New ways to finance terrorism

Terrorists from inside
  • Luddites / Radicalized employees
  • Intelligent Agents as terrorists?
Environment 2040

Climate change:
- More disasters
- Severe impacts on economy
- Insufficient mitigation efforts

Agriculture: Global food crisis?
- Water scarcity – source of conflicts
- Arable land – decreasing
- Hopes in biotech?

Resource depletion
- Increasing shortages of high tech resources (rare earth elements)
- Increasing disputes about resources (e.g. Arctic)
- Peak Soil reached; Phosphorus as limiting resource (peak ~2040)
Environment 2040 – Some Implications

Rising CO\textsubscript{2} emissions and temperatures
- Rising sea levels and extreme weather patterns
- Many wild cards (disruption of Gulf Stream, runaway climate…)

Environmental problems as risk factor
- Air pollution, ground water contamination, degraded land and waste endanger economic growth
- Conflicts on access to water

$\rightarrow$ Social impact of climate change largely unknown!
$\rightarrow$ Controversies about climate / geo-engineering
$\rightarrow$ Controversies about climate induced resettlement programs
Politics 2040

Fundamentals
- China and India become world powers
- Western/US power in relative decline?
- Africa – the North, more than Sub-Saharan Africa – despite several conflicts, is at a turning point
- Stronger coalitions between nations outside the established Western powers
- Growing role of values and religion

International Security Concerns
- Old and new areas of conflict
- Proliferation of old & new WMD
- Persistence of regional conflicts and terrorism

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Politics 2024 – Some Implications

Punctuated political equilibriums
- No stable global configuration in sight
- Persistent instabilities in global economy
- In a multipolar world, South-South conflicts become more important

Scenarios
- Pluralistic, polycentric world
- Trade blocks, protectionism
- “Clash of Cultures” – chaos and permanent conflicts

“Arabellion-type” upheavals
Hybrid wars

→ New causes of unrest
→ New reasons for terrorists
Increasing Attention to Risks…

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… and Vulnerabilities

VUCA World:
• Volatility
• Uncertainty
• Complexity
• Ambiguity

→ Risks & Threats
→ Disruptions & Discontinuities
→ Wild Cards & Black Swans

WHAT ARE THE THREATS?

TEN GENERIC THREATS

PEER POLITICS
DELIBERATE DAMAGE
STUXNET 2010, NORWAY 2010,
GEORGIA 2008, ESTONIA 2007
NATO 1999

EXTERNAL TENSIONS
ECOHOMIC BASE
INHERENT STRAIN
Y2K WALL STREET 2009

DOMESTIC TENSIONS / STAGNATION
ECONOMIC BASE

DISASTER (unnatural)

INNO TUNNEL VISION

ECOLOGICAL

NECESSITIES

DECREASE

ECOSTRESS

OIL PRICES
SOLAR STORMS
COST OF DISASTERS

DEPLETION

ECOLOGICAL

DEGRADATION

HABITAT

DISRUPTION

TECHHOL BASE

NATURAL RESOURCES
Wild Cards

“surprising disruptions”
• Low ex ante probability
• High impact
• Surprising character
→ “disruptive potential”

Specific lessons
• Easy to find, easy to invent wild cards, but difficult to use them properly
• Small WC driven scenarios are highly valuable
# Ideas for Wild Cards Related to Terrorism

**New Sources**
- Civil war in Egypt
- Destabilization and refugees from Turkey

**New Targets**
- Climate (e.g. terrorism against geo-engineering)
- Food security
- Culture (e.g. terrorism against museums, operas…)

**New Kinds of Deterrence**
- Prosecution of next of kin (“Sippenhaft”)

**High-Tech Terrorism**
- New kinds of hacktivist activities / cyber terrorism (e.g. attacks on blockchain – disruption of banking)
- Autonomous vehicles as weapons
- Drones, robots
- EMP terrorism
- Bio/eco terrorism based on gene edition
- Cyborg / enhanced terrorists (“superterrorists”)
3D Printing of (new kinds of) weapons

“Fabbing”
- At home
- At copy shop
- At point of sale
- At local factory

State Department Demands Takedown Of 3D-Printable Gun Files For Possible Export Control Violations

The sixteen parts of Defense Distributed's 3D-printable gun, the Liberator.

The battle for control of dangerous digital shapes may have just begun.

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Forbes 2013/05/09
New Space – Arena for Terrorists?

New space
• Private commercial actors
• New business models
• Decline of launch prices
• New space race?

High tech terrorism
• Affordability of micro launchers for terrorist organization
• New options for attacks

Space debris – environmental problem of the future

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Ideas From Science Fiction: The Unwitting Terrorist


Core ideas:
- Brainwashing
- Mind control
- Sleeper
- How to detect an unwitting terrorist?
Ideas From Science Fiction: Precrime


Core ideas:

• Early detection through precognition
• Preemptive intervention
• Punishment for not committed crimes?

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A Cautionary Conclusion

Wild cards:
- Low individual probability
- Large number – *increasing with time*

For \( p_i > \varepsilon, \varepsilon \ll 1 \) holds for sufficiently large \( n (n \to \infty) \):

\[
\prod_{i} (1 - p_i) \to 0
\]

The probability of realization of the standard scenario approaches zero.

*In the long run, wild cards will shape the future.*
Foretcasting is very difficult, especially about the future.
Thank You For Your Attention!

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