

SECURITY THREATS, CHALLENGES, VULNERABILITY AND RISKS

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Summary

Four security dangers are distinguished: threats, challenges, vulnerabilities and risks. Two developments have influenced the reconceptualization of security since 1990: a) the global contextual change with the end of the Cold War and b) constructivist approaches in the social sciences. This dual change had a direct impact as to how security threats, challenges, vulnerabilities and risks have been reconceptualized during the 1990s and in the new millennium.

Below, first the etymological origins, the synonyms and meanings of the four terms “threats, challenges, vulnerabilities and risks” in contemporary English will be analyzed, then definitions of these concepts in scientific dictionaries and encyclopedias as well as in key publications will be reviewed. With the end of the cold war, the relatively simple concept of security threats was increasingly replaced by references to new security challenges and risks, partly with references to the high degree of vulnerability of modern societies to attacks by non-state terrorist actors.

The concepts of vulnerability and risks are not only used in the context of foreign and defense policy, but also with regard to environmental security challenges by the global environmental change, the climate change and the hazard and disaster communities, where no consensus within and among these communities exists on the meaning of vulnerability and risks. This survey of the conceptual thinking on *security threats, challenges, vulnerabilities and risks* has stressed a dual need for: a) *more precise definitions* and for a consensus on these concepts especially with regard to practical political measures to achieve the agreed goals; and b) *a systematization of the threats, challenges, vulnerabilities and risks* for military, diplomatic, economic, societal, environmental as well as human, food, health, energy, livelihood, and gender security.

1. Introduction: Four Security Dangers: Threats, Challenges, Vulnerabilities and Risks

Today ‘security’ as a political value has no independent meaning and is related to individual or societal value systems. Wolfers (1962) pointed to two sides of the security concept: “Security, in an objective sense, measures the absence of threats to acquired values, in a subjective sense, the absence of fear that such values will be attacked”. Thus, in its double meaning security refers to an *absence of objective dangers*, i.e. of threats, challenges, vulnerabilities and risks, and of subjective fears, and subjectively to the perception thereof. Objective security is achieved if the dangers posed by manifold threats, challenges, vulnerabilities and risks are avoided, prevented, managed, coped with, mitigated and adapted to by individuals, societal groups, the state or regional or global international organizations.

This article tries to clarify the four specific security dangers that are posed for the five security dimensions (military, diplomatic, economic, societal and environmental) by: a) security threats; b) security challenges, c) security vulnerabilities, and d) security risks.

What do we mean with “threats, challenges, vulnerabilities and risks” that pose dangers for security? How have these words been used in common English language and how are they being used as scientific concepts in the social and natural sciences relevant for the different dimensions of security?

2. Impact of Global Contextual Change since 1990 and of Scientific Change on Reconceptualization of Security

The international political reality and the threats, challenges, vulnerabilities and risks for peace and security we perceive depend on our *worldview*, our *conceptual models* and *theoretical concepts* but also on our *mindsets* that are influenced by our traditions, experience and by the media that select the facts and interpret the images of the world that constitute reality for us. Thus, both the scientific concepts we use and the reality we perceive through our conceptual lenses, and which we interpret with our concepts, models and theories, are socially constructed.

For a rethinking or a reconceptualization of the “security concept” (see: *Reconceptualizing Security From National to Environmental and Human Security*) and of its associated features: “threats, challenges, vulnerabilities and risks” two events have been instrumental: (1) the change in international order triggered by the two events of 11/9 (fall of the Berlin wall) and 9/11 (terrorist attack on USA), and (2) a paradigmatic shift in the social sciences from positivism to constructivism and towards concepts of a (world) risk society (Beck 1986, 1998).

2.1. Global Contextual Change as a Cause for Reconceptualizing for Security

With the end of the Cold War, the global turn of 1989-1991 overcame the bipolar world order based on nuclear deterrence concepts of mutual assured destruction. For Abdus Sabur (2003), “the end of the Cold War and the accompanying structural changes of monumental proportion introduced a revolutionary change in security thinking” that resulted both in a dramatic decline in traditional security threats and to a series of intra-state conflicts, large-scale atrocities and genocide. The new security agenda included:

intra-state conflict, ethnic-religious violence, landmines, terrorism, democracy, human rights, gender, crime, poverty, hunger, deprivation, inequality, diseases and health hazards, human development, economic security, markets, water, energy, migration, environmental degradation and so on.

The terrorist attack of 11 September 2001 did not change the post-Cold War order, but it created a new awareness that non-state actors could exploit the “vulnerability” of highly developed countries with non-military means afflicting major damage against civilians during peacetime. With the end of the Cold War, a dual process stimulated a reconceptualization of the key concept of “security”:

- a) The fundamental changes in the *international political order* resulted in new hard security threats, soft (environmental) security challenges, in new vulnerabilities and risks that are perceived and interpreted differently depending on the models by the analyst;
- b) The increasing perception of new challenges triggered by global environmental

change (gec) and processes of globalization that may result in fatal outcomes (hazards, migration) and that escalate into political crises and violent conflicts.

With the Rio (1992) and Johannesburg (2002) summits problems of climate change, biodiversity and desertification were added to the policy agenda. But the implementation strategies for sustainable development fell behind the declaratory policy statements, such as the Agenda 21 or the Millennium goals, and the Johannesburg Plan of Action. Both the increasing hydro-meteorological hazards—partly due to climate change impacts—and of costs of insured damages (IPCC 2001), have increasingly focused attention of policy-makers to new “environmental security threats, challenges, vulnerabilities and risks” but also of UN officials and of analysts to new “human threats, challenges, vulnerabilities and risks”. Against many of these non-military soft security challenges, vulnerabilities and risks no military defense is possible, but the military infrastructure can assist in the early warning against these challenges, and in a speedy and well-organized disaster response. Many of these security challenges, or mega-catastrophes (e.g. the tsunami of 26 December 2004) do not discriminate between powerful and poor countries, although rich countries have better means to insure against damages, to adapt, to mitigate against and to enhance their own resilience.

2.2. Scientific Innovation and Reconceptualization of Security

The reconceptualizing of security has not only been provoked by the global contextual change but also by fundamental changes in the approaches of the social sciences from positivism to constructivism (ideas matter, reality and knowledge are socially constructed) in political science and international relations to a “reflexive modernity” in sociology (Beck 1992, 1998; Giddens 1990). It may be doubted, however, that the shift towards constructivist approaches may be identified as a scientific revolution (Kuhn 1964). The combination of the impact of the change of international order on the object of security analysis, and of the new theoretical approaches in the social sciences have amalgamated in manifold new concepts and theoretical approaches on security threats, challenges, vulnerabilities and risks that has resulted in a new scientific diversity.

2.3. Widening and Deepening of Security: Environmental and Human Security Concept

Widening the policy focus from military threats to new challenges of global environmental change and globalization, as well as to manifold environmental stresses, requires a basic change in the mindset of policymakers and of the scientific community. This has resulted in a:

- a) *Widening* from the political and military dimension of security, including economic, societal and especially environmental dimensions, and
- b) *Deepening* from the narrow *national security focus* down to other referents of securitization from the individual to the global and interplanetary system.

In European security discourses an expanded security concept has been used by governments and in scientific debates that combines five security dimensions with five levels of analysis (see: *Reconceptualising Security From National to Environmental and*

Human Security). While *national security* has the state as the major referent, *human security* has human beings and human kind as the referent. The answers to the questions of security for whom, from whom, by whom, of what values, from what threats and by what means fundamentally differ for both concepts (Abdus Sabur 2003: 41). Bogardi (2004) and Brauch (2003) suggested focusing the human security discourse on the environmental dimension especially on interactions between the individual or humankind as the cause and victim of factors of global environmental change both in anthropogenic and natural variability contexts.

Below, the reconceptualization of the four key features of the security concept: “threats, challenges, vulnerabilities and risks” will be discussed. Which fundamental changes in the conceptual thinking on the four security dangers have been triggered by the fundamental global contextual change with the end of the Cold War?

3. Reconceptualizing Security Threats after the Cold War

3.1. Etymological Origins of the Term “Threat”

The English term “threat”, or “menace” (L: “trudere”, to push, thrust; fr. “menace”; it.: “minaccia”; sp.: “amenaza” or: “conminación”; po: “ameaça”; ge.: “Drohung” or “Bedrohung”) refers to “a communication of a disagreeable alternative to an individual or group by one in authority or who pretends to be” (Koschnik 1992: 210). The *New Collins Thesaurus* gives these synonyms: “1. commination, intimidatory remark, warning; 2. foreboding, foreshadowing, omen, portent, presage, warning, writing on the wall; 3. danger, hazard, menace, peril, risk”. The *Oxford Compact Thesaurus* interprets threat as: 1. threatening remark: warning, ultimatum; 2. danger, peril, hazard, menace, risk; 3. possibility, chance, probability, likelihood, risk”. *Roget’s Thesaurus* equates threat with “danger, intimidation” and with “menace, threatfulness, ominousness, challenge; defiance, blackmail; intimidation, deterrent; danger; warning”.

According to *Webster’s Dictionary* a *threat* is “1. a statement or expression of intention to hurt, destroy, punish, etc. in retaliation or intimidation”, and 2. “an indication of imminent danger, harm, evil etc.; as, the threat of war”; and according to *Webster’s International Dictionary*: “1. to utter threats against: promise punishment, reprisal, or other distress to; 2. archaic: to charge under pain of punishment: warn; 3. to promise as a threat: hold out by way of menace or warning; 4a. to give signs of the approach of something (evil or unpleasant): indicate as impending; 4b: to hang over as a threat: menace; 5. to announce as intended or possible; ...menace may connote more deeply a dire, malignant, hostile or fearful character or aspect.”

British English dictionaries offer additional meanings, e.g. *Longman* defines threat as: “1. a statement that you will cause someone pain, unhappiness, or trouble...; 2. the possibility that something very bad will happen (famine, attack etc.)...; 3. someone or something that is regarded as a possible danger”. For the *Compact Oxford English Dictionary* threat means: “1. a stated intention to inflict injury, damage, or other hostile action on someone; 2. a person or thing likely to cause damage or danger; 3. the possibility of trouble or danger”.

3.2. Security Threats as a Political and as a Scientific Concept during the Cold War

In security policy and security studies the “threat” is widely used as a “political term” and as a “scientific concept”. However, in many social science dictionaries the term remains undefined. For Schwarz and Hadik (1966: 113) threat is “an assessment of a potential opponent’s military capability”. Robertson (1987: 304-305) introduced the concept “threat assessment” as:

the military intelligence calculation of the danger presented by another country, or more specifically the threat posed by a particular action of that country. ...General threat assessment, however, ought to, but usually does not, involve a consideration of the reasons behind an opponent’s armament programs. Instead the assessment is usually made on a worst case basis. For example, the threat posed by the USSR is assessed by counting up the hardware and personnel it has, and assuming that whatever this force structure *could* be used for is what it *will* be used for... ...But is the capacity to do something evidence of such an intention? ...Naturally other elements besides personnel and hardware totals have to be taken into account, the primary one being the opponent’s strategic doctrine.

Buzan (1983: 57) pointed to a dual threat to state institutions by force (capabilities) and by ideas (ideology). The state’s territory “can be threatened by seizure or damage, and the threats can come from within and outside of the state”. For Buzan different components of the state are vulnerable to different types of threats where strong states are primarily threatened by outside forces while weak states may be challenged from within and outside. From a national security perspective, Buzan (1983: 75-83) distinguished between *military threats* (seizure of territory, invasion, occupation, change of government, manipulation of policy), *economic threats* (export practices, import restrictions, price manipulations, default on debt, currency controls etc., and those to domestic stability), *ecological threats* (damaging the physical base of the state). These threats, Buzan (1983: 88) argued “define its insecurity, and set the agenda for national security as a security problem”. Understanding the threats requires understanding of the state’s vulnerabilities. Weapons development has often been semi-independent from threats, as a combination of capabilities and intentions. While the national security strategy primarily deals with the threatened state whose vulnerabilities can be reduced by “increasing self-reliance, and countervailing forces” (Buzan 1983: 218). Dealing with specific threats, an international security strategy focuses on “the sources and causes of threats, the purpose being not to block or offset the threats, but to reduce or eliminate them by political action”.

3.3. Security Threats as a Political and as a Scientific Concept after the Cold War

This type of “threat” disappeared with the end of the East-West Conflict in 1990, and thus the threat perception has fundamentally changed. In USA since the 1990s the focus has shifted to so-called “Rogue States” that are beyond its influence and control and who are assumed will acquire weapons of mass destruction. Buchbender, Bühl and Kujat (1992: 24) described “threat” or “Bedrohung” as a “political attitude of a state, of a group of states or of an alliance, that—based on military means—creates dangers for the sovereignty and integrity of another state or of another group of states”. During detente the classic threat concept lost in importance. Since 1990, threat is defined as

referring to the dangers the planet earth is confronted with due to the manifold destructive potentials of the environment and its global consequences. Steiner (2001) pointed to the fundamental change in the risks, dangers and threats since 1990 that has increased the dangers of violent domestic wars and has reduced the effectiveness of the arms control regime aiming at strategic stability. The increase in asymmetric forms of warfare (Münker 2002), and of the increasing role of more sophisticated and brutal non-state actors (terrorist networks) have made the security challenges more complex and complicated, and the security risks less calculable and predictable.

Several countries reacted in their national defense white papers and national strategic documents to the fundamental change in the nature of threats with an extended security concept that included many new non-military soft security threats such as: economic vulnerabilities, environmental challenges, political and societal instabilities (e.g. German Defense White paper 1994: 25-26) that pointed to a “multitude of risk factors of a different nature with widely varying regional manifestations”. The official German document suggested that “risk analysis of future developments must be based on a broad concept of security ...They must include social economic and ecological trends and view them in relation to the security of Germany and its allies”.

In USA several national security strategy papers of the Clinton administration have also pointed to the fundamental change in security threats and perception. With the election of George W. Bush, the worldview of neo-conservatives fundamentally shifted the focus of U.S. national security policy. This trend was further enhanced after 11 September 2001. Defense Secretary Rumsfeld launched a fundamental reassessment of U.S. military strategy and force posture that resulted in two key documents: the *Quadrennial Defense Review Report* (QDR) and the Nuclear Posture Statement that were released after 11 September 2001. On 30 September 2001, the QDR outlined the defense strategy of the Bush Administration. As the central objective, Secretary Rumsfeld noted in his foreword:

to shift the basis of defense planning from a ‘threat-based’ model that has dominated thinking in the past to a ‘capabilities-based’ model in the future [that] ...focuses more on how an adversary might fight rather than specifically who the adversary might be or where a war might occur. ...The U.S. must identify the capabilities required to deter and defeat adversaries who will rely on surprise, deception, and asymmetric warfare to achieve their objectives.

The QDR (2001: 6-7) noted as key military trends: a) rapid advancement of military technologies, b) increasing proliferation of chemical, biological, radiological, unclear and enhanced high explosives weapons and ballistic missiles, c) emergence of new areas of military competition (space and cyberspace) and d) increasing potential for miscalculation and surprise. In the *Nuclear Posture Review Report* (NPR), Rumsfeld, announced a new triad composed of: a) nuclear and non-nuclear offensive strike systems, b) active and passive defenses and c) a revitalized defense infrastructure. The Nuclear Posture Review shifts planning for America’s strategic forces from the threat-based approach of the Cold War to a capabilities-based approach. On 9 January 2002, J.D. Crouch, Assistant Secretary of Defense for International Security Policy, outlined its key goals that included a fundamental shift towards “multiple potential opponents, sources of conflict, and unprecedented challenges, a new relationship with Russia, a

spectrum of contingencies and varying and unequal stakes” that imply that nuclear planning will be “capabilities-based” and include unilateral reductions to preserve flexibility and transparency.

The goal would be to achieve reductions that were consistent with the security requirements of USA, and its allies and friends “without requirement for Cold War-style treaties”, “to develop and field missile defenses more capable than the ABM treaty permits”, and to stress advanced conventional weapons. The new “capabilities-based approach” implies that the needed capabilities “are not country-specific”, and should be available “for unexpected and potential threat contingencies”, and should “reduce risk to nation as reductions occur”. They should include active defense and non-nuclear capabilities and thus reduce the dependency “on offensive strike forces”.

The threat concept as the basis for military planning and legitimating of military programs has fundamentally changed after 1990, and, in USA, since 2001. With the widening of the security concept from the traditional military and diplomatic, to the new economic, societal and environmental dimensions, the threat concept has also widened and been applied to a series of new threats not only to the “state” but also to the other referents of the new security concepts: from human to global security. Below, only the new threats to human and environmental security will be reviewed.

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Bibliography

Additional bibliographic references (also other than in English) not included in this list can be obtained from:

Brauch, Hans Günter, (2005a). *Threats, Challenges, Vulnerabilities and Risks of the Environmental Dimension of Human Security, Intersections*, UNU-EHS Policy Brief (Bonn: UNU-EHS). [This free report may be accessed free of charge at: < <http://www.ehs.unu.edu/index.php?action=overview&cat=17&menu=36>>. Hard covers may be ordered by Email from: roberts@ehs.unu.edu].

Brauch, H.G.; Liotta, P.H; Marquina, A.; Rogers, P.; Selim, M. El-Sayed (Eds.): *Security and Environment in the Mediterranean. Conceptualising Security and Environmental Conflicts*. Berlin-Heidelberg, Germany: Springer, 1003-1089. [This book has been donated to more than 200 libraries in 91 countries. A list of the depositary libraries may be fund at: < http://www.afes-press-books.de/html/book_aid_project.htm>]

Selected and commented references referred to in the text:

Abdus Sabur, A.K.M., (2003) “Evolving a Theoretical Perspective of Human Security: the South Asian Context”, in: Chari, P.R.; Gupta, Sonika (Eds.): *Human Security in South Asia* (New Delhi: Social Science Press): 35-51. [A theoretical perspective form the third world]

- Abramovitz, Janet N., (2001). *Unnatural Disasters*. Worldwatch Paper 158 (Washington: Worldwatch Institute). [A brief and critical survey of human-induced natural disasters]
- Barnett, Jon, (2001). *The Meaning of Environmental Security. Ecological Politics and Policy in the New Security Era* (London – New York: Zed). [Key study on the development of the debate and the concept of environmental security]
- Beck, Ulrich, (1992). *Risk Society* (London: Sage). [English translation of the book *Risikogesellschaft* published in 1986 in German by the noted contemporary German sociologist]
- Beck, Ulrich, (1999). *World Risk Society* (Cambridge: Polity). [An essay that applies the concept of risk society on the global level]
- Blaikie, Piers; Cannon, Terry; Davis, Ian; Wisner, Ben, (1994, 2000). *At Risk, Natural Hazards, Peoples' Vulnerability and Disasters*, 1st ed., 2nd ed. (London, New York: Routledge). [Basic text on the social aspects of natural disasters]
- Bogardi, Janos; Brauch, Hans Günter, (2005). "Global Environmental Change: A Challenge for Human Security – Defining and conceptualising the environmental dimension of human security", in: Rechkemmer, Andreas (Ed.): *UNEO – Towards an International Environment Organization – Approaches to a sustainable reform of global environmental governance* (Baden-Baden: Nomos, 2005): 85-109. [This contribution conceptualizes human security in light of global environmental change and suggests as a third pillar of human security: freedom from hazard impacts]
- Brauch, Hans Günter, (2003). "Security and Environment Linkages in the Mediterranean: Three Phases of Research on Human and Environmental Security and Peace", in: Brauch, Hans Günter; Liotta, P.H.; Marquina, Antonio; Rogers, Paul; Selim, Mohammed El-Sayed (Eds.): *Security and Environment in the Mediterranean. Conceptualising Security and Environmental Conflicts* (Berlin-Heidelberg: Springer 2003): 35-143. [This text offers an introduction to the research on environment and security issues since the 1980's with a special geographical focus on the Mediterranean]
- Brundtland Commission, (1987). *Our Common Future. The World Commission on Environment and Development* (Oxford – New York: Oxford University Press): 290-307. [This commission headed by the former prime Minister of Norway introduced the concept of 'sustainable development' to the policy community]
- Buzan, Barry; Wæver, Ole; Wilde, Jaap de, (1998). *Security. A New Framework for Analysis* (Boulder-London: Lynne Rienner). Standard work on the debate on reconceptualizing of security in the 1990's from a constructivist perspective of international relations theory]
- Cardona, Omar D., (2004). "The Need for Rethinking the Concepts of Vulnerability and Risk from a Holistic Perspective: A Necessary Review and Criticism for Effective Risk Management", in: Bankoff, Gerg; Frerks, Georg; Hilhorst, Dorothea (Eds.): *Mapping Vulnerability. Disasters, Development & People* (London – Sterling, Va.: Earthscan): 37-51. [One of several chapters focusing on a conceptual mapping of vulnerability and risks in hazards and disasters]
- Herrmann, Richard K.; Ned Lebow, Richard, (Eds.) (2004). *Ending the Cold War. Interpretations, Causation, and the Study of International Relations* (New York: Palgrave). [An analytic social science study on the global turn of 1989-1991 with different interpretations on its causes]
- Homer-Dixon, Thomas F., (1999). *Environment, Scarcity, and Violence* (Princeton, NJ: Princeton University Press). [Study summarizing the theoretical and empirical results of the second phase of environmental security of the Toronto school]
- IFRC, (2002). *World Disasters Report 2002. Focus on reducing risk* (Bloomfield, CT: Kumarian – London: Eurospan). [Annual report by the Red Cross based on CRED data on the persons that were killed or affected by manifold hazards and disasters]
- IPCC, (2001). *Climate Change 2001. Impacts, Adaptation and Vulnerability. Mitigation* (Cambridge – New York: Cambridge University Press). [One of four volumes of the third assessment report of the Intergovernmental Panel on Climate Change, the first assessment was in 1990 and the second in 1995, the fourth is due in 2006/2007]
- ISDR, (2004). *Living with Risk. A Global Review of Disaster Reduction Initiatives* (Geneva: ISDR). [A global review of the activities on disaster reduction activities by the director of the UN International

Secretariate on Disaster Reduction in Geneva]

Jaeger, Carlo C.; Renn, Ortwin; Rosa, Eugene A.; Webler, Thomas, (2001). *Risk, Uncertainty, and Rational Action* (London-Sterling Va.: Earthscan). [Sociological study on the concepts of risk and uncertainty]

Munich Re, (2000). *Topics – Annual Review of Natural Catastrophes 1999* (München: Munich Re). [Annual report of one of the largest reinsurance companies on the natural hazards and disasters and on their human, economic and insures losses]

Myers, Norman, (1994, 1996). *Ultimate Security. The Environmental Basis of Political Stability* (New York: W.W. Norton). [Classic Neo-malthusian study on environmental security issues]

Nathan, Fabien, (2007). "Natural Disasters, Vulnerability and Human Security", in: Brauch H.G.; Grin, J.; Mesjasz, C.; Behera, N.; Chourou, B.; Oswald Spring, U.; Liotta, P. H. ; Kameri-Mbote. P. (Eds.): *Facing Global Environmental Change: Environmental, Human, Energy, Food, Health and Water Security Concepts*. (Berlin – Heidelberg – New York – Hong Kong – London – Milan – Paris – Tokyo: Springer-Verlag). [Systematic analysis of the concept of vulnerability in hazards]

Oliver-Smith, Anthony, (2004). "Theorizing Vulnerability in a Globalized World: A Political Ecological Perspective", in: Bankoff, Gerg; Frerks, Georg; Hilhorst, Doreothea (Eds.): *Mapping Vulnerability. Disasters, Development & People* (London – Sterling, Va.: Earthscan): 10-24. [One of several chapters focusing on a conceptual mapping of vulnerability and risks in hazards and disasters]

Oswald Spring, Ursula, (2001). "Sustainable Development with Peace Building and Human security", in: Tolba, M.K. (Ed.): Our Fragile World. Challenges and Opportunities for Su-stainable Development. Forerunner to the Encyclopedia of Life Support Systems (Oxford, UK; Eolss Publishers), Vol. 1: 873-916. [This text combines gender, human and environmental security [HUGE] into an integrated concept]

Pelling, Mark, (2003). *The Vulnerability of Cities. Natural Disasters and Social Resilience* (London: Earthscan). []

Smith, Keith, (2001). *Environmental Hazards. Assessing Risk and Reducing Disaster*, 3rd ed. (London – New York: Routledge). [Key study on environmental hazards and associated risks and efforts to reduce disasters]

Steffen, W.; Sanderson, A.; Tyson, P.D.; Jäger, J.; Matson, P.A.; Moore III, B.; Oldfield, F.; Richardson, K.; Schellnhuber, H.J.; Turner II, B.L.; Wasson, R.J., (2004). *Global Change and the Earth System. A Planet under Pressure. The IGBP Series* (Berlin-Heidelberg-New York: Springer-Verlag). [Major study of the International Geosphere-Biosphere Programme (IGBP) on global environmental change]

Tobin, Graham A.; Montz, Burrell E., (1997). *Natural Hazards. Explanation and Integration* (New York – London: Guilford Press). [Key study on natural and environmental hazards]

UNDP, (2004). *Reducing Disaster Risk a Challenge for Development*, a global report, UNDP Bureau for Crisis Prevention and Recovery (New York: UNDP). [Major analytical study of UNDP on disaster risk reduction]

UNISDR, (2004). *Living with Risk. A global review of disaster reduction activities*, 2 vol. (Geneva: UNISDR). [A global review of the activities on disaster reduction activities by the director of the UN International Secretariate on Disaster Reduction in Geneva]

Wisner, Ben, (2004). "Assessment of Capability and Vulnerability", in: Bankoff, Gerg; Frerks, Georg; Hilhorst, Doreothea (Eds.): *Mapping Vulnerability. Disasters, Development & People* (London – Sterling, Va.: Earthscan): 183-193. [One of several chapters focusing on a conceptual mapping of vulnerability and risks in hazards and disasters]

Wolfers, Arnold, (1962). "National Security as an Ambiguous Symbol", in: Wolfers, Arnold: *Discord and Collaboration. Essays on International Politics* (Baltimore: John Hopkins University Press): 147-165. [this articles offers a classic definition of the objective and subjective approaches to security]

Biographical Sketch

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Since 1999 PD Dr. habil. (equiv. of Adj. Prof.) at the Faculty of Political Science and Social Sciences,

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