

# **Water-related natural risks as insecurity**

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## **Introduction**

Every year thousands of people die, are injured, lose their homes, livelihoods or jobs because of natural disasters, especially those related to water. And the trends are on the rise. This clearly constitutes a very important threat for a growing amount of people and cannot be ignored by the security studies. The aim of the paper is first to show the importance of this underestimated threat, and second to present risks as a situation of insecurity which calls for new conceptions of security, such as Human Security. This concept may be useful to encompass these threats under specific conditions.

### **I. What insecurity: natural risks and disasters**

#### **A. Types of water-related hazards and disasters considered**

Water gives life but also massive deaths and destructions. To be sustainable, life needs to find an equilibrium between “not enough” and “too much” water. When the structural equilibrium between sociosystems and ecosystems is not guaranteed, disruptions occur under the form of disasters. What natural hazards generate a potentially devastating excess of water?

The main ones are floods, like river overflowing or flash floods, generally due to high precipitations, storms or snow melting.

Coastal water-related hazards are also commonplace, like extreme meteorological conditions (storms, cyclones, etc), tsunamis, or sea-level rise.

Mudflows, which are mobile material mixed with water rapidly moving down a slope, also constitute a serious threat, as well as storms, which also affect continental lands.

These hazards do not necessarily convert into disasters. They need to encounter a society that is not in position to resist or adapt to the impact, i.e. that is vulnerable. Their impact then become disastrous. What are their manifestations?

#### **B. Disaster impacts of water-related hazards**

According to the World Water Assessment Programme,

« more than 2200 major and minor water-related disasters occurred in the world during the period 1990-2001 »

Of these disasters, 50% were floods.

Among the 234 biggest disasters of the second half of the century, 90% of them are constituted of storms and floods, amounting to about 1.4 million deaths<sup>1</sup>.

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<sup>1</sup> MunichRe, *Topics 2000*, p 43.

Since the 1970s, the global number of deaths has amounted to approximately 3.6 million (without droughts, famines and epidemics<sup>2</sup>). The 1970 Bangladesh cyclone itself killed an estimate of 300.000 people, and the Tangshan earthquake in China between 242.000 and 600.000 according to the estimations. The 1991 Bangladesh cyclone has also overtaken the 100.000 deaths.

The cumulative number of affected people is rising very fast, respectively 717, 1.374 and 1.880 million people in the 1970s, 1980s and 1990s.

The most spectacular trend in disasters is their rising costs, which overtake the rise induced by economic growth.

In the 1970s, natural disasters have cost 54 billion dollars, raising to 201 in the 1980s and 686 in the 1990s<sup>3</sup>. It is estimated, that the growth rate of economic damages due to natural disasters is increasing by 6 % a year<sup>4</sup>. Since the 1950s, the value of damages in the 1990s have multiplied by a factor of 13.9<sup>5</sup>

The most expensive disaster of the history, the 1995 Kobe earthquake, has cost more than 100 billion dollars alone, devastating the city's portal economy up to present. Second comes the 1994 Los Angeles Earthquake (44 billions), then the 1992 hurricane Andrew, also in the United States (30 billions).

Floods account for a high proportion of damages and suffering throughout the world, accounting to 49% of the deaths of natural disasters from 1985 to 1999<sup>6</sup>. In absolute numbers,

« between 1973 and 1997 an average of 66 million people a year suffered flood damage, making flooding the most damaging of all natural disasters.<sup>7</sup> »

In terms of economic losses also:

« global economic losses to floods alone average US\$3 billion per year, equivalent of 20% of new investment in the water sector in developing countries<sup>8</sup>. »

Moreover, forty-six million people per year in coastal areas are at risk from storm surges and sea-level rise<sup>9</sup>.

These figures highlight the tremendous importance of water-related disasters. About 70% of the sum of all natural disasters are already induced by climatic processes<sup>10</sup>, and climate change

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<sup>2</sup> OFDA/CRED, *International Disaster Database*, 2002. [www.cred.be](http://www.cred.be)

<sup>3</sup> Source : *ibid.*

<sup>4</sup> Dollfus and d'Ercole, in Dauphiné, A. (2001), *Risques et catastrophes. Observer, spatialiser, comprendre, gérer*, Paris, Armand Colin.

<sup>5</sup> Munich Re, *Topics 2000*, p 43.

<sup>6</sup> Abramovitz (2001), *Unnatural Disasters*, Worldwatch Paper 158 , p 11. [www.worldwatch.org](http://www.worldwatch.org)

<sup>7</sup> UNESCO-WWAP, *Ibid.*, p 274

<sup>8</sup> World Water Assessment Programme (2001), *Water security : A Preliminary Assessment of Policy Progress since Rio*, Bonn, p 22

<sup>9</sup> UN/ISDR (2002), *Living with Risk. A global Review of Disaster Reduction Initiatives*, Preliminary version, Geneva, p 57.

<sup>10</sup> UN/ISDR (2001), *Lutter contre les catastrophes, cibler la vulnérabilité*, Kit d'information, Campagne mondiale 2001 des Nations Unies pour la prévention des catastrophes, p 16.

should increase this figure, contributing to more extreme precipitation patterns, accelerated sea-level rise, and the like.

The trend followed by these types of disasters is the same as the general trend in disasters: a tremendous increase<sup>11</sup>.

### C. Types of societal impacts

Disasters induce several types of impacts. They produce three types of **losses or damages**, both at the individual and collective level, and also direct, indirect, and secondary.

- **Human losses or damages**, characterized by deaths, injuries, physical and mental affections. In statistical databases, only numbers of deaths, injured and affected people usually sum up these damages, and the mental/psychological consequences are swept away. Secondary effects include for instance the premature deaths due to the increased vulnerability caused by a disaster, such as illnesses, impoverishment and degradation of the quality of life. A disaster, by increasing vulnerability to future disasters, can be a cause of human losses in another disaster.

- **Economic losses**, like destructions of goods, livelihoods, networks, services, and economic fluxes. Disorganization is high when networks essential for social reproduction (communication networks, big technical macro-systems<sup>12</sup> in industrialized countries) are interrupted. Indirect economic damages and secondary effects are much more difficult to quantify but can be even greater.

- **Environmental losses** consist of damages to one or several ecosystems. These losses are generally more induced by non-water-related hazards, as these are often integral parts of the ecosystems.

These impacts induce several **types of crises**:

- **Economic crisis**: entire economical recessions can result from the impact of natural disasters. In Ecuador, the El Niño phenomenon of 1998-1999 induced a decrease of more than 7 % of the country's Gross Domestic Product from one year to the other<sup>13</sup>. A World Bank's projection for Honduras (1999-2008) shows, that "if access to foreign savings is limited post-event, catastrophes could stagnate GDP for Honduras over the next 8 years."<sup>14</sup> Economic crisis, in turn, is a great factor of vulnerability to future disasters.

- **Socio-political**: a disaster always threatens social order in some way. That is the reason why the States have always been so willing to control disaster response, through civil protection schemes. The actual domination of those in power might be threatened by the impact, as the

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<sup>11</sup> When encompassing technological disasters, the Em-Dat database reports 1366 events in the 1970s, 2969 in the 1980s, and 4777 in the 1990s. [www.cred.be](http://www.cred.be)

<sup>12</sup> Such as the energy, transportation, commercial, financial networks and public services in capitalist societies. See Gras, A. (2003), *Fragilité de la puissance. Se libérer de l'emprise technologique*, Paris, Fayard.

<sup>13</sup> *Living with Risk*, op. cit., p 34.

<sup>14</sup> Freeman and al. (2002), *Catastrophes and development. Integrating natural catastrophes into development planning*, Disaster Risk Management Working Paper Series, The World Bank, April 2002.

challenge of the domination of any power is to guarantee stability and order. Disasters therefore are proofs of the imperfection of the actual social order, and contestation might arise.

- **Cultural crisis:** a disaster is also generally a cultural shock. They always induce a cultural trauma, as it deeply reminds the mortal character of societies and the fragility, even the arbitrariness, of our cultural arrangements.<sup>15</sup>

Generally, a disaster generates a mix of these damages and crises.

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<sup>15</sup> See Duclos, D (1991), « La société de raison et le retour du risque », in *Conquête de la sécurité, gestion des risques*, l'Harmattan, coll. « Logiques sociales », Paris, pp 257 – 276.

## **II. Who is threatened and why?**

### **A. The South more than the North, the poor more than the rich**

Disasters do not affect societies evenly. Asia is disproportionately affected, concentrating 94% of the victims of natural disasters between 1964 and 1998<sup>16</sup>. Bangladesh, China and India gather 85% of the affected people in the world, 90% of which because of floods and landslides.

Broadly, there is a clear differentiation in the severity of the impact between rich and poor countries, the second ones being relatively much more severely disturbed by the impact of natural disasters, both in human and economic terms.

97 % of the deaths relative to natural disasters occur in “developing countries”. Among the 50 deadliest natural disasters of the period 1960-2000, none occurred in an “industrialized country”<sup>17</sup>. It is the same among the 50 disasters that have affected most people, and only 3 of them appear in the “top 50” of injuries. But when considering the most costly disasters, “industrialized countries” appear 25 times in the “top 50”. Indeed, the economic prejudice in absolute values is much bigger in these countries. But in relative values, much closer from the reality of the impact, poorer countries suffer much more. Between 1985 and 1999, 57.3% of the economic losses occurred in the richest countries, representing 2.5% of their GDP. In the same period, the poorest countries have undergone 24.4% of the economic losses, representing 13.4% of the GDP<sup>18</sup>.

This dichotomy between rich well-protected and poor at high risk is relevant both for countries, sub-regions, and social groups or individuals within the countries. Rich people are generally less affected, living in less dangerous areas, and being able to overcome losses.

### **B. Why these inequalities in front of impacts? Concept of vulnerability.**

Disasters are less numerous and severe in well-off countries, even when the hazards are comparable. This can be explained by their different state of vulnerability.

#### Conceptual precisions

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<sup>16</sup> Michellier, C. (1999), *L'évaluation des risques aux catastrophes naturelles en vue de leur prévention: l'utilité et l'utilisation de EM-DAT à une échelle mondiale et infra-nationale*, mémoire de maîtrise, CRED/Université de Savoie, Septembre 1999.

<sup>17</sup> These data and the following are drawn after the CRED/Em-Dat database, including droughts, famines, and epidemics.

<sup>18</sup> Abramovitz, J. (2001), *Unnatural disasters*, Worldwatch paper 158, Worldwatch Institute, Washington, October 2001, pp 13-14.

## 1. Risk

One can distinguish two types of definitions of risk:

- **objectivist definition:** a *probability of damages* inflicted by one or several hazards to a vulnerable unit, or “stake”. It accounts for latent threats, not yet manifested, but objectively and virtually existing (probable) and sometimes measurable.
- **subjectivist definition:** “*perception of a possible danger*, more or less previsible by a social group or individual exposed to it”; “representation of a danger or hazard, real or supposed, affecting the stakes, indicators of a vulnerability”<sup>19</sup>. It accounts for socially constructed threats, and is closely related to their perception and representation.

## 2. Vulnerability

Vulnerability can be described on the one side as a tendency to undergo damages, i.e. a state of fragility, or a set of conditions, that raise the **susceptibility** of a community to the impact of a damaging phenomenon. On the other side, vulnerability is a **incapacity** to anticipate, cope with, resist to, adapt to and recover from hazards.

Vulnerable units are either not resistant, i.e. not capable to withstand the shock (without adapting); and/or not resilient, i.e not capable to absorb the shock and adapt to come back to an acceptable state.

## 3. Security and safety

Security Studies and Risk/Disaster Studies use different vocabulary, but often qualify the same type of uncertain or realized states or situations. In order to make better integration between these disciplines, it would be very useful to try a transcription of one « language game » in another. That is what we are proposing now.

If one endorses the definition of security as being the absence of threats, be them objective or subjective, and safety as the absence of damages, then :

- **Risk** as a threat (real or perceived) accounts for a **state of insecurity**
- **Disaster** as a realized threat describes a state of **non-safety**
- **Vulnerability**, as a contributor for potential disaster, is a **component of insecurity**.

Therefore :

- **People** or societies **affected** by disasters are **not safe** ;
- **Vulnerable people** or societies at risk of hazards are **insecure**.

Gustavo Wilches-Chaux remarks that if “secure” means “free and exempt from any danger, damage or risk”, vulnerability is a synonymous of insecurity:

“in the most profound sense of the term: insecurity for the existence; uncertainty in front of the daily history and in front of the surrounding world”<sup>20</sup>.

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<sup>19</sup> Ibid., p 16 and 20.

<sup>20</sup> Wilches-Chaux, G.(1993), “La vulnerabilidad global” p 23, in Maskrey (eds), *Los desastres no son naturales*, La Red.pp 11-44.



But according to our above-mentioned reasoning, vulnerability is not exactly a *synonymous* of insecurity, but a *component* of insecurity. If there is no hazard, the people, as vulnerable as they can be, wouldn't be threatened, and would not live in insecurity.

The concept of risk would be closer to describe a state of insecurity.

Nevertheless, risk is a function of hazards and vulnerability. Consequently, no vulnerability (or no hazard) means no risk, which means no disaster, which means a situation of objective security and safety<sup>21</sup>. For this reason is vulnerability at the center of the security problem.

It is thus very important to have an idea of the different components of vulnerability.

### Components of vulnerability

#### *External: exposure*

- **physical exposure:** presence and density of the people, habitat, networks, goods and services in risk zones, defining potential losses or damages, both human and non-human (stakes).
- **socio-ecological:** human-induced ecosystemic perturbations aggravating the natural hazard (deforestation, land degradation, street pavement, some engineering practices, climate change, etc.)

#### *Internal: incapacities to prevent, prepare for, face and cope with hazards and disasters*

- **physical weakness:** physical incapacity to resist or recover from a hazard's impact.
- **legal:** weak state of the legislative and judiciary regulations to prevent, mitigate, prepare for, face and recover from disasters.
- **organizational:** weak state of the organizational disposals, at all levels, to prevent, mitigate, prepare for, face and recover from disasters.
- **technical:** inadequate knowledge and/or use of risk management techniques.
- **political:** weakness of the political powers, their legitimacy and control. Inadequacy of the control schemes, policies and planning, or broad political conditions.
- **socio-economical:** socio-spatial segregation, large inequalities of wealth and of access to the security disposals, misery, anomie and social disorganization, poor social position and social isolation of exposed people, existence of higher social risks undergone by people.
- **psychological and cultural:** inadequate security paradigm or risk perceptions ; cultural anomie or weakness; attachment to risk zones or risky behavior, non-willingness or incapacity to protect oneself.

The overall vulnerability of an element (or stake in the economic language) to one or several hazards is a mix of these particular vulnerabilities. They need to be related the one with each other in an explicative model. Only then can one really understand the roots of this insecurity and try to create conditions for security.

### Trends in global vulnerability

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<sup>21</sup> Note that there can be no vulnerability and no risk (objective security) but still insecurity in a subjective sense.

Vulnerability is also evolving. The rising number and severity of disasters worldwide shows a tremendous increase in vulnerability. At the global level, the main general trends explaining the rise are the following:

- *demographic pressures* : population growth, rapid and unplanned urbanization, increase of population density.
- *ecological degradation* : pollution, losses of biodiversity, land degradation, deforestation. (“global change”)
- *socio-economic deterioration*: a reinforcement of the structures of domination throughout the world. Impoverishment, massive unemployment, rising inequalities, increasing violence, forced migrations, increasing concentrations of misery and extreme wealth, destruction of public collective structures, “international financial pressures<sup>22</sup>” (structural adjustments), etc.
- *disasters*: global epidemics like AIDS and malaria; proliferation of “low intensity” and high intensity wars. It could be added that the rise of natural disasters themselves constitute a dynamics that increase vulnerability to future disasters.

At the local level, disasters are clearly linked with a mix of social risks, i.e. a situation of insecurity of the daily life including a state of misery, exclusion of services, goods, networks and rights. It is manifest in the existence of many people living in informal settlements like slums. People are forced to live in the most dangerous areas in poorly built houses. This situation of need and survival hinders the capacities to prevent and cope with hazards.

Now, how can security studies qualify and encompass this underestimated situation of insecurity? Is Human Security a possible concept ?

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<sup>22</sup> Blaikie and al (1994), *At Risk. Natural Hazards, People’s Vulnerability, and Disasters*, London, Routledge, p 32.

### III. How could the Security Studies encompass these threats ? Is “Human Security” adequate, for which security?

#### A. Requisites of an integral conception of security

Security is never neutral. It is focused on a specific object (e.g. some people, the State), that one aims to protect and secure against specific threats induced by some agents of insecurity.

It is evident that in the case of disasters, the threat is not a breach in security brought about by a foreign State or by terrorists. Disasters induce a crisis, or disruption in the functioning of a society in a manner that exceeds its ability to cope using its own resources. It is therefore one of the highest form of failure of security and stability at the collective level. We have seen the amazing impacts they can generate, much bigger than those currently being caused by terrorism. In terms of number of people affected, they are even much more important than wars. The nature of the threat is thus different.

At the individual level, the people to protect also differ from the previous vision. In the old State security conception, security meant protection for those people pertaining to the national community, by strengthening the State against one or several enemies. In our case there is no enemy to fight, but negative social, economic and ecological forces that induce disasters. These are the agents of insecurity, conveyed by specific social individuals, groups and institutions, sometimes without even realizing it.

The entire humankind is to protect, but in priority the most vulnerable people. As we have seen, they are the miserable or marginalized people, mainly found in the South. These vulnerable people need to be spotted as the « target » of this type of security.

Therefore, we need a new vision of security that would:

1. **recognize the threats** : e.g. natural disasters and their various impacts; other related threats.
2. **take into account all its different levels**: global, regional, national/societal, meso (subregions, groups, communities) and individual;
3. **take into account all different temporal dimensions**: pre-disaster time, impact, post-disaster, short-term/long term/ future generations.
4. **identify what to protect in priority**: people, goods, livelihoods, infrastructures, networks, ecosystems, etc.;
5. **identify the agents of insecurity**: social, economical, ecological, political, cultural (etc<sup>23</sup>.) forces and actors involved, and all their interactions. Natural disasters and social risks are intertwined.
6. **propose a desirable state of security**: stability, absence or minimized disasters; and
7. **propose the necessary changes to reach it**: prevention, mitigation, preparation, precaution, but also the struggle against misery, precarity, inequalities of wealth and power, domination, ecological degradation, etc.

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<sup>23</sup> see our classification of vulnerability components in II.B

It is very clear that international relations theory alone won't be able to make these analyses. The analyses of vulnerability and socio-ecological dynamics required need to be interdisciplinary and hybrid, holistic, and with strong social and ecological focus.

## **B. Advantages of the Human Security concept**

Numerous events, factors and trends have put the pressure on the old militaristic-realist conception of security focused on the State. Among others, one can quote the end of the cold war, liberal globalization and economical deregulation, the ecological crisis, the increase of misery and inequalities, the changing nature of conflicts (more internal to States), the irruption of powerful non-State actors (NGOs, corporations, armed groups), the multiplication of disasters of all kind, etc. These trends have forced scholars and practitioners to extend the definition of security. Considerable literature can be found on this broadening and deepening of the concept of security<sup>24</sup> to new referent objects (e.g. the individuals, communities, society, etc.), new domains (environment, economy, etc.), new means (conflict resolution, poverty alleviation, etc.), new levels (regional, community, societal...), etc.

*Human Security* is part of this conceptual trend<sup>25</sup>.

UNDP, who has introduced the concept in 1994<sup>26</sup>, divides it into seven categories, which are interrelated: economic security, food security, health security, environmental security, personal security, community security and political security. Its two major components are summarized by "*freedom of fear*" and "*freedom from want*". Some of the threats to Human Security include population growth, economical disparities, migrations, ethnic disputes, social disintegration, environmental degradation, drugs trafficking, poverty, etc. It is complementary to Human Development, which consists in *widening the range of choices*; Human Security is about *ensuring that people can exercise these choices*, by offering them the necessary stability. It is closed to Sen's *Entitlements theory*, which is not surprising, his being one of the promoters of the concept.

According to the Human Security Commission, it is a goal to reach in order " *to safeguard the vital core of all human lives from critical pervasive threats, in a way that is consistent with long-term human fulfillment*"<sup>27</sup>.

In our understanding of this concept still under construction, Human Security would then be interesting for points 1, 4. and 6 mentioned above, and incidentally for points 5 and 7. Indeed, the concept is envisaging security as a desirable state to reach (point 6.) in which disruptions would be avoided (1.) and stability guaranteed. It also focuses on individuals and communities, i.e. on the Human component (point 4), more than immaterial entities like the State. It seeks to enlarge the narrow conceptions of security, in order to focus on those who really suffer. By doing this it

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<sup>24</sup> See for instance Wing, I (2000), *Refocusing concepts of security. The convergence of military and non-military tasks*, Land Warfare Studies Centre, Working Paper n° 111, november 2000.  
[www.defence.gov.au/army/lwsc/Publications/wp111.pdf](http://www.defence.gov.au/army/lwsc/Publications/wp111.pdf)

<sup>25</sup> See for instance Debiel, T. (2004), *Extended vs. Human Security : The Need for an Integrated Security Concept for Development, Foreign, and Security Policy*, Paper to be presented at the ACUNS Seventeenth Annual Meeting, Geneva, Switzerland, July 2004, draft version.

<sup>26</sup> UNDP, *Human Development Report*, 1994. [www.undp.org](http://www.undp.org)

<sup>27</sup> Alkire, S. (2002), *Conceptual framework for Human Security*, Human Security Commission, 16 February 2002.

introduces a slice of social sciences analysis in international relations (IR), security studies and their networks, providing an interesting strategic advantage for points 5 and 7. It proposes a humanistic revolution in security studies and IR.

### **C. Deficiencies in “Human Security”, and how to make it useful for security**

Human Security has understood that the main threat is the disruption of what is really important in people's lives: a decent life at reasonable standards (“freedom from want”, i.e. from the most “basic” needs); and stability, i.e. a possibility to consider life and future with serenity (“freedom from fear”), exempt from killings, injuries, huge losses, brutal changes, job insecurity, disasters, etc. Both objective (“absence of threats to acquired values”) and subjective senses (“absence of fear that such values will be attacked”<sup>28</sup>) are contained in Human Security. What is implied if one takes it seriously is no less than a huge social change at all levels, including global, necessary to reach such an ambitious goal. But neither does it explain anything to make better diagnostics (points 2, 3 and 5), nor does it propose clear means for the changes and how to obtain their implementation (point 7).

To make it useful, its promoters should explicitly recognize these deficiencies and more clearly separate the normative part, i.e. the objective proposed - who to protect, from what and how - points 4, 1, 6 and 7 - , and the necessary analyses to be made for it (points 1 to 5).

Human Security therefore needs an explicit agenda to understand and explain the root causes of human insecurity, by integrating studies of social sciences, ecological and natural sciences, IR, critical analysis of power struggles and vulnerability, development studies, etc.

Only then would it be possible to formulate more adequately the necessary changes to reach the goal of Human Security, and how to implement them. A tough political work would then remain to be done.

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<sup>28</sup> Wolfers, A. (1962), *Discord and Collaboration: Essays on International Politics*, Johns Hopkins Press, Baltimore, p. 150. Quoted by Brauch, H.G.(....) *Security and Environment Linkages on the Mediterranean Space: Three Phases of Research on Human and Environmental Security and Peace*,... p 23.

## **Conclusion**

We have seen that water-related natural disasters constitute a very important threat for millions of people, usually poorly taken into account in security studies, even though their acuteness is constantly growing. They generate social, economical, political and cultural crises, with enormous human impact, mostly on the poorest and most fragile people of Southern countries. This can be characterized as a situation of chronic insecurity and may be understood only by recognizing the vulnerability of these people and societies, and all its components, that are found deep into the social fabric (such as patterns of inequalities of wealth and power, the ecological crisis, and political, economical, cultural, or legal frameworks, etc.).

In front of this insecurity, traditional security thinking is unable to comply with what we call the « requisites of an integral conception of security » that recognizes the threats and analyzes all their dimensions. The concept of Human Security that emerged in the 1990s is useful to place these new elements on the agenda, and insist on human suffering. It is more accurate as a desirable objective for security than as an analytical framework. Despite these deficiencies, it could be used as a strategic means to elaborate an integral conception of security. For that to happen, a clear agenda of interdisciplinary and hybrid research would need to be elaborated, with strong focus on critical social science and ecological research. This could serve as a basis to formulate more accurate normative social changes and policies, and the means to achieve them, that is, a truly political work.

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