Resilience and nuclear post-accidental situations: Lessons from Chernobyl and Fukushima

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Objective of the presentation

- To define the concept of **resilience** and present its main characteristics emphasizing both its individual and collective aspects
- To describe the main lessons I learned concerning resilience from my experience with the rehabilitation of living conditions of the affected people by the Chernobyl and Fukushima accident:
  - The **Ethos project** (1996-2001). An European pilot project to involve the villagers of a Belarus village in the rehabilitation process
  - The **CORE Programme** (2004-2008). An international initiative to implement local inclusive projects in 4 districts of Belarus
  - The **Suetsugi experience** (2011 - today). The follow-up of the recovery process of a community in the Iwaki District in Japan

The concept of resilience

How resilience is defined in the dictionary?

- **"The capacity to recover quickly from difficulties; toughness*."** Oxford Dictionary

  ** Toughness: the ability to deal with hardship or to cope in difficult situations*

- **"The quality of being able to return quickly to a previous good condition after problems."** Cambridge Dictionary

- **Etymology**: Latin re-salire. re: movement backwards, salire: jumping

An iconic character of resilience: Snow White

About the history of the concept of resilience (1)

- 17th century: idea of rebound used in philosophy (Francis Bacon, and Henry More)
- 18th century: used in physics to characterize the resistance of metals (Thomas Tregold)
- 20th century: introduction to the social sciences by American psychologists (Emmy Werner, Michael Rutter and Norman Garmezy) in the 1950s. First study: E. Werner followed a group of Haitian children who underwent prenatal and perinatal stress
- Since then, numerous studies that have progressively refined and enriched the concept

About the history of the concept of resilience (2)

- At first the pioneers of resilience attributed the latter to **individual qualities**
- Then researchers have proposed to consider resilience as a **process** with the help of 'caregivers' or '**tutors of resilience'**
- A third wave of studies led to considering resilience as a **strength / aptitude** related to personal characteristics but also influenced by the person's environment
- To summarize, in the psychological sense, resilience can be defined as **the ability to overcome trauma and / or continue to build oneself in an adverse environment**

The ‘Tutors of resilience’

- ‘Tutors of resilience’ are people who accompany victims of traumatic experiences to **guide and support them**. To this, they must create an opportunity to meet, establish links and provide benchmarks to the persons

- Experience has shown that ‘**tutors of resilience**’ :
  - show interest and sensitivity to the questions and concerns of persons
  - are primarily interested in the positive aspects of the persons
  - leave to persons the freedom to speak or to keep quiet
  - do not get discouraged by apparent failures
  - respect the process of resilience of each person
  - promote the self-esteem of others

The roots of human resilience

- Develop communication
- Take rational initiatives
- Do not give in to guilt
- Make sense of the hardships you are going through
- Build relationships with those who have experienced similar difficulties

Julius Segal; Winning Life's Toughest Battles: Roots of Human Resilience. New York, Mc Graw-Hill (1986)

The main factors that contribute to resilience

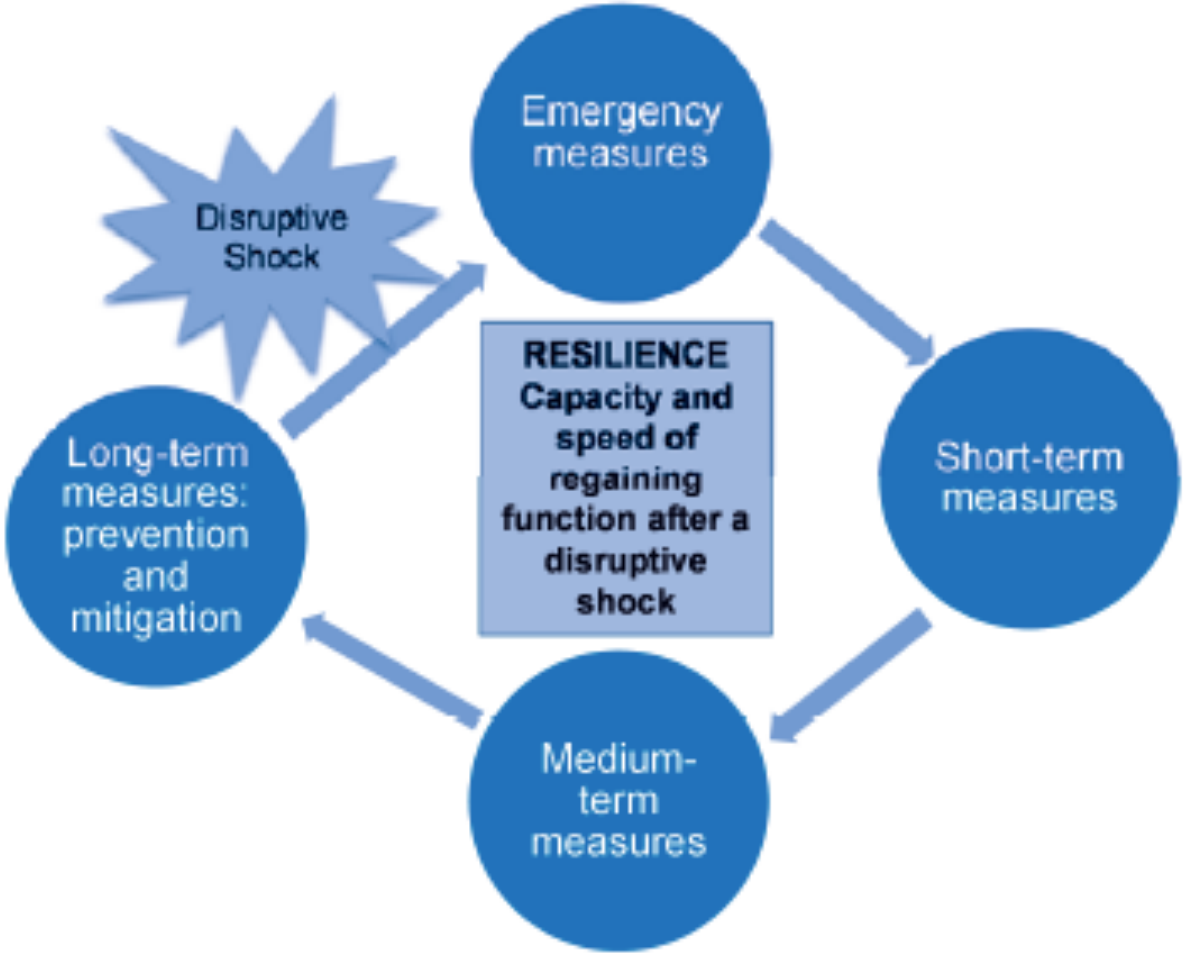
- The recognition of **reality**
- **Self-esteem**
- **Attachment** to others
- The ability to attract others and to be appreciated by them (**Leadership**)
- The ability to meet and spend time with other people (**Sociability**)
- The intervention of '**Tutors of resilience**'

Collective resilience

- Since the 2000s resilience has been applied at the **collective level** and its meaning has been widened to become the paradigm of a "**new rebirth**" whose components are at the same time psychological, social, economic, and political
- In its collective sense resilience found a privileged field of application in the domain of **large scale natural and human-induced disasters**
- In this domain resilience is defined as 'the **capacity of a system to absorb disturbance and reorganise** while undergoing change so as to still retain essentially the same function, structure, identity, and feedbacks*'

** OECD (2014), Boosting Resilience through Innovative Risk Governance, OECD Publishing*
http://dx.doi.org/10.1787/9789264209114-en

Resilience to disruptive shocks



Source: OECD (idem)

How to achieve 'optimal' collective resilience (1)
Key policy recommendations

- Promote forward-looking **risk governance** for complex risks
- Establish a wide understanding of how acceptable levels of risk can be determined at **all stakeholder levels**
- Decide on an optimal and complementary mix of **resilience measures**
- Ensure resilience measures **adapt** to changing risk patterns

Source: OECD (idem)

How to achieve "optimal' collective resilience (2)
Measures to achieve 'optimal' resilience

• Risk identification and assessment	e.g. Multi-hazard risk assessment
• Risk awareness measures	e.g. Public information campaigns
• Technical engineering measures	e.g. Dikes, landslide barriers
• Biological measures	e.g. Creation of forest to act as natural barrier
• Socio-economic measures	e.g. Financial funds
• Regulatory/planning measures	e.g. Building codes
• Health measures	e.g. Vaccinations

Source: OECD (idem)

Finally…

Lessons from Chernobyl and Fukushima

The disruptive shock of radiation disasters

- The irruption of radioactivity into people's everyday lives and its long term persistence create an unprecedented **complex situation** which profoundly upsets daily life, raises many **questions and concerns,** generates **numerous views**, and exacerbates c**onflicts**
- **All dimensions of daily life are affected**: health, environment, social life, production and distribution of foodstuffs and commodities… but also psychological, cultural, ethical and political dimensions: the **well being of individuals** and the **quality of the** '**living together**' are severely degraded
- Radioactivity is an **invisible**, **disquieting** and **unspeakable** presence which puts people at a **distance from reality** and tends to **paralyze their individual initiative**

The human dimension of nuclear accidents consequences

The **Fukushima** accident confirmed what had already been observed among the population living in areas affected by the **Chernobyl** accident:

- **Mistrust** of authorities and experts
- A strong **concern** for health, especially that of children
- The apprehension about the **future**
- A general feeling **of helplessness and abandonment** reinforced by the **discrimination and exclusion** from outside
- The **loss of control** on everyday life
- The loss of **self-esteem** and the **withdrawal into oneself**
- The threat to the **autonomy** and **dignity** of people

Belrarus, 1996

Individual attitudes observed among people living in contaminated areas vis-à-vis radiation risk

- Denial of the risk
- Resignation and fatalism
- Concern, anxiety and stress
- **Desire, motivation, willingness, commitment to improve the situation**

The dynamics of resilient communities

- **Stupor** and incomprehension
- **Anger** and loss of confidence
- Discouragement and **despair**
- **Reaction** initiated by local leaders with the support of outside experts or vice versa
- **Commitment** and active **participation** of the population
- Progressive return to **quietude**
- Setting up of **vigilance**
- Implementation of **local projects** in cooperation with authorities and experts

The ‘co-expertise process’ to develop resilience in affected communities

- The so called “**co-expertise process**” emerged in the late 1990s in Belarus in the context of the rehabilitation of living conditions in the territories affected by the **Chernobyl** accident

- It has been enriched and refined in recent years through the experience gained in communities of Japan following the **Fukushima** accident

- This process based on the **direct involvement** of the affected people in the rehabilitation has proved to be a very effective way to **support and develop the resilience of the communities**

The co-expertise process
ETHOS Project, Olmany village, Belarus, 1996-2001

The main step of the co-expertise process (1)

- The first step is to initiate a **dialogue** between affected people and experts.
  - Local people **express** their **concerns**, **challenges** and **expectations**, and also ask questions
  - Experts **listen** carefully, share free from euphemisms the information they have on the current situation, and provide responses when they can
- The next step is to share **knowledge** and **experiences** about the local situation
  - Affected people bring their knowledge about their **living conditions** and that of their communities
  - Experts bring their knowledge about the **science of radiation** and practical implementation of **radiological protection**

The co-expertise process

Suetsugi village, Fukushima Prefecture, 2013

The main steps of the co-expertise process (2)

- The following step is to **characterize the radiological situation of the community** in order to:
  - Identify individual **behaviours** and **habits**, local **uses** and **customs**
  - Perform relevant **measurements** going step by step **from causes of exposure to effects of radiation** to characterize the exposure situation of individuals and the community
- The next step is to use the **collective results** to discuss individual situations, identify **margins of manoeuver** and implement **protective actions at the individual and collective levels**

The main steps of the co-expertise process (3)

- The final step is to organize the **vigilance** to ensure the long term protection of the people and the environment and to implement **local projects** contributing to improve the living conditions
- For implementing effectively these local projects **cooperation** with relevant authorities, public and private organizations, experts and professionals is indispensible
- Experience has shown that when these local projects mobilized external resources to the community, it was necessary to put in place appropriate **governance structures** to ensure legitimacy, transparency and fairness of the **decision-making process** related to these projects

Inspection visit by villagers of the Suetsugi decontamination waste storage site

Practical radiological protection culture and self help protection

- The co-expertise process allows to develop the **practical radiological protection culture** among the involved people which allows individuals:
  - To **interpret** the results of their measurements
  - To **build** their own benchmarks in relation to the radioactivity present in their daily life
  - To **make their own decisions** to protect themselves and their loved ones
  - To **assess the effectiveness** of the protective actions implemented by themselves or by authorities and organisations

- In other words, the co-expertise process allows to **empower** those involved, favour their **autonomy** and the implementation of **self-help protection actions** adapted to their situation

Behaviour of experts to favour resilience in the co-expertise process

- To be attentive to others (**Solicitude**)
- To listen and to be available to others
- To avoid ready-made answers
- To understand and share feelings (**Empathy**)
- To not impose help
- To ask what people like in life and talk about it
- To place themselves at the level of feelings and not opinions
- To not judge
- To put the **narrative** before the **scientific discourse**
- To accompany people without squeezing and jostling them
- To adhere to **ethical values** (beneficence/non maleficence, prudence, justice, dignity) and to give themselves rules of conduct

What I learned about resilience in Chernobyl and Fukushima

- Resilience is an **evolutionary process** that consists in making its way **towards autonomy**
- There is no resilience without **accomplishment,** that is without **projects**
- The **co-expertise** process is a **powerful level** to favor resilience
- **Experts** play a crucial role to promote the resilience and for that they must imperatively combine **solid scientific and technical knowledge** and the **skills of 'tutors**
- With regard to resilience **time** is an essential factor
- **Resilience is first of all a way of approaching the problems**

Concluding remarks

Challenges to promote resilience to radiation disasters (1)

- What are the **challenges** in terms of resilience concerning the effects of **low doses**, **medical care**, **social impacts** and **radiological protection** of people in the event of a radiation accident?
  - **Low doses** - To improve the understanding of radiological risk to refine and reinforce or adapt the current protection strategy (based on the adoption of thresholds for deterministic effects and the optimization principle for stochastic effects)
  - **Medical care** - To develop innovative public health systems to address the complexity of health surveillance during the emergency and recovery phases of radiation disasters

Challenges to promote resilience to radiation disasters (2)

- **Social impacts**
  - To develop **tools, methodologies and procedures** to accompany individuals and communities in the **co-expertise process**
  - To develop innovative mode of **governance** that can address simultaneously the **co-expertise process** at the local level and the **collective response** at the regional, national and international levels?
- **Radiological protection**
  - To refine the search for **reasonableness** in the implementation of the **optimisation principle**
  - To develop and promote the **practical radiological protection culture** indispensible for regaining control

Challenges to promote resilience to radiation disasters (3)

Given the complexity of the situations generated by radiation disasters the above challenges can only be addressed by adopting a **trans-disciplinary approach** in a spirit of **social innovation**, i.e. with the desire to meet **social needs**, create **new social relationships** and **new forms of collaboration** between stakeholders

Thank you for your attention