SFDRR PRIORITY 3: INVESTING IN DISASTER RISK REDUCTION FOR RESILIENCE: *HOW SAFE IS SAFE ENOUGH?*

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RISKS AND DISASTERS PORTFOLIO

Disasters

Natural Hazards
- Sudden
  - Volcanic Eruptions
  - Tsunamis
  - Floods
  - Landslides
  - Storms, Cyclones
  - Earthquakes
  - Meteorites
- Slow
  - Climate Change
  - Desertification
  - Drought
  - Erosion
- Environmental
  - Climate Change
  - Deforestation
  - Uncontrolled town planning, megacities
  - Drying Lakes
  - Wild fires
- Technological
  - Chemistry (Bhopal, AZT)
  - Nuclear (Chernobyl, Fukushima)
  - Oil spill (Exxon Valdez/Alaska)
  - Fire
  - Building Collapse

Anthropogenic Hazards

Health and Social Risks
- Conflicts
  - Terrorist acts
  - Riots
  - Wars

Complex Emergencies
What has to be done?
Measures to be taken

What can happen?
Hazard analysis (hazard intensity and exposure analysis, vulnerability, Scenarios important)

Risk Analysis

What is acceptable to happen?
What is an accepted safety level? (Protection goals, acceptable risk levels)

Risk Assessment

How safe is safe enough?

INTEGRATIVE RISK MANAGEMENT IRM
KEY QUESTIONS
Fundamental Causes of Vulnerability

- Weak buildings and critical facilities and lifelines, unplanned settlements (**physical vulnerability**)
- Lack of access to resources (**material vulnerability**)
- Disintegration of social patterns (**social vulnerability**)
- Degradation of the environment (**ecological vulnerability**)
- Lack of strong institutional structures (**organizational vulnerability**)
- Lack of access to info and knowledge (**educational vulnerability**)
- Lack of public awareness (**attitudinal and motivational vulnerability**)
- Certain beliefs and customs (**cultural vulnerability**)
- Limited access to political power (**political vulnerability**)
Fundamentals in Resilience

Each type of vulnerability has its counterpart in resilience

- Lack of access to resources (**material vulnerability**)
- Disintegration of social patterns (**social vulnerability**)
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- Weak buildings and critical facilities and lifelines, unplanned settlements (**physical vulnerability**)
How to define resilience?

Resilience is high if A is small.

Event

100%

Functionality

Loss in Functionality (Vulnerability)

Robustness

A

Indirect secondary damage costs

Recovery Time

Direct damage costs

t \_ \_ \_ \_ \_ event

t \_ \_ \_ \_ recovery
THE ROLE OF RESILIENCE

- Regain functionality and preventing subsequent damage and losses (technical, social, political, financial, ecological, etc.)
- Prevent or cut chains of causalities
- Prevent simultaneous failures
- Decrease collateral vulnerability
- Decrease the effects of interactions
- Increase effectiveness and efficiency in response and recovery
INTEGRATIVE RISK MANAGEMENT

- Limited resources (financial, human, social, ecologic)

- Investment in vulnerability reduction and in resilience increase

- How to find an optimal way for investing in safety and security resp. in DRR?

- Decoupling the costs for vulnerability decrease (limits direct damage costs) and for resilience increase (limits indirect, secondary damage costs)
VULNERABILITY DECREASE: MARGINAL COST CONCEPT

Monetarization of risks to make risks comparable

Concept: Marginal costs (willingness to pay per life saved)

Collective risk (EUR)

Overall risk level

Maximum risk reduction for a given investment

Costs for a measure

Optimal function of risk reduction measures

Costs for risk reduction measures (EUR)
Rule of Thumb:

Optimum for measures:
$\frac{1}{3} - \frac{1}{2}$ of risk level (potential damage)
RESILIENCE OPTIMIZATION (INDIRECT DAMAGE COSTS)

Costs

Costs for resilience measures

Optimal recovery time

Indirect damage costs
DRR AND THE IMPORTANCE OF A RISK DIALOGUE

Stakeholders have to know in advance that:

- Prevention/Mitigation have their limits
- Prevention/Mitigation require a lot of public resources (Tax money, human resources)
- ZERO-Risk situation does not exist

*If stakeholders are not aware about these issues, they keep on demanding for more protection/security*
“FROM THOUGHTS TO ACTION”

THANK YOU FOR YOUR KIND ATTENTION

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