GLOBAL RISK FORUM GRF DAVOS

DRR for Communities – Planning and Engineering Challenges and Best Practices

Integrative Risk and Disaster Management – A Holistic

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pproach

www.grforum.org

IRM – SAFETY - KEY QUESTIONS

How safe is safe enough?



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

Risk Assessment

Risk Analysis

analysis, vulnerability,

Scenarios important

What can

happen?

Hazard analysis (hazard

What has to be done?

Measures to be taken

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THE TWINS IN URBAN ENVIRONMENT AND BUSINESS- RISKS AND OPPORTUNITIES

"A ship is safe in harbor, but that's not what ships are for." (William Shedd)





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RISKS – WHAT CAN HAPPEN?



Values exposed to hazards Damage potential



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VALUES EXPOSED TO HAZARDS

Damage Potential (what can be affected?)

- Human lives and health
- Live-stock (urbanisation)
- Critical Infrastructures and Services (Hospitals, schools, transportation, energy, food, water, waste-water, etc.)
- Communication (IT infrastructure)
- Production (Industry)
- Image, reputation
- Etc





(MATHEMATICAL) DEFINITION OF RISK

RISK



Hazard



Climate Change will increase the frequency and intensity

X Values at Risk X



Humans, Animals, Assets, Infrastructures, Services, **Environment**

Vulnerability



All values are vulnerable. Vulnerability can be reduced with measures

Resilience



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EXPOSURE ANALYSIS – HAZARD MAPS



national





local



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POLLUTION, HEALTH, CLIMATE CHANGE,

- Increasing susceptibility to diseases, epidemics etc.
- Combination of high temperatures and water and air pollution in urbanized areas often leads to increased illnesses, respiratory problems, allergies etc.

 \rightarrow Extreme atmospheric situations (e.g. heat waves)





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GARBAGE/RUBBISH, - HEALTH ISSUES



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CASCADING DISASTERS

Earthquake

Präfektur Miyagi Fukushima 1 - Daiichi Fukushima 2 - Daini Tokai Tokio Pazifiso JAPAN

O Pazifischer Ozean ¥ Epizentrum des Erdbeden ⅔ Kernkraftwerke Radioactive Kontamination

Tsunami

Fires

Aftershocks



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Nuclear Radiation



Economy (Nikkei Index)

Technology

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DEFINITION - NATECH RISKS

- Technological risks and any subsequent risks that are triggered or made worse by the impact of natural hazards.
- NATECH = NAtural hazards triggering TECHnological disasters
- With heavy impact on environment

 "TechNat" sometimes more
 appropriate







RISK MANAGEMENT (RISK MATRIX)



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PROTECTION GOALS – ACCEPTED RISK?

- Limit fatalities
- Limit economic losses
- Limit damage to infrastructure



- Limit damage to livestock, food production
- Limit damage to the social/ political coherence
- Limit damage to the resources/ environment (water, air, soil, biodiversity)
- Limit damage to cultural heritage



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COST EFFECTIVENESS OF MEASURES



IRM – THE RISK REDUCTION STAIR-CASE





IRM - RISK REDUCTION & DISASTER MANAGEMENT

Integrative Risk Management IRM concentrates equally on all phases of the risk circle - on prevention, intervention and recovery





NEW TECHNOLOGIES WITHIN THE DISASTER RISK CYCLE

vulnberability red.

"The benefits of prevention are not tangible; they are the disasters that did not happen." *Kofi Annan, Former UN General Secretary*

"The benefits of **prevention** are not tangible; they are the disasters that did not happen

Kofi Annan, former UN SG



Hazard/Risk wapping
Land use planning
Design codes
Technical measures
Eco-engineering
Capacity Building

Ex-ante responsibilities (loss of human life, environment), not only ex-post would strengthen prevention and preparedness





NEW TECHNOLOGIES WITHIN THE DISASTER RISK CYCLE





Preparedness:
early warning
business continuity planning
emergency prepardness and exercises
Gapacity building





Resilience is key!



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- Rescue, crisis and disaster management
- Disaster communication (ICT, social media, media, etc.)
- Damage and needs assessment (numerical models/ GIS)
- Critical infrastructure rehabilitation

NEW TECHNOLOGIES WITHIN THE DISASTER RISK CYCLE





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DISASTER



THE HUMAN FACTOR - RESILIENCE

Damage as a result of human actions and behaviour

Timely and appropriate intervention influences extent of damage and human behaviour

Robustness- redundancy – resilience: A resilient system helps to recover faster and to keep secondary damage contained



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Schematic of Resilience







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Civil protection, civil defence and resilience

- POLICE

POLICE

POLICE

POLICE

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RISK PORTFOLIO – PERIODIC REVIEW



Strategic Risk Controlling:

- Periodic Review of the Risk Portfolio
- Efficiency of Measures
- Status of Measures, Maintenance planning

Example: Dubai

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RISK COMMUNICATION – RISK DIALOGUE

- Awareness rising
- Public- private partnership
- Capacity building
- People getting prepared for a crisis



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SUMMARY – SUSTAINABLE COMMUNITIES

- All hazards approach for risk analysis and assessment, (cascading effects!) – Risk Matrix.
- Integrative risk management (prevention, preparedness, intervention/ response, recovery)
- Resilience, robustness, redundancy
- Proportionality, cost effectiveness, cost-efficiency
- All-stakeholder approach (cooordination of institutions, sectors, etc.)
- Subsidiarity (local comm. first responders)
- Strengthen public-private partnership
- Communication, awareness raising

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MAKING COMMUNITIES RESILIENT – ESSENTIALS

Capacity building



- Harmonize CCA and DRR (Climate Change intensity, frequency, hazard patterns: diseases, allergies, heat waves, etc)
- Science: resilience indicators (sustainable performance based planning)



BASIC PRINCIPLES – SOCIAL DIMENSIONS





FROM THOUGHTS TO ACTION!

Vision without action – a day-dream

Action without vision – a nightmare

Jan Egeland, Kobe 2005

THANK YOU FOR YOUR ATTENTION!

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