



GAMING SIMULATIONS METHOD AND APPLICATION

Stakeholder oriented / participatory approach to dealing with multi risks

BACKGROUND

South American countries are exposed to multiple hazards like tsunamis, volcanic eruptions, flooding, extreme droughts and landslides. Thus, the **integration of multi-risk information into land use planning as well as emergency response planning and the collaboration** between planners and stakeholders related to disaster prevention are important.

PARADIGM SHIFT IN DISASTER RISK MANAGEMENT

The growing challenges due to complex interrelations and dependencies of infrastructures and uncertainty of future hazards and vulnerabilities ask for approaches with **more peer-to-peer relationships, horizontal communication and active cooperation**. This can be provided by **gaming simulations**.

GAMING SIMULATION AS A TOOL FOR INVOLVING SECTORIAL AND REGIONAL/ LOCAL STAKEHOLDERS

Since the 1950s, gaming simulations have been widely used in the context of urban planning but in recent years also for other topics such as disaster risk management.

The objective of a gaming simulation is to provide **insight into real-life problems and relations between actors**, especially in new problem settings such as new challenges, new analysis methods, new management approaches or even new laws.

A gaming simulation consists of **four phases**:

- ◇ Preparation
- ◇ Introduction and distribution of roles
- ◇ Simulation and negotiation phase (the gaming simulation as such)
- ◇ Evaluation and wrap-up



High-voltage line in Lima, picture source: Christian León

In the simulation and negotiation phase the participants play their own “role” in order to bring the applicability of **innovative elements as close to reality** as possible, including elements such as:

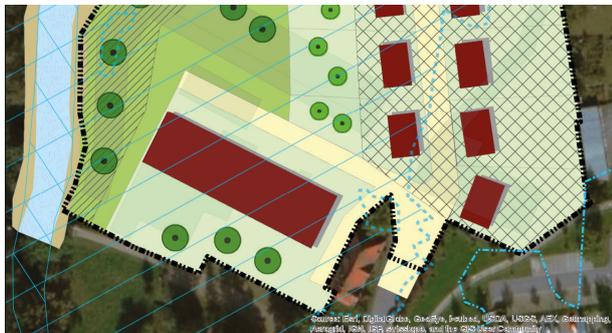
- ◇ Identification and visualization of **impact chains and dependencies**
- ◇ Self-assessment of systems operators about the **preferred level of impact acceptability**
- ◇ **Participatory mapping** based on previous analyses
- ◇ Assessment about **responsibilities of actors** within multi-risk management process
- ◇ Identification of **how multi-risk relationships and knowledge flow into planning processes**

APPLICATION EXAMPLES

Gaming simulations can be used in a variety of thematic backgrounds, e.g. urban planning, disaster risk management, environmental planning and for different objectives such as the testing of new methods, simulating new legal requirements or management schemes. In the following, some examples are briefly described.

SELECTIVE RETREAT OF BUILDINGS IN FLOOD-PRONE AREA

Due to previous floods and the poor condition and close position of buildings to the Elbe River, the German cities Pirna and Meißen were discussed as examples for gaming simulations **in the context of retreat of buildings**. It was discussed under which circumstances (legislation, finances, planning, civil protection) a retreat would be possible. The gaming simulation **brought together stakeholders (regional and local planning authorities, water management, flood protection, etc.) for the first time and showed new perspectives** that had not been identified before (alternative way of financing, new land-use concept).



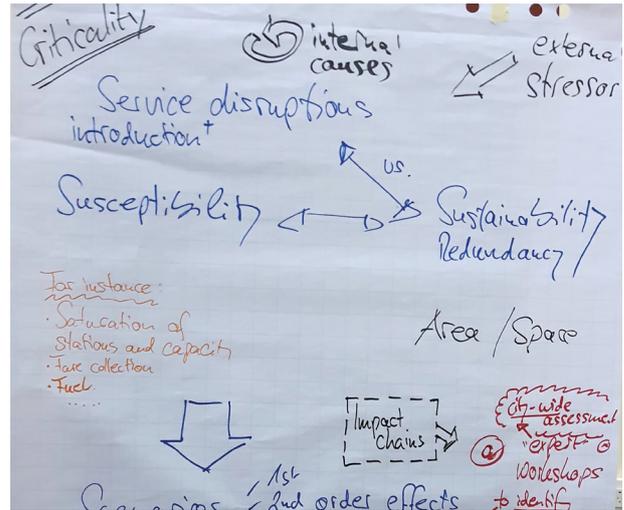
Legende

Gebäude	Grünfläche	Wesenitz	HQ100 spez. Abfluss >2 m³/s
Bestand	Gehölz	Wesenitz Flussbett	Untersuchungsgebiet
Flurstücke	Baum groß	HQ100 Grenze	Geländehöhe 120,2 m über NN
Straßenverkehrsfl.		HQ100 Abfluss 0,5 - 2 m³/s	Geländehöhe 119 m über NN

Concept for retreat in the city of Pirna, Elbe river

IDENTIFICATION OF TRANSPORTATION DISRUPTIONS IN DAR ES SALAAM

Objective of a gaming simulation in Dar es Salaam, Tanzania was to **analyze potential service system disruptions and appropriate mitigation options**. During the simulation highly critical elements of the transportation system (fast track bus lane) and cascading effects were identified.



Participatory identification of criticality, Dar es Salaam

The results showed entry points for interventions & mitigation and thus contributed to ensuring business continuity (goods & services).

CASCADING EFFECTS DUE TO DISRUPTION OF CRITICAL INFRASTRUCTURES IN LIMA, PERU

In the simulation in the Lima metropolitan region stakeholders are going to **identify dependencies of sectors, evaluate their criticality and identify resulting cascading effects in a participatory approach**. The disruption of the electricity grid due to an earthquake/tsunami-event poses as a starting point for this simulation. Further steps will be a discussion of results, recommendations and validation.

More information about the project:
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