



# REGIONAL DISASTERS + SYSTEMIC REACTIONS

**Gerhard Chroust**

*J. Kepler University Linz, Austria*

[Gerhard.chroust@jku.at](mailto:Gerhard.chroust@jku.at)

**Günther Ossimitz**

*Alpen-Adria University Klagenfurt, Austria*

[Guenther.ossimitz@aau.at](mailto:Guenther.ossimitz@aau.at)

- 
- regional emergencies and disasters have grown in number, scale and impact.
  - ... and also in **media coverage** -> increasing awareness and fear
  - many are man-made or triggered by human activities
  - disasters increasingly impact people, society, environment, infrastructure, and economy
  - in complex, multi-faceted, and interrelated ways
  - need **systemic reactions!**

- 
- WHAT IS A DISASTER? WHAT TYPES EXIST? : Definition
  - WHAT CAN/SHOULD WE DO : Reactions
  - HOW SHOULD WE BE PREPARED: "Expect the Unexpected"
  - HOW TO COUNTERACT / FIGHT : Compensation System - Process view
  - HOW DO VICTIMS/HELPERS FEEL? : Human/Psychological Needs and Problems
  - DO WE ALL REACT SIMILAR ? : NO - Cultural Differences

## the functionalistic or event based perspective:

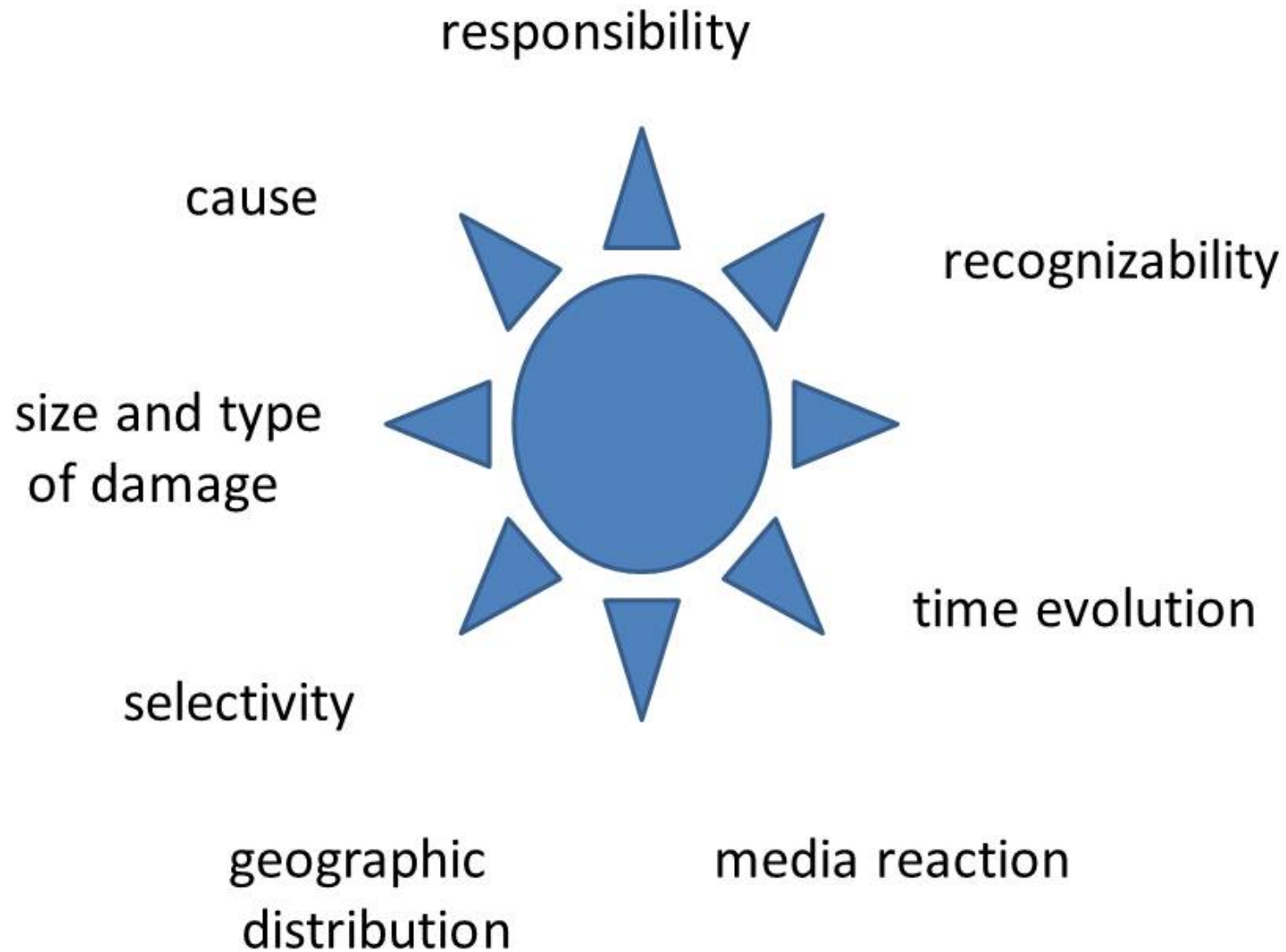
... a natural or man-made hazard taking effect ... of substantial extent causing significant physical damage or destruction, loss of life, or drastic change to the natural environment....

## the social constructionism:

... are social constructions ... do not exist sui generis, ... are products of social definition:  
"disasters are in the eye of the beholders".

## the vulnerability perspective:

... consider vulnerability of the built environment and the social vulnerability of exposed populations

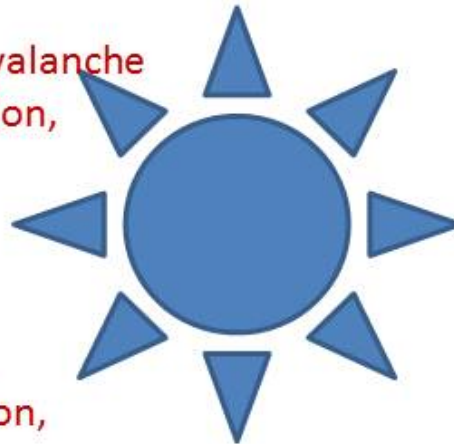


## responsibility

Man-made, man-triggered, natural

## cause

Volcanic, epidemiological, ,avalanche  
earthquake, chemical explosion,  
atomic reaction, ...



## recognizability

big bang, slowly growing,  
hindsight recognizable,  
Human senses,  
simple/complex sensors

## size and type of damage

Small material, large distruction,  
human lives

## time evolution

Reversible/irreversible  
growing, shrinking, periodic,

## selectivity

what and/or who is affected?  
(humans, some animals, only artifacts, ...).

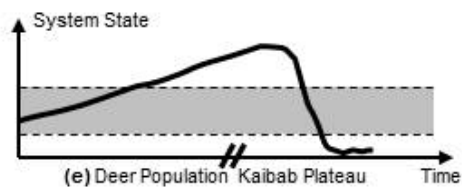
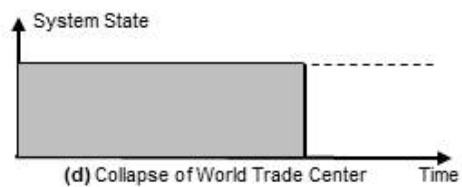
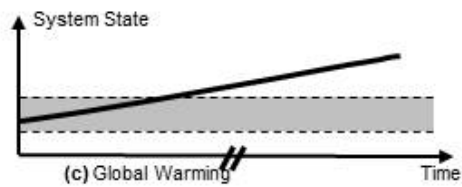
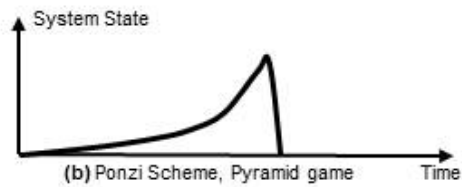
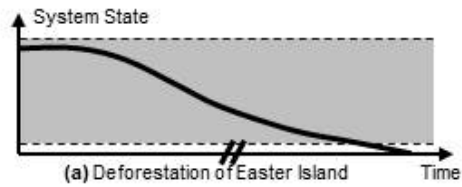
## media reaction

daily headline/news, remark, ignored

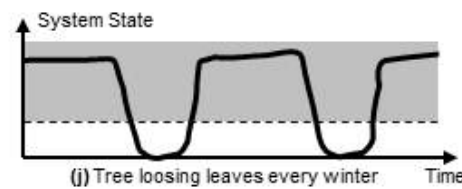
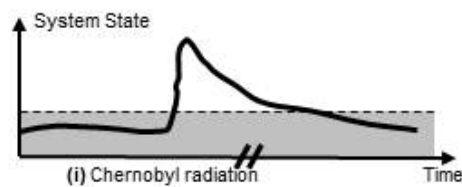
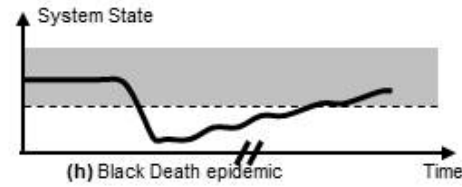
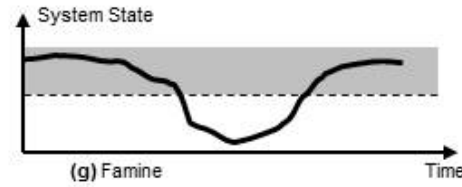
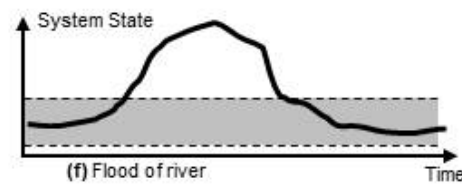
## geographic distribution

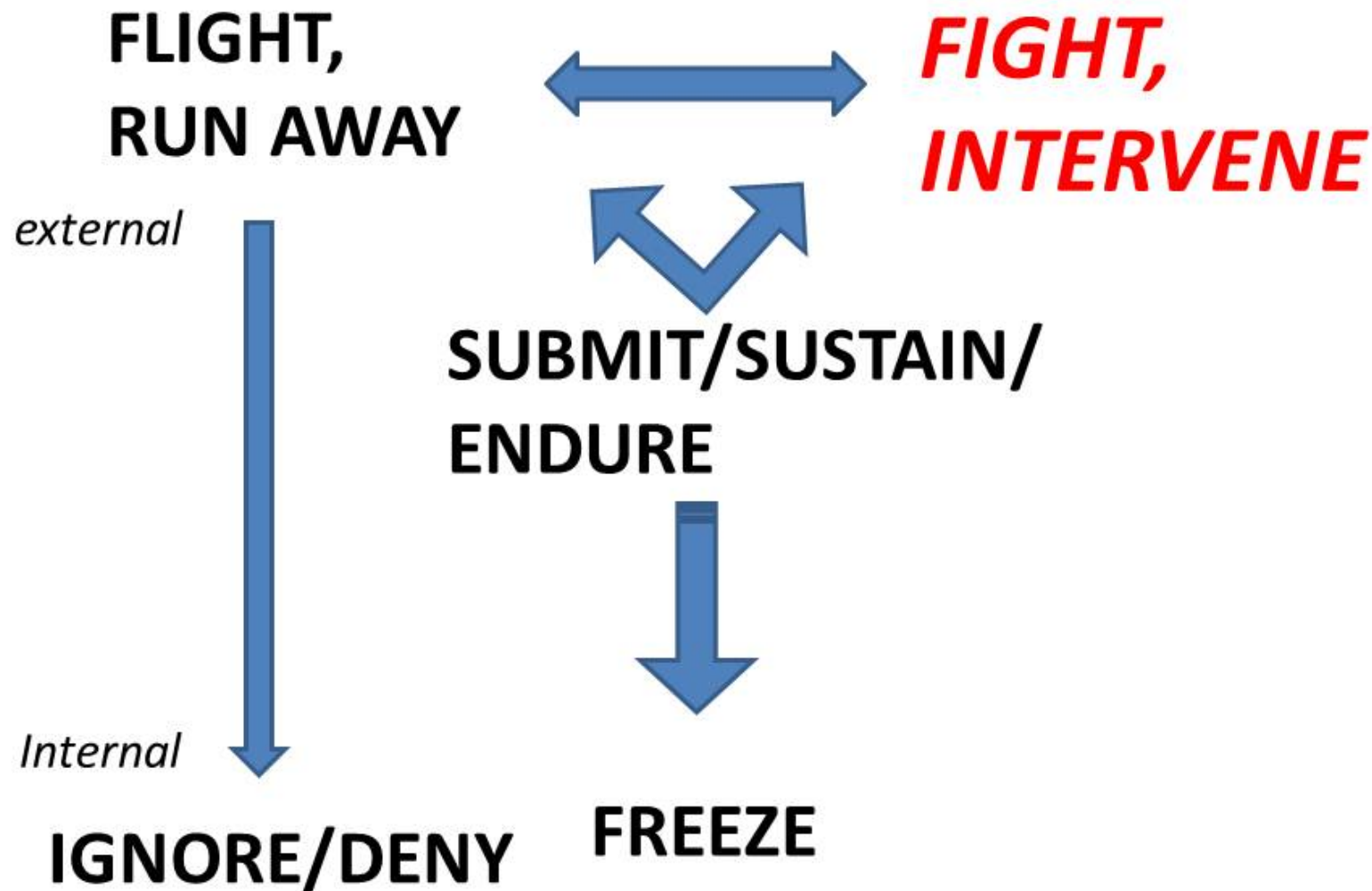
Local, regional, international, global

## Irreversible

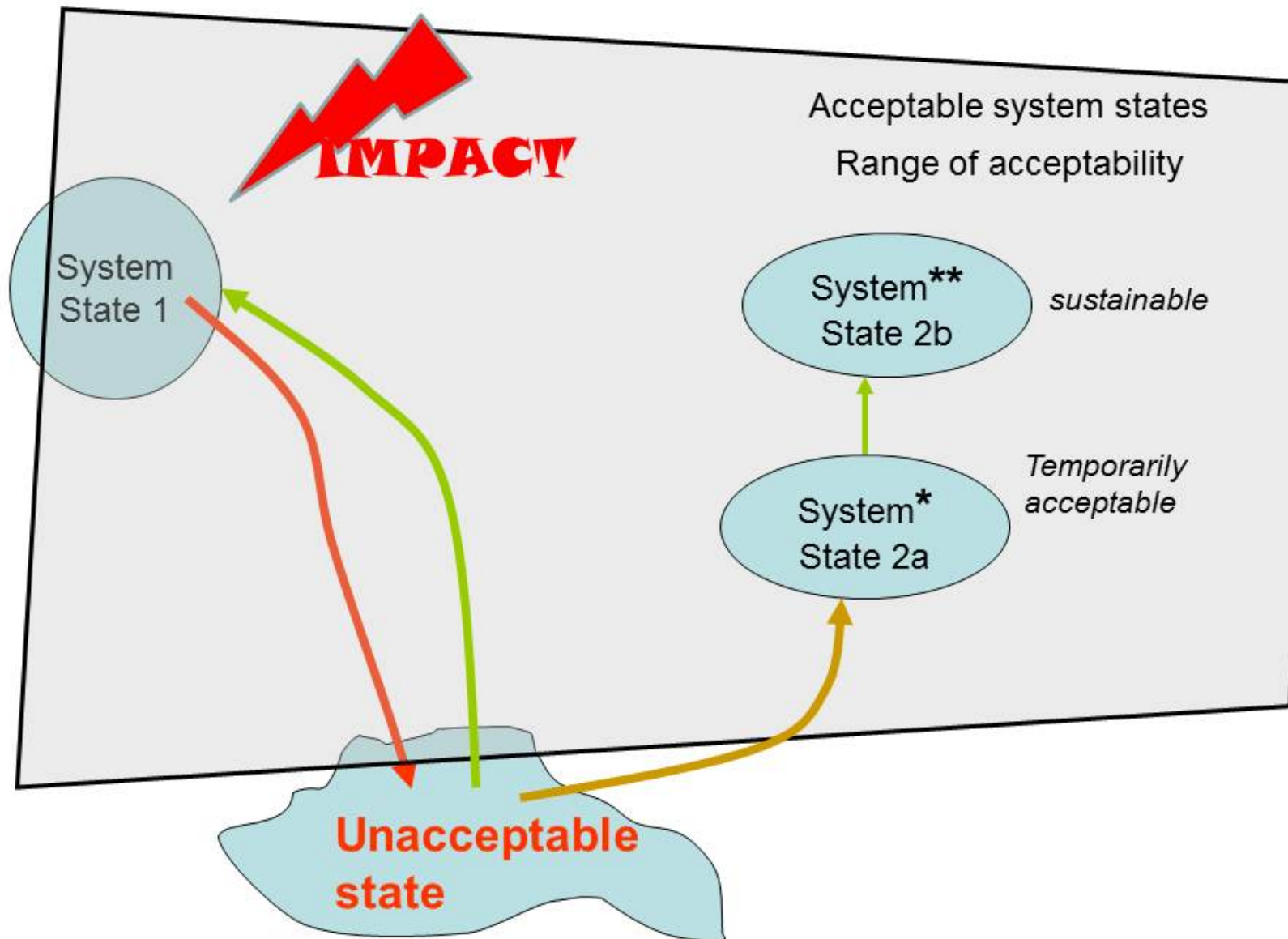


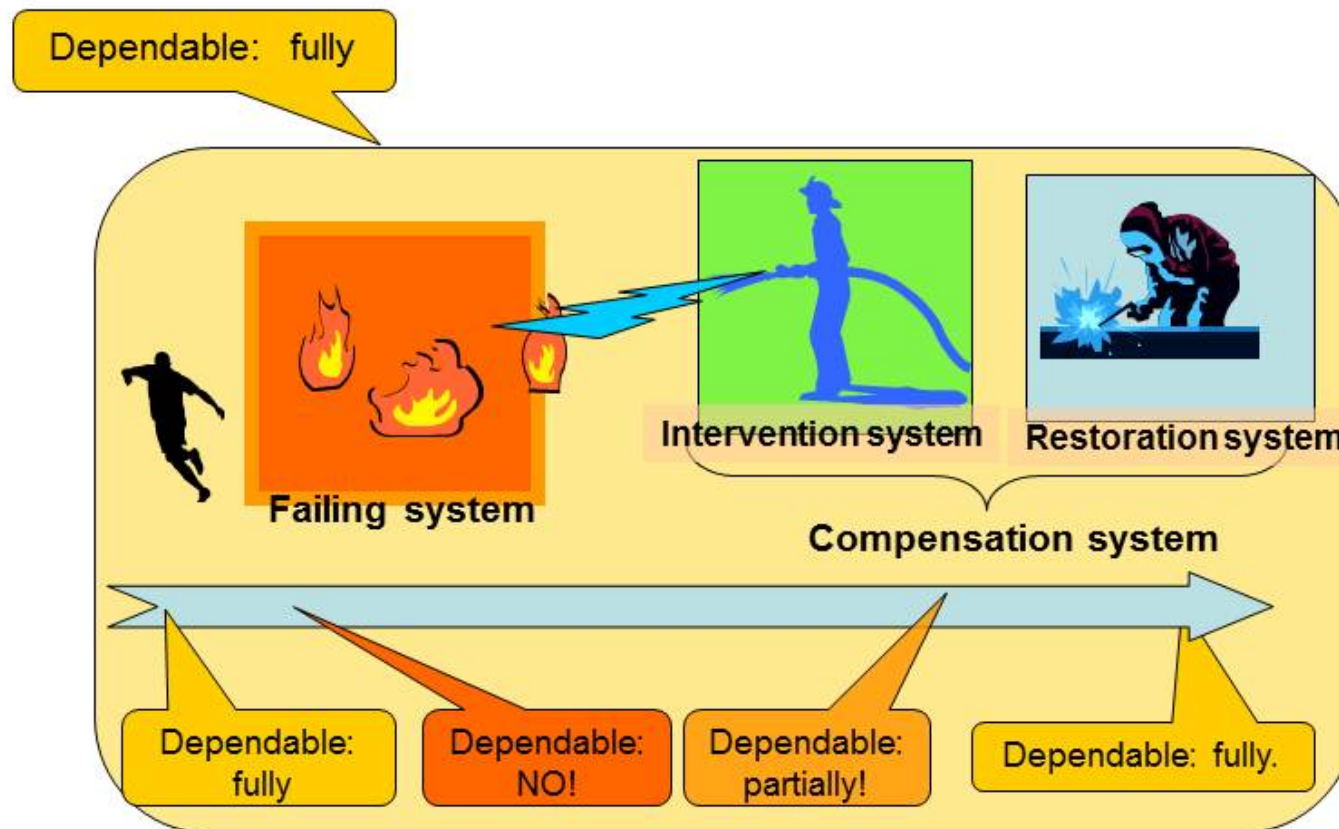
## Reversible

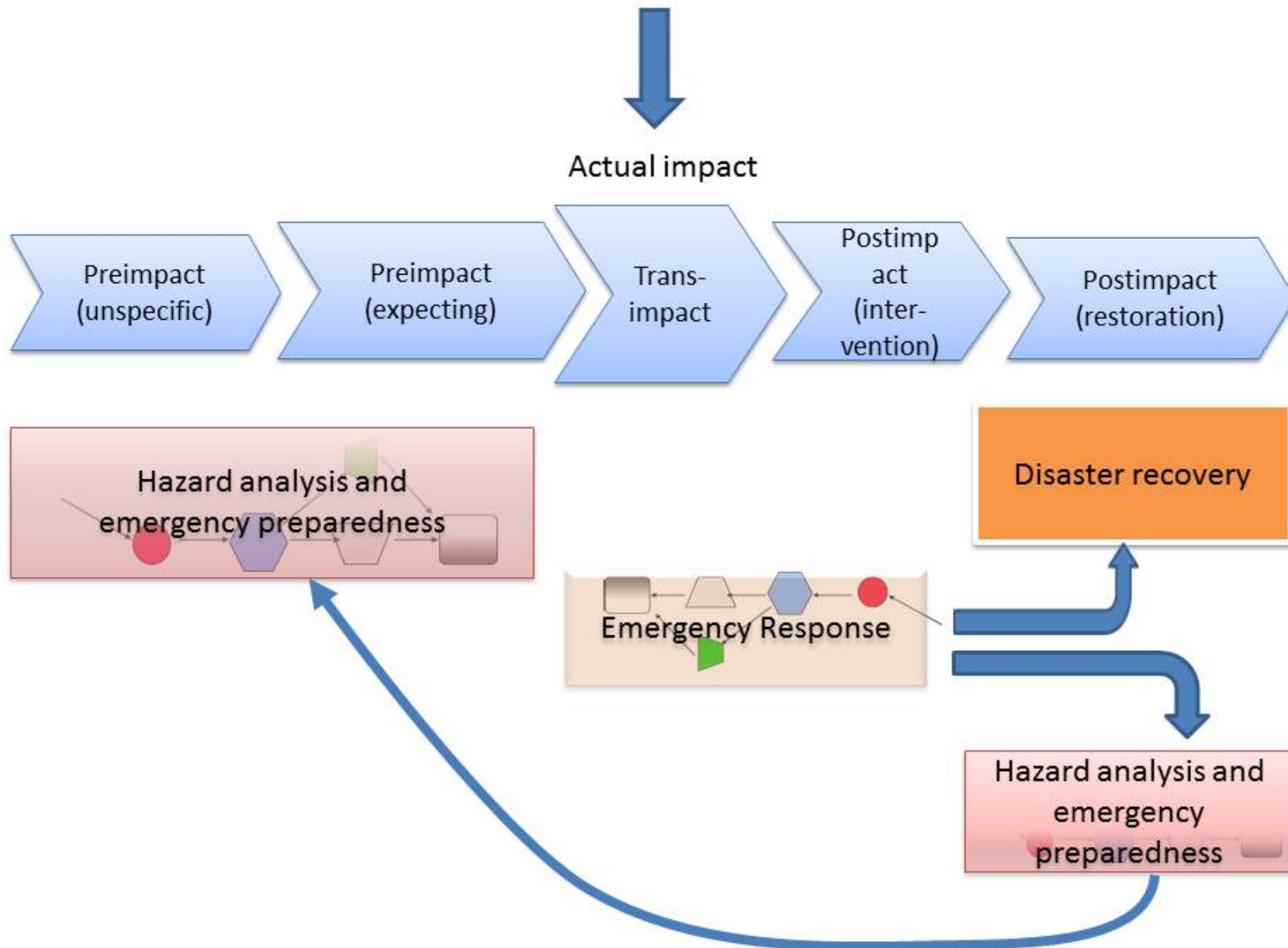






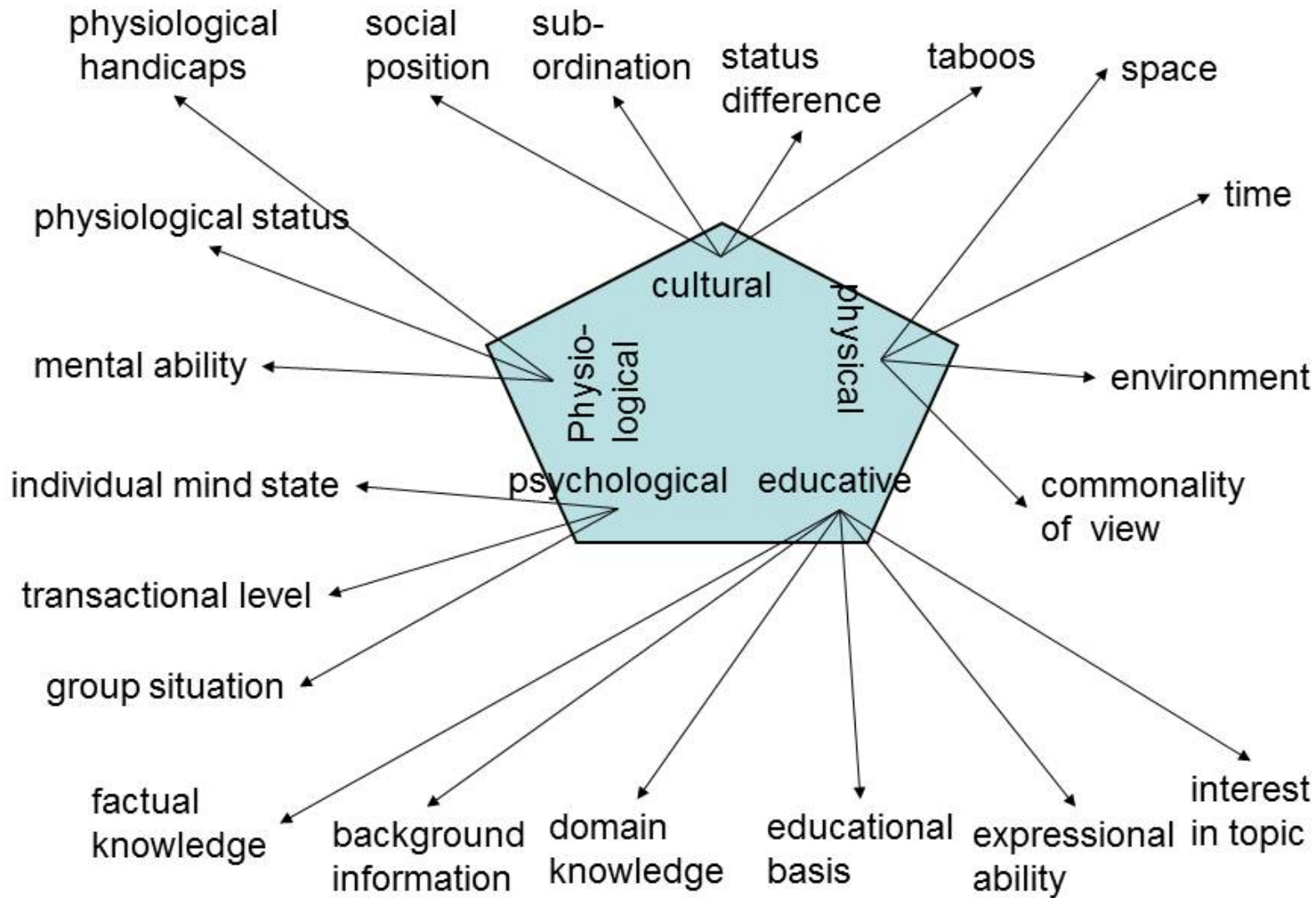






- 
- immediate help needed, but also longterm support!
  - posttraumatic stress disorder (PTSD)
  - identify early
  - problem: when needed, services themselves often deteriorate
  - 'forgotten victims' - First Responders

# Disruptions in cooperation



---

ISSS 2009, Brisbane, AU July 2010 : paper session

3rd Symp. Intelligent Distributed Computing 2009 Ayia  
Napa, Cyprus, GR, Oct. 2009 :papers

Int. Conf. Computational Intelligence, Modelling and Simulation  
Brno, CZ, 2009: papers

6. Gemeinsame Tagung ÖVS - FS Alpbach in Tirol, AT]  
Sept. 2009: conference

EMCSR 2010 Vienna, April 2010 : 1 paper

ISSS 2010, Waterloo, USA July 2010 : paper session + Work-  
shop

IDIMT 2010 Jindrichuv Hradec, Cz, Sept 2010 : paper session

Disaster Management 2011 Orlando, USA, May 2011

Innpower-exercise Ried im I., AT, June 2011: training exercise,  
2000 First responders

- 
- regional disasters are growing (in reality, in awareness, in believe, in media coverage)
  - affect more people, more areas in more different ways
  - have more secondary and ternary effects (less buffers!)
  - reactions **need systemic approaches**:  
multidisciplinary, transdisciplinary, transnational, transcultural
  - need of improved ICT support : in training and operation!
  - **human are central** both as **victims and first responders**
  - need more research and analysis

- 
- Classification of disasters, interactions and effects (e.g. earthquakes, floods, volcanoes and air traffic breakdown, chemical explosions, .),
  - Analysis of typical emergency scenarios + possible reactions,
  - Training for First Responders using ICT (e.g. Virtual and Augmented Reality, System Dynamics models, human evaluation models),
  - IT support for prediction, tactical and strategic planning, and interventions (victim detection, tracking first responders, logistic of transport vehicles, .)



- 
- analysis of deficiencies and improvement of organizational structures (e.g. Viable system Models, ISO standards),
  - protection of emergency personnel (e.g. early danger detection and warnings),
  - plan and anticipate post-disaster recovery activities,
  - psychological and cultural differences and problems
  - road maps for further studies and investigations.
  - learn from the past

---

"Disasters never come alone"

"Calamity is man's true touchstone"

"An ounce of prevention is worth a pound of cure."

THANK YOU!

---

"SimRad.COMP " Simulations- und Informationssystem zum Administrieren von Hilfseinheiten bei Katastrophen " -  
Project number 818784 of "KIRAS"-Programm of the Austrian Federal Ministry for Transport, Innovation and Technology.