

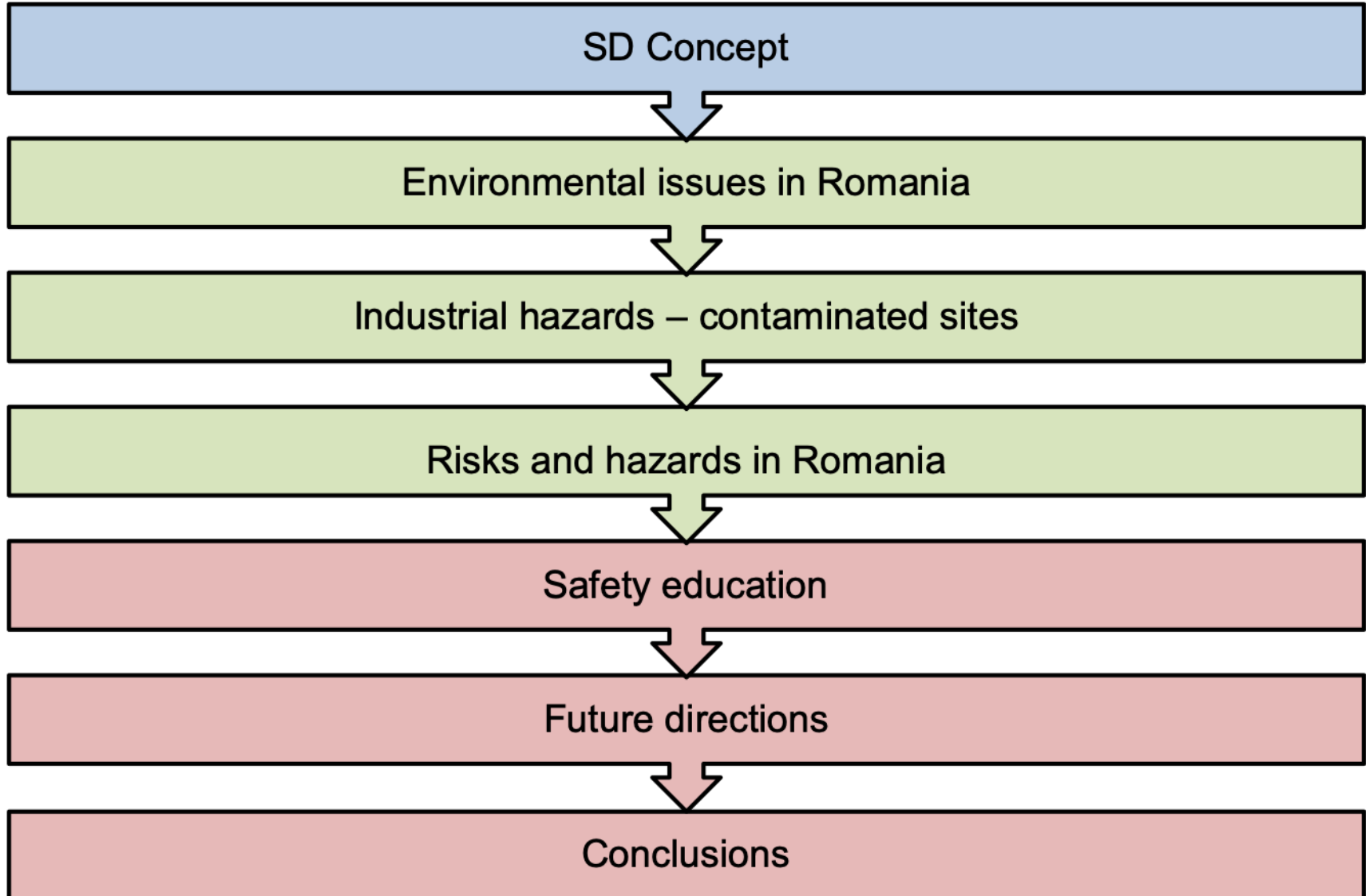
# ASPECTS REGARDING THE IMPROVEMENT OF SAFETY CULTURE IN ROMANIA

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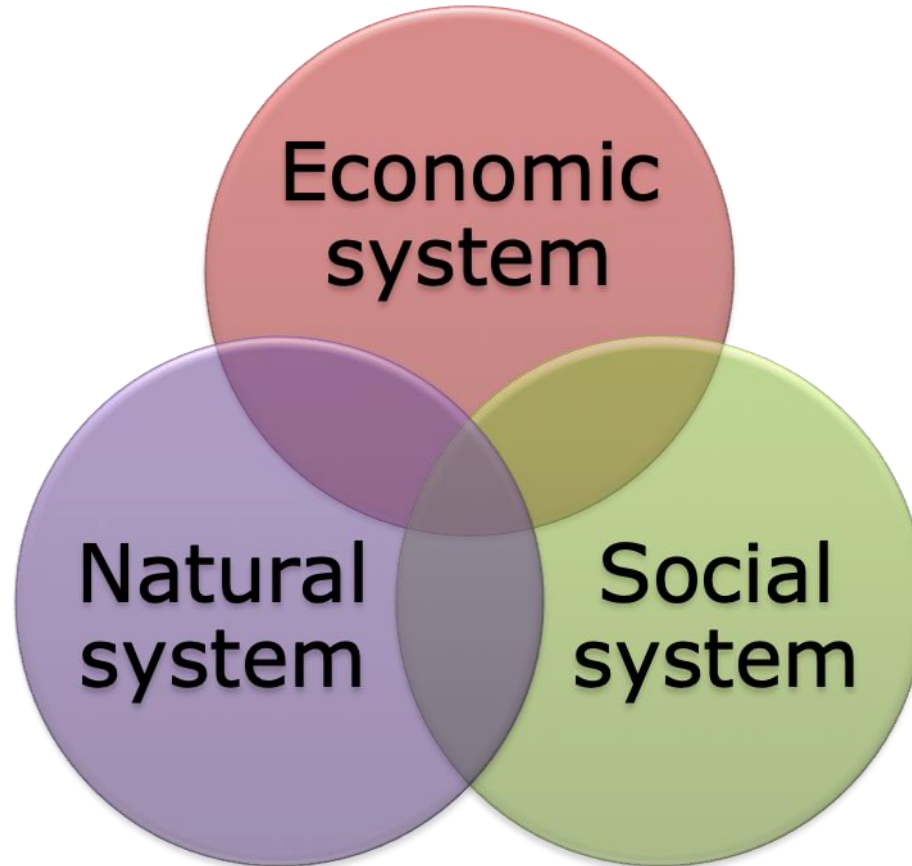
Professor Alexandru Ozunu, PhD  
Babes-Bolyai University- Cluj-Napoca  
Faculty of Environmental Science and Engineering  
Research Institute for Sustainability and Disaster Management  
*ISUMADECIP*

*Implementation of UN 2030 SDGs in the Black Sea Region  
October 4th, 2019, Romanian Parliament Palace*

# Contents



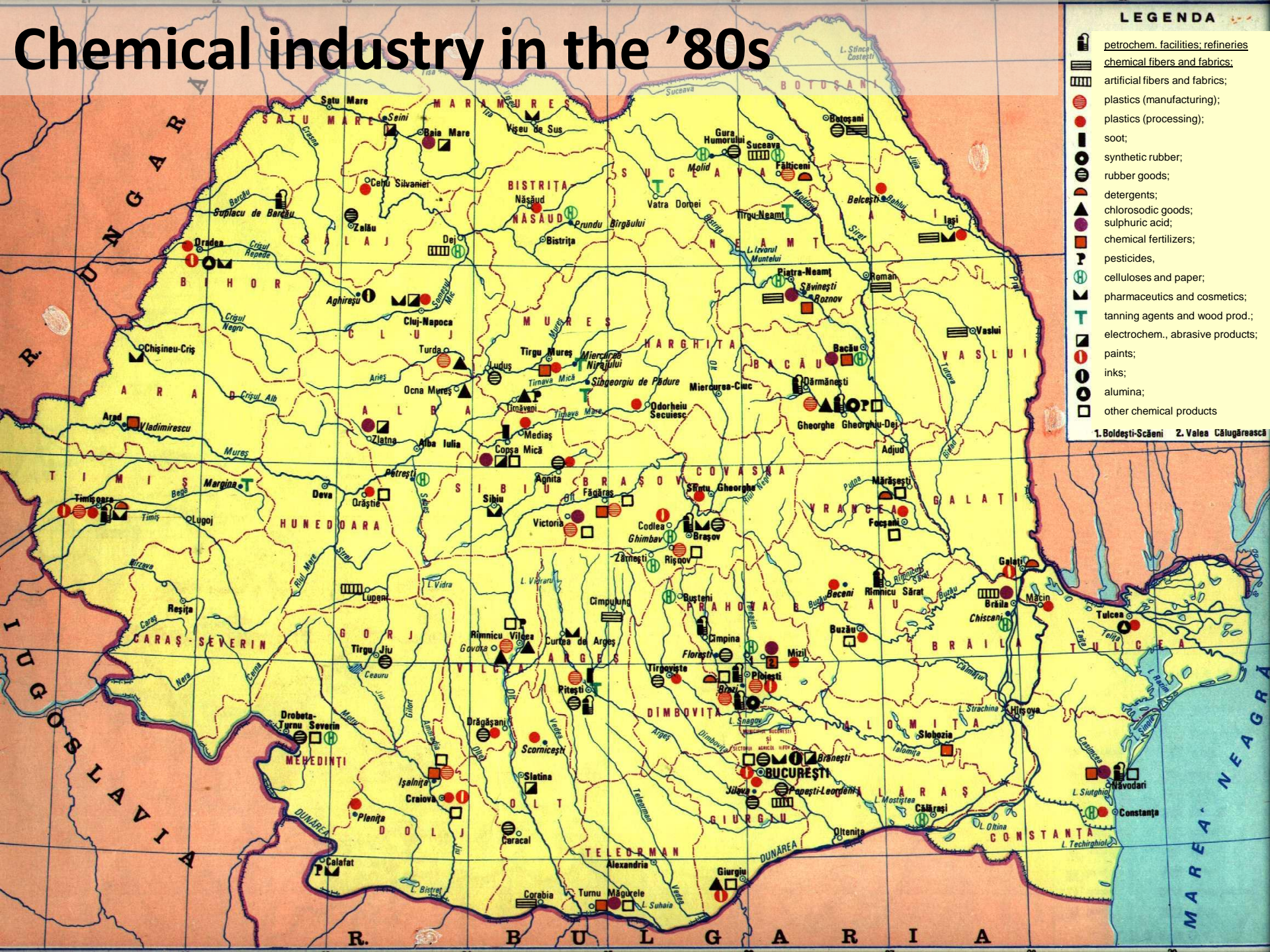
# Sustainable development



*VULNERABILITY  
to Natural and Technological Disaster*



# Chemical industry in the '80s



**LEGENDA**

- petrochem. facilities; refineries
- chemical fibers and fabrics;
- artificial fibers and fabrics;
- plastics (manufacturing);
- plastics (processing);
- soot;
- synthetic rubber;
- rubber goods;
- detergents;
- chlorosodic goods;
- sulphuric acid;
- chemical fertilizers;
- pesticides;
- cellulose and paper;
- pharmaceuticals and cosmetics;
- tanning agents and wood prod.;
- electrochem., abrasive products;
- paints;
- inks;
- alumina;
- other chemical products

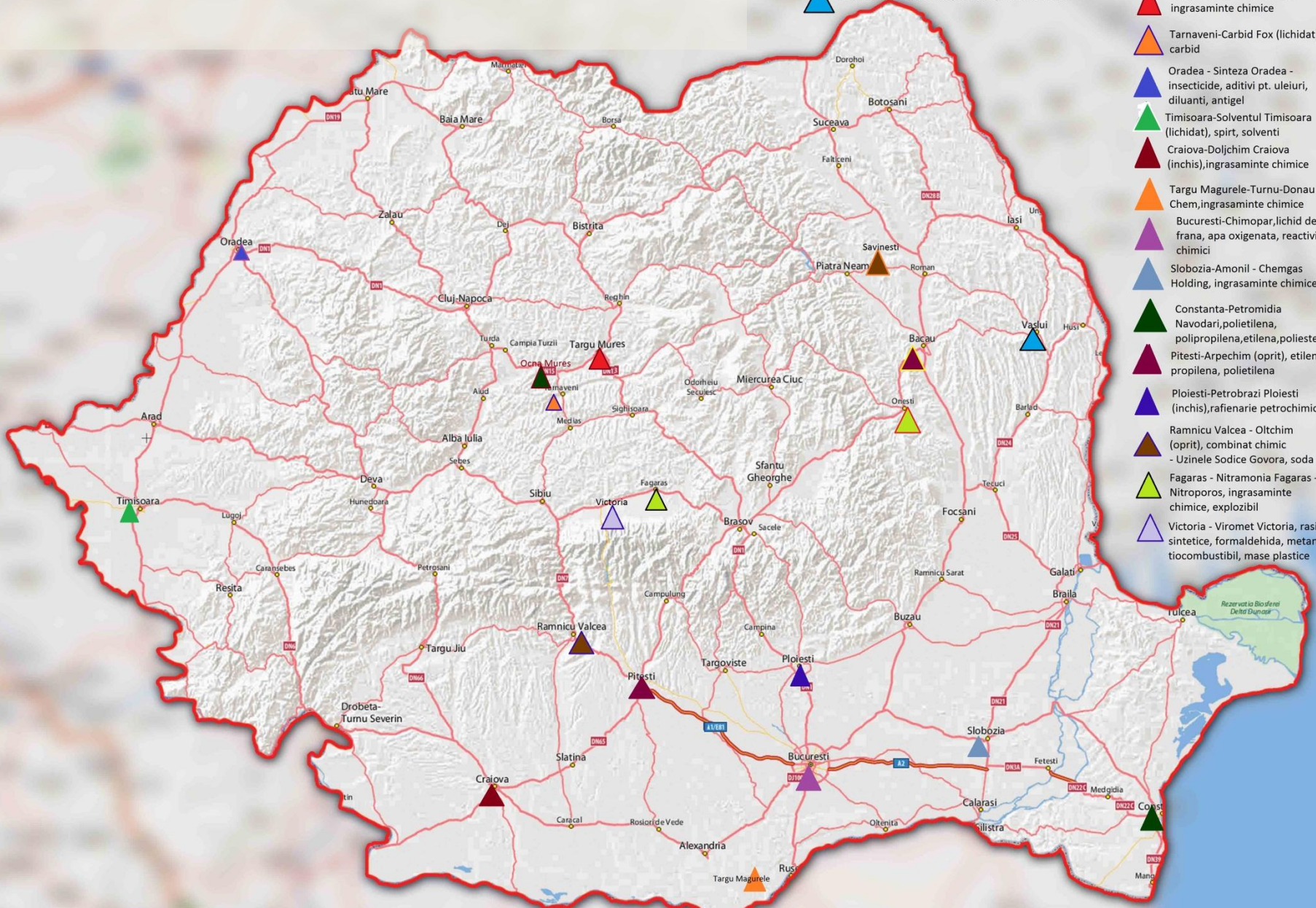
1. Boldești-Șcaeni 2. Valea Călugărească



# Chemical industry in 2000

## Legenda :

- ▲ Onesti - Carom Onesti (faliment),cauciuc sintetic  
- Chimcomplex Borzesti, soda caustica, solventi organici, ierbicide, fungicide
- ▲ Savinesti - Azochim Savinesti-Ga-Pro-Co, ingrasaminte azotoase; - Fibrex Savinesti, fibre si fire sintetice
- ▲ Vaslui-Moldosin Vaslui (lichidata), fibre sintetice
- ▲ Bacau - Sofert Bacau- Amurco, ingrasaminte chimice, acid sulfuric pentru acumulatori
- ▲ Ocna Mures - Upsom Ocna Mures (insolventa), soda calcinata
- ▲ Targu Mures - Azomures, ingrasaminte chimice
- ▲ Tarnaveni-Carbid Fox (lichidat), carbid
- ▲ Oradea - Sinteza Oradea - insecticide, aditivi pt. uleiuri, diluanti, antigel
- ▲ Timisoara-Solventul Timisoara (lichidat), spirit, solventi
- ▲ Craiova-Doljchim Craiova (inchis),ingrasaminte chimice
- ▲ Targu Magurele-Turnu-Donau Chem,ingrasaminte chimice
- ▲ Bucuresti-Chimopar,lichid de frana, apa oxigenata, reactivi chimici
- ▲ Slobozia-Amonil - Chemgas Holding, ingrasaminte chimice
- ▲ Constanta-Petromidia Navodari,polietilena, polipropilena,etilena,poliesteri
- ▲ Pitesti-Arpechim (oprit), etilena, propilena, polietilena
- ▲ Ploiesti-Petrobrazi Ploiesti (inchis),rafinarie petrochimica
- ▲ Ramnicu Valcea - Oltchim (oprit), combinat chimic
- ▲ Uzinele Sodice Govora, soda
- ▲ Fagaras - Nitramonia Fagaras - Nitroporos, ingrasaminte chimice, explozibil
- ▲ Victoria - Viromet Victoria, rasini sintetice, formaldehida, metanol, tiocombustibil, mase plastice

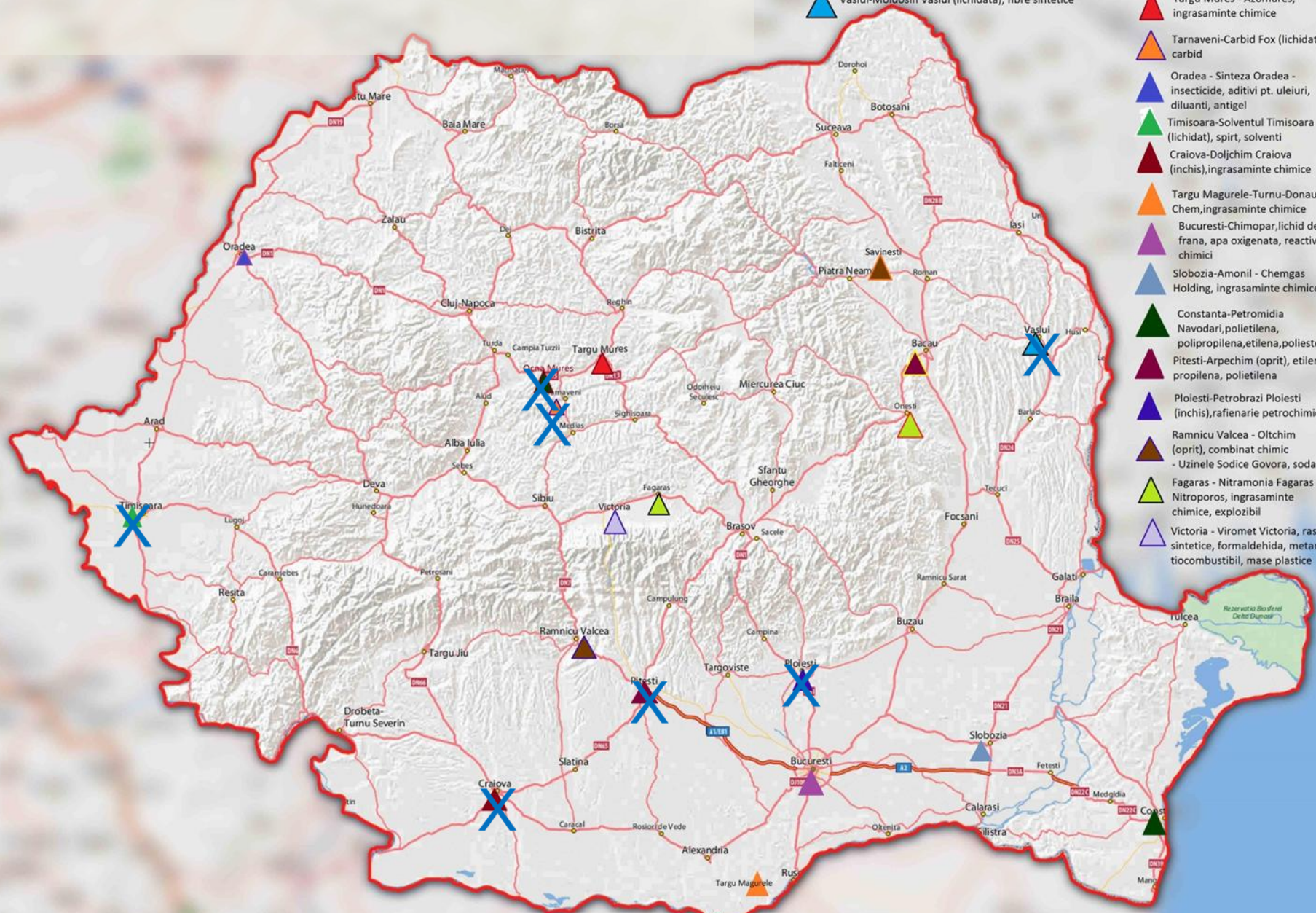




# Chemical industry in 2018

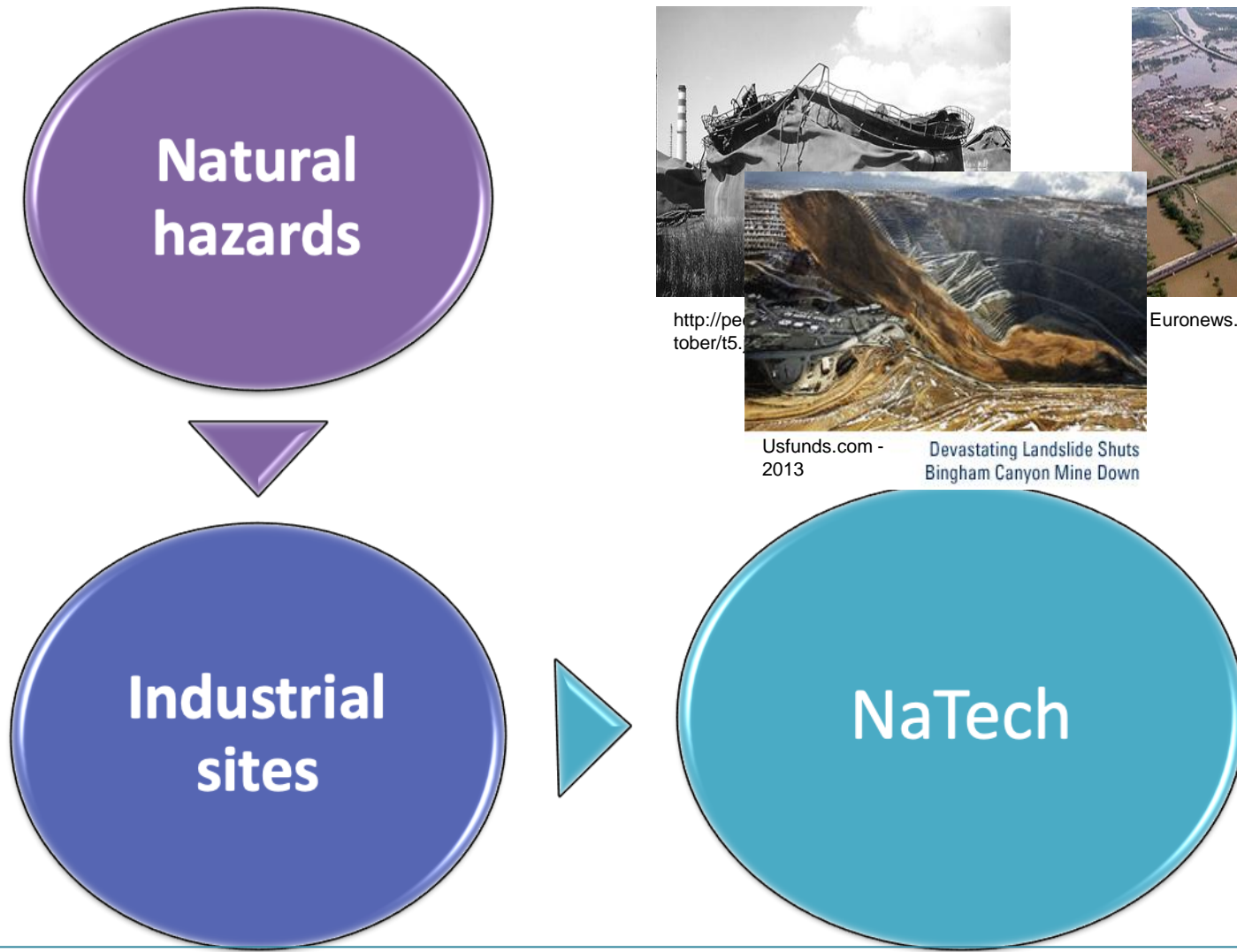
Legenda :

- ▲ Onesti - Carom Onesti (faliment),cauciuc sintetic  
- Chimcomplex Borzesti, soda caustica, solventi organici, ierbicide, fungicide
- ▲ Savinesti - Azochim Savinesti-Ga-Pro-Co, ingrasaminte azotoase; - Fibrex Savinesti, fibre si fire sintetice
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- ▲ Ramnicu Valcea - Oltchim (oprit), combinat chimic
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# Natural hazards and industrial sites



<http://pe.tober/t5>



Euronews.com



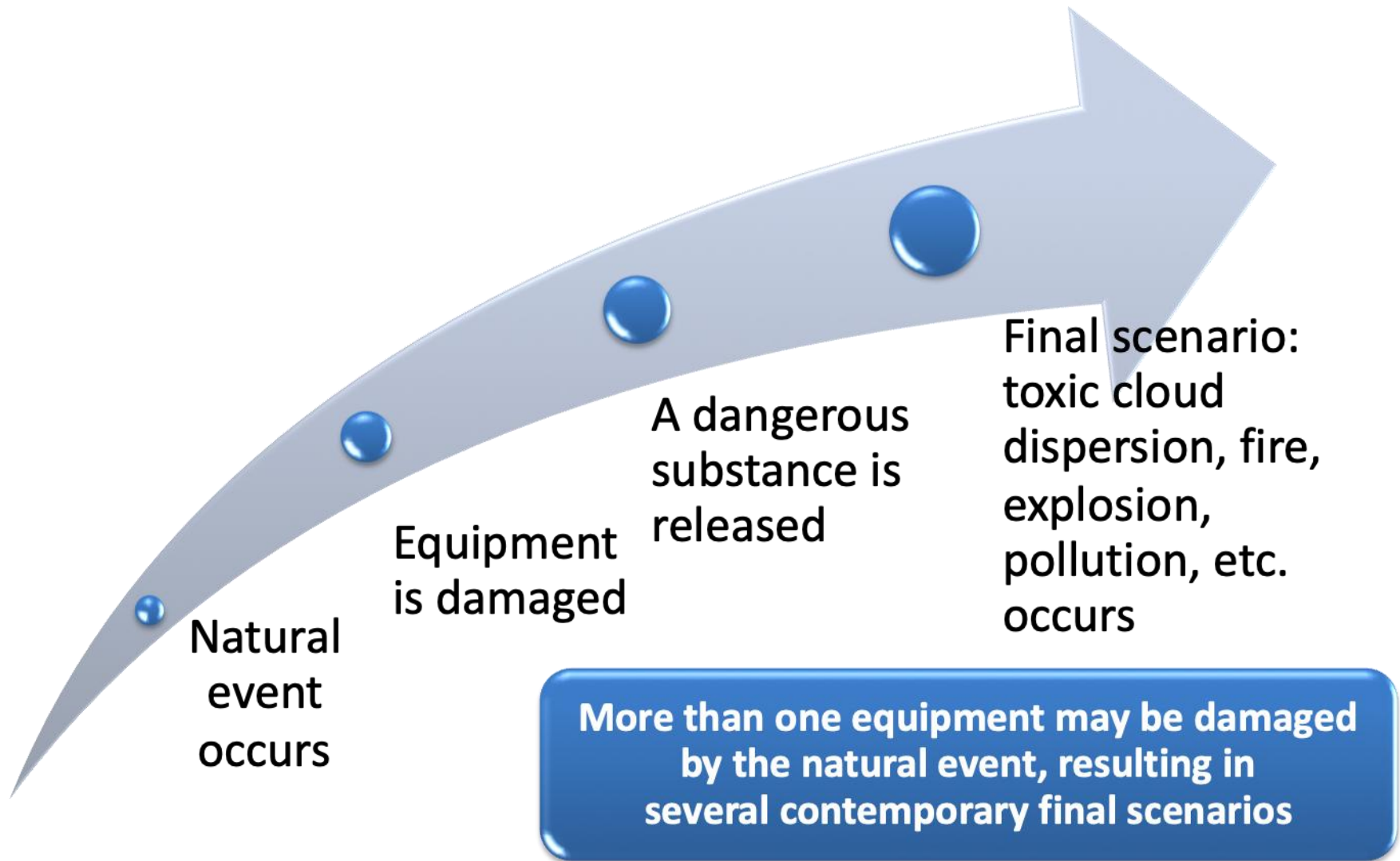
Usfunds.com - 2013

Devastating Landslide Shuts Bingham Canyon Mine Down



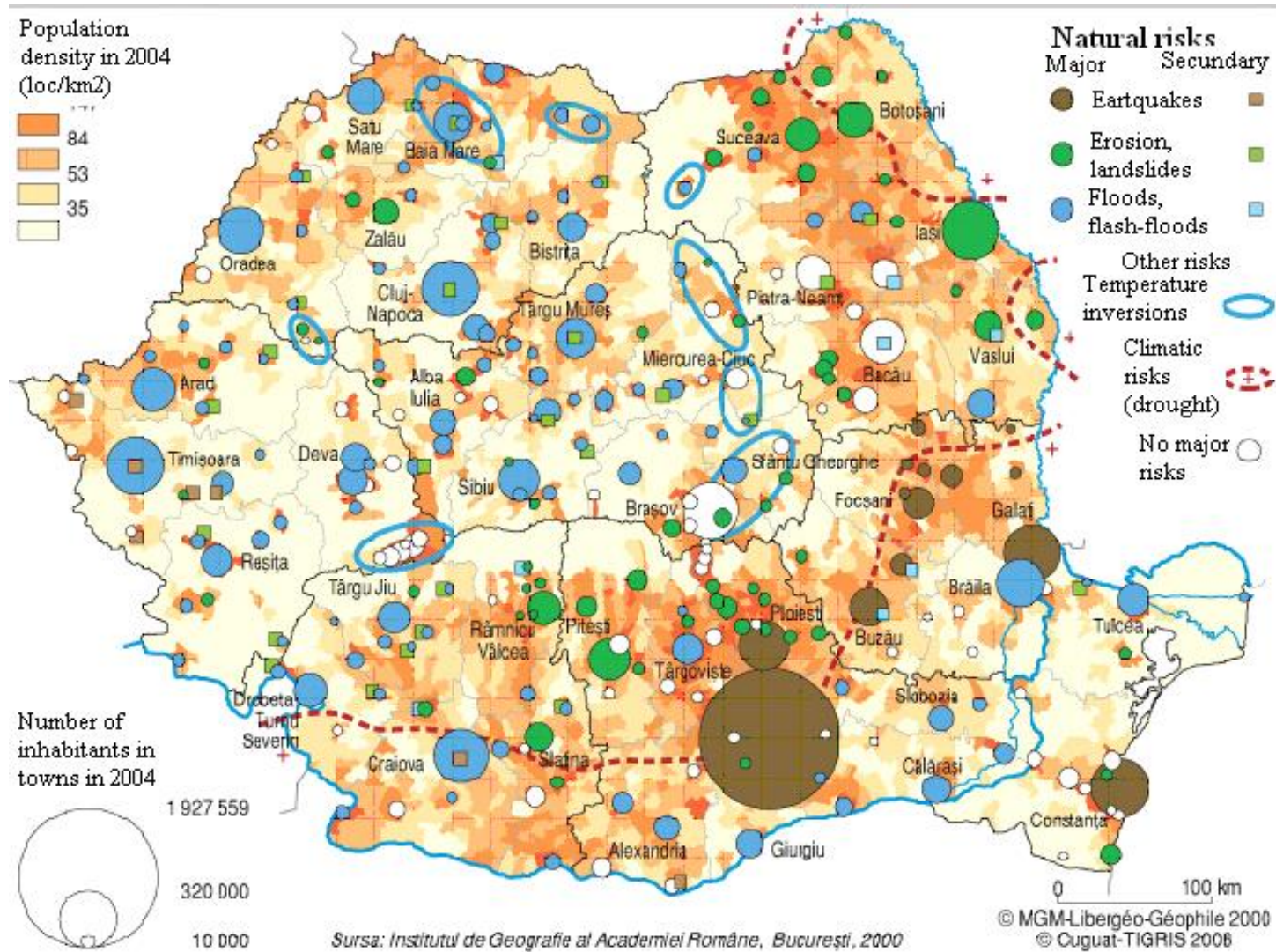
Perthnow.com.au

# Natural hazards and industrial sites

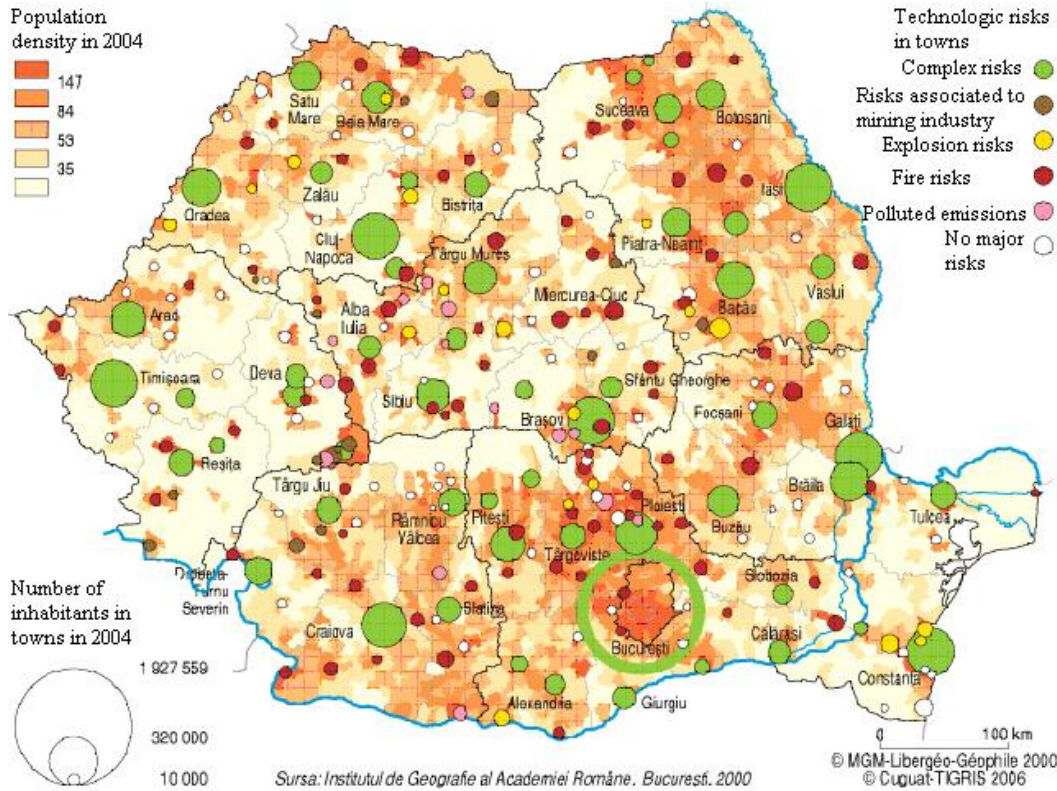




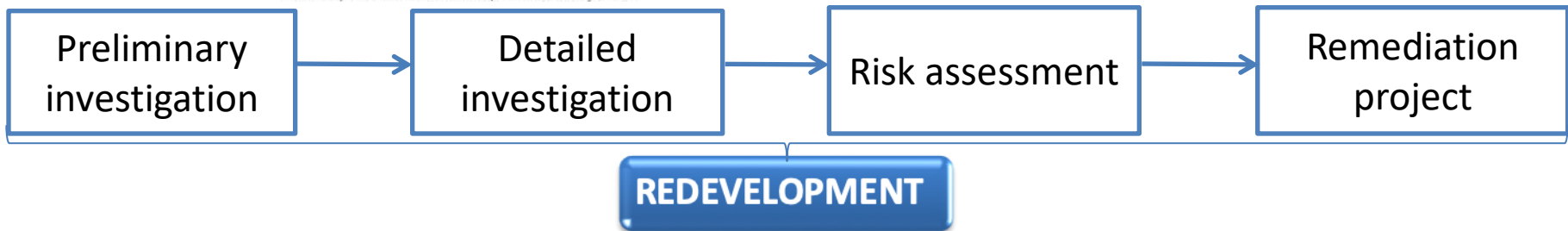
# Significant natural hazards connected to the industrial sites



# Industrial Contaminated Sites Management



Major technologic risks in Romania (mining, chemical industry etc.)



Stezar I.C., Ozunu A., Barry D.L., 2014, The role of stakeholder attitudes in managing contaminated sites: Survey of Romanian stakeholder awareness, ISSN 0944-1344, Volume 21, Number 1, Environ Sci Pollut Res (2014) 21:787-800, DOI 10.1007/s11356-013-2238-0,

Olah (Vasile) A., Stezar I.C., Török Z., Ozunu A., 2013, Soil remediation comparative analysis on two historically contaminated industrial sites in Romania. AES Bioflux 5(2):178-188, BDI indexed CABI, CNCIS B+,

Stezar I.C., Modoi O.C., Coşara Gh.V., Torok Z., Ajtai N., Crisan A.D., Senzaconi F., Ozunu A., 2011, Preliminary investigation and risk assessment of contamination on an industrial site in Maramures County, Env. Eng. Man. J., Vol.10, No. 1, 65-73, Iaşi, ISSN 1582-9596.



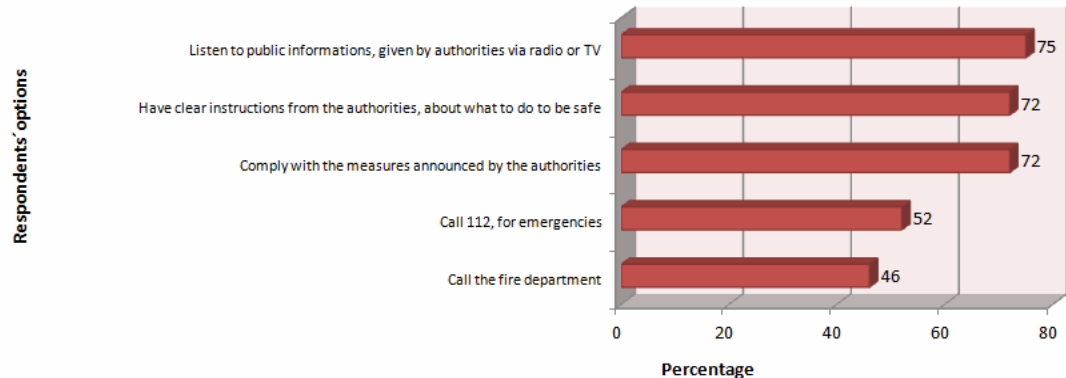
# National risk assessment: RO-RISK project- SIPOCA 30

- Direct link: [www.ro-risk.ro](http://www.ro-risk.ro)
- Project co-funded by the European Social Fund under the Operational Programme Administrative Capacity
- Total value of the project: 7,683,332 USD
- Main coordinator: General Inspectorate for Emergency Situations
- 13 partner institutions
- UBB assessed risks:
  - [Major industrial accidents involving dangerous substances \(SEVESO accidents\)](#)
  - [Major transportation accidents involving dangerous goods](#)

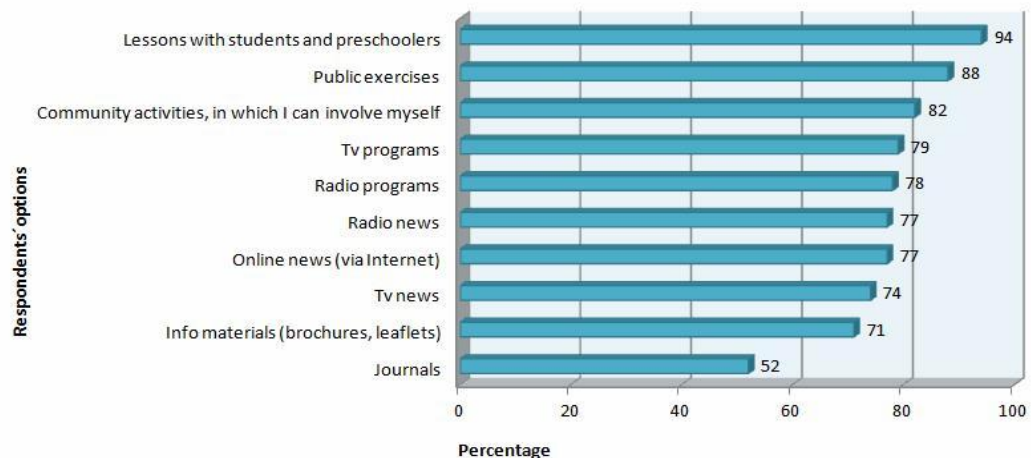


# Safety education

- the effectiveness of an emergency response depends on how well the population is informed and prepared to respond to the demands of the authorities.
- preparedness of the population refers to the training and acquiring of emergency response methods aiming at protecting the population, its property and the environment



## Actions considered most useful after a disaster



## Means of information considered effective for natural disaster preparedness





UBB



College of  
Environmental  
Science and  
Engineering

"Development of Research Infrastructure for HPC-Based Disaster Management" – MADECIP, SMIS CODE 48801/1862, co-financed by the European Union through the European Regional Development Fund.

# ISUMADECIP

Research Institute for Sustainability and Disaster Management based on High Performance Computing



# ISUMADECIP Consortium



## 9 Faculties within Babeş-Bolyai University:



Faculty of Environmental Science and Engineering



Faculty of Economics and Business Administration



Faculty of Mathematics and Informatics



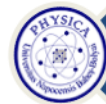
Faculty of Political, Administrative and Communication Sciences



Faculty of Geography



Faculty of Chemistry and Chemical Engineering



Faculty of Physics



Faculty of Biology and Geology



Faculty of Business



# New research centers



**Training Centre  
for Disaster  
Management**



**Modeling,  
Optimization  
and Simulation  
Center  
(MOS)**



**High  
Performance  
Computing  
Center  
(HPC)**

# Our main research fields

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- Natural and technological disaster management
- Modeling, optimization and simulation of environmental processes
- High performance computing
- Remote sensing and climate change research
- Climate change and "green" energy
- Sustainable Transport
- Sustainable economic development - economic growth and resource management
- Natural resource conservation and management
- Regional Development, sustainable and resilient regions
- Risk and disaster communication



# Practical activities for students

## “Risk Assessment and Environmental Safety” master programme



# Practical activities for students

## “Risk Assessment and Environmental Safety” master programme





# Future directions

- Safety education may be improved by implementing strategies and programs that cover the entire population.
- Trainings should be conducted through practical and attractive exercises, in which the population is directly involved.

# Conclusions

- importance of education at all levels,
  - appropriate educational curriculum,
  - engaging in voluntary activities
- 
- integration of educational objectives with other major national targets orientated towards sustainable development



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