SAVARe
Pozavarovalnica Sava, d. d.

Dr. Janez Komelj

Reinsurance of catastrophe risks in Slovenia

Aranđelovac, June 5, 2015

Definitions and criterions of a catastrophe/disaster

Qualitative definition (United Nations)

A catastrophe is a serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources.

Quantitative definition (Centre for Research on the Epideomology of Disasters)

An event is classified as a disaster if at least 10 people are killed and/or 100 or more are affected and/or an appeal for international assistance is made or a state of emergency declared.

Quantitative criterion (European Union Solidarity Fund)

A natural disaster is considered as "major" if it results in damage on the State's territory estimated either at over EUR 3 billion (2011 prices), or at more than 0.6% of its gross national income. A regional natural disaster is also defined, namely as any natural disaster that results in direct damage in excess of 1.5% of that region's gross domestic product (GDP). In the case of outermost regions, this threshold is set at 1% of the regional GDP.

Slovenia's exposure to natural disasters

Long-term statistics

- Slovenia is exposed to floods, earthquakes, landslides and snowslides, falls of ground and slumps, drought and frost, lightning and wildfires, hail and storms, but is not exposed to some other natural disasters, e.g. volcanic eruptions.
- Taking a period longer than just a couple of years in which all types of natural disasters can be expected, however not all major ones, we can see that Slovenia is mainly threatened by earthquakes and floods.
- Storms and hail also occur but do not cause such damage as tornadoes, hurricanes and more violent storms that tend to occur in other parts of the world.
- Agriculture is also threatened by drought, which, however, is not geographically limited as hail and therefore not yet insurable in Slovenia.
- Annual losses from natural disasters in Slovenia represent around 3% of GDP in years without a major natural disaster.
- Material losses are usually very high, but luckily human losses are not.
- An analysis of newspaper reports from the mid-nineteenth century to the present day shows that the majority of deaths were caused by snowslides (37%) and earthquakes (30%), lightning (13%), floods (12%), storms (6%) and other natural disasters (2%).

Insured and uninsured loss

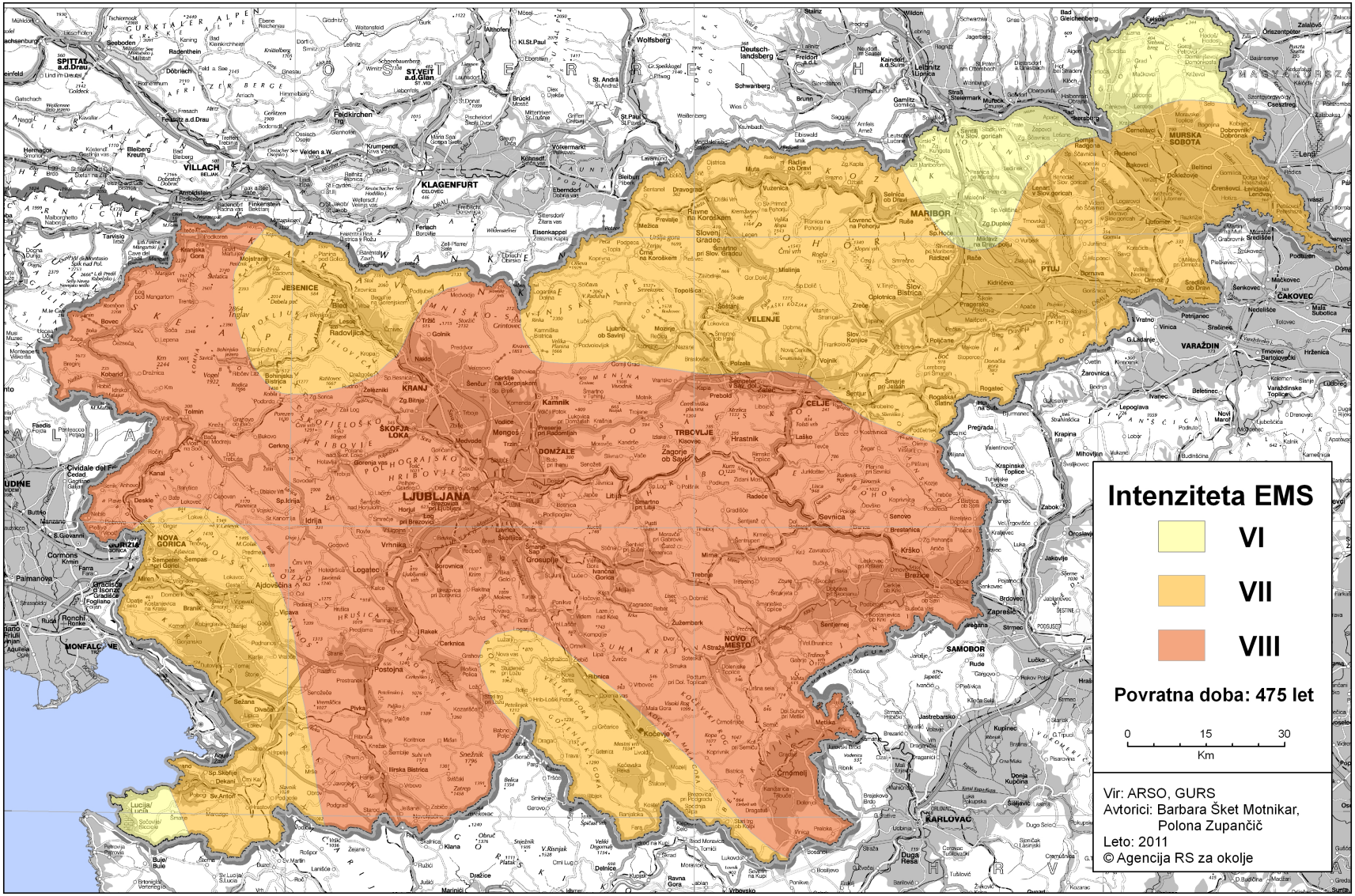
Limitations of insurance

There is no insurance cover against some natural perils and/or for some types of objects. But although many objects could be insured, they are not.

Example: The catastrophic glazed frost of January and February 2014

- The catastrophic glazed frost hit the entire Slovenia except for the Prekmurje and Primorska regions and damaged energy infrastructure, leaving some 250,000 people without power also for a week or even more.
- Direct losses reached almost EUR 430 million:
  - 13 million was damage to listed buildings and other property
  - 43 million to the economy
  - 9 million to state roads
  - 80 million to energy infrastructure
  - 3 million to listed parks, gardens and tree-lined roads
  - 41 million to rail infrastructure
  - 214 million to forests and forest roads
  - 27 million to water courses
- Losses suffered by the biggest four insurance companies holding a 78% share of the non-life market was slightly less than EUR 32 million or only 7.4% of total damage.
- Losses exceeded double the assistance threshold of EUR 209.6 million, which means that Slovenia will obtain EUR 18.4 million from the European Union Solidarity Fund.

Exposure to earthquake



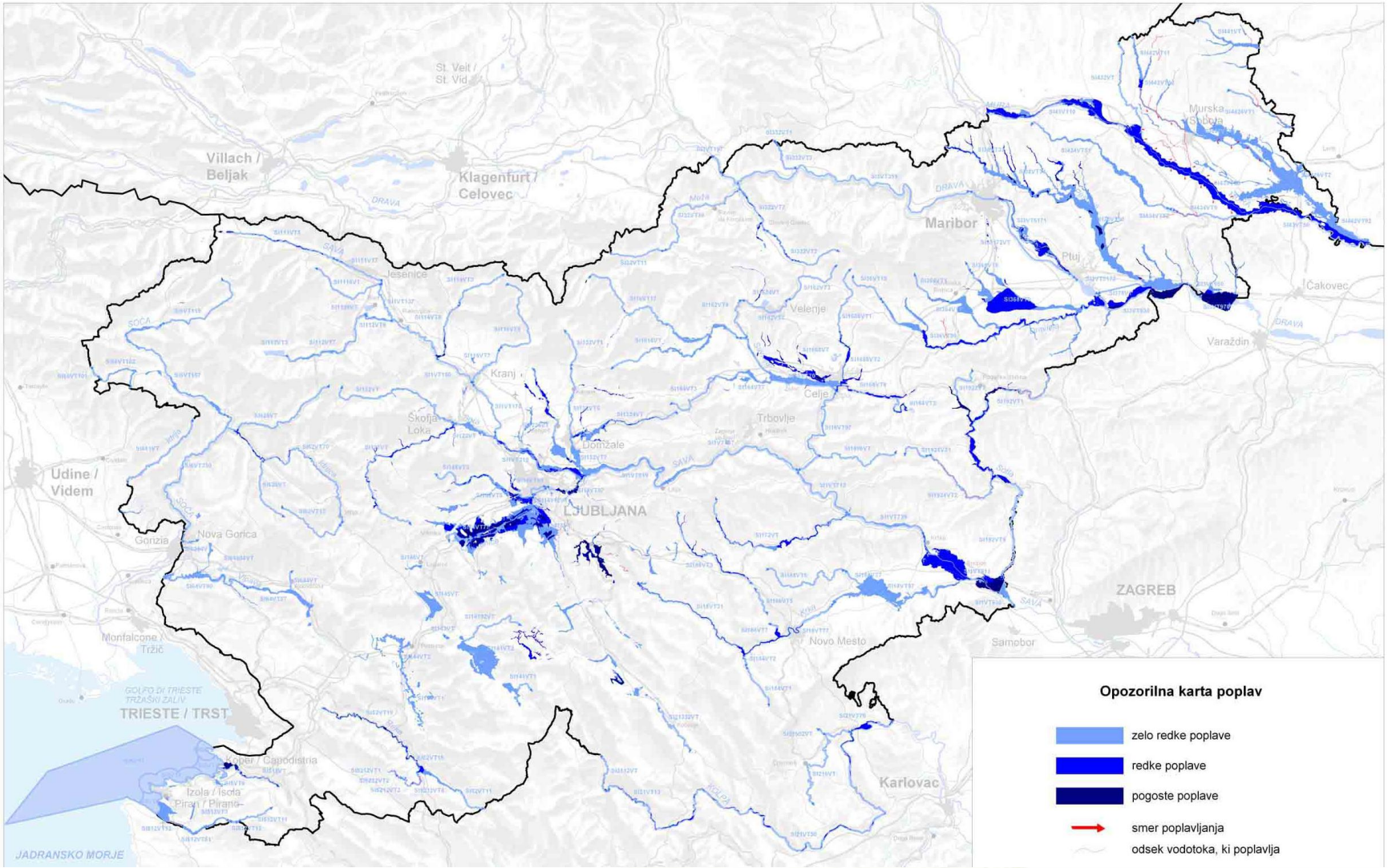
Source: Slovenian Environment Agency

Historic earthquakes in Slovenia

Slovenia has been hit with X EMS earthquake

- The strongest earthquake to hit Slovenia's ethnic territory and the entire Central Europe was the 1348 earthquake near Villach. It had an intensity level of X EMS (IX EMS in the present Slovenia's territory).
- In the present Slovenia's territory, the strongest earthquake had an intensity level of X EMS and happened in 1511 near Idrija.
- The best-known earthquake had a magnitude of 6.1 and an intensity level between VIII and IX EMS and happened in 1895 in Ljubljana.
- The two 1976 earthquakes that took place in the Italian region of Friuli and affected also Posočje in Slovenia had an intensity level between IX and X and IX EMS respectively (between VIII and IX and VIII EMS respectively in Slovenia) and a magnitude of 6.5 and 5.9 respectively.
- Posočje was hit again in 1998 by an earthquake with a magnitude of 5.7 and an EMS level between VII and VIII, and then again in 2004 by an earthquake with a magnitude of 4.9 and an intensity level between VI and VII EMS.

Exposure to flood



Source: Institute for Water of the Republic of Slovenia

Exposure to flood and historic floods

Exposure to flood

- The area threatened by floods with a two- to five-year return period is 65 km^2, while the area threatened by floods with a 20- to 50-year and over 50-year return period is 192 km^2 and 731 km^2 respectively.
- The majority of flood-threatened area are narrow valley bottoms alongside torrents and built-up alluvial plains, and, consequently, more than 3,000 km^2 or almost 15% of Slovenia's territory is flood-threatened.
- Of this area, 50% and 40% is in the Sava river and Drava river basin respectively, and 4% is in the Soča river basin.
- Flood risk is very high in the southern part of Ljubljana, which lies in the northern part of Ljubljana marshes.

Historic floods in Slovenia

- In the 20th century, Slovenia experienced catastrophic floods in 1901, 1910, 1923, 1925, 1926, 1933, 1954, 1972, 1990, 1998 and 2000.
- In the 21st century, catastrophic floods hit the country in 2004 (and caused losses of EUR 11 million), 2007 (EUR 81 million), 2009 (EUR 25 million), 2010 (EUR 225 million), 2012 (EUR 373 million) and 2014, when it was hit by three major floods causing total direct losses of EUR 227 million (VAT excluded).

Protection against natural perils

Earthquake insurance

- 4 tariff zones and 11 accumulation zones.
- Residential, commercial and industrial property risks.
- Deductibles 2%, 5% or 10% of the sum insured.
- Premiums are lower for the buildings constructed after 1964.

Flood insurance

- Additional peril – a specific agreement and an additional premium payment.
- Flood insurance is typically first loss insurance, the premium depending on the flood risk – geographic areas are classified into three flooding classes.
- Covered by 50% of residential insurance policies, by 5% of commercial insurance policies and by 10% of industrial insurance policies.

Reinsurance

- This would usually be a combination of a proportional reinsurance with an excess of loss cover triggered "per event".

Modelling of natural perils-related losses

Available modells

- Slovenian (re)insurance companies alone are not capable of developing a good earthquake or flooding model for Slovenia.
- There are two specific providers of earthquake models, RMS (Risk Management Solutions) and AIR Worldwide, and none for flooding models.
- Slovenian insurance companies have their aggregate PML calculated (based on the data collected) by foreign reinsurance companies and brokers, such as Munich Re, Aon Benfield and Guy Carpenter using the RMS or AIR model or their own model.
- The results obtained based on the same input data but using different models can significantly differ.

Example: Earthquake PML for Slovenia

- We combined gross PMLs for earthquake insurance of Zavarovalnica Triglav, Zavarovalnica Maribor and Tilia, as calculated by foreign reinsurance companies or brokers using their own models.
- For the return periods of 100, 250, 500 and 1,000 years we obtained gross PMLs of 0.35%, 0.77%, 1.37% and 2.71% of the total EUR 26.1 billion exposure.

Earthquake – annual exceedance probability curve