

MATJAŽ MIKOŠ, UNIVERSITY OF LJUBLJANA, SLOVENIA



United Nations
Educational, Scientific and
Cultural Organization



Univerza v Ljubljani



- UNESCO Chair on
- Water-related Disaster Risk Reduction
- University of Ljubljana, Ljubljana, Slovenia

WRDRR Chair and its recent activities





PRESENTATION OUTLINE

- UNESCO WRDRR Chair Past and Current Activities
 - UNESCO WCDRR Chair Targets
 - Conclusions

WCDRR Activities I



ULFGG Chair of Hydrology and Hydraulic Engineering was supporting UNESCO IHP activities for decades – applied hydrological studies: flood hazards & risks, statistical hydrology, and contributed especially by field work in experimental river basins: hydrometeorology (interception studies, rainfall erosivity, soil erosion), sediment transport (turbidity, suspended loads, granulometry,...), landslide hydrology, ...



Šraj et al. (2016): „Review of Hydrological Studies Contributing to the Advancement of Hydrological Sciences in Slovenia“, Acta hydrotechnica, 29/50, 47-71. (available: <ftp://ksh.fgg.uni-lj.si/acta/a29ms.pdf>)

WCDRR Activities II



- ❑ **COST ES0901: European procedures for flood frequency estimation (2010-2015).**
- ❑ **Past multilateral cooperation in the Sava River and the Danube River basins.**
- ❑ **International Sava River Basin Commission (ISRBC) – Estimation of Sediment Balance for the Sava River (2014) & Establishment of the Sediment Monitoring System for the Sava River Basin (2015).**
- ❑ **Hydrological Study of the Mura River (2012) & Study on Climate Change Impact on Flood Hazard in the Sava River Basin (2015).**

Brilly et al. (2015): „Climate Change Impact on Flood Hazard in the Sava River Basin“, In: R. Milačić et al. (eds.): „The Sava River“, 27-52, Springer Verlag, doi: 10.1007/978-3-662-44034-6_2

- ❑ **The project NACER (Settlements & Corine Entity Results - Naselja & Corine Entitetski Rezultat) for Hrvatske vode, Croatia (2017).**

Zabret et al (2018): „Development of model for the estimation of direct flood damage including the movable property“. Journal of flood risk management, 11(S1), 527-540, doi: 10.1111/jfr3.12255

- ❑ **Flood Event Analysis in May 2014 in Bosnia and Herzegovina for the Bosna River in the Context of Supplementary Aid of the Republic of Slovenia (2014).**

Kobold et al. (2015): „Development of the hydrological model for the Bosna River basin to simulate the flood event in May 2014 in Bosnia and Herzegovina“, Acta hydrotechnica, 28/49, 77-100, <ftp://ksh.fgg.uni-lj.si/acta/a49mk.pdf>.

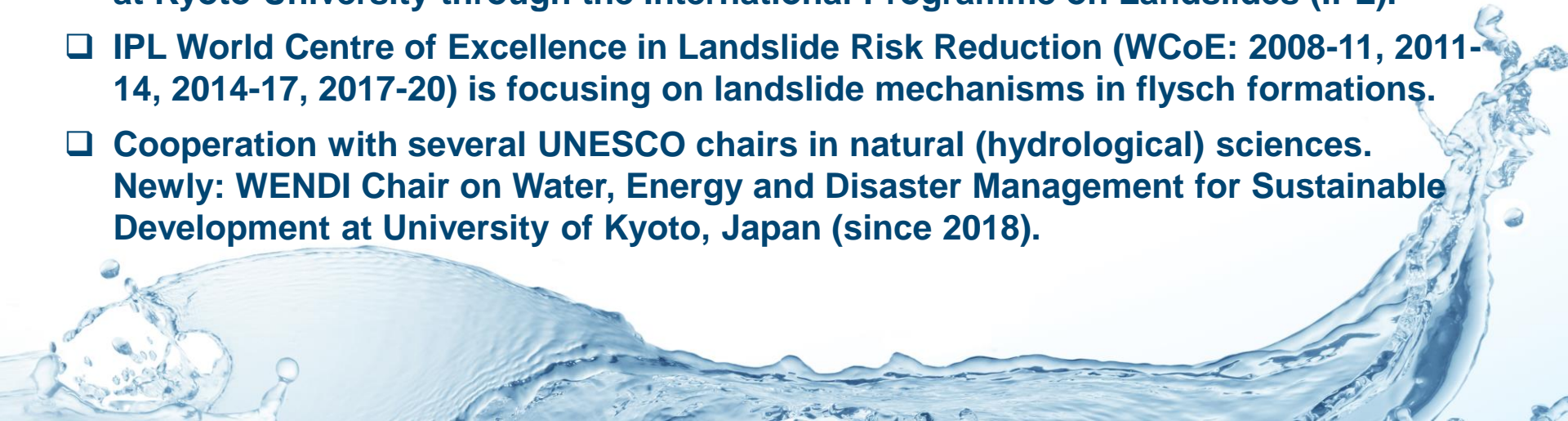
Kobold et al. (2015): „Hydrological analysis of catastrophic flood that struck Bosnia and Herzegovina in May 2014“, UJMA, 29, 252-263, http://www.sos112.si/slo/tdocs/ujma/2015/252_263.pdf.

Vidmar et al. (2016): „The Bosna River floods in May 2014“, NHESS, 16(10), 2235-2246, doi: [10.5194/nhess-16-2235-2016](https://doi.org/10.5194/nhess-16-2235-2016).

WCDRR Activities III



- ❑ Research Programme „Water Science and Technology & Geotechnical Eng.“ (since 2004) financed by Slovenian Research Agency (ARRS).
- ❑ ARRS project in debris-flow triggering mechanisms and modelling (2017-20).
- ❑ ARRS project on modelling of hydrological responses of non-homogenous catchments (2016-18).
- ❑ ARRS project on resilience of Alpine environment from the natural hazards perspective (2014-2017).
- ❑ ARRS project on developing of a unified method for estimation of cost-benefit of structural and non-structural measures for flood risk reduction (2018-19).
- ❑ Cooperation with UNITWIN Landslide and Water-related Disaster Risk Management at Kyoto University through the International Programme on Landslides (IPL).
- ❑ IPL World Centre of Excellence in Landslide Risk Reduction (WCoE: 2008-11, 2011-14, 2014-17, 2017-20) is focusing on landslide mechanisms in flysch formations.
- ❑ Cooperation with several UNESCO chairs in natural (hydrological) sciences. Newly: WENDI Chair on Water, Energy and Disaster Management for Sustainable Development at University of Kyoto, Japan (since 2018).



WCDRR Activities IV



This 2-year Master Programme (in 2011-2017 over 100 MSc; now new for 2019-2024) follows the holistic approach and is explicitly designed to cover a wide range of topics – from drivers and natural processes to different models, decisions and socio-economic consequences and institutional environment, and is therefore an important advance in water education for Europe.

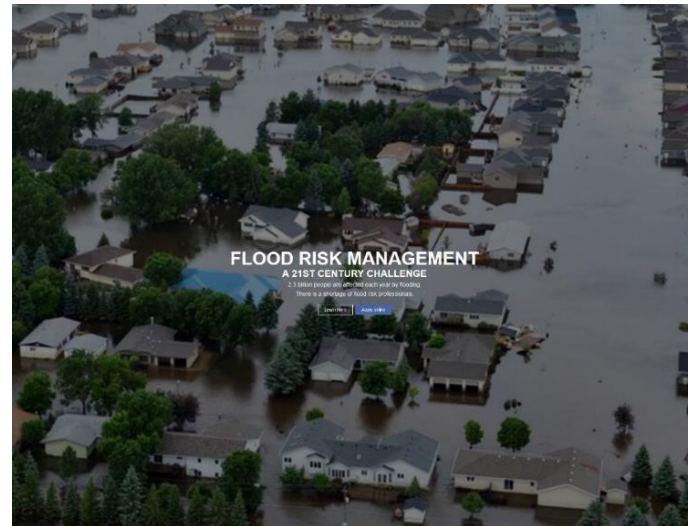
Partners:

TU Dresden, Germany

IHE Delft, Netherlands

TU Catalonia, Barcelona, Spain

University of Ljubljana, Slovenia



<http://www.floodriskmaster.org/>

WCDRR Activities V



4th World Landslide Forum (May 29 - June 2, 2017, Ljubljana)



www.wlf4.org

3rd Regional Symposium on Landslides
in the Adriatic-Balkan Region (October
11 – 13, 2017, Ljubljana)

World Construction Forum (April 8 – 11, 2019, Ljubljana)



www.wcf2019.org

WCDRR Targets I



WRDRR Chair is targeting below shown 4 SDGs.

Therefore, we are networking with other UNESCO Chairs in related fields – technical & natural sciences: U Brescia (Italy), U Florence (Italy), U Kyoto (Japan).

This year, at IHP meeting in Paris we launched the More-Room-for-Water (MR4W) Initiative that is in line with the world-wide efforts to reach four of Sustainable Development Goals till 2030 and by Building Back Better (BBB) approach.

The idea is to give (back) more space for natural processes – through spatial planning procedures, and by nature-based solutions in order to increase society resilience against water hazards and to contribute to sustainable development.



<https://sustainabledevelopment.un.org/sdgs>

WRDRR Targets I

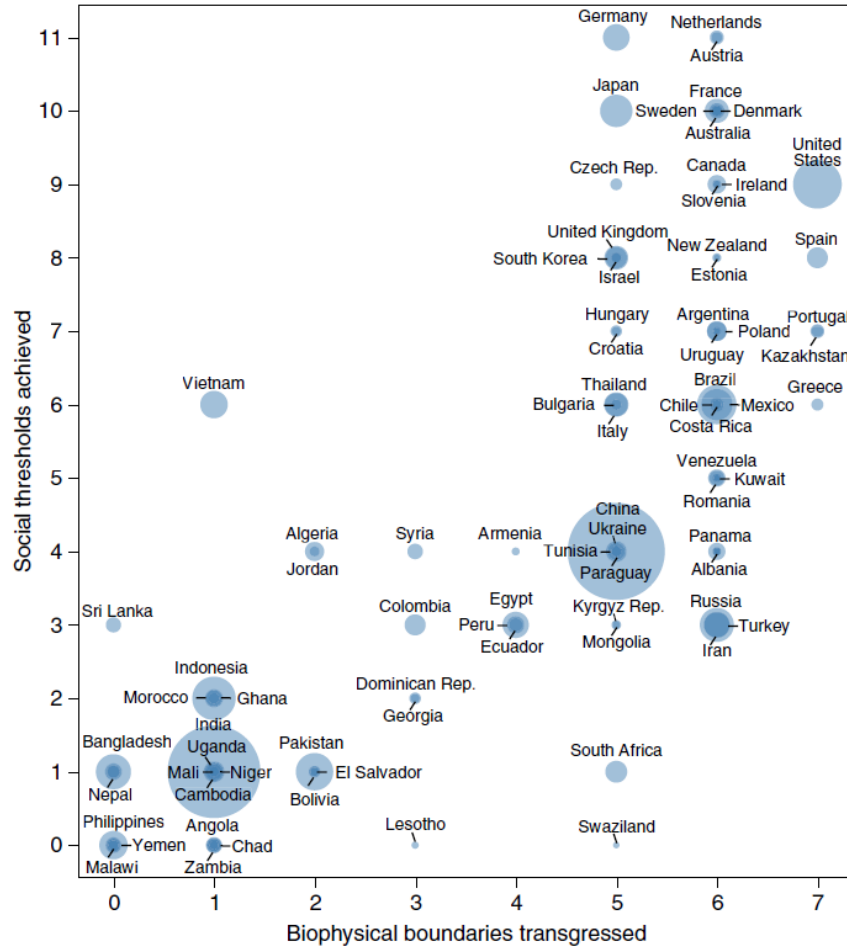


Table 2 | Country performance with respect to social thresholds

Social indicator	N	Threshold	Countries above threshold (%)
Life satisfaction	134	6.5 on 0-10 Cantril ladder scale	25
Healthy life expectancy	134	65 years	40
Nutrition	144	2,700 kilocalories per person per day	59
Sanitation	141	95% of people have access to improved sanitation facilities	37
Income	106	95% of people earn above US\$1.90 a day	68
Access to energy	151	95% of people have electricity access	59
Education	117	95% enrolment in secondary school	37
Social support	133	90% of people have friends or family they can depend on	26
Democratic quality	134	0.80 (approximate US/UK value)	18
Equality	133	70 on 0-100 scale (Gini index of 0.30)	16
Employment	151	94% employed (6% unemployment)	38

Table 1 | Country performance with respect to per capita biophysical boundaries

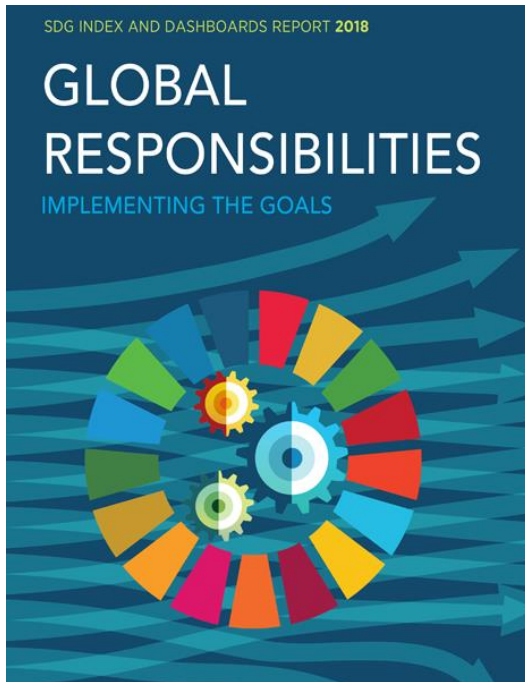
Biophysical indicator	N	Planetary boundary	Per capita boundary	Countries within boundary (%)
CO ₂ emissions	145	2°C warming	1.61 t CO ₂ yr ⁻¹	34
Phosphorus	144	6.2 Tg P yr ⁻¹	0.89 kg P yr ⁻¹	44
Nitrogen	144	62 Tg N yr ⁻¹	8.9 kg N yr ⁻¹	45
Blue water	141	4,000 km ³ yr ⁻¹	574 m ³ yr ⁻¹	84
eHANPP	150	18.2 Gt C yr ⁻¹	2.62 t C yr ⁻¹	44
Ecological footprint	149		1.72 gha yr ⁻¹	43
Material footprint	144		7.2 t yr ⁻¹	44

N is the number of countries.

Fig. 2 | Number of social thresholds achieved versus number of biophysical boundaries transgressed for different countries (scaled by population). Ideally, countries would be located in the top-left corner. Only countries with data for all 7 biophysical indicators and at least 10 of the 11 social indicators are shown (N=109).

O'Neill et al.: A good life for all within planetary boundaries. *Nature Sustainability* 1, 88-95, 2018.

WRDRR Targets II – SDG Dashboard Report 2018



On track for the global goals:

Which country performs best to achieve the Sustainable Development Goals by 2030?



The Scores represent the overall rankings from the SDG-Index (157 country's) for individual countries. 100 is the maximum score.



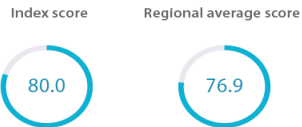
BertelsmannStiftung

WRDRR Targets I – SDG Index

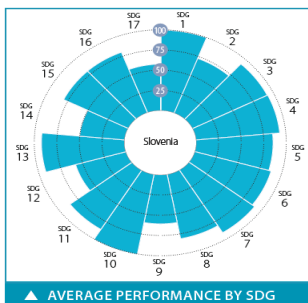


SLOVENIA
OECD Countries

OVERALL PERFORMANCE



SDG Global rank
8 (of 156)



SLOVENIA

Performance by Indicator

Indicator	Value	Rating	Trend	Value	Rating	Trend
SDG1 – End Poverty						
Poverty headcount ratio at \$1.90/day (% population)	0.2	●	→	4.6	●	→
Projected poverty headcount ratio at \$1.90/day in 2030 (% population)	0.2	●	→	3.2	●	→
Poverty rate after taxes and transfers, poverty line 50% (population)	9.2	●	→	26.1	●	→
SDG2 – Zero Hunger						
Prevalence of undernourishment (% population)	2.5	●	→	1.6	●	→
Prevalence of stunting (low height-for-age) in children under 5 years of age (%)	2.6	●	→	2.2	●	→
Prevalence of wasting in children under 5 years of age (%)	0.7	●	→	8.4	●	→
Prevalence of obesity, BMI ≥ 30 (per adult population)	20.2	●	→	4.9	●	→
Cereal yield (t/ha)	6.5	●	→	69.4	●	→
Sustainable Nitrogen Management Index	0.8	●	→	31.1	●	→
SDG3 – Good Health and Well-Being						
Maternal mortality rate (per 100,000 live births)	9.0	●	→	27.5	●	→
Neonatal mortality rate (per 1,000 live births)	1.3	●	→	0.8	●	→
Mortality rate, under-5 (per 1,000 live births)	2.3	●	→	13.5	●	→
Incidence of tuberculosis (per 100,000 population)	6.5	●	→	20.3	●	→
HIV prevalence (per 1,000)	0.0	●	→	67.0	●	→
Age-standardised death rate due to cardiovascular disease, cancer, diabetes, and chronic respiratory disease in populations age 30–70 years (per 100,000 population)	13.2	●	→	5.9	●	→
Age-standardised death rate attributable to household air pollution and ambient air pollution (per 100,000 population)	20.4	●	→	15.0	●	→
Traffic deaths rate (per 100,000 population)	6.5	●	→	34.7	●	→
Healthy Life Expectancy at birth (years)	80.8	●	→	8.1	●	→
Adolescent fertility rate (births per 1,000 women ages 15-19)	4.3	●	→	17.4	●	→
Births attended by skilled health personnel (%)	99.8	●	→	34.7	●	→
Surviving infants who received 2 WHO-recommended vaccines (%)	92.0	●	→	125.0	●	→
Universal Health Coverage Tracer Index (0-100)	80.5	●	→	0.7	●	→
Subjective Wellbeing (average ladder score, 0-10)	6.2	●	→	6.2	●	→
Gap in life expectancy at birth among regions (years)	2.2	●	→	1.4	●	→
Gap in self-reported health by income (0-100)	20.8	●	→	450.5	●	→
Daily smokers (% population age 15+)	18.9	●	→	23.3	●	→
SDG4 – Quality Education						
Net primary enrolment rate (%)	97.8	●	→	6.0	●	→
Mean years of schooling	12.1	●	→	23.3	●	→
Literacy rate of 15-24 year olds, both sexes (%)	NA	●	→	13.5	●	→
Population age 25-64 with tertiary education (%)	38.7	●	→	15.0	●	→
PISA score (0-400)	509.3	●	→	34.6	●	→
Variation in science performance explained by students' socio-economic status (%)	13.5	●	→	10.0	●	→
Students performing below level 2 in science (%)	15.0	●	→	97.5	●	→
Resident students (%)	34.6	●	→	85.0	●	→
SDG5 – Gender Equality						
Unmet demand for contraception, estimated (% women married or in union, ages 15-49)	10.0	●	→	36.7	●	→
Female to male labour force participation rate (%)	97.5	●	→	5.0	●	→
Female to male mean years of schooling, population age 25+ (%)	85.0	●	→	98.0	●	→
Seats held by women in national parliaments (%)	36.7	●	→	NA	●	→
Gender wage gap (total % male median wage)	5.0	●	→	75.7	●	→
SDG6 – Clean Water and Sanitation						
High-income countries: population using safely managed water services (%)	98.0	●	→	NA	●	→
Other countries: population using at least basic drinking water services (%)	NA	●	→	75.7	●	→
High-income countries: population using safely managed sanitation services (%)	75.7	●	→	NA	●	→
Other countries: population using at least basic sanitation services (%)	NA	●	→	61.1	●	→
Freshwater withdrawal as % total renewable water resources	61.1	●	→	91	●	→
Imported groundwater depletion (m ³ /year/capita)	91	●	→	100.0	●	→
SDG7 – Affordable and Clean Energy						
Access to electricity (% population)	100.0	●	→	98.2	●	→
Access to clean fuels & technology for cooking (% population)	98.2	●	→	0.9	●	→
CO ₂ emissions from fuel combustion / electricity output (MCO ₂ /TWh)	0.9	●	→	20.9	●	→
Share of renewable energy in total final energy consumption (%)	20.9	●	→	-1.2	●	→
SDG8 – Decent Work and Economic Growth						
Adjusted Growth (%)	-1.2	●	→	80.0	●	→
Slavery score (0-100)	80.0	●	→	97.5	●	→
Adults (15 years+) with an account at a bank or other financial institution or with a mobile-money-service provider (%)	97.5	●	→	11.6	●	→
Employment-to-population ratio (%)	69.3	●	→	75.5	●	→
Youth not in employment, education or training (NEET) (%)	11.6	●	→	62.3	●	→
SDG9 – Industry, Innovation and Infrastructure						
Proportion of the population using the internet (%)	75.5	●	→			
Mobile broadband subscriptions (per 100 inhabitants)	62.3	●	→			
SDG10 – Reduced Inequalities						
Quality of overall infrastructure (1=extremely underdeveloped; 7=extensive and efficient by international standards)	4.6	●	→			
Logistics performance index: Quality of trade and transport-related infrastructure (1=low to 5=high)	3.2	●	→			
The Times Higher Education Universities Ranking, Average score of top 3 universities (0-100)	26.1	●	→			
Number of scientific and technical journal articles (per 1,000 population)	1.6	●	→			
Research and development expenditure (% GDP)	2.2	●	→			
Research and development researchers (per 1,000 employed)	8.4	●	→			
Patent families filed (per million population)	4.9	●	→			
Gap in internet access by income (%)	69.4	●	→			
Women in science and engineering (%)	31.1	●	→			
SDG11 – Sustainable Cities and Communities						
Annual mean concentration of particulate matter of less than 2.5 microns of diameter (PM _{2.5}) in urban areas (µg/m ³)	20.3	●	→			
Improved water source, piped (in urban population with access)	99.3	●	→			
Satisfaction with public transport (%)	67.0	●	→			
Rent overburden rate (%)	5.9	●	→			
SDG12 – Responsible Consumption and Production						
E-waste generated (kg/capita)	15.0	●	→			
Anthropogenic wastewater that receives treatment (%)	34.7	●	→			
Production-based SO ₂ emissions (kg/capita)	8.1	●	→			
Net imported SO ₂ emissions (kg/capita)	17.4	●	→			
Reactive nitrogen production footprint (kg/capita)	34.7	●	→			
Net imported emissions of reactive nitrogen (kg/capita)	125.0	●	→			
Non-Recycled Municipal Solid Waste (MSW) in (kg/person/day)	0.7	●	→			
SDG13 – Climate Action						
Energy-related CO ₂ emissions per capita (tCO ₂ /capita)	6.2	●	→			
Imported CO ₂ emissions, technology-adjusted (tCO ₂ /capita)	-1.4	●	→			
Climate Change Vulnerability Monitor (best 0=worst)	6.0	●	→			
CO ₂ emissions embodied in fossil fuel exports (kg/capita)	450.5	●	→			
Effective Carbon Rate from all non-renewable energy, excluding emissions from biomass (tCO ₂ e)	23.3	●	→			
SDG14 – Life Below Water						
Mean area that is protected in marine sites important to biodiversity (%)	99.9	●	→			
Ocean Health Index Good-Biodiversity (0-100)	95.4	●	→			
Ocean Health Index Good-Clean Water (0-100)	28.4	●	→			
Ocean Health Index Good-Fisheries (0-100)	75.3	●	→			
Fish Stocks overexploited or collapsed by EEZ (%)	NA	●	→			
Fish caught by trawling (%)	89.7	●	→			
SDG15 – Life on Land						
Mean area that is protected in terrestrial sites important to biodiversity (%)	85.6	●	→			
Mean area that is protected in freshwater sites important to biodiversity (%)	92.1	●	→			
Red List index of species survival (0-1)	0.9	●	→			
Annual change in forest area (%)	2.2	●	→			
Imported biodiversity threats (threats per million population)	14.0	●	→			
SDG16 – Peace, Justice and Strong Institutions						
Homicides (per 100,000 population)	1.2	●	→			
Prison population (per 100,000 population)	67.7	●	→			
Population who feel safe walking alone at night in city or area where they live (%)	88.0	●	→			
Government Efficiency (1-7)	3.0	●	→			
Property Rights (1-7)	4.5	●	→			
Birth registrations with civil authority, children under 5 years of age (%)	100.0	●	→			
Corruption Perception Index (0-100)	61.0	●	→			
Children 5-14 years old involved in child labour (%)	0.0	●	→			
Transfers of major conventional weapons (exports) (constant 1990 US\$ million per 100,000 population)	0.0	●	→			
SDG17 – Partnerships for the Goals						
Government Health and Education spending (% GDP)	14.8	●	→			
High-income and all OECD DAC countries: international concessional public finance, including official development assistance (% GNI)	6.2	●	→			
Other countries: Tax revenue (% GDP)	NA	●	→			
Other countries: Tax revenue (Best 0-5 worst)	6.0	●	→			
Financial Safety Score (best 0=100 worst)	41.8	●	→			

Notes: The full title of Goal 2 "Zero Hunger" is "End hunger, achieve food security and improved nutrition and promote sustainable agriculture". The full title of Goal 6 is available here: <https://sustainabledevelopment.un.org/topics/sustainabledevelopmentgoals>

PART 4. COUNTRY PROFILES

Conclusions



Universities in Europe and worldwide are more and more networking to get more research funds, attract new especially international students and to get higher on the existing university rankings.

At public as well as private universities, we should steer existing curricula towards new goals, incorporating new knowledge and give new competencies to students in the fast 21th century.

The Bologna process needs some rethinking. University of Ljubljana as the largest and oldest public university in Slovenia is a research oriented university, seeking wider internationalisation and excellence in higher education & research.

UNESCO chairs are a very good opportunity to enhance international cooperation in teaching and research, and to support internationalisation efforts at universities (e.g. ERASMUS in Europe).

Thank You for Your attention !

