

# 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. Milačič 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/docs/ujma/2015/252\\_263.pdf](http://www.sos112.si/slo/docs/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.**

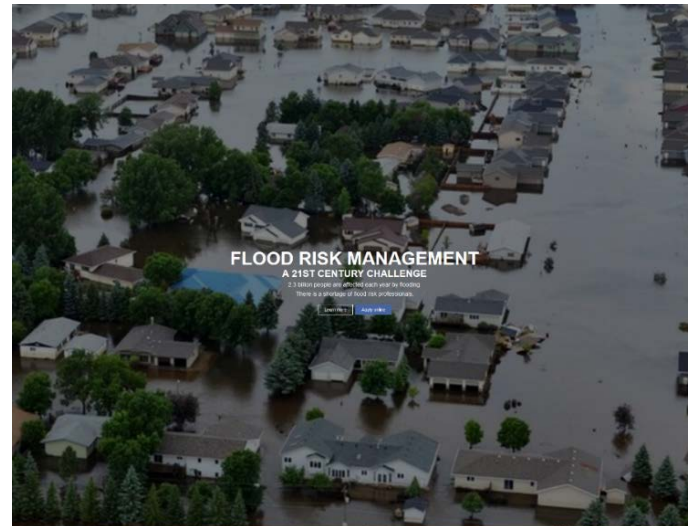
## **Partners:**

**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](http://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](http://www.wcf2019.org)

# WCDRR Targets I



WRDRR Chair is targeting below shown 5 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 five of the Sustainable Development Goals till 2030 and by Building Back Better (BBB) approach.

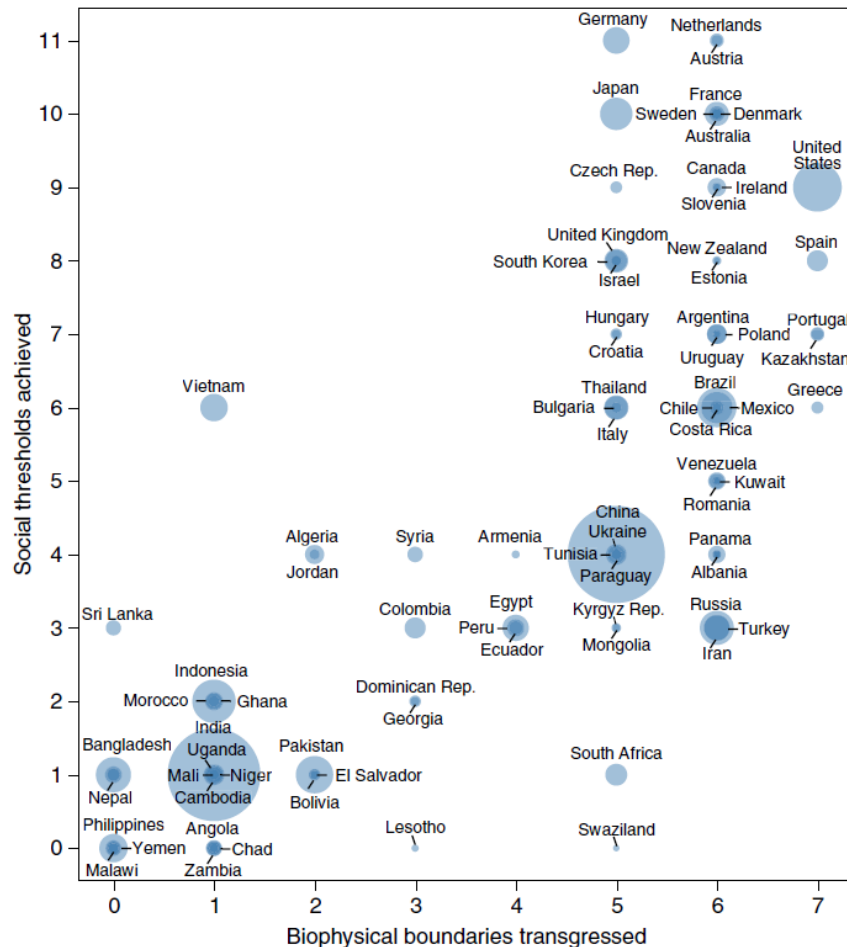
The idea is to give (back) more space for natural processes – through spatial planning procedures, and by nature-based solutions in order to increase society resilience against water hazards and to contribute to sustainable development.



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



# WRDRR Targets II



**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**

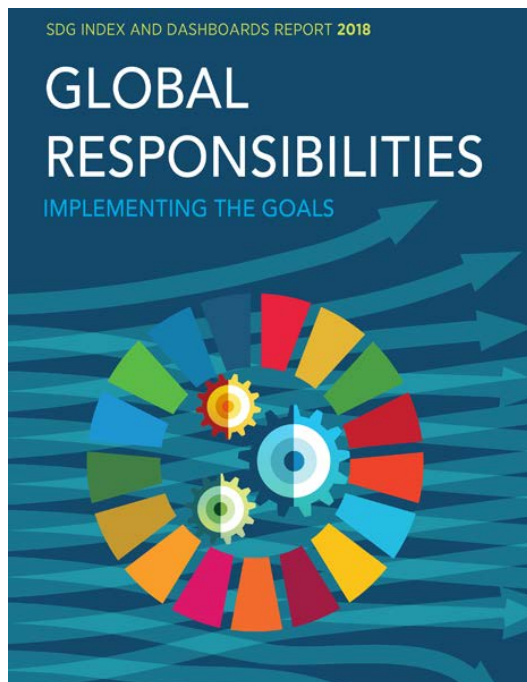
Biophysical indicator	N	Planetary boundary	Per capita boundary	Countries within boundary (%)
CO <sub>2</sub> emissions	145	2°C warming	1.61 t CO <sub>2</sub> yr <sup>-1</sup>	34
Phosphorus	144	6.2 Tg P yr <sup>-1</sup>	0.89 kg P yr <sup>-1</sup>	44
Nitrogen	144	62 Tg N yr <sup>-1</sup>	8.9 kg N yr <sup>-1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

SLOVENIA

OECD Countries

## OVERALL PERFORMANCE

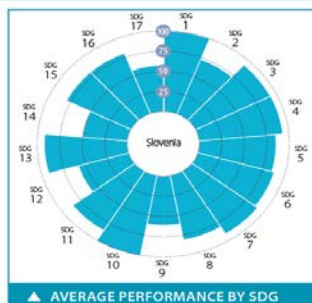
Index score

Regional average score



SDG Global rank

8 (OF 156)



## AVERAGE PERFORMANCE BY SDG

## CURRENT ASSESSMENT – SDG DASHBOARD



## SDG TRENDS



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 each SDG is available here: <https://sustainabledevelopment.un.org/topics/sustainabledevelopmentgoals>

## SLOVENIA

Performance by Indicator

SDG1 – End Poverty	Value	Rating	Trend	Value	Rating	Trend
Poverty headcount ratio at \$1.90/day (% population)	0.2	→		Quality of overall infrastructure (1=extremely underdeveloped; 7=extensive and efficient by international standards)	4.6	→
Projected poverty headcount ratio at \$1.90/day in 2030 (% population)	0.2	→		Logistics performance index: Quality of trade and transport-related infrastructure (1=low to 5=high)	3.2	→
Poverty rate after taxes and transfers, poverty line 50% (% population)	9.2	→		The Times Higher Education Universities Ranking: Average score of top 3 universities (0-100)	26.1	→
SDG2 – Zero Hunger				Number of scientific and technical journal articles (per 1,000 population)	1.6	→
Prevalence of undernourishment (% population)	3.5	→		Research and development expenditure (% GDP)	2.2	→
Prevalence of stunting (low height-for-age) in children under 5 years of age (%)	2.6	→		Research and development researchers (per 1,000 employed)	8.4	→
Prevalence of wasting in children under 5 years of age (%)	0.7	→		Trademark families fled (per million population)	4.9	→
Prevalence of obesity, BMI > 30 (% adult population)	20.2	→		Gap in internet access by income (%)	60.4	→
Cereal yield (t/ha)	6.5	→		Women in science and engineering (%)	31.1	→
Sustainable Nitrogen Management Index	0.8	→		SDG10 – Reduced Inequalities		
SDG3 – Good Health and Well-Being				Gini Coefficient adjusted for top income (1-100)	27.5	→
Maternal mortality rate (per 100,000 live births)	9.0	→		Palma ratio	0.8	→
Neonatal mortality rate (per 1,000 live births)	1.3	→		Elderly poverty rate (%)	13.5	→
Mortality rate, under-5 (per 1,000 live births)	2.3	→		SDG11 – Sustainable Cities and Communities		
Incidence of tuberculosis (per 100,000 population)	6.5	→		Annual mean concentration of particulate matter of less than 2.5 microns of diameter (PM2.5) in urban areas (µg/m³)	20.3	→
HIV prevalence (per 1,000)	0.0	→		Improved water source, piped (% urban population with access)	99.3	→
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	→		Saturation with public transport (%)	5.9	→
Age-standardised death rate attributable to household air pollution and ambient air pollution (per 100,000 population)	20.4	→		Rent overburden rate (%)	9.9	→
Traffic deaths rate (per 100,000 population)	6.5	→		SDG12 – Responsible Consumption and Production		
Healthy Life Expectancy at birth (years)	80.8	→		E-waste generated (kg/capita)	15.0	→
Adolescent fertility rate (births per 1,000 women ages 15-19)	4.2	→		Anthropogenic wastewater that receives treatment (%)	34.7	→
Births attended by skilled health personnel (%)	99.8	→		Production-based SO <sub>2</sub> emissions (kg/capita)	8.1	→
Surviving infants who received 2 WHO-recommended vaccines (%)	92.0	→		Net imported SO <sub>2</sub> emissions (kg/capita)	17.4	→
Universal Health Coverage Tracer Index (0-100)	80.5	→		Reactive nitrogen production footprint (kg/capita)	34.7	→
Subjective Wellbeing (average ladder score, 0-10)	6.2	→		Net imported emissions of reactive nitrogen (kg/capita)	125.0	→
Gap in life expectancy at birth among regions (years)	2.2	→		Non-Recycled Municipal Solid Waste (MSW) in kg (person/day)	0.7	→
Gap in self-reported health by income (0-100)	20.8	→		SDG13 – Climate Action		
Daily smokers (% population age 15+)	18.9	→		Energy-related CO <sub>2</sub> emissions per capita (tCO <sub>2</sub> /capita)	6.2	→
SDG4 – Quality Education				Imported CO <sub>2</sub> emissions, technology-adjusted (tCO <sub>2</sub> /capita)	-1.4	→
Net primary enrolment rate (%)	97.8	→		Climate Change Vulnerability Monitor (best 0= worst)	450.5	→
Mean years of schooling	12.1	→		CO <sub>2</sub> emissions embodied in fossil fuel exports (kg/capita)	23.3	→
Literacy rate of 15-24 year olds, both sexes (%)	NA	→		Effective Carbon Rate from all non-wood energy, excluding emissions from biomass (tCO <sub>2</sub> /t)	23.3	→
Population age 25-64 with tertiary education (%)	30.7	→		SDG14 – Life Below Water		
PISA score (0-600)	509.3	→		Mean area that is protected in marine sites important to biodiversity (%)	99.9	→
Variation in science performance explained by students' socio-economic status (%)	13.5	→		Ocean Health Index: Goal-Biodiversity (0-100)	95.4	→
Students performing below level 2 in science (%)	11.0	→		Ocean Health Index: Goal-Clean Water (0-100)	28.4	→
Resident students (%)	34.6	→		Ocean Health Index: Goal-Resilience (0-100)	75.3	→
SDG5 – Gender Equality				Fish stocks overexploited or collapsed by EEZ (%)	NA	→
Unmet demand for contraception, estimated (% women married or in union, ages 15-49)	10.0	→		Fish caught by trawling (%)	89.7	→
Female to male mean years of schooling, population age 25+ (%)	97.5	→		SDG15 – Life on Land		
Seats held by women in national parliaments (%)	85.0	→		Mean area that is protected in terrestrial sites important to biodiversity (%)	85.6	→
Gender wage gap (total, % male median wage)	36.7	→		Mean area that is protected in freshwater sites important to biodiversity (%)	93.1	→
SDG6 – Clean Water and Sanitation				Red List Index of species survival (0-1)	0.0	→
High-income countries population using safely managed water services (%)	98.0	→		Annual change in forest area (thousands per million population)	2.2	→
Other countries population using at least basic drinking water services (%)	NA	→		Imported biodiversity threats (threats per million population)	14.0	→
High-income countries population using safely managed sanitation services (%)	75.7	→		SDG16 – Peace, Justice and Strong Institutions		
Other countries population using at least basic sanitation services (%)	NA	→		Homicides (per 100,000 population)	1.2	→
Freshwater withdrawal as % total renewable water resources	6.1	→		Prison population (per 100,000 population)	67.7	→
Imported groundwater depletion (m³/year/capita)	9.1	→		Population who sleep walking alone at night in city or area where they live (%)	88.0	→
SDG7 – Affordable and Clean Energy				Government Efficiency (1-7)	3.0	→
Access to electricity (% population)	100.0	→		Property Rights (1-7)	4.5	→
Access to clean fuels & technology for cooking (% population)	98.2	→		Birth registrations with civil authority, children under 5 years of age (%)	100.0	→
CO <sub>2</sub> emissions from fuel combustion / electricity output (tCO <sub>2</sub> /TWh)	0.9	→		Corruption Perception Index (0-100)	61.0	→
Share of renewable energy in total final energy consumption (%)	20.9	→		Children 5-14 years old involved in child labour (%)	0.0	→
SDG8 – Decent Work and Economic Growth				Transfers of major conventional weapons (exports) (constant 1990 US\$ million per 100,000 population)	0.0	→
Adjusted Growth (0-100)	-1.2	→		SDG17 – Partnerships for the Goals		
Adults (15 years+) with an account at a bank or other financial institution or with a mobile-money-service provider (%)	97.5	→		Government Health and Education spending (% GDP)	14.8	→
Employment-to-population ratio (%)	69.3	→		High-income and all OECD DAC countries: International concessional public finance, including official development assistance (% GNI)	6.2	→
Youth not in employment, education or training (NEET) (%)	11.6	→		Other countries: Tax revenue (% GDP)	NA	→
SDG9 – Industry, Innovation and Infrastructure				Tax Haven Score (best 0-5 worst)	0.0	→
Proportion of the population using the internet (%)	75.5	→		Financial Secrecy Score (best 0-100 worst)	41.8	→
Mobile broadband subscriptions (per 100 inhabitants)	62.3	→				





# 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 21<sup>st</sup> 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 !**