Supplementary Information

Harmonising geospatial indicators for flood vulnerability indices: an IPCC-aligned scoping review to support urban flood adaptation planning

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Description

This Supplementary Information accompanies the article "Harmonising geospatial indicators for flood vulnerability indices: an IPCC-aligned scoping review to support urban flood adaptation planning". It provides the methodological documentation, structured databases and reference catalogues supporting the analyses presented in the manuscript.

Contents

Data Availability

The structured database of geospatial indicators, methodological variables and geospatial data sources generated during this study is publicly available through the Zenodo repository under a Creative Commons Attribution 4.0 International (CC BY 4.0) licence. The repository includes the structured Excel database compiled from the 131 studies included in this scoping review, together with the accompanying FAIR-oriented documentation and metadata supporting data reuse and interoperability. The dataset will be available at [Zenodo DOI to be inserted upon acceptance].

Supplementary Information

The online version contains supplementary material available at the journal website.

*SUBMISSION NOTE

In accordance with the journal's initial submission requirements, all supplementary materials are provided here as a single PDF document. Upon acceptance, Additional file 4 will be supplied in its native Microsoft Excel (.xlsx) format to enable filtering, querying and reuse of the structured database in accordance with the FAIR principles.

Harmonising geospatial indicators for flood vulnerability indices: an IPCC-aligned scoping review to support urban flood adaptation planning

Additional file 1: Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist.

Purpose of this supplementary file

This file provides the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) checklist, documenting the reporting compliance of this scoping review with the recommendations proposed by Tricco et al. The checklist identifies the location of each reporting item within the manuscript, facilitating transparent assessment of the review methodology and supporting the reproducibility, completeness and quality of reporting.

Note: The checklist follows the reporting recommendations of Tricco et al. (2018) for PRISMA-ScR and includes all 22 reporting items covering the Title, Abstract, Introduction, Methods, Results, Discussion and Funding sections.

Table AF1: PRISMA-ScR checklist based on the reporting guidelines of Tricco et al. (2018).

Section	Item	PRISMA-ScR checklist item	Page
Title			
Title	1	Identify the report as a scoping review.	1
Abstract			
Structured summary	2	Provide a structured summary that includes (as applicable): background, objectives, eligibility criteria, sources of evidence, charting methods, results, and conclusions that relate to the review questions and objectives.	1
Introduction			
Rationale	3	Describe the rationale for the review in the context of what is already known. Explain why the review questions/objectives lend themselves to a scoping review approach.	2
Objectives	4	Provide an explicit statement of the questions and objectives being addressed with reference to their key elements (e.g., population or participants, concepts, and context) or other relevant key elements used to conceptualize the review questions and/or objectives.	2
Results			
Selection of sources of evidence	5	Give numbers of sources of evidence screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally using a flow diagram.	3
Characteristics of sources of evidence	6	For each source of evidence, present characteristics for which data were charted and provide the citations.	3
Results of individual sources of evidence	7	For each included source of evidence, present the relevant data that were charted that relates to the review questions and objectives.	5
Critical appraisal within sources of evidence§	8	If done, present data on critical appraisal of included sources of evidence (see Methods, Critical appraisal of indiv. sources of evidence).	6
Synthesis of results	9	Summarize and/or present the charting results as they relate to the review questions and objectives.	6
Discussion			
Summary of evidence	10	Summarize the main results (including an overview of concepts, themes, and types of evidence available), link to the review questions and objectives, and consider the relevance to key groups.	12
Limitations	11	Discuss the limitations of the scoping review process.	12
Conclusions	12	Provide a general interpretation of results with respect to the review questions and objectives, as well potential implications and/or next steps.	13
Methods			

Section	Item	PRISMA-ScR checklist item	Page
Protocol and registration	13	Indicate whether a review protocol exists; state if and where it can be accessed (e.g., a Web address); and if available, provide registration information, including the registration number.	14
Eligibility criteria	14	Specify characteristics of the sources of evidence used as eligibility criteria (e.g., years, language, and publication status) and provide a rationale.	14
Information sources*	15	Describe all information sources in the search (e.g., databases with dates of coverage and contact with authors to identify additional sources), as well as the date the most recent search was executed.	14
Search	16	Present the full electronic search strategy for at least 1 database, including any limits used, such that it could be repeated.	14
Selection of sources of evidence†	17	State the process for selecting sources of evidence (i.e., screening and eligibility) included in the scoping review.	14
Data charting process‡	18	Describe the methods of charting data from the included sources of evidence (e.g., calibrated forms or forms that have been tested by the team before their use, and whether data charting was done independently or in duplicate) and any processes for obtaining and confirming data from investigators.	14
Data items	19	List and define all variables for which data were sought and any assumptions and simplifications made.	14
Critical appraisal of individual sources of evidence§	20	If done, provide a rationale for conducting a critical appraisal of included sources of evidence; describe the methods used and how this information was used in any data synthesis (if appropriate).	14
Synthesis of results	21	Describe the methods of handling and summarizing the data that were charted.	15
Funding			
Funding	22	Describe sources of funding for the scoping review. Describe the role of the funders of the scoping review.	16

JBI = Joanna Briggs Institute; PRISMA-ScR = Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews.

* Where *sources of evidence* (see second footnote) are compiled from, such as bibliographic databases, social media platforms, and Web sites.

† A more inclusive/heterogeneous term used to account for the different types of evidence or data sources (e.g., quantitative and/or qualitative research, expert opinion, and policy documents) that may be eligible in a scoping review as opposed to only studies. This is not to be confused with *information sources* (see first footnote).

‡ The framework by Arksey and O'Malley(Arksey & O'Malley, 2005) refer to the process of data extraction in a scoping review as data charting.

§ The process of systematically examining research evidence to assess its validity, results, and relevance before using it to inform a decision. This term is used for Critical appraisal of individual sources of evidence instead of "risk of bias" (which is more applicable to systematic reviews of interventions) to include and acknowledge the various sources of evidence that may be used in a scoping review (e.g., quantitative and/or qualitative research, expert opinion, and policy document).

Citation

Users of this supplementary material should cite the associated article and refer to this file as:
Additional file 1: Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist.

Reference

Arksey, H., & O'Malley, L. (2005). Scoping studies: towards a methodological framework. *International Journal of Social Research Methodology*, *8*(1), 19–32. https://doi.org/10.1080/1364557032000119616

Tricco, A. C., Lillie, E., Zarin, W., O'Brien, K. K., Colquhoun, H., Levac, D., Moher, D., Peters, M. D. J., Horsley, T., Weeks, L., Hempel, S., Akl, E. A., Chang, C., McGowan, J., Stewart, L., Hartling, L., Aldcroft, A., Wilson, M. G., Garritty, C.,…Straus, S. E. (2018). PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation. *Annals of Internal Medicine*, *169*(7), 467–+. https://doi.org/10.7326/M18-0850

Harmonising geospatial indicators for flood vulnerability indices: an IPCC-aligned scoping review to support urban flood adaptation planning

Additional file 2: FAIR-oriented workflow for harmonising geospatial indicators in Flood Vulnerability Indices

Purpose of this supplementary file

This supplementary file documents the structure and documentation logic of **Additional file 4**, which provides a structured database of all studies included in this scoping review (n = 131). The database compiles information on Flood Vulnerability Indices (FVI), including geospatial indicators, conceptual domains, analytical methods, and data sources, following IPCC-aligned vulnerability and risk frameworks. This file supports transparency, reproducibility, and reuse by describing how indicators and their attributes were identified, harmonised, classified, and documented in alignment with FAIR principles (Findable, Accessible, Interoperable, and Reusable; Wilkinson et al., 2016).

Scope of the structured database

The structured database includes peer-reviewed studies that:

(i) develop or apply Flood Vulnerability Indices (FVI).
(ii) use geospatial indicators to operationalise exposure, sensitivity, adaptive capacity, and/or hazard.
(iii) provide sufficient methodological detail to enable indicator classification, spatial interpretation, and data-source identification.

Each record in the database corresponds to an individual geospatial indicator reported in the included studies.

FAIR principles implementation

FAIR principles were implemented through standardised column names, IPCC-aligned conceptual classifications, harmonised terminology for indicators and methods, and explicit documentation of data sources and access conditions. These principles were operationalised through four interrelated analytical steps applied during database construction:

(i) data compilation, corresponding to the systematic organisation of indicators and attributes into a unified database; (ii) data source documentation, ensuring transparency regarding data provenance and access conditions; (iii) data comparison and harmonisation, aligning indicators with IPCC vulnerability and risk components; and (iv) data correlation, enabling cross-study synthesis and reuse of harmonised indicators.

Findability is ensured through unique study and indicator identifiers and consistent naming conventions.

Accessibility is supported by the provision of the database as an open Excel file with documented data access conditions.

Interoperability is achieved through alignment with IPCC frameworks and harmonised terminology.

Reusability is supported by explicit documentation of indicator definitions, methodological attributes, and data-source characteristics. Together, these processes ensure conceptual transparency, methodological consistency, and FAIR-aligned documentation across the structured database.

Database structure

The database is organised into structured columns grouped into five conceptual blocks reflecting their analytical and documentary roles within the parameter-oriented framework adopted in this scoping review: (I) Study and framework context; (II) Parameter and indicator core; (III) Equity and index structure; (IV) Methods and spatialisation; and (V) Data source and FAIR attributes.

(I) STUDY AND FRAMEWORK CONTEXT

Column name	Description
Indicator_ID	Unique identifier for each indicator included in the scoping review (n = 2,437).
Study_ID	Unique identifier for each study included in the scoping review (n = 131).
Conceptual_Framework	Indicates whether the Flood Vulnerability Indice follows a vulnerability-based or risk-based approach, consistent with IPCC terminology.

(II) CONCEPTUAL CLASSIFICATION

Column name	Description
Original_Dimension	Dimension terminology as reported in the original publication, preserving traceability to the source literature.
Reviewed_Dimension_IPCC	Harmonised classification of each indicator according to IPCC macro-components: Exposure, Sensitivity, Adaptive Capacity, or Hazard.
Thematic_Domain	Thematic grouping of indicators within each IPCC component, representing functional groupings with similar analytical roles in FVIs.

(II) INDICATOR ATTRIBUTES

Column name	Description
Original_Indicator	Indicator name as originally reported by the authors in the reviewed study
Reviewed_Indicator	Revised and harmonised indicator name used for comparative analysis across studies.
Indicator_Description	Brief description of how the indicator is defined or characterised in the original study.
GBI_Included	Indicates whether the indicator explicitly addresses Green-Blue Infrastructure (Yes/No).

(III) METHODS AND SPATIALISATION

Column name	Description
Method	Main analytical or aggregation method used to integrate the indicator (e.g. PCA, MCA, weighted overlay).
Spatial_Data_Type	Type of spatial data used to operationalise the indicator (Raster, Vector, or Mixed).

(IV) DATA SOURCE ATTRIBUTES

Column name	Description
Data_Source	Descriptive name of the data source used to derive the indicator.
Data_Source_Category	General category of the data source (e.g. Census, Satellite Imagery, Governmental, Survey, Health, Model).

Intended use

The structured database supports comparative analysis of FVIs construction practices, assessment of conceptual alignment across studies, and the development of more transparent, replicable, and interoperable urban flood vulnerability assessments for research and climate adaptation planning.

Limitations

The database reflects the scope and inclusion criteria of the scoping review and relies on information reported in the original studies. Indicator classification follows IPCC definitions. The database does not evaluate the empirical performance of individual indicators or indices.

Relationship to other supplementary materials

Additional file 3: Overview of FVI studies included in the scoping review (n = 131).

Additional file 4: Structured dataset of included studies, geospatial indicators, methods, and data sources.

Citation

Users of this supplementary material should cite the associated article and refer to this file as:

Additional file 2: FAIR-oriented workflow for harmonising geospatial indicators in Flood Vulnerability Indices.

Reference

Wilkinson, M. D., Dumontier, M., Aalbersberg, I. J., Appleton, G., Axton, M., Baak, A., Blomberg, N., Boiten, J.-W., da Silva Santos, L. B., Bourne, P. E., Bouwman, J., Brookes, A. J., Clark, T., Crosas, M., Dillo, I., Dumon, O., Edmunds, S., Evelo, C. T., Finkers, R.,…Mons, B. (2016). The FAIR guiding principles for scientific data management and stewardship. Scientific Data, 3(1), 160018. https://doi.org/10.1038/sdata.2016.18

Harmonising geospatial indicators for flood vulnerability indices: an IPCC-aligned scoping review to support urban flood adaptation planning

Additional file 3: Overview of FVI studies included in the scoping review (n=131).

Purpose of this supplementary file

This file provides a complete overview of the 131 studies included in the scoping review, serving as the reference catalogue for all analyses presented in the manuscript and associated supplementary materials. Each study is assigned a unique Study ID, enabling consistent cross-referencing throughout the structured database (Additional file 4) and the study article. The overview documents the bibliographic identity of every included study, facilitating transparent traceability between published articles, extracted indicators, methodological characteristics and geospatial data sources.

Note: The Study ID is used consistently throughout all supplementary materials as the primary identifier linking individual studies to the structured indicator database (Additional file 4) and the catalogue of geospatial data sources in the main article.

Table AF3: Overview of studies included in the scoping review (Study ID, article title, reference and publication year).

STUDY ID	TITLE	REFERENCE	YEAR
Art. 001	Building a flood vulnerability index for urban resilience: Insights from Kelowna, British Columbia	(Kaur et al., 2025)	2025
Art. 002	A methodological approach to flood dynamics based on satellite-derived spectral indices and altimetric forecast models: a case study in Southern Brazil	(da Silva Junior et al., 2025)	2025
Art. 003	Coastal Flood Vulnerability and Spatial Risk Assessment for Small Island Urban of Cat Ba Town, Northern Vietnam	(Phi et al., 2025)	2025
Art. 004	Urbanization under extreme climate events leads to synchronized decreases in flood protection and increases in vulnerability	(Elliot et al., 2025)	2025
Art. 005	Flood risk assessment under land use dynamics during 2000–2020 in the yellow river basin, China	(T. Liu et al., 2025)	2025
Art. 006	Strategic deployment of nature-based solutions for urban flood management in high-density urban landscapes	(Wang et al., 2025)	2025
Art. 007	Flash flood risk zoning in Gomti River Basin in Eastern Bangladesh and Tripura State (India) using MCDM-GIS Tool	(Alif et al., 2025)	2025
Art. 008	Flood hazard zones prediction using machine-learning-based geospatial approach in lower Niger River basin, Nigeria	(Adeyemi & Komolafe, 2025)	2025
Art. 009	Cloud-Powered Flood Mapping and Impact Assessment: Leveraging Sentinel-1 SAR Imagery for Thailand's Disaster Response	(Anucharn et al., 2025)	2025
Art. 010	Identification of urban waterlogging risk zones using Analytical Hierarchy Process (AHP): a case of Agartala city	(Das et al., 2025)	2025
Art. 011	Assessing the geographical diversity of climate change risks in Japan by overlaying climatic impacts with exposure and vulnerability indicators	(Liu & Masago, 2025)	2025
Art. 012	Compound risks of floods and droughts over multi-hazard catchments: Revealing association through hydrodynamic-cum-statistical modelling and novel bivariate risk classifier	(Tyagi et al., 2024)	2024
Art. 013	Socioeconomic impacts of flooding and its coping strategies in Nigeria: Evidence from Dagiri community, Gwagwalada area council of Abuja	(Badamosi et al., 2024)	2024
Art. 014	Assessment of multi-components and sectoral vulnerability to urban floods in Peshawar – Pakistan	(Ali et al., 2024)	2024
Art. 015	A geospatial analysis of flood risk zones in Cyprus: insights from statistical and multi-criteria decision analysis methods	(Ghanem & Zaifoglu, 2024)	2024
Art. 016	Geospatial analysis of flood risk hazard in Zambezi Region, Namibia	(Mshelia et al., 2024)	2024
Art. 017	Assessing the vulnerability offlashfloods to climate change in arid zones: Amman–Zarqa Basin, Jordan	(Saodi et al., 2023)	2023
Art. 018	Estimation of the flood vulnerability index (FVI) for Alexandria city-Egypt: A case study	(Afifi et al., 2023)	2023
Art. 019	Analysis of flood-poverty relationship in burkina faso using remotely sensed nighttime light	(Naba et al., 2023)	2023
Art. 020	AHP and TOPSIS based flood risk assessment- a case study of the Navsari City, Gujarat, India	(Pathan et al., 2022)	2022
Art. 021	Waterlogging risk assessment of the Beijing-Tianjin-Hebei urban agglomeration in the past 60 years	(Y. Wang et al., 2021)	2021
Art. 022	Adaptive Capacity Assessment for A Flood Vulnerable Region through Land Use Modelling and Socio Economic and Physical Indicators	(Narendr et al., 2020)	2020
Art. 023	A framework for pluvial flood risk assessment in Alexandria considering the coping capacity	(Elboshy et al., 2019)	2019
Art. 024	Linking Water Infrastructure, Public Health, and Sea Level Rise: Integrated Assessment of Flood Resilience in Coastal Cities	(Allen et al., 2019)	2019

Art. 025	Towards a better understanding of the evolution of the flood risk in Mediterranean urban areas: the case of Barcelona.	(Cortès et al., 2018)	2018
Art. 026	Mainstreaming climate adaptation in spatial planning. The case of Baixa Pombalina in Lisbon	(Ribeiro et al., 2018)	2018
Art. 027	Risk analysis and visualization for detecting signs of flood disaster in Twitter	(Kwon & Kang, 2016)	2016
Art. 028	Future Climate Extremes in Bangladesh: Insights from a Multi-Model Ensemble of CMIP6 Simulations	(Nazrul et al., 2025)	2025
Art. 029	Machine Learning Enhances Flood Resilience Measurement in a Coastal Area - Case Study of Morocco	(Satour et al., 2023)	2023
Art. 030	Vulnerability of flash flooding in Riyadh, Saudi Arabia	(Rahman et al., 2016)	2016
Art. 031	Mapping social vulnerability to flood hazard in Norfolk, England	(Garbutt et al., 2015)	2015
Art. 032	Assessing Adaptive Capacity of Urban Coastal Communities to Flooding: The Case of La Paz District, Philippines	(Kirugumi & Reyes, 2025)	2025
Art. 033	Multi-Scenario Flood Susceptibility Projections in the Eastern Hindu Kush: Integrating Machine Learning, CMIP6, and Land Use Change	(K. Ullah et al., 2025)	2025
Art. 034	Multi-hazard Vulnerability Assessment Through RS-GIS and AHP: A Geo-Spatial Study of Keleghai River Basin in India	(Roy & Dhar, 2025)	2025
Art. 035	Integrating LiDAR, Sentinel-2 data and Bluespot modeling for flood risk mapping in Mihăesti, Romania	(Vizireanu et al., 2025)	2025
Art. 036	Geoinformatics-based watershed-level flood hazard analysis using fuzzy analytic hierarchy process across the Ganga-Brahmaputra basin	(Kaushik et al., 2025)	2025
Art. 037	Remote sensing and climatic data for flood impact assessment in Al-Ain (UAE)	(Bersi et al., 2025)	2025
Art. 038	GIS-based AHP approach to flood susceptibility assessment in Tangail district, Bangladesh	(Sharker et al., 2025)	2025
Art. 039	Vulnerability of Populations to Flooding and Marine Submersion in the Wouri Estuary (Cameroon), in the Context of Climate Change	(Ebodé et al., 2025)	2025
Art. 040	A semi-quantitative multi-hazard risk assessment framework for European coastal urban areas	(Figueiredo et al., 2024)	2024
Art. 041	Towards urban place-based resilience modeling: Mixed methods for a flood resilience assessment index	(Bottoms et al., 2024)	2024
Art. 042	Multi-hazard assessment of climate-related hazards for European coastal cities	(Laino & Iglesias, 2024)	2024
Art. 043	Flood risk mapping under changing climate in Lower Tapi river basin, India	(Chandole et al., 2024)	2024
Art. 044	Deep learning rapid flood risk predictions for climate resilience planning	(Yosri et al., 2024)	2024
Art. 045	Advancing Flood Risk Assessment through Integrated Hazard Mapping: A Google Earth Engine-Based Approach for Comprehensive Scientific Analysis and Decision Support	(Agrawal et al., 2024)	2024
Art. 046	Localising vulnerability assessment to urban floods: A comparative analysis of top-down and bottom-up geospatial approaches in Patna City, India	(Kumari et al., 2024)	2024
Art. 047	Climate uncertainty and vulnerability of urban flooding associated with regional risk using multi-criteria analysis in Mumbai, India	(Yadav et al., 2024)	2024
Art. 048	Rural-urban disparities in spatiotemporal pattern of vulnerability to climate change: a study of Madhya Pradesh, India	(George et al., 2023)	2023
Art. 049	Urban flood risk assessment under rapid urbanization in Zhengzhou City, China	(Li et al., 2023)	2023
Art. 050	Urban flood risk assessment using AHP and geospatial techniques in swat Pakistan	(Waseem et al., 2023)	2023
Art. 051	Climate change vulnerability hotspots in Costa Rica: constructing a sub-national index	(Nawrotzki et al., 2023)	2023
Art. 052	Towards flood risk reduction: Commonalities and differences between urban flood resilience and risk based on a case study in the Pearl River Delta	(Zheng & Huang, 2023)	2023
Art. 053	An integrated indicator-based approach for constructing an urban flood vulnerability index as an urban decision-making tool using the PCA and AHP techniques: A case study of Alexandria, Egypt	(Abdrabo et al., 2023)	2023
Art. 054	Flood vulnerability and buildings' flood exposure assessment in a densely urbanised city: comparative analysis of three scenarios using a neural network approach	(Pham et al., 2022)	2022
Art. 055	A framework for risk-based assessment of urban floods in coastal cities	(Kumar et al., 2022)	2022
Art. 056	Spatialized flood resilience measurement in rapidly urbanized coastal areas with a complex semi-arid environment in northern Morocco	(Satour et al., 2021)	2021
Art. 057	Integration of earth observation and census data for mapping a multi-temporal flood vulnerability index: a case study on Northeast Italy	(Cian et al., 2021)	2021
Art. 058	An Indicator-Based Approach for Micro-Scale Assessment of Physical Flood Vulnerability of Individual Buildings	(Kaoje et al., 2021)	2021
Art. 059	Assessing coastal vulnerability of Chittagong District, Bangladesh using geospatial techniques	(Miah et al., 2020)	2020
Art. 060	Comprehensive evaluation of urban flood-bearing risks based on combined compound fuzzy matter-element and entropy weight model	(Lv et al., 2020)	2020
Art. 061	A methodology for urban micro-scale coastal flood vulnerability and risk assessment and mapping	(Percival & Teeuw, 2019)	2019
Art. 062	Flood hazards: household vulnerability and resilience in disaster-prone districts of Khyber Pakhtunkhwa province, Pakistan	(Shah et al., 2018)	2018
Art. 063	Integration of multi-parametric fuzzy analytic hierarchy process and GIS along the UNESCO World Heritage: a flood hazard index, Mombasa County, Kenya	(Hategekimana et al., 2018)	2018
Art. 064	The KULTURisk Regional Risk Assessment methodology for water-related natural hazards - Part 1: Physical-environmental assessment	(Ronco et al., 2014)	2014

Art. 065	Enhancing flood susceptibility mapping in Sana'a,Yemen with random forest and eXtreme gradient boosting algorithms	(Alwathaf et al., 2025)	2025
Art. 066	Resilient coasts: A holistic approach to flood risk assessment and mitigation on the East Coast of Ghana	(Kwang et al., 2025)	2025
Art. 067	Understanding urban flood risk perception and its determinants across diverse hazard sources	(Waseem & Rana, 2025)	2025
Art. 068	Enhancing Urban Flood Vulnerability Mapping with Multi-Criteria Decision Analysis	(Sukri et al., 2025)	2025
Art. 069	AI-Driven GIS Modeling of Future Flood Risk and Susceptibility for Typhoon Krathon under Climate Change	(C. Liu et al., 2025)	2025
Art. 070	Mapping pluralistic future flood risk scenarios for informal settlements in the eThekwini metropolitan municipality, South Africa	(Broekman et al., 2025)	2025
Art. 071	Evaluating Yangtze River Delta Urban Agglomeration flood risk using a hybrid method of automated machine learning and analytic hierarchy process	(Gao et al., 2025)	2025
Art. 072	Integrated hydrologic-economic modeling for urban flood risk mitigation using SWMM, HEC-RAS, and HAZUS: a case study of the Bronx river watershed, NYC	(Sabbaghian et al., 2025)	2025
Art. 073	Integrated flood risk prediction and zonation in bihar: observations from climate change projection using GIS-based AHP-Multicriteria approach	(Kumar et al., 2025)	2025
Art. 074	Identification of flood vulnerability areas using analytical hierarchy process techniques in the Wuseta watershed, Upper Blue Nile Basin, Ethiopia	(Mulu et al., 2025)	2025
Art. 075	Optimizing Flood Susceptibility Detection Using Ensemble Learning Methods	(Dai et al., 2025)	2025
Art. 076	Impact of climate change on flood risk with urban resilience perspective using fuzzy logic model	(I. Ullah et al., 2025)	2025
Art. 077	Assessment of flood risk based on CMIP6 for the Northern foothills of Qinling mountain	(Ahmed et al., 2025)	2025
Art. 078	Urban flood hazard assessment using FLA-optimized boost algorithms in Ankara, Türkiye	(Gul, 2025)	2025
Art. 079	Spatial Assessment of Territorial Resilience to Floods Using Comprehensive Indicators: Application to Greater Papeete (French Polynesia)	(Bourlier et al., 2025)	2025
Art. 080	Assessment of Rainfall Forecasts and Flood Risk in a Coastal Urban Catchment Considering Different Urban Canopy Scenarios	(Ghosh et al., 2025)	2025
Art. 081	Impact of land use and climate change on urban flooding: a case study of Bhubaneswar city in India	(Das & Sahoo, 2025)	2025
Art. 082	Multi-hazard vulnerability zone identification using GIS-based fuzzy AHP and MCDM techniques	(Sood et al., 2025)	2025
Art. 083	Flood vulnerability mapping in an urban area with high levels of impermeable coverage in southern Brazil	(Alves et al., 2024)	2024
Art. 084	Climate change vulnerability assessment of Karsıyaka, Izmir	(Cangüzel & Hepcan, 2024)	2024
Art. 085	Understanding flood risk in urban environments: spatial analysis of building vulnerability and hazard areas in the Lisbon metropolitan area	(Santos et al., 2024)	2025
Art. 086	Flood vulnerability assessment in rural and urban informal settlements: case study of Karonga District and Lilongwe City in Malawi	(Mwalwimba et al., 2024)	2024
Art. 087	Long-term flood exposure assessment using satellite-based land use change detection and inundation simulation: A 30-year case study of the Bangkok Metropolitan Region	(Darnkachatarn & Kajitani, 2024)	2024
Art. 088	Urban Flood Hazard Zonation in Bengaluru Urban District, India	(Dwarakish et al., 2024)	2024
Art. 089	Urban waterlogging risk susceptibility within changing pattern of rainfall intensity in Delhi, India	(Kumar et al., 2024)	2024
Art. 090	Suitability Analysis for Resettlement Potential Sites of Flood Vulnerable Community in Kigali city, Rwanda	(Izere et al., 2024)	2024
Art. 091	Flood susceptibility assessment of the Agartala Urban Watershed, India, using Machine Learning Algorithm	(Debnath et al., 2024)	2024
Art. 092	Identifying vulnerable populations in urban society: a case study in a flood-prone district of Wuhan, China	(Xu et al., 2024)	2024
Art. 093	Mapping flood vulnerability using an analytical hierarchy process (AHP) in the Metropolis of Mumbai	(Mann & Gupta, 2023)	2023
Art. 094	Application of analytic network process (ANP), local and indigenous knowledge in mapping flood vulnerability in an informal settlement	(Membele et al., 2024)	2023
Art. 095	Flood risk assessment in Limbe (Cameroon) using a GIS weighed sum method	(Enomah et al., 2024)	2024
Art. 096	Urban flood risk assessment characterizing the relationship among hazard, exposure, and vulnerability	(Bin et al., 2023)	2023
Art. 097	Risk of Flash Floods in Urban and Rural Municipalities Triggered by Intense Precipitation in Wielkopolska of Poland	(Pinskwar et al., 2023)	2023
Art. 098	Settlement suitability analysis of a riverine floodplain in the perspective of GIS-based multicriteria decision analysis	(Alam et al., 2023)	2023
Art. 099	Measure and spatial identification of social vulnerability, exposure and risk to natural hazards in Japan using open data	(Raduszynski & Numada, 2023)	2023
Art. 100	Mainstreaming climate resilience: A GIS-based methodology to cope with cloudbursts in Turin, Italy	(Brunetta et al., 2022)	2022
Art. 101	A comparison of three multi-criteria decision-making models in mapping flood hazard areas of Northeast Penang, Malaysia	(Mudashiru et al., 2022)	2022
Art. 102	A hybridized model based on neural network and swarm intelligence-grey wolf algorithm for spatial prediction of urban flood-inundation	(Darabi et al., 2021)	2021
Art. 103	An urban system perspective on urban flood resilience using SEM: evidence from Nanjing city, China	(P. Wang et al., 2021)	2021

Art. 104	The socioeconomic impact of climate-related hazards: flash flood impact assessment in Kuala Lumpur, Malaysia	(Bhuiyan et al., 2021)	2021
Art. 105	Enhancing urban flood resilience: A holistic framework incorporating historic worst flood to Yangtze River Delta, China	(Zhu et al., 2021)	2021
Art. 106	A city-scale assessment of emergency response accessibility to vulnerable populations and facilities under normal and pluvial flood conditions for Shanghai, China	(Yin et al., 2021)	2021
Art. 107	Vulnerability assessment for flash floods using GIS spatial modeling and remotely sensed data in El-Arish City, North Sinai, Egypt	(Mohamed & El-Raey, 2020)	2020
Art. 108	Flood vulnerability assessment using MOVE framework: a case study of the northern part of district Peshawar, Pakistan	(Hamidi et al., 2020)	2020
Art. 109	Floodhazard mappingusingamulti-criteria decisionanalysis and GIS (case study Gaza Governorate, Palestine)	(Ajjur & Mogheir, 2020)	2020
Art. 110	Assessing vulnerability for inhabitants of Dhaka City considering flood-hazard exposure	(Huq et al., 2020)	2020
Art. 111	Measuring urban vulnerability to climate change using an integrated approach, assessing climate risks in Beijing	(Zhang et al., 2019)	2019
Art. 112	Implementing a Flood Vulnerability Index in urban coastal areas with industrial activity	(Giannakidou et al., 2019)	2019
Art. 113	Multidimensional Model for Vulnerability Assessment of Urban Flooding: An Empirical Study in Pakistan	(Rana & Routray, 2018b)	2018
Art. 114	Integrated methodology for flood risk assessment and application in urban communities of Pakistan	(Rana & Routray, 2018a)	2018
Art. 115	Construction of an integrated social vulnerability index in urban areas prone to flash flooding	(Aroca-Jimenez et al., 2017)	2017
Art. 116	A catchment scale Integrated Flood Resilience Index to support decision making in urban flood control design	(Miguez & Veról, 2017)	2017
Art. 117	Predictability of state-level flood damage in the conterminous United States: the role of hazard, exposure and vulnerability	(Zhou et al., 2017)	2017
Art. 118	Integration of inland and coastal storms for flood hazard assessment using a distributed hydrologic model	(Karamouz et al., 2017)	2017
Art. 119	Assessing Urban Vulnerability in the Context of Flood and Heat Hazard: Pathways and Challenges for Indicator-Based Analysis	(Krellenberg & Welz, 2017)	2017
Art. 120	An assessment of urban vulnerability in the Amazon Delta and Estuary: a multi-criterion index of flood exposure, socio-economic conditions and infrastructure	(Mansur et al., 2016)	2016
Art. 121	Socio-economic vulnerability of the megacity of Shanghai (China) to sea-level rise and associated storm surges	(Yan et al., 2016)	2016
Art. 122	Regional Risk Assessment addressing the impacts of climate change in the coastal area of the Gulf of Gabes (Tunisia)	(Rizzi et al., 2016)	2016
Art. 123	Holistic approach to flood risk assessment in areas with cultural heritage: a practical application in Ayutthaya, Thailand	(Vojinovic et al., 2016)	2016
Art. 124	Characterizing the multi-risk with respect to plausible natural hazards in the Balasore coast, Odisha, India: a multi-criteria analysis (MCA) appraisal	(Mukhopadhyay et al., 2016)	2016
Art. 125	Social vulnerability assessment of flood risk using GIS-based multicriteria decision analysis. A case study of Vila Nova de Gaia (Portugal)	(Fernandez et al., 2016)	2016
Art. 126	An integrated approach of flood risk assessment in the eastern part of Dhaka City	(Gain et al., 2015)	2015
Art. 127	Urban flood vulnerability zoning of Cochin City, southwest coast of India, using remote sensing and GIS	(Sowmya et al., 2015)	2015
Art. 128	A study of evaluating and forecasting watersheds using the flood vulnerability assessment index in Korea	(Baeck et al., 2014)	2014
Art. 129	Flood risks in a dynamic urban agglomeration: a conceptual and methodological assessment framework	(Müller, 2013)	2013
Art. 130	Exploring multicriteria flood vulnerability by integrating economic, social and ecological dimensions of flood risk and coping capacity: from a starting point view towards an end point view of vulnerability	(Scheuer et al., 2011)	2011
Art. 131	Flood risks in urbanized areas - multi-sensoral approaches using remotely sensed data for risk assessment	(Taubenböck et al., 2011)	2011

Relationship to other supplementary materials

Additional file 4: Structured dataset of included studies, geospatial indicators, methods, and data sources.

Citation

Users of this supplementary material should cite the associated article and refer to this file as:

Additional file 3: Structured dataset of included studies, geospatial indicators, methods, and data sources.

Endnote	Study_ID	Title	Authorship	Year	Author's country	total indicators	Sensitivity	Exposure	Adaptive Capacity	Hazard	GBI	Study-case	Study-case Country	Study Case continent	Scale	Journal	IPCC	VULN OR RISK	weblink / DOI
24	Art. 001	Building a flood vulnerability index for urban resilience: Insights from Kelowna, British Columbia	Kaur, M.Sultana, S.Ishaq, S.Sal	2025	Canada; Morocco	30	6	4	7	13	✓	Kelowna, British Columbia, Cana	Canada	North America	Municipal scale	Journal of Urban Management	No	VULN INTO RISK	https://doi.org/10.1016/j.uclim.202
25	Art. 002	A methodological approach to flood dynamics based on satellite-derived spectral indices and altimetric forecast models: a case study in South	da Silva Junior, U. J.da Pachec	2025	Brazil; Spain	11	0	3	0	8	✓	Rio Grande do Sul, Brazil	Brazil	South America	Watershed scale	Science of the Total Environment	Yes	RISK	https://doi.org/10.1016/j.nhres.202
35	Art. 003	Coastal Flood Vulnerability and Spatial Risk Assessment for Small Island Urban of Cat Ba Town, Northern Vietnam	Phi, N. Q.Hoa, P. T. M.Tuan, T.	2025	Vietnam	15	0	7	3	5	✓	Cat Ba Town, Vietnam	Vietnam	Asia	Municipal scale	International Journal of Geoinformatics	Biblio only	VULN INTO RISK	https://doi.org/10.21608/JESAUN.2
46	Art. 004	Urbanization under extreme climate events leads to synchronized decreases in flood protection and increases in vulnerability	Elliot, T.Torres-Matallana, J. A.	2025	Denmark; Germany	15	0	6	1	8	✗	Lisbon (Portugal); Postdam (Gerr	Portugal; Germany	Europe	Municipal scale	Cities (160)	No	VULN INTO RISK	https://doi.org/10.3233/jcc240007
51	Art. 005	Flood risk assessment under land use dynamics during 2000–2020 in the yellow river basin, China	Liu, T.; Sun, S.; Wang, N.; War	2025	China	15	4	7	2	2	✓	Yellow River Basin, China.	China	Asia	Watershed scale	Environmental Earth Sciences (2025) 84:513	Yes	VULN INTO RISK	https://doi.org/10.1007/s00704-02
73	Art. 006	Strategic deployment of nature-based solutions for urban flood management in high-density urban landscapes	Wang, M.; Zhao, J.; Xiong, Z.;	2025	China	16	1	9	6	0	✓	Shenzen, China	China	Asia	Municipal scale	Ecological Indicators 176 (2025)	No	VULN	https://doi.org/10.1007/s12517-01
83	Art. 007	Flash flood risk zoning in Gomti River Basin in Eastern Bangladesh and Tripura State (India) using MCDM-GIS Tool	Alif, M. S. A.; Marma, M. E. S.,	2025	India	9	0	4	1	4	✓	Gomti River Basin, India	India	Asia	Watershed scale	Safety in Extreme Environments (2025) 7:7	No	VULN INTO RISK	https://doi.org/10.1007/s11356-02
84	Art. 008	Flood hazard zones prediction using machine-learning-based geospatial approach in lower Niger River basin, Nigeria	Adedoyin Benson Adeyemi, A	2025	Nigeria	27	0	12	0	15	✓	lower Niger River basin, Nigeria	Nigeria	Africa	Watershed scale	Natural Hazards Research 5 (2025)	No	RISK	https://doi.org/10.1016/j.nhres.202
88	Art. 009	Cloud-Powered Flood Mapping and Impact Assessment: Leveraging Sentinel-1 SAR Imagery for Thailand's Disaster Response	Anucharn, T.; Chaikaew, N.; Si	2025	Thailand	13	0	5	0	8	✓	Chiang Rai, Phra Nakhon Si Ayutt	Thailand	Asia	Municipal scale	International Journal of Geoinformatics, Vol. 21, No. 5	No	RISK	https://doi.org/10.1007/s42797-02
104	Art. 010	Identification of urban waterlogging risk zones using Analytical Hierarchy Process (AHP): a case of Agartala city	Das, B.; Ray, T. K.; Boral, E.	2025	India	16	0	6	6	4	✓	Agartala city, India	India	Asia	Municipal scale	Environ Monit Assess (2025) 197:322	No	VULN INTO RISK	https://doi.org/10.1177/1087724X1
117	Art. 011	Assessing the geographical diversity of climate change risks in Japan by overlaying climatic impacts with exposure and vulnerability indicators	Liu, F.; Masago, Y.	2025	Japan	20	2	14	2	2	✓	Japan	Japan	Asia	country scale	Science of the Total Environment 959 (2025) 178076	Yes	VULN INTO RISK	https://doi.org/10.1007/s10113-02
164	Art. 012	Compound risks of floods and droughts over multi-hazard catchments: Revealing association through hydrodynamic-cum-statistical modelling	Tyagi, M.; Singh, H.; Thakur, D	2024	India	26	0	6	0	20	✗	Mahanadi River Basin, India	India	Asia	Watershed scale	Science of the Total Environment 957 (2024) 177689	Yes	RISK	https://doi.org/10.1080/10106049.
196	Art. 013	Socioeconomic impacts of flooding and its coping strategies in Nigeria: Evidence from Dagiri community, Gwagwalada area council of Abuja	Badamosi, A. P.; Olutumise, A	2024	Germany, Nigeria	29	7	6	9	7	✓	Dagiri community, Gwagwalada	Nigeria	Africa	Municipal scale	Natural Hazards Research 4 (2024) 374–386	No	VULN INTO RISK	https://doi.org/10.52939/ijg.v21i5.4
200	Art. 014	Assessment of multi-components and sectoral vulnerability to urban floods in Peshawar – Pakistan	Ali, A.; Waheed, W.; Khan, U.	2024	Pakistan, United Arab Em	53	3	14	11	25	✓	River Kabul, Peshawar, Pakistan	Pakistan	Asia	Watershed scale	Natural Hazards Research 4 (2024) 507–519	No	VULN INTO RISK	https://doi.org/10.5194/nhess-17-1
215	Art. 015	A geospatial analysis of flood risk zones in Cyprus: insights from statistical and multi-criteria decision analysis methods	Ghanem, M. A. A. N.; Zaifoglu	2024	Turkey	38	1	23	4	10	✓	Cyprus	Cyprus	Asia	Watershed scale	Environmental Science and Pollution Research (2024) 3	No	VULN INTO RISK	https://doi.org/10.1016/j.nhres.202
222	Art. 016	Geospatial analysis of flood risk hazard in Zambezi Region, Namibia	Mshelia, Z. H.; Nyam, Y. S.; Jo	2024	South Africa	11	0	5	2	4	✓	Zambezi Region, Namibia	Namibia	Africa	Municipal scale	Environmental Challenges 15 (2024) 100915	No	VULN INTO RISK	https://doi.org/10.1080/19475705.
278	Art. 017	Assessing the vulnerability offlashfloods to climate change in arid zones: Amman–Zarqa Basin, Jordan	Saodi, R. A.; Al Kuisi, M. A.; Sa	2023	Jordan	29	0	10	3	16	✓	Amman–Zarqa Basin, Jordan	Jordan	Asia	Watershed scale	Journal of Water and Climate Change Vol 14 No 12	Yes	VULN INTO RISK	https://doi.org/10.1038/s41598-02
302	Art. 018	Estimation of the flood vulnerability index (FVI) for Alexandria city-Egypt: A case study	Afifi, M. M.; Mokhtar Khalifa,	2023	Egypt	11	0	6	2	3	✓	Alexandria city, Egypt	Egypt	Africa	Municipal scale	Journal of Engineering Sciences	No	VULN INTO RISK	https://doi.org/10.1007/s11069-02
327	Art. 019	Analysis of flood-poverty relationship in burkina faso using remotely sensed nighttime light	Naba, C.; Ishidaira, H.; Magom	2023	Japan	5	3	1	0	1	✗	Burkina Faso	Burkina Faso	Africa	country scale	Journal of Japan Society of Civil Engineers	No	VULN INTO RISK	https://doi.org/10.1007/s11356-02
363	Art. 020	AHP and TOPSIS based flood risk assessment- a case study of the Navsari City, Gujarat, India	Pathan, A. I.; Agnihotri, P.; Sai	2022	India	14	3	6	2	3	✓	Navsari City, India	India	Asia	Municipal scale	Environ Monit Assess (2022)	No	VULN INTO RISK	https://doi.org/10.1177/239980832
424	Art. 021	Waterlogging risk assessment of the Beijing-Tianjin-Hebei urban agglomeration in the past 60 years	Wang, Y.; Zhai, J.; Song, L.	2021	China	8	1	2	2	3	✓	Beijing-Tianjin-Hebei (BTH), Chin	China	Asia	Metropolitan scale	Theoretical and Applied Climatology (2021) 145:1039–	Yes	VULN INTO RISK	https://doi.org/10.1111/jfr3.70005
483	Art. 022	Adaptive Capacity Assessment for A Flood Vulnerable Region through Land Use Modelling and Socio Economic and Physical Indicators	Narendr, A.; Das, S.; Shivamur	2020	India	13	3	6	2	2	✓	Andhra Pradesh Capital Region	India	Asia	Municipal scale	Journal of Environmental Informatics Letters 3(2) 107-1	Yes	VULN INTO RISK	https://doi.org/10.1007/s11069-02
524	Art. 023	A framework for pluvial flood risk assessment in Alexandria considering the coping capacity	Elboshy, B.Kanae, S.; GamalEl	2019	Egypt, Japan	23	4	5	10	4	✓	Alexandria city, Egypt	Egypt	Africa	Municipal scale	Environment Systems and Decisions (2019) 39:77–94	No	VULN INTO RISK	https://doi.org/10.1177/239980832
534	Art. 024	Linking Water Infrastructure, Public Health, and Sea Level Rise: Integrated Assessment of Flood Resilience in Coastal Cities	Allen, T. R.; Crawford, T.; Mor	2019	USA	19	0	3	10	6	✗	Charleston, South Carolina, and I	United States of America (USA)	North America	Municipal scale	Public Works Management and Policy	Yes	VULN INTO RISK	https://doi.org/10.1007/s11069-02
542	Art. 025	Towards a better understanding of the evolution of the flood risk in Mediterranean urban areas: the case of Barcelona.	Cortès, M.Llasat, M. C.Gilaber	2018	Spain	22	1	5	3	13	✓	Barcelona, Spain	Spain	Europe	Municipal scale	Nat Hazards (2018) 93:S39–S60	Yes	VULN INTO RISK	https://doi.org/10.1007/s00477-02
559	Art. 026	Mainstreaming climate adaptation in spatial planning. The case of Baixa Pombalina in Lisbon	Ribeiro, P.; Ferrão, J.; Seixas, J	2018	Portugal	20	5	8	5	2	✗	Lisbon (Portugal)	Portugal	Europe	Street block scale	Finisterra, LIII, 108, 2018, pp. 15 -38	Yes	VULN INTO RISK	https://doi.org/10.1007/s11069-02
604	Art. 027	Risk analysis and visualization for detecting signs of flood disaster in Twitter	Kwon, H. Y.; Kang, Y. O.	2016	South Korea	24	2	4	5	13	✓	Seoul, South Korea	South Korea	Asia	Municipal scale	Spatial Information Research	Yes	VULN INTO RISK	https://doi.org/10.1007/s11069-01
693	Art. 028	Future Climate Extremes in Bangladesh: Insights from a Multi-Model Ensemble of CMIP6 Simulations	Nazrul, FB; Karim, MR; Pavan,	2025	Bangladesh, USA	22	0	0	0	22	✗	Bangladesh	Bangladesh	Asia	country scale	Earth Systems and Environment	No	RISK	https://doi.org/10.1016/j.scitotenv.
697	Art. 029	Machine Learning Enhances Flood Resilience Measurement in a Coastal Area - Case Study of Morocco	Satour, N; Benyacoub, B; El M	2023	Morocco	19	6	6	7	0	✗	Fnideq, M'diq and Martil municipalities	Morocco	Africa	Watershed scale	Journal of Environmental Informatics 42(1), 53-64 (2023	Yes	VULN	https://doi.org/10.1007/s11269-02
709	Art. 030	Vulnerability of flash flooding in Riyadh, Saudi Arabia	Rahman, MT; Aldosary, AS; Na	2016	Saudi Arabia	13	5	4	1	3	✗	Riyadh, Saudi Arabia	Saudi Arabia	Asia	Street block scale	Natural Hazards	No	VULN INTO RISK	https://doi.org/10.1016/j.jhydrol.20
710	Art. 031	Mapping social vulnerability to flood hazard in Norfolk, England	Garbutt, K; Ellul, C; Fujiyama,	2015	UK	54	41	2	9	2	✗	Norfolk, England	England	Europe	Municipal scale	Environmental Hazards	No	VULN INTO RISK	https://doi.org/10.1111/jfr3.12997
712	Art. 032	Assessing Adaptive Capacity of Urban Coastal Communities to Flooding: The Case of La Paz District, Philippines	Kirugumi, GW; Reyes, MRD	2025	Philippines	38	7	2	28	1	✓	La Paz District, Philippines	Philippines	Asia	Municipal scale	Environment and Urbanization Asia	Yes	VULN INTO RISK	https://doi.org/10.1007/s11069-02
722	Art. 033	Multi-Scenario Flood Susceptibility Projections in the Eastern Hindu Kush: Integrating Machine Learning, CMIP6, and Land Use Change	Ullah, K; Wang, Y; Xi, C; Du, BY	2025	China, Egypt	19	0	9	1	9	✓	Eastern Hindu Kush, Pakistan	Pakistan	Asia	Watershed scale	Earth Systems and Environment	No	VULN INTO RISK	https://doi.org/10.1007/s10661-02
725	Art. 034	Multi-hazard Vulnerability Assessment Through RS-GIS and AHP: A Geo-Spatial Study of Keleghai River Basin in India	Roy, A; Dhar, SB	2025	India	8	0	6	0	2	✓	Keleghai River Basin, India	India	Asia	Watershed scale	International Journal of Environmental Research	No	RISK	https://doi.org/10.1007/s10661-02
726	Art. 035	Integrating LiDAR, Sentinel-2 data and Bluespot modeling for flood risk mapping in Mihăesti, Romania	Vizireanu, I; Grigoras, G; Radu	2025	Romania	12	0	9	0	3	✓	Mihăești commune, Romania	Romania	Europe	Municipal scale	Environmental Earth Sciences (2025) 84:470	Biblio only	RISK	https://doi.org/10.2478/jlecol-2024
727	Art. 036	Geoinformatics-based watershed-level flood hazard analysis using fuzzy analytic hierarchy process across the Ganga-Brahmaputra basin	Kaushik, K; Pandey, AC; Parida	2025	India	14	0	8	1	5	✓	Ganga-Brahmaputra basin, India	India	Asia	Watershed scale	Journal of Earth System Science	No	VULN INTO RISK	https://doi.org/10.1007/s12237-02
728	Art. 037	Remote sensing and climatic data for flood impact assessment in Al-Ain (UAE)	Bersi, M; Saibi, H; Abdelrahma	2025	UAE	15	0	3	1	11	✓	Al-Ain (UAE)	United Arab Emirates (UAE)	Asia	Watershed scale	Scientific Reports	No	VULN INTO RISK	https://doi.org/10.1007/s10669-01
739	Art. 038	GIS-based AHP approach to flood susceptibility assessment in Tangail district, Bangladesh	Sharker, R; Islam, MR; Hosen,	2025	Bangladesh	10	0	5	2	3	✓	Tangail district, Bangladesh	Bangladesh	Asia	Municipal scale	Journal of Earth System Science	No	VULN INTO RISK	https://doi.org/10.1016/j.cities.202
740	Art. 039	Vulnerability of Populations to Flooding and Marine Submersion in the Wouri Estuary (Cameroon), in the Context of Climate Change	Ebodé, VB; Onguéné, R; Marie	2025	France; Cameroon	22	0	9	12	1	✓	Wouri Estuary, Cameroon	Cameroon	Africa	Watershed scale	Estuaries and Coasts (2025) 48:28	Yes	VULN INTO RISK	https://doi.org/10.1007/s10668-02
744	Art. 040	A semi-quantitative multi-hazard risk assessment framework for European coastal urban areas	Figueiredo, RRangel-Parra, R; Bussi, G; C[illegible], P; Coccia, G; Martina, MLV	2024	Portugal; Italy	16	2	8	1	5	✓	Benidorm in Spain, Dublin in Irel	Spain; Ireland; Poland; Italy; Port	Europe	Municipal scale	Geomatics Natural Hazards & Risk	Biblio only	VULN INTO RISK	https://doi.org/10.1080/19475705.
761	Art. 041	Towards urban place-based resilience modeling: Mixed methods for a flood resilience assessment index	Bottoms, B; Arbit, J; Lewis, E;	2024	USA	35	18	2	15	0	✗	Alameda CA; Maricopa AZ; Wash	United States of America (USA)	North America	Municipal scale	Environment and Planning B-Urban Analytics and City Sc	No	VULN	https://doi.org/10.1080/19475705.
762	Art. 042	Multi-hazard assessment of climate-related hazards for European coastal cities	Laino, E; Iglesias, G	2024	Ireland; UK	15	0	1	0	14	✗	Benidorm in Spain, Dublin in Irel	Spain; Ireland; Poland; Italy; Port	Europe	Municipal scale	Journal of Environmental Management	Yes	RISK	https://doi.org/10.1007/s11069-01
765	Art. 043	Flood risk mapping under changing climate in Lower Tapi river basin, India	Chandole, V; Joshi, GS; Srivast	2024	India	17	2	9	1	5	✓	Lower Tapi river basin, India	India	Asia	Watershed scale	Stochastic Environmental Research and Risk Assessme	No	VULN INTO RISK	https://doi.org/10.5194/nhess-25-3
766	Art. 044	Deep learning rapid flood risk predictions for climate resilience planning	Yosri, A; Ghaith, M; El-Dakhak	2024	Canada	31	9	10	4	8	✓	Bow and Elbow Rivers in Calgary	Canada	North America	Watershed scale	Journal of Hydrology	No	VULN INTO RISK	https://doi.org/10.1080/17477891.
769	Art. 045	Advancing Flood Risk Assessment through Integrated Hazard Mapping: A Google Earth Engine-Based Approach for Comprehensive Scientific A	Agrawal, R; Singh, SK; Kanga, S	2024	India, Japan	12	0	8	0	4	✓	Jaipur District, India.	India	Asia	Municipal scale	Journal of Climate Change	Biblio only	RISK	https://doi.org/10.1007/s12665-02
771	Art. 046	Localising vulnerability assessment to urban floods: A comparative analysis of top-down and bottom-up geospatial approaches in Patna City, India		2024	India	38	23	5	10	0	✗	Patna City, India	India	Asia	Street block scale	International Journal of Disaster Risk Reduction 100 (20	Yes	VULN	https://doi.org/10.1007/s11356-02
772	Art. 047	Climate uncertainty and vulnerability of urban flooding associated with regional risk using multi-criteria analysis in Mumbai, India	Yadav, NWu, JP; Banerjee, A; F	2024	China; India	15	0	8	0	7	✓	Mumbai, India	India	Asia	Municipal scale	Environmental Research 244 (2024) 117962	Yes	RISK	https://doi.org/10.1111/jfr3.70028
774	Art. 048	Rural-urban disparities in spatiotemporal pattern of vulnerability to climate change: a study of Madhya Pradesh, India	George, A; Sharma, P; Pradhar	2023	India	16	8	0	4	4	✗	Madhya Pradesh, India	India	Asia	Municipal scale	Environmental Earth Sciences (2023) 82:588	Yes	VULN INTO RISK	https://doi.org/10.1007/s11069-01
777	Art. 049	Urban flood risk assessment under rapid urbanization in Zhengzhou City, China	Li, GY; Liu, JH; Shao, WW	2023	China	8	1	5	0	2	✓	Zhengzhou City, China	China	Asia	Municipal scale	Regional Sustainability 4 (2023) 332–348	No	VULN INTO RISK	https://doi.org/10.1007/s13201-02
780	Art. 050	Urban flood risk assessment using AHP and geospatial techniques in swat Pakistan	Waseem, M; Ahmad, S; Ahma	2023	Pakistan, Germany	9	0	6	0	3	✓	Swat (river) District, Pakistan	Pakistan	Asia	Watershed scale	Sn Applied Sciences	No	RISK	https://doi.org/10.1007/s11069-02
785	Art. 051	Climate change vulnerability hotspots in Costa Rica: constructing a sub-national index	Nawrotzki, RJ; Tebeck, M; Har	2023	Germany	16	5	4	3	4	✓	Costa Rica	Costa Rica	Central America	country scale	Journal of Environmental Studies and Sciences (2023) 1	Yes	VULN INTO RISK	https://doi.org/10.1007/s11069-01
790	Art. 052	Towards flood risk reduction: Commonalities and differences between urban flood resilience and risk based on a case study in the Pearl River I	Jiaxuan Zheng, Guoru Huan	2023	China	12	1	4	3	4	✓	Pearl River Delta, China	China	Asia	Watershed scale	International Journal of Disaster Risk Reduction; 86 (202	No	VULN INTO RISK	https://doi.org/10.15233/gfz.2020.3
793	Art. 053	An integrated indicator-based approach for constructing an urban flood vulnerability index as an urban decision-making tool using the PCA an	Abdrabo, KIKantoush, SAEsma	2023	Egypt, Japan	41	25	7	9	0	✓	Alexandria city, Egypt	Egypt	Africa	Municipal scale	Urban Climate 48 (2023) 101426	Yes	VULN	https://doi.org/10.1007/s41748-02
805	Art. 054	Flood vulnerability and buildings' flood exposure assessment in a densely urbanised city: comparative analysis of three scenarios using a neura	Pham, QB; Ali, AS; Bielecka, E;	2022	Poland, India	15	0	9	0	6	✓	Warsaw, Poland	Poland	Europe	Municipal scale	Natural Hazards (2022) 113:1043–1081	No	RISK	https://doi.org/10.11113/ijbes.v8.n
816	Art. 055	A framework for risk-based assessment of urban floods in coastal cities	Kumar, MD; Tandon, S; Bassi,	2022	India	20	1	4	11	4	✓	Cuttack, India	India	Asia	Municipal scale	Natural Hazards (2022) 110:2035–2057	Yes	VULN INTO RISK	https://doi.org/10.1007/s12665-01
819	Art. 056	Spatialized flood resilience measurement in rapidly urbanized coastal areas with a complex semi-arid environment in northern Morocco	Satour, N; Raji, O; El Moçayd,	2021	Morocco	13	4	6	2	1	✓	Fnideq, M'diq, and Martil, north	Morocco	Africa	Municipal scale	Natural Hazards and Earth System Sciences, 21, 1101–1	Yes	VULN INTO RISK	https://doi.org/10.1016/j.jum.2025.
820	Art. 057	Integration of earth observation and census data for mapping a multi-temporal flood vulnerability index: a case study on Northeast Italy	Cian, F; Giupponi, C; Marconc	2021	Italy, Germany	14	6	5	3	0	✗	Northeast Italy (multiple cities)	Italy	Europe	country scale	Natural Hazards (2021) 106:2163–2184	No	VULN	https://doi.org/10.1007/s12040-02
827	Art. 058	An Indicator-Based Approach for Micro-Scale Assessment of Physical Flood Vulnerability of Individual Buildings	Kaoje, IU; Rahman, MZA; Tam	2021	Malaysia	6	0	2	2	2	✓	Bandar Kota Bharu, Malaysia	Malaysia	Asia	Street block scale	International Journal of Built Environment and Sustainab	No	VULN INTO RISK	https://doi.org/10.1177/09754253
831	Art. 059	Assessing coastal vulnerability of Chittagong District, Bangladesh using geospatial techniques	Miah, J; Hossain, KT; Hossain,	2020	Germany, Bangladesh	7	0	3	1	3	✓	Chittagong District, Bangladesh	Bangladesh	Asia	Municipal scale	Journal of Coastal Conservation (2020) 24:66	Yes	VULN	https://doi.org/10.1007/s11205-01
842	Art. 060	Comprehensive evaluation of urban flood-bearing risks based on combined compound fuzzy matter-element and entropy weight model	Lv, H; Guan, XJ; Meng, Y	2020	China	12	0	3	6	3	✓	Zhengzhou City, China	China	Asia	Municipal scale	Natural Hazards (2020) 103:1823–1841	No	VULN	https://doi.org/10.1007/s11069-02
856	Art. 061	A methodology for urban micro-scale coastal flood vulnerability and risk assessment and mapping	Percival, S; Teeuw, R	2019	UK	26	10	4	11	1	✓	Hilsea ward - Portsmouth, UK	United Kingdom (UK)	Europe	Municipal scale	Natural Hazards (2019) 97:355–377	Yes	VULN INTO RISK	https://doi.org/10.1007/s11600-02
862	Art. 062	Flood hazards: household vulnerability and resilience in disaster-prone districts of Khyber Pakhtunkhwa province, Pakistan	Shah, AA; Ye, JZ; Abid, M; Kha	2018	China, Pakistan	35	11	3	17	4	✓	Khyber Pakhtunkhwa province, I	Pakistan	Asia	Street block scale	Natural Hazards (2018) 93:147–165	Yes	VULN INTO RISK	https://doi.org/10.1007/s00704-02
863	Art. 063	Integration of multi-parametric fuzzy analytic hierarchy process and GIS along the UNESCO World Heritage: a flood hazard index, Mombasa Co	Hategekimana, Y; Yu, LJ; Nie, Y	2018	China	8	0	1	5	2	✓	Mombasa County, Kenya	Kenya	Africa	Municipal scale	Nat Hazards (2018) 92:1137–1153	Yes	VULN INTO RISK	https://doi.org/10.1016/j.ijdrr.2023
869	Art. 064	The KULTURisk Regional Risk Assessment methodology for water-related natural hazards - Part 1: Physical-environmental assessment	Ronco, P; Gallina, V; Torresan, S; Zabeo, A; Semenzin, E; Critto, A; Marcomini, A	2014	Italy	11	0	0	0	11	✓	Zurich, Switzerland	Switzerland	Europe	Watershed scale	Hydrol. Earth Syst. Sci., 18, 5399–5414, 2014	Yes	VULN INTO RISK	https://doi.org/10.1007/s11852-02
886	Art. 065	Enhancing flood susceptibility mapping in Sana'a,Yemen with random forest and eXtreme gradient boosting algorithms	Alwathaf, Y; Al-Areeq, AM; Al-	2025	Yemen, Egypt, Saudi Ara	15	0	2	1	12	✓	Sana'a,Yemen	Yemen	Asia	Watershed scale	GEOCARTO INTERNATIONAL 2025, VOL. 40, NO. 1, 248	No	VULN INTO RISK	https://doi.org/10.1007/s41324-01
904	Art. 066	Resilient coasts: A holistic approach to flood risk assessment and mitigation on the East Coast of Ghana	Kwang, C; Yeboah, E; Mensah	2025	Ghana, China, USA, Keny	11	0	2	3	6	✓	East Coast of Ghana	Ghana	Africa	Municipal scale	Journal of Coastal Conservation (2025) 29:66	Yes	VULN INTO RISK	https://doi.org/10.1016/j.jenvman.2
907	Art. 067	Understanding urban flood risk perception and its determinants across diverse hazard sources	Waseem, HB; Rana, IA	2025	Pakistan	22	0	6	9	7	✓	Islamabad, Pakistan	Pakistan	Asia	Street block scale	URBAN WATER JOURNAL 2026, VOL. 23, NO. 3, 460–48	Yes	VULN INTO RISK	https://doi.org/10.1016/j.rsgus.20
914	Art. 068	Enhancing Urban Flood Vulnerability Mapping with Multi-Criteria Decision Analysis	Sukri, NSM; Maulud, KNA; Ra	2025	Malaysia, Uzbekistan	7	0	4	0	3	✓	Taman Sri Muda, Selangor; Maly	Malaysia	Asia	Municipal scale	Jurnal Kejuruteraan 37(7) 2025: 3641-3654	Yes	RISK	https://doi.org/10.32604/cmes.202
918	Art. 069	AI-Driven GIS Modeling of Future Flood Risk and Susceptibility for Typhoon Krathon under Climate Change	Liu, CY; Ku, CY; Tsai, MH; You,	2025	Taiwan	7	0	3	0	4	✓	Keelung City, Taiwan	Taiwan	Asia	Municipal scale	ComputModelEngSci. 2025;144(3)	Yes	RISK	https://doi.org/10.1016/j.scitotenv.
921	Art. 070	Mapping pluralistic future flood risk scenarios for informal settlements in the eThekwini metropolitan municipality, South Africa	Broekman, C; Coetzee, C; Cilli	2025	South Africa	16	2	5	1	8	✓	eThekwini metropolitan municip	South Africa	Africa	Metropolitan scale	Natural Hazards (2025) 121:20949–20983	No	VULN INTO RISK	https://doi.org/10.1007/s12665-02
924	Art. 071	Evaluating Yangtze River Delta Urban Agglomeration flood risk using a hybrid method of automated machine learning and analytic hierarchy p	Gao, YLu, HPZhang, YR; Jin, H	2025	China	25	6	8	4	7	✓	Yangtze River Delta, China	China	Asia	Watershed scale	Nat. Hazards Earth Syst. Sci., 25, 3087–3108, 2025	Biblio only	VULN INTO RISK	https://doi.org/10.1007/s11069-02
927	Art. 072	Integrated hydrologic-economic modeling for urban flood risk mitigation using SWMM, HEC-RAS, and HAZUS: a case study of the Bronx river w	Sabbaghian, RJ; Fereshtehpou	2025	Iran, Canada	22	0	9	2	11	✓	Bronx River watershed, NY, USA	United States of America (USA)	North America	Watershed scale	Sustainable Water Resources Management (2025) 11:5	No	VULN INTO RISK	https://doi.org/10.1007/s10661-02
928	Art. 073	Integrated flood risk prediction and zonation in bihar: observations from climate change projection using GIS-based AHP-Multicriteria approac	Kumar, V; Rashiq, A; Prakash,	2025	India	22	3	7	5	7	✓	Bihar state, India	India	Asia	Metropolitan scale	Theoretical and Applied Climatology (2025) 156:468	No	VULN INTO RISK	https://doi.org/10.1007/s12165-01
938	Art. 074	Identification of flood vulnerability areas using analytical hierarchy process techniques in the Wuseta watershed, Upper Blue Nile Basin, Ethiop	Mulu, A; Kassa, SB; Wossene,	2025	Ethiopia	8	0	4	1	3	✓	Wuseta watershed, Upper Blue N	Ethiopia	Africa	Watershed scale	Nature Scientific Reports (2025) 15:28680	No	VULN INTO RISK	https://doi.org/10.1007/s11069-02
944	Art. 075	Optimizing Flood Susceptibility Detection Using Ensemble Learning Methods	Dai, ZH; Arabameri, A; Yariyan	2025	China, Iran, India	19	0	9	1	9	✓	Nekaroud Watershed, Iran	Iran	Asia	Watershed scale	Water Resources Management (2025) 39:7109–7132	No	VULN INTO RISK	https://doi.org/10.1007/s11852-02
957	Art. 076	Impact of climate change on flood risk with urban resilience perspective using fuzzy logic model	Ullah, I; Kovacs, G; Lenner, T	2025	Hungary	19	0	6	3	10	✓	Gyor-Moson-Sopron County, Hur	Hungary	Europe	Watershed scale	Earth Science Informatics (2025) 18:346	No	VULN INTO RISK	https://doi.org/10.1177/02658135
977	Art. 077	Assessment of flood risk based on CMIP6 for the Northern foothills of Qinling mountain	Ahmed, AHuo, ADYang, LY; Zh	2025	China, Egypt, Pakistan	23	1	5	1	16	✓	Northern Qinling Mountains, Chi	China	Asia	Watershed scale	Theoretical and Applied Climatology (2025) 156:232	No	VULN INTO RISK	https://doi.org/10.1007/s11069-02
978	Art. 078	Urban flood hazard assessment using FLA-optimized boost algorithms in Ankara, Türkiye	Enes Gul	2025	Turkey	13	0	4	2	7	✓	Çubuk Basin boundary, Turkey	Turkey	Asia	Watershed scale	Applied Water Science (2025) 15:78	No	VULN INTO RISK	https://doi.org/10.1016/j.envc.2024
987	Art. 079	Spatial Assessment of Territorial Resilience to Floods Using Comprehensive Indicators: Application to Greater Papeete (French Polynesia)	Bourlier, B; Taillandier, F; Hein	2025	France	12	3	3	5	1	✓	Greater Papeete conurbation, Ta	Tahiti	Oceania	Metropolitan scale	Journal of Flood Risk Management, 2025; 18:e70005	Biblio only	VULN INTO RISK	https://doi.org/10.1007/s11069-02
989	Art. 080	Assessment of Rainfall Forecasts and Flood Risk in a Coastal Urban Catchment Considering Different Urban Canopy Scenarios	Ghosh, M; Paul, S; Ghosh, S; K	2025	India	12	0	5	1	6	✓	Mumbai, India	India	Asia	Municipal scale	Journal of Flood Risk Management, 2025; 18:e70028	No	VULN INTO RISK	https://doi.org/10.1007/s11069-01
995	Art. 081	Impact of land use and climate change on urban flooding in Bhubaneswar city in India	Das, A; Sahoo, SN	2025	India	19	0	5	2	12	✓	Bhubaneswar city, India	India	Asia	Municipal scale	Natural Hazards (2025) 121:8655–8674	No	VULN INTO RISK	https://doi.org/10.1007/s11069-01
1001	Art. 082	Multi-hazard vulnerability zone identification using GIS-based fuzzy AHP and MCDM techniques	Sood, A; Vignesh, KS; Prapanc	2025	India	7	0	6	0	1	✗	Chennai, India	India	Asia	Municipal scale	Natural Hazards (2025) 121:8501–8534	No	RISK	https://doi.org/10.1038/s41598-02
1050	Art. 083	Flood vulnerability mapping in an urban area with high levels of impermeable coverage in southern Brazil	Alves, RA; Rudke, AP; Souza, S	2024	Brazil, Sweden	5	0	3	0	2	✓	Igapó Lake basin, Paraná, Brazil	Brazil	South America	Watershed scale	Regional Environmental Change (2024) 24:96	No	RISK	https://doi.org/10.1038/s41598-02
1058	Art. 084	Climate change vulnerability assessment of Karsıyaka, Izmir	Cangüzel, A; Hepcan, CC	2024	Turkey	29	4	2	15	8	✓	Karsıyaka, Izmir, Turkey	Turkey	Asia	Municipal scale	Natural Hazards (2024) 120:14869–14888	Yes	VULN INTO RISK	https://doi.org/10.2208/JOURNALO
1062	Art. 085	Understanding flood risk in urban environments: spatial analysis of building vulnerability and hazard areas in the Lisbon metropolitan area	Santos, PP; Pereira, S; Zezere,	2024	Portugal, UK	15	0	5	2	8	✓	Lisbon, Portugal	Portugal	Europe	Metropolitan scale	Natural Hazards (2024) 121:23603–23626	No	VULN INTO RISK	https://doi.org/10.3808/jei.202000
1066	Art. 086	Flood vulnerability assessment in rural and urban informal settlements: case study of Karonga District and Lilongwe City in Malawi	Mwalwimba, IK; Manda, M; N	2024	Malawi	55	11	6	31	7	✓	Karonga District and Lilongwe Ci	Malawi	Africa	Municipal scale	Natural Hazards (2024) 120:10141–10184	Yes	VULN INTO RISK	https://doi.org/10.1007/s13412-02
1071	Art. 087	Long-term flood exposure assessment using satellite-based land use change detection and inundation simulation: A 30-year case study of the E	Darnkachatarn, S; Kajitani, Y	2024	Thailand	14	1	5	0	8	✓	Chao Phraya River Basin, Bangko	Thailand	Asia	Watershed scale	Journal of Flood Risk Management, 2024; 17:e12997	Yes	VULN INTO RISK	https://doi.org/10.1007/s41748-02
1073	Art. 088	Urban Flood Hazard Zonation in Bengaluru Urban District, India	Dwarakish, GS; Pai, BJ; Rajees	2024	India	8	0	6	0	2	✓	Bengaluru Urban District, India	India	Asia	Metropolitan scale	Journal of Landscape Ecology (2024), Vol: 17 / No. 1	No	VULN INTO RISK	https://doi.org/10.1007/s10661-02
1076	Art. 089	Urban waterlogging risk susceptibility within changing pattern of rainfall intensity in Delhi, India	Kumar, P; Thakur, S; Ashwani;	2024	India	20	0	11	4	5	✓	North Delhi, India	India	Asia	Municipal scale	Acta Geophysica (2024) 72:4525–4543	Biblio only	VULN INTO RISK	https://doi.org/10.1007/s11069-01
1090	Art. 090	Suitability Analysis for Resettlement Potential Sites of Flood Vulnerable Community in Kigali city, Rwanda	Izere, D; Li, LH; Mind'je, R; Kay	2024	China,Rwanda	12	0	6	3	3	✓	Nyarugenge District, Kigali city, F	Rwanda	Africa	Street block scale	Earth Systems and Environment (2024) 8:521–544	Biblio only	VULN INTO RISK	https://doi.org/10.1007/s11069-02
1097	Art. 091	Flood susceptibility assessment of the Agartala Urban Watershed, India, using Machine Learning Algorithm	Debnath, J; Debbarma, J; Debl	2024	India, Japan	21	0	8	2	11	✓	Agartala Urban Watershed, India	India	Asia	Watershed scale	Environ Monit Assess (2024) 196:110	No	VULN INTO RISK	https://doi.org/10.52939/ijg.v21i10.
1103	Art. 092	Identifying vulnerable populations in urban society: a case study in a flood-prone district of Wuhan, China	Xu, J; Takahashi, M; Li, WF	2024	China, Japan	23	8	6	9	0	✓	Wuhan, China	China	Asia	Street block scale	Nat. Hazards Earth Syst. Sci., 24, 179–197, 2024	Yes	VULN	https://doi.org/10.1007/s13753-02
1116	Art. 093	Mapping flood vulnerability using an analytical hierarchy process (AHP) in the Metropolis of Mumbai	Mann, R; Gupta, A	2023	India	9	0	4	0	5	✓	Greater Mumbai, India	India	Asia	Metropolitan scale	Environ Monit Assess (2023) 195:1534	No	RISK	https://doi.org/10.1038/s41598-02
1118	Art. 094	Application of analytic network process (ANP), local and indigenous knowledge in mapping flood vulnerability in an informal settlement	Membele, GM; Naidu, M; Mu	2023	Zambia, South Africa	18	3	4	6	5	✓	Quarry Road West informal settl	South Africa	Africa	Street block scale	Natural Hazards (2024) 120:2929–2951	No	VULN INTO RISK	https://doi.org/10.1007/s11069-01
1128	Art. 095	Flood risk assessment in Limbe (Cameroon) using a GIS weighed sum method	Enomah, LD; Downs, J; Mbaig	2024	USA, Cameroon	8	0	4	0	4	✗	Limbe, Cameroon	Cameroon	Africa	Municipal scale	Environment, Development and Sustainability (2024) 2	Yes	RISK	https://doi.org/10.1007/s11069-01
1139	Art. 096	Urban flood risk assessment characterizing the relationship among hazard, exposure, and vulnerability	Bin, LL; Xu, K; Pan, H; Zhuang,	2023	China	12	0	4	2	6	✓	Haikou city, Hainan, China	China	Asia	Municipal scale	Environmental Science and Pollution Research (2023) 3	Yes	VULN INTO RISK	https://doi.org/10.1007/s13753-01
1146	Art. 097	Risk of Flash Floods in Urban and Rural Municipalities Triggered by Intense Precipitation in Wielkopolska of Poland	Pinskwar, I; Chorynski, A; Gra	2023	Poland	15	0	7	4	4	✓	Wielkopolska Province, Poland	Poland	Europe	Metropolitan scale	International Journal of Disaster Risk Science (2023) 14	No	VULN INTO RISK	https://doi.org/10.18055/finis13457
1149	Art. 098	Settlement suitability analysis of a riverine floodplain in the perspective of GIS-based multicriteria decision analysis	Alam, N; Saha, S; Gupta, S; Ch	2023	India	12	0	5	1	6	✓	Lower Ganga river plains, India	India	Asia	Watershed scale	Environmental Science and Pollution Research (2023) 3	No	VULN INTO RISK	https://doi.org/10.1007/s11625-01
1165	Art. 099	Measure and spatial identification of social vulnerability, exposure and risk to natural hazards in Japan using open data	Raduszynski, T; Numada, M	2023	Japan	17	6	1	6	4	✗	Japan	Japan	Asia	country scale	Scientific Reports (2023) 13:664	No	VULN INTO RISK	https://doi.org/10.5194/hess-18-53
1222	Art. 100	Mainstreaming climate resilience: A GIS-based methodology to cope with cloudbursts in Turin, Italy	Brunetta, G; Caldarice, O; Fara	2022	Italy	9	0	4	1	4	✓	Turin, Italy	Italy	Europe	Municipal scale	Environment and Planning B: Urban Analytics and City	Yes	VULN INTO RISK	https://doi.org/10.1007/s41742-02
1228	Art. 101	A comparison of three multi-criteria decision-making models in mapping flood hazard areas of Northeast Penang, Malaysia	Mudashiru, RB; Sabtu, N; Abd	2022	Malaysia, Nigeria	11	0	4	1	6	✓	Northeast Penang, Malaysia	Malaysia	Asia	Watershed scale	Natural Hazards (2022) 112:1903–1939	Yes	VULN INTO RISK	https://doi.org/10.1007/s40899-02
1256	Art. 102	A hybridized model based on neural network and swarm intelligence-grey wolf algorithm for spatial prediction of urban flood-inundation	Darabi, H; Haghighi, AT; Rahm	2021	Finland, Iran, Australia, I	14	0	3	0	11	✓	Sari City, Iran	Iran	Asia	Municipal scale	Journal of Hydrology 603 (2021) 126854	No	RISK	https://doi.org/10.1007/s11069-02
1267	Art. 103	An urban system perspective on urban flood resilience using SEM: evidence from Nanjing city, China	Wang, P; Li, YB; Zhang, YH	2021	China	24	8	1	14	1	✓	Nanjing city, China	China	Asia	Municipal scale	Natural Hazards (2021) 109:2575–2599	No	VULN INTO RISK	https://doi.org/10.2166/wcc.2023.2
1271	Art. 104	The socioeconomic impact of climate-related hazards: flash flood impact assessment in Kuala Lumpur, Malaysia	Bhuiyan, TR; Er, AC; Muhamac	2021	Malaysia	22	10	1	6	5	✗	Kuala Lumpur, Malaysia	Malaysia	Asia	Metropolitan scale	Natural Hazards (2021) 109:1509–1538	No	VULN INTO RISK	https://doi.org/10.3808/jei.202300
1276	Art. 105	Enhancing urban flood resilience: A holistic framework incorporating historic worst flood to Yangtze River Delta, China	Zhu, SY; Li, DZ; Huang, GY; Ch	2021	China; Canada	16	4	2	8	2	✓	Yangtze River Delta, China	China	Asia	Watershed scale	International Journal of Disaster Risk Reduction 61 (202	No	VULN INTO RISK	https://doi.org/10.5194/nhess-21-1
1317	Art. 106	A city-scale assessment of emergency response accessibility to vulnerable populations and facilities under normal and pluvial flood conditions	Yin, J; Yu, DP; Liao, BG	2021	China, UK	18	3	3	9	3	✓	Shanghai, China	China	Asia	Metropolitan scale	Environment and Planning B: Urban Analytics and City	Yes	VULN INTO RISK	https://doi.org/10.1007/s11069-01
1338	Art. 107	Vulnerability assessment for flash floods using GIS spatial modeling and remotely sensed data in El-Arish City, North Sinai, Egypt	Mohamed, AS; El-Raey, ME	2020	Egypt	9	0	5	0	4	✗	Wadi El-Arish, Sinai, Egypt.	Egypt	Africa	Watershed scale	Natural Hazards (2020) 102:707–728	Yes	RISK	https://doi.org/10.1007/s11069-01
1349	Art. 108	Flood vulnerability assessment using MOVE framework: a case study of the northern part of district Peshawar, Pakistan	Hamidi, AR; Wang, JW; Guo, S	2020	China	17	6	3	5	3	✓	Peshawar, Pakistan	Pakistan	Asia	Municipal scale	Natural Hazards (2020) 101:385–408	Yes	VULN INTO RISK	https://doi.org/10.1007/s12040-02
1353	Art. 109	Floodhazard mappingusingamulti-criteria decisionanalysis and GIS (case study Gaza Governorate, Palestine)	Ajjur, SB; Mogheir, YK	2020	Palestine, Qatar	7	0	3	1	3	✓	Gaza Governorate, Palestine	Palestine	Asia	Municipal scale	Arabian Journal of Geosciences (2020) 13: 44	Yes	VULN INTO RISK	https://doi.org/10.1007/s11069-02
1356	Art. 110	Assessing vulnerability for inhabitants of Dhaka City considering flood-hazard exposure	Huq, ME; Cheng, QM; Altan, C	2020	China, Turkey, Banglade	21	7	1	13	0	✗	Dhaka City, Bangladesh	Bangladesh	Asia	Street block scale	Geofizika (2020) Vol. 37 No. 2	Yes	VULN	https://doi.org/10.1007/s11069-01
1375	Art. 111	Measuring urban vulnerability to climate change using an integrated approach, assessing climate risks in Beijing	Zhang, MS; Liu, ZL; van Dijk, M	2019	China, the Netherlands	9	1	2	3	3	✓	Beijing, China	China	Asia	Municipal scale	Peerj	Yes	VULN INTO RISK	https://doi.org/10.17576/jkukm-20
1377	Art. 112	Implementing a Flood Vulnerability Index in urban coastal areas with industrial activity	Giannakidou, C; Diakoulaki, D	2019	Greece	21	2	6	7	6	✓	Elefsina, Thessaloniki, Rio, Patras	Greece	Europe	Municipal scale	Natural Hazards (2019) 97:99–120	Yes	VULN INTO RISK	https://doi.org/10.5194/nhess-11-4
1394	Art. 113	Multidimensional Model for Vulnerability Assessment of Urban Flooding: An Empirical Study in Pakistan	Rana, IA; Routray, JK	2018	Pakistan, Thailand	43	9	4	27	3	✗	Punjab Province, Pakistan	Pakistan	Asia	Municipal scale	Int J Disaster Risk Sci (2018) 9:359–375	Yes	VULN INTO RISK	https://doi.org/10.1016/j.scitotenv.
1408	Art. 114	Integrated methodology for flood risk assessment and application in urban communities of Pakistan	Rana, IA; Routray, JK	2018	Pakistan, Thailand	57	14	4	27	12	✓	Rawalpindi, Sialkot and Muzaffa	Pakistan	Asia	Watershed scale	Natural Hazards (2018) 91:239–266	No	VULN INTO RISK	https://doi.org/10.1007/s12145-02
1425	Art. 115	Construction of an integrated social vulnerability index in urban areas prone to flash flooding	Aroca-Jimenez, E; Bodoque, JI	2017	Spain	59	24	14	16	5	✓	region of Castilla y León, Spain	Spain	Europe	Watershed scale	Nat. Hazards Earth Syst. Sci., 17, 1541–1557, 2017	No	VULN INTO RISK	https://doi.org/10.1007/s41748-02
1427	Art. 116	A catchment scale Integrated Flood Resilience Index to support decision making in urban flood control design	Miguez, MG; Veról, AP	2017	Brazil	12	2	0	7	3	✓	Dona Eugênia River Basin, Rio de	Brazil	South America	Watershed scale	Environment and Planning B: Urban Analytics and City	No	VULN INTO RISK	https://doi.org/10.1007/s12665-02
1428	Art. 117	Predictability of state-level flood damage in the conterminous United States: the role of hazard, exposure and vulnerability	Zhou, QQ; Leng, GY; Feng, LY	2017	China, USA	11	1	3	0	7	✓	USA	United States of America (USA)	North America	country scale	Scientific Reports (nature)	No	VULN INTO RISK	https://doi.org/10.1007/s11069-01
1432	Art. 118	Integration of inland and coastal storms for flood hazard assessment using a distributed hydrologic model	Karamouz, M; Razmi, A; Nazif,	2017	Iran, Canada	30	0	15	1	14	✓	Manhattan, New York, USA	United States of America (USA)	North America	Municipal scale	Environ Earth Sci (2017) 76:395	No	VULN INTO RISK	https://doi.org/10.1016/j.ecolind.20
1433	Art. 119	Assessing Urban Vulnerability in the Context of Flood and Heat Hazard: Pathways and Challenges for Indicator-Based Analysis	Krellenberg, K; Welz, J	2017	Germany	25	4	10	7	4	✓	Santiago, Chile	Chile	South America	Street block scale	Soc Indic Res (2017) 132:709–731	No	VULN INTO RISK	https://doi.org/10.1007/s11069-02
1453	Art. 120	An assessment of urban vulnerability in the Amazon Delta and Estuary: a multi-criterion index of flood exposure, socio-economic conditions an	Mansur, AV; Brondízio, E; Roy	2016	Spain, USA, Brazil, Norw	13	4	1	6	2	✓	Macapa and Belem, Brazil	Brazil	South America	Municipal scale	Sustain Sci (2016) 11:625–643	Yes	VULN INTO RISK	https://doi.org/10.1007/s00704-02
1455	Art. 121	Socio-economic vulnerability of the megacity of Shanghai (China) to sea-level rise and associated storm surges	Yan, BY; Li, SS; Wang, J; Ge, ZN	2016	China	6	2	1	1	2	✗	Shanghai, China	China	Asia	Metropolitan scale	Reg Environ Change (2016) 16:1443–1456	Yes	VULN INTO RISK	https://doi.org/10.1080/1573062x.2
1457	Art. 122	Regional Risk Assessment addressing the impacts of climate change in the coastal area of the Gulf of Gabes (Tunisia)	Rizzi, J; Gallina, V; Torresan, S,	2016	Italy, Tunisia	14	0	9	2	3	✓	Gulf of Gabes, Tunisia	Tunisia	Africa	Metropolitan scale	Sustain Sci (2016) 11:455–476	Yes	VULN INTO RISK	https://doi.org/10.1007/s42452-02
1460	Art. 123	Holistic approach to flood risk assessment in areas with cultural heritage: a practical application in Ayutthaya, Thailand	Vojinovic, Z; Hammond, M; Go	2016	The Netherlands, UK, Ser	20	4	3	7	6	✗	Ayutthaya, Thailand	Thailand	Asia	Street block scale	Nat Hazards (2016) 81:589–616	Yes	VULN INTO RISK	https://doi.org/10.5194/nhess-24-1
1461	Art. 124	Characterizing the multi-risk with respect to plausible natural hazards in the Balasore coast, Odisha, India: a multi-criteria analysis (MCA) appr	Mukhopadhyay, A; Hazra, S; M	2016	India, UK	8	0	2	0	6	✗	Balasore coast, Odisha, India	India	Asia	Municipal scale	Nat Hazards (2016) 80:1495–1513	Yes	RISK	https://doi.org/10.1016/j.envres.20
1464	Art. 125	Social vulnerability assessment of flood risk using GIS-based multicriteria decision analysis. A case study of Vila Nova de Gaia (Portugal)	Fernandez, P; Mourato, S; Mo	2016	Portugal	23	13	8	2	0	✓	Vila Nova de Gaia, Portugal	Portugal	Europe	Municipal scale	Geomatics, Natural Hazards and Risk, 2016 - Vol. 7, No.	No	VULN	https://doi.org/10.1007/s10113-01
1467	Art. 126	An integrated approach of flood risk assessment in the eastern part of Dhaka City	Gain, AK; Mojtahed, V; Biscar	2015	Germany, Italy, Austria,	19	8	4	4	3	✗	Dhaka City, Bangladesh	Bangladesh	Asia	Municipal scale	Nat Hazards (2015) 79:1499–1530	Yes	VULN INTO RISK	https://doi.org/10.1177/239980832
1478	Art. 127	Urban flood vulnerability zoning of Cochin City, southwest coast of India, using remote sensing and GIS	Sowmya, K; John, CM; Shrivas	2015	India	16	2	5	8	1	✓	Cochin, India	India	Asia	Municipal scale	Nat Hazards (2015) 75:1271–1286	No	VULN INTO RISK	https://doi.org/10.1016/j.jhydrol.20
1480	Art. 128	A study of evaluating and forecasting watersheds using the flood vulnerability assessment index in Korea	Baeck, SH; Choi, SJ; Choi, GW;	2014	South Korea	17	2	4	7	4	✓	South Korea	South Korea	Asia	country scale	Geomatics, Natural Hazards and Risk	Yes	VULN INTO RISK	https://doi.org/10.7717/peerj.7018
1492	Art. 129	Flood risks in a dynamic urban agglomeration: a conceptual and methodological assessment framework	Müller, A	2013	Germany	13	6	3	3	1	✓	Santiago, Chile	Chile	South America	Street block scale	Nat Hazards (2013) 65:1931–1950	Yes	VULN INTO RISK	https://doi.org/10.1016/j.ijdrr.2023.
1505	Art. 130	Exploring multicriteria flood vulnerability by integrating economic, social and ecological dimensions of flood risk and coping capacity: from a s	Scheuer, S; Haase, D; Meyer, V	2011	Germany	27	5	6	8	8	✓	Leipzig, Germany	Germany	Europe	Municipal scale	Nat Hazards (2011) 58:731–751	Yes	VULN INTO RISK	https://doi.org/10.1038/s41598-01
1508	Art. 131	Flood risks in urbanized areas - multi-sensoral approaches using remotely sensed data for risk assessment	Taubenböck, H; Wurm, M; Ne	2011	Germany, India	11	0	7	0	4	✗	Cairo, Egypt; Gorakhpur, India; D	Bangladesh	Asia ; Europe ; Afric	Municipal scale	Nat. Hazards Earth Syst. Sci., 11, 431–444, 2011	No	RISK	https://doi.org/10.1016/j.ijdrr.2021.

Harmonising geospatial indicators for flood vulnerability indices: an IPCC-aligned scoping review to support urban flood adaptation planning

Additional file 4: Structured dataset of included studies, geospatial indicators, methods, and data sources.

Purpose of this supplementary file

This supplementary file contains a structured dataset of 2,437 geospatial indicators extracted from 131 studies included in the scoping review. It was developed to support the transparent comparison, reuse and further development of Flood Vulnerability Indices (FVIs).

The database follows a parameter-oriented structure that enables systematic cross-study analysis of geospatial indicators, methodological approaches and associated data sources. Variables are organised into five thematic blocks covering: (i) study characteristics and conceptual framework; (ii) IPCC AR6 climate dimensions, thematic domains and indicators; (iii) population focus and FVI composition; (iv) methodological and spatial implementation; and (v) data-source metadata. Together, these components provide a consistent, interoperable and reusable framework for examining how FVIs are constructed and operationalised across different geographic contexts.

Content

Section AF4.1: Overview of the reviewed studies.
Section AF4.2: Structured dataset of included studies, geospatial indicators, methods, and data sources.

Table Legends:

- Hazard
- Exposure
- Adaptive Capacity
- Sensitivity

Note 1: A detailed description of the database structure is provided in Additional file 2, Item 5 (Database structure).
Note 2: Study ID corresponds to the unique numerical identifier assigned to each reviewed study in Additional file 3 (Overview of studies included in the scoping review), enabling direct cross-referencing throughout the supplementary materials.

Relationship to other supplementary materials

Additional file 2: Search strategy and database structure.

Additional file 3: Overview of studies included in the scoping review (n = 131).

Citation

Users of this supplementary material should cite the associated article and refer to this file as:

Additional file 4: Structured dataset of included studies, geospatial indicators, methods, and data sources.

SUBMISSION NOTE: In accordance with the journal's initial submission requirements, Additional file 4 is provided in PDF format for the initial submission. Upon acceptance, Additional file 4 will be supplied in its native Microsoft Excel (.xlsx) format to enable filtering, querying and reuse of the structured database in accordance with the FAIR principles

List of Abbreviations

AHP: Analytic Hierarchy Process

ALOS: Advanced Land Observing Satellite

AOC: Ability to Organize and Coordinate

AR4: IPCC Fourth Assessment Report

AR5: IPCC Fifth Assessment Report

AR6: IPCC Sixth Assessment Report

ASTER GDEM: Advanced Spaceborne Thermal Emission and Reflection Radiometer Global Digital Elevation Model

AW3D30: ALOS World 3D 30 m Digital Surface Model

CORINE: Coordination of Information on the Environment

DEM: Digital Elevation Model

DTR: Diurnal Temperature Range

ESA: European Space Agency

FAO: Food and Agriculture Organization of the United Nations

FAIR: Findable, Accessible, Interoperable and Reusable

FVI: Flood Vulnerability Indice

GBI: Green–Blue Infrastructure

GCMs: Global Climate Models

GDP: Gross Domestic Product

GIS: Geographic Information System

GVA: Gross Value Added

HH: Household

IDW: Inverse Distance Weighting

IMD: Index of Multiple Deprivation

I**PCC:** Intergovernmental Panel on Climate Change

IRS: Indian Remote Sensing Satellite

ISRO: Indian Space Research Organisation

JAXA: Japan Aerospace Exploration Agency

LISS III: Linear Imaging Self-Scanning Sensor III

LULC: Land Use and Land Cover

MCDA: Multi-Criteria Decision Analysis

MSI: Multi Spectral Instrument

NASA: National Aeronautics and Space Administration

NSE: Nash–Sutcliffe Efficiency

ODI: Open Development Initiative

OLI/TIRS: Operational Land Imager/Thermal Infrared Sensor

OSM: OpenStreetMap

PALSAR: Phased Array L-band Synthetic Aperture Radar

PCA: Principal Component Analysis

PD: Population Density

PET: Potential Evapotranspiration

PP: Precipitation

PRISMA-ScR: Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews

RQ: Research Question

SAR: Synthetic Aperture Radar

Sentinel-1: Sentinel-1 Synthetic Aperture Radar Mission

Sentinel-2: Sentinel-2 Multispectral Mission

SLT: Short Lag Time

SN: Social Networks

SRTM: Shuttle Radar Topography Mission

TAR: Third Assessment Report (Intergovernmental Panel on Climate Change)

TWI: Topographic Wetness Index

UNESCO: United Nations Educational, Scientific and Cultural Organization

USGS: United States Geological Survey

WEF: World Economic Forum

WHO: World Health Organization

WorldPop: WorldPop Gridded Population Dataset

WRF: Weather Research and Forecasting Model

(I)Study and framework context				(II) Conceptual classification			(III) Indicator Attributes				(IV) Methods and spatialisation			(V) Data source attributes			DATA SOURCE COMPARISON															
Indicat	Endnote	2. Study ID	Original_Dimension	Reviewed_Dim	Spatial_Data_Type	Original_Indicator	Reviewed_Indicator	Thematic_Domain	Other_Po	GBI_In	Index_Struct	Method	Indicator_Description	Data_Source	Data_Source_Category	Data_Processing	Other	Censu	Offici	GPS	Health data	Mete	Surve	On-	Open	Satelli	Scient	Softw	No-	Contr	Open-Acess	Conceptual_Fram
95	73	Art. 006	Vulnerability	Adaptive	Number of	Educational Facilities	Access to educational facilities	Access to Community			Vulnerability	Spatial Multi-	Educational Institutions	AMAP: https://gaode.com/	Open Urban data	Small number of facilities (< 0)									✓							VULN
238	196	Art. 013	socio-economic impacts	Adaptive	The socio-	The socio-economic impacts	Access to educational facilities	Access to Community			3.2. Analysis	An integrated	About 91% of the	(1) Questionnaire and Interviews	Survey/ Questionnaire: On-site:	Primary data were used for the				✓			✓	✓								VULN INTO RISK
658	712	Art. 032	Adaptive capacity	Adaptive	Number of	Education	Access to educational facilities	Access to Community			Information		Preparedness improves	Philippine Statistics Authority	Census Data	ArcGIS software		✓														VULN
1423	957	Art. 076	Adaptive capacity	Adaptive	Educational	Educational Facilities	Access to educational facilities	Access to Community			Coping	UFResi-Mm	Locations of schools and	(1) Gyor City Government -	Official data	Data collection: GIS environment			✓													VULN INTO RISK
1677	1090	Art. 090	Suitability	Adaptive	Distance to school	Distance to Education	Access to educational facilities	Access to Community			SOCIOECONO	Analytical	Proximity to educational	(1) Rwanda Geoportal -	Official data: Open Urban Data:	Education facility location			✓						✓			✓				VULN INTO RISK
2118	1425	Art. 115	Exposure	Adaptive	Kindergartens	KINDERG	Access to educational facilities	Access to Community			Total Social	HSA; PCA; (SV)	The number of	Spanish Ministry of Education,	Official data	Variables were normalized to			✓													VULN INTO RISK
2119	1425	Art. 115	Exposure	Adaptive	Elementary	ELEM_SCH	Access to educational facilities	Access to Community			Total Social	HSA; PCA; (SV)	The number of	Spanish Ministry of Education,	Official data	Variables were normalized to			✓													VULN INTO RISK
2120	1425	Art. 115	Exposure	Adaptive	Secondary schools	SEC_SCH	Access to educational facilities	Access to Community			Total Social	HSA; PCA; (SV)	The number of secondary	Spanish Ministry of Education,	Official data	Variables were normalized to			✓													VULN INTO RISK
2369	1428	Art. 127	Socio-economic	Adaptive	Educational	Schools	Access to educational facilities	Access to Community			Socio-	GIS analysis	Schools and educational	(1) Cochin City Corporation map,	Official data: On-site	Schools identified from			✓					✓								VULN
167	104	Art. 010	vulnerability	Adaptive	Municipal data:	Distance to flood shelter or	Access to flood shelters	Access to Community			Waterlogging	Analytical	Represents accessibility	(1) Agartala Municipal	Official data: Satellite imagery	Attribute data collected from the			✓							✓						VULN INTO RISK
462	534	Art. 024	Emergency Services	Adaptive	Emergency	Emergency shelters	Access to flood shelters	Access to Community			Emergency		Designated facilities used	North Carolina Center for	Official data				✓													VULN INTO RISK
822	761	Art. 041	Infrastructure	Adaptive	Distance to	Distance to Shelter	Access to flood shelters	Access to Community			Infrastructure		Percentage of total	(1) Homeland Infrastructure	Official Data: Open Urban data:				✓						✓	✓					✓	VULN
1198	862	Art. 062	Institutional	Adaptive	Building code	Zoning and building codes	Access to flood shelters	Access to Community			Resilience -	Subjective	Whether household is	Household survey (N=600)	Survey/questionnaire	Percentage calculation per							✓									VULN INTO RISK
1265	904	Art. 066	none	Adaptive	Point locations	Evacuation Centers	Access to flood shelters	Access to Community				GIS overlay	Potential evacuation	(1) Google Earth Engine (GEE)	Open Urban data; GPS data; On-	Digitization of facilities in Google			✓	✓				✓	✓							VULN INTO RISK
1475	987	Art. 079	Organisational	Adaptive	Shelter locations	Shelters	Access to flood shelters	Access to Community			Organisation	Territorial	Locations of emergency	(1) French Polynesia	Official data	Shelter location identification:			✓													VULN INTO RISK
1811	1165	Art. 099	Vulnerability	Adaptive	Distance to shelter	Distance to closest disaster	Access to flood shelters	Access to Community			ACCESSIBILIT	Principal	Euclidean distance from	(1) Ministry of Land,	Official data: Software Simulation	Facility location extraction:			✓									✓				VULN INTO RISK
1977	1356	Art. 110	Vulnerability	Adaptive	Availability of	Shelter in Flood	Access to flood shelters	Access to Community			STRUCTURAL	Analytic	Availability of shelter	(1) Household survey (300	Survey/questionnaire	Survey data collection: pairwise							✓									VULN
2000	1377	Art. 112	Resilience	Adaptive	Number of	Shelters (S)	Access to flood shelters	Access to Community			SOCIOECONO	CCFVI:	Number of shelters per	(1) Ministry of Health, Greece -	Official data	Data collection for 6 study areas:			✓													VULN INTO RISK
2045	1394	Art. 113	Vulnerability	Adaptive	Knowledge of	Household's awareness	Access to flood shelters	Access to Community			Institutional	Index-based	Whether the household is	(1) Primary data collected	Survey/questionnaire	Raw survey responses (Yes/No)							✓									VULN
2108	1408	Art. 114	Adaptive capacity	Adaptive	Knowledge of	Households aware of	Access to flood shelters	Access to Community			Capacity	Index-based	Whether the household is	(1) Primary data collected	Survey/questionnaire	Raw survey responses (Yes/No)							✓									VULN INTO RISK
2168	1425	Art. 115	Resilience	Adaptive	Areas suited to	EVACUAT	Access to flood shelters	Access to Community			Not retained	GIS analysis:	The availability of areas	GIS analysis (ArcGIS), 2015,	GIS data: Official data	GIS analysis to identify suitable			✓													VULN INTO RISK
499	559	Art. 026	Sensitivity	Adaptive	Public services	Public services	Access to Public service facility	Access to Community			Economic		Absolute number of public service	Câmara Municipal de Lisboa	Official data: Open Urban data				✓						✓							VULN
764	740	Art. 039	Socioeconomic and	Adaptive	E3: Number of	E3: Number of social and	Access to Public service facility	Access to Community			Socioeconom	Feature	Count of buildings with	(1) orthophotos (Douala City	Satellite Imagery: On-site: GPS	ArcGIS 10.5				✓				✓		✓						VULN INTO RISK
891	766	Art. 044	Vulnerability	Adaptive	Vector (Grid)	Number of service units	Access to Public service facility	Access to Community			PHYSICAL	Entropy	Number of critical service	City of Calgary Open Data Portal	Official data	Direct assignment to 500m grid			✓												✓	VULN INTO RISK
1150	856	Art. 061	Physical Vulnerability	Adaptive	Number of	Essential Buildings	Access to Public service facility	Access to Community			Physical	GIS spatial	Critical infrastructure	(1) Ordnance Survey (OS)	Official data	Extraction of essential building			✓													VULN INTO RISK
2228	1433	Art. 119	Socio-Environmental	Adaptive	Proximity to	Accessibility to basic services	Access to Public service facility	Access to Community			Socio-	Spatial	The level of access to	National census (Instituto	Census Data	Census data on infrastructure		✓														VULN INTO RISK
2287	1460	Art. 123	Physical Vulnerability	Adaptive	Hospitals, schools,	Critical facilities	Access to Public service facility	Access to Community			Physical	Participatory	Critical infrastructure	(1) Group mapping exercises	Survey/questionnaire: On-site	Critical facilities identified							✓	✓								VULN INTO RISK
2413	1505	Art. 130	Social Risk	Adaptive	Social	Social hot spots	Access to Public service facility	Access to Community			Social Risk	Multicriteria	Critical social	Kubal et al. (2009), City of	Scientific Literature: Official data	Infrastructure points intersected			✓								✓					VULN INTO RISK
1873	1267	Art. 103	Institutional	Adaptive	Fitness activities	Number of National Fitness	Access to Recreational and sports facilities	Access to Community			INSTITUTION	Principal	Number of national	(1) Nanjing Yearbook; (2) China	Official data	Data extraction: missing data			✓													VULN INTO RISK
1879	1271	Art. 104	Socioeconomic	Adaptive	Loss of recreation	Loss of leisure and	Access to Recreational and sports facilities	Access to Community			Direct	Structural	Loss of leisure time and	(1) Household survey (231 valid	Survey/questionnaire	Survey data collection: 4-point							✓									VULN INTO RISK
2408	1505	Art. 130	Economic Risk	Adaptive	Recreation	Recreational areas	Access to Recreational and sports facilities	Access to Community			Economic	Multicriteria	Recreational areas	Kubal et al. (2009), City of	Scientific Literature: Official data	Recreational areas intersected			✓								✓					VULN INTO RISK
637	710	Art. 031	Adaptive capacity	Adaptive	Access to	Car travel time to food store	Access to Retail and food services	Access to Community			Accessibility		Areas where car travel	(1) UK Ordnance Survey	Official Data: Open Urban Data				✓						✓						✓	VULN INTO RISK
761	740	Art. 039	Socioeconomic and	Adaptive	E2: Number of	E2: Number of commercial	Access to Retail and food services	Access to Community			Socioeconom	Feature	Count of commercial or	(1) orthophotos (Douala City	Satellite Imagery: On-site: GPS	ArcGIS 10.5				✓				✓		✓						VULN INTO RISK
816	761	Art. 041	Health & Morbidity	Adaptive	Food insecurity	Food insecurity	Access to Retail and food services	Access to Community			Health &		Percentage of total	Feeding America - Map the Meal	Survey/questionnaire								✓									VULN
1606	1066	Art. 086	Economic Vulnerability	Adaptive	Market access	Lack of Markets (LM)	Access to Retail and food services	Access to Community			ECONOMIC	Multiple	Limited access to markets	(1) Structured field survey; (2)	Survey/questionnaire	Household survey data							✓									VULN INTO RISK
1809	1165	Art. 099	Vulnerability	Adaptive	Retail density	Number of retail stores per	Access to Retail and food services	Access to Community			ECONOMIC	Principal	Number of retail stores	(1) eStat - Statistical	Official data	Retail store count extraction: per			✓													VULN INTO RISK
2426	1505	Art. 130	Adaptive capacity	Adaptive	Binary (within	Accessibility: supermarkets	Access to Retail and food services	Access to Community			Coping	Multicriteria	1 if within 500m of	City of Leipzig commercial data,	Official data	500m buffer created. Overlay to			✓													VULN INTO RISK
438	524	Art. 023	Vulnerability	Exposure		The building's Condition	Building age (conservation)	Built Characteristics			Vulnerability	vulnerability	The building's condition	General Organization for	Official data	ArcMap GIS			✓													VULN INTO RISK
493	559	Art. 026	Sensitivity	Exposure		Conservation of buildings	Building age (conservation)	Built Characteristics			Physical		Physical conservation	Câmara Municipal de Lisboa	Official data				✓													VULN
565	697	Art. 029	Sensitivity	Exposure	Housing age	House age (>10 years / <50	Building age (conservation)	Built Characteristics			Housing age	PCA; SOM	Percentage of housing	Morocco Census RGPH 2014	Census Data: Official data			✓	✓													VULN
879	766	Art. 044	Vulnerability	Exposure	Vector (Grid)	Building age	Building age (conservation)	Built Characteristics			PHYSICAL	Entropy	Age of buildings in years.	City of Calgary Open Data Portal	Official data	Direct assignment to 500m grid			✓												✓	VULN INTO RISK
928	771	Art. 046	Sensitivity	Exposure	Condition of HH	Households in dilapidated	Building age (conservation)	Built Characteristics			Social	Principal		(1) Scientific Literature [13,17]:	Scientific Literature	Safe condition (1): Need repair											✓					VULN INTO RISK
1086	816	Art. 055	Sensitivity	Exposure	Dilapidated	Presence of dilapidated	Building age (conservation)	Built Characteristics			Exposure	Field surveys;	Ratio of dilapidated	Cuttack Municipal Corporation	Census Data: Official data: On-	Building condition assessment		✓	✓					✓								VULN INTO RISK
1100	819	Art. 056	Physical	Exposure	Old-building rate	Percentage of buildings >50	Building age (conservation)	Built Characteristics			Physical	Building stock	Percentage of buildings	Haut-Commissariat Au Plan	Census Data: Official data	Building age classification:		✓	✓													VULN
1117	821	Art. 057	Susceptibility	Exposure	Weighted sum	Building age	Building age (conservation)	Built Characteristics			Susceptibility	Census data	Weighted index of	Italian National Institute of	Census Data	Extraction of building age		✓														VULN
1118	821	Art. 057	Susceptibility	Exposure	(0.5 * N_buildings	Conservation status	Building age (conservation)	Built Characteristics			Susceptibility	Census data	Weighted index of	Italian National Institute of	Census Data	Extraction of building condition		✓														VULN
1133	831	Art. 059	Social	Exposure	Housing	Housing structure	Building age (conservation)	Built Characteristics			Social	Equal	Classification of housing	(1) Bangladesh Bureau of	Census Data: Official data	Calculation of housing		✓	✓													VULN
1468	987	Art. 079	Infrastructural	Exposure	Building age (year	Building Date	Building age (conservation)	Built Characteristics			Infrastructura	Territorial	Age of buildings	(1) French Polynesia	Official data	Building age classification: spatial			✓													VULN INTO RISK
1557	1062	Art. 085	Vulnerability	Exposure	Building age class	Period of construction (P1)	Building age (conservation)	Built Characteristics			Vulnerability	Indicator-	Building age indicator	(1) Portuguese Census 2011 -	Census Data	Building age extraction per		✓												✓		RISK
1563	1062	Art. 085	Vulnerability	Exposure	Building condition	Condition (P7)	Building age (conservation)	Built Characteristics			Vulnerability	Indicator-	Building condition	(1) Portuguese Census 2011 -	Census Data	Building condition extraction per		✓												✓		RISK
1874	1271	Art. 104	Socioeconomic	Exposure	Building damage	Buildings	Building age (conservation)	Built Characteristics			Direct	Structural	Physical damage to	(1) Household survey (231 valid	Survey/questionnaire	Survey data collection: 4-point							✓									VULN INTO RISK
2031	1394	Art. 113	Vulnerability	Exposure	Age of structure	Building age of the house	Building age (conservation)	Built Characteristics			Physical/Infra	Index-based	The age of the house (in	(1) Primary data collected	Survey/questionnaire	Raw survey responses were							✓									VULN
2071	1408	Art. 114	Exposure	Exposure	Age of structure	Building age	Building age (conservation)	Built Characteristics			Exposure	Index-based	The age of the house.	(1) Primary data collected	Survey/questionnaire	Raw survey responses were							✓									VULN INTO RISK
2164	1425	Art. 115	Sensitivity	Exposure	Mean age of	CON_AGE	Building age (conservation)	Built Characteristics			Not retained	HSA; PCA; (SV)	The average age of	Spanish Cadastre (Catastro).	Official data	Variables were normalized. HSA			✓													VULN INTO RISK
2241	1433	Art. 119	Susceptibility	Exposure	Physical housing	Housing condition (COFIVI)	Building age (conservation)	Built Characteristics			Physical	Index-based	Physical housing condition of	COFIVI Index (Welz, J. (2014).	Survey/questionnaire: Scientific	Respondents identified roof, wall,							✓				✓					VULN INTO RISK
2320	1464	Art. 125	Buildings	Exposure	Percentage of	Buildings built before 1980	Building age (conservation)	Built Characteristics			Buildings	GIS-MCDA:	Buildings constructed	National Statistics Institute (INE)	Census Data	Data standardized using linear		✓														VULN
2321	1464	Art. 125	Buildings	Exposure	Percentage of	Buildings built after 1980	Building age (conservation)	Built Characteristics			Buildings	GIS-MCDA:	Buildings constructed	National Statistics Institute (INE)	Census Data	Data standardized using linear		✓														VULN
2343	1467	Art. 126	Vulnerability	Exposure	Percentage of	Building age	Building age (conservation)	Built Characteristics			Vulnerability	Integrated	The proportion of	Detailed Area Plan (DAP) 2010.	Official data	Percentage of buildings >30			✓													VULN INTO RISK
2032	1394	Art. 113	Vulnerability	Exposure	Number of stories	Building height	Building height	Built Characteristics			Physical/Infra	Index-based	The number of stories in	(1) Primary data collected	Survey/questionnaire	Raw survey responses were							✓									VULN
2072	1408	Art. 114	Exposure	Exposure	Number of stories	Building height	Building height	Built Characteristics			Exposure	Index-based	The number of stories in	(1) Primary data collected	Survey/questionnaire	Raw survey responses were							✓									VULN INTO RISK
283	200	Art. 014	Commercial sector -	Exposure	physical	Unit ID building	Building material	Built Characteristics			Commercial	modified	The physical vulnerability	(1) Government of Khyber	Official data: Scientific literature:	This indexing assigns weightage			✓					✓			✓					VULN INTO RISK
437	524	Art. 023	Vulnerability	Exposure		Building Material	Building material	Built Characteristics			Vulnerability	vulnerability	The building's material. In	General Organization for	Official data	ArcMap GIS			✓													VULN INTO RISK
470	542	Art. 025	Flood Event Classification	Exposure	Houses with one	Private houses damage	Building material	Built Characteristics			Flood Event		Flood impact affecting	Flood impact reports compiled	Meteorological Data: Official	Arc-Info GIS			✓			✓										VULN INTO RISK
562	697	Art. 029	Sensitivity	Exposure	Housing structure	Wall materials	Building material	Built Characteristics			Building	PCA; SOM	Housing construction	(1) Morocco Census RGPH 2014	Census Data: Official data			✓	✓													VULN
563	697	Art. 029	Sensitivity	Exposure	Housing structure	Flooring materials	Building material	Built Characteristics			Building	PCA; SOM	Housing flooring	(1) Morocco Census RGPH 2014	Census Data: Official data			✓	✓													VULN
652	712	Art. 032	Adaptive capacity	Exposure	Houses with	Housing	Building material	Built Characteristics			Infrastructure		Lightweight houses	(1)Iloilo CPDO. (2022). Iloilo city	Official Data: Survey/	ArcGIS software			✓				✓									VULN
781	744	Art. 040	Building	Exposure	Building type	Building Material	Building material	Built Characteristics			Exposure	SCORF –	Characterizing the	ESRM20; res.; Administrative	Gov. Agency data: Software													✓				VULN INTO RISK
1022	791	Art. 053	Physical	Exposure	BLDBRGW1	Bearing wall buildings/km²	Building material	Built Characteristics			Physical	PCA; Varimax	Number of bearing walls	General Organization of Physical	Official data: Census Data	Density calculation:		✓	✓													VULN
1101	819	Art. 056	Physical	Exposure	Percentage of	Percentage of reinforced	Building material	Built Characteristics			Physical	Equal	Based on building	Haut-Commissariat Au Plan	Census Data: Official data	Building material classification:		✓	✓													VULN
1124	827	Art. 058	Susceptibility	Exposure	Construction	Building material	Building material	Built Characteristics			Susceptibility	Weighted	Type of building	(1) Field survey using ArcGIS	Satellite Imagery: Open Urban	Heads-up digitizing of building				✓				✓	✓	✓						VULN INTO RISK
1203	862	Art. 062	Physical	Exposure	Building material	Building material (Resilience)	Building material	Built Characteristics			Resilience -	Subjective	Houses built with flood-	Household survey (N=600)	Survey/questionnaire	Percentage calculation per							✓									VULN INTO RISK
1469	987	Art. 079	Infrastructural	Exposure	Construction type	Construction Materials	Building material	Built Characteristics			Infrastructura	Territorial	Type of materials	(1) French Polynesia	Official data: On-site	Material classification (light			✓					✓								VULN INTO RISK
1477	987	Art. 079	Risk	Exposure	Material	Material Resilience Score	Building material	Built Characteristics			Risk	Territorial	Resilience score based on	Derived from building materials	Software Simulation	Overlay of building materials												✓				VULN INTO RISK
1559	1062	Art. 085	Vulnerability	Exposure	External wall	External cladding (P3)	Building material	Built Characteristics			Vulnerability	Indicator-	External cladding	(1) Portuguese Census 2011 -	Census Data	Cladding material extraction per		✓												✓		RISK
1560	1062	Art. 085	Vulnerability	Exposure	Building structural	Structural system (P4)	Building material	Built Characteristics			Vulnerability	Indicator-	Structural system	(1) Portuguese Census 2011 -	Census Data	Structural system extraction per		✓												✓		RISK
1562	1062	Art. 085	Vulnerability	Exposure	Building isolation	Building exposure (P6)	Building material	Built Characteristics			Vulnerability	Indicator-	Building exposure	(1) Portuguese Census 2011 -	Census Data	Building exposure extraction per		✓												✓		RISK
1573	1066	Art. 086	Physical Vulnerability	Exposure	Building quality	Poor Construction of	Building material	Built Characteristics			PHYSICAL	Multiple	Substandard construction	(1) Structured field survey; (2)	Survey/questionnaire	Household survey data							✓									VULN INTO RISK
1574	1066	Art. 086	Physical Vulnerability	Exposure	Material	Lack of Building Materials	Building material	Built Characteristics			PHYSICAL	Multiple	Use of low-quality	(1) Structured field survey; (2)	Survey/questionnaire	Household survey data							✓									VULN INTO RISK
1741	1118	Art. 094	Sensitivity	Exposure	Building material	Type of building material	Building material	Built Characteristics			PHYSICAL	Analytic	Construction materials	(1) Household survey (n=359);	Survey/questionnaire: GPS data:	Building material classification:				✓			✓	✓								VULN INTO RISK
1943	1349	Art. 108	Susceptibility	Exposure	Percentage of	Building material	Building material	Built Characteristics			SUSCEPTIBILI	MCVE	Indicator measuring	(1) Household survey (210	Survey/questionnaire	Survey data collection: building							✓									VULN INTO RISK
2034	1394	Art. 113	Vulnerability	Exposure	Material type	Construction materials of	Building material	Built Characteristics			Physical/Infra	Index-based	The construction	(1) Primary data collected	Survey/questionnaire	Raw survey responses were							✓									VULN
2074	1408	Art. 114	Exposure	Exposure	Material type	Building construction	Building material	Built Characteristics			Exposure	Index-based	The type of construction	(1) Primary data collected	Survey/questionnaire	Raw survey responses were							✓									VULN INTO RISK
2147	1425	Art. 115	Sensitivity	Exposure	Households in	POORCOND	Building material	Built Characteristics			Constructive	HSA; PCA; (SV)	The number of	Population and Housing Census	Census Data	Variables were normalized to		✓														VULN INTO RISK
2345	1467	Art. 126	Vulnerability	Exposure	Percentage of	Building materials	Building material	Built Characteristics			Vulnerability	Integrated	The proportion of	Detailed Area Plan (DAP) 2010.	Official data	Percentage of Kutcha and Jhupri			✓													VULN INTO RISK
2391	1492	Art. 129	Vulnerability	Exposure	Proportion of	Construction material	Building material	Built Characteristics			Vulnerability	Multi-criteria	The proportion of	Chilean National Statistics	Census Data:	Variables transformed into ratio		✓					✓									VULN INTO RISK
564	697	Art. 029	Sensitivity	Exposure	Housing structure	Roofing materials	Building roof	Built Characteristics			Building	PCA; SOM	Housing roof material	(1) Morocco Census RGPH 2014	Census Data: Official data			✓	✓													VULN
2233	1433	Art. 119	Exposure	Exposure	Roof shape (flat	Roof form	Building roof	Built Characteristics			Exposure	Indicator-	The shape of the roof	Field mapping of 5,477 plots in	On-site	Variables pre-processed in Excel								✓								VULN INTO RISK
55	35	Art. 001	Built Environment	Exposure	Building Height	Building Height (BH)	Building typology	Built Characteristics			Built	The study	Estimated height of	(1) Google Earth; (2)Field Survey	Satellite Imagery: On Site											✓						RISK
88	71	Art. 006	Exposure	Exposure	Building	Building Congestion Degree	Building typology	Built Characteristics			Exposure	Spatial Multi-	Various metrics have	AMAP: https://gaode.com/	Open Urban data	Fully built-up areas (< 0.05)									✓							VULN
250	200	Art. 014	Housing sector - Physical	Exposure	physical	physical vulnerability of the	Building typology	Built Characteristics			Housing	modified	The physical vulnerability	(1) Government of Khyber	Official data: Scientific literature:	This indexing assigns weightage			✓					✓			✓					VULN INTO RISK
252	200	Art. 014	Housing sector - Physical	Exposure	House Type	House Type	Building typology	Built Characteristics			Housing	modified	The physical vulnerability	(1) Government of Khyber	Official data: Scientific literature:	This indexing assigns weightage			✓					✓			✓					VULN INTO RISK
256	200	Art. 014	Housing sector - Physical	Exposure	House Design	House Design	Building typology	Built Characteristics			Housing	modified	The physical vulnerability	(1) Government of Khyber	Official data: Scientific literature:	This indexing assigns weightage			✓					✓			✓					VULN INTO RISK
285	200	Art. 014	Physical Vulnerability	Exposure		ConstructionType	Building typology	Built Characteristics			Physical	modified	The physical vulnerability	(1) Government of Khyber	Official data: Scientific literature:	This indexing assigns weightage			✓					✓			✓					VULN INTO RISK
502	559	Art. 026	Sensitivity	Exposure		Restaurants and bars/cafes	Building typology	Built Characteristics			Economic		Absolute number of	Câmara Municipal de Lisboa.	Official data				✓												✓	VULN
598	710	Art. 031	Sensitivity	Exposure	Housing	Residents in communal	Building typology	Built Characteristics			"Economic		Percentage of residents	UK Office for National Statistics	Census Data			✓														VULN INTO RISK
782	744	Art. 040	Building	Exposure	Building type	Building type distribution	Building typology	Built Characteristics			Exposure	SCORF –	Characterizing the	ESRM20; res.; Administrative	Gov. Agency data: Software													✓				VULN INTO RISK
796	761	Art. 041	Housing & Demographic	Exposure	Multi-unit	Multi-unit Structures	Building typology	Built Characteristics			Housing &		Percentage of total	U.S. Census Bureau - American	Census Data			✓														VULN
799	761	Art. 041	Housing & Demographic	Exposure	Mobile homes	Mobile Homes	Building typology	Built Characteristics			Housing &		Percentage of total	U.S. Census Bureau - American	Census Data			✓														VULN
886	766	Art. 044	Vulnerability	Exposure	Vector (Grid)	Building asset value	Building typology	Built Characteristics			ECONOMIC	Entropy	Monetary value of	City of Calgary Open Data Portal	Official data	Direct assignment to 500m grid			✓												✓	VULN INTO RISK
1063	805	Art. 054	Topographic	Exposure	Ridge level (m)	Ridge level	Building typology	Built Characteristics			Topographic	Analytic	Maximum vertical	United States Geological Survey	Satellite Imagery	DEM processing: ridge level										✓					✓	RISK
1071	805	Art. 054	Buildings	Exposure	Building	Building categories	Building typology	Built Characteristics			Buildings	Analytic	Building use/zoning categories	Topographic Object Database,	Official data: Census Data	Building extraction:		✓	✓													RISK
1119	821	Art. 057	Susceptibility	Exposure	Number of	Number of multi-storey	Building typology	Built Characteristics			Susceptibility	Census data	Percentage of multi-	Italian National Institute of	Census Data	Extraction of building height		✓														VULN
1125	827	Art. 058	Susceptibility	Exposure	Number of	Number of storeys	Building typology	Built Characteristics			Susceptibility	Weighted	Number of floors in	(1) Field survey using ArcGIS	Satellite Imagery: Open Urban	Heads-up digitizing of building				✓				✓	✓	✓						VULN INTO RISK
1156	856	Art. 061	Physical Vulnerability	Exposure	Number of	Vulnerable Buildings	Building typology	Built Characteristics			Physical	GIS spatial	Buildings with special	Ordnance Survey (OS)	Official data	Extraction of vulnerable building			✓													VULN INTO RISK
1206	862	Art. 062	Physical	Exposure	Second floor	Housing units with second	Building typology	Built Characteristics			Resilience -	Subjective	Whether the house has a	Household survey (N=600)	Survey/questionnaire	Percentage calculation per							✓									VULN INTO RISK
1207	862	Art. 062	Physical	Exposure	Multi-unit house	Multi-unit structure	Building typology	Built Characteristics			Resilience -	Subjective	Whether house has three	Household survey (N=600)	Survey/questionnaire	Percentage calculation per							✓									VULN INTO RISK
1419	957	Art. 076	Exposure	Exposure	Building structure	Building Type	Building typology	Built Characteristics			Exposure	UFResi-Mm	Building structures	(1) Gyor City Government -	Official data	Building classification into 3			✓													VULN INTO RISK
1558	1062	Art. 085	Vulnerability	Exposure	Building height	Number of storeys (P2)	Building typology	Built Characteristics			Vulnerability	Indicator-	Number of storeys	(1) Portuguese Census 2011 -	Census Data	Storey count extraction per		✓												✓		RISK
1572	1066	Art. 086	Exposure	Exposure	House type (% of	Housing Typology (HT)	Building typology	Built Characteristics			PHYSICAL	Binomial	Type of housing	(1) Structured field survey; (2)	Survey/questionnaire	Household survey data							✓									VULN INTO RISK
1703	1103	Art. 092	Exposure	Exposure	Building safety	Building	Building typology	Built Characteristics			EXPOSURE	Analytic	Respondent's evaluation	(1) Questionnaire survey (599	Survey/questionnaire	Survey data collection:							✓									VULN
1705	1103	Art. 092	Demographic	Exposure	Hukou type	Household registration	Building typology	Built Characteristics			SOCIO-	K-means	Type of household	(1) Questionnaire survey (599	Survey/questionnaire	Survey data collection: hukou							✓									VULN
1721	1103	Art. 092	Community Type	Exposure	High-grade	Type I Communities	Building typology	Built Characteristics			COMMUNITY	K-means	Communities with high-	(1) Questionnaire survey (599	Official data:	Community classification (4			✓				✓									VULN
1722	1103	Art. 092	Community Type	Exposure	Newly demolished	Type II Communities	Building typology	Built Characteristics			COMMUNITY	K-means	Newly demolished and	(1) Questionnaire survey (599	Official data:	Community classification (4			✓				✓									VULN
1723	1103	Art. 092	Community Type	Exposure	Old demolished	Type III Communities	Building typology	Built Characteristics			COMMUNITY	K-means	Old demolished and	(1) Questionnaire survey (599	Official data:	Community classification (4			✓				✓									VULN
1724	1103	Art. 092	Community Type	Exposure	Urban villages	Type IV Communities	Building typology	Built Characteristics			COMMUNITY	K-means	Urban villages, with poor	(1) Questionnaire survey (599	Official data:	Community classification (4			✓				✓									VULN
1976	1356	Art. 110	Vulnerability	Exposure	Building	Housing Type	Building typology	Built Characteristics			STRUCTURAL	Analytic	Housing type categories:	(1) Household survey (300	Survey/questionnaire	Survey data collection: pairwise							✓									VULN
2033	1394	Art. 113	Vulnerability	Exposure	House structure	Building type	Building typology	Built Characteristics			Physical/Infra	Index-based	The structural type of the	(1) Primary data collected	Survey/questionnaire	Raw survey responses were							✓									VULN
2073	1408	Art. 114	Exposure	Exposure	Building	Building structure	Building typology	Built Characteristics			Exposure	Index-based	The structural	(1) Primary data collected	Survey/questionnaire	Raw survey responses were							✓									VULN INTO RISK
2127	1425	Art. 115	Exposure	Exposure	Households with 1	ST_AGBG	Building typology	Built Characteristics			Constructive	HSA; PCA; (SV)	The number of	Population and Housing Census	Census Data	Variables were normalized to		✓														VULN INTO RISK
2128	1425	Art. 115	Resilience	Exposure	Households with 2	ST_AGL	Building typology	Built Characteristics			Constructive	HSA; PCA; (SV)	The number of	Population and Housing Census	Census Data	Variables were normalized to		✓														VULN INTO RISK
2231	1433	Art. 119	Exposure	Exposure	Building	Housing type	Building typology	Built Characteristics			Exposure	Indicator-	The structural	Field mapping of 5,477 plots in	On-site	Variables pre-processed in Excel								✓								VULN INTO RISK
2232	1433	Art. 119	Exposure	Exposure	Building	Building structure	Building typology	Built Characteristics			Exposure	Indicator-	The structural	Field mapping of 5,477 plots in	On-site	Variables pre-processed in Excel								✓								VULN INTO RISK
2322	1464	Art. 125	Buildings	Exposure	Percentage of	Buildings with 1 or 2 floors	Building typology	Built Characteristics			Buildings	GIS-MCDA:	Low-rise buildings with	National Statistics Institute (INE)	Census Data	Data standardized using linear		✓														VULN
2323	1464	Art. 125	Buildings	Exposure	Percentage of	Buildings with 3 or more	Building typology	Built Characteristics			Buildings	GIS-MCDA:	Multi-storey buildings	National Statistics Institute (INE)	Census Data	Data standardized using linear		✓														VULN
2344	1467	Art. 126	Vulnerability	Exposure	Percentage of	Building types	Building typology	Built Characteristics			Vulnerability	Integrated	The proportion of	Detailed Area Plan (DAP) 2010.	Official data	Percentage of thin shed			✓													VULN INTO RISK
2436	1508	Art. 131	Vulnerability	Exposure	Stable vs. highly	Building stability	Building typology	Built Characteristics			Padang,	Capacity	Classification of building	(1) Remote sensing derived	Satellite Imagery: On-site:	Capacity spectrum method							✓	✓		✓	✓					RISK
2431	1508	Art. 131	Vulnerability	Exposure	Building	3-D city model	Building typology	Built Characteristics			Dresden,	Object-	Highly detailed urban	(1) Maxar Technologies	Satellite Imagery: Other (Airborne	Object-oriented segmentation	✓									✓						RISK
631	710	Art. 031	Adaptive capacity	Sensitivity	Local Economy	Individual insolvencies %	Debt: high rate areas (%)	Economic and			Strength of		Areas with high	UK Government Insolvency	Official Data				✓													VULN INTO RISK
632	710	Art. 031	Adaptive capacity	Sensitivity	Local Economy	Bankruptcies %	Debt: high rate areas (%)	Economic and			Strength of		Areas with high	UK Government Insolvency	Official Data				✓													VULN INTO RISK
633	710	Art. 031	Adaptive capacity	Sensitivity	Local Economy	House repossessions %	Debt: high rate areas (%)	Economic and			Strength of		Areas with house	UK Government Housing Market	Official Data				✓													VULN INTO RISK
634	710	Art. 031	Adaptive capacity	Sensitivity	Local Economy	Landlord repossessions %	Debt: high rate areas (%)	Economic and			Strength of		Areas with landlord	UK Government Housing Market	Official Data				✓													VULN INTO RISK
807	761	Art. 041	Economic, Education, &	Sensitivity	Access to Loans	Access to Loans	Debt: high rate areas (%)	Economic and			Economic,		Percentage of total home	Consumer Financial Protection	Official data				✓													VULN
1707	1103	Art. 092	Sensitivity	Sensitivity	Loan status	Debt	Debt: high rate areas (%)	Economic and			SENSITIVITY	Analytic	Whether the respondent	(1) Questionnaire survey (599	Survey/questionnaire	Survey data collection:							✓									VULN
2083	1408	Art. 114	Sensitivity	Sensitivity	Loan status	Households who have	Debt: high rate areas (%)	Economic and			Sensitivity	Index-based	Whether the household	(1) Primary data collected	Survey/questionnaire	Raw survey responses (Yes/No)							✓									VULN INTO RISK
506	559	Art. 026	Adaptive capacity	Sensitivity	mean of	Human capital – residents	Education: High educated people	Economic and			Resident		Number of residents with	Instituto Nacional de Estatística	Census Data: Official data			✓	✓													VULN
868	766	Art. 044	Vulnerability	Sensitivity	Vector (Grid)	Number of people without	Education: High educated people	Economic and			SOCIAL	Entropy	Count of individuals aged	City of Calgary Open Data Portal	Census Data	Distribution across 500m grid		✓													✓	VULN INTO RISK
870	766	Art. 044	Vulnerability	Sensitivity	Vector (Grid)	Number of people with post	Education: High educated people	Economic and			SOCIAL	Entropy	Count of individuals aged	City of Calgary Open Data Portal	Census Data	Distribution across 500m grid		✓													✓	VULN INTO RISK
1110	821	Art. 057	Adaptive capacity	Sensitivity	People with high	Education	Education: High educated people	Economic and			Adaptive	Census data	Percentage of population	Italian National Institute of	Census Data	Extraction of education variables:		✓														VULN
1854	1267	Art. 103	Social	Sensitivity	Highly educated	Population with	Education: High educated people	Economic and			SOCIAL	Principal	Number of people with	(1) Nanjing Statistical Yearbook,	Official data: Census Data	Data extraction: missing data		✓	✓													VULN INTO RISK
2018	1394	Art. 113	Vulnerability	Sensitivity	Highest education	Education level of household	Education: High educated people	Economic and			Social	Index-based	The highest level of	(1) Primary data collected	Survey/questionnaire	Raw survey responses were							✓									VULN
2094	1408	Art. 114	Adaptive capacity	Sensitivity	Highest education	Highest education level	Education: High educated people	Economic and			Capacity	Index-based	The highest level of	(1) Primary data collected	Survey/questionnaire	Raw survey responses were							✓									VULN INTO RISK
2326	1464	Art. 125	Socio-economics	Sensitivity	Percentage of	High school education	Education: High educated people	Economic and			Socio-	GIS-MCDA:	Proportion of population	National Statistics Institute (INE)	Census Data	Data standardized using linear		✓														VULN
2327	1464	Art. 125	Socio-economics	Sensitivity	Percentage of	University education	Education: High educated people	Economic and			Socio-	GIS-MCDA:	Proportion of population	National Statistics Institute (INE)	Census Data	Data standardized using linear		✓														VULN
223	196	Art. 013	socio-economic impacts	Sensitivity	Adult literacy rate	Literacy	Education: Illiteracy	Economic and			Education	An integrated		(1) Semi-structure	Survey/ Questionnaire: On-site	Primary data were used for the							✓	✓								VULN INTO RISK
396	363	Art. 020	Vulnerability	Sensitivity		Literacy rate	Education: Illiteracy	Economic and			Flood	multi-criteria	Public knowledge of	District Census Handbook (DCH)	Census Data	GIS Modelling		✓														VULN INTO RISK
558	697	Art. 029	Sensitivity	Sensitivity	Education level	Illiteracy	Education: Illiteracy	Economic and			Education	PCA; SOM	Percentage of population	Morocco Census RGPH 2014	Census Data			✓														VULN
611	710	Art. 031	Adaptive capacity	Sensitivity	Education	No qualifications	Education: Illiteracy	Economic and			Health: Self		Percentage of residents	UK Office for National Statistics	Census Data			✓														VULN INTO RISK
672	712	Art. 032	Sensitivity	Sensitivity	Illiterate	Literacy	Education: Illiteracy	Economic and			Demographic		Lack of access to	Philippine Statistics Authority	Census Data	ArcGIS software		✓														VULN
919	771	Art. 046	Sensitivity	Sensitivity	Total illiterates	Total illiterates	Education: Illiteracy	Economic and			Social	Principal		(1) Scientific Literature [19]	Scientific Literature	0–1 (1); 1–4 (2); 4–8 (3)											✓					VULN INTO RISK
961	774	Art. 048	Vulnerability	Sensitivity	Dependent	Literacy	Education: Illiteracy	Economic and			SOCIOECONO	PCA with	Proportion of literate	Census of India - 1991, 2001,	Census Data	Data extraction; normalization;		✓														VULN INTO RISK
1002	785	Art. 051	Adaptive capacity	Sensitivity	Literacy (2011)	Literacy rate, Literacy	Education: Illiteracy	Economic and			Adaptive	Statistical	Literacy rate, Literacy	Instituto Nacional de Estadistica	Census Data: Official data	Literacy rate calculation: canton-		✓	✓													VULN
1030	793	Art. 053	Social	Sensitivity	ILLTER17	Illiterate population/km²	Education: Illiteracy	Economic and			Social	PCA; Varimax	Number of illiterate	Central Agency for Public	Census Data: Official data	Density calculation:		✓	✓													VULN
1106	819	Art. 056	Social	Sensitivity	Illiteracy rate (IR)	Percentage of illiterate	Education: Illiteracy	Economic and			Social	Min-max	Persons who have never	Haut-Commissariat Au Plan	Census Data: Official data	Illiteracy rate calculation per		✓	✓													VULN
1134	831	Art. 059	Social	Sensitivity	Literacy rate (%)	Literacy rate	Education: Illiteracy	Economic and			Social	Equal	Percentage of literate	(1) Bangladesh Bureau of	Census Data: Official data	Literacy rate calculation per		✓	✓													VULN
1186	862	Art. 062	Social	Sensitivity	Literacy (Yes/No)	Literacy status	Education: Illiteracy	Economic and			Resilience -	Subjective	Whether household head	Household survey (N=600)	Survey/questionnaire	Percentage calculation per							✓									VULN INTO RISK
1392	938	Art. 073	Vulnerability	Sensitivity	Percentage (%)	Literacy Rate (R)	Education: Illiteracy	Economic and			Vulnerability	Multi-criteria	Literacy influences a	Census of India, 2011.	Census Data: Official data	Illiteracy rate calculation		✓	✓													VULN INTO RISK
1491	988	Art. 080	Socio-economic	Sensitivity	Illiteracy rate	Vulnerability indicators	Education: Illiteracy	Economic and			socioeconom	Principal	Selected vulnerability	(1) Census of India, 2011 -	Census Data	Indicator extraction per ward:		✓														VULN INTO RISK
1947	1349	Art. 108	Susceptibility	Sensitivity	Percentage of	Illiteracy	Education: Illiteracy	Economic and			SUSCEPTIBILI	MCVE	Indicator measuring	(1) Household survey (210	Survey/questionnaire	Survey data collection: literacy							✓									VULN INTO RISK
2141	1425	Art. 115	Sensitivity	Sensitivity	Illiterate people	ILLITER	Education: Illiteracy	Economic and			Constructive	HSA; PCA; (SV)	The number of residents	Population and Housing Census	Census Data	Variables were normalized to		✓														VULN INTO RISK
2155	1425	Art. 115	Resilience	Sensitivity	Illiterate people	LITER	Education: Illiteracy	Economic and			Not retained	HSA; PCA; (SV)	The number of residents	Population and Housing Census	Census Data	Variables were normalized to		✓														VULN INTO RISK
2331	1464	Art. 125	Socio-economics	Sensitivity	Percentage of	Illiteracy rate	Education: Illiteracy	Economic and			Socio-	GIS-MCDA:	The proportion of	National Statistics Institute (INE)	Census Data	Data standardized using linear		✓														VULN
2340	1467	Art. 126	Adaptive capacity	Sensitivity	Percentage of	Literacy rate	Education: Illiteracy	Economic and			Adaptive	Integrated	The proportion of	Bangladesh Bureau of Statistics	Census Data	Literacy ratio normalized using		✓														VULN INTO RISK
2341	1467	Art. 126	Adaptive capacity	Sensitivity	Percentage of	Literacy rate	Education: Illiteracy	Economic and			Adaptive	Integrated	The proportion of	Bangladesh Bureau of Statistics	Census Data	Literacy ratio normalized using		✓														VULN INTO RISK
610	710	Art. 031	Adaptive capacity	Sensitivity	Education	Low qualifications	Education: low educated people	Economic and			Health: Self		Percentage of residents	UK Office for National Statistics	Census Data			✓														VULN INTO RISK
1029	793	Art. 053	Social	Sensitivity	CANRDWRT17	Read/write (no	Education: low educated people	Economic and			Social	PCA; Varimax	Number of population	Central Agency for Public	Census Data: Official data	Density calculation:		✓	✓													VULN
1370	926	Art. 071	Limited Resilience	Sensitivity	Low education	Low education	Education: low educated people	Economic and			Limited	Census data	Residents with no formal	2011 UK National Census -	Census Data	Education level data extraction:		✓														VULN INTO RISK
1330	924	Art. 070	Vulnerability	Sensitivity	%	Proportion of uneducated	Education: low educated people	Economic and			Vulnerability	AHP weighting	[illegible]	Provincial and municipal	Census Data: Official data	Educational attainment data		✓	✓													VULN INTO RISK
14	24	Art. 001	Vulnerability	Sensitivity	Education Levels	% Location Levels	Educational level	Economic and			Social	Fuzzy rating	% Localized Flood	D.K. Jha, R.K. Bhattacharyya, S.	Scientific Literature	Importance level x Fuzzy number											✓					VULN INTO RISK
222	196	Art. 013	socio-economic impacts	Sensitivity	Adult secondary	Education level	Educational level	Economic and			3.2. Analysis	An integrated		(1) Semi-structure	Survey/ Questionnaire: On-site	Primary data were used for the							✓	✓								VULN INTO RISK
232	196	Art. 013	socio-economic impacts	Sensitivity	Adult Literacy	Educational status of the	Educational level	Economic and			3.2. Analysis	An integrated	Over 90% of the sampled	(1) Questionnaire; (2) GPS Field	Survey/ Questionnaire:GPS	Primary data were used for the				✓			✓									VULN INTO RISK
434	524	Art. 023	Vulnerability	Sensitivity		Educational Level	Educational level	Economic and			Social	social	Risk awareness level	Central Agency for Public	Census Data	ArcMap GIS		✓														VULN INTO RISK
809	761	Art. 041	Economic, Education, &	Sensitivity	Education Level	Education Level	Educational level	Economic and			Economic,		Percentage of population	U.S. Census Bureau - American	Census Data			✓														VULN
933	771	Art. 046	Adaptive capacity	Sensitivity	Population with	Population with secondary	Educational level	Economic and			Adaptive	Principal		(1) Scientific Literature [17]; R.K.	Scientific Literature												✓					VULN INTO RISK
1032	793	Art. 053	Social	Sensitivity	PRMSTUDNT	Primary school students/km²	Educational level	Economic and			Social	PCA; Varimax	Number of students in	General Authority for	Official data	Point density analysis: spatial			✓													VULN
1168	856	Art. 061	Social Vulnerability	Sensitivity	Student	Number of Students	Educational level	Economic and			Social	Census data	Students enrolled in college	2011 UK National Census -	Census Data	Student population extraction:		✓														VULN INTO RISK
1182	862	Art. 062	Social	Sensitivity	Education level	Education	Educational level	Economic and			Resilience -	Subjective	Whether household head	Household survey (N=600)	Survey/questionnaire	Percentage calculation per							✓									VULN INTO RISK
1470	987	Art. 079	Socio-economic	Sensitivity	Educational	Level of Education	Educational level	Economic and			Socio-	Territorial	Percentage of educational	(1) Institut de la Statistique de la	Census Data: Official data	Educational attainment		✓	✓													VULN INTO RISK
1545	1058	Art. 084	Social Vulnerability	Sensitivity	Education level	Education level in the	Educational level	Economic and			Social	Indicator	Education level in the	(1) Turkish Statistical Institute	Census Data	Education level extraction per		✓														VULN INTO RISK
1624	1066	Art. 086	Demographic	Sensitivity	Education level	Education Level	Educational level	Economic and			DEMOGRAPH	Chi-square	Education level of	(1) Structured field survey; (2)	Survey/questionnaire	Education data collection:							✓									VULN INTO RISK
1710	1103	Art. 092	Adaptive capacity	Sensitivity	Education level (I-	Education level	Educational level	Economic and			ADAPTIVE	Analytic	Respondent's education	(1) Questionnaire survey (599	Survey/questionnaire	Survey data collection:							✓									VULN
1743	1118	Art. 094	Sensitivity	Sensitivity	Education Level	Level of education	Educational level	Economic and			Sensitivity	Analytic	Educational attainment	(1) Household survey (n=359):	Survey/questionnaire: GPS data:	Education data collection:				✓			✓	✓								VULN INTO RISK
1963	1356	Art. 110	Vulnerability	Sensitivity	Education level	Education	Educational level	Economic and			SOCIAL	Analytic	Education attainment	(1) Household survey (300	Survey/questionnaire	Survey data collection: pairwise							✓									VULN
2240	1433	Art. 119	Susceptibility	Sensitivity	Household socio-	Socio-economic status (GSE)	Educational level	Economic and			Susceptibility	Indicator-	The socio-economic	GSE Index (Sabatini, F., Salcedo,	Survey/questionnaire: Scientific	GSE categories: ABC1 (highest),							✓				✓					VULN INTO RISK
2325	1464	Art. 125	Socio-economics	Sensitivity	Percentage of	Junior high school education	Educational level	Economic and			Socio-	GIS-MCDA:	Proportion of population	National Statistics Institute (INE)	Census Data	Data standardized using linear		✓														VULN
21	24	Art. 001	Vulnerability	Sensitivity	Employment	Employment rate	Employment status	Economic and			Economic	Fuzzy rating	% Localized Flood	(1) M.T. Anees, A.F.B. Abu Bakar,	Official data, Scientific Literature	Importance level x Fuzzy number			✓								✓					VULN INTO RISK
217	196	Art. 013	socio-economic impacts	Sensitivity	Employment	Employment	Employment status	Economic and			Economic	An integrated		(1) Semi-structure	Survey/ Questionnaire: On-site	Primary data were used for the							✓	✓								VULN INTO RISK
233	196	Art. 013	socio-economic impacts	Sensitivity	Employment and	Livelihood pattern	Employment status	Economic and			3.2. Analysis	An integrated	The	(1) Questionnaire; (2) GPS Field	Survey/ Questionnaire:GPS	Primary data were used for the				✓			✓									VULN INTO RISK
587	710	Art. 031	Adaptive capacity	Sensitivity	Employment and	Working ≥49 hours/week	Employment status	Economic and			"Economic		Percentage of LSOA	UK Office for National Statistics	Census Data			✓														VULN INTO RISK
588	710	Art. 031	Adaptive capacity	Sensitivity	Employment and	Working age unemployed	Employment status	Economic and			"Economic		Percentage of	UK Office for National Statistics	Census Data			✓														VULN INTO RISK
590	710	Art. 031	Adaptive capacity	Sensitivity	Employment and	Retired	Employment status	Economic and			"Economic		Percentage of residents	UK Office for National Statistics	Census Data			✓														VULN INTO RISK
669	712	Art. 032	Adaptive capacity	Sensitivity	Number of	Employment	Employment status	Economic and			Economic		Data sharing, local	Philippine Statistics Authority	Census Data	ArcGIS software		✓														VULN
812	761	Art. 041	Economic, Education, &	Sensitivity	Occupational	Occupational Dependency	Employment status	Economic and			Economic,		Percentage of civilian	U.S. Census Bureau - American	Census Data			✓														VULN
1001	785	Art. 051	Adaptive capacity	Sensitivity	Employment	Employment	Employment status	Economic and			Adaptive	Statistical	Employment rate.	Instituto Nacional de Estadistica	Census Data: Official data	Employment rate calculation:		✓	✓													VULN
1109	821	Art. 057	Adaptive capacity	Sensitivity	Active labor force	Employment	Employment status	Economic and			Adaptive	Census data	Percentage of active	Italian National Institute of	Census Data	Extraction of census variables:		✓														VULN
1163	856	Art. 061	Social Vulnerability	Sensitivity	Number of part-	Employment	Employment status	Economic and			Social	Census data	Number of employed part-	2011 UK National Census -	Census Data	Part-time worker data extraction:		✓														VULN INTO RISK
1192	862	Art. 062	Economic	Sensitivity	Employment	Employment (Resilience)	Employment status	Economic and			Resilience -	Subjective	Whether household head	Household survey (N=600)	Survey/questionnaire	Percentage calculation per							✓									VULN INTO RISK
1393	938	Art. 073	Vulnerability	Sensitivity	Percentage (%)	Employment Rate (ER)	Employment status	Economic and			Vulnerability	Multi-criteria	Socio-economic	Census of India, 2011.	Census Data: Official data	Employment rate calculation		✓	✓													VULN INTO RISK
1471	987	Art. 079	Socio-economic	Sensitivity	Employment rate	Level of Employment	Employment status	Economic and			Socio-	Territorial	Population's employment	(1) Institut de la Statistique de la	Census Data: Official data	Employment rate calculation per		✓	✓													VULN INTO RISK
1626	1066	Art. 086	Demographic	Sensitivity	Occupation type	Occupation	Employment status	Economic and			DEMOGRAPH	Chi-square	Occupation of household	(1) Structured field survey; (2)	Survey/questionnaire	Occupation data collection:							✓									VULN INTO RISK
1719	1103	Art. 092	Demographic	Sensitivity	Occupation type	Occupation	Employment status	Economic and			SOCIO-	K-means	Respondent's occupation:	(1) Questionnaire survey (599	Survey/questionnaire	Survey data collection:							✓									VULN
1911	1276	Art. 105	Adaptive capacity	Sensitivity	(average number	RA6 – Employment	Employment status	Economic and			Post-Flood	VIKOR-GRA	Employment is measured	China City Statistical Yearbook	Official data	RA6 = (average number of			✓													VULN INTO RISK
1951	1349	Art. 108	Resilience	Sensitivity	Percentage of	Occupation	Employment status	Economic and			RESILIENCE	MCVE	Indicator measuring	(1) Household survey (210	Survey/questionnaire	Survey data collection:							✓									VULN INTO RISK
1964	1356	Art. 110	Vulnerability	Sensitivity	Employment type	Occupation	Employment status	Economic and			SOCIAL	Analytic	Type of occupation	(1) Household survey (300	Survey/questionnaire	Survey data collection: pairwise							✓									VULN
2024	1394	Art. 113	Vulnerability	Sensitivity	Occupation	Occupation of household	Employment status	Economic and			Economic	Index-based	The primary occupation	(1) Primary data collected	Survey/questionnaire	Raw survey responses were							✓									VULN
2082	1408	Art. 114	Sensitivity	Sensitivity	Primary	Primary occupation	Employment status	Economic and			Sensitivity	Index-based	The primary occupation	(1) Primary data collected	Survey/questionnaire	Raw survey responses were							✓									VULN INTO RISK
2106	1408	Art. 114	Adaptive capacity	Sensitivity	Employment	Households with family	Employment status	Economic and			Capacity	Index-based	Whether the household has	(1) Primary data collected	Survey/questionnaire	Raw survey responses (Yes/No)							✓									VULN INTO RISK
2156	1425	Art. 115	Resilience	Sensitivity	Households where	HS_OEMP	Employment status	Economic and			Not retained	HSA; PCA; (SV)	The number of	Population and Housing Census	Census Data	Variables were normalized to		✓														VULN INTO RISK
2239	1433	Art. 119	Susceptibility	Sensitivity	Primary	Employment status	Employment status	Economic and			Susceptibility	Indicator-	The employment status	Household survey conducted in	Survey/questionnaire	Data pre-processed in Excel and							✓									VULN INTO RISK
2236	1433	Art. 119	Adaptive capacity	Sensitivity	Income stability	Job tenure	Employment status	Economic and			Susceptibility	Indicator-	Regular, secure income	Household survey conducted in	Survey/questionnaire	Pearson correlation: 0.63							✓									VULN INTO RISK
2396	1492	Art. 129	Vulnerability	Sensitivity	Proportion of	Unemployment	Employment status	Economic and			Vulnerability	Multi-criteria	The proportion of people	Chilean National Statistics	Census Data:	Variables transformed into ratio		✓					✓									VULN INTO RISK
386	327	Art. 019	Vulnerability	Sensitivity	Nighttime light	Nighttime lights (NTL)	Energy consumption	Economic and			Flood	Geographical	Reflects nighttime lights (NTL)	(1) United States Geological	Satellite imagery: Official data				✓							✓					✓	VULN INTO RISK
593	710	Art. 031	Sensitivity	Sensitivity	Housing	No central heating	Energy consumption	Economic and			"Economic		Percentage of households	UK Office for National Statistics	Census Data			✓														VULN INTO RISK
1139	842	Art. 060	Vulnerability of Urban	Sensitivity	Total fixed asset	Fixed Asset Investment (FAI)	Fixed Asset Investment (FAI)	Economic and			Economic	Entropy	Total fixed asset	(1) Zhengzhou Bureau of	Census Data	Calculation using Eq. (5): FAIi =		✓														VULN
1865	1267	Art. 103	Economic	Sensitivity	Fixed asset	Fixed Asset Investment	Fixed Asset Investment (FAI)	Economic and			ECONOMIC	Principal	Investment in fixed	(1) Nanjing Statistical Yearbook,	Official data	Data extraction: missing data			✓													VULN INTO RISK
2150	1425	Art. 115	Resilience	Sensitivity	Fixed investments per	Fixed Investment per	Fixed Asset Investment (FAI)	Economic and			Constructive	HSA; PCA; (SV)	The level of fixed	Spanish Ministry of Finance and	Official data	Variables were normalized to			✓													VULN INTO RISK
81	51	Art. 005	Restorability	Sensitivity	GDP density	Gross Domestic Product	Gross Domestic Product (GDP)	Economic and			Restorability	H–S–V–R flood	GDP density derived from	Resource and Environment	Official data				✓												✓	VULN INTO RISK
82	51	Art. 005	Restorability	Sensitivity	Regional GDP/	Gross Domestic Product	Gross Domestic Product (GDP)	Economic and			Restorability	H–S–V–R flood	GDP per capita derived	National Bureau of Statistics of	Census Data			✓														VULN INTO RISK
85	51	Art. 005	Restorability	Sensitivity	Population	Gross Domestic Product	Gross Domestic Product (GDP)	Economic and			Restorability	H–S–V–R flood	Derived from	National Bureau of Statistics of	Census Data			✓														VULN INTO RISK
86	51	Art. 005	Restorability	Sensitivity	Regional GDP	Gross Domestic Product	Gross Domestic Product (GDP)	Economic and			Restorability	H–S–V–R flood	GDP per land area	National Bureau of Statistics of	Census Data			✓														VULN INTO RISK
98	73	Art. 006	Vulnerability	Sensitivity	Gross Domestic	Gross Domestic Product	Gross Domestic Product (GDP)	Economic and			Vulnerability	Spatial Multi-	The socio-economic	Resource and Environment	Open Urban data	Low GDP (< 196.43 million RMB)									✓						✓	VULN
411	424	Art. 021	Exposure	Sensitivity	Economic output	GDP density	Gross Domestic Product (GDP)	Economic and			Exposure	Normalization	GDP density at 1 km	(1) Data Center for Resources	Census Data	GDP grid data at 1 km resolution		✓													✓	VULN INTO RISK
980	777	Art. 049	Exposure	Sensitivity	Raster	Gross Domestic Product	Gross Domestic Product (GDP)	Economic and			EXPOSURE	Economic data	Gross Domestic Product	Resources and Environment	Official data: Software Simulation	Spatial distribution mapping:			✓									✓			✓	VULN INTO RISK
1014	790	Art. 052	Vulnerability	Sensitivity	Gross domestic	Gross Domestic Product	Gross Domestic Product (GDP)	Economic and			VULNERABILI	Pressure-state-	Gross domestic product	RESDC: Chinese Resource	Official data	The spatial pattern of Flood			✓												✓	VULN INTO RISK
1138	842	Art. 060	Vulnerability of Urban	Sensitivity	GDP / urban area	Gross Domestic Product	Gross Domestic Product (GDP)	Economic and			Vulnerability	Entropy	Economic output per unit	(1) Zhengzhou Bureau of	Census Data	Calculation using Eq. (4): A-GDPi		✓														VULN
1141	842	Art. 060	Vulnerability	Sensitivity	GDP / population	Gross Domestic Product	Gross Domestic Product (GDP)	Economic and			Disaster	Entropy	Economic output per	(1) Zhengzhou Bureau of	Census Data	Calculation using Eq. (7): P-GDPi		✓														VULN
1215	863	Art. 063	Flood Hazard Index (FHI)	Sensitivity	GDP per capita	Gross Domestic Product	Gross Domestic Product (GDP)	Economic and			Flood	Fuzzy Analytic	Economic output per	(1) Kenya National Bureau of	Census Data: Official data	Economic data collection:		✓	✓													VULN INTO RISK
1450	977	Art. 078	Vulnerability	Sensitivity	GDP per km²	Gross Domestic Product	Gross Domestic Product (GDP)	Economic and				Analytic	Global gridded GDP data	(1) Wang T., Sun F. (2022) -	Census Data: Software Simulation	Data extraction (2040-2060,		✓										✓				VULN INTO RISK
1840	1211	Art. 102	Sensitivity	Sensitivity	GDP (billion USD)	Gross Domestic Product	Gross Domestic Product (GDP)	Economic and			Socioeconom	Statistical	Gross Domestic Product	(1) National Economic and	Official data	GDP data collection (1992-2021):			✓													VULN INTO RISK
1850	1267	Art. 103	Economic	Sensitivity	GDP (10^8 yuan)	Gross Domestic Product	Gross Domestic Product (GDP)	Economic and			ECONOMIC	Principal	Total economic output of	(1) Nanjing Statistical Yearbook,	Official data: Census Data	Data extraction for 1990-2017:		✓	✓													VULN INTO RISK
2190	1428	Art. 117	Exposure	Sensitivity	State-level GDP	Gross Domestic Product	Gross Domestic Product (GDP)	Economic and			Exposure	Multivariate	The total economic	United States Department of	Official data	GDP data aggregated to annual			✓													VULN INTO RISK
2266	1455	Art. 121	Sensitivity	Sensitivity	Gross Domestic	Gross Domestic Product	Gross Domestic Product (GDP)	Economic and			Sensitivity	SPRC	The economic output per	Shanghai Statistical Yearbook	Census Data: Official data	GDP per capita mapped at		✓	✓													VULN INTO RISK
2267	1455	Art. 121	Sensitivity	Sensitivity	Gross Domestic	Gross Domestic Product	Gross Domestic Product (GDP)	Economic and			Sensitivity	SPRC	The monetary value	Shanghai Statistical Yearbook	Census Data: Official data	GDP per unit land mapped based		✓	✓													VULN INTO RISK
18	24	Art. 001	Vulnerability	Sensitivity	Average	Average household income	Income per capita	Economic and			Economic	Fuzzy rating	Median income in CAD	(1) City of Kelowna City profile	Official data: Census Datva:	Importance level x Fuzzy number		✓	✓								✓					VULN INTO RISK
584	709	Art. 030	Social vulnerability	Sensitivity	Average	Average household annual	Income per capita	Economic and			Social		Average annual household	(1) 2006 census data; (2) 2013	Census Data:			✓					✓									VULN INTO RISK
592	710	Art. 031	Adaptive capacity	Sensitivity	Employment and	Median household income	Income per capita	Economic and			"Economic		Percentage of households	UK Office for National Statistics	Official Data				✓													VULN INTO RISK
887	766	Art. 044	Vulnerability	Sensitivity	Vector (Grid)	Household income	Income per capita	Economic and			ECONOMIC	Entropy	Annual income of	City of Calgary Open Data Portal	Official data	Direct assignment to 500m grid			✓												✓	VULN INTO RISK
934	771	Art. 046	Adaptive capacity	Sensitivity	Average monthly	Average monthly household	Income per capita	Economic and			Adaptive	Principal	What forms the regular	Modified from (1) Scientific	Scientific Literature												✓					VULN INTO RISK
1271	907	Art. 067	Socioeconomic	Sensitivity	Income (PKR/USD)	Average monthly household	Income per capita	Economic and			Socioeconom	In this study, a	Average monthly	Household survey (N=600) - Face	Survey/questionnaire	Data cleaning: descriptive							✓									VULN INTO RISK
1332	924	Art. 071	Resilience	Sensitivity	CNY per 100	GDP per capita	Income per capita	Economic and			Resilience	AHP weighting	Ratio of regional GDP to	Provincial and municipal	Census Data: Official data	GDP per capita calculation:		✓	✓													VULN INTO RISK
1605	1066	Art. 086	Resilience	Sensitivity	Household income	Lack of Income (LI)	Income per capita	Economic and			ECONOMIC	Binomial	Household income levels	(1) Structured field survey; (2)	Survey/questionnaire	Household survey data							✓									VULN INTO RISK
1706	1103	Art. 092	Sensitivity	Sensitivity	Occupation	Income	Income per capita	Economic and			SENSITIVITY	Analytic	Respondent's perception	(1) Questionnaire survey (599	Survey/questionnaire	Survey data collection:							✓									VULN
1718	1103	Art. 092	Economic	Sensitivity	Annual income	Personal annual income	Income per capita	Economic and			SOCIO-	K-means	Respondent's personal	(1) Questionnaire survey (599	Survey/questionnaire	Survey data collection: income							✓									VULN

1742	1118	Art. 094	Sensitivity	Sensitivity	Income level (ZAR)	Average income	Income per capita	Economic and			Sensitivity
1806	1165	Art. 099	Vulnerability	Sensitivity	Adjusted income	Average income (by cost of	Income per capita	Economic and			ECONOMIC
1852	1267	Art. 103	Economic	Sensitivity	Disposable	Per Capita Disposable	Income per capita	Economic and			ECONOMIC
1884	1271	Art. 104	Socioeconomic	Sensitivity	Income disruption	Income	Income per capita	Economic and			Indirect
1895	1271	Art. 104	Socioeconomic	Sensitivity	Individual	Earnings person	Income per capita	Economic and			Control
1905	1276	Art. 105	Adaptive capacity	Sensitivity	(total income –	C5 – Economic Tolerance	Income per capita	Economic and			During-Flood
1950	1349	Art. 108	Resilience	Sensitivity	Percentage of	Income	Income per capita	Economic and			RESILIENCE
1970	1356	Art. 110	Vulnerability	Sensitivity	Household	Income	Income per capita	Economic and			ECONOMIC
2022	1394	Art. 113	Vulnerability	Sensitivity	Monthly income	Average monthly	Income per capita	Economic and			Economic
2081	1408	Art. 114	Sensitivity	Sensitivity	Monthly income	Average monthly	Income per capita	Economic and			Sensitivity
2161	1425	Art. 115	Resilience	Sensitivity	Per capita income	PC_INC	Income per capita	Economic and			Not retained
2176	1427	Art. 116	Vulnerability	Sensitivity	Average monthly	Income per Capita (In)	Income per capita	Economic and			Flood Risk
1193	862	Art. 062	Economic	Sensitivity	Income level	Household income	Income per household	Economic and			Resilience -
1195	862	Art. 062	Economic	Sensitivity	Livelihood	Multiple livelihood sources	Income per household	Economic and			Resilience -
1889	1271	Art. 104	Socioeconomic	Sensitivity	Household	Household Economy	Income per household	Economic and			Control
1894	1271	Art. 104	Socioeconomic	Sensitivity	Monthly	Household income	Income per household	Economic and			Control
2026	1394	Art. 113	Vulnerability	Sensitivity	Number of	Livelihood options of the	Income per household	Economic and			Economic
2098	1408	Art. 114	Adaptive capacity	Sensitivity	Number of	Households having multiple	Income per household	Economic and			Capacity
2101	1408	Art. 114	Adaptive capacity	Sensitivity	Monthly savings	Average monthly households	Income per household	Economic and			Capacity
1184	862	Art. 062	Adaptive capacity	Sensitivity	Income	Multiple income sources	Income: High-income people	Economic and			Vulnerability -
1952	1349	Art. 108	Resilience	Sensitivity	Percentage of	Multiple income sources	Income: High-income people	Economic and			RESILIENCE
2419	1505	Art. 130	Adaptive capacity	Sensitivity	Percentage of high	High income households	Income: High-income people	Economic and			Coping
219	196	Art. 013	socio-economic impacts	Sensitivity	Proportion of	Income poverty	Income: Low-income people	Economic and			Poverty
388	327	Art. 019	Vulnerability	Sensitivity		Poverty Headcount Ratio	Income: Low-income people	Economic and			Flood
389	327	Art. 019	Vulnerability	Sensitivity	Poverty index	Poverty index	Income: Low-income people	Economic and			Flood
417	483	Art. 022	Regional Vulnerability	Sensitivity	No. of marginal	No. of marginal worker	Income: Low-income people	Economic and			Regional
666	712	Art. 032	Adaptive capacity	Sensitivity	% informal settler	Income/ Poverty	Income: Low-income people	Economic and			Economic
805	761	Art. 041	Economic, Education, &	Sensitivity	Below Poverty	Below Poverty	Income: Low-income people	Economic and			Economic,
806	761	Art. 041	Economic, Education, &	Sensitivity	Emergency	Emergency Savings	Income: Low-income people	Economic and			Economic,
910	771	Art. 046	Sensitivity	Sensitivity	No. of marginal	Population of marginal	Income: Low-income people	Economic and			Social
963	774	Art. 048	Vulnerability	Sensitivity	Marginalized	Percentage of main workers	Income: Low-income people	Economic and			SOCIOECONO
964	774	Art. 048	Vulnerability	Sensitivity	Dependent	Percentage of marginal	Income: Low-income people	Economic and			SOCIOECONO
1044	793	Art. 053	Economic	Sensitivity	WORWOPAYM06	Unpaid workers/km²	Income: Low-income people	Economic and			Economic
1048	793	Art. 053	Economic	Sensitivity	EXTPOV17	Extreme poverty ratio	Income: Low-income people	Economic and			Economic
1089	816	Art. 055	Vulnerability	Sensitivity	Poverty rate	Proportion of people living	Income: Low-income people	Economic and			Vulnerability
1310	921	Art. 070	Current Flood Risk	Sensitivity	Household	Census data	Income: Low-income people	Economic and			Current Flood
1472	987	Art. 079	Socio-economic	Sensitivity	Informal/social	Low-Income Habitats	Income: Low-income people	Economic and			Socio-
1490	988	Art. 080	Socio-economic	Sensitivity	slum population	Vulnerability indicators	Income: Low-income people	Economic and			socioeconom
1492	988	Art. 080	Socio-economic	Sensitivity	marginal workers	Vulnerability indicators	Income: Low-income people	Economic and			socioeconom
1533	1058	Art. 084	Sensitivity	Sensitivity	Percentage (%)	The percentage of low	Income: Low-income people	Economic and			Sensitivity -
1603	1066	Art. 086	Economic Vulnerability	Sensitivity	Income level	Poverty (POL)	Income: Low-income people	Economic and			ECONOMIC
2253	1453	Art. 120	Socio-economic	Sensitivity	Percentage of	No income and income less	Income: Low-income people	Economic and			Socio-
2256	1453	Art. 120	Socio-economic	Sensitivity	Percentage of	Population living in	Income: Low-income people	Economic and			Socio-
2397	1492	Art. 129	Vulnerability	Sensitivity	Proportion of	Income status	Income: Low-income people	Economic and			Vulnerability
2254	1453	Art. 120	Socio-economic	Sensitivity	Percentage of	Income between one and	Income: Medium-income people	Economic and			Socio-
282	200	Art. 014	Housing sector -	Sensitivity	practices during	Practices - Housing sector	Local Economic Activity and Output	Economic and			Housing
289	200	Art. 014	Commercial sector -	Sensitivity	Type of Economic	Type of Economic Activity	Local Economic Activity and Output	Economic and			Commercial
295	200	Art. 014	Commercial sector -	Sensitivity	practices during	Practices- Commercial sector	Local Economic Activity and Output	Economic and			Commercial
507	559	Art. 026	Adaptive capacity	Sensitivity	mean of	Employed population in	Local Economic Activity and Output	Economic and			Commercial
788	744	Art. 040	Exposure	Sensitivity	Gross value added	Gross value added (EUR)	Local Economic Activity and Output	Economic and			Exposure
811	761	Art. 041	Economic, Education, &	Sensitivity	Economic	Economic Diversity	Local Economic Activity and Output	Economic and			Economic,
855	765	Art. 043	Vulnerability	Sensitivity	Economic assets	Average crop production -	Local Economic Activity and Output	Economic and			FLOOD
856	765	Art. 043	Vulnerability	Sensitivity	Same as above.	Average crop production -	Local Economic Activity and Output	Economic and			FLOOD
998	785	Art. 051	Sensitivity	Sensitivity	Work in climate	Work in climate sensitive	Local Economic Activity and Output	Economic and			Sensitivity
1036	793	Art. 053	Economic	Sensitivity	TRANSCOMMACT	Workers in Transport and	Local Economic Activity and Output	Economic and			Economic
1037	793	Art. 053	Economic	Sensitivity	SERVOCCUACT06	Public services workers/km²	Local Economic Activity and Output	Economic and			Economic
1038	793	Art. 053	Economic	Sensitivity	MANCONSTACT06	Industrial/construction	Local Economic Activity and Output	Economic and			Economic
1047	793	Art. 053	Economic	Sensitivity	SERVPRIVACT06	Household service	Local Economic Activity and Output	Economic and			Economic
1049	793	Art. 053	Economic	Sensitivity	PRIMACT06	Primary sector workers/km²	Local Economic Activity and Output	Economic and			Economic
1326	924	Art. 071	Exposure	Sensitivity	10.000 CNY per	GDP density (DGDP)	Local Economic Activity and Output	Economic and			
1808	1165	Art. 099	Vulnerability	Sensitivity	Business density	Number of businesses per	Local Economic Activity and Output	Economic and			ECONOMIC
1910	1276	Art. 105	Adaptive capacity	Sensitivity	per capita gross	RA5 – Local Economic Level	Local Economic Activity and Output	Economic and			Post-Flood
2300	1460	Art. 123	Economic Vulnerability	Sensitivity	Portion of normal	Operational capacity during	Local Economic Activity and Output	Economic and			Economic
2339	1467	Art. 126	Adaptive capacity	Sensitivity	Percentage of	Income dependent on	Local Economic Activity and Output	Economic and			Vulnerability
2351	1467	Art. 126	Exposure	Sensitivity	Number of	Garments industry	Local Economic Activity and Output	Economic and			Exposure
2352	1467	Art. 126	Exposure	Sensitivity	Agricultural land	Paddy production	Local Economic Activity and Output	Economic and			Exposure
312	215	Art. 015	Vulnerability	Sensitivity	Local prices of	Economic value of buildings	Real Estate / Land Value	Economic and			Exposure (E)
2409	1505	Art. 130	Economic Risk	Sensitivity	Land value per	Land value	Real Estate / Land Value	Economic and			Economic
938	771	Art. 046	Adaptive capacity	Sensitivity	No. of HHs not	Households without	Savings status (Yes/No)	Economic and			Adaptive
1972	1356	Art. 110	Vulnerability	Sensitivity	Savings status	Savings	Savings status (Yes/No)	Economic and			ECONOMIC
2100	1408	Art. 114	Adaptive capacity	Sensitivity	Savings status	Households having any kind	Savings status (Yes/No)	Economic and			Capacity
560	697	Art. 029	Sensitivity	Sensitivity	Employment	Unemployment	Unemployed people	Economic and			Employment
585	709	Art. 030	Social vulnerability	Sensitivity		Percentage of unemployed	Unemployed people	Economic and			Social
589	710	Art. 031	Adaptive capacity	Sensitivity	Employment and	Never worked	Unemployed people	Economic and			"Economic
630	710	Art. 031	Adaptive capacity	Sensitivity	Local Economy	Local unemployment	Unemployed people	Economic and			Strength of
810	761	Art. 041	Economic, Education, &	Sensitivity	Unemployment	Unemployment	Unemployed people	Economic and			Economic,
866	766	Art. 044	Vulnerability	Sensitivity	Vector (Grid)	Number of unemployed	Unemployed people	Economic and			SOCIAL
869	766	Art. 044	Vulnerability	Sensitivity	Vector (Grid)	Number of employed	Unemployed people	Economic and			SOCIAL
1043	793	Art. 053	Economic	Sensitivity	UNEMPOL06	Unemployed	Unemployed people	Economic and			Economic
1045	793	Art. 053	Economic	Sensitivity	OSLBRFRC17	Outside labor force/km²	Unemployed people	Economic and			Economic
1107	819	Art. 056	Economic	Sensitivity	Unemployment	Percentage of unemployed	Unemployed people	Economic and			Economic
1169	856	Art. 061	Limited Resilience	Sensitivity	Unemployment	Socio-Economic Status	Unemployed people	Economic and			Limited
1333	924	Art. 071	Resilience	Sensitivity	%	Unemployment rate (UEMP)	Unemployed people	Economic and			Resilience
1493	988	Art. 080	Socio-economic	Sensitivity	non-workers	Vulnerability indicators	Unemployed people	Economic and			socioeconom
1609	1066	Art. 086	Elements at Risk	Sensitivity	Employment	Lack of Employment (LE)	Unemployed people	Economic and			ECONOMIC
1747	1118	Art. 094	Sensitivity	Sensitivity	Unemployment	Level of unemployment	Unemployed people	Economic and			Sensitivity
1851	1267	Art. 103	Economic	Sensitivity	Unemployment	Unemployment Rate	Unemployed people	Economic and			ECONOMIC
2099	1408	Art. 114	Adaptive capacity	Sensitivity	Count of	Number of earning members	Unemployed people	Economic and			Capacity
2133	1425	Art. 115	Sensitivity	Sensitivity	Unemployment	UN_RAT	Unemployed people	Economic and			Labour Social
2134	1425	Art. 115	Sensitivity	Sensitivity	Long-term	LT_UNEMP	Unemployed people	Economic and			Labour Social
2135	1425	Art. 115	Sensitivity	Sensitivity	Households where	HS_0UNEMP	Unemployed people	Economic and			Labour Social
2330	1464	Art. 125	Socio-economics	Sensitivity	Percentage of	Unemployment rate	Unemployed people	Economic and			Socio-
2420	1505	Art. 130	Adaptive capacity	Sensitivity	Percentage of	Share of unemployment	Unemployed people	Economic and			Coping
100	73	Art. 006	Adaptive capacity	Adaptive	Coping capability	Civil Defense and Rescue	Emergency Rescue Accessibility	Emergency Response			Adaptability
426	524	Art. 023	Adaptive capacity	Adaptive	Ambulance	Ambulance Arrive Time	Emergency Rescue Accessibility	Emergency Response			Response
428	524	Art. 023	Adaptive capacity	Adaptive	Rescue Arriving	Rescue Arrive Time	Emergency Rescue Accessibility	Emergency Response			Response
461	534	Art. 024	Emergency Services	Adaptive	Fire and police	Fire and police stations	Emergency Rescue Accessibility	Emergency Response			Emergency
1092	816	Art. 055	Vulnerability	Adaptive	DRF access	Disaster Response Force	Emergency Rescue Accessibility	Emergency Response			Vulnerability
1479	987	Art. 079	Risk	Adaptive	Travel time under	Emergency Access Resilience	Emergency Rescue Accessibility	Emergency Response			Risk
1478	987	Art. 079	Organisational	Adaptive	Travel time to	Emergency Access Resilience	Emergency Rescue Accessibility	Emergency Response			Organisation
1781	1146	Art. 097	Exposure	Adaptive	Distance to SES	Mean distance from State	Emergency Rescue Accessibility	Emergency Response			Exposure
1786	1146	Art. 097	Risk	Adaptive	Number of State	State Fire Service	Emergency Rescue Accessibility	Emergency Response			Risk
1919	1317	Art. 106	Exposure	Adaptive	Fire house	Fire & Rescue Service (FRS)	Emergency Rescue Accessibility	Emergency Response			INFRASTRUCT
2296	1460	Art. 123	Adaptive capacity	Adaptive	Level of	External support	Emergency Rescue Accessibility	Emergency Response			Social
463	534	Art. 024	Emergency Services	Adaptive	Evacuation zones	Evacuation zones	Evacuation routes	Emergency Response			Emergency
1928	1317	Art. 106	Exposure	Adaptive	Response time	Fastest Routes	Evacuation routes	Emergency Response			MODEL
2046	1394	Art. 113	Vulnerability	Adaptive	Knowledge of	Household's awareness	Evacuation routes	Emergency Response			Institutional
2109	1408	Art. 114	Adaptive capacity	Adaptive	Knowledge of	Households aware of	Evacuation routes	Emergency Response			Capacity
3	24	Art. 001	Vulnerability	Adaptive	Emergency	Emergency coordination	Healthcare Capacity	Emergency Response			Physical
84	51	Art. 005	Restorability	Adaptive	Number of	Number of hospital beds	Healthcare Capacity	Emergency Response			Restorability
101	73	Art. 006	Adaptive capacity	Adaptive	Coping capability	Emergency shelters	Healthcare Capacity	Emergency Response			Adaptability
425	524	Art. 023	Adaptive capacity	Adaptive	Ambulance	Ambulance Services Capacity	Healthcare Capacity	Emergency Response			Response
427	524	Art. 023	Adaptive capacity	Adaptive	Rescue Services	Rescue Services Capacity	Healthcare Capacity	Emergency Response			Response
454	534	Art. 024	Hospitals and Health Care	Adaptive	Assisted living,	Assisted living, nursing	Healthcare Capacity	Emergency Response			Hospitals and
456	534	Art. 024	Hospitals and Health Care	Adaptive	Registered home	Registered home health care	Healthcare Capacity	Emergency Response			Hospitals and
636	710	Art. 031	Adaptive capacity	Adaptive	Access to	Hospital beds availability	Healthcare Capacity	Emergency Response			Accessibility
654	712	Art. 032	Adaptive capacity	Adaptive	Availability of	Emergency services and	Healthcare Capacity	Emergency Response			Infrastructure
1144	842	Art. 060	Adaptive capacity	Adaptive	Medical beds /	Number of Medical Beds Per	Healthcare Capacity	Emergency Response			Disaster
1145	842	Art. 060	Adaptive capacity	Adaptive	Health workers /	Number of Health-care	Healthcare Capacity	Emergency Response			Disaster
1334	924	Art. 071	Resilience	Adaptive	Persons	Number of doctors (DOCS)	Healthcare Capacity	Emergency Response			Resilience
1336	924	Art. 071	Resilience	Adaptive	Beds	Number of hospital beds	Healthcare Capacity	Emergency Response			Resilience
1864	1267	Art. 103	Physical	Adaptive	Hospital beds (per	Number of Hospital Beds per	Healthcare Capacity	Emergency Response			PHYSICAL
1902	1276	Art. 105	Adaptive capacity	Adaptive	number of	C2 – Medical Capacity	Healthcare Capacity	Emergency Response			During-Flood
1954	1349	Art. 108	Resilience	Adaptive	Percentage of	Emergency service	Healthcare Capacity	Emergency Response			RESILIENCE
1980	1356	Art. 110	Vulnerability	Adaptive	Institutional aid	Aid in Flood	Healthcare Capacity	Emergency Response			INSTITUTION
2116	1425	Art. 115	Resilience	Adaptive	Hospital beds	H_BEDS	Healthcare Capacity	Emergency Response			Total Social
2117	1425	Art. 115	Resilience	Adaptive	Medical staff	MED_ST	Healthcare Capacity	Emergency Response			Total Social
2158	1425	Art. 115	Sensitivity	Adaptive	Type of healthcare	TYPE_H	Healthcare Capacity	Emergency Response			Not retained
2421	1505	Art. 130	Adaptive capacity	Adaptive	Number of	Hospital beds	Healthcare Capacity	Emergency Response			Coping
2422	1505	Art. 130	Adaptive capacity	Adaptive	Number of	Doctors	Healthcare Capacity	Emergency Response			Coping
7	24	Art. 001	Vulnerability	Adaptive	No. of	No. of Hospital/Clinic	Proximity to Healthcare Facilities	Emergency Response			Physical
102	73	Art. 006	Adaptive capacity	Adaptive	Coping capability	Medical Services and	Proximity to Healthcare Facilities	Emergency Response			Adaptability
165	104	Art. 010	vulnerability	Adaptive	Google Earth's	Distance to hospital	Proximity to Healthcare Facilities	Emergency Response			Waterlogging
314	215	Art. 015	Vulnerability	Adaptive	Distance from	distance from hospitals	Proximity to Healthcare Facilities	Emergency Response			Coping
390	363	Art. 020	Vulnerability	Adaptive		Distance to hospital	Proximity to Healthcare Facilities	Emergency Response			Flood
415	483	Art. 022	Regional Vulnerability	Adaptive	Health	Health infrastructure	Proximity to Healthcare Facilities	Emergency Response			Regional
455	534	Art. 024	Hospitals and Health Care	Adaptive		Hospitals, pharmacies,	Proximity to Healthcare Facilities	Emergency Response			Hospitals and
457	534	Art. 024	Hospitals and Health Care	Adaptive	Renal dialysis	Renal dialysis treatment	Proximity to Healthcare Facilities	Emergency Response			Hospitals and
638	710	Art. 031	Adaptive capacity	Adaptive	Access to	Car travel time to hospital	Proximity to Healthcare Facilities	Emergency Response			Accessibility
639	710	Art. 031	Adaptive capacity	Adaptive	Access to	Car travel time to GP	Proximity to Healthcare Facilities	Emergency Response			Accessibility
640	710	Art. 031	Exposure	Adaptive	Access to	Access cut off by flood zone	Proximity to Healthcare Facilities	Emergency Response			Accessibility
651	712	Art. 032	Adaptive capacity	Adaptive	Number of health	Health facilities	Proximity to Healthcare Facilities	Emergency Response			Infrastructure
823	761	Art. 041	Infrastructure,	Adaptive	Distance to	Distance to Medical Care	Proximity to Healthcare Facilities	Emergency Response			Infrastructure
936	771	Art. 046	Adaptive capacity	Adaptive	Area not covered	Population beyond 3 km	Proximity to Healthcare Facilities	Emergency Response			Adaptive
1006	785	Art. 051	Adaptive capacity	Adaptive	Distance from	Distance from health centers	Proximity to Healthcare Facilities	Emergency Response			Adaptive
1018	790	Art. 052	Vulnerability	Adaptive	Distance to	Distance to hospitals (m)	Proximity to Healthcare Facilities	Emergency Response			VULNERABILI
1054	793	Art. 053	Physical	Adaptive		Distance to nearest hospital	Proximity to Healthcare Facilities	Emergency Response			Physical
1172	856	Art. 061	Limited Resilience	Adaptive	Distance to	Emergency Facilities	Proximity to Healthcare Facilities	Emergency Response			Limited
1335	924	Art. 071	Resilience	Adaptive	Count	Number of medical	Proximity to Healthcare Facilities	Emergency Response			Resilience
1422	957	Art. 076	Adaptive capacity	Adaptive	Health facility	Health Facilities	Proximity to Healthcare Facilities	Emergency Response			Coping
1474	987	Art. 079	Organisational	Adaptive	Emergency facility	Emergency Services	Proximity to Healthcare Facilities	Emergency Response			Organisation
1587	1066	Art. 086	Susceptibility	Adaptive	Healthcare access	Lack of Access to Health	Proximity to Healthcare Facilities	Emergency Response			SOCIAL
1667	1076	Art. 089	Vulnerability	Adaptive	Distance (km)	Distance from Emergency	Proximity to Healthcare Facilities	Emergency Response			Flood
1678	1090	Art. 090	Suitability	Adaptive	Distance to health	Distance to Health Facilities	Proximity to Healthcare Facilities	Emergency Response			SOCIOECONO
1769	1139	Art. 096	Vulnerability	Adaptive	Distance to	Distance from hospital	Proximity to Healthcare Facilities	Emergency Response			Vulnerability
1810	1165	Art. 099	Vulnerability	Adaptive	Distance to	Distance to closest medical	Proximity to Healthcare Facilities	Emergency Response			ACCESSIBILIT
1872	1267	Art. 103	Institutional	Adaptive	Rescue	Unit Number of Rescue	Proximity to Healthcare Facilities	Emergency Response			INSTITUTION
1901	1276	Art. 105	Adaptive capacity	Adaptive	number of	C1 – Health Access	Proximity to Healthcare Facilities	Emergency Response			During-Flood
1918	1317	Art. 106	Exposure	Adaptive	Ambulance	Emergency Medical Service	Proximity to Healthcare Facilities	Emergency Response			INFRASTRUCT
1920	1317	Art. 106	Vulnerability	Adaptive	Nursing homes	Vulnerable Facilities	Proximity to Healthcare Facilities	Emergency Response			INFRASTRUCT
1927	1317	Art. 106	Exposure	Adaptive	Service area (km²)	Emergency Service Coverage	Proximity to Healthcare Facilities	Emergency Response			MODEL
1929	1317	Art. 106	Vulnerability	Adaptive	Percentage of	Population Coverage	Proximity to Healthcare Facilities	Emergency Response			MODEL
2035	1394	Art. 113	Vulnerability	Adaptive	Travel distance	Distance to nearest medical	Proximity to Healthcare Facilities	Emergency Response			Physical/Infra
2085	1408	Art. 114	Sensitivity	Adaptive	Travel distance	Distance to nearest medical	Proximity to Healthcare Facilities	Emergency Response			Sensitivity
2115	1425	Art. 115	Resilience	Adaptive	Health centres	HEALTH_C	Proximity to Healthcare Facilities	Emergency Response			Total Social
2142	1425	Art. 115	Sensitivity	Adaptive	Distance to the	DIST_H	Proximity to Healthcare Facilities	Emergency Response			Social
2143	1425	Art. 115	Sensitivity	Adaptive	Travel time to the	TIME_H	Proximity to Healthcare Facilities	Emergency Response			Social
2144	1425	Art. 115	Sensitivity	Adaptive	Distance to the	DIST_HC	Proximity to Healthcare Facilities	Emergency Response			Social Health
2145	1425	Art. 115	Sensitivity	Adaptive	Travel time to the	TIME_HC	Proximity to Healthcare Facilities	Emergency Response			Social Health
2368	1478	Art. 127	Infrastructure	Adaptive	Healthcare	Hospitals	Proximity to Healthcare Facilities	Emergency Response			Infrastructure
1537	1058	Art. 084	Sensitivity	Exposure	Number of days	The number of days during	Air pollution	Environmental Pollution			Sensitivity -
770	740	Art. 039	Socioeconomic and	Exposure	E8: Number of	E8: Number of	Soil and water pollution	Environmental Pollution			Socioeconom
2414	1505	Art. 130	Ecological Risk	Exposure	Contaminated	Potential pollution	Soil and water pollution	Environmental Pollution			Ecological
2416	1505	Art. 130	Ecological Risk	Exposure	Peat bogs, heath,	Trophic level	Soil and water pollution	Environmental Pollution			Ecological
1090	816	Art. 055	Vulnerability	Adaptive	Backup power	Provision for alternative	Alternative power supply	Essential Utility			Vulnerability
218	196	Art. 013	socio-economic impacts	Adaptive	Proportion of	Sanitation	Basic utilities coverage	Essential Utility			Poverty
237	196	Art. 013	socio-economic impacts	Adaptive	Proportion of	The socio-economic impact	Basic utilities coverage	Essential Utility			3.2. Analysis
376	302	Art. 018	Susceptibility	Adaptive	Population access	% Population access to	Basic utilities coverage	Essential Utility			Social (FVIS)
775	740	Art. 039	Level of Adaptation	Adaptive	A5: Sanitation and	A5: Sanitation and	Basic utilities coverage	Essential Utility			Level of
924	771	Art. 046	Sensitivity	Adaptive	No. of HHs having	Households with	Basic utilities coverage	Essential Utility			Social
941	771	Art. 046	Adaptive capacity	Adaptive	No. of HHs having	Households with improved	Basic utilities coverage	Essential Utility			Adaptive
967	774	Art. 048	Vulnerability	Adaptive	Access to	Percentage of households	Basic utilities coverage	Essential Utility			INFRASTRUCT
1019	793	Art. 053	Physical	Adaptive	BUNCSNT17	Buildings without	Basic utilities coverage	Essential Utility			Physical
1097	819	Art. 056	Physical	Adaptive	Connection to	Percentage of households	Basic utilities coverage	Essential Utility			Physical
1151	856	Art. 061	Physical Vulnerability	Adaptive	Number of utility	Utilities	Basic utilities coverage	Essential Utility			Physical
1586	1066	Art. 086	Environmental	Adaptive	Waste and	Level of Waste Management	Basic utilities coverage	Essential Utility			SOCIAL
1983	1356	Art. 110	Vulnerability	Adaptive	Sanitation facility	Availability of Sanitation	Basic utilities coverage	Essential Utility			ENVIRONME
2037	1394	Art. 113	Vulnerability	Adaptive	Access to	Household access to	Basic utilities coverage	Essential Utility			Physical/Infra
2087	1408	Art. 114	Sensitivity	Adaptive	Access to	Households not having	Basic utilities coverage	Essential Utility			Sensitivity
2177	1427	Art. 116	Vulnerability	Adaptive	Proportion of	Inadequate Sanitation (IS)	Basic utilities coverage	Essential Utility			Flood Risk
2262	1453	Art. 120	Infrastructure	Adaptive	Percentage of	Households with incidence	Basic utilities coverage	Essential Utility			Infrastructure
969	774	Art. 048	Vulnerability	Adaptive	Access to	Percentage of households	Clean Fuel coverage	Essential Utility			INFRASTRUCT
1020	793	Art. 053	Physical	Adaptive	BUNCNAT17	Buildings without natural	Clean Fuel coverage	Essential Utility			Physical
220	196	Art. 013	socio-economic impacts	Adaptive	Proportion of	Drinking water	Drinking water coverage	Essential Utility			Poverty
921	771	Art. 046	Sensitivity	Adaptive	No. of HHs not	Households without	Drinking water coverage	Essential Utility			Social
922	771	Art. 046	Sensitivity	Adaptive	No. of HHs having	Households accessing	Drinking water coverage	Essential Utility			Social
942	771	Art. 046	Adaptive capacity	Adaptive	No. of HHs having	Households with improved	Drinking water coverage	Essential Utility			Adaptive
968	774	Art. 048	Vulnerability	Adaptive	Access to	Percentage of households	Drinking water coverage	Essential Utility			INFRASTRUCT
2036	1394	Art. 113	Vulnerability	Adaptive	Access to safe	Household access to	Drinking water coverage	Essential Utility			Physical/Infra
2086	1408	Art. 114	Sensitivity	Adaptive	Access to safe	Households' access to	Drinking water coverage	Essential Utility			Sensitivity
526	604	Art. 027	Elements of city	Adaptive	City infrastructure	Area of electricity supply	Energy supply coverage	Essential Utility			Elements of
568	697	Art. 029	Adaptive capacity	Adaptive	Infrastructure	Electricity accessibility	Energy supply coverage	Essential Utility			Utilities
650	712	Art. 032	Adaptive capacity	Adaptive	Households with	Electricity	Energy supply coverage	Essential Utility			Infrastructure
825	761	Art. 041	Infrastructure,	Adaptive	Electricity	Electricity Reliability	Energy supply coverage	Essential Utility			Infrastructure
966	774	Art. 048	Vulnerability	Adaptive	Access to	Percentage of households	Energy supply coverage	Essential Utility			INFRASTRUCT
1021	793	Art. 053	Physical	Adaptive	BUNCELCT17	Buildings without	Energy supply coverage	Essential Utility			Physical
1026	793	Art. 053	Social	Adaptive	HHWOELECT17	Households without	Energy supply coverage	Essential Utility			Social
2038	1394	Art. 113	Vulnerability	Adaptive	Access to power	Household access to	Energy supply coverage	Essential Utility			Physical/Infra
2088	1408	Art. 114	Sensitivity	Adaptive	Access to	Households not getting	Energy supply coverage	Essential Utility			Sensitivity
466	534	Art. 024	Water & Sewer	Adaptive		On-site residential	Sewage network coverage	Essential Utility			Water &
530	604	Art. 027	Elements of city	Adaptive	City infrastructure	Area of sewage	Sewage network coverage	Essential Utility			Elements of
923	771	Art. 046	Sensitivity	Adaptive	No. of HHs not	Households without	Sewage network coverage	Essential Utility			Social
1082	816	Art. 055	Exposure	Adaptive	Sewer type	Type of sewerage systems	Sewage network coverage	Essential Utility			Exposure
1084	816	Art. 055	Exposure	Adaptive	Common toilet	Proportion of people	Sewage network coverage	Essential Utility			Exposure
1861	1267	Art. 103	Physical	Adaptive	Wastewater	Waste Water Annual	Sewage network coverage	Essential Utility			PHYSICAL
2259	1453	Art. 120	Infrastructure	Adaptive	Percentage of	Households with domestic	Sewage network coverage	Essential Utility			Infrastructure
1739	1118	Art. 094	Exposure	Adaptive	Waste	Accumulated waste	Waste collection coverage	Essential Utility			Exposure
2258	1453	Art. 120	Infrastructure	Adaptive	Percentage of	Households served by solid	Waste collection coverage	Essential Utility			Infrastructure
2261	1453	Art. 120	Infrastructure	Adaptive	Percentage of	Households with	Waste collection coverage	Essential Utility			Infrastructure
464	534	Art. 024	Water & Sewer	Adaptive		Water supply storage tanks	Water supply coverage	Essential Utility			Water &
465	534	Art. 024	Water & Sewer	Adaptive		Water treatment plants,	Water supply coverage	Essential Utility			Water &
525	604	Art. 027	Elements of city	Adaptive	City infrastructure	Area of water supply facility	Water supply coverage	Essential Utility			Elements of
569	697	Art. 029	Adaptive capacity	Adaptive	Infrastructure	Water infrastructure	Water supply coverage	Essential Utility			Utilities
648	712	Art. 032	Adaptive capacity	Adaptive	Households	Water	Water supply coverage	Essential Utility			Infrastructure
824	761	Art. 041	Infrastructure,	Adaptive	Water Access	Water Access	Water supply coverage	Essential Utility			Infrastructure
1083	816	Art. 055	Exposure	Adaptive	Common water	Proportion of people	Water supply coverage	Essential Utility			Exposure
1091	816	Art. 055	Vulnerability	Adaptive	Private water	Proportion of people with	Water supply coverage	Essential Utility			Vulnerability
1982	1356	Art. 110	Vulnerability	Adaptive	Drinking water	Availability of Water	Water supply coverage	Essential Utility			ENVIRONME
2257	1453	Art. 120	Infrastructure	Adaptive	Percentage of	Households with public	Water supply coverage	Essential Utility			Infrastructure
139	85	Art. 009	Flood Impact Assessment	Hazard	ESA WorldCover +	Flood-Affected Agricultural	Affected Agricultural Area	Flood Damage			Flood Impact
236	196	Art. 013	socio-economic impacts	Hazard	Agricultural area	The socio-economic impacts	Affected Agricultural Area	Flood Damage			3.2. Analysis
1178	862	Art. 062	Sensitivity	hazard	Livestock loss	Animal loss	Affected Agricultural Area	Flood Damage			Vulnerability -
1236	880	Art. 064	Risk	hazard	Crop loss	Agriculture flood risk	Affected Agricultural Area	Flood Damage			Risk
151	85	Art. 009	Flood Impact Assessment	Hazard	Buildings + Flood	Flood-Affected Buildings	Affected Buildings	Flood Damage			Flood Impact
230	196	Art. 013	Vulnerability and baseline	Hazard	Map of residences	Analysis of vulnerability of	Affected Buildings	Flood Damage			3.1.
234	196	Art. 013	socio-economic impacts	Hazard	loss of physical	Socio-economic impact of	Affected Buildings	Flood Damage			3.2. Analysis
246	200	Art. 014	Housing sector - Economic	Hazard	Structural	Structural Damages -	Affected Buildings	Flood Damage			Housing
520	604	Art. 027	Present city vulnerability	Hazard	Historical damage	Number of flooded buildings	Affected Buildings	Flood Damage			Present city
994	785	Art. 051	Exposure	Hazard	Flood risk - land	Flood risk - land cover class	Affected Buildings	Flood Damage			Exposure
1234	880	Art. 064	Risk	hazard	Inundation, Partial	Building flood risk classes	Affected Buildings	Flood Damage			Risk
1531	1058	Art. 084	Exposure	Hazard	Binary indicator (0	The existence of residential	Affected Buildings	Flood Damage			Exposure
1570	1062	Art. 085	Exposure	Hazard	Number of	Flood hazard - ASPFR	Affected Buildings	Flood Damage			Exposure
1575	1066	Art. 086	Elements at Risk	Hazard	% Houses, toilets,	Loss of Physical Assets (LPA) -	Affected Buildings	Flood Damage			PHYSICAL
1875	1271	Art. 104	Socioeconomic	Hazard	Household	Household contents	Affected Buildings	Flood Damage			Direct

2030	1394	Art. 113	Vulnerability	Hazard	Relative position	Location of the house	Affected Buildings	Flood Damage			Physical/Infra	Index-based	The geographical position
2244	1433	Art. 119	Susceptibility	Hazard	Number of	Degree of affectedness	Affected Buildings	Flood Damage			Susceptibility	Indicator-	The number of
2293	1460	Art. 123	Social Vulnerability	Hazard	Percentage of	Flood effect on property	Affected Buildings	Flood Damage			Social	Focus group	The extent to which
2405	1505	Art. 130	Economic Risk	Hazard	Residential	Housing affected by flood	Affected Buildings	Flood Damage			Economic	Multicriteria	Residential buildings
287	200	Art. 014	Commercial sector -	Hazard	Structural	Structural Damages -	Affected Community amenities and services	Flood Damage			Commercial	modified	The economic
474	542	Art. 025	Flood Event Classification	Hazard	Gas, electricity,	Services disruption	Affected Community amenities and services	Flood Damage			Flood Event		Disruption of urban
475	542	Art. 025	Flood Event Classification	Hazard	Industry,	Productive activities	Affected Community amenities and services	Flood Damage			Flood Event		Economic activity
513	604	Art. 027	Social sensing	Hazard	Text analysis	Disaster sign words	Affected Community amenities and services	Flood damage			Social		Presence of disaster-
1283	907	Art. 067	Risk Perception Indicator	Hazard	Interruption (1-5	RP6: Supplies interruption	Affected Community amenities and services	Flood Damage			Risk	In this study, a	Perceived likelihood of
2298	1460	Art. 123	Economic Vulnerability	Hazard	Number of	Duration of complete	Affected Community amenities and services	Flood Damage			Economic	Business	The duration (in months)
2299	1460	Art. 123	Economic Vulnerability	Hazard	Number of	Duration of reduced activity	Affected Community amenities and services	Flood Damage			Economic	Business	The duration (in months)
2406	1505	Art. 130	Economic Risk	Hazard	Industrial and	Commerce	Affected Community amenities and services	Flood Damage			Economic	Multicriteria	Industrial and
2407	1505	Art. 130	Economic Risk	Hazard	Administration	Administration	Affected Community amenities and services	Flood Damage			Economic	Multicriteria	Administrative and
260	200	Art. 014	Critical Facilities -	Hazard	cost of structural	Structural Damages - Critical	Affected Essential Utility Services	Flood Damage			Critical	modified	The economic
1087	816	Art. 055	Exposure	Hazard	High-risk power	Presence of high-risk power	Affected Essential Utility Services	Flood Damage			Exposure	GIS-based	Presence of high-tension
1088	816	Art. 055	Exposure	Hazard	Transformer/	Level of transformers and	Affected Essential Utility Services	Flood Damage			Exposure	GIS-based	Whether transformers
1576	1066	Art. 086	Elements at Risk	Hazard	% Houses, toilets,	Loss of Physical Assets (LPA) -	Affected Essential Utility Services	Flood Damage			PHYSICAL	Descriptive	Physical damage to
1885	1271	Art. 104	Socioeconomic	Hazard	Utility service	Disruption to utility services	Affected Essential Utility Services	Flood Damage			Indirect	Structural	Disruption to essential
2242	1433	Art. 119	Susceptibility	Hazard	Number of water	Interruption in water supply	Affected Essential Utility Services	Flood Damage			Susceptibility	Indicator-	The number of times
28	24	Art. 001	Vulnerability	hazard	Deterioration of	Deterioration of wetlands	Affected Green areas	Flood Damage		GBI	Environment	Fuzzy rating	Y/N. Localized Flood
1237	880	Art. 064	Risk	hazard	Susceptibility-	Natural systems flood risk	Affected Green areas	Flood Damage		GBI	Risk	Multi-Criteria	Risk for Natural
1238	880	Art. 064	Risk	hazard	Inundated	Cultural heritage flood risk	Affected Heritage	Flood Damage			Risk	Multi-Criteria	Number of
2301	1460	Art. 123	Cultural Vulnerability	Hazard	Level of cultural	Cultural significance	Affected Heritage	Flood Damage			Cultural	Multicriteria	The cultural, historical,
16	24	Art. 001	Vulnerability	Hazard	People on	People on floodplain	Affected Population	Flood Damage			Social	Fuzzy rating	Total population within
145	85	Art. 009	Flood Impact Assessment	Hazard	GHSL Population +	Population Exposure (un.)	Affected Population	Flood Damage			Flood Impact	Overall Kappa	Population exposure
197	164	Art. 012	Exposure	Hazard	Percentage of	% of population exposed to	Affected Population	Flood Damage			Population	GIS overlay	Proportion of total
224	196	Art. 013	socio-economic impacts	Hazard	Percentage of	Vulnerability to natural	Affected Population	Flood Damage			Natural	An Integrated	
512	604	Art. 027	Social sensing	Hazard	Text analysis	Level of flood keywords	Affected Population	Flood damage			Social		Classification of flood-
1177	862	Art. 062	Sensitivity	hazard	Flood fatalities	Human loss	Affected Population	Flood Damage			Vulnerability -	Subjective	Whether household
1463	978	Art. 078	Hazard	Hazard	Distance to	Distance to Settlement	Affected Population	Flood Damage			Hazard	XGBoost:	Euclidean distance from
1528	1058	Art. 084	Exposure	Hazard	Binary indicator (0	The existence of population	Affected Population	Flood Damage			Exposure	Geographic	Existence of population
1571	1062	Art. 085	Exposure	Hazard	Number of	Flood hazard - ASPFR	Affected Population	Flood Damage			Exposure	Dasymetric	Population living within
1813	1165	Art. 099	Exposure	Hazard	Exposed	Storm surge exposure	Affected Population	Flood Damage			HAZARD	Spatial	Population exposed to
1814	1165	Art. 099	Exposure	Hazard	Exposed	River flooding exposure	Affected Population	Flood Damage			HAZARD	Spatial	Population exposed to
1900	1276	Art. 105	Adaptive capacity	Hazard	registered	R5: People exposure	Affected Population	Flood Damage			Pre-flood	VIKOR-GRA	People exposure is
1941	1349	Art. 108	Exposure	Hazard	Percentage of	Injuries/deaths in previous	Affected Population	Flood Damage			EXPOSURE	MOVE	Indicator measuring
2001	1377	Art. 112	Exposure	Hazard	Number of people	Population close to coastline	Affected Population	Flood Damage			SOCIOECONO	CCFVI:	Number of people
2027	1394	Art. 113	Vulnerability	Hazard	Employment	Household with family	Affected Population	Flood Damage			Economic	Index-based	Whether a household has
2069	1408	Art. 114	Exposure	Hazard	Prior casualty	Households with	Affected Population	Flood Damage			Exposure	Index-based	Whether the household
2157	1425	Art. 115	Resilience	Hazard	People that work	WORK_M	Affected Population	Flood Damage			Not retained	HSA; PCA; ISVI	The number of residents
2251	1453	Art. 120	Exposure	Hazard	Number of people	Population under risk of	Affected Population	Flood Damage			Exposure	GIS analysis	The total population
2348	1467	Art. 126	Exposure	Hazard	Number of people	Exposed people	Affected Population	Flood Damage			Exposure	Integrated	The number of people
2349	1467	Art. 126	Exposure	Hazard	Number of people	Injured people	Affected Population	Flood Damage			Exposure	Integrated	The number of people
2411	1505	Art. 130	Social Risk	Hazard	Affected children	Affected children per	Affected Population	Flood Damage			Social Risk	Multicriteria	Children age 0-10
471	542	Art. 025	Flood Event Classification	Hazard	Bridges,	Bridges damage	Affected transportation and mobility	Flood Damage			Flood Event		Structural damage or
487	542	Art. 025	Flood Event Classification	Hazard	Vehicles damaged	Cars	Affected transportation and mobility	Flood Damage			Flood Event		Number of vehicles
1235	880	Art. 064	Risk	hazard	Inundated	Infrastructure flood risk	Affected transportation and mobility	Flood Damage			Risk	Multi-Criteria	Percentage
1529	1058	Art. 084	Exposure	Hazard	Binary indicator (0	The existence of	Affected transportation and mobility	Flood damage			Exposure	Geographic	Existence of
1577	1066	Art. 086	Elements at Risk	Hazard	% Houses, toilets,	Loss of Physical Assets (LPA) -	Affected transportation and mobility	Flood Damage			PHYSICAL	Descriptive	Physical damage to
20	24	Art. 001	Vulnerability	Hazard	Annual average	Annual average flood	Flood Economic Damage ($)	Flood Damage			Environment	Fuzzy rating	Average financial
183	117	Art. 011	Climatic impact (HIZ)	hazard		Flood damage	Flood Economic Damage ($)	Flood Damage			Climatic		Projected variations in
235	196	Art. 013	socio-economic impacts	Hazard	Income	The socio-economic impacts	Flood Economic Damage ($)	Flood Damage			3.2. Analysis	An Integrated	Income is a key factor of
266	200	Art. 014	Critical Facilities -	Hazard	Non-Structural	Non-Structural Damages in	Flood Economic Damage ($)	Flood Damage			Critical	modified	The economic
271	200	Art. 014	Housing sector - Economic	Hazard	Non-Structural	Non-Structural Damages in	Flood Economic Damage ($)	Flood Damage			Housing	modified	The economic
288	200	Art. 014	Commercial sector -	Hazard	Non-Structural	Non-Structural Damages in	Flood Economic Damage ($)	Flood Damage			Commercial	modified	The economic
290	200	Art. 014	Commercial sector -	Hazard	Hierarchy/ Assets	Hierarchy/ Assets Value	Flood Economic Damage ($)	Flood Damage			Commercial	modified	The economic
467	542	Art. 025	Economic Impact	Hazard	Flood economic	Flood economic damages	Flood Economic Damage ($)	Flood Damage			Economic		Municipal-level
881	766	Art. 044	Hazard	Hazard	Vector (Grid)	Expected damage severity	Flood Economic Damage ($)	Flood Damage			PHYSICAL	Stage-damage	Damage cost expected
1362	927	Art. 072	Flood risk analysis	Hazard	Damage ($)	Flood Damage ($)	Flood Economic Damage ($)	Flood Damage			Flood risk	EPA's Storm	Monetary flood damage
1363	927	Art. 072	Flood risk analysis	Hazard	Dtotal ($)	Total Damage ($)	Flood Economic Damage ($)	Flood Damage			Flood risk	EPA's Storm	Total damage calculated
2193	1428	Art. 117	Damage	Hazard	Flood damage	Total annual flood damage	Flood Economic Damage ($)	Flood Damage			Damage	Pearson	Direct economic damage
2195	1428	Art. 117	Damage	Hazard	Flood damage per	Damage per unit of wealth	Flood Economic Damage ($)	Flood Damage			Damage (Per	Pearson	Total annual flood
2194	1428	Art. 117	Damage	Hazard	Flood damage per	Damage per capita (DPC)	Flood Economic Damage ($)	Flood Damage			Damage (Per	Pearson	Total annual flood
2268	1455	Art. 121	Sensitivity	Hazard	Percentage of	Loss rate under flooding (α	Flood Economic Damage ($)	Flood Damage			Sensitivity	SPRC	The proportion of
2292	1460	Art. 123	Social Vulnerability	Hazard	Percentage of	Flood effect on	Flood Economic Damage ($)	Flood Damage			Social	Focus group	The extent to which
514	604	Art. 027	Social sensing	Hazard	Text analysis	Degree adverbs	Population routines disruption	Flood damage			Social		Adverbs intensifying
515	604	Art. 027	Risk indicator	Hazard	Text-based risk	Risk expression level of	Population routines disruption	Flood damage			Risk indicator		Five-level classification
1284	907	Art. 067	Risk Perception Indicator	Hazard	Lifestyle change (1-	RP7: Adapting lifestyles	Population routines disruption	Flood Damage			Risk	In this study, a	Perceived likelihood that
1285	907	Art. 067	Risk Perception Indicator	Hazard	Relationship	RP8: Altering relationships	Population routines disruption	Flood Damage			Risk	In this study, a	Perceived likelihood that
1878	1271	Art. 104	Socioeconomic	Hazard	Disruption of daily	Disruption to living	Population routines disruption	Flood Damage			Direct	Structural	Disruption to living
1881	1271	Art. 104	Socioeconomic	Hazard	Loss of	Loss of memorable items	Population routines disruption	Flood Damage			Direct	Structural	Loss of irreplaceable
71	46	Art. 004	Hazard	hazard	debris factor	Flood hazard	Presence of debris / floating material	Flood Damage			Hazard	Cellular	The flood hazard is
1219	880	Art. 064	Hazard	hazard	Debris factor (0-1)	Debris factor	Presence of debris / floating material	Flood Damage			Hazard	Multi-Criteria	Presence of debris
380	302	Art. 018	Resilience	Hazard	Recovery time to	Resilience Recovery Time to	Time needed by the city to recover (days)	Flood Damage					Time required for the city
61	46	Art. 004	Hazard	Hazard	Rainfall_2-year	Rainfall_2-year Return	002-year flood / 50% AEP flood	Flood Extreme Events			Hydrology	Cellular	Historical rainfall data are
2226	1433	Art. 119	Hazard	Hazard	Areas flooded at	Flood hazard zones	002-year flood / 50% AEP flood	Flood Extreme Events			Hazard	Spatial	Flood hazard zones
261	200	Art. 014	hazard	hazard	probability of the	Recurrence Interval / return	005-year flood / 20% AEP flood	Flood Extreme Events			Flood	modified	In the present study, the
272	200	Art. 014	hazard	hazard	intensity of one	intensity of one flood event	005-year flood / 20% AEP flood	Flood Extreme Events			Flood	modified	In the present study, the
276	200	Art. 014	hazard	hazard	duration of flood	duration of flood event	005-year flood / 20% AEP flood	Flood Extreme Events			Flood	modified	In the present study, the
2061	1408	Art. 114	Hazard	Hazard	Length of	duration of flood event	005-year flood / 20% AEP flood	Flood Extreme Events			Hazard	Index-based	The duration of flooding
262	200	Art. 014	hazard	hazard	probability of the	Recurrence Interval / return	010-year flood / 10% AEP flood	Flood Extreme Events			Flood	modified	In the present study, the
273	200	Art. 014	hazard	hazard	intensity of one	intensity of one flood event	010-year flood / 10% AEP flood	Flood Extreme Events			Flood	modified	In the present study, the
277	200	Art. 014	hazard	hazard	duration of flood	duration of flood event	010-year flood / 10% AEP flood	Flood Extreme Events			Flood	modified	In the present study, the
2062	1408	Art. 114	Hazard	Hazard	Length of	duration of flood event	010-year flood / 10% AEP flood	Flood Extreme Events			Hazard	Index-based	The duration of flooding
62	46	Art. 004	Hazard	Hazard	Rainfall_50-	Rainfall_50-yearReturn	050-year flood / 2% AEP flood	Flood Extreme Events			Hydrology	Cellular	Historical rainfall data are
194	164	Art. 012	Hazard (Flood)	Hazard	Rainfall for R50	Design rainfall for 50-yr	050-year flood / 2% AEP flood	Flood Extreme Events			Design hydro-	Extreme value	Design rainfall values for
263	200	Art. 014	hazard	hazard	probability of the	Recurrence Interval / return	050-year flood / 2% AEP flood	Flood Extreme Events			Flood	modified	In the present study, the
274	200	Art. 014	hazard	hazard	intensity of one	intensity of one flood event	050-year flood / 2% AEP flood	Flood Extreme Events			Flood	modified	In the present study, the
278	200	Art. 014	hazard	hazard	duration of flood	duration of flood event	050-year flood / 2% AEP flood	Flood Extreme Events			Flood	modified	In the present study, the
834	762	Art. 042	Hazard	Hazard	Annual highest	Annual highest high tide (m)	050-year flood / 2% AEP flood	Flood Extreme Events				Tidal	Statistical annual highest
835	762	Art. 042	Hazard	Hazard	50-year return	Coastal flooding extents (%)	050-year flood / 2% AEP flood	Flood Extreme Events				Hydrodynamic	Percentage of city area
2063	1408	Art. 114	Hazard	Hazard	Length of	duration of flood event	050-year flood / 2% AEP flood	Flood Extreme Events			Hazard	Index-based	The duration of flooding
2387	1492	Art. 129	Hazard	Hazard	Flood hazard level	Flood probability	050-year flood / 2% AEP flood	Flood Extreme Events			Hazard	GIS analysis:	The probability of flood
2400	1505	Art. 130	Hazard	Hazard	Flood extent and	50-year flood event	050-year flood / 2% AEP flood	Flood Extreme Events			Hazard	Multicriteria	Inundation depth and
63	46	Art. 004	Hazard	Hazard	Rainfall_100-year	Rainfall_100-year Return	100-year flood / 1% AEP flood	Flood Extreme Events			Hydrology	Cellular	Historical rainfall data are
195	164	Art. 012	Hazard (Flood)	Hazard	Rainfall for R100	Design rainfall for 100-yr	100-year flood / 1% AEP flood	Flood Extreme Events			Design hydro-	Extreme value	Design rainfall values for
264	200	Art. 014	hazard	hazard	probability of the	Recurrence Interval / return	100-year flood / 1% AEP flood	Flood Extreme Events			Flood	modified	In the present study, the
275	200	Art. 014	hazard	hazard	intensity of one	intensity of one flood event	100-year flood / 1% AEP flood	Flood Extreme Events			Flood	modified	In the present study, the
279	200	Art. 014	hazard	hazard	duration of flood	duration of flood event	100-year flood / 1% AEP flood	Flood Extreme Events			Flood	modified	In the present study, the
678	712	Art. 032	Exposure	Hazard	Exposure to a 100-	Exposure to a 100-year flood	100-year flood / 1% AEP flood	Flood Extreme Events			Flood		Exposure to a 100-year
837	762	Art. 042	Hazard	Hazard	100-year return	Land flooding area (%)	100-year flood / 1% AEP flood	Flood Extreme Events				USFLOOD	Percentage of city area
1566	1062	Art. 085	Hazard	Hazard	Peak flow (m³/s)	Flood hazard - 100-year	100-year flood / 1% AEP flood	Flood Extreme Events			Hazard	Statistical	Flood peak flows for 100-
1750	1118	Art. 094	Validation	Hazard	Flood extent	1:100 years flood line	100-year flood / 1% AEP flood	Flood Extreme Events			Validation	GIS overlay	Flood line for 100-year
2064	1408	Art. 114	Hazard	Hazard	Length of	duration of flood event	100-year flood / 1% AEP flood	Flood Extreme Events			Hazard	Index-based	The duration of flooding
2209	1432	Art. 118	Flood Scenario	Hazard	100-year rainfall	Scenario S2	100-year flood / 1% AEP flood	Flood Extreme Events			Flood	Frequency	Inland flooding only: 100-
2210	1432	Art. 118	Flood Scenario	Hazard	100-year water	100-year water level (coastal	100-year flood / 1% AEP flood	Flood Extreme Events			Flood	Frequency	Coastal flooding only:
2211	1432	Art. 118	Flood Scenario	Hazard	100-year	Scenario S4	100-year flood / 1% AEP flood	Flood Extreme Events			Flood	Frequency	Coupled inland and
2214	1432	Art. 118	Flood Scenario	Hazard	Sandy water level	Scenario S7	100-year flood / 1% AEP flood	Flood Extreme Events			Flood	Frequency	Coupled inland and
2401	1505	Art. 130	Hazard	Hazard	Flood extent and	100-year flood event	100-year flood / 1% AEP flood	Flood Extreme Events			Hazard	Multicriteria	Inundation depth and
196	164	Art. 012	Hazard (Flood)	Hazard	Rainfall for R200	Design rainfall for 200-yr	200-year flood / 0.5% AEP flood	Flood Extreme Events			Design hydro-	Extreme value	Design rainfall values for
2212	1432	Art. 118	Flood Scenario	Hazard	200-year water	Scenario S5	200-year flood / 0.5% AEP flood	Flood Extreme Events			Flood	Frequency	Coupled inland and
2402	1505	Art. 130	Hazard	Hazard	Flood extent and	200-year flood event	200-year flood / 0.5% AEP flood	Flood Extreme Events			Hazard	Multicriteria	Inundation depth and
1555	1058	Art. 084	Hazard	Hazard	Flood extent (km²)	Floodplain Map (500-year	500-year flood / 0.2% AEP flood	Flood Extreme Events			Hazard	HecGeoRas:	Flood risk estimation for
2171	1425	Art. 115	Hazard (Study Area	Hazard	Low probability	500-year flood zones	500-year flood / 0.2% AEP flood	Flood Extreme Events			Flash Flood	GIS overlay	Flood hazard zones with
2403	1505	Art. 130	Hazard	Hazard	Flood extent and	500-year flood event	500-year flood / 0.2% AEP flood	Flood Extreme Events			Hazard	Multicriteria	Extreme flood event with
794	744	Art. 040	Hazard	Hazard	Evolutionary trend	Coastline segments	Coastal erosion	Flood Extreme Events			Hazard	SCORE –	Qualitative classification
836	762	Art. 042	Hazard	Hazard	Coastline length	Coastline length undergoing	Coastal erosion	Flood Extreme Events				CORINE	Percentage of total
2304	1461	Art. 124	Hazard	Hazard	Land to water	Coastal erosion	Coastal erosion	Flood Extreme Events			Hazard	Multi-criteria	The rate of shoreline
2	24	Art. 001	Vulnerability	Hazard	Waterfront	Waterfront community	Distance to flood-prone areas (m)	Flood Extreme Events			Physical	Fuzzy rating	Y/N. Localized Flood
9	24	Art. 001	Vulnerability	Hazard	Proximity to flood	Proximity to flood area	Distance to flood-prone areas (m)	Flood Extreme Events			Physical	Fuzzy rating	Km. Localized Flood
1105	819	Art. 056	Natural	Hazard	Distance from	Distance to flood-prone	Distance to flood-prone areas (m)	Flood Extreme Events			Natural	GIS proximity	Distance from flood-
1228	1101	Art. 101	Hazard	Hazard	Distance to flood	Distance to flood source	Distance to flood-prone areas (m)	Flood Extreme Events			HYDROLOGIC	AHP; TF-AHP;	Euclidean distance from
2028	1394	Art. 113	Vulnerability	Hazard	Asset location	Household with land/house	Distance to flood-prone areas (m)	Flood Extreme Events			Economic	Index-based	Whether the household
44	35	Art. 003	flood hazard and	Hazard	Distance to river (DR)	Distance to river (DR)	Distance to Water Bodies	Flood Extreme Events		GBI	flood hazard	The study	
121	84	Art. 008	none	Hazard	(DEM)	Distance from the River	Distance to Water Bodies	Flood Extreme Events		GBI		Integrate	Indicates proximity to
157	104	Art. 010	Hazard	Hazard	Google Earth's	Distance to waterbody	Distance to Water Bodies	Flood Extreme Events		GBI	Waterlogging	Analytical	Indicates proximity to
305	215	Art. 015	Hazard	Hazard	Distance from	Distance from River	Distance to Water Bodies	Flood Extreme Events		GBI	Hydrologic	Comparative	
337	222	Art. 016	none	Hazard	distance to river	distance to river	Distance to Water Bodies	Flood Extreme Events		GBI		The analytical	Wherever there is
381	302	Art. 018	Exposure	Hazard	Proximity to	Proximity to stream (DS)	Distance to Water Bodies	Flood Extreme Events		GBI	Physical		Indicates proximity to
400	363	Art. 020	Hazard	Hazard	Distance to river	Distance to river	Distance to Water Bodies	Flood Extreme Events		GBI	Flood hazard	multi-criteria	Distance to the river is one of
419	483	Art. 022	Regional Vulnerability	Hazard	Stream Network	Distance from the stream	Distance to Water Bodies	Flood Extreme Events		GBI	Regional	Deterministic	The proximity to the river
686	722	Art. 033	Flood Inventory	Hazard	Shapefile	Distance to streams	Distance to Water Bodies	Flood Extreme Events		GBI	Flood		Proximity to river
712	726	Art. 035	Hazard	Hazard	Buffer analysis	Distance to rivers	Distance to Water Bodies	Flood Extreme Events		GBI	Hydrological	GIS-based	Proximity to water bodies
722	727	Art. 036	Flood hazard	Hazard	Distance from	Distance from River	Distance to Water Bodies	Flood Extreme Events		GBI	Flood hazard		Euclidean distance from
754	739	Art. 038	Proximity / Flood	Hazard	Euclidean distance	Distance from river (m)	Distance to Water Bodies	Flood Extreme Events		GBI	Proximity /	Euclidean	Euclidean distance from
845	765	Art. 043	Hazard	Hazard	Determines the	Distance to river	Distance to Water Bodies	Flood Extreme Events		GBI	FLOOD	Geographic	Determines the proximity
884	766	Art. 044	Hazard	Hazard	Vector (Grid)	Distance to nearest river	Distance to Water Bodies	Flood Extreme Events		GBI	PHYSICAL	Euclidean	Euclidean distance from
895	769	Art. 045	Hazard	Hazard	Raster	Distance to Stream	Distance to Water Bodies	Flood Extreme Events		GBI	Flood Hazard	Euclidean	Measures proximity of
949	772	Art. 047	Hazard	Hazard	ALOS PALSAR	Distance to Water Bodies	Distance to Water Bodies	Flood Extreme Events		GBI	GEOPHYSICA	Proximity	Euclidean distance from
975	777	Art. 049	Hazard	Hazard	Raster (derived)	Distance to river	Distance to Water Bodies	Flood Extreme Events		GBI	HAZARD	Euclidean	Euclidean distance from
985	780	Art. 050	Susceptibility	Hazard	DEM	Distance from Rivers	Distance to Water Bodies	Flood Extreme Events		GBI	FLOOD	Multi-criteria	Proximity to rivers
992	785	Art. 051	Exposure	Hazard	Flood risk -	Flood risk - vicinity to rivers	Distance to Water Bodies	Flood Extreme Events		GBI	Exposure	Buffer	Binary indicator of areas
1013	790	Art. 052	hazard	Hazard	Distance to rivers	Distance to rivers (m)	Distance to Water Bodies	Flood Extreme Events		GBI	HAZARD RISK	Pressure-state-	Distance to rivers
1062	805	Art. 054	Topographic	Hazard	Distance to river	Distance to river	Distance to Water Bodies	Flood Extreme Events		GBI	Topographic	Analytic	Euclidean distance from
1123	827	Art. 058	Exposure	Hazard	Distance to river	Distance to river	Distance to Water Bodies	Flood Extreme Events		GBI	Exposure	Weighted	Euclidean distance to
1173	862	Art. 062	Exposure	Hazard	Proximity to river	Houses constructed near	Distance to Water Bodies	Flood Extreme Events		GBI	Vulnerability -	Subjective	Whether house is located
1204	862	Art. 062	Physical	Hazard	Proximity to river	Location	Distance to Water Bodies	Flood Extreme Events		GBI	Resilience -	Subjective	Whether house is located
1251	886	Art. 065	Flood Conditioning Factor	Hazard	Distance to river	Distance to River (DTRiver)	Distance to Water Bodies	Flood Extreme Events		GBI	Flood	GIS proximity	Euclidean distance to the
1277	907	Art. 067	Flood Hazard Determinant	Hazard	Distance (m)	Distance from hazard source	Distance to Water Bodies	Flood Extreme Events		GBI	Flood Hazard	In this study, a	Proximity to flood hazard
1289	914	Art. 068	none	Hazard	Distance (m)	Distance from Main Channel	Distance to Water Bodies	Flood Extreme Events		GBI		Multi-Criteria	Euclidean distance from
1307	921	Art. 070	Current Flood Risk	Hazard	Distance to river	Distance from rivers	Distance to Water Bodies	Flood Extreme Events		GBI	Current Flood	GIS proximity	Euclidean distance from
1374	928	Art. 073	Hazard	Hazard	Distance (m)	Distance to River (DRI)	Distance to Water Bodies	Flood Extreme Events		GBI	Hazard	Analytical	Proximity to river
1400	944	Art. 075	Hazard	Hazard	Distance (m)	Distance to Residential	Distance to Water Bodies	Flood Extreme Events		GBI	Hazard	Radial Basis	Euclidean distance from
1398	944	Art. 075	Hazard	Hazard	Distance (m)	Distance to Stream	Distance to Water Bodies	Flood Extreme Events		GBI	Hazard	Radial Basis	Euclidean distance from
1418	957	Art. 076	Exposure	Hazard	Distance (m)	Distance to Water Body	Distance to Water Bodies	Flood Extreme Events		GBI	Exposure	UFResi-Mm	Proximity to water bodies
1464	978	Art. 078	Hazard	Hazard	Distance to	Distance to Stream	Distance to Water Bodies	Flood Extreme Events		GBI	Hazard	XGBoost:	Euclidean distance from
1526	1050	Art. 083	Hazard	Hazard	Distance from	Channel Distance	Distance to Water Bodies	Flood Extreme Events		GBI	Hazard	Analytical	Euclidean distance from
1578	1066	Art. 086	Exposure	Hazard	Distance to rivers	Location (LC)	Distance to Water Bodies	Flood Extreme Events		GBI	PHYSICAL	Geographic	Household distance to
1616	1066	Art. 086	Exposure	Hazard	Distance to rivers	Proximity to Rivers (PR)	Distance to Water Bodies	Flood Extreme Events		GBI	LAND	Geographic	Household distance to
1642	1073	Art. 088	Hazard	Hazard	Distance to	Distance to Drainage	Distance to Water Bodies	Flood Extreme Events		GBI	HYDROLOGIC	Euclidean	Proximity to drainage
1660	1076	Art. 089	Hazard	Hazard	Distance (m)	Distance from River	Distance to Water Bodies	Flood Extreme Events		GBI	Waterlogging	Analytical	Proximity to rivers, canals
1674	1090	Art. 090	Hazard / Vulnerability /	Hazard	Distance to river	Distance to River	Distance to Water Bodies	Flood Extreme Events		GBI	HYDROLOGIC	Analytical	Proximity to rivers and
1690	1097	Art. 091	Hazard	Hazard	Distance to river	Proximity to River (PRi)	Distance to Water Bodies	Flood Extreme Events		GBI	HYDROLOGIC	K-Nearest	Main paths for flood
1728	1116	Art. 093	Hazard	Hazard	Distance to	Vicinity to Sewers and Storm	Distance to Water Bodies	Flood Extreme Events		GBI	INFRASTRUCT	Euclidean	Proximity to artificial
1729	1116	Art. 093	Hazard	Hazard	Distance to	Vicinity to Natural Drainage	Distance to Water Bodies	Flood Extreme Events		GBI	HYDROLOGIC	Euclidean	Proximity to natural
1734	1118	Art. 094	Exposure	Hazard	Distance to river	Proximity to river	Distance to Water Bodies	Flood Extreme Events		GBI	Exposure	Analytic	Distance of households to
1768	1139	Art. 096	Vulnerability	Hazard	Distance to river	Distance from river	Distance to Water Bodies	Flood Extreme Events		GBI	Vulnerability	AHP-entropy	Euclidean distance from
1794	1149	Art. 098	Suitability	Hazard	Distance to river	Distance to River	Distance to Water Bodies	Flood Extreme Events		GBI	HYDROLOGIC	CRITIC	Euclidean distance from
1840	1256	Art. 102	Hazard	Hazard	Distance to river	Distance to River	Distance to Water Bodies	Flood Extreme Events		GBI	HYDROLOGIC	ANN-SGW; RF;	Euclidean distance to
1841	1256	Art. 102	Hazard	Hazard	Distance to	Distance to Channel	Distance to Water Bodies	Flood Extreme Events		GBI	HYDROLOGIC	ANN-SGW; RF;	Euclidean distance to
1940	1349	Art. 108	Exposure	Hazard	Percentage of	Location of residence	Distance to Water Bodies	Flood Extreme Events		GBI	EXPOSURE	MOVE	Indicator measuring
2070	1408	Art. 114	Exposure	Hazard	Relative position	Location of the house	Distance to Water Bodies	Flood Extreme Events		GBI	Exposure	Index-based	The geographical position
2273	1457	Art. 122	Pathway	Hazard	Euclidean distance	Distance from coastline	Distance to Water Bodies	Flood Extreme Events		GBI	Pathway	GIS analysis	The distance of each
2355	1478	Art. 127	Physical Vulnerability	Hazard	Euclidean distance	Distance from water bodies	Distance to Water Bodies	Flood Extreme Events		GBI	Physical	Multi-criteria	The distance from each
1832	1228	Art. 101	Hazard	Hazard	Distance to river	Distance from Rivers (C8)	Distance to Water Bodies	Flood Extreme Events		GBI	HYDROLOGIC	AHP; TF-AHP;	Euclidean distance from
1	24	Art. 001	Vulnerability	Hazard	Floodplain map	Floodplain map	Flood Extent area	Flood Extreme Events			Physical	Fuzzy rating	Localized Flood
32	25	Art. 002	Mapping Flood-	Hazard	HAND modelled	flood-susceptible areas	Flood Extent area	Flood Extreme Events			Mapping	Prediction of	"Prediction of Flood-
33	25	Art. 002	Spectral Sensitivity of	Hazard	pure water pixels	Non flooded Normalized	Flood Extent area	Flood Extreme Events			Spectral	Monitoring	Are spectral water
34	25	Art. 002	Spectral Sensitivity of	Hazard	pure water pixels	Non flooded Weighted	Flood Extent area	Flood Extreme Events			Spectral	Monitoring	Are spectral water
51	35	Art. 003	flood hazard and	Hazard	Flood inventory	Flood inventory	Flood Extent area	Flood Extreme Events			flood hazard	The study	Change detection
138	84	Art. 008	none	Hazard	Field observations	Field Survey	Flood Extent area	Flood Extreme Events				Integrate	Provides ground-truth
141	85	Art. 009	Flood Impact Assessment	Hazard	Flooded area	Flood Extent area (km2)	Flood Extent area	Flood Extreme Events			Flood Impact	Overall Kappa	The Sentinel-1 SAR
144	85	Art. 009	Analyze Flood Impact	Hazard	Sentinel 1- SAR	Pre-flood Imagery	Flood Extent area	Flood Extreme Events			Analyze	Overall Kappa	The Sentinel-1 SAR
147	85	Art. 009	Flood Impact Assessment	Hazard	ESA WorldCover +	Flood Affected Urban area	Flood Extent area	Flood Extreme Events			Flood Impact	Overall Kappa	Urban impact assessment
148	85	Art. 009	Flood Inundation Extent	Hazard	Predefined	floodwaters (Flood	Flood Extent area	Flood Extreme Events			Flood	Overall Kappa	This step involves
150	85	Art. 009	Analyze Flood Impact	Hazard	Sentinel 1- SAR	Post-flood Imagery	Flood Extent area	Flood Extreme Events			Analyze	Overall Kappa	The Sentinel-1 SAR
229	196	Art. 013	Vulnerability and baseline	Hazard	Map of area at	Analysis of flood hazard	Flood Extent area	Flood Extreme Events			3.1.	An Integrated	The flooded area from
249	200	Art. 014	hazard	hazard	Urban flooding	Urban flooding areas	Flood Extent area	Flood Extreme Events			Urban floods	modified	Based on the literature
254	200	Art. 014	Physical Vulnerability	Hazard	Flood Proofing	Flood Proofing	Flood Extent area	Flood Extreme Events			Physical	modified	The physical vulnerability
344	222	Art. 016	Flood susceptibility map	Hazard	Flood	Susceptibility to flood	Flood Extent area	Flood Extreme Events			Flood	The analytical	The flood factors maps
385	327	Art. 019	Vulnerability	Hazard		Flood maps	Flood Extent area	Flood Extreme Events			Flood	Geographical	Many flood maps
485	542	Art. 025	Hydrology	Hazard		River network and flood	Flood Extent area	Flood Extreme Events			Hydrology		Spatial cartography
503	559	Art. 026	Exposure	Hazard		Urban floods (SLR) registered	Flood Extent area	Flood Extreme Events			Exposure		Number of flood
504	559	Art. 026	Exposure	Hazard		Area exposed to coastal	Flood Extent area	Flood Extreme Events			Exposure		Classification of
509	604	Art. 027	Social sensing	Hazard	Tweet extraction	Flood-related keywords	Flood Extent area	Flood Extreme Events			Social		Keywords related to
510	604	Art. 027	Social sensing	Hazard	Tweet extraction	Flooding sign tweets	Flood Extent area	Flood Extreme Events			Social		Tweets containing flood-
511	604	Art. 027	Social sensing	Hazard	Location	Tweet location from text	Flood Extent area	Flood Extreme Events			Social		Geographic locations
516	604	Art. 027	Risk indicator	Hazard	Spatial risk	Flood vulnerability of tweet	Flood Extent area	Flood Extreme Events			Risk indicator		Vulnerability level
517	604	Art. 027	Risk indicator	Hazard	Risk matrix	Final risk level of tweet	Flood Extent area	Flood Extreme Events			Risk indicator		Final disaster risk level
696	722	Art. 033	Flood hazard	Hazard	Raster	Baseline Flood Susceptibility	Flood Extent area	Flood Extreme Events			Flood hazard		A map indicating areas
716	726	Art. 035	Hazard	Hazard	Weighted overlay	Flood Susceptibility Index	Flood Extent area	Flood Extreme Events			Flood risk	GIS-based	Composite index
719	727	Art. 036	Flood inundation	Hazard	Flood inundation	Flood frequency map	Flood Extent area	Flood Extreme Events			Flood		Threshold-based flood
741	728	Art. 037	Flood Hazard	Hazard	Flood Extent Map	Flood Extent Map	Flood Extent area	Flood Extreme Events			Flood Hazard	Raster to	Polygon layer of the
745	728	Art. 037	Flood Risk	Hazard	Composite Risk	Composite Risk Map	Flood Extent area	Flood Extreme Events			Flood Risk	Multi-criteria	Integrated map reflecting
790	744	Art. 040	Hazard	Hazard	Water depth (m)	Fluvial flooding	Flood Extent area	Flood Extreme Events			Hazard	SCORE –	Flood extent and water
904	769	Art. 045	Hazard	Hazard	Raster	Flood Hazard Map	Flood Extent area	Flood Extreme Events			Flood Hazard	Multi-criteria	Final synthesized layer
957	772	Art. 047	Hazard	Hazard	Composite Raster:	Flood Hazard Zones - 2012	Flood Extent area	Flood Extreme Events			FLOOD	Analytical	Flood susceptibility map
993	785	Art. 051	Exposure	Hazard	Flood risk - coastal	Flood risk - coastal flooding	Flood Extent area	Flood Extreme Events			Exposure	Coastal	Binary indicator of pixels
1074	805	Art. 054	Flood Vulnerability	hazard	Flood/non-flood	Flood inventory	Flood Extent area	Flood Extreme Events			Flood	Analytic	360 randomly distributed
1218	880	Art. 064	Hazard	hazard	Inundated area	Flood extension	Flood Extent area	Flood Extreme Events			Hazard	Multi-Criteria	Spatial extent of flooding
1229	880	Art. 064	Susceptibility	Hazard	Area vulnerability	Area vulnerability	Flood Extent area	Flood Extreme Events			Susceptibility	Multi-Criteria	Combined factor of flood
1239	880	Art. 064	Risk	hazard	Integrated risk	Total Risk Index	Flood Extent area	Flood Extreme Events			Total Risk	Multi-Criteria	Integrated risk score (0-1)
1264	904	Art. 066	none	hazard	Risk score (1-5)	Flood Risk Map	Flood Extent area	Flood Extreme Events				Weighted Sum	Integrated flood risk map
1276	907	Art. 067	Flood Hazard Determinant	hazard	Damage extent (1-	Flood damage extent	Flood Extent area	Flood Extreme Events			Flood Hazard	In this study, a	Perceived extent of
1294	914	Art. 068	none	hazard	Historical flood	Flood History	Flood Extent area	Flood Extreme Events				Multi-Criteria	Historical flood events in
1298	918	Art. 069	none	Hazard	Flood events per	Flood incidence records	Flood Extent area	Flood Extreme Events				Multi-Criteria	Historical flood disaster
1312	921	Art. 070	Current Flood Risk	Hazard	Flood risk	Current Flood Risk Map	Flood Extent area	Flood Extreme Events			Current Flood	Multi-Criteria	Current flood risk map
1317	921	Art. 070	Future Flood Risk	Hazard	Risk certainty (1-	Cross-Scenario Flood Risk	Flood Extent area	Flood Extreme Events			Future Flood	GIS overlay	Integrated map showing
1339	924	Art. 071	Exposure	Hazard	Exposure	Flood exposure map	Flood Extent area	Flood Extreme Events				AHP: weighted	Spatial distribution of
1340	924	Art. 071	Vulnerability	Hazard	Vulnerability	Flood vulnerability map	Flood Extent area	Flood Extreme Events				AHP: weighted	Spatial distribution of
1341	924	Art. 071	Resilience	Hazard	Resilience	Flood resilience map	Flood Extent area	Flood Extreme Events				AHP: weighted	Spatial distribution of
1342	924	Art. 071	Risk	Hazard	Risk classification	Flood Risk Map	Flood Extent area	Flood Extreme Events				AHP: weighted	Comprehensive flood risk
1355	927	Art. 072	Floodplain determination	Hazard	Flood area (km²)	Flood inundation extent	Flood Extent area	Flood Extreme Events			Floodplain	EPA's Storm	Area inundated by
1385	928	Art. 073	Hazard	Hazard	Hazard	Flood Hazard Zone (FHZ)	Flood Extent area	Flood Extreme Events			Hazard	Analytical	Spatial distribution of
1386	928	Art. 073	Risk	Hazard	Risk classification	Flood Risk Zone (FRZ) Map	Flood Extent area	Flood Extreme Events			Risk	Receiver	Comprehensive flood risk
1393	938	Art. 074	Risk	Hazard	Vulnerability	Flood Vulnerability Map	Flood Extent area	Flood Extreme Events			Risk	Analytical	Integrated flood
1411	944	Art. 075	Risk	Hazard	Susceptibility	Flood Susceptibility Map	Flood Extent area	Flood Extreme Events			Risk	Radial Basis	Flood susceptibility map
1412	944	Art. 075	Risk	Hazard	Susceptibility	Flood Susceptibility Map	Flood Extent area	Flood Extreme Events			Risk	Radial Basis	Flood susceptibility map
1413	944	Art. 075	Risk	Hazard	Susceptibility	Flood Susceptibility Map	Flood Extent area	Flood Extreme Events			Risk	Radial Basis	Flood susceptibility map
1451	977	Art. 077	Hazard	Hazard	Hazard	Flood Hazard Map	Flood Extent area	Flood Extreme Events				Analytic	Composite hazard
1452	977	Art. 077	Vulnerability	Hazard	Vulnerability	Flood Vulnerability Map	Flood Extent area	Flood Extreme Events				Analytic	Composite vulnerability
1453	977	Art. 077	Risk	Hazard	Risk classification	Flood Risk Map	Flood Extent area	Flood Extreme Events				Disaster Risk	Comprehensive flood risk
1465	978	Art. 078	Model Training / Model	Hazard	Flood event	Flood Inventory	Flood Extent area	Flood Extreme Events			Model	XGBoost:	Historical flood events
1476	987	Art. 079	Hazard	Hazard	Flood hazard	Flood Hazard Zones	Flood Extent area	Flood Extreme Events			Hazard	Territorial	Spatial extent of flood
1487	988	Art. 080	Hazard	Hazard	Inundation depth	Flood Hazard Map	Flood Extent area	Flood Extreme Events			Hazard	MIKE FLOOD:	Flood inundation maps
1488	988	Art. 080	Risk	Hazard	Risk classification	Flood Risk Map -	Flood Extent area	Flood Extreme Events			Risk	Bivariate risk	Bivariate flood risk maps
1530	1058	Art. 084	Exposure	Hazard	Binary indicator (0	The existence of coastal	Flood Extent area	Flood Extreme Events			Exposure	Geographic	Existence of coastal areas
1535	1058	Art. 084	Sensitivity	Hazard	Percentage (%)	The percentage of areas	Flood Extent area	Flood Extreme Events			Sensitivity -	Geographic	Percentage of built-up
1536	1058	Art. 084	Sensitivity	Hazard	Percentage (%)	The percentage of areas	Flood Extent area	Flood Extreme Events			Sensitivity -	Geographic	Percentage of built-up
1564	1062	Art. 085	Hazard	Hazard	Susceptibility	Flood susceptibility -	Flood Extent area	Flood Extreme Events			Hazard	Reis (2011)	Identification of river
1565	1062	Art. 085	Hazard	Hazard	Flood susceptible	Flood susceptibility -	Flood Extent area	Flood Extreme Events			Hazard	Díez-Herrero	Delimitation of flood
1567	1062	Art. 085	Hazard	Hazard	Floodplain area	Flood hazard - flood extent	Flood Extent area	Flood Extreme Events			Hazard	MOHID Land	Flood extent mapping
1633	1071	Art. 087	Hazard	Hazard	Flooded area	Flood Inundation Extent	Flood Extent area	Flood Extreme Events			FLOOD	Rainfall-Runoff-	Spatial extent of flooding
1648	1073	Art. 088	Validation	Hazard	Historical flood	Flood Extent area	Flood Extent area	Flood Extreme Events			VALIDATION	Field	Validation : 127 frequent

1697	1097	Art. 091	Validation	Hazard	Flood occurrence	Flood Inventory Map (FIM)	Flood Extent area	Flood Extreme Events	
1698	1097	Art. 091	Risk	Hazard	Susceptibility	Flood Susceptibility Index	Flood Extent area	Flood Extreme Events	
1699	1097	Art. 091	Risk	Hazard	Susceptibility	Flood Susceptibility Index	Flood Extent area	Flood Extreme Events	
1700	1097	Art. 091	Risk	Hazard	Susceptibility	Flood Susceptibility Index	Flood Extent area	Flood Extreme Events	
1701	1097	Art. 091	Risk	Hazard	Susceptibility	Flood Susceptibility Index	Flood Extent area	Flood Extreme Events	
1733	1116	Art. 093	Risk	Hazard	Vulnerability	flood-vulnerable zones	Flood Extent area	Flood Extreme Events	
1751	1118	Art. 094	Risk	Hazard	Vulnerability	Flood Vulnerability Map	Flood Extent area	Flood Extreme Events	
1758	1128	Art. 095	Validation	Hazard	Qualitative	Flood Risk Map Validation	Flood Extent area	Flood Extreme Events	
1759	1128	Art. 095	Risk	Hazard	Risk classification	Flood Risk Zones Map	Flood Extent area	Flood Extreme Events	
1770	1139	Art. 096	Risk	Hazard	Risk classification	Comprehensive Flood Risk	Flood Extent area	Flood Extreme Events	
1797	1149	Art. 098	Suitability	Hazard	Flood vulnerability	Flood Vulnerability Index	Flood Extent area	Flood Extreme Events	
1815	1165	Art. 099	Risk	Hazard	Risk classification	Risk Map (Hazard-Specific)	Flood Extent area	Flood Extreme Events	
1817	1222	Art. 100	Hazard	Hazard	Flooded areas	Cloudburst Event Areas	Flood Extent area	Flood Extreme Events	
1820	1222	Art. 100	Hazard	Hazard	Distance between	Flood-Prone Areas	Flood Extent area	Flood Extreme Events	
1824	1222	Art. 100	Risk	Hazard	Vulnerability	Cloudburst Vulnerability	Flood Extent area	Flood Extreme Events	
1834	1228	Art. 101	Risk	Hazard	Hazard	Flood Hazard Map (AHP)	Flood Extent area	Flood Extreme Events	
1845	1256	Art. 102	Risk	Hazard	Susceptibility	Flood Susceptibility Map	Flood Extent area	Flood Extreme Events	
1846	1256	Art. 102	Risk	Hazard	Susceptibility	Flood Susceptibility Map	Flood Extent area	Flood Extreme Events	
1847	1256	Art. 102	Risk	Hazard	Susceptibility	Flood Susceptibility Map	Flood Extent area	Flood Extreme Events	
1848	1256	Art. 102	Risk	Hazard	Susceptibility	Flood Susceptibility Map	Flood Extent area	Flood Extreme Events	
1849	1256	Art. 102	Risk	Hazard	Susceptibility	Flood Susceptibility Map	Flood Extent area	Flood Extreme Events	
1899	1276	Art. 105	Adaptive capacity	Hazard	area with	R4: Flood exposure	Flood Extent area	Flood Extreme Events	
1916	1317	Art. 106	Hazard	Hazard	Water depth (m)	FloodMap-	Flood Extent area	Flood Extreme Events	
1926	1317	Art. 106	Hazard	Hazard	Maximum	Pluvial Flood Inundation	Flood Extent area	Flood Extreme Events	
1938	1318	Art. 107	Risk	Hazard	Vulnerability	Flash Floods Composite	Flood Extent area	Flood Extreme Events	
1961	1353	Art. 109	Risk	Hazard	Vulnerability	Flood-Prone Areas Map	Flood Extent area	Flood Extreme Events	
2007	1377	Art. 112	Susceptibility	Hazard	Existence of flood	Flood hazard maps (FHM)	Flood Extent area	Flood Extreme Events	
2013	1377	Art. 112	Risk	Hazard	Vulnerability	Total Coastal City Flood	Flood Extent area	Flood Extreme Events	
2066	1408	Art. 114	Hazard	Hazard	Severity of past	Damages of previous flood	Flood Extent area	Flood Extreme Events	
2170	1425	Art. 115	Hazard (Study Area	Hazard	APSFR boundaries	Areas with Potential	Flood Extent area	Flood Extreme Events	
2172	1425	Art. 115	Study Area Delineation	Hazard	Urban areas prone	Urban areas prone to flash	Flood Extent area	Flood Extreme Events	
2178	1427	Art. 116	Risk	Hazard	Composite flood	Flood Risk Index (FRI)	Flood Extent area	Flood Extreme Events	
2202	1432	Art. 118	Hazard	Hazard	Baseline storm for	Referenced storm (Irene)	Flood Extent area	Flood Extreme Events	
2252	1453	Art. 120	Exposure	Hazard	Surface area	Area under risk of flooding	Flood Extent area	Flood Extreme Events	
2308	1461	Art. 124	Hazard	Hazard	Tsunami surge	Tsunami inundation	Flood Extent area	Flood Extreme Events	
2383	1480	Art. 128	Vulnerability (Historical)	Hazard	Disaster risk	Disaster risk district area	Flood Extent area	Flood Extreme Events	
2427	1508	Art. 131	Hazard	Hazard	Scenario-based	Flood prone areas	Flood Extent area	Flood Extreme Events	
2430	1508	Art. 131	Hazard	Hazard	Spatial extent of	Flood-affected areas	Flood Extent area	Flood Extreme Events	
2437	1508	Art. 131	Hazard	Hazard	Maximum spatial	Current flood extent	Flood Extent area	Flood Extreme Events	
255	200	Art. 014	Hazard	hazard		Historical flood frequency analysis	Flood frequency (Return period)	Flood Extreme Events	
352	278	Art. 017	hazard	hazard		Historical Flood Intensity	Flood frequency (Return period)	Flood Extreme Events	
364	278	Art. 017	hazard	hazard		Historical Flood Intensity	Flood frequency (Return period)	Flood Extreme Events	
875	766	Art. 044	Hazard	Hazard	Frequency of daily	Hazard probability	Flood frequency (Return period)	Flood Extreme Events	
1274	907	Art. 067	Flood Hazard Determinant	hazard	Frequency (1-5	Flood frequency	Flood frequency (Return period)	Flood Extreme Events	
1431	957	Art. 076	Risk	Hazard	Flood risk value (0-	Fuzzy Logic Risk Output	Flood frequency (Return period)	Flood Extreme Events	
2057	1408	Art. 114	Hazard	Hazard	Number of times	Frequency of flood inside	Flood frequency (Return period)	Flood Extreme Events	
2058	1408	Art. 114	Hazard	Hazard	Number of times	Frequency of floods	Flood frequency (Return period)	Flood Extreme Events	
2243	1433	Art. 119	Susceptibility	Hazard	Likelihood to be	Occurrence of hazardous	Flood frequency (Return period)	Flood Extreme Events	
36	25	Art. 002	Thematic mapping	Hazard	HEC-RAS	HEC-RAS simulation model -	Flood susceptibility - Future scenario	Flood Extreme Events	
37	25	Art. 002	Thematic mapping	Hazard	HEC-RAS	HEC-RAS simulation model -	Flood susceptibility - Future scenario	Flood Extreme Events	
355	278	Art. 017	hazard	hazard	Future Flood	Future Flood Intensity (FFI)	Flood susceptibility - Future scenario	Flood Extreme Events	
372	278	Art. 017	hazard	hazard	Future Flood	Future Flood Intensity (FFI)	Flood susceptibility - Future scenario	Flood Extreme Events	
424	483	Art. 022	Prediction of Future Risk	Hazard	Total risk map	Total risk map 2050	Flood susceptibility - Future scenario	Flood Extreme Events	
697	722	Art. 033	Flood hazard	Hazard	Future flood	Future flood susceptibility	Flood susceptibility - Future scenario	Flood Extreme Events	
1314	921	Art. 070	Future Flood Risk	Hazard	Flood risk	SSP1 Flood Risk Map (2050)	Flood susceptibility - Future scenario	Flood Extreme Events	
1315	921	Art. 070	Future Flood Risk	Hazard	Flood risk	SSP2 Flood Risk Map (2050)	Flood susceptibility - Future scenario	Flood Extreme Events	
1316	921	Art. 070	Future Flood Risk	Hazard	Flood risk	SSP5 Flood Risk Map (2050)	Flood susceptibility - Future scenario	Flood Extreme Events	
4	24	Art. 001	Vulnerability	Hazard	Flood events faced	Flood events faced over the	Historical flood areas	Flood Extreme Events	
35	25	Art. 002	Spectral Sensitivity of	Hazard	pure water pixels	Post-Flooded Weighted	Historical flood areas	Flood Extreme Events	
132	84	Art. 008	none	Hazard	Flooded locations	Flood Points	Historical flood areas	Flood Extreme Events	
133	84	Art. 008	none	Hazard	Non-flooded	Non-Flood Points	Historical flood areas	Flood Extreme Events	
134	84	Art. 008	none	Hazard	Historical flood	Historical Flood Archives	Historical flood areas	Flood Extreme Events	
135	84	Art. 008	none	Hazard	Published	Published literature of	Historical flood areas	Flood Extreme Events	
136	84	Art. 008	none	Hazard	Satellite-based	Satellite Imagery	Historical flood areas	Flood Extreme Events	
137	84	Art. 008	none	Hazard	Past flood	Past Flood Pictures	Historical flood areas	Flood Extreme Events	
239	196	Art. 013	causes and coping	Hazard	Historical Causes	Causes of flood in the area	Historical flood areas	Flood Extreme Events	
453	534	Art. 024	hazard	hazard		Historic flooded roads and	Historical flood areas	Flood Extreme Events	
480	542	Art. 025	Hazard Events	Hazard		Historical flood events	Historical flood areas	Flood Extreme Events	
481	542	Art. 025	Hazard Events	Hazard		Media reports of natural	Historical flood areas	Flood Extreme Events	
679	722	Art. 033	Flood inventory	Hazard	Point data	Historical flood point data	Historical flood areas	Flood Extreme Events	
704	725	Art. 034	Validation	Hazard	Historical Flood	Historical Flood Data	Historical flood areas	Flood Extreme Events	
740	728	Art. 037	Historical Records	Hazard	Historical Flood	Historical Flood Data	Historical flood areas	Flood Extreme Events	
744	728	Art. 037	Media and News	Hazard	Validation Points	Damages, flood points	Historical flood areas	Flood Extreme Events	
956	777	Art. 047	Hazard	Hazard	Composite Raster	Flood Hazard Zones - 2002	Historical flood areas	Flood Extreme Events	
1254	886	Art. 065	Flood Inventory Map	Hazard	Flood/non-flood	Flood inventory points	Historical flood areas	Flood Extreme Events	
1338	924	Art. 071	Model Training	Hazard	Flooded/non-	Flood inundation points	Historical flood areas	Flood Extreme Events	
1384	928	Art. 073	Model Validation	Hazard	Flooded/non-	Historical flood points	Historical flood areas	Flood Extreme Events	
1394	938	Art. 074	Model Validation	Hazard	Flooded locations	Historical flood points	Historical flood areas	Flood Extreme Events	
1409	944	Art. 075	Model Training / Model	Hazard	Flood locations	Flood Inventory Points	Historical flood areas	Flood Extreme Events	
1410	944	Art. 075	Model Training	Hazard	Non-flood	Non-Flood Points	Historical flood areas	Flood Extreme Events	
1466	978	Art. 079	Model Training / Model	Hazard	Flood occurrence	Historical Flood Events	Historical flood areas	Flood Extreme Events	
1634	1071	Art. 087	Risk	Hazard	Inundated built-up	Flood Exposure - Total	Historical flood areas	Flood Extreme Events	
1668	1076	Art. 089	Validation	Hazard	Waterlogging	Waterlogging Inventory	Historical flood areas	Flood Extreme Events	
1680	1090	Art. 090	Validation	Hazard	Flood occurrence	Historical Flood Events	Historical flood areas	Flood Extreme Events	
1732	1116	Art. 093	Validation	Hazard	Flood occurrence	Waterlogged Locations	Historical Flood areas	Flood Extreme Events	
1771	1139	Art. 096	Validation	Hazard	Model	Model Validation	Historical Flood areas	Flood Extreme Events	
1816	1222	Art. 100	Hazard	Hazard	Flood vulnerability	Hydraulic Vulnerability Map	Historical Flood areas	Flood Extreme Events	
1835	1228	Art. 101	Validation	Hazard	Flood occurrence	Historical Flood Events	Historical Flood areas	Flood Extreme Events	
1844	1256	Art. 102	Validation	Hazard	Flood and non-	Flood Inventory Points	Historical Flood areas	Flood Extreme Events	
1939	1349	Art. 108	Exposure	Hazard	Percentage of	Past experience	Historical Flood areas	Flood Extreme Events	
1962	1353	Art. 109	Validation	Hazard	Historical Flood	Historical Flood Events	Historical Flood areas	Flood Extreme Events	
1984	1375	Art. 111	Exposure	Hazard	Urban drainage	Drainage floods	Historical Flood areas	Flood Extreme Events	
2065	1408	Art. 114	Hazard	Hazard	Probability of	Likelihood of inundation	Historical Flood areas	Flood Extreme Events	
746	728	Art. 037	Infrastructure and Urban	Hazard	Spatial	Infrastructure Data (Roads,	Intersection: Road X River	Flood Extreme Events	GBI
861	765	Art. 043	Vulnerability	Hazard	Infrastructure	Road river intersection	Intersection: Road X River	Flood Extreme Events	GBI
2167	1425	Art. 115	Sensitivity	Hazard	Potential	INTERS	Intersection: Road X River	Flood Extreme Events	GBI
624	710	Art. 031	Exposure	Hazard	LSOA centroid	Lower Layer Super Output	Lower Layer Super Output Area (LSOA)	Flood Extreme Events	
625	710	Art. 031	Exposure	Hazard	LSOA >50% area	Lower Layer Super Output	Lower Layer Super Output Area (LSOA)	Flood Extreme Events	
187	117	Art. 011	Climatic impact (HIZ)	hazard		Landslide	Multi-risk-prone area	Flood Extreme Events	
204	164	Art. 012	Compound Risk	Hazard	Compound flood-	Bivariate Risk Classifier (BRC)	Multi-risk-prone area	Flood Extreme Events	
521	604	Art. 027	Potential vulnerable area	Hazard	Hazard zone	Area of landslide danger	Multi-risk-prone area	Flood Extreme Events	
793	744	Art. 040	Hazard	Hazard	Susceptibility	Landslide	Multi-risk-prone area	Flood Extreme Events	
843	762	Art. 042	Hazard	Hazard	Number of winter	Strong winds frequency	Multi-risk-prone area	Flood Extreme Events	
844	762	Art. 042	Hazard	Hazard	Landslide-prone	Landslide-prone area (%)	Multi-risk-prone area	Flood Extreme Events	
1812	1165	Art. 099	Exposure	Hazard	Exposed	Tsunami exposure	Multi-risk-prone area	Flood Extreme Events	
1987	1375	Art. 111	Sensibility	Hazard	Secondary	Risk of secondary disasters	Multi-risk-prone area	Flood Extreme Events	
2311	1461	Art. 124	Risk	Hazard	Combined hazard	Multi-risk	Multi-risk-prone area	Flood Extreme Events	
791	744	Art. 040	Hazard	Hazard	Water depth (m)	Coastal flooding	Sea level rise (SLR)	Flood Extreme Events	
831	762	Art. 042	Hazard	Hazard	MSL rate	Mean Sea Level rise (MSL)	Sea level rise (SLR)	Flood Extreme Events	
1147	856	Art. 061	Hazard	hazard	Flood Zone extent	Coastal Flood Hazard	Sea level rise (SLR)	Flood Extreme Events	
1261	904	Art. 066	none	hazard	Inundation status	Sea Level Rise Inundation -	Sea level rise (SLR)	Flood Extreme Events	
1262	904	Art. 066	none	hazard	Inundation status	Sea Level Rise Inundation -	Sea level rise (SLR)	Flood Extreme Events	
1263	904	Art. 066	none	hazard	Inundation status	Sea Level Rise Inundation -	Sea level rise (SLR)	Flood Extreme Events	
1556	1058	Art. 084	Hazard	Hazard	Sea level rise	Sea Level Rise Inundation	Sea level rise (SLR)	Flood Extreme Events	
1993	1377	Art. 112	Exposure	Hazard	Sea-level rise	Sea-level rise (SLR)	Sea level rise (SLR)	Flood Extreme Events	
2270	1457	Art. 122	Hazard	Hazard	Projected mean	Sea-level rise water level	Sea level rise (SLR)	Flood Extreme Events	
2307	1461	Art. 124	Hazard	Hazard	Permanent	Coastal flooding	Sea level rise (SLR)	Flood Extreme Events	
2306	1461	Art. 124	Hazard	Hazard	Rate of sea level	Sea level rise (SLR)	Sea level rise (SLR)	Flood Extreme Events	
242	196	Art. 013	causes and coping	Adaptive	Relief Assistance	Relief Assistance	Access to credit facilities	Governance and	
1180	862	Art. 062	Adaptive capacity	Adaptive	Credit access	Access to credit facilities	Access to credit facilities	Governance and	
1600	1066	Art. 086	Adaptive capacity	Adaptive	Adaptive capacity	Saving Agricultural Produce	Access to credit facilities	Governance and	
1607	1066	Art. 086	Economic Vulnerability	Adaptive	Financial access	Limited Credit Unions (ICU)	Access to credit facilities	Governance and	
1617	1066	Art. 086	Cultural Vulnerability	Adaptive	Land tenure	Land Governance Issues (LGI)	Access to credit facilities	Governance and	
1867	1267	Art. 103	Political	Adaptive	Disaster relief	Natural Disasters Living	Access to credit facilities	Governance and	
1974	1356	Art. 110	Vulnerability	Adaptive	Loan amount	Loan Status	Access to credit facilities	Governance and	
2024	1394	Art. 113	Vulnerability	Adaptive	Loan status	Household that has taken	Access to credit facilities	Governance and	
2050	1394	Art. 113	Vulnerability	Adaptive	Trust/Interaction	Household that has gone to	Access to credit facilities	Governance and	
2160	1425	Art. 115	Sensitivity	Adaptive	Municipal debt	DEBTS	Access to credit facilities	Governance and	
2269	1455	Art. 121	Adaptive capacity	Adaptive	Local government	Fiscal revenue (K)	Access to credit facilities	Governance and	
82	51	Art. 005	Restorability	Adaptive	Local general	Local public budget revenue	Climate budgeting	Governance and	
244	200	Art. 014	Social Vulnerability	Adaptive	Capability	Capability	Climate budgeting	Governance and	
643	712	Art. 032	Adaptive capacity	Adaptive	Investment	Government efficiency	Climate budgeting	Governance and	
1146	842	Art. 060	Adaptive capacity	Adaptive	Government	Ratio of Government	Climate budgeting	Governance and	
1594	1066	Art. 086	Social/Institutional	Adaptive	Institutional	Lack of Institutional Support	Climate budgeting	Governance and	
1866	1267	Art. 103	Political	Adaptive	Government	Public Budget Expenditure	Climate budgeting	Governance and	
2151	1425	Art. 115	Resilience	Adaptive	Municipal	BUDGET	Climate budgeting	Governance and	
2377	1480	Art. 128	Vulnerability	Adaptive	Number of water	Water control related	Climate budgeting	Governance and	
2386	1480	Art. 128	Vulnerability (Economic)	Adaptive	(Local tax + non-	Financial independence rate	Climate budgeting	Governance and	
240	196	Art. 013	causes and coping	Adaptive	Disaster	Existing coping strategies in	Climate plans	Governance and	
642	712	Art. 032	Adaptive capacity	Adaptive	Investment	Local government plans on	Climate plans	Governance and	
1287	907	Art. 067	Risk Perception Indicator	Adaptive	Policy agreement	RP10: Agreement with	Climate plans	Governance and	
1539	1058	Art. 084	Adaptive capacity	Adaptive	Binary indicator (0	The existence of climate	Climate plans	Governance and	
1540	1058	Art. 084	Adaptive capacity	Adaptive	Binary indicator (0	The existence of climate	Climate plans	Governance and	
1542	1058	Art. 084	Adaptive capacity	Adaptive	Binary indicator (0	The existence of disaster risk	Climate plans	Governance and	
1581	1066	Art. 086	Adaptive capacity	Adaptive	Adaptive capacity	Enforcement of Building	Climate plans	Governance and	
1599	1066	Art. 086	Susceptibility	Adaptive	DRR planning	Limited DRR Strategies	Climate plans	Governance and	
1613	1066	Art. 086	Environmental	Adaptive	Land use practices	Poor Land Management	Climate plans	Governance and	
1614	1066	Art. 086	Environmental	Adaptive	Resource	Inappropriate Use of	Climate plans	Governance and	
1615	1066	Art. 086	Environmental	Adaptive	Environmental	Environmental	Climate plans	Governance and	
1619	1066	Art. 086	Adaptive capacity	Adaptive	Adaptive capacity	Land Use Planning (LUP)	Climate plans	Governance and	
1909	1276	Art. 105	Adaptive capacity	Adaptive	number of	RA4 – Learning Mechanism	Climate plans	Governance and	
2051	1394	Art. 113	Vulnerability	Adaptive	Compliance with	Community having land	Climate plans	Governance and	
2111	1408	Art. 114	Adaptive capacity	Adaptive	Compliance with	Community having land	Climate plans	Governance and	
19	24	Art. 001	Vulnerability	Adaptive	Flood insurance	Flood insurance	Insurance and social support	Governance and	
591	710	Art. 031	Adaptive capacity	Adaptive	Employment and	Working age claiming Key	Insurance and social support	Governance and	
618	710	Art. 031	Sensitivity	Adaptive	Carers	Unpaid care ≥50h/week	Insurance and social support	Governance and	
619	710	Art. 031	Sensitivity	Adaptive	Carers	Unpaid care 20–49h/week	Insurance and social support	Governance and	
668	712	Art. 032	Adaptive capacity	Adaptive	Persons covered	Insurance cover	Insurance and social support	Governance and	
813	761	Art. 041	Health & Mobility	Adaptive	Health Insurance	Health Insurance	Insurance and social support	Governance and	
1003	785	Art. 051	Adaptive capacity	Adaptive	Remittances	Remittances received	Insurance and social support	Governance and	
1126	827	Art. 058	Resilience	Adaptive	Insurance	Flood insurance	Insurance and social support	Governance and	
1162	856	Art. 061	Socio-Economic	Adaptive	Number of unpaid	Providers of Unpaid Care	Insurance and social support	Governance and	
1189	862	Art. 062	Social	Adaptive	Health insurance	Health insurance	Insurance and social support	Governance and	
1201	862	Art. 062	Institutional	Adaptive	Post-flood	Livelihood restoration	Insurance and social support	Governance and	
1713	1103	Art. 092	Adaptive capacity	Adaptive	Insurance	Social insurance	Insurance and social support	Governance and	
1714	1103	Art. 092	Adaptive capacity	Adaptive	Social security	Social security	Insurance and social support	Governance and	
1868	1267	Art. 103	Political	Adaptive	Minimum living	Number of People with	Insurance and social support	Governance and	
1908	1276	Art. 105	Adaptive capacity	Adaptive	persons covered	RA3 – Social Insurance	Insurance and social support	Governance and	
1973	1356	Art. 110	Vulnerability	Adaptive	Insurance	Insurance	Insurance and social support	Governance and	
2102	1408	Art. 114	Adaptive capacity	Adaptive	Insurance	Households having insurance	Insurance and social support	Governance and	
2103	1408	Art. 114	Adaptive capacity	Adaptive	Building insurance	Households having building	Insurance and social support	Governance and	
2110	1408	Art. 114	Adaptive capacity	Adaptive	Self-reliance	Households that have not	Insurance and social support	Governance and	
292	200	Art. 014	Social Vulnerability	Adaptive	Community-based	Community-based	Multi-agency collaboration	Governance and	
644	712	Art. 032	Adaptive capacity	Adaptive	Investment	Fairness and inclusion	Multi-agency collaboration	Governance and	
645	712	Art. 032	Adaptive capacity	Adaptive	Investment	Local government leadership	Multi-agency collaboration	Governance and	
664	712	Art. 032	Adaptive capacity	Adaptive	Number of	Presence of Research	Multi-agency collaboration	Governance and	
828	761	Art. 041	Infrastructure.	Adaptive	Voter	Voter Participation	Multi-agency collaboration	Governance and	
829	761	Art. 041	Infrastructure.	Adaptive	Registered Voters	Registered Voters	Multi-agency collaboration	Governance and	
1199	862	Art. 062	Institutional	Adaptive	Post-flood	Humanitarian assistance	Multi-agency collaboration	Governance and	
1421	957	Art. 076	Adaptive capacity	Adaptive	Institutional	Institutional Capacity	Multi-agency collaboration	Governance and	
1541	1058	Art. 084	Adaptive capacity	Adaptive	Binary indicator (0	Signatories to Covenant of	Multi-agency collaboration	Governance and	
1543	1058	Art. 084	Adaptive capacity	Adaptive	Binary indicator (0	National and international	Multi-agency collaboration	Governance and	
1544	1058	Art. 084	Adaptive capacity	Adaptive	Binary indicator (0	Collaboration with partners	Multi-agency collaboration	Governance and	
1546	1058	Art. 084	Adaptive capacity	Adaptive	Number of NGOs	The number of	Multi-agency collaboration	Governance and	
1593	1066	Art. 086	Susceptibility	Adaptive	Regulatory	Lack of Adherence to	Multi-agency collaboration	Governance and	
1596	1066	Art. 086	Cultural Vulnerability	Adaptive	Social conflicts	Power Conflicts (PC)	Multi-agency collaboration	Governance and	
1871	1267	Art. 103	Institutional	Adaptive	Disaster reduction	Number of National	Multi-agency collaboration	Governance and	
1888	1271	Art. 104	Socioeconomic	Adaptive	Institutional trust	Loss of confidence in	Multi-agency collaboration	Governance and	
1990	1375	Art. 111	Adaptive capacity	Adaptive	Institutional	Governance capacity	Multi-agency collaboration	Governance and	
2008	1377	Art. 112	Resilience	Adaptive	Number of	Institutional organizations	Multi-agency collaboration	Governance and	
2012	1377	Art. 112	Risk	Adaptive	Vulnerability	CCFVI Administrative-	Multi-agency collaboration	Governance and	
2044	1394	Art. 113	Vulnerability	Adaptive	Comprehension	Household's level of	Multi-agency collaboration	Governance and	
2056	1394	Art. 113	Vulnerability	Adaptive	Trust in	Household's level of trust	Multi-agency collaboration	Governance and	
1161	856	Art. 061	Socio-Economic	Adaptive	Mean house price	Economic	Real Estate and Land value (%)	Governance and	
1804	1165	Art. 099	Vulnerability	Adaptive	Land value	Average real estate price	Real Estate and Land value (%)	Governance and	
1805	1165	Art. 099	Vulnerability	Adaptive	Land value change	Real estate price evolution	Real Estate and Land value (%)	Governance and	
75	51	Art. 005	Sensitivity	Exposure	NDVI	Normalized Difference	Vegetation coverage	Green and Blue surface	GBI
87	73	Art. 006	Exposure	Exposure	Normalized	Normalized Difference	Vegetation coverage	Green and Blue surface	GBI
126	84	Art. 008	none	Exposure	Normalized	Normalized Difference	Vegetation coverage	Green and Blue surface	GBI
160	104	Art. 010	hazard	Exposure	NDVI (Normalized	Normalized Difference	Vegetation coverage	Green and Blue surface	GBI
342	222	Art. 016	none	Exposure	modified soil	Modified Soil Adjusted	Vegetation coverage	Green and Blue surface	GBI
690	722	Art. 033	Flood inventory	Exposure	Raster	Normalized Difference	Vegetation coverage	Green and Blue surface	GBI
700	725	Art. 034	Forest Cover Loss	Exposure	Raster	Normalized Difference	Vegetation coverage	Green and Blue surface	GBI
710	726	Art. 035	Exposure	Exposure	Spectral index	Normalized Difference	Vegetation coverage	Green and Blue surface	GBI
711	726	Art. 035	Exposure	Exposure	Image	Normalized Difference	Vegetation coverage	Green and Blue surface	GBI
730	727	Art. 036	Flood hazard	Exposure	NDVI	Normalized Difference	Vegetation coverage	Green and Blue surface	GBI
752	739	Art. 038	Vegetation / Flood	Exposure	Normalized	Normalized Difference	Vegetation coverage	Green and Blue surface	GBI
853	765	Art. 043	Hazard	Exposure	Vegetation cover	Normalized Difference	Vegetation coverage	Green and Blue surface	GBI
854	765	Art. 043	Hazard	Exposure	Same as above.	Normalized Difference	Vegetation coverage	Green and Blue surface	GBI
899	769	Art. 045	Hazard	Exposure	Raster	Normalized Difference	Vegetation coverage	Green and Blue surface	GBI
978	777	Art. 049	Vulnerability	Exposure	Raster	Normalized Difference	Vegetation coverage	Green and Blue surface	GBI
988	780	Art. 050	Susceptibility	Exposure	NDVI Data	Normalized Difference	Vegetation coverage	Green and Blue surface	GBI
1000	785	Art. 051	Sensitivity	Exposure	Percentage of tree	Tree cover	Vegetation coverage	Green and Blue surface	GBI
1071	805	Art. 054	Vegetation related	Exposure	NDVI	Normalized Difference	Vegetation coverage	Green and Blue surface	GBI
1248	886	Art. 065	Flood Conditioning Factor	Exposure	NDVI (-1 to 1)	Normalized Difference	Vegetation coverage	Green and Blue surface	GBI
1300	918	Art. 069	none	Exposure	Normalized	Normalized Difference	Vegetation coverage	Green and Blue surface	GBI
1321	924	Art. 071	Hazard	Exposure	NDVI (-1 to 1)	Normalized Difference	Vegetation coverage	Green and Blue surface	GBI
1375	928	Art. 073	Hazard	Exposure	NDVI (-1 to 1)	Normalized Difference	Vegetation coverage	Green and Blue surface	GBI
1406	944	Art. 075	Hazard	Exposure	NDVI (-1 to 1)	Normalized Difference	Vegetation coverage	Green and Blue surface	GBI
1657	1076	Art. 089	Hazard	Exposure	NDVI (-1 to 1)	Normalized Difference	Vegetation coverage	Green and Blue surface	GBI
1730	1116	Art. 093	Hazard	Exposure	NDVI value	Normalized Difference	Vegetation coverage	Green and Blue surface	GBI
1823	1222	Art. 100	Exposure	Exposure	Vegetation cover	Normalized Difference	Vegetation coverage	Green and Blue surface	GBI
25	24	Art. 001	Vulnerability	Exposure	Environmental	Environmental protection	Vegetation type	Green and Blue surface	GBI
174	117	Art. 011	Exposure	Exposure		Forests	Vegetation type	Green and Blue surface	GBI
175	117	Art. 011	Exposure	Exposure		Paddy fields	Vegetation type	Green and Blue surface	GBI
176	117	Art. 011	Exposure	Exposure		Other agricultural lands	Vegetation type	Green and Blue surface	GBI
181	117	Art. 011	Exposure	Exposure		Golf courses	Vegetation type	Green and Blue surface	GBI
184	117	Art. 011	Climatic impact (HIZ)	Exposure		Rice yield	Vegetation type	Green and Blue surface	GBI
185	117	Art. 011	Climatic impact (HIZ)	Exposure		Pine wilt disease	Vegetation type	Green and Blue surface	GBI
186	117	Art. 011	Climatic impact (HIZ)	Exposure		Bamboo distribution	Vegetation type	Green and Blue surface	GBI
214	196	Art. 013	socio-economic impacts	Exposure	Arable and	Arable and Permanent	Vegetation type	Green and Blue surface	GBI
345	278	Art. 017	Adaptive capacity	Exposure	Vegetation Extent	Vegetation Extent (VE)	Vegetation type	Green and Blue surface	GBI
404	424	Art. 021	Adaptive capacity	Exposure	Percentage of	Vegetation coverage rate (V)	Vegetation type	Green and Blue surface	GBI
723	727	Art. 036	Vegetation	Exposure	Vegetation	Vegetation	Vegetation type	Green and Blue surface	GBI
769	740	Art. 039	Socioeconomic and	Exposure	E7: Presence of	E7: Presence of protected	Vegetation type	Green and Blue surface	GBI
784	744	Art. 040	Exposure	Exposure	Land cover:	Vegetation: agricultural	Vegetation type	Green and Blue surface	GBI
785	744	Art. 040	Exposure	Exposure	Land cover:	Vegetation: Forest Area	Vegetation type	Green and Blue surface	GBI
1223	880	Art. 064	Exposure	Exposure	Crop types	Agricultural typologies	Vegetation type	Green and Blue surface	GBI
1224	880	Art. 064	Exposure	Exposure	Protected areas.	Natural and semi-natural	Vegetation type	Green and Blue surface	GBI
1230	880	Art. 064	Susceptibility	Exposure	Vegetation type	Vegetation cover	Vegetation type	Green and Blue surface	GBI
1618	1066	Art. 086	Environmental	Exposure	Agricultural land	Cultivated Land (CL)	Vegetation type	Green and Blue surface	GBI
1628	1071	Art. 087	Exposure	Exposure	Agricultural and	LULC - Vegetated Areas	Vegetation type	Green and Blue surface	GBI
1898	1276	Art. 105	Adaptive capacity	Exposure	green covered	R3: Green coverage	Vegetation type	Green and Blue surface	GBI
2192	1428	Art. 117	Exposure	Exposure	Cropland area	Cropland	Vegetation type	Green and Blue surface	GBI

2236	1433	Art. 119	Exposure	Exposure	Percentage of	Vegetation cover (local)	Vegetation type	Green and Blue surface		GBI	Exposure:	Indicator-	The amount of vegetation	Field mapping of 5,477 plots in	On-site	Variables pre-processed in Excel
2237	1433	Art. 119	Exposure	Exposure	Presence of trees	Trees in frontyard	Vegetation type	Green and Blue surface		GBI	Exposure:	Indicator-	Trees can help absorb	Field mapping of 5,477 plots in	On-site	Variables pre-processed in Excel
2229	1433	Art. 119	Socio-Environmental	Exposure	Percentage of	Vegetation cover (regional)	Vegetation type	Green and Blue surface		GBI	Socio-	Satellite	The amount of vegetation	Landsat satellite imagery, 2010	Satellite Imagery	Satellite imagery processed to
2275	1457	Art. 122	Susceptibility	Exposure	Land cover type	Vegetation cover	Vegetation type	Green and Blue surface		GBI	Susceptibility	Multi-Criteria	The typology of	Land use/land cover map from	Official data	Vegetation cover classes
2282	1457	Art. 122	Receptor (Target)	Exposure	Arable land	Agricultural areas	Vegetation type	Green and Blue surface		GBI	Receptor	Regional Risk	Areas comprised of	Land use/land cover map from	Official data	Agricultural areas identified from
2333	1464	Art. 125	Exposure	Exposure	Percentage of	Agricultural area	Vegetation type	Green and Blue surface		GBI	Exposed	GIS-MCDA:	The proportion of land	Portuguese Geographic Institute	Official data	Land use classification extracted
2334	1464	Art. 125	Exposure	Exposure	Percentage of	Forestry area	Vegetation type	Green and Blue surface		GBI	Exposed	GIS-MCDA:	The proportion of land	Portuguese Geographic Institute	Official data	Land use classification extracted
2375	1480	Art. 128	Vulnerability (Physical)	Exposure	Rice paddy area /	Rice paddy area ratio	Vegetation type	Green and Blue surface		GBI	Basin	Factor	The percentage of rice	Statistics Korea - land use data	Census Data: Official data	Rice paddy area per basin divided
2417	1505	Art. 130	Ecological Risk	Exposure	Semi-arid	Biodiversity	Vegetation type	Green and Blue surface		GBI	Ecological	Multicriteria	Biodiversity-sensitive	Kubal et al. (2009), City of	Scientific Literature: Official data	Biodiversity-sensitive areas
2418	1505	Art. 130	Ecological Risk	Exposure	Forest areas with	Forest	Vegetation type	Green and Blue surface		GBI	Ecological	Multicriteria	Forest areas with flood-	Kubal et al. (2009), City of	Scientific Literature: Official data	Sensitive forest areas intersected
79	51	Art. 005	Sensitivity	Exposure	River network	River network density	Water body coverage	Green and Blue surface		GBI	Sensitivity	H–S–V–R flood	River network density	National Geomatics Center of	Official data	
93	73	Art. 006	Exposure	Exposure	Riverway density	Riverway density (RD)	Water body coverage	Green and Blue surface		GBI	Exposure	Spatial Multi-	River is typically an	Chinese Resource and	Official data	Sparse river network (< 0 % of
120	84	Art. 008	none	Exposure	(DEM)	Drainage Density	Water body coverage	Green and Blue surface		GBI		Integrate	Represents the	(1) United States Geological	Satellite imagery	Generated from the stream layer
159	104	Art. 010	Hazard	Exposure	NDWI	NDWI (Normalized	Water body coverage	Green and Blue surface		GBI	Waterlogging	Analytical	Detects surface water	(1) United States Geological	Satellite imagery	30 m resolution Landsat 8
328	215	Art. 015	Hazard	Exposure	Stream frequency	Morphometric risk	Water body coverage	Green and Blue surface		GBI	Morphometri	Comparative	The morphometric	(1) JAXA ALOS World 3D-Res.;	Satellite imagery: Software	GIS Modelling
399	363	Art. 020	Hazard	Exposure	SRTM DEM	Drainage Density	Water body coverage	Green and Blue surface		GBI	Flood hazard	multi-criteria	Drainage density is	(1) United States Geological	Satellite imagery: Software	GIS Modelling
731	727	Art. 036	Flood hazard	Exposure	Stream Density	Stream Density	Water body coverage	Green and Blue surface		GBI	Flooded	Multi-criteria	Vegetation coverage	(1) United States Geological	satellite imagery	ArcGIS
737	728	Art. 037	Flooded Areas	Exposure	False Color	False Color Composite (FCC)	Water body coverage	Green and Blue surface		GBI	Flooded	Preprocessing	Composite image using	ESA Copernicus Sentinel-2 A	satellite imagery	ESA SNAP 9.0.0; ArcGIS 10.8.2
893	769	Art. 045	Hazard	Exposure	Raster	Water Occurrence	Water body coverage	Green and Blue surface		GBI	Flood Hazard	Remote	Provides a detailed	European Commission - Joint	Satellite Imagery: Official data	Extracted and processed in
950	772	Art. 047	Hazard	Exposure	ALOS PALSAR	Drainage Density (DD)	Water body coverage	Green and Blue surface		GBI	GEOPHYSICA	Hydrological	Ratio of total stream	(1) Alaska Satellite Facility (ASF)	Satellite Imagery: Software	Flow accumulation: stream order
1104	819	Art. 056	Natural	Exposure	Stream network	Stream length per km²	Water body coverage	Green and Blue surface		GBI	Natural	Hydrological	Describes the degree of	(1) United States Geological	Satellite Imagery: Software	Stream network extraction: line
1143	847	Art. 060	Adaptive capacity	Exposure	River length /	River length / Drainage Density (DD)	Water body coverage	Green and Blue surface		GBI	Disaster	Entropy	Ratio of urban river	(1) Zhengzhou Bureau of	Census Data: Official data	Calculation using Eq. (9): D(i) =
1290	914	Art. 068	none	Exposure	Stream length per	Drainage Density	Water body coverage	Green and Blue surface		GBI		Multi-Criteria	Total length of streams	(1) Airbus Defence and Space	Satellite Imagery: Software	Stream network extraction: line
1302	921	Art. 070	none	Exposure	Stream length per	Total stream length	Water body coverage	Green and Blue surface		GBI		Multi-Criteria	Total stream length	Taiwan Ministry of the Interior,	Official data: Satellite imagery:	Stream network extraction: line
1629	1071	Art. 087	Exposure	Exposure	Rivers, streams,	LULC - Water Bodies	Water body coverage	Green and Blue surface		GBI	LAND	Supervised	Areas on the Earth's	(1) United States Geological	Satellite Imagery	Atmospheric correction:
1776	1146	Art. 097	Exposure	Exposure	Water cover (%)	Proportion of water bodies	Water body coverage	Green and Blue surface		GBI	Exposure	Multiple linear	Proportion of land area	(1) Database of General	Official data; Satellite imagery	Land use classification: water
2364	1478	Art. 127	Physical	Exposure	Rivers, lakes,	Water bodies	Water body coverage	Green and Blue surface		GBI	Physical	GIS analysis	Natural and man-made	(1) Survey of India toposheets at	Satellite Imagery: Official data:	Water bodies digitized from
41	25	Art. 002	Thematic mapping	Exposure	Boundary	Boundary conditions	Water body type	Green and Blue surface		GBI	Thematic	Monitoring	Upstream hydrographs	HEC-RAS 6.3.1 simulations	Software Simulation	(i) data acquisition, (ii)
50	35	Art. 003	flood hazard and	Exposure	Normalized	Surface water bodies (NDWI)	Water body type	Green and Blue surface		GBI	flood hazard	The study	Computed from green	Sentinel-2 imagery of 2024	Satellite Imagery	
109	83	Art. 007	none	Exposure	NDWI	Surface water bodies (NDWI)	Water body type	Green and Blue surface		GBI		Multi-criteria	Surface water bodies	United States Geological Survey	Satellite Imagery	NDWI values were classified from
127	84	Art. 008	none	Exposure	Normalized	Vegetation water content	Water body type	Green and Blue surface		GBI		Integrate	Represents vegetation	(1) European Space Agency (ESA)	Satellite imagery	Calculated in GEE from Sentinel-2
149	85	Art. 009	Flood Inundation Extent	Exposure	JRC Global Surface	permanent water bodies	Water body type	Green and Blue surface		GBI	Flood	Overall Kappa	Surface Water Data (JSJ)	(1) GEE Google: JRC Global	Satellite imagery	Number of months water is
178	117	Art. 011	Exposure	Exposure	Rivers and lakes	Surface water bodies	Water body type	Green and Blue surface		GBI	Exposure /		Projected coverage	(1) NUID (2016) Land Utilization	Official data: Scientific literature	Aggregated to ~1 km × 1 km
179	117	Art. 011	Exposure	Exposure	Seashores	Seashores	Water body type	Green and Blue surface		GBI	Exposure /		Projected coverage	(1) NUID (2016) Land Utilization	Official data: Scientific literature	Aggregated to ~1 km × 1 km
180	117	Art. 011	Exposure	Exposure	Sea	Sea	Water body type	Green and Blue surface		GBI	Exposure /		Projected coverage	(1) NUID (2016) Land Utilization	Official data: Scientific literature	Aggregated to ~1 km × 1 km
327	215	Art. 015	Hazard	Exposure	Total stream	Morphometric risk	Water body type	Green and Blue surface		GBI	Morphometri	Comparative	The morphometric	(1) JAXA ALOS World 3D-Res.;	Satellite imagery: Software	GIS Modelling
699	725	Art. 034	Drought	Exposure	Normalized	Normalized Difference	Water Body Type	Green and Blue surface		GBI	Multi-hazard		Represents moisture	(1) United States Geological	satellite imagery	
724	727	Art. 036	Water bodies	Exposure	Water bodies	Permanent Water bodies	Water body type	Green and Blue surface		GBI	Water bodies		NDWI calculation:	(1) United States Geological	satellite imagery	ArcGIS
787	744	Art. 040	Exposure	Exposure	Land cover: water	Land cover: water bodies.	Water body type	Green and Blue surface		GBI	Exposure	SCORE –	In order to map different	ESA Copernicus CORINE Land	Satellite Imagery	
894	769	Art. 045	Hazard	Exposure	Raster	Permanent Water	Water body type	Green and Blue surface		GBI	Flood Hazard	Temporal	Builds on Water	European Commission - Joint	Satellite Imagery: Official data	Threshold classification (80%
900	769	Art. 045	Hazard	Exposure	Raster	Normalized Difference	Water body type	Green and Blue surface		GBI	Flood Hazard	NDWI = (Band	Computed using Landsat	(1) United States Geological	Satellite Imagery: Software	Spectral index calculation in GEE
1070	805	Art. 054	Water related	Exposure	NDWI	Normalized Difference	Water body type	Green and Blue surface		GBI	Water	Analytic	Provides information on	United States Geological Survey	Satellite Imagery: Software	NDWI calculation using Landsat
1653	1076	Art. 089	Hazard	Exposure	NDWI (-1 to 1)	Normalized Difference	Water body type	Green and Blue surface		GBI	Waterlogging	Analytical	Index to identify water	(1) United States Geological	Satellite Imagery	NDWI calculation using formula
1998	1377	Art. 112	Exposure	Exposure	Length of	Coastline (CL)	Water body type	Green and Blue surface		GBI	NATURAL	CCFVI:	Length of coastline along	(1) WWF Hellas, web mapping	Satellite Imagery: Official data	Data collection for 6 study areas:
2207	1432	Art. 118	Study Area Delineation	Exposure	Coastal boundary	Shoreline	Water body type	Green and Blue surface		GBI	Physical	GIS extraction:	The interface between	(1) United States Geological	Official data: Satellite Imagery:	Shoreline extracted from DEM
2279	1457	Art. 122	Receptor (Target)	Exposure	Sandy coastal	Beaches	Water body type	Green and Blue surface		GBI	Receptor	Regional Risk	Sandy coastal areas	Land use/land cover map from	Official data	Beaches identified from land use
786	744	Art. 040	Exposure	Exposure	Land cover:	Land cover: wetlands	Wetland coverage	Green and Blue surface		GBI	Exposure	SCORE –	In order to map different	ESA Copernicus CORINE Land	Satellite Imagery	
1233	880	Art. 064	Susceptibility	Exposure	Wetland area	Wetland extension	Wetland coverage	Green and Blue surface		GBI	Susceptibility	Multi-Criteria	Surface area of wetlands	CORINE Land Cover: Wetland	Satellite Imagery: Official data	Wetland area calculation:
2277	1457	Art. 122	Susceptibility	Exposure	Surface area of	Wetland extension	Wetland coverage	Green and Blue surface		GBI	Susceptibility	GIS analysis:	The extent of coastal	Wetland extension data	Official data	Wetland areas identified and
1225	880	Art. 064	Exposure	Exposure	wetlands	Natural and semi-natural	Wetland Type	Green and Blue surface		GBI	Exposure	Multi-Criteria	Identification of natural	CORINE Land Cover: Protected	Satellite Imagery: Official data	Natural area extraction: polygon
2280	1457	Art. 122	Receptor (Target)	Exposure	Coastal wetlands.	Wetlands	Wetland Type	Green and Blue surface		GBI	Receptor	Regional Risk	Coastal wetlands	Wetland extension data from	Official data	Wetlands identified from
1364	927	Art. 072	Flood risk analysis	Adaptive	flood damage	Benefit-to-Cost ratio	BGI's Benefit-to-Cost	Grey and Green-Blue		GBI	Flood risk	EPA's Storm	Economic efficiency	(1) Flood damage data from	Official Data: Scintific Literature	BC ratio = (Damage_baseline -
45	35	Art. 003	flood hazard and	Adaptive	Drainage density	Drainage density (DD)	Blue drainage network	Grey and Green-Blue		GBI	flood hazard	The study	Total stream length per	OpenStreetMap (OSM)	Open Urban data	
329	215	Art. 015	Hazard	Adaptive	Drainage density	Drainage density (DD) /	Blue drainage network	Grey and Green-Blue		GBI	Morphometri	Comparative	The morphometric	(1) JAXA ALOS World 3D-Res.;	Satellite imagery: Software	GIS Modelling
340	222	Art. 016	none	Adaptive	drainage density	drainage density	Blue drainage network	Grey and Green-Blue		GBI		The analytical	Drainage density is	(1) Line Density tool in the	Software Simulation: Satellite	
406	424	Art. 021	Adaptive capacity	Adaptive	River length per	River network density (R)	Blue drainage network	Grey and Green-Blue		GBI	Vulnerability	Equal weight	Density of natural river	(1) Land use data from Tsinghua	Satellite Imagery	River network density calculated
750	739	Art. 038	Hydrology / Flood	Adaptive	Drainage Density	Drainage Density	Blue drainage network	Grey and Green-Blue		GBI	Hydrology /	Line density	Ratio of total stream	United States Geological Survey	Satellite imagery	ArcGIS
848	765	Art. 043	Hazard	Adaptive	Indicates	Drainage density (km/km²)	Blue drainage network	Grey and Green-Blue		GBI	FLOOD	Geographic	Indicates concentration	(1) United States Geological	Satellite Imagery	Flow accumulation and stream
1080	816	Art. 055	Exposure	Adaptive	Natural drainage	Drainage Density (DD)	Blue drainage network	Grey and Green-Blue		GBI	Exposure	Field surveys:	Whether natural drainage	Cuttack Municipal Corporation	Official data: GPS data: On-site	Natural drainage assessment per
1258	904	Art. 066	none	Adaptive	Stream length per	Drainage Density	Blue drainage network	Grey and Green-Blue		GBI		Drainage	Total length of rivers and	(1) United States Geological	Satellite Imagery: Software	Stream network extraction using
1306	921	Art. 070	Current Flood Risk	Adaptive	Drainage density	Drainage Density (DD)	Blue drainage network	Grey and Green-Blue		GBI	Current Flood	GIS line	Total stream length per	eThekwini Metropolitan	Official data: Software Simulation	Stream network extraction: line
1320	924	Art. 071	Hazard	Adaptive	Stream length per	Drainage Density (DD)	Blue drainage network	Grey and Green-Blue		GBI		AutoML:	Total length of rivers or	Derived from river network data:	Official data: Software Simulation	Line density calculation:
1370	928	Art. 073	Hazard	Adaptive	Stream length per	Drainage Density (DD)	Blue drainage network	Grey and Green-Blue		GBI	Hazard	Analytical	Total drainage network	OpenStreetMap (OSM) - River	Open Urban data	Drainage network extraction: line
1391	938	Art. 074	Hazard	Adaptive	Stream length per	Drainage Density	Blue drainage network	Grey and Green-Blue		GBI	Hazard	Analytical	Total length of drainage	(1) United States Geological	Satellite Imagery: Open urban	Drainage network extraction
1399	944	Art. 075	Hazard	Adaptive	Stream length per	Drainage Density (DD)	Blue drainage network	Grey and Green-Blue		GBI	Hazard	Radial Basis	Total length of drainage	(1) United States Geological	Satellite Imagery: Software	Drainage network extraction: line
1460	978	Art. 078	Hazard	Adaptive	Stream length per	Drainage Density (DD)	Blue drainage network	Grey and Green-Blue		GBI	Hazard	XGBoost:	Total length of streams	(1) General Directorate of	Satellite Imagery: Software	Stream network extraction from
1554	1058	Art. 084	Adaptive capacity	Adaptive	Percentage (%)	The percentage of blue	Blue drainage network	Grey and Green-Blue		GBI	Adaptive	Indicator-	Percentage of blue	(1) Hydrology map; (2) Land	Official data: Satellite Imagery	Blue infrastructure percentage
1659	1076	Art. 089	Hazard	Adaptive	Stream length per	Drainage Density	Blue drainage network	Grey and Green-Blue		GBI	Waterlogging	Analytical	Total length of drainage	(1) Alaska Satellite Facility -	Satellite Imagery: Software	Drainage network extraction: line
1689	1097	Art. 091	Hazard	Adaptive	Stream length per	Drainage Density (DD)	Blue drainage network	Grey and Green-Blue		GBI	HYDROLOGIC	K-Nearest	Primary regulating	(1) United States Geological	Satellite Imagery: Software	Drainage network extraction: line
2183	1427	Art. 116	Design Alternative	Adaptive	Sustainable Urban	Sustainable Drainage (SD)	Blue drainage network	Grey and Green-Blue		GBI	DESIGN	MODCEL	A flood control	COPPETEC (2009). Field surveys	Software Simulation: Scientific	Distributed storage volume
2206	1432	Art. 118	Physical System	Adaptive	Streamlines and	Drainage system	Blue drainage network	Grey and Green-Blue		GBI	Physical	GIS hydrologic	The network of surface	(1) United States Geological	Official data: Satellite Imagery:	Flow direction and flow
2365	1478	Art. 127	Infrastructure	Adaptive	Drainage network	Streams	Blue drainage network	Grey and Green-Blue		GBI	Infrastructure	GIS analysis	Natural and man-made	(1) Survey of India toposheets at	Satellite Imagery: Official data:	Streams digitized from
1825	1228	Art. 101	Hazard	Adaptive	Stream length per	Drainage Density (C1)	Blue drainage network	Grey and Green-Blue		GBI	HYDROLOGIC	AHP; TF-AHP:	Total length of streams	(1) German Aerospace Center	Satellite Imagery: Software	DEM processing: flow direction
772	740	Art. 039	Level of Adaptation	Adaptive	A2: Natural	A2: Natural protection	Blue mitigation units	Grey and Green-Blue		GBI	Level of	Vegetation	Total length (in meters)	(1) orthophotos (Douala City	Satellite Imagery: On-site	ArcGIS 10.5
1357	927	Art. 072	LID scenarios	Adaptive	Bio-retention area	Bio-retention cell area	Blue mitigation units	Grey and Green-Blue		GBI	LID scenarios	EPA's Storm	Area allocated to bio-	(1) Zahmatkesh (2014); (2) U.S.	Scientific Literature: Official data:	Area allocation per sub-
1358	927	Art. 072	LID scenarios	Adaptive	Infiltration trench	Infiltration trench area	Blue mitigation units	Grey and Green-Blue		GBI	LID scenarios	EPA's Storm	Area allocated to	(1) Zahmatkesh (2014); (2) U.S.	Scientific Literature: Official data:	Area allocation per sub-
1360	927	Art. 072	LID scenarios	Adaptive	Rain barrel units	Rain barrel units	Blue mitigation units	Grey and Green-Blue		GBI	LID scenarios	EPA's Storm	Number of rain barrel	(1) Zahmatkesh (2014); (2) U.S.	Scientific Literature: Official data:	Unit count allocation per sub-
1611	1066	Art. 086	Adaptive capacity	Adaptive	Adaptive capacity	Afforestation and Re-	Blue mitigation units	Grey and Green-Blue		GBI	LAND	Qualitative	Adaptive measure to	(1) Structured field survey; (2)	Satellite Imagery:	Adaptive capacity assessment:
2182	1427	Art. 116	Design Alternative	Adaptive	River restoration	River Restoration (RR)	Blue mitigation units	Grey and Green-Blue		GBI	DESIGN	MODCEL	A flood control	COPPETEC (2009). Field surveys	Software Simulation: Official	Three intervention zones defined
2184	1427	Art. 116	Design Alternative	Adaptive	River Restoration	Combined (RR+SD)	Blue mitigation units	Grey and Green-Blue		GBI	DESIGN	MODCEL	Combined design	COPPETEC (2009). Field surveys	Software Simulation: Official	Combined effects of RR and SD
2379	1480	Art. 128	Vulnerability	Adaptive	Repaired	Bank maintenance ratio	Blue mitigation units	Grey and Green-Blue		GBI	Flood	Factor	The percentage of	Ministry of Land, Infrastructure	Official data	Repaired length divided by
445	524	Art. 023	Vulnerability	Adaptive	Drainage	Drainage Maintenance	Drainage condition and maintenance	Grey and Green-Blue		GBI			The drainage systems	(1) African Development Bank	Official data: On-site	ArcMap GIS
472	542	Art. 025	Flood Event Classification	Adaptive	Damage to Mills,	Hydraulic infrastructures	Drainage condition and maintenance	Grey and Green-Blue		GBI	Flood Event		Damage affecting	Flood impact reports compiled	Meteorological Data: Official	Arc-Info GIS
1991	1375	Art. 111	Adaptive capacity	Adaptive	Drainage	Capacity and quality of	Drainage condition and maintenance	Grey and Green-Blue		GBI	FLOOD	Analytical	Quality and capacity of	(1) Beijing Municipal Water	Official data	Data collection: normalization (0-
2179	1427	Art. 116	Resilience	Adaptive	Loss of flood	Loss of project efficiency	Drainage condition and maintenance	Grey and Green-Blue		GBI	Flood	MODCEL	Measures the loss of	MODCEL hydrodynamic model	Software Simulation	FRI values calculated for present
2359	1478	Art. 127	Infrastructure	Adaptive	Number of	Density of drainage block	Drainage obstructions locations	Grey and Green-Blue		GBI	Infrastructure	Multi-criteria	The number of drainage	Field survey using handheld GPS	On-site: GPS data	Drainage block sites located and
2360	1478	Art. 127	Infrastructure	Adaptive	Euclidean distance	Distance from drainage	Drainage obstructions locations	Grey and Green-Blue		GBI	Infrastructure	Multi-criteria	The distance from each	(1) Derived from drainage block	On-site: GPS data	Euclidean distance calculated
2366	1478	Art. 127	Infrastructure	Adaptive	Locations of	Drainage block sites	Drainage obstructions locations	Grey and Green-Blue		GBI	Infrastructure	GPS field	Specific locations where	Field survey using handheld GPS	On-site: GPS data	Drainage block sites located
8	24	Art. 001	Vulnerability	Adaptive	Urban Forest	Urban Forest covered area	Green urban areas	Grey and Green-Blue		GBI	Physical	Fuzzy rating	20%. Localized Flood	(1) City of Kelowna	Official data, Scientific Literature	Importance level x Fuzzy number
653	712	Art. 032	Adaptive capacity	Adaptive	% green area	Green and open spaces	Green urban areas	Grey and Green-Blue		GBI	Infrastructure		Proactive disaster	(1)Iloilo CPDO. (2022). Iloilo city	Official Data: Survey/	ArcGIS software
1050	793	Art. 053	Physical	Adaptive		Green space area ratio	Green urban areas	Grey and Green-Blue		GBI	Physical	Analytic	Ratio of green space area	General Organization of Physical	Official data	Area ratio calculation:
1140	842	Art. 060	Adaptive capacity	Adaptive	Green area / total	Proportion of Urban Green	Green urban areas	Grey and Green-Blue		GBI	Disaster	Entropy	Percentage of urban area	(1) Zhengzhou Bureau of	Census Data	Calculation using Eq. (6): PUGi =
1149	856	Art. 061	Physical Vulnerability	Adaptive	Green space area	Green Areas	Green urban areas	Grey and Green-Blue		GBI	Physical	GIS spatial	Total area of parks,	(1) Ordnance Survey (OS)	Official data	Extraction of green space
1553	1058	Art. 084	Adaptive capacity	Adaptive	Percentage (%)	The percentage of green	Green urban areas	Grey and Green-Blue		GBI	Adaptive	Indicator-	Percentage of green	(1) Land use/cover map	Official data: Satellite Imagery	Green infrastructure percentage
1777	1146	Art. 097	Exposure	Adaptive	Forest and green	Proportion of forest and	Green urban areas	Grey and Green-Blue		GBI	Exposure	Multiple linear	Percentage of forest and	(1) Database of General	Official data: Satellite Imagery	Land use classification: forest
1858	1267	Art. 103	Natural	Adaptive	Urban green	Green Coverage Ratio in	Green urban areas	Grey and Green-Blue		GBI	NATURAL	Principal	Percentage of green	(1) Nanjing Statistical Yearbook,	Official data: Satellite Imagery	Data extraction: missing data
1859	1267	Art. 103	Natural	Adaptive	Park green space	Urban Per Capita Park Green	Green urban areas	Grey and Green-Blue		GBI	NATURAL	Principal	Area of park green space	(1) Nanjing Statistical Yearbook,	Official data: Satellite Imagery	Data extraction: missing data
2283	1457	Art. 122	Receptor (Target)	Adaptive	Animal and plant	Terrestrial ecosystems	Green urban areas	Grey and Green-Blue		GBI	Receptor	Regional Risk	Animal and plant	Land use/land cover map from	Official data	Terrestrial ecosystems identified
2395	1492	Art. 129	Vulnerability	Adaptive	Proportion of	Green spaces	Green urban areas	Grey and Green-Blue		GBI	Vulnerability	Object-	The proportion of urban	(1) Maxar Technologies	Satellite Imagery	Variables transformed into ratio
405	424	Art. 021	Adaptive capacity	Adaptive	Drainage pipeline	Drainage pipe network	Grey drainage network	Grey and Green-Blue		GBI	Vulnerability	Expert scoring	Density of urban drainage	(1) China City Statistical	Official data: Census Data	Drainage network density
1142	842	Art. 060	Adaptive capacity	Adaptive	Drainage pipe	Density of Urban Drainage	Grey drainage network	Grey and Green-Blue		GBI	Disaster	Entropy	Length of urban drainage	(1) Zhengzhou Bureau of	Census Data: Official data	Calculation using Eq. (8): DUDPi =
1485	988	Art. 080	Hazard	Adaptive	Road Network	Stormwater drainage	Grey drainage network	Grey and Green-Blue		GBI	Hazard	MIKE HYDRO:	Primary stormwater	(1) Municipal Corporation of	Official data: Open Urban Data	Consultation with MCGM:
1765	1139	Art. 096	Exposure	Adaptive	Drainage network	Pipeline network density	Grey drainage network	Grey and Green-Blue		GBI	Exposure	AHP-entropy	Density of drainage pipe	(1) Pipeline network data; (2)	Official data: Software Simulation	Pipeline network extraction:
1863	1267	Art. 103	Physical	Adaptive	Drainage network	Length of Water Drainage	Grey drainage network	Grey and Green-Blue		GBI	PHYSICAL	Principal	Total length of water	(1) Nanjing Statistical Yearbook,	Official data	Data extraction: missing data
1915	1317	Art. 106	Hazard	Adaptive	Storm drainage	Drainage Capacity	Grey drainage network	Grey and Green-Blue		GBI	HYDROLOGIC	FloodMap-	Default drainage capacity	(1) Shanghai Municipal	Official data	Drainage capacity specification:
1956	1353	Art. 109	Hazard	Adaptive	Distance to	Distance to Stormwater	Grey drainage network	Grey and Green-Blue		GBI	HAZARD	GIS-MCDA:	Euclidean distance to the	(1) Municipality of Gaza (MoG) -	Official data: On-site: GPS data	Euclidean distance calculation:
2006	1377	Art. 112	Resilience	Adaptive	Length of	km of drainage (D)	Grey drainage network	Grey and Green-Blue		GBI	SOCIOECONO	CCFVI: expert	Length of drainage	(1)Greece Municipalities sewage	Official Data	Data identified as N/A for all 6
2260	1453	Art. 120	Infrastructure	Adaptive	Percentage of	Households without	Grey drainage network	Grey and Green-Blue		GBI	Infrastructure	Multi-criterion	The proportion of	Brazilian Institute for Geography	Census Data	Data extracted at census sector
2378	1480	Art. 128	Vulnerability	Adaptive	Installed storm	Storm sewer pipeline	Grey drainage network	Grey and Green-Blue		GBI	Flood	Factor	The percentage of storm	Ministry of Land, Infrastructure	Official data	Installed length divided by
10	24	Art. 001	Vulnerability	Adaptive	Availability of	Availability of flood control	Grey mitigation units	Grey and Green-Blue		GBI	Physical	Fuzzy rating	Y/N. Localized Flood	Flood vulnerability assessment	Scientific Literature	Importance level x Fuzzy number
443	524	Art. 023	Vulnerability	Adaptive	Dewatering Pump	Dewatering Pump trucks	Grey mitigation units	Grey and Green-Blue		GBI			The most significant	(1) African Development Bank	Official data: On-site	ArcMap GIS
1093	816	Art. 055	Vulnerability	Adaptive	Flood-fighting	Availability of pumping	Grey mitigation units	Grey and Green-Blue		GBI	Vulnerability	Infrastructure	Availability of pumps to	Cuttack Municipal Corporation	Official data: On-site	Equipment availability
1548	1058	Art. 084	Adaptive capacity	Adaptive	Binary indicator (0	The existence of gray	Grey mitigation units	Grey and Green-Blue		GBI	Adaptive	Indicator-	Existence of gray	(1) İzmir Metropolitan	Official data: On-site	Gray infrastructure extraction per
1549	1058	Art. 084	Adaptive capacity	Adaptive	Binary indicator (0	The existence of gray	Grey mitigation units	Grey and Green-Blue		GBI	Adaptive	Indicator-	Existence of gray	(1) State Hydraulic Works (DSİ),	Official data: On-site	Gray infrastructure extraction per
1612	1066	Art. 086	Adaptive capacity	Adaptive	Adaptive capacity	Building Dykes and	Grey mitigation units	Grey and Green-Blue		GBI	LAND	Qualitative	Adaptive measure to	(1) Structured field survey; (2)	Survey/questionnaire	Adaptive capacity assessment:
1704	1103	Art. 092	Exposure	Adaptive	Infrastructure	Critical infrastructure	Grey mitigation units	Grey and Green-Blue		GBI	EXPOSURE	Analytic	Respondent's evaluation	(1) Questionnaire survey (599	Survey/questionnaire	Survey data collection:
2181	1427	Art. 116	Design Alternative	Adaptive	Dam with	Dam	Grey mitigation units	Grey and Green-Blue		GBI	DESIGN	MODCEL	A traditional flood	COPPETEC (2009) - Water	Software Simulation: Official data	Dam dimensions and reservoir
2234	1433	Art. 119	Exposure	Adaptive	Presence of flood	Protection walls	Grey mitigation units	Grey and Green-Blue		GBI	Exposure:	Indicator-	Physical barriers around	Field mapping of 5,477 plots in	On-site	Variables pre-processed in Excel
2385	1480	Art. 128	Vulnerability	Adaptive	Pump station	Drainage pump station	Grey mitigation units	Grey and Green-Blue		GBI	Defence	Factor	The total drainage pump	Ministry of Land, Infrastructure	Official data	Total pump station capacity per
1081	816	Art. 055	Exposure	Adaptive	Drainage capacity	Design rainfall intensity vs	Mitigation performance	Grey and Green-Blue		GBI	Exposure	IDF curve	Ratio of design rainfall	Cuttack Municipal Corporation	Official data: Software Simulation	Calculation of design capacity (8
1361	927	Art. 072	LID scenarios	Adaptive	Q_reduction (%)	Peak discharge reduction	Mitigation performance	Grey and Green-Blue		GBI	LID scenarios	EPA's Storm	Percentage reduction in	SWMM simulations	Software Simulation	SWMM simulations for baseline
2180	1427	Art. 116	Resilience	Adaptive	Relative efficiency	Relative efficiency in adverse	Mitigation performance	Grey and Green-Blue		GBI	Flood	MODCEL	Measures the efficiency	MODCEL hydrodynamic model	Software Simulation	FRI values calculated for future
105	83	Art. 007	none	Adaptive	Drainage Density	Drainage Density (km/km²)	Mixed (Grey + GBI) drainage network	Grey and Green-Blue		GBI		Multi-criteria	Indicates the	United States Geological Survey	Satellite imagery	Drainage density classes were
156	104	Art. 010	hazard	Adaptive	(DEM)	Drainage density	Mixed (Grey + GBI) drainage network	Grey and Green-Blue		GBI	Waterlogging	Analytical	Measures drainage	(1) United States Geological	Satellite imagery: Software	30-m resolution SRTM DEM
247	200	Art. 014	Physical Vulnerability	Adaptive	Drainage System	Drainage System analysis	Mixed (Grey + GBI) drainage network	Grey and Green-Blue		GBI	Physical	modified	The network of irrigation	ArcMap's Hydrology tool set.	Software Simulation	This indexing assigns weightage
346	278	Art. 017	Adaptive capacity	Adaptive	Stormwater	Stormwater Drainage	Mixed (Grey + GBI) drainage network	Grey and Green-Blue		GBI	Vulnerability -	Normalization	Highlighted the role of	(1) Greater Amman	Official data	
444	524	Art. 023	Vulnerability	Adaptive	Drainage	Drainage Infrastructure	Mixed (Grey + GBI) drainage network	Grey and Green-Blue		GBI			The drainage systems	(1) African Development Bank	Official data: On-site	ArcMap GIS
649	712	Art. 032	Adaptive capacity	Adaptive	Drainage length	Stormwater management	Mixed (Grey + GBI) drainage network	Grey and Green-Blue		GBI	Infrastructure		Reduces flooding but	Iloilo City. (2014). Iloilo city local	Official Data	ArcGIS software
726	727	Art. 036	Flood hazard	Adaptive	Drainage Density	Drainage Density	Mixed (Grey + GBI) drainage network	Grey and Green-Blue		GBI	Flood hazard		Ratio of total drainage	(1)United States Geological	satellite imagery: Software	ArcGIS
1079	816	Art. 055	Exposure	Adaptive	Storm water	Presence of storm water	Mixed (Grey + GBI) drainage network	Grey and Green-Blue		GBI	Exposure	GIS-based	Whether the ward has	Cuttack Municipal Corporation	Official data	Drainage network extraction:
1252	886	Art. 065	Flood Conditioning Factor	Adaptive	Distance to	Distance to Drainage	Mixed (Grey + GBI) drainage network	Grey and Green-Blue		GBI	Flood	GIS proximity	Euclidean distance to the	Sana'a Municipality urban	Official data	Euclidean distance calculation
1503	995	Art. 081	Hazard	Adaptive	Stormwater	Drainage network geometry	Mixed (Grey + GBI) drainage network	Grey and Green-Blue		GBI	Hazard	Geographic	Bhubaneswar Municipal	(1) Bhubaneswar One -	Official data	Drainage network
1745	1118	Art. 094	Sensitivity	Adaptive	Drainage quality	Drainage system	Mixed (Grey + GBI) drainage network	Grey and Green-Blue		GBI	Sensitivity	Analytic	Presence and quality of	(1) Field observations (May	Official data: On-site	Drainage system assessment:
1818	1222	Art. 100	Exposure	Adaptive	Artificial drainage	Harmonized Hydrographic	Mixed (Grey + GBI) drainage network	Grey and Green-Blue		GBI	HYDROLOGIC	Digitization:	Digital model combining	(1) Municipality of Torino -	Official data: Satellite Imagery:	Digitization of analogic maps:
1903	1276	Art. 105	Adaptive capacity	Adaptive	drainage length	C3 – Storm Water	Mixed (Grey + GBI) drainage network	Grey and Green-Blue		GBI	During-Flood	VIKOR-GRA	Storm water absorption	China City Statistical Yearbook	Official data	C3 = drainage length/urban area
308	215	Art. 015	Hazard	Adaptive	Relative reservoir	Relative reservoir area	Mixed (Grey + GBI) mitigation units	Grey and Green-Blue		GBI	Hydrologic	Comparative	relative reservoir ratio	(1) Cyprus Wetlands Project	Satellite Imagery, Scientific	GIS Modelling
468	542	Art. 025	Water Infrastructure	Adaptive	Rainwater storage	Rainwater storage tanks	Mixed (Grey + GBI) mitigation units	Grey and Green-Blue		GBI	Water		After an unexpected	Barcelona Water Cycle Agency -	Official Data	Arc-Info GIS
531	604	Art. 027	Elements of city	Adaptive	City infrastructure	Area of water pollution	Mixed (Grey + GBI) mitigation units	Grey and Green-Blue		GBI	Elements of		Spatial extent of facilities	MLTM, 2011; Shim, 2013	Official data: Open Urban data:	
641	712	Art. 032	Adaptive capacity	Adaptive	Indicator	flood control structures	Mixed (Grey + GBI) mitigation units	Grey and Green-Blue		GBI	Infrastructure		Net Effect on Adaptive	Iloilo City. (2014). Iloilo city local	Official Data	ArcGIS software
771	740	Art. 039	Level of Adaptation	Adaptive	A1: Structural	A1: Structural protection	Mixed (Grey + GBI) mitigation units	Grey and Green-Blue		GBI	Level of	Feature	Total length (in meters)	(1) orthophotos (Douala City	Satellite Imagery: On-site: GPS	ArcGIS 10.5
773	740	Art. 039	Level of Adaptation	Adaptive	A3: Mitigation	A3: Mitigation measures	Mixed (Grey + GBI) mitigation units	Grey and Green-Blue		GBI	Level of	Visual	Estimated percentage of	(1) orthophotos (Douala City	Satellite Imagery: On-site	ArcGIS 10.5
1205	862	Art. 062	Physical	Adaptive	Proximity to flood	Infrastructure	Mixed (Grey + GBI) mitigation units	Grey and Green-Blue		GBI	Resilience -	Subjective	Whether house is near	Household survey (N=600)	Survey/questionnaire	Percentage calculation per
2010	1377	Art. 112	Resilience	Adaptive	Existence of	Flood protection (FP)	Mixed (Grey + GBI) mitigation units	Grey and Green-Blue		GBI	ADMINISTRA	CCFVI: expert	Existence of structural	(1) Special Secretariat for	Official data	Data identified as N/A for all 6
2274	1457	Art. 122	Attenuation	Adaptive	Coastal defense	Artificial and natural	Mixed (Grey + GBI) mitigation units	Grey and Green-Blue		GBI	Attenuation	GIS analysis	Natural or artificial	Artificial protection and natural	Official data	Presence of artificial/natural
2384	1480	Art. 128	Vulnerability	Adaptive	Dam upstream	Flood control capacity	Mixed (Grey + GBI) mitigation units	Grey and Green-Blue		GBI	Flood Control	Factor	The percentage of basin	Ministry of Land, Infrastructure	Official data	Dam upstream basin area per
925	771	Art. 046	Sensitivity	Sensitivity	No. of incidences	Incidences of water-borne	Flood-Related Illness	Health			Social	Principal	WB and VB diseases	(1) Department of Science and	Official data	0 (1); 1 (2); >1 (3)
926	771	Art. 046	Sensitivity	Sensitivity	Location of DW	Incidences of vector-borne	Flood-Related Illness	Health			Social	Principal	WB and VB diseases	(1) Department of Science and	Official data	Within HH premises (1); Near HH
1886	1271	Art. 104	Socioeconomic	Sensitivity	Health impacts	Health and disease	Flood-Related Illness	Health			Indirect	Structural	Waterborne diseases and	(1) Household survey (231 valid	Survey/questionnaire	Survey data collection: 4-point
2289	1460	Art. 123	Social Vulnerability	Sensitivity	Percentage of	Health risks caused by floods	Flood-Related Illness	Health			Social	Focus group	The extent to which	Community workshops with 33	Survey/questionnaire	Questions answered using binary
2353	1467	Art. 126	Exposure	Sensitivity	Incidence rate of	Spread of diseases	Flood-Related Illness	Health			Exposure	Integrated	Indirect intangible	(1) Hashizume et al. (2008,	Scientific Literature	Incidence rate: IR = (tdc / tp) ×
488	542	Art. 025	Flood Event Classification	Sensitivity	Flood-related	Deaths	Flood-Related Incidents and Mortality	Health			Flood Event		Number of fatalities	INUNGAMA Flood Event	Health Data: Official Data	Arc-Info GIS
1876	1271	Art. 104	Socioeconomic	Sensitivity	Fatalities	Loss of lives	Flood-Related Incidents and Mortality	Health			Direct	Structural	Deaths caused by flash	(1) Household survey (231 valid	Survey/questionnaire	Survey data collection: 4-point
1877	1271	Art. 104	Socioeconomic	Sensitivity	Physical injury	Injury	Flood-Related Incidents and Mortality	Health			Direct	Structural	Physical harm or injury	(1) Household survey (231 valid	Survey/questionnaire	Survey data collection: 4-point
2350	1467	Art. 126	Exposure	Sensitivity	Number of	Deaths	Flood-Related Incidents and Mortality	Health			Exposure	Integrated	The number of people	Bangladesh Bureau of Statistics	Census Data	Number of deaths: n.dth.i =
430	524	Art. 023	Vulnerability	Sensitivity	percentage of	Incapability: disabled	Population with disability	Health			Social	social	incapability which	Central Agency for Public	Census Data	ArcMap GIS
557	697	Art. 029	Sensitivity	Sensitivity	Population health	Special needs	Population with disability	Health			Population	PCA; SOM	Percentage of population	Morocco Census RGPH 2014	Census Data	
604	710	Art. 031	Sensitivity	Sensitivity	Health and Special	Incapacity benefit claimants	Population with disability	Health			Health, Self		Percentage of working-	(1) UK Department for Work and	Official Data	
605	710	Art. 031	Sensitivity	Sensitivity	Health and Special	Bad health	Population with disability	Health			Health, Self		Percentage of residents	UK Office for National Statistics	Census Data	
606	710	Art. 031	Sensitivity	Sensitivity	Health and Special	Limited daily activities	Population with disability	Health			Health, Self		Percentage of residents	UK Office for National Statistics	Census Data	
607	710	Art. 031	Sensitivity	Sensitivity	Health and Special	One-person households with	Population with disability	Health			Health, Self		Percentage of single	UK Office for National Statistics	Census Data	
609	710	Art. 031	Sensitivity	Sensitivity	Health and Special	Adult mental health service	Population with disability	Health			Health, Self		Local authority areas	UK National Health Service	Health Data	
622	710	Art. 031	Sensitivity	Sensitivity	Disability	Disability households	Population with disability	Health			Health, Self		Percentage of households	UK Office for National Statistics	Census Data	
675	712	Art. 032	Sensitivity	Sensitivity	% people with	Disability	Population with disability	Health			Demographic		Lack of inclusive	Philippine Statistics Authority	Census Data	ArcGIS software
814	761	Art. 041	Health & Mobility	Sensitivity	Physical Health	Physical Health	Population with disability	Health			Health &		Percentage of adult	Centers for Disease Control and	Survey/questionnaire	
815	761	Art. 041	Health & Mobility	Sensitivity	Mental Health	Mental Health	Population with disability	Health			Health &		Percentage of adult	Centers for Disease Control and	Survey/questionnaire	
818	761	Art. 041	Health & Mobility	Sensitivity	General Disability	General Disability	Population with disability	Health			Health &		Percentage of civilian	U.S. Census Bureau - American	Census Data	
819	761	Art. 041	Health & Mobility	Sensitivity	Impaired	Impaired Movement	Population with disability	Health			Health &		Percentage of	U.S. Census Bureau - American	Census Data	
920	771	Art. 046	Sensitivity	Sensitivity	Population with	Population having	Population with disability	Health			Social	Principal	'Disabled Population' in	Modified from (1) Scientific	Scientific Literature	0 (1); 1 (2); >1 (3)
1041	793	Art. 053	Economic	Sensitivity	DISBLDNWRKR06	Disabled unable to	Population with disability	Health			Economic	PCA: Varimax	Number of disabled	Central Agency for Public	Census Data: Official data	Density calculation:
1057	793	Art. 053	Social	Sensitivity		Disabled population density	Population with disability	Health			Social	AHP: pairwise	Number of disabled	Central Agency for Public	Census Data: Official data	Density calculation:
1095	819	Art. 056	Social	Sensitivity	Vulnerable-	Percentage of vulnerable	Population with disability	Health			Social	Min-max	All vulnerable people	Haut-Commissariat Au Plan	Census Data: Official data	Population age group extraction:
1159	856	Art. 061	Socio-Economic	Sensitivity	Number of	Illness or Disability	Population with disability	Health			Socio-	Census data	Population with health	2011 UK National Census -	Census Data	Illness/disability data extraction:
1174	862	Art. 062	Sensitivity	Sensitivity	Disability	Disabled people	Population with disability	Health			Vulnerability -	Subjective	Whether household has	Household survey (N=600)	Survey/questionnaire	Percentage calculation per
1228	880	Art. 064	Susceptibility	Sensitivity	Disabled/infirm	Population with disabilities	Population with disability	Health			Susceptibility	Multi-Criteria	Percentage of residents	Census data (national statistics)	Census Data: Official data: Health	Percentage calculation per
1705	1103	Art. 092	Sensitivity	Sensitivity	Physical condition	Health/physical ability	Population with disability	Health			SENSITIVITY	Analytic	Respondent's perception	(1) Questionnaire survey (599	Survey/questionnaire	Survey data collection:
1925	1317	Art. 106	Vulnerability	Sensitivity	Health status	People with Very Bad Health	Population with disability	Health			DEMOGRAPH	GIS spatial	People with very bad	(1) Sixth National Population	Census Data	Health status extraction:
1944	1349	Art. 108	Susceptibility	Sensitivity	Percentage of	Chronic illness/disability	Population with disability	Health			SUSCEPTIBILI	MOVE	Indicator measuring	(1) Household survey (210	Survey/questionnaire	Survey data collection:
1967	1356	Art. 110	Vulnerability	Sensitivity	Presence of	Disabled Person	Population with disability	Health			SOCIAL	Analytic	Presence of disabled	(1) Household survey (300	Survey/questionnaire	Survey data collection: pairwise
2003	1377	Art. 112	Susceptibility	Sensitivity	Percentage of	% Vulnerable population	Population with disability	Health			SOCIOECONO	CCFVI:	Percentage of population	(1) Hellenic Statistical Authority	Census Data: Official data	Data collection for 6 study areas:
2017	1394	Art. 113	Vulnerability	Sensitivity	Number of	Presence of chronically ill,	Population with disability	Health			Social	Index-based	The count of household	(1) Primary data collected	Survey/questionnaire	Raw survey responses were
2079	1408	Art. 114	Sensitivity	Sensitivity	Number of	Households having family	Population with disability	Health			Sensitivity	Index-based	The count of household	(1) Primary data collected	Survey/questionnaire	Raw survey responses were
2154	1425	Art. 115	Sensitivity	Sensitivity	Disabled people	DISABLED	Population with disability	Health			Not retained	HSA: PCA: ISVI	The number of residents	Institute of Social Services and	Official data	Variables were normalized to
2290	1460	Art. 123	Social Vulnerability	Sensitivity	Percentage of	Vulnerable groups: disabled	Population with disability	Health			Social	Focus group	The proportion of	Community workshops with 33	Survey/questionnaire	Questions answered using binary
2371	1480	Art. 128	Vulnerability	Sensitivity	Vulnerable	Vulnerable population	Population with disability	Health			Loss	Factor	The density of vulnerable	Statistics Korea - population	Census Data	Vulnerable population (under 15
17	24	Art. 001	Vulnerability	Sensitivity	Average	Average household size	Household composition (nº people)	Household			Economic	Fuzzy rating	Average number of	M.E. Huq, A.Z.M. Shoeb, A.	Scientific Literature	Importance level x Fuzzy number
395	363	Art. 020	Vulnerability	Sensitivity	household	Household	Household composition (nº people)	Household			Flood	multi-criteria	Potential to influence the	District Census Handbook (DCH)	Census Data	GIS Modelling
595	710	Art. 031	Sensitivity	Sensitivity	Housing	One-person households	Household composition (nº people)	Household			"Economic		Percentage of households	UK Office for National Statistics	Census Data	
596	710	Art. 031	Sensitivity	Sensitivity	Housing	Elderly one-person	Household composition (nº people)	Household			"Economic		Percentage of single	UK Office for National Statistics	Census Data	
597	710	Art. 031	Sensitivity	Sensitivity	Housing	Persons per bedroom	Household composition (nº people)	Household			"Economic		Percentage of	UK Office for National Statistics	Census Data	
676	712	Art. 032	Sensitivity	Sensitivity	household	household composition	Household composition (nº people)	Household			Demographic		Though demographic	Philippine Statistics Authority	Census Data	ArcGIS software
797	761	Art. 041	Housing & Demographic	Sensitivity	Crowding	Crowding	Household composition (nº people)	Household			Housing &		Percentage of total	U.S. Census Bureau - American	Census Data	
798	761	Art. 041	Housing & Demographic	Sensitivity	Group Quarters	Group Quarters	Household composition (nº people)	Household			Housing &		Percentage of total	U.S. Census Bureau - American	Census Data	
905	771	Art. 046	Sensitivity	Sensitivity	Household Size	Household Size	Household composition (nº people)	Household			Social	Principal	For instance, a HH with a	Household Survey Constructed	On-Site: Survey/questionnaire	1–4 (1); 4–7 (2); 7–13 (3)
1033	793	Art. 053	Social	Sensitivity	AVERFAMSIZ17	Average family size	Household composition (nº people)	Household			Social	PCA: Varimax	Average family size, High	Central Agency for Public	Census Data: Official data	Average calculation per
1034	793	Art. 053	Social	Sensitivity	OCROW17	Overcrowding rate	Household composition (nº people)	Household			Social	PCA: Varimax	Overcrowding rate	Central Agency for Public	Census Data: Official data	Rate calculation: normalization
1120	821	Art. 057	Susceptibility	Sensitivity	Number of empty	Empty buildings	Household composition (nº people)	Household			Susceptibility	Census data	Percentage of empty	Italian National Institute of	Census Data	Extraction of building occupancy
1267	907	Art. 067	Socioeconomic	Sensitivity	Number of	Household size	Household composition (nº people)	Household			Socioeconom	In this study, a	Total number of	Household survey (N=600) - Face	Survey/questionnaire	Data cleaning: descriptive
1494	988	Art. 080	Socio-economic	Sensitivity	household size	Vulnerability indicators	Household composition (nº people)	Household			socioeconom	Principal	Selected vulnerability	(1) Census of India, 2011 -	Census Data	Indicator extraction per ward:
1625	1066	Art. 086	Demographic	Sensitivity	Marital status	Marital Status	Household composition (nº people)	Household			DEMOGRAPH	Chi-square	Marital status of	(1) Structured field survey; (2)	Survey/questionnaire	Marital status data collection:
1711	1103	Art. 092	Adaptive capacity	Sensitivity	Dependency ratio	Family structure	Household composition (nº people)	Household			ADAPTIVE	Analytic	In the respondent's	(1) Questionnaire survey (599	Survey/questionnaire	Survey data collection:
1892	1271	Art. 104	Socioeconomic	Sensitivity	Household	Household combination	Household composition (nº people)	Household			Control	Structural	Number of household	(1) Household survey (231 valid	Survey/questionnaire	Survey data collection:
1893	1271	Art. 104	Socioeconomic	Sensitivity	Household size	Household member	Household composition (nº people)	Household			Control	Structural	Number of persons per	(1) Household survey (231 valid	Survey/questionnaire	Survey data collection:
1966	1356	Art. 110	Vulnerability	Sensitivity	Number of	Family Size	Household composition (nº people)	Household			SOCIAL	Analytic	Household size	(1) Household survey (300	Survey/questionnaire	Survey data collection: pairwise
2014	1394	Art. 113	Vulnerability	Sensitivity	Number of	Household size	Household composition (nº people)	Household			Social	Index-based	The total number of	(1) Primary data collected	Survey/questionnaire	Raw survey responses were
2015	1394	Art. 113	Vulnerability	Sensitivity	Family structure	Family type	Household composition (nº people)	Household			Social	Index-based	Describes the structure of	(1) Primary data collected	Survey/questionnaire	Raw survey responses were
2067	1408	Art. 114	Exposure	Sensitivity	Number of	Household size	Household composition (nº people)	Household			Exposure	Index-based	The total number of	(1) Primary data collected	Survey/questionnaire	Raw survey responses were
2068	1408	Art. 114	Exposure	Sensitivity	Family structure	Family type	Household composition (nº people)	Household			Exposure	Index-based	Describes the structure of	(1) Primary data collected	Survey/questionnaire	Raw survey responses were
2317	1464	Art. 125	Population	Sensitivity	Percentage of	Households over five	Household composition (nº people)	Household			Population	GIS-MCDA:	The proportion of	National Statistics Institute (INE)	Census Data	Data standardized using linear
2318	1464	Art. 125	Population	Sensitivity	Percentage of	Households under four	Household composition (nº people)	Household			Population	GIS-MCDA:	The proportion of	National Statistics Institute (INE)	Census Data	Data standardized using linear
2319	1464	Art. 125	Buildings	Sensitivity	Percentage of	Collective accommodation	Household composition (nº people)	Household			Buildings	GIS-MCDA:	Buildings such as	National Statistics Institute (INE)	Census Data	Data standardized using linear
2394	1492	Art. 129	Vulnerability	Sensitivity	Proportion of	Overcrowding	Household composition (nº people)	Household			Vulnerability	Multi-criteria	The proportion of	Chilean National Statistics	Census Data:	Variables transformed into ratio
416	483	Art. 022	Regional Vulnerability	Sensitivity	No. of kutcha	No. of kutcha houses in a	Household quality conditions	Household			Regional	Deterministic	Kutcha houses are non-	(1) Indian Census 2011; (2)	Census Data, Official data	The socio-economic data used
508	559	Art. 026	Adaptive capacity	Sensitivity	percentage of four	Four and five star hotel units	Household quality conditions	Household			Commercial		Percentage of hotel	Câmara Municipal de Lisboa.	Official data	
911	771	Art. 046	Sensitivity	Sensitivity	Slum population	Slum population	Household quality conditions	Household			Social	Principal		(1) Scientific Literature: [19]	Scientific Literature	
997	785	Art. 051	Sensitivity	Sensitivity	Asset index (2011)	Asset index	Household quality conditions	Household			Sensitivity	Principal	Composite index of	IPUMS International - Microdata	Census Data: Scientific Literature	Extraction of 7 census variables:
1035	793	Art. 053	Social	Sensitivity	NHHL2R17	Households in ≤2 rooms/km²	Household quality conditions	Household			Social	PCA: Varimax	Number of households	Central Agency for Public	Census Data: Official data	Density calculation:
1051	793	Art. 053	Physical	Sensitivity		Low-rise buildings density	Household quality conditions	Household			Physical	AHP: pairwise	Number of low-rise	General Organization of Physical	Official data: Census Data	Density calculation:
1052	793	Art. 053	Physical	Sensitivity		Low-quality buildings	Household quality conditions	Household			Physical	AHP: pairwise	Number of low-quality	General Organization of Physical	Official data: Census Data	Density calculation:
1053	793	Art. 053	Physical	Sensitivity		Makeshift buildings density	Household quality conditions	Household			Physical	AHP: pairwise	Number of makeshift	Central Agency for Public	Census Data: Official data	Density calculation:
1153	856	Art. 061	Physical Vulnerability	Sensitivity	Number of	Dwellings	Household quality conditions	Household			Physical	GIS spatial	Total number of houses	Ordnance Survey (OS)	Official data	Residential building extraction:
1313	921	Art. 070	Future Flood Risk	Sensitivity	Projected	Future Informal Settlement	Household quality conditions	Household			Future Flood	GIS spatial	Projected horizontal	(1) Statistics South Africa -	Census Data: Official data:	Spatial query identifying informal
1579	1066	Art. 086	Exposure	Sensitivity	Settlement	Growth of Informal	Household quality conditions	Household			PHYSICAL	Geographic	Expansion of informal	(1) Structured field survey; (2)	Satellite Imagery: Official data:	Settlement growth assessment:
1604	1066	Art. 086	Economic Vulnerability	Sensitivity	Livelihood	Limited Livelihoods (LVs)	Household quality conditions	Household			ECONOMIC	Multiple	Limited livelihood	(1) Structured field survey; (2)	Survey/questionnaire	Household survey data
2146	1425	Art. 115	Resilience	Sensitivity	Households in	GDCOND	Household quality conditions	Household			Constructive	HSA: PCA: ISVI	The number of	Population and Housing Census	Census Data	Variables were normalized to
2166	1425	Art. 115	Resilience	Sensitivity	Households' mean	USE_AR	Household quality conditions	Household			Not retained	HSA: PCA: ISVI	The average useful floor	Population and Housing Census	Census Data	Variables were normalized, HSA
2175	1427	Art. 116	Exposure	Sensitivity	Number of	Dwelling Density (DD)	Household quality conditions	Household			Flood Risk	FRI multi-	The density of dwellings	Brazilian Census (IBGE), 2010	Census Data:	Dwelling density calculated per
241	196	Art. 013	causes and coping	Adaptive	Alternative	Alternative livelihood in the	Housing tenure: 2nd home	Housing Tenure and			3.3.	An Integrated	27% of the respondents	(1) Semi-structure	Survey/ Questionnaire: On-site	Primary data were used for the
2104	1408	Art. 114	Adaptive capacity	Adaptive	External assets	Households having	Housing tenure: 2nd home	Housing Tenure and			Capacity	Index-based	Whether the household	(1) Primary data collected	Survey/questionnaire	Raw survey responses (Yes/No)
1085	816	Art. 055	Exposure	Adaptive	Temporary	Proportion of people living	Housing Tenure: Communal Residence	Housing Tenure and			Exposure	Census data	Ratio of population living	Census of India 2011; Cuttack	Census Data: Official data: On-	Ratio calculation per ward:
1164	856	Art. 061	Socio-Economic	Adaptive	Number of	Communal Establishment	Housing Tenure: Communal Residence	Housing Tenure and			Socio-	Census data	Population in care	2011 UK National Census -	Census Data	Communal establishment data
801	761	Art. 041	Housing & Demographic	Adaptive	Unhoused	Unhoused Populations	Housing Tenure: Houseless	Housing Tenure and			Housing &		Percentage of total	U.S. Department of Housing and	Survey/questionnaire: Official	
927	771	Art. 046	Sensitivity	Adaptive	Houseless	Houseless population	Housing Tenure: Houseless	Housing Tenure and			Social	Principal		(1) Scientific Literature [17]; R.K.	Scientific Literature	
566	697	Art. 029	Adaptive capacity	Adaptive	Housing tenure	Owner / co-owner	Housing tenure: owned	Housing Tenure and			Ownership	PCA; SOM	Percentage of housing	Morocco Census RGPH 2014	Census Data	
885	766	Art. 044	Vulnerability	Adaptive	Vector (Grid)	Fraction of population with	Housing tenure: owned	Housing Tenure and			SOCIAL	Entropy	Percentage of households	City of Calgary Open Data Portal	Official data	Direct assignment to 500m grid
1108	821	Art. 057	Adaptive capacity	Adaptive	Rented houses /	House property	Housing tenure: owned	Housing Tenure and			Adaptive	Census data	Percentage of rented	Italian National Institute of	Census Data	Extraction of housing tenure
1191	862	Art. 062	Economic	Adaptive	Home ownership	Home owners	Housing tenure: owned	Housing Tenure and			Resilience -	Subjective	Whether household owns	Household survey (N=600)	Survey/questionnaire	Percentage calculation per
1744	1118	Art. 094	Sensitivity	Adaptive	Tenure status	Land ownership	Housing tenure: owned	Housing Tenure and			Sensitivity	Analytic	Ownership of land, Lack	(1) Household survey (n=359);	Survey/questionnaire: GPS data	Land ownership data collection:
1971	1356	Art. 110	Vulnerability	Adaptive	Land ownership	Land Ownership	Housing tenure: owned	Housing Tenure and			ECONOMIC	Analytic	Land ownership (0.130)	(1) Household survey (300	Survey/questionnaire	Survey data collection: pairwise
2249	1433	Art. 119	Adaptive capacity	Adaptive	Property	Land tenure	Housing tenure: owned	Housing Tenure and			Coping	Indicator-	Ownership enables	Household survey conducted in	Survey/questionnaire	73% owner-occupied. Mean
2328	1464	Art. 125	Socio-economics	Adaptive	Percentage of	Owned homes	Housing tenure: owned	Housing Tenure and			Socio-	GIS-MCDA:	Proportion of households	National Statistics Institute (INE)	Census Data	Data standardized using linear
567	697	Art. 029	Sensitivity	Adaptive	Housing tenure	Tenant	Housing Tenure: rented	Housing Tenure and			Ownership	PCA; SOM	Percentage of rented	Morocco Census RGPH 2014	Census Data	
795	761	Art. 041	Housing & Demographic	Adaptive	Renters	Renters	Housing Tenure: rented	Housing Tenure and			Housing &		Percentage of total	U.S. Census Bureau - American	Census Data	
808	761	Art. 041	Economic, Education, &	Adaptive	Rent Burden	Rent Burden	Housing Tenure: rented	Housing Tenure and			Economic,		Percentage of total	U.S. Census Bureau - American	Census Data	
1027	793	Art. 053	Social	Adaptive	OTYPRNT17	Other rented	Housing Tenure: rented	Housing Tenure and			Social	PCA: Varimax	Number of households	Central Agency for Public	Census Data: Official data	Density calculation:

1031	793	Art. 053	Social	Adaptive	OldRent12	Controlled rent	Housing Tenure: rented	Housing Tenure and	Social
1154	856	Art. 061	Physical Vulnerability	Adaptive	Number of rented	Tenure	Housing Tenure: rented	Housing Tenure and	Physical
1208	1103	Art. 092	Sensitivity	Adaptive	Housing tenure	Renters	Housing Tenure: rented	Housing Tenure and	SENSITIVITY
1807	1165	Art. 099	Vulnerability	Adaptive	Rental housing (%)	Part of renting households	Housing Tenure: rented	Housing Tenure and	SOCIOECONO
2025	1394	Art. 113	Vulnerability	Adaptive	Tenure status	Household residing in rented	Housing Tenure: rented	Housing Tenure and	Economic
2084	1408	Art. 114	Sensitivity	Adaptive	Tenure status	Households living in rented	Housing Tenure: rented	Housing Tenure and	Sensitivity
2329	1464	Art. 125	Socio-economics	Adaptive	Percentage of	Rented homes	Housing Tenure: rented	Housing Tenure and	Socio-
833	762	Art. 042	Hazard	Hazard	Significant wave	Significant wave height (m)	Coastal wave height (m)	Hydrological variables	
40	25	Art. 002	Thematic mapping	Hazard	Streamflow input	Streamflow input	Discharge (m³/s)	Hydrological variables	Thematic
70	46	Art. 004	Hazard	Hazard	water velocity	Flood hazard	Discharge (m³/s)	Hydrological variables	Hazard
191	164	Art. 012	Hazard (Flood)	Hazard	Annual maximum	Annual maxima (discharge)	Discharge (m³/s)	Hydrological variables	Design hydro-
198	164	Art. 012	Hazard (Flood)	Hazard	K-S test statistic	Goodness of fit test	Discharge (m³/s)	Hydrological variables	Design hydro-
199	164	Art. 012	Hazard (Flood)	Hazard	Daily river	Daily discharge data	Discharge (m³/s)	Hydrological variables	Design hydro-
257	200	Art. 014	Hazard	Hazard	Stream flow	Stream flow: Discharge of rivers and	Discharge (m³/s)	Hydrological variables	Flood
1348	927	Art. 072	Performance assessment	Hazard	Q_obs (m³/s)	Observed discharge	Discharge (m³/s)	Hydrological variables	Performance
1356	927	Art. 072	Floodplain determination	Hazard	Q_peak (m³/s)	Peak discharge for	Discharge (m³/s)	Hydrological variables	Floodplain
1425	957	Art. 076	Hazard	Hazard	River discharge	River Discharge	Discharge (m³/s)	Hydrological variables	Hazard
1486	988	Art. 080	Hazard	Hazard	Upstream	Discharge (m³/s)	Discharge (m³/s)	Hydrological variables	Hazard
1632	1071	Art. 087	Hazard	Hazard	Flow rate (m³/s)	River Discharge	Discharge (m³/s)	Hydrological variables	FLOOD
1762	1139	Art. 096	Hazard	Hazard	Discharge (m³/s)	Flood volume (m3/s)	Discharge (m³/s)	Hydrological variables	Hazard Index
1995	1377	Art. 112	Exposure	Hazard	Maximum	River discharge (RD)	Discharge (m³/s)	Hydrological variables	NATURAL
200	164	Art. 012	Hazard (Flood)	Hazard	Discharge for R50.	Design discharge for	Discharge for 050-year / 2% AEP (m³/s)	Hydrological variables	Design hydro-
201	164	Art. 012	Hazard (Flood)	Hazard	Discharge for R50.	Design discharge for	Discharge for 100-year / 1% AEP (m³/s)	Hydrological variables	Design hydro-
202	164	Art. 012	Hazard (Flood)	Hazard	Discharge for R50.	Design discharge for	Discharge for 200-year / 0.5% AEP (m³/s)	Hydrological variables	Design hydro-
203	164	Art. 012	Hazard (Flood)	Hazard	Maximum water	Flood depth	Flood Inundation depth (m)	Hydrological variables	Flood
440	524	Art. 023	Vulnerability	hazard	Flood Level (FL)	Flood Level	Flood Inundation depth (m)	Hydrological variables	hazard
574	709	Art. 030	Physical vulnerability	Hazard		Flood depth	Flood Inundation depth (m)	Hydrological variables	Physical
1122	827	Art. 058	Exposure	hazard	Flood depth (m)	Floodwater depth	Flood Inundation depth (m)	Hydrological variables	Exposure
1275	907	Art. 067	Flood Hazard Determinant	hazard	Height (1-5 scale)	Flood height	Flood Inundation depth (m)	Hydrological variables	Flood Hazard
1512	995	Art. 081	Hazard	Hazard	Flood Inundation	Flood Inundation depth (m) -	Flood Inundation depth (m)	Hydrological variables	Risk
1513	995	Art. 081	Hazard	Hazard	Flood Inundation	Flood Inundation depth (m) -	Flood Inundation depth (m)	Hydrological variables	Risk
1514	995	Art. 081	Hazard	Hazard	Flood Inundation	Flood Inundation depth (m) -	Flood Inundation depth (m)	Hydrological variables	Risk
1635	1071	Art. 087	Risk	Hazard	Shallow	Flood Exposure - Depth <1 m	Flood Inundation depth (m)	Hydrological variables	FLOOD
1636	1071	Art. 087	Risk	Hazard	Moderate	Flood Exposure - Depth 1-2	Flood Inundation depth (m)	Hydrological variables	FLOOD
1637	1071	Art. 087	Risk	Hazard	Moderate	Flood Exposure - Depth 2-3	Flood Inundation depth (m)	Hydrological variables	FLOOD
1638	1071	Art. 087	Risk	Hazard	Severe inundation	Flood Exposure - Depth >3 m	Flood Inundation depth (m)	Hydrological variables	FLOOD
1761	1139	Art. 096	Hazard	Hazard	Inundation depth	Flood Inundation depth (m)	Flood Inundation depth (m)	Hydrological variables	Hazard Index
1831	1228	Art. 101	Hazard	Hazard	Inundation depth	Flood Depth (C7)	Flood Inundation depth (m)	Hydrological variables	HYDROLOGIC
2264	1455	Art. 121	Exposure	Hazard	Maximum water	Flooding depth (h_i)	Flood Inundation depth (m)	Hydrological variables	Exposure
2335	1467	Art. 126	Hazard	Hazard	Maximum water	Flood inundation depth	Flood Inundation depth (m)	Hydrological variables	Hazard
2432	1508	Art. 131	Hazard	Hazard	Water depth (m)	Flood depth	Flood Inundation depth (m)	Hydrological variables	Dresden.
2284	1460	Art. 123	Hazard	Hazard	Maximum water	Flood depth	Flood Inundation depth (m)	Hydrological variables	Hazard
106	83	Art. 007	none	Hazard	Flow	Flow Accumulation (pixels)	Flow Accumulation	Hydrological variables	
119	84	Art. 008	none	Hazard	(DEM)	Flow Accumulation	Flow Accumulation	Hydrological variables	
155	104	Art. 010	hazard	hazard	(DEM)	Flow accumulation	Flow Accumulation	Hydrological variables	Waterlogging
873	766	Art. 044	Hazard	Hazard	Time Series	Flow data	Flow Accumulation	Hydrological variables	HYDROLOGIC
1211	863	Art. 063	Flood Hazard Index (FHI)	hazard	Flow	Flow Accumulation	Flow Accumulation	Hydrological variables	Flood
1259	904	Art. 066	none	hazard	Upstream	Flow Accumulation	Flow Accumulation	Hydrological variables	
1301	918	Art. 069	none	Hazard	Flow	Flow accumulation	Flow Accumulation	Hydrological variables	
1523	1050	Art. 083	Hazard	Hazard	Flow	Flow Accumulation	Flow Accumulation	Hydrological variables	Hazard
1661	1076	Art. 089	Hazard	Hazard	Flow	Flow Accumulation	Flow Accumulation	Hydrological variables	Waterlogging
1688	1097	Art. 091	Hazard	Hazard	Flow	Flow Accumulation (FA)	Flow Accumulation	Hydrological variables	HYDROLOGIC
1755	1128	Art. 095	Hazard	Hazard	Flow	Flow Accumulation	Flow Accumulation	Hydrological variables	HYDROLOGIC
118	84	Art. 008	none	Hazard	(DEM)	Flow Direction	Flow Direction	Hydrological variables	
1936	1318	Art. 107	Hazard	Hazard	Flow direction	Flow Direction	Flow Direction	Hydrological variables	HYDRO-
486	542	Art. 025	Hydrology	hazard		River flow measurements	Flow velocity (m/s)	Hydrological variables	Hydrology
1217	880	Art. 064	Hazard	hazard	Flow velocity	Water velocity	Flow velocity (m/s)	Hydrological variables	Hazard
1569	1062	Art. 085	Hazard	Hazard	Flow velocity	Flood hazard - flood velocity	Flow velocity (m/s)	Hydrological variables	Hazard
1737	1118	Art. 094	Exposure	Hazard	Flow velocity	Flow velocity	Flow velocity (m/s)	Hydrological variables	Exposure
1760	1139	Art. 096	Hazard	Hazard	Flow velocity	Flow velocity (m/s)	Flow velocity (m/s)	Hydrological variables	Hazard Index
29	24	Art. 001	Vulnerability	Hazard	Groundwater level	Groundwater level	Groundwater Depth (m)	Hydrological variables	Environment
1647	1073	Art. 088	Hazard	Hazard	Depth to water	Groundwater Depth	Groundwater Depth (m)	Hydrological variables	HYDROGEOL
1790	1149	Art. 098	Suitability	Hazard	Depth to	Groundwater Depth	Groundwater Depth (m)	Hydrological variables	HYDROGEOL
1843	1256	Art. 102	Hazard	Hazard	Depth to water	Depth to Groundwater	Groundwater Depth (m)	Hydrological variables	HYDROGEOL
1960	1353	Art. 109	Hazard	Hazard	Depth to water	Groundwater Depth	Groundwater Depth (m)	Hydrological variables	HYDROGEOL
735	728	Art. 037	Flooded Areas	Hazard	Sentinel-2 A	Index of Turbid Waters (ITW)	Index of Turbid Waters (ITW)	Hydrological variables	Flooded
736	728	Art. 037	Flooded Areas	Hazard	Sentinel-2 A	Normalized Difference	Index of Turbid Waters (ITW)	Hydrological variables	Flooded
1349	927	Art. 072	Performance assessment	Hazard	Nash-Sutcliffe	Nash-Sutcliffe Efficiency	NSE - Hydrologic Model	Hydrological variables	Performance
332	215	Art. 015	Hazard	Hazard	Stream order	Morphometric risk	River / Stream order	Hydrological Variables	Morphometri
333	215	Art. 015	Hazard	Hazard	Stream number	Morphometric risk	River / Stream order	Hydrological Variables	Morphometri
1467	978	Art. 078	Framework Component	Hazard	Stream order	Stream Network	River / Stream order	Hydrological Variables	Framework
1937	1318	Art. 107	Hazard	Hazard	Stream order	Streams	River / Stream order	Hydrological Variables	HYDRO-
331	215	Art. 015	Hazard	Hazard	Bifurcation ratio	Bifurcation ratio	River Bifurcation ratio	Hydrological Variables	Morphometri
1798	1149	Art. 098	Suitability	Hazard	River channel	River Shifting Zone	River channel migration rate (m/year)	Hydrological variables	HYDROLOGIC
212	164	Art. 012	Hazard (Flood)	Hazard	River channel	Bank width	River channel width (m)	Hydrological variables	Flood
1482	988	Art. 080	Hazard	Hazard	Stream channel	River Network	River channel width (m)	Hydrological variables	Hazard
1350	927	Art. 072	Performance assessment	Hazard	RMSE (m³/s)	Root Mean Square Error	Root Mean Square Error (RMSE)	Hydrological variables	Performance
64	46	Art. 004	Roughness	Hazard	roughness	Roughness	Runoff	Hydrological variables	Run-off
65	46	Art. 004	Roughness	Hazard	Surface water run-	surface water run-off	Runoff	Hydrological variables	Run-off
306	215	Art. 015	Hazard	Hazard	Curve number	Curve number	Runoff	Hydrological variables	Hydrologic
322	215	Art. 015	Hazard	Hazard	Ruggedness	Ruggedness number	Runoff	Hydrological variables	Morphometri
351	278	Art. 017	Exposure	Hazard	Observed Rainfall	Change in Runoff (RA)	Runoff	Hydrological variables	Vulnerability -
370	278	Art. 017	hazard	Hazard		Observed runoff	Runoff	Hydrological variables	
403	363	Art. 020	Hazard	Hazard	SRTM DEM	Flow Accumulation	Runoff	Hydrological variables	Flood hazard
450	534	Art. 024	hazard	Hazard		Extreme rainfall runoff sinks	Runoff	Hydrological variables	Hazard Risk
478	542	Art. 025	Hydrological Parameters	Hazard	Runoff coefficients	Runoff coefficients by land	Runoff	Hydrological variables	Hydrological
743	728	Art. 037	Flood Hazard / Impact	Hazard	Runoff Estimates	Runoff Estimates	Runoff	Hydrological variables	Flood Hazard
880	766	Art. 044	Vulnerability	Hazard	Vector (Grid)	Land cover (flow resistance)	Runoff	Hydrological variables	PHYSICAL
1249	886	Art. 065	Flood Conditioning Factor	Hazard	CN	Curve Number (CN)	Runoff	Hydrological variables	Flood
1347	927	Art. 072	Performance assessment	Hazard	Soil Curve Number	Soil Curve NumbeR (CN)	Runoff	Hydrological variables	Performance
1416	957	Art. 076	Hazard	Hazard	CN Grid (unitless)	Curve Number (CN) Grid	Runoff	Hydrological variables	Hazard
1509	995	Art. 081	Hazard	Hazard	Discharge (m³/s)	Baseline Surface Runoff	Runoff	Hydrological variables	Hazard
1510	995	Art. 081	Hazard	Hazard	Discharge (m³/s)	Future Surface Runoff	Runoff	Hydrological variables	Hazard
1685	1097	Art. 091	Hazard	Hazard	Roughness index	Roughness (Rn)	Runoff	Hydrological variables	TOPOGRAPHI
1839	1256	Art. 102	Hazard	Hazard	CN (unitless)	Curve Number (CN)	Runoff	Hydrological variables	HYDROLOGIC
2187	1428	Art. 117	Hazard	Hazard	Total runoff	Annual total runoff	Runoff	Hydrological variables	Hazard
2188	1428	Art. 117	Hazard	Hazard	Maximum 1-day	1-day extreme runoff	Runoff	Hydrological variables	Hazard
123	84	Art. 008	none	Hazard	(DEM)	Sediment Transport Index	Runoff - Sediment Transport Index (STI)	Hydrological variables	
1372	928	Art. 073	Hazard	Hazard	STI (unitless)	Sediment Transport Index	Runoff - Sediment Transport Index (STI)	Hydrological variables	Hazard
1351	927	Art. 072	Design rainfall	Hazard	Tc (hours)	Time of concentration (Tc)	Runoff - time of concentration (Tc)	Hydrological variables	Design
1621	1066	Art. 086	Hazard	Hazard	Short duration of	Short Inundation Time (SIT)	Short Inundation Time (SIT)	Hydrological variables	LAND
1620	1066	Art. 086	Hazard	Hazard	Short time	Short Lag Time (SLT)	Short Lag Time (SLT)	Hydrological variables	LAND
27	24	Art. 001	Vulnerability	Hazard	Water level during	Water level during flood	Storm surge level (m)	Hydrological variables	Environment
441	524	Art. 023	Vulnerability	hazard		Actual Flood level	Storm surge level (m)	Hydrological variables	hazard
448	534	Art. 024	hazard	hazard		Storm surge extent and	Storm surge level (m)	Hydrological variables	Hazard Risk
449	534	Art. 024	hazard	hazard		Tidal flood levels	Storm surge level (m)	Hydrological variables	Hazard Risk
832	762	Art. 042	Hazard	Hazard	Storm surge level	Storm surge level (m)	Storm surge level (m)	Hydrological variables	
1994	1377	Art. 112	Exposure	Hazard	Rapid rise in water	Storm surge (SS)	Storm surge level (m)	Hydrological variables	NATURAL
2200	1432	Art. 118	Hazard	Hazard	Water level minus	Storm surge	Storm surge level (m)	Hydrological variables	Hazard:
2208	1432	Art. 118	Flood Scenario	Hazard	Hurricane Irene	Hurricane Irene (referenced	Storm surge level (m)	Hydrological variables	Flood
2199	1432	Art. 118	Hazard	Hazard	Maximum water	Extreme water level (EWL)	Storm surge level (m)	Hydrological variables	Hazard:
2213	1432	Art. 118	Flood Scenario	Hazard	Superstorm Sandy	Superstorm Sandy (actual	Storm surge level (m)	Hydrological variables	Flood
2271	1457	Art. 122	Hazard	Hazard	Maximum storm	Storm surge water level	Storm surge level (m)	Hydrological variables	Hazard
2305	1461	Art. 124	Hazard	Hazard	Predicted storm	Storm surge inundation	Storm surge level (m)	Hydrological variables	Hazard
49	35	Art. 003	flood hazard and	Hazard	Stream Power	Stream Power Index (SPI)	Stream power index (SPI)	Hydrological variables	flood hazard
111	83	Art. 007	none	Hazard	Stream Power	Stream Power Index (SPI)	Stream Power Index (SPI)	Hydrological variables	
124	84	Art. 008	none	Hazard	(DEM)	Stream Power Index (SPI)	Stream Power Index (SPI)	Hydrological variables	
304	215	Art. 015	Hazard	Hazard	Stream power	Stream power index (SPI)	Stream power index (SPI)	Hydrological variables	Hydrologic
689	722	Art. 033	Flood inventory	Hazard	Raster	SPI (Stream Power Index)	Stream Power Index (SPI)	Hydrological variables	Flood
1066	805	Art. 054	Water related	hazard	SPI	Stream Power Index (SPI)	Stream power index (SPI)	Hydrological variables	Water
1246	886	Art. 065	Flood Conditioning Factor	Hazard	SPI	Stream Power Index (SPI)	Stream Power Index (SPI)	Hydrological variables	Flood
1373	928	Art. 073	Hazard	Hazard	SPI (unitless)	Stream Power Index (SPI)	Stream power index (SPI)	Hydrological variables	Hazard
1401	944	Art. 075	Hazard	Hazard	SPI (unitless)	Stream Power Index (SPI)	Stream Power Index (SPI)	Hydrological variables	Hazard
1687	1097	Art. 091	Hazard	Hazard	SPI (unitless)	Stream Power Index (SPI)	Stream Power Index (SPI)	Hydrological variables	HYDROLOGIC
353	278	Art. 017	hazard	hazard		Temporal Flood Intensity	Temporal Flood Intensity Ratio (STFIR)	Hydrological variables	Sakib Flood
354	278	Art. 017	hazard	hazard		Temporal Flood Intensity	Temporal Flood Intensity Ratio (STFIR)	Hydrological variables	Sakib Flash
1891	1271	Art. 104	Hazard	Hazard	Depth (maximum	Flash floods intensity	Temporal Flood Intensity Ratio (STFIR)	Hydrological variables	Hazard
902	769	Art. 045	Hazard	Hazard	Raster	Topographic Hazard Score	Topographic Position Index (TPI)	Hydrological variables	Flood Hazard
1369	928	Art. 073	Hazard	Hazard	TPI (unitless)	Topographic Position Index	Topographic Position Index (TPI)	Hydrological variables	Hazard
48	35	Art. 003	flood hazard and	Hazard	Topographic	Topographical Wetness	Topographical Wetness Index (TWI)	Hydrological variables	flood hazard
108	83	Art. 007	none	Hazard	Topographic	Topographical Wetness	Topographical Wetness Index (TWI)	Hydrological variables	
122	84	Art. 008	none	Hazard	(DEM)	Topographical Wetness	Topographical Wetness Index (TWI)	Hydrological variables	
154	104	Art. 010	hazard	Hazard	(DEM)	Topographical Wetness	Topographical Wetness Index (TWI)	Hydrological variables	Waterlogging
303	215	Art. 015	Hazard	Hazard	Topographic	Topographical Wetness	Topographical Wetness Index (TWI)	Hydrological variables	Hydrologic
338	222	Art. 016	none	Hazard	topographic	Topographical Wetness	Topographical Wetness Index (TWI)	Hydrological variables	
688	722	Art. 033	Flood inventory	Hazard	Raster	Topographical Wetness	Topographical Wetness Index (TWI)	Hydrological variables	Flood
698	725	Art. 034	Flood	Hazard	Topographical	Topographical Wetness	Topographical Wetness Index (TWI)	Hydrological variables	Multi-hazard
725	727	Art. 036	Flood hazard	Hazard	Topographical	Topographical Wetness	Topographical Wetness Index (TWI)	Hydrological variables	Flood hazard
749	739	Art. 038	Hydrology / Flood	Hazard	(DEM)	Topographical Wetness	Topographical Wetness Index (TWI)	Hydrological variables	Hydrology /
850	765	Art. 043	Hazard	Hazard	Directly identifies	Topographical Wetness	Topographical Wetness Index (TWI)	Hydrological variables	FLOOD
903	769	Art. 045	Hazard	Hazard	Raster	Wetness Hazard Score	Topographical Wetness Index (TWI)	Hydrological variables	Flood Hazard
951	772	Art. 047	Hazard	Hazard	ALOS PALSAR	Topographical Wetness	Topographical Wetness Index (TWI)	Hydrological variables	GEOPHYSICA
982	780	Art. 050	Susceptibility	Hazard	DEM	Topographical Wetness	Topographical Wetness Index (TWI)	Hydrological variables	FLOOD
1068	805	Art. 054	Topographic	Hazard	TWI	Topographical Wetness	Topographical Wetness Index (TWI)	Hydrological variables	Topographic
1245	886	Art. 065	Flood Conditioning Factor	Hazard	TWI	Topographical Wetness	Topographical Wetness Index (TWI)	Hydrological variables	Flood
1297	918	Art. 069	none	Hazard	TWI	Topographical Wetness	Topographical Wetness Index (TWI)	Hydrological variables	
1371	928	Art. 073	Hazard	Hazard	TWI (unitless)	Topographical Wetness	Topographical Wetness Index (TWI)	Hydrological variables	Hazard
1402	944	Art. 075	Hazard	Hazard	TWI (unitless)	Topographical Wetness	Topographical Wetness Index (TWI)	Hydrological variables	Hazard
1461	978	Art. 078	Hazard	Hazard	TWI (unitless)	Topographical Wetness	Topographical Wetness Index (TWI)	Hydrological variables	Hazard
1651	1076	Art. 089	Hazard	Hazard	TWI (unitless)	Topographical Wetness	Topographical Wetness Index (TWI)	Hydrological variables	Waterlogging
1686	1097	Art. 091	Hazard	Hazard	TWI (unitless)	Topographical Wetness	Topographical Wetness Index (TWI)	Hydrological variables	HYDROLOGIC
213	164	Art. 012	Hazard (Drought)	Hazard	Difference	Water balance (mm)	Water balance - Precipitation minus PET	Hydrological variables	Drought
69	46	Art. 004	Hazard	Hazard	water depth (m)	Flood hazard	Water depth (m)	Hydrological variables	Hazard
709	726	Art. 035	Hazard	Hazard	Bluespot	Bluespot Depth (BS)	Water depth (m)	Hydrological variables	Hydrological
742	728	Art. 037	Flood Hazard / Impact	Hazard	Water Depth	Water Depth Estimates	Water depth (m)	Hydrological variables	Flood Hazard
760	740	Art. 039	Hydrology	Hazard	Water Level Data	Water Level Data	Water depth (m)	Hydrological variables	Hydrology
874	766	Art. 044	Hazard	Hazard	Model Output	Inundation depth	Water depth (m)	Hydrological variables	HAZARD
1060	805	Art. 054	Topographic	Hazard	Valley depth (m)	Valley depth	Water depth (m)	Hydrological variables	Topographic
1216	880	Art. 064	Hazard	hazard	Flood depth (m)	Water depth	Water depth (m)	Hydrological variables	Hazard
1424	957	Art. 076	Hazard	Hazard	River level (m)	River Level	Water depth (m)	Hydrological variables	Hazard
1515	995	Art. 081	Hazard	Hazard	Stage Gauging	Water level (m)	Water depth (m)	Hydrological variables	Model
1568	1062	Art. 085	Hazard	Hazard	Water depth (m)	Flood hazard - flood depth	Water depth (m)	Hydrological variables	Hazard
1631	1071	Art. 087	Hazard	Hazard	Flood inundation	Rainfall-Runoff-Inundation	water depth (m)	Hydrological variables	FLOOD
2059	1408	Art. 114	Hazard	Hazard	Water depth	Height of flood measured	Water depth (m)	Hydrological variables	Hazard
2060	1408	Art. 114	Hazard	Hazard	Water depth on	Height of flood measured	Water depth (m)	Hydrological variables	Hazard
2173	1427	Art. 116	Hazard	Hazard	Maximum water	Depth (D)	Water depth (m)	Hydrological variables	Flood Risk
2201	1432	Art. 118	Hazard	Hazard	Hourly water level	Water level hydrograph	Water depth (m)	Hydrological variables	Hazard:
5	24	Art. 001	Vulnerability	Exposure	Number of	Number of housings	Land use and land cover classification (LULC)	Land Cover and	Physical
47	35	Art. 003	flood hazard and	Exposure	Land use and land	Land use and land cover	Land use and land cover classification (LULC)	Land Cover and	flood hazard
54	35	Art. 003	Built Environment	Exposure	Built-up Area	Built-up Area Density (BAD)	Land use and land cover classification (LULC)	Land Cover and	Built
59	46	Art. 004	Land Cover	Exposure	CORINE land cover	Land Cover (present)	Land use and land cover classification (LULC)	Land Cover and	Land Cover
68	46	Art. 004	Land Cover	Exposure	density of	density of enriching	Land use and land cover classification (LULC)	Land Cover and	Land Cover
74	51	Art. 005	Sensitivity	Exposure	Land use	Land use sensitivity	Land use and land cover classification (LULC)	Land Cover and	Sensitivity
94	73	Art. 006	Vulnerability	Exposure	Number of sites	Heritage and Cultural Relics	Land use and land cover classification (LULC)	Land Cover and	Vulnerability
110	83	Art. 007	none	Exposure	LULC	LULC	Land use and land cover classification (LULC)	Land Cover and	
125	84	Art. 008	none	Exposure	Land Use and	Land Use and Land Cover	Land use and land cover classification (LULC)	Land Cover and	
142	85	Art. 009	Flood Impact Assessment	Exposure	ESA WorldCover	Cropland & Built-up area	Land use and land cover classification (LULC)	Land Cover and	Flood Impact
146	85	Art. 009	Flood Impact Assessment	Exposure	Google Research –	Building Footprints (un.)	Land use and land cover classification (LULC)	Land Cover and	Flood Impact
166	104	Art. 010	vulnerability	Exposure	LULC	LULC	Land use and land cover classification (LULC)	Land Cover and	Waterlogging
171	117	Art. 011	Exposure	Exposure		Built-up areas	Land use and land cover classification (LULC)	Land Cover and	Exposure /
177	117	Art. 011	Exposure	Exposure		Wastelands	Land use and land cover classification (LULC)	Land Cover and	Exposure /
182	117	Art. 011	Exposure	Exposure	LCLU	Others	Land use and land cover classification (LULC)	Land Cover and	Exposure /
188	164	Art. 012	Hazard (Flood)	Exposure	Land Use/Land	LULC	Land use and land cover classification (LULC)	Land Cover and	Flood
225	196	Art. 013	Vulnerability and baseline	Exposure	Land use change	Land use and status	Land use and land cover classification (LULC)	Land Cover and	Land
226	196	Art. 013	Vulnerability and baseline	Exposure	Historical Land	Land cover map of the whole	Land use and land cover classification (LULC)	Land Cover and	Vulnerability
227	196	Art. 013	Vulnerability and baseline	Exposure	Current Land	Land cover map of the whole	Land use and land cover classification (LULC)	Land Cover and	3.1.
243	200	Art. 014	3.2. The nexus of urban	Exposure	temporal datasets	Land use identification and	Land use and land cover classification (LULC)	Land Cover and	3.2. The
245	200	Art. 014	3.2. The nexus of urban	Exposure	temporal datasets	Land use identification and	Land use and land cover classification (LULC)	Land Cover and	3.2. The
324	215	Art. 015	Hazard	Exposure	Compactness ratio	Compactness ratio	Land use and land cover classification (LULC)	Land Cover and	Morphometri
341	222	Art. 016	none	Exposure	land use and land	land use and land cover	Land use and land cover classification (LULC)	Land Cover and	
357	278	Art. 017	Sensitivity	Exposure		Urban Extent (UE)	Land use and land cover classification (LULC)	Land Cover and	Vulnerability -
362	278	Art. 017	Sensitivity	Exposure		Urbanization Ratio (UH)	Land use and land cover classification (LULC)	Land Cover and	Sakib Flood
378	302	Art. 018	Exposure	Exposure		Land use (LU)	Land use and land cover classification (LULC)	Land Cover and	
379	302	Art. 018	Susceptibility	Exposure	Urban growth (%)	Urban growth (UG)	Land use and land cover classification (LULC)	Land Cover and	
391	363	Art. 020	Vulnerability	Exposure		Land use	Land use and land cover classification (LULC)	Land Cover and	Flood
421	483	Art. 022	Land Use Classification	Exposure	Land use map	Land use map 2011	Land use and land cover classification (LULC)	Land Cover and	Land Use
422	483	Art. 022	Land Use Classification	Exposure	Land use map	Land use map 2018	Land use and land cover classification (LULC)	Land Cover and	Land Use
436	524	Art. 023	Vulnerability	Exposure		Urban Context	Land use and land cover classification (LULC)	Land Cover and	Vulnerability
459	534	Art. 024	Population and	Exposure		County and city parcel	Land use and land cover classification (LULC)	Land Cover and	Population
469	542	Art. 025	Flood Event Classification	Exposure	City hall, hospital,	Public buildings damage	Land use and land cover classification (LULC)	Land Cover and	Flood Event
476	542	Art. 025	Land Cover	Exposure	Land cover and	Land cover and land use	Land use and land cover classification (LULC)	Land Cover and	Land Cover
477	542	Art. 025	Land Cover	Exposure	LCLU - 1956,	Historical Land cover and	Land use and land cover classification (LULC)	Land Cover and	Land Cover
497	559	Art. 026	Sensitivity	Exposure	Classified heritage	Classified heritage	Land use and land cover classification (LULC)	Land Cover and	Cultural
498	559	Art. 026	Sensitivity	Exposure		Archaeological areas	Land use and land cover classification (LULC)	Land Cover and	Cultural
500	559	Art. 026	Sensitivity	Exposure		Tourist accommodation	Land use and land cover classification (LULC)	Land Cover and	Economic
501	559	Art. 026	Sensitivity	Exposure		Retail stores	Land use and land cover classification (LULC)	Land Cover and	Economic
505	559	Art. 026	Adaptive capacity	Exposure	percentage of	Buildings – empty homes (%)	Land use and land cover classification (LULC)	Land Cover and	Resident
527	604	Art. 027	Elements of city	Exposure	City infrastructure	Area of gas supply facility	Land use and land cover classification (LULC)	Land Cover and	Elements of
528	604	Art. 027	Elements of city	Exposure	City infrastructure	Area of heat supply facility	Land use and land cover classification (LULC)	Land Cover and	Elements of
529	604	Art. 027	Elements of city	Exposure	City infrastructure	Area of oil storage cavern	Land use and land cover classification (LULC)	Land Cover and	Elements of
532	604	Art. 027	Elements of city	Exposure	Building	Number of detached house	Land use and land cover classification (LULC)	Land Cover and	Elements of
578	709	Art. 030	Physical vulnerability	Exposure		Land use / land cover	Land use and land cover classification (LULC)	Land Cover and	Physical
586	709	Art. 030	Social vulnerability	Exposure		Percentage of land used as	Land use and land cover classification (LULC)	Land Cover and	Social
594	710	Art. 031	Sensitivity	Exposure	Housing	Caravan accommodation	Land use and land cover classification (LULC)	Land Cover and	"Economic
692	722	Art. 033	Exposure	Exposure	Raster	LULC 2020 (CA-Markov	Land use and land cover classification (LULC)	Land Cover and	Flood
703	725	Art. 034	Built-up Area	Exposure	Raster	Normalized Difference Built-	Land use and land cover classification (LULC)	Land Cover and	Multi-hazard
713	726	Art. 035	Exposure	Exposure	Image	Land cover Classification/	Land use and land cover classification (LULC)	Land Cover and	Land cover
714	726	Art. 035	Exposure	Exposure	Vectorization:	Building footprints	Land use and land cover classification (LULC)	Land Cover and	Infrastructure
717	726	Art. 035	Exposure	Exposure	Aerial	Orthoimagery	Land use and land cover classification (LULC)	Land Cover and	Base
720	727	Art. 036	Land use/land cover	Exposure	Land use/land	Land use/land cover	Land use and land cover classification (LULC)	Land Cover and	Land
751	739	Art. 038	Land Cover / Flood	Exposure	Land Use/Land	Land Use/Land Cover (LULC)	Land use and land cover classification (LULC)	Land Cover and	Land Cover /
762	740	Art. 039	Socioeconomic and	Exposure	E1: Number of	E1: Number of households	Land use and land cover classification (LULC)	Land Cover and	Socioeconom
765	740	Art. 039	Socioeconomic and	Exposure	E4: Number of	E4: Number of cultural	Land use and land cover classification (LULC)	Land Cover and	Socioeconom
768	740	Art. 039	Socioeconomic and	Exposure	E6: Number of	E6: Number of	Land use and land cover classification (LULC)	Land Cover and	Socioeconom
774	740	Art. 039	Level of Adaptation	Exposure	A4: Non-buildable	A4: Non-buildable areas in	Land use and land cover classification (LULC)	Land Cover and	Level of
857	765	Art. 043	Vulnerability	Exposure	Different land use	Land use land cover - Base	Land use and land cover classification (LULC)	Land Cover and	FLOOD
858	765	Art. 043	Vulnerability	Exposure	Same as above.	Land use land cover -	Land use and land cover classification (LULC)	Land Cover and	FLOOD
876	766	Art. 044	Vulnerability	Exposure	Number of	Number of historic places	Land use and land cover classification (LULC)	Land Cover and	PHYSICAL
877	766	Art. 044	Vulnerability	Exposure	Vector (Grid)	Urban density	Land use and land cover classification (LULC)	Land Cover and	PHYSICAL
878	766	Art. 044	Vulnerability	Exposure	Vector (Grid)	Land use	Land use and land cover classification (LULC)	Land Cover and	PHYSICAL
901	769	Art. 045	Hazard	Exposure	Raster	Land Use Land Cover (LULC)	Land use and land cover classification (LULC)	Land Cover and	Flood Hazard
908	771	Art. 046	Physical	Exposure	Land Use / Land	Land Use / Land Cover	Land use and land cover classification (LULC)	Land Cover and	Physical
952	772	Art. 047	Exposure	Exposure	Landsat 5 TM	Land Use Land Cover (LULC) -	Land use and land cover classification (LULC)	Land Cover and	LULC
953	772	Art. 047	Exposure	Exposure	Landsat 7 ETM+	Land Use Land Cover (LULC) -	Land use and land cover classification (LULC)	Land Cover and	LULC
954	772	Art. 047	Exposure	Exposure	Landsat 8 OLI	Land Use Land Cover (LULC) -	Land use and land cover classification (LULC)	Land Cover and	LULC
981	777	Art. 049	Exposure	Exposure	Raster	Land Use Land Cover (LULC)	Land use and land cover classification (LULC)	Land Cover and	EXPOSURE
987	780	Art. 050	Susceptibility	Exposure	LULC Data	Land Use Land Cover (LULC)	Land use and land cover classification (LULC)	Land Cover and	FLOOD
1012	790	Art. 052	hazard	Exposure	Land-use type (LU)	Land-use type (LU)	Land use and land cover classification (LULC)	Land Cover and	HAZARD (risk
1023	793	Art. 053	Physical	Exposure	BLDRSDNO	Residential buildings/km²	Land use and land cover classification (LULC)	Land Cover and	Physical
1024	793	Art. 053	Physical	Exposure	BUFAR	Built-up area density	Land use and land cover classification (LULC)	Land Cover and	Physical
1042	793	Art. 053	Economic	Exposure	LURSDSK	Residential land use ratio	Land use and land cover classification (LULC)	Land Cover and	Economic
1046	793	Art. 053	Economic	Exposure	LUSRVSK	Service land use ratio	Land use and land cover classification (LULC)	Land Cover and	Economic
1059	793	Art. 053	Economic	Exposure		Industrial and commercial	Land use and land cover classification (LULC)	Land Cover and	Economic
1067	805	Art. 054	Land cover	Exposure	Land cover type	Land cover	Land use and land cover classification (LULC)	Land Cover and	Land cover

1346	927	Art. 072	Performance assessment	Exposure	Imperviousness	Percentage of impervious	Surface Permeability Class	Land Cover and
1359	927	Art. 072	LID scenarios	Exposure	Permeable	Permeable pavement area	Surface Permeability Class	Land Cover and
1822	1222	Art. 100	Exposure	Exposure	Sealed surface (%)	Imperviousness (IMP)	Surface Permeability Class	Land Cover and
1914	1317	Art. 106	Hazard	Exposure	Hydraulic	Infiltration Parameters	Surface Permeability Class	Land Cover and
1986	1375	Art. 111	Sensibility	Exposure	Impervious	Percentage of paved area	Surface Permeability Class	Land Cover and
2230	1433	Art. 119	Socio-Environmental	Exposure	Percentage of	Degree of impermeability	Surface Permeability Class	Land Cover and
2278	1457	Art. 122	Susceptibility	Exposure	Urbanized area	Percentage of urbanization	Surface Permeability Class	Land Cover and
544	693	Art. 028	Hazard	Hazard	Tmin	CSDI – Cold spell duration	Cold spell frequency (days/year)	Meteorological
842	762	Art. 042	Hazard	Hazard	Number of days in	Cold spell frequency	Cold spell frequency (days/year)	Meteorological
452	534	Art. 024	hazard	hazard		Hurricane forecast tracks,	Cyclone frequency (events/year)	Meteorological
1009	790	Art. 052	hazard	hazard	Typhoon	Typhoon frequency	Cyclone frequency (events/year)	Meteorological
2382	1480	Art. 128	Hazard	Hazard	Number of annual	Typhoon frequency	Cyclone frequency (events/year)	Meteorological
694	722	Art. 033	Flood hazard	Hazard	Raster	Global Climate Models	Global Climate Models (GCMs)	Meteorological
872	766	Art. 044	Hazard	Hazard	Gridded Raster	GCM climate indices (5th,	Global Climate Models (GCMs)	Meteorological
205	164	Art. 012	Hazard (Drought)	Hazard	PET (mm)	Potential Evapotranspiration	Potential Evapotranspiration (PET) (mm)	Meteorological
206	164	Art. 012	Hazard (Flood)	Hazard	Annual maximum	Annual maxima (rainfall)	Precipitation - 5-day continuous max. (mm)	Meteorological
408	424	Art. 021	Hazard	Hazard	5-day	Maximum 5-day continuous	Precipitation - 5-day continuous max. (mm)	Meteorological
546	693	Art. 028	Hazard	Hazard	Precipitation	RX5day – Maximum 5-day	Precipitation - 5-day continuous max. (mm)	Meteorological
1440	977	Art. 077	Hazard	Hazard	Max 5-day	Rx5day	Precipitation - 5-day continuous max. (mm)	Meteorological
207	164	Art. 012	Hazard (Flood)	Hazard	K-S test statistic	Goodness of fit test (rainfall)	Precipitation - Annual max. (mm/year)	Meteorological
208	164	Art. 012	Hazard (Flood)	Hazard	Extreme rainfall	Extreme value event	Precipitation - Annual max. (mm/year)	Meteorological
270	200	Art. 014	hazard	hazard	The amount of	heavy rainfalls in the	Precipitation - Annual max. (mm/year)	Meteorological
577	709	Art. 030	Physical vulnerability	Hazard		Total rainfall duration	Precipitation - Annual max. (mm/year)	Meteorological
1323	924	Art. 071	Hazard	Hazard	Total number of	Annual Cumulative Heavy	Precipitation - Annual max. (mm/year)	Meteorological
2196	1432	Art. 118	Hazard	Hazard	Annual maximum	Maximum annual rainfall	Precipitation - Annual max. (mm/year)	Meteorological
22	24	Art. 001	Vulnerability	Hazard	Annual	Annual precipitation (mm)	Precipitation - Annual mean (mm/year)	Meteorological
23	24	Art. 001	Vulnerability	Hazard	Snow	Snow	Precipitation - Annual mean (mm/year)	Meteorological
39	25	Art. 002	Thematic mapping	Hazard	Rainfall input	Rainfall input	Precipitation - Annual mean (mm/year)	Meteorological
46	35	Art. 003	flood hazard and	Hazard	Rainfall (annual)		Precipitation - Annual mean (mm/year)	Meteorological
128	84	Art. 008	none	Hazard	WorldClim rainfall	Rainfall	Precipitation - Annual mean (mm/year)	Meteorological
158	104	Art. 010	hazard	hazard	0.25 × 0.25	Rainfall	Precipitation - Annual mean (mm/year)	Meteorological
296	215	Art. 015	Hazard	Hazard	Mean annual	Mean annual rainfall	Precipitation - Annual mean (mm/year)	Meteorological
336	222	Art. 016	none	Hazard	annual rainfall	annual rainfall	Precipitation - Annual mean (mm/year)	Meteorological
366	278	Art. 017	hazard	hazard		Historical rainfall	Precipitation - Annual mean (mm/year)	Meteorological
383	302	Art. 018	Exposure	Hazard	Rainfall amount	Rainfall amount (R)	Precipitation - Annual mean (mm/year)	Meteorological
401	363	Art. 020	Hazard	Hazard		Rainfall (annual average)	Precipitation - Annual mean (mm/year)	Meteorological
439	524	Art. 023	Vulnerability	hazard		Rainfall rate	Precipitation - Annual mean (mm/year)	Meteorological
554	693	Art. 028	Hazard	Hazard	Precipitation	SDII – Simple daily intensity	Precipitation - Annual mean (mm/year)	Meteorological
691	722	Art. 033	Flood inventory	Hazard	Gridded Dataset	Rainfall	Precipitation - Annual mean (mm/year)	Meteorological
722	727	Art. 036	Rainfall	Hazard	Rainfall	Rainfall intensity	Precipitation - Annual mean (mm/year)	Meteorological
729	727	Art. 036	Hazard	Hazard	Annual Mean	Annual Mean Rainfall	Precipitation - Annual mean (mm/year)	Meteorological
753	739	Art. 038	Climate / Flood	Hazard	Annual rainfall	Precipitation (mm)	Precipitation - Annual mean (mm/year)	Meteorological
851	765	Art. 043	Hazard	Hazard	Climatic trigger	Average annual rainfall -	Precipitation - Annual mean (mm/year)	Meteorological
943	772	Art. 047	Hazard	Hazard	Meteo-station	Rainfall distribution map in	Precipitation - Annual mean (mm/year)	Meteorological
944	772	Art. 047	Hazard	Hazard	Meteo-station	Rainfall distribution map in	Precipitation - Annual mean (mm/year)	Meteorological
945	772	Art. 047	Hazard	Hazard	Meteo-station	Rainfall distribution map in	Precipitation - Annual mean (mm/year)	Meteorological
974	777	Art. 049	Hazard	Hazard	Gridded Raster	Average annual rainfall	Precipitation - Annual mean (mm/year)	Meteorological
990	780	Art. 050	Susceptibility	Hazard	Rainfalll Data	Rainfall	Precipitation - Annual mean (mm/year)	Meteorological
1065	805	Art. 054	Climate related	hazard	Rainfall (mm)	Rainfall	Precipitation - Annual mean (mm/year)	Meteorological
1075	816	Art. 055	Hazard	hazard	Annual rainfall	Magnitude of annual rainfall	Precipitation - Annual mean (mm/year)	Meteorological
1309	921	Art. 070	Current Flood Risk	Hazard	Mean annual	Rainfall data	Precipitation - Annual mean (mm/year)	Meteorological
1322	924	Art. 071	Hazard	Hazard	Annual	Precipitation data	Precipitation - Annual mean (mm/year)	Meteorological
1353	927	Art. 072	Design rainfall	Hazard	Rainfall depth	Temporal pattern of	Precipitation - Annual mean (mm/year)	Meteorological
1365	928	Art. 073	Hazard	Hazard	Annual	Annual Average Rainfall	Precipitation - Annual mean (mm/year)	Meteorological
1392	938	Art. 074	Hazard	Hazard	Annual	Rainfall factor	Precipitation - Annual mean (mm/year)	Meteorological
1430	957	Art. 076	Hazard	Hazard	Snow	Snow Accumulation	Precipitation - Annual mean (mm/year)	Meteorological
1432	977	Art. 077	Hazard	Hazard	Precipitation	Historical Precipitation	Precipitation - Annual mean (mm/year)	Meteorological
1458	978	Art. 078	Hazard	Hazard	Annual average	Precipitation	Precipitation - Annual mean (mm/year)	Meteorological
1481	988	Art. 080	Hazard	Hazard	Weather Research	Forecasted rainfall (mm)	Precipitation - Annual mean (mm/year)	Meteorological
1522	1001	Art. 082	Hazard	Hazard	Rainfall (mm)	Rainfall (R)	Precipitation - Annual mean (mm/year)	Meteorological
1641	1073	Art. 088	Hazard	Hazard	Annual rainfall	Rainfall	Precipitation - Annual mean (mm/year)	Meteorological
1652	1076	Art. 089	Hazard	Hazard	Annual rainfall	Rainfall	Precipitation - Annual mean (mm/year)	Meteorological
1673	1090	Art. 090	Hazard / Suitability	Hazard	Mean annual	Rainfall	Precipitation - Annual mean (mm/year)	Meteorological
1695	1097	Art. 091	Hazard	Hazard	Annual rainfall	Rainfall (Rf)	Precipitation - Annual mean (mm/year)	Meteorological
1725	1116	Art. 093	Hazard	Hazard	Annual rainfall	Rainfall	Precipitation - Annual mean (mm/year)	Meteorological
1736	1118	Art. 094	Exposure	Hazard	Rainfall (mm)	Amount of rainfall	Precipitation - Annual mean (mm/year)	Meteorological
1791	1149	Art. 098	Suitability	Hazard	Annual	Precipitation	Precipitation - Annual mean (mm/year)	Meteorological
1829	1228	Art. 101	Hazard	Hazard	Average annual	Rainfall (C5)	Precipitation - Annual mean (mm/year)	Meteorological
1842	1256	Art. 102	Hazard	Hazard	Mean annual	Precipitation	Precipitation - Annual mean (mm/year)	Meteorological
1912	1317	Art. 106	Hazard	Hazard	Design rainfall	Precipitation	Precipitation - Annual mean (mm/year)	Meteorological
1935	1318	Art. 107	Hazard	Hazard	Rainfall intensity	Rainfall Distribution	Precipitation - Annual mean (mm/year)	Meteorological
2185	1428	Art. 117	Hazard	Hazard	Total precipitation	Annual total precipitation	Precipitation - Annual mean (mm/year)	Meteorological
549	693	Art. 028	Hazard	Hazard	Precipitation	R10mm – Heavy	Precipitation - Annual very heavy days	Meteorological
550	693	Art. 028	Hazard	Hazard	Precipitation	R20mm – Very heavy	Precipitation - Annual very heavy days	Meteorological
553	693	Art. 028	Hazard	Hazard	Precipitation	PRCPTOT – Total	Precipitation - Annual very heavy days	Meteorological
1441	977	Art. 077	Hazard	Hazard	Number of very	R20mm – Very heavy	Precipitation - Annual very heavy days	Meteorological
551	693	Art. 028	Hazard	Hazard	Precipitation	CDD – Consecutive dry days	Precipitation - Consecutive dry days (CDD)	Meteorological
442	524	Art. 023	Vulnerability	Hazard	T= is the number	Exposure Time / Rainfall	Precipitation - Continous duration (h)	Meteorological
1241	886	Art. 065	Flood Conditioning Factor	hazard	Rainfall duration	Rainfall duration	Precipitation - Continous duration (h)	Meteorological
2198	1432	Art. 118	Hazard	Hazard	Hourly rainfall	Rainfall hyetograph	Precipitation - Continous duration (h)	Meteorological
1240	886	Art. 065	Flood Conditioning Factor	hazard	Rainfall intensity	Rainfall intensity	Precipitation - Continous intensity (mm/h)	Meteorological
1511	995	Art. 081	Hazard	Hazard	Intensity-Duration-	Rainfall intensity (mm/hr)	Precipitation - Continous intensity (mm/h)	Meteorological
1985	1375	Art. 111	Sensibility	Hazard	Heavy rainfall	Annual rainstorm hours	Precipitation - Continous intensity (mm/h)	Meteorological
72	51	Art. 005	Hazard	Hazard	Daily precipitation	Rainy season rainstorm days	Precipitation - Daily (mm/day)	Meteorological
209	164	Art. 012	Hazard (Flood)	Hazard	Rainfall - Daily	Daily rainfall data	Precipitation - Daily (mm/day)	Meteorological
259	200	Art. 014	hazard	hazard	Daily rainfall (mm)	Daily rainfall	Precipitation - Daily (mm/day)	Meteorological
482	542	Art. 025	Precipitation Hazard	Hazard		Daily expected precipitation	Precipitation - Daily (mm/day)	Meteorological
483	542	Art. 025	Precipitation Observations	Hazard		Long-term daily rainfall data	Precipitation - Daily (mm/day)	Meteorological
484	542	Art. 025	Precipitation Hazard	Hazard		Daily precipitation fields	Precipitation - Daily (mm/day)	Meteorological
732	728	Art. 037	Weather Data	Hazard	Climatic Data	Rainfall	Precipitation - Daily (mm/day)	Meteorological
871	766	Art. 044	Hazard	Hazard	Point Data	Daily precipitation	Precipitation - Daily (mm/day)	Meteorological
1007	790	Art. 052	hazard	hazard	Daily precipitation	Daily precipitation	Precipitation - Daily (mm/day)	Meteorological
1299	918	Art. 069	none	Hazard	Cumulative	Rainfall data	Precipitation - Daily (mm/day)	Meteorological
1480	988	Art. 080	Hazard	Hazard	Automatic	Observed rainfall (mm)	Precipitation - Daily (mm/day)	Meteorological
1499	995	Art. 081	Hazard	Hazard	Weather Input	Daily precipitation (mm)	Precipitation - Daily (mm/day)	Meteorological
2197	1432	Art. 118	Hazard	Hazard	Total rainfall over	24-hour cumulative rainfall	Precipitation - Daily (mm/day)	Meteorological
1437	977	Art. 077	Hazard	Hazard	Corrected	Downscaled Precipitation	Precipitation - Daily difference (Future -	Meteorological
409	424	Art. 021	Hazard	Hazard	1-day	Maximum 1-day	Precipitation - Daily Max. (mm/day)	Meteorological
519	604	Art. 027	Exposure	Hazard	Climate exposure	Annual average daily	Precipitation - Daily Max. (mm/day)	Meteorological
545	693	Art. 028	Hazard	Hazard	Precipitation	RX1day – Maximum 1-day	Precipitation - Daily Max. (mm/day)	Meteorological
1443	977	Art. 077	Hazard	Hazard	Annual total wet	PRCPTOT	Precipitation - Daily Max. (mm/day)	Meteorological
2186	1428	Art. 117	Hazard	Hazard	Maximum 1-day	1-day extreme precipitation	Precipitation - Daily Max. (mm/day)	Meteorological
365	278	Art. 017	hazard	hazard	General	Future rainfall (2020–2060)	Precipitation - Future annual mean	Meteorological
695	722	Art. 033	Flood hazard	Hazard	Raster	Future rainfall simulation	Precipitation - Future annual mean	Meteorological
852	765	Art. 043	Hazard	Hazard	Same as above.	Average annual rainfall -	Precipitation - Future annual mean	Meteorological
1260	904	Art. 066	none	hazard	Rainfall intensity	Future Precipitation	Precipitation - Future annual mean	Meteorological
1311	921	Art. 070	Future Flood Risk	Hazard	Future rainfall	Shared Socioeconomic	Precipitation - Future annual mean	Meteorological
1500	995	Art. 081	Hazard	Hazard	Climate Change	Projected precipitation (mm)	Precipitation - Future annual mean	Meteorological
1506	995	Art. 081	Hazard	Hazard	Climate Model	Climate Model Future	Precipitation - Future annual mean	Meteorological
1507	995	Art. 081	Hazard	Hazard	Climate Model	Climate Model Future	Precipitation - Future annual mean	Meteorological
1508	995	Art. 081	Hazard	Hazard	Climate Model	Climate Model Future	Precipitation - Future annual mean	Meteorological
1433	977	Art. 077	Hazard	Hazard	Simulated	CMIP6 Climate Model Data -	Precipitation - Future daily mean (mm/day)	Meteorological
1434	977	Art. 077	Hazard	Hazard	Simulated	CMIP6 Climate Model Data -	Precipitation - Future daily mean (mm/day)	Meteorological
1435	977	Art. 077	Hazard	Hazard	Simulated	CMIP6 Climate Model Data -	Precipitation - Future daily mean (mm/day)	Meteorological
1436	977	Art. 077	Hazard	Hazard	Simulated	CMIP6 Climate Model Data -	Precipitation - Future daily mean (mm/day)	Meteorological
26	24	Art. 001	Vulnerability	Hazard	Months with	Months with heavy	Precipitation - Heavy frequency (days/year)	Meteorological
73	51	Art. 005	Hazard	Hazard	Daily precipitation	Rainy season precipitation	Precipitation - Heavy frequency (days/year)	Meteorological
210	164	Art. 012	Hazard (Drought)	Hazard	Standardized	SPEI	Precipitation - Heavy frequency (days/year)	Meteorological
297	215	Art. 015	Hazard	Hazard	Very heavy	Very heavy precipitation	Precipitation - Heavy frequency (days/year)	Meteorological
350	278	Art. 017	Exposure	Hazard	Observed Rainfall	Change in Rainfall (RI)	Precipitation - Heavy frequency (days/year)	Meteorological
451	534	Art. 024	Hazard	Hazard	Precursor rainfall	Precursor rainfall event	Precipitation - Heavy frequency (days/year)	Meteorological
518	604	Art. 027	Exposure	Hazard	Climate exposure	Number of days with	Precipitation - Heavy frequency (days/year)	Meteorological
547	693	Art. 028	Hazard	Hazard	Precipitation	R95p – Very wet days	Precipitation - Heavy frequency (days/year)	Meteorological
548	693	Art. 028	Hazard	Hazard	Precipitation	R99p – Extremely wet days	Precipitation - Heavy frequency (days/year)	Meteorological
576	709	Art. 030	Physical vulnerability	Hazard	rainfall intensity	Hourly rainfall intensity	Precipitation - Heavy frequency (days/year)	Meteorological
792	744	Art. 040	Hazard	Hazard	Precipitation	Extreme precipitation	Precipitation - Heavy frequency (days/year)	Meteorological
838	762	Art. 042	Hazard	Hazard	Frequency of daily	Rainfall - Heavy frequency	Precipitation - Heavy frequency (days/year)	Meteorological
971	774	Art. 048	Hazard	Hazard	Variation in	Coefficient of variation in	Precipitation - Heavy frequency (days/year)	Meteorological
972	774	Art. 048	Hazard	Hazard	Weighted addition	Climate Index (CI): Variation	Precipitation - Heavy frequency (days/year)	Meteorological
1076	816	Art. 055	Hazard	hazard	High rainfall	Frequency of daily rainfall	Precipitation - Heavy frequency (days/year)	Meteorological
1438	977	Art. 077	Hazard	Hazard	Very wet days	R95p – Very wet days	Precipitation - Heavy frequency (days/year)	Meteorological
1442	977	Art. 077	Hazard	Hazard	Simple daily	SDII	Precipitation - Heavy frequency (days/year)	Meteorological
1782	1146	Art. 097	Hazard	Hazard	Heavy	Number of days with	Precipitation - Heavy frequency (days/year)	Meteorological
1783	1146	Art. 097	Hazard	Hazard	Heavy	Number of days with	Precipitation - Heavy frequency (days/year)	Meteorological
1784	1146	Art. 097	Hazard	Hazard	Heavy	Number of days with	Precipitation - Heavy frequency (days/year)	Meteorological
1785	1146	Art. 097	Hazard	Hazard	Heavy	Number of days with	Precipitation - Heavy frequency (days/year)	Meteorological
1860	1267	Art. 103	Natural	Hazard	Summer rainfall	Monthly Total Summer	Precipitation - Heavy frequency (days/year)	Meteorological
2174	1427	Art. 116	Hazard	Hazard	Flood duration	Duration Factor (DF)	Precipitation - Heavy frequency (days/year)	Meteorological
2380	1480	Art. 128	Hazard	Hazard	Number of days	Daily rainfall casualty	Precipitation - Heavy frequency (days/year)	Meteorological
2381	1480	Art. 128	Hazard	Hazard	Summer rainfall /	Summer rainfall localization	Precipitation - Heavy frequency (days/year)	Meteorological
410	424	Art. 021	Hazard	Hazard	1-hour	Maximum 1-hour	Precipitation - Hourly Max. (mm/h)	Meteorological
1429	957	Art. 076	Hazard	Hazard	Hourly maximum	Precipitation (mm)	Precipitation - Hourly Max. (mm/h)	Meteorological
369	278	Art. 017	hazard	hazard	Rainfall intensity	Intensity-Duration-	Precipitation - intensity - Future (mm/h)	Meteorological
371	278	Art. 017	hazard	hazard	Rainfall intensity	Intensity-Duration-	Precipitation - intensity - Historical (mm/h)	Meteorological

1352	927	Art. 072	Design rainfall	Hazard	Rainfall intensity	Intensity-Duration-	Precipitation - intensity (mm/h)	Meteorological			Design	EPA's Storm	Statistical-probabilistic	Northeast Regional Climate	Meteorological Data: Official data	IDF curve derivation: extraction		✓				✓											VULN INTO RISK
839	762	Art. 042	Hazard	Hazard	Drought	Drought frequency	Precipitation - Low frequency: drought	Meteorological				Standardized	Number of months with	(1) European Commission - Joint	Meteorological Data: Satellite	Extraction of SPI-3 values at city						✓				✓							RISK
991	785	Art. 051	Exposure	Hazard	Drought months	Drought months	Precipitation - Low frequency: drought	Meteorological			Exposure	Statistical	Number of months	University of East Anglia Climate	Meteorological Data: Scientific	Time series extraction: anomaly						✓					✓	✓					VULN
552	693	Art. 028	Hazard	Hazard	Precipitation	CWD – Consecutive wet days	Precipitation - Max. consecutive days	Meteorological			Duration	ETCCDI	Maximum number of	ERA5 reanalysis dataset.	Meteorological Data: Official			✓															RISK
1439	977	Art. 077	Hazard	Hazard	Consecutive wet	CWD – Consecutive wet days	Precipitation - Max. consecutive days	Meteorological				RClimdex	Extreme precipitation	Derived from downscaled CMIP6	Software Simulation	Calculation using RClimdex						✓						✓					VULN INTO RISK
101	83	Art. 007	none	Hazard	Rainfall	Rainfall (June–September)	Precipitation - Monthly (mm/month)	Meteorological				Multi-criteria	Represents the intensity	USGS NASA POWER Data Access	Meteorological Data	Rainfall was classified into five						✓										✓	RISK
1008	790	Art. 052	hazard	Hazard	monthly	monthly precipitation	Precipitation - Monthly (mm/month)	Meteorological			HAZARD (risk	Pressure-state-	Monthly precipitation	28 meteorological stations	Meteorological Data: Official	The spatial pattern of Flood						✓											VULN INTO RISK
1212	863	Art. 063	Flood Hazard Index (FHI)	Hazard	Average Rainfall -	Rainfall	Precipitation - Monthly (mm/month)	Meteorological			Flood	Fuzzy Analytic	Precipitation intensity	Climatic Research Unit (CRU)	Meteorological Data: Scientific	Rainfall data extraction: spatial						✓					✓						VULN INTO RISK
1291	914	Art. 068	none	hazard	Rainfall (mm)	Rainfall Distribution	Precipitation - Monthly (mm/month)	Meteorological				Multi-Criteria	Spatial distribution of	Malaysian Department of	Meteorological Data: Official	Inverse Distance Weighting (IDW)						✓										✓	RISK
1752	1128	Art. 095	Hazard	Hazard	Rainfall -Monthly	Precipitation	Precipitation - Monthly (mm/month)	Meteorological			METEOROLO	GIS weighted	Historical monthly	(1) WorldClim - Historical	Meteorological Data: Software	Data download; resampling to 30						✓											RISK
533	693	Art. 028	Hazard	Hazard	Annual maximum	TXx – Annual maxima of	Temperature - Annual max, daytime (ºC)	Meteorological			Absolute	ETCCDI	Annual maximum value	ERA5 reanalysis dataset.	Meteorological Data: Official			✓				✓											RISK
1426	957	Art. 076	Hazard	Hazard	Temperature (°C)	Temperature	Temperature - Annual max, daytime (ºC)	Meteorological			Hazard	MKT; SSE;	Mean, maximum, and	(1) Hungarian Meteorological	Meteorological Data: Official	Data collection (1973–2022):		✓				✓											VULN INTO RISK
534	693	Art. 028	Hazard	Hazard	Annual maximum	TNx – Annual maxima of	Temperature - Annual max, nighttime (ºC)	Meteorological			Absolute	ETCCDI	Annual maximum value	ERA5 reanalysis dataset.	Meteorological Data: Official			✓				✓											RISK
24	24	Art. 001	Vulnerability	Hazard	Temperature (ºC)	Temperature (ºC)	Temperature - Annual mean (ºC)	Meteorological			Environment	Fuzzy rating	Normal (max 1.25 ºC and	(1) Kelowna Weather Stats	Meteorological Data: Scientific	Importance level x Fuzzy number						✓					✓						VULN INTO RISK
129	84	Art. 008	none	Hazard	WorldClim	Temperature	Temperature - Annual mean (ºC)	Meteorological				Interpolated	Influences	Climate data obtained from the	Meteorological Data: Official	WorldClim temperature data						✓											RISK
364	278	Art. 017	hazard	Hazard	Historical temperature	Historical temperature	Temperature - Annual mean (ºC)	Meteorological				Normalization	Future climate data The	(1) Jordanian Ministry of Water	Official data	Trend analysis		✓				✓											VULN INTO RISK
1427	957	Art. 076	Hazard	Hazard	Temperature (°C)	Temperature	Temperature - Annual mean (ºC)	Meteorological			Hazard	MKT; SSE;	Mean, maximum, and	(1) Hungarian Meteorological	Meteorological Data: Official	Data collection (1973–2022):		✓				✓											VULN INTO RISK
1792	1149	Art. 098	Suitability	Hazard	Mean annual	Temperature	Temperature - Annual mean (ºC)	Meteorological			CLIMATIC	CRITIC	Average annual	(1) NASA/POWER (Prediction of	Meteorological Data: Software	Temperature data extraction:						✓					✓						VULN INTO RISK
535	693	Art. 028	Hazard	Hazard	Annual minimum	TXn – Annual minima of	Temperature - Annual min, daytime (ºC)	Meteorological			Absolute	ETCCDI	Annual minimum value of	ERA5 reanalysis dataset.	Meteorological Data: Official			✓				✓											RISK
536	693	Art. 028	Hazard	Hazard	Annual minimum	TNn – Annual minima of	Temperature - Annual min, nighttime (ºC)	Meteorological			Absolute	ETCCDI	Annual minimum value of	ERA5 reanalysis dataset.	Meteorological Data: Official			✓				✓											RISK
1428	957	Art. 076	Hazard	Hazard	Temperature (°C)	Temperature	Temperature - Annual min, nighttime (ºC)	Meteorological			Hazard	MKT; SSE;	Mean, maximum, and	(1) Hungarian Meteorological	Meteorological Data: Official	Data collection (1973–2022):		✓				✓											VULN INTO RISK
538	693	Art. 028	Hazard	Hazard	Percentage of	TX10p – Cold days	Temperature - Cold days (days/year)	Meteorological			Percentile	ETCCDI	Percentage of days when	ERA5 reanalysis dataset.	Meteorological Data: Official			✓				✓											RISK
841	762	Art. 042	Hazard	Hazard	Day: 1981–2020	Extreme low temperature	Temperature - Cold days (days/year)	Meteorological				Inverse	1st percentile of daily	(1) European Drought	Meteorological Data: Official	Extraction of daily minimum						✓										✓	RISK
537	693	Art. 028	Hazard	Hazard	Percentage of	TN10p – Cold nights	Temperature - Cold nights (days/year)	Meteorological			Percentile	ETCCDI	Percentage of days when	ERA5 reanalysis dataset.	Meteorological Data: Official			✓				✓											RISK
543	693	Art. 028	Hazard	Hazard	Tmax; Tmin	DTR – Diurnal temperature	Temperature - Diurnal temperature range	Meteorological			Variability	ETCCDI	Annual mean difference	ERA5 reanalysis dataset.	Meteorological Data: Official			✓				✓											RISK
367	278	Art. 017	hazard	Hazard	General	Future temperature	Temperature - Future scenario (specify SSP)	Meteorological				Normalization	Future climate data The	Regional Initiative for the	Meteorological Data: Official	Climate projection analysis		✓				✓											VULN INTO RISK
349	278	Art. 017	Exposure	Hazard	Observed	Change in Temperature (TC)	Temperature - Rate of Change in Annual	Meteorological			Vulnerability -	Normalization	This component	(1) Ministry of Water and	Official data; Meteorological Data	Observed temperatures data and		✓				✓											VULN INTO RISK
733	728	Art. 037	Weather Data	Hazard	Climatic Data	Temperature	Temperature - Rate of Change in Annual	Meteorological			Weather	Temporal	Rainfall and temperature	16 weather stations from United	Meteorological data	WPS Office Sheets 12.2.0.18911						✓											VULN INTO RISK
970	774	Art. 048	Hazard	Hazard	Change in	Rate of change in annual	Temperature - Rate of Change in Annual	Meteorological			CLIMATE	PCA with	Trend in maximum	India Water Resources	Meteorological Data: Scientific	Time series analysis: trend						✓						✓					VULN INTO RISK
971	774	Art. 048	Hazard	Hazard	Weighted addition	Climate Index (CI): Change in	Temperature - Rate of Change in Annual	Meteorological			CLIMATE	Software	Weighted addition of two	PCA extraction: component	Software Simulation	Principal Component Analysis												✓					VULN INTO RISK
1454	977	Art. 078	Framework Component	Hazard	Trend magnitude	Climate Tendency Rate	Temperature - Rate of Change in Annual	Meteorological				Climate	Rate of change for each	Derived from extreme	Software Simulation	Unary linear fitting method:												✓					VULN INTO RISK
540	693	Art. 028	Hazard	Hazard	Percentage of	TX90p – Warm days	Temperature - Warm days (days/year)	Meteorological			Percentile	ETCCDI	Percentage of days when	ERA5 reanalysis dataset.	Meteorological Data: Official			✓				✓											RISK
541	693	Art. 028	Hazard	Hazard	Annual number of	SU – Summer days	Temperature - Warm days (days/year)	Meteorological			Threshold	ETCCDI	Annual number of days	ERA5 reanalysis dataset.	Meteorological Data: Official			✓				✓											RISK
840	762	Art. 042	Hazard	Hazard	Day: 1981–2020	Extreme high temperature	Temperature - Warm days (days/year)	Meteorological				Inverse	99th percentile of daily	(1) European Drought	Meteorological Data: Official	Extraction of daily maximum						✓										✓	RISK
539	693	Art. 028	Hazard	Hazard	Percentage of	TN90p – Warm nights	Temperature - Warm nights (days/year)	Meteorological			Percentile	ETCCDI	Percentage of days when	ERA5 reanalysis dataset.	Meteorological Data: Official			✓				✓											RISK
542	693	Art. 028	Hazard	Hazard	Annual number of	TR – Tropical nights	Temperature - Warm nights (days/year)	Meteorological			Threshold	ETCCDI	Annual number of days	ERA5 reanalysis dataset.	Meteorological Data: Official			✓				✓											RISK
914	771	Art. 046	Sensitivity	Sensitivity	No. of dependent	No. of dependent population	People <5 and 65+ years	Population age	Older		Social	Principal		(1) Scientific Literature [51]: S.	Scientific Literature	0–2 (1); 2–4 (2); 4–10 (3)											✓						VULN INTO RISK
1058	793	Art. 053	Economic	Sensitivity	Dependency ratio (age)	Dependency ratio (age)	People <5 and 65+ years	Population age	Older		Economic	AHP: pairwise	Ratio of dependent	Central Agency for Public	Census Data: Official data	Ratio calculation: normalization	✓	✓															VULN
1096	819	Art. 056	Social	Sensitivity	Vulnerable-	Percentage of vulnerable	People <5 and 65+ years	Population age	Older		Social	Min-max	All vulnerable people	Haut-Commissariat Au Plan	Census Data: Official data	Population age group extraction:	✓	✓															VULN INTO RISK
1532	1058	Art. 084	Sensitivity	Sensitivity	Percentage (%)	The percentage of vulnerable	People <5 and 65+ years	Population age	Older		Sensitivity -	Indicator-		(1) Turkish Statistical Institute		Age group extraction: vulnerable	✓																VULN INTO RISK
2021	1394	Art. 113	Vulnerability	Sensitivity	Ratio of	Dependency ratio	People <5 and 65+ years	Population age	Older		Economic	Index-based	The ratio of dependents	(1) Primary data collected	Survey/questionnaire	Raw survey responses were used							✓										VULN
2077	1408	Art. 114	Sensitivity	Sensitivity	Ratio of	Ratio of dependents to total	People <5 and 65+ years	Population age	Older		Sensitivity	Index-based	The ratio of dependents	(1) Primary data collected	Survey/questionnaire	Raw survey responses were used							✓										VULN INTO RISK
2291	1460	Art. 123	Social Vulnerability	Sensitivity	Percentage of	Vulnerable groups: elderly,	People <5 and 65+ years	Population age	Older		Social	Focus group	The proportion of	Community workshops with 33	Survey/questionnaire	Questions answered using binary							✓										VULN INTO RISK
2372	1480	Art. 128	Vulnerability	Sensitivity	Vulnerable	Vulnerable population	People <5 and 65+ years	Population age	Older		Loss	Factor	The density of vulnerable	Statistics Korea - population	Census Data	Vulnerable population (under 15	✓																VULN INTO RISK
2398	1492	Art. 129	Vulnerability	Sensitivity	Proportion of	Age	People <5 and 65+ years	Population age	Older		Vulnerability	Multi-criteria	The proportion of	Chilean National Statistics	Census Data	Variables transformed into ratio							✓										VULN INTO RISK
2130	1425	Art. 115	Sensitivity	Sensitivity	Inhabitants aged	POP5	People 05 to 14 years	Population age			Youth Social	HSA; PCA; ISVI	The number of residents	Spanish Statistics Institute	Census Data	Variables were normalized to	✓																VULN INTO RISK
2132	1425	Art. 115	Sensitivity	Sensitivity	Population	PROJ_5	People 05 to 14 years	Population age			Youth Social	HSA; PCA; ISVI	The number of residents	Spanish Statistics Institute	Census Data	Variables were normalized to	✓																VULN INTO RISK
169	117	Art. 011	Vulnerability	Sensitivity	pop. Under 5	Population density (aged ≤5	People <5 years	Population age			Exposure /		Projected future	(1) NIES (2021) Japan SSP	Census Data: Official data	Aggregated to ~1 km x 1 km	✓										✓						VULN INTO RISK
495	559	Art. 026	Sensitivity	Sensitivity	Sensitive	Sensitive population –	People <5 years	Population age			Social		Number of residents	Instituto Nacional de Estatística	Census Data		✓																VULN
523	604	Art. 027	Elements of city	Sensitivity	Citizen	Number of people aged over	People <5 years	Population age			Elements of		Number of young	MLTM, 2011; Shim, 2013	Official data; Census Data:		✓	✓									✓						VULN
620	710	Art. 031	Sensitivity	Sensitivity	Dependent	≥3 dependent children	People <5 years	Population age			Health, Self		Percentage of households	UK Office for National Statistics	Census Data		✓																VULN INTO RISK
623	710	Art. 031	Sensitivity	Sensitivity	Dependent	Children households	People <5 years	Population age			Health, Self		Percentage of households	UK Office for National Statistics	Census Data		✓																VULN INTO RISK
1056	793	Art. 053	Social	Sensitivity		Children under 5 years	People <5 years	Population age			Social	AHP: pairwise	Number of children	Central Agency for Public	Census Data: Official data	Density calculation:	✓	✓															VULN
1328	924	Art. 071	Vulnerability	Sensitivity	%	Proportion of child	People <5 years	Population age			Vulnerability	AHP weighting	Percentage of population	Provincial and municipal	Census Data: Official data	Population age group extraction:	✓	✓															VULN INTO RISK
1924	1317	Art. 106	Vulnerability	Sensitivity	Children under 5	Young Children	People <5 years	Population age			DEMOGRAPH	GIS spatial	The number of children	(1) Sixth National Population	Census Data	Age group extraction: children	✓																VULN INTO RISK
2129	1425	Art. 115	Sensitivity	Sensitivity	Inhabitants aged	POP0	People <5 years	Population age			Youth Social	HSA; PCA; ISVI	The number of residents	Spanish Statistics Institute	Census Data	Variables were normalized to	✓																VULN INTO RISK
2131	1425	Art. 115	Sensitivity	Sensitivity	Population	PROJ_0	People <5 years	Population age			Youth Social	HSA; PCA; ISVI	Projected number of	Spanish Statistics Institute	Census Data	Variables were normalized to	✓																VULN INTO RISK
2357	1478	Art. 127	Demographic	Sensitivity	Persons under	Children population density	People <5 years	Population age			Demographic	Multi-criteria	The number of children	Census of India 2001 data for	Census Data	Demographic database (.dbf)	✓																VULN
2423	1505	Art. 130	Adaptive capacity	Sensitivity	Percentage of	Young people	People <5 years	Population age			Coping	Multicriteria	Young people assumed	City of Leipzig census data. Age	Census Data	Percentage of young people	✓																VULN INTO RISK
915	771	Art. 046	Sensitivity	Sensitivity	Population < 6	Population < 6 years	People <6 years	Population age			Social	Principal		(1) Census of India, 2011; (2)	Census Data; Scientific literature	0 (1); 1 (2); >1 (3)											✓						VULN INTO RISK
958	774	Art. 048	Vulnerability	Sensitivity	Dependent	Dependent population (0–6)	People <6 years	Population age			SOCIOECONO	PCA with	Proportion of young	Census of India - 1991, 2001,	Census Data	Data extraction; normalization:	✓																VULN INTO RISK
581	709	Art. 030	Social vulnerability	Sensitivity		Percentage of children (<7)	People <7 and 65+ years	Population age	Older		SOCIOECONO	CCFVI	Percentage of young	(1) 2006 census data; (2) 2013	Census Data:								✓										VULN INTO RISK
559	697	Art. 029	Sensitivity	Sensitivity	Education	Schooling age (7–12)	People 07 to 12 years	Population age			Social	PCA; SOM	Percentage of school age	Morocco Census RGPH 2014	Census Data		✓																VULN
1801	1165	Art. 099	Vulnerability	Sensitivity	Population under	Part of residents below the	People <9 years	Population age			DEMOGRAPH	Principal	The number of children	(1) eStat - Japan national census	Census Data	Age group extraction; percentage	✓																VULN INTO RISK
1125	862	Art. 062	Sensitivity	Sensitivity	Household	Dependents	People <10 and 60+ years	Population age	Older		Vulnerability	Subjective	Households with	Household survey (N=600)	Survey/questionnaire	Percentage calculation per							✓										VULN INTO RISK
1946	1349	Art. 108	Susceptibility	Sensitivity	Percentage of	Dependent person	People <10 and 60+ years	Population age	Older		SUSCEPTIBILI	MCVI	Indicator measuring	(1) Household survey (210	Survey/questionnaire	Survey data collection; age group							✓										VULN INTO RISK
431	524	Art. 023	Vulnerability	Sensitivity	percentage of	Incapability: children and	People <10 and 65+ years	Population age	Older		Social		Incapability which	Central Agency for Public	Census Data	ArcMap GIS	✓																VULN INTO RISK
2255	1453	Art. 120	Socio-economic	Sensitivity	Percentage of	Children (<10 years old) and	People <10 and 65+ years	Population age	Older		Socio-	Multi-criteria	The proportion of	Brazilian Institute for Geography	Census Data	Data extracted at census sector															✓		VULN INTO RISK
2004	1377	Art. 112	Vulnerability	Sensitivity	Percentage of	% Vulnerable population	People <10 and 65+ years	Population age	Older		SOCIOECONO	CCFVI	Percentage of population	(1) Hellenic Statistical Authority	Census Data: Official data	Data collection for 6 study areas	✓	✓															VULN INTO RISK
555	697	Art. 029	Sensitivity	Sensitivity	Population age	Children under 14 years	People <14 years	Population age			Population	PCA; SOM	Percentage of children	Morocco Census RGPH 2014	Census Data		✓																VULN
2317	1464	Art. 125	Population	Sensitivity	Percentage of	Residents under 14 years old	People <14 years	Population age			Population	GIS-based	The proportion of	National Statistics Institute (INE)	Census Data	Data standardized using linear	✓														✓		VULN
1904	1276	Art. 105	Adaptive capacity	Sensitivity	number of	C4 – People Vulnerability	People <15 and 60+ years	Population age	Older		During-Flood	VIKOR-GRA	People vulnerability is	Statistical Yearbook of Jiangsu	Census Data	C4 = number of vulnerable	✓																VULN INTO RISK
803	761	Art. 041	Housing & Demographic	Sensitivity	Dependency Ratio	age under 15 or over 65+	People <15 and 65+ years	Population age	Older		Housing &		Percentage of total	U.S. Census Bureau - American	Census Data		✓																VULN
2342	1467	Art. 126	Adaptive capacity	Sensitivity	Percentage of	Dependency ratio	People <15 and 65+ years	Population age	Older		Vulnerability	Integrated	The proportion of	Bangladesh Bureau of Statistics	Census Data	Dependency ratio normalized	✓																VULN INTO RISK
1269	907	Art. 067	Socioeconomic	Sensitivity	Children count	Number of children in a	People <15 years	Population age			Socioeconom	In this study, a	Number of children	Household survey (N=600) - Face	Survey/questionnaire	Data cleaning: descriptive							✓										VULN INTO RISK
1495	988	Art. 080	Socio-economic	Sensitivity	children (0-14	Vulnerability indicators	People <15 years	Population age			socioeconom	Principal	Selected vulnerability	(1) Census of India, 2011 -	Census Data	Indicator extraction per ward:	✓																VULN INTO RISK
1157	856	Art. 061	Socio-Economic	Sensitivity	Population of	Age	People <16 and 65+ years	Population age	Older		Socio-	Census data	Number of residents	2011 UK National Census -	Census Data	Age group extraction: count per	✓																VULN INTO RISK
599	710	Art. 031	Sensitivity	Sensitivity	Age	Young population	People <16 years	Population age			Health, Self		Percentage of young	UK Office for National Statistics	Census Data		✓																VULN INTO RISK
863	766	Art. 044	Vulnerability	Sensitivity	Count of	Number of vulnerable	People <18 and 65+ years	Population age	Older		SOCIAL	Entropy	Count of individuals	City of Calgary Open Data Portal	Census Data	Distribution across 500m grid	✓																VULN INTO RISK
170	117	Art. 011	Vulnerability	Sensitivity	pop. Over 65+	Population density (aged	People 65+ years	Population age	Older		Exposure /		Projected future	(1) NIES (2021) Japan SSP	Census Data: Official data	Aggregated to ~1 km x 1 km	✓										✓						VULN INTO RISK
496	559	Art. 026	Sensitivity	Sensitivity	Sensitive	Sensitive population –	People 65+ years	Population age	Older		Social		Number of residents	Instituto Nacional de Estatística	Census Data		✓																VULN
522	604	Art. 027	Elements of city	Sensitivity	Citizen	Number of people aged over	People 65+ years	Population age	Older		Elements of		Number of elderly	MLTM, 2011; Shim, 2013	Official data; Census Data:		✓	✓									✓						VULN
556	697	Art. 029	Sensitivity	Sensitivity	Population age	Elderly	People 65+ years	Population age	Older		Population	PCA; SOM	Percentage of elderly	Morocco Census RGPH 2014	Census Data		✓																VULN
600	710	Art. 031	Sensitivity	Sensitivity	Age	Elderly population	People 65+ years	Population age	Older		Health, Self		Percentage of elderly	UK Office for National Statistics	Census Data		✓																VULN INTO RISK
601	710	Art. 031	Sensitivity	Sensitivity	Age	Median age above LSOA	People 65+ years	Population age	Older		Health, Self		Percentage of residents	UK Office for National Statistics	Census Data		✓																VULN INTO RISK
916	771	Art. 046	Sensitivity	Sensitivity	Population > 65 years	Population > 65 years	People 65+ years	Population age	Older		Social	Principal		(1) Census of India, 2011; (2)	Census Data; Scientific literature	0 (1); 1 (2); >1 (3)											✓						VULN INTO RISK
1039	791	Art. 053	Economic	Sensitivity	RETIRPOP65	Retired population/km²	People 65+ years	Population age	Older		Economic	PCA; Varimax	Number of retired	Central Agency for Public	Census Data: Official data	Density calculation:	✓	✓															VULN
1040	791	Art. 053	Economic	Sensitivity	OLDNOWORK65	Elderly unable to work/km²	People 65+ years	Population age	Older		Economic	PCA; Varimax	Number of elderly	Central Agency for Public	Census Data: Official data	Density calculation:	✓	✓															VULN
1055	793	Art. 053	Social	Sensitivity		Elderly people above 65 years	People 65+ years	Population age	Older		Social	AHP: pairwise	Number of people above	Central Agency for Public	Census Data: Official data	Density calculation:	✓	✓															VULN
1329	924	Art. 071	Vulnerability	Sensitivity	%	Proportion of elderly	People 65+ years	Population age	Older		Vulnerability	AHP weighting	Percentage of population	Provincial and municipal	Census Data: Official data	Population age group extraction:	✓	✓															VULN INTO RISK
1856	1267	Art. 103	Social	Sensitivity	Elderly population	Aging Growth Rate	People 65+ years	Population age	Older		SOCIAL	Principal	Growth rate of the	(1) Nanjing Statistical Yearbook	Official data; Census Data	Data extraction; missing data	✓	✓															VULN INTO RISK
1923	1317	Art. 106	Vulnerability	Sensitivity	Population over	Elderly Population	People 65+ years	Population age	Older		DEMOGRAPH	GIS spatial	Elderly population over	(1) Sixth National Population	Census Data	Age group extraction; elderly	✓																VULN INTO RISK
1988	1375	Art. 111	Exposure	Sensitivity	Elderly population	Percentage of population	People 65+ years	Population age	Older		FLOOD	Analytical	Percentage of elderly	(1) Beijing Municipal Statistics	Census Data; Official data	Data collection; normalization (0-	✓	✓															VULN INTO RISK
2136	1425	Art. 115	Sensitivity	Sensitivity	Inhabitants aged	POP65	People 65+ years	Population age	Older		Social	HSA; PCA; ISVI	The number of elderly	Spanish Statistics Institute	Census Data	Variables were normalized to	✓																VULN INTO RISK
2137	1425	Art. 115	Sensitivity	Sensitivity	Population	PROJ_65	People 65+ years	Population age	Older		Social	HSA; PCA; ISVI	Projected elderly	Spanish Statistics Institute	Census Data	Variables were normalized to	✓																VULN INTO RISK
2135	1425	Art. 115	Sensitivity	Sensitivity	Households where	HOUSE_OLD	People 65+ years	Population age	Older		Social	HSA; PCA; ISVI	The number of	Population and Housing Census	Census Data	Variables were normalized to	✓																VULN INTO RISK
2311	1464	Art. 125	Population	Sensitivity	Percentage of	Residents over 65 years old	People 65+ years	Population age	Older		Population	GIS-MCDA	The proportion of	National Statistics Institute (INE)	Census Data	Data standardized using linear	✓																VULN
2412	1505	Art. 130	Social Risk	Sensitivity	Affected elderly	Pensioners	People 65+ years	Population age	Older		Social Risk	Multicriteria	Number of over 65 affected	Kubal et al. (2009). City of	Scientific Literature; Census Data	Elderly per residential building											✓						VULN INTO RISK
1227	880	Art. 066	Exposure	Sensitivity	Elderly population	Percentage of residents over 75 years	People 75+ years	Population age	Older		Susceptibility	Multi-Criteria	Percentage of residents	Census data (national statistics);	Census Data; Official data	Percentage calculation per	✓	✓															VULN INTO RISK
1802	1165	Art. 099	Vulnerability	Sensitivity	Elderly population	Part of residents above the	People 75+ years	Population age	Older		DEMOGRAPH	Principal	The number of	(1) eStat - Japan national census	Census Data	Age group extraction; percentage	✓																VULN INTO RISK
231	196	Art. 013	socio-economic impacts	Sensitivity	Population Age, of	Age distribution of the	Pop. Age structure	Population age			3.2. Analysis	An Integrated	More than half of the	(1) Questionnaire; (2) GPS Field	Survey/ Questionnaire;GIS	Primary data were used for the				✓			✓										VULN INTO RISK
631	712	Art. 032	Sensitivity	Sensitivity	Population by age	Population age	Pop. Age structure	Population age			Demographic		Vulnerable age groups	Philippine Statistics Authority	Census Data	ArcGIS software		✓															VULN
780	744	Art. 040	Exposure	Sensitivity	Population Age	Population age	Pop. Age structure	Population age			Exposure	SCORE –	Vulnerable age groups	Eurostat - European statistics;	Census Data; Geo. Agency data												✓						VULN INTO RISK
1115	821	Art. 057	Adaptive capacity	Sensitivity	(People > 74 +	Population age	Pop. Age structure	Population age			Coping	Census data	Percentage of vulnerable	Italian National Institute of	Census Data	Extraction of age group variables;	✓																VULN INTO RISK
1266	907	Art. 067	Socioeconomic	Sensitivity	Age (years)	Age	Pop. Age structure	Population age			Socioeconom	In this study, a	Age of the respondent	Household survey (N=600) - Face	Survey/questionnaire	Data cleaning: descriptive							✓										VULN INTO RISK
1717	1103	Art. 092	Demographic	Sensitivity	Age (years)	Age	Pop. Age structure	Population age			SOCIO-	K-means	Age of respondent	(1) Questionnaire survey (599	Survey/questionnaire	Survey data collection; age							✓										VULN INTO RISK
2238	1433	Art. 119	Susceptibility	Sensitivity	Household	Age of household members	Pop. Age structure	Population age	Older		Susceptibility	Indicator	The age distribution of	(1) Household survey conducted in	Survey/questionnaire	Data pre-processed in Excel and							✓										VULN INTO RISK
1800	1165	Art. 099	Vulnerability	Sensitivity	Population change	Projected variation of	Pop. Age structure - Future scenario	Population age			DEMOGRAPH	Principal	Projected population	(1) Professor Inoue, Aoyama	Official data; Software Simulation	Data extraction; projection to	✓						✓										VULN INTO RISK
1183	862	Art. 062	Adaptive capacity	Sensitivity	Working age	Working age	Working age: People 15 to 60 years	Population age			Vulnerability	Subjective	Whether household has	Household survey (N=600)	Survey/questionnaire	Percentage calculation per							✓										VULN INTO RISK
1114	821	Art. 057	Adaptive capacity	Sensitivity	Total labor force	Dependency ratio	Working age: People 15 to 64 years	Population age			Coping	Census data	Ratio between	Italian National Institute of	Census Data	Extraction of labor force and	✓																VULN INTO RISK
2148	1425	Art. 115	Resilience	Sensitivity	Inhabitants aged	POP15	Working age: People 15 to 64 years	Population age			Mature	HSA; PCA; ISVI	The number of residents	Spanish Statistics Institute	Census Data	Variables were normalized to	✓																VULN INTO RISK
2149	1425	Art. 115	Resilience	Sensitivity	Population	PROJ_15	Working age: People 15 to 64 years	Population age			Mature	HSA; PCA; ISVI	The number of residents	Spanish Statistics Institute	Census Data	Variables were normalized to	✓																VULN INTO RISK
2314	1464	Art. 125	Population	Sensitivity	Percentage of	Residents between 14 and	Working age: People 15 to 64 years	Population age			Population	GIS-MCDA	The proportion of	National Statistics Institute (INE)	Census Data	Data standardized using linear	✓																VULN
17	24	Art. 001	Vulnerability	Exposure	Population density	Population (present)	Population Density (PD)	Population Distribution			Social	Fuzzy rating	People/ID*, Localized	(1) M.T. Anees, A.F.B. Abu Bakar	Official data; Scientific Literature	Importance level x Fuzzy number		✓									✓						VULN INTO RISK
57	46	Art. 004	Vulnerability	Exposure	Population (per	Population density	Population Density (PD)	Population Distribution			Vulnerability	Cellular	An average population	European Environment Agency	Official data	Urban flood simulations		✓															VULN INTO RISK
80	51	Art. 005	Vulnerability	Exposure	Population	Population density	Population Density (PD)	Population Distribution			Vulnerability	H–S–V–R flood	Population density	Resource and Environment	Official data			✓														✓	VULN INTO RISK
99	73	Art. 006	Vulnerability	Exposure	Population	Population density	Population Density (PD)	Population Distribution			Vulnerability	Spatial Multi-	The socio-economic	WorldPop;	Open Urban data	Sparsely populated areas (<																✓	VULN
140	85	Art. 009	Flood Impact Assessment	Exposure	GHSL Population	Population (un.)	Population Density (PD)	Population Distribution			Flood Impact	Overall Kappa	Population data [47]: The	(1) GEE Google; Global	Satellite imagery	Gridded population count by																✓	RISK
161	104	Art. 010	Vulnerability	Exposure	Municipal	Population density	Population Density (PD)	Population Distribution			Waterlogging	Analytical	Reflects concentration of	Agartala Municipal Corporation	Census Data	Population data in the year 2017	✓																VULN INTO RISK
168	117	Art. 011	Exposure	Exposure	Population	Population density (overall)	Population Density (PD)	Population Distribution			Exposure /		Projected future overall	(1) NIES (2021) Japan SSP	Census Data	Aggregated to ~1 km x 1 km	✓										✓						VULN INTO RISK
189	164	Art. 012	Exposure	Exposure	Persons per km²	Population density	Population Density (PD)	Population Distribution			Population	GIS overlay	Population density	(1) WorldPop population	Census Data; Satellite Imagery	Population density calculated per										✓							RISK
310	215	Art. 015	Vulnerability	Exposure	Population	Population Density (PD)	Population Density (PD)	Population Distribution			Social Vulnerability	Comparative	Population density, as	(1) Cyprus administrative level	Census Data; Open Urban Data	GIS Modelling	✓	✓															VULN INTO RISK
359	278	Art. 017	Sensitivity	Exposure		Population Density (PD)	Population Density (PD)	Population Distribution			Vulnerability	Normalization	Indicates the potential	(1) Jordanian Department of	Census Data		✓																VULN INTO RISK
374	302	Art. 018	Exposure	Exposure	Population (cap.)	Population (P)	Population Density (PD)	Population Distribution			Social (EVIS)		High P, high the	Egyptian central agency for	Census Data		✓																VULN INTO RISK
375	302	Art. 018	Exposure	Exposure	Population	Population Density (PD)	Population Density (PD)	Population Distribution			Social (EVIS)		High PD, high the	Egyptian central agency for	Census Data		✓																VULN INTO RISK
387	327	Art. 019	Vulnerability	Exposure		Population	Population Density (PD)	Population Distribution			Flood	Geographical	Population data was	(1) Landscan program from the	Open Urban Data; Official data		✓																VULN INTO RISK
393	363	Art. 020	Vulnerability	Exposure		Population density	Population Density (PD)	Population Distribution			Flood	multi-criteria	Flood consequences on	District Census Handbook (DCH)	Census Data	GIS Modelling	✓																VULN INTO RISK
407	424	Art. 021	Exposure	Exposure	Persons per km²	Population density (P)	Population Density (PD)	Population Distribution			Exposure	Normalization	Grid population density	(1) Data Center for Resources	Census Data	Population grid data at 1 km	✓																VULN INTO RISK
413	483	Art. 022	Regional Vulnerability	Exposure	Population	Population density	Population Density (PD)	Population Distribution			Regional	Deterministic	Higher the population	(1) Indian Census 2011; (2)	Census Data	The socio-economic data used	✓	✓															VULN INTO RISK
429	524	Art. 023	Vulnerability	Exposure		Population Density	Population Density (PD)	Population Distribution			Social	social	In order to estimate the	Central Agency for Public	Census Data	ArcMap GIS	✓																VULN INTO RISK
458	534	Art. 024	Population and	Exposure		Census 2010 population in	Population Density (PD)	Population Distribution			Population		Population counts and	United States Census Bureau	Census Data											✓							VULN INTO RISK
460	534	Art. 024	Population and	Exposure		Population and density (gridded	Population Density (PD)	Population Distribution			Population		Gridded spatial	United States Geological Survey	Census Data; Satellite imagery											✓							VULN INTO RISK
479	542	Art. 025	Demographics	Exposure	Population	Population density	Population Density (PD)	Population Distribution			Demographic		Population distribution	Statistical Institute of Catalonia	Census Data	Arc-Info GIS	✓																VULN INTO RISK
494	559	Art. 026	Sensitivity	Exposure		Population density	Population Density (PD)	Population Distribution			Social		Total number of residents	Instituto Nacional de Estatística	Census Data		✓																VULN
561	697	Art. 029	Exposure	Exposure	Population	Household density	Population Density (PD)	Population Distribution			Density	PCA; SOM	Number of household	Morocco Census RGPH 2014	Census Data		✓																VULN
580	709	Art. 030	Social vulnerability	Exposure		Population density	Population Density (PD)	Population Distribution			SOCIOECONO	CCFVI	Population density at	(1) 2006 census data; (2) 2013	Census Data:								✓										VULN INTO RISK
677	712	Art. 032	Sensitivity	Exposure	population settled	Population size	Population Density (PD)	Population Distribution			Demographic		Population settled in	Philippine Statistics Authority	Census Data	ArcGIS software	✓																VULN
721	727	Art. 036	Socioeconomic	Exposure	Population count	Population count per pixel	Population Density (PD)	Population Distribution			Socioeconom		Zonal statistics;	(1) Copernicus Emergency	Official data; Scientific Literature;	ArcGIS; Google Earth Engine		✓									✓	✓				✓	RISK
738	728	Art. 037	Socioeconomic / Exposure	Exposure	GHS Population	GHS Population Grid (R2023)	Population Density (PD)	Population Distribution			Socioeconom	Spatial overlay	Gridded population data	ESA Copernicus Emergency	satellite imagery	ArcGIS 10.8.2										✓						✓	RISK
779	744	Art. 040	Exposure	Exposure	Population	PD: Population Density	Population Density (PD)	Population Distribution			Exposure	SCORE –	In order to estimate the	WORLDPOP dataset, res.: 3" (z	Open Urban data										✓							✓	VULN INTO RISK
859	765	Art. 043	Vulnerability	Exposure	Presence of	Population density - Base	Population Density (PD)	Population Distribution			FLOOD	Census data	Presence of people in	(1) Census of India - Population	Census Data	Extraction of population	✓																VULN INTO RISK
867	766	Art. 044	Vulnerability	Exposure	Vector (Grid)	Population size	Population Density (PD)	Population Distribution			SOCIAL	Entropy	Total number of people	City of Calgary Open Data Portal	Census Data	Distribution across 500m grid	✓															✓	VULN INTO RISK
909	771	Art. 046	Sensitivity	Exposure	Population	Population density	Population Density (PD)	Population Distribution			Social	Principal		Census of India, 2011			✓																VULN INTO RISK
955	772	Art. 047	Exposure	Exposure	WorldPop	Population Map	Population Density (PD)	Population Distribution			SOCIO-	Population	Gridded population	WorldPop/GP/100m/pop -	Census Data; Open Urban data;	Acquired and processed in	✓								✓			✓				✓	RISK
979	777	Art. 049	Exposure	Exposure	Raster	Population density	Population Density (PD)	Population Distribution			EXPOSURE	Census data	Number of people per	Resources and Environment	Census Data; Official data;	Spatial distribution mapping;	✓											✓				✓	VULN INTO RISK
999	785	Art. 051	Sensitivity	Exposure	Population	Population density	Population Density (PD)	Population Distribution			Sensitivity	Demographic	Number of people per	Instituto Nacional de Estadística	Census Data; Official data	Population density calculation;	✓	✓															VULN
1015	790	Art. 052	Vulnerability	Exposure	Population	Population density (PD,	Population Density (PD)	Population Distribution			VULNERABILI	Pressure-state-	Population density (PD,	WORLD POP, res.: 100 m.	Open Urban data	The spatial pattern of Flood									✓							✓	VULN INTO RISK
1025	793	Art. 053	Social	Exposure	POPDEN17	Population density/km²	Population Density (PD)	Population Distribution			Social	AHP: pairwise	Population density per	Central Agency for Public	Census Data; Official data	Density calculation;	✓	✓															VULN
1094	816	Art. 055	Vulnerability	Exposure	Population	Population density	Population Density (PD)	Population Distribution			Vulnerability	Census data	Number of people per	(1) Census of India 2011; (2)	Census Data; Official data	Population density calculation;	✓	✓															VULN INTO RISK
1131	831	Art. 059	Social	Exposure	Population	Population density	Population Density (PD)	Population Distribution			Social	Equal	Number of people per	(1) Bangladesh Bureau of	Census Data; Official data	Population density calculation	✓	✓															VULN
1137	842	Art. 060	Vulnerability of Urban	Exposure	Population /	Density of Urban Population	Population Density (PD)	Population Distribution			Vulnerability	Entropy	Number of urban	(1) Zhengzhou Bureau of	Census Data	Calculation using Eq. (3): DUPi =	✓																VULN
1148	856	Art. 061	Physical Vulnerability	Exposure	Population / area	Population Density	Population Density (PD)	Population Distribution			Physical	Index-based	Number of people per	(1) Ordnance Survey (OS)	Census Data; Official data	Population data extraction;	✓	✓														✓	VULN INTO RISK
1165	856	Art. 061	Socio-Economic	Exposure	Total resident	Home Population	Population Density (PD)	Population Distribution			Socio-	Census data	Total population count,	2011 UK National Census -	Census Data	Population extraction; count per	✓																VULN INTO RISK
1214	863	Art. 063	Flood Hazard Index (FHI)	Exposure	Population	Population	Population Density (PD)	Population Distribution			Flood	Fuzzy Analytic	Total population counts	Kenya National Bureau of	Census Data	Downscaling of population	✓																VULN INTO RISK
1220	880	Art. 064	Exposure	Exposure	People per km²	Population density	Population Density (PD)	Population Distribution			Exposure	Multi-Criteria	Number of people per	Census data (national statistics);	Census Data; Official data;	Population density calculation	✓	✓								✓							VULN INTO RISK
1325	924	Art. 071	Exposure	Exposure	Persons per km²	Population density (DPOP)	Population Density (PD)	Population Distribution				AHP weighting	Number of people per	Provincial and municipal	Census Data; Official data	Population density calculation;	✓	✓															VULN INTO RISK
1331	924	Art. 071	Vulnerability	Exposure	Proportion of	Urbanization rate (UR)	Population Density (PD)	Population Distribution			Vulnerability	AHP weighting	Proportion of urban	Provincial and municipal	Census Data; Official data	Urban/rural population	✓	✓															VULN INTO RISK
1376	928	Art. 073	Vulnerability	Exposure	Population (count)	Total Population (TP)	Population Density (PD)	Population Distribution			Vulnerability	Analytical	Rapid population growth	Census of India, 2011.	Census Data; Official data	Population data extraction at	✓	✓															VULN INTO RISK
1377	928	Art. 073	Vulnerability	Exposure	Persons per km²	Population Density (PD)	Population Density (PD)	Population Distribution			Vulnerability	Analytical	Reflects pressure on land	Census of India, 2011.	Census Data; Official data	Population density calculation	✓	✓															VULN INTO RISK
1449	977	Art. 077	Vulnerability	Exposure	Population per	Population Density	Population Density (PD)	Population Distribution				Analytic	Global gridded	(1) Wang X., Meng X., Long Y.	Census Data; Software Simulation	Data extraction (2040-2060,	✓											✓					VULN INTO RISK
1489	988	Art. 080	Socio-economic	Exposure	population	Vulnerability indicators	Population Density (PD)	Population Distribution			socioeconom	Principal	Selected vulnerability	(1) Census of India, 2011 -	Census Data	Indicator extraction per ward;	✓																VULN INTO RISK
1501	995	Art. 081	Socio-economic	Exposure	Population	Population density	Population Density (PD)	Population Distribution			Socio-	Cellular	Population data used as	(1) Census of India - Population	Census Data	Population data extraction;	✓																VULN INTO RISK
1639	1071	Art. 087	Socioeconomic	Exposure	Registered	Population	Population Density (PD)	Population Distribution			SOCIOECONO	Statistical	Registered population in	(1) National Statistical Office of	Census Data	Population data collection (1992-	✓																VULN INTO RISK
1663	1076	Art. 089	Vulnerability	Exposure	Persons per km²	Population Density	Population Density (PD)	Population Distribution			Flood	Analytical	Population density	(1) Census of India, 2011 -	Census Data	Attribute data conversion to	✓																VULN INTO RISK
1676	1090	Art. 090	Vulnerability / Suitability	Exposure	Persons per km²	Population Density	Population Density (PD)	Population Distribution			DEMOGRAPH	Analytical	Population density	(1) National Institute of Statistics	Census Data	Attribute data conversion to	✓																VULN INTO RISK
1746	1118	Art. 094	Sensitivity	Exposure	Persons per unit	Population density	Population Density (PD)	Population Distribution			Sensitivity	Analytic	Density of population in	(1) Household survey (n=359);	Survey/questionnaire; Official	Population density calculation;		✓					✓										VULN INTO RISK
1767	1139	Art. 096	Vulnerability	Exposure	Persons per km²	Population density (p/km2)	Population Density (PD)	Population Distribution			Vulnerability	AHP-entropy	Population density per	(1) Statistical data; (2) Census	Census Data; Official data	Population density calculation	✓	✓															VULN INTO RISK
1772	1146	Art. 097	Vulnerability	Exposure	Persons per km²	Population density	Population Density (PD)	Population Distribution			Vulnerability	Multiple linear	Population density per	(1) Statistics Poland (GUS) -	Census Data	Population data extraction;	✓																VULN INTO RISK
1795	1149	Art. 098	Suitability	Exposure	Persons per km²	Population Density	Population Density (PD)	Population Distribution			DEMOGRAPH	CRITIC	Population density from	(1) Census of India, 2011 -	Census Data; Software Simulation	Population data extraction;	✓											✓					VULN INTO RISK
1799	1165	Art. 099	Vulnerability	Exposure	Persons per km²	Population density	Population Density (PD)	Population Distribution			DEMOGRAPH	Principal	Population density per	(1) eStat - Japan national census.	Census Data	Data extraction; spatial join to	✓																VULN INTO RISK
1922	1317	Art. 106	Vulnerability	Exposure	Total population	Population	Population Density (PD)	Population Distribution			DEMOGRAPH	GIS spatial	Sixth National Population	(1) Sixth National Population	Census Data	Census data extraction;	✓																VULN INTO RISK
1955	1349	Art. 108	Exposure	Exposure	Total population	Total population of study	Population Density (PD)	Population Distribution			GEOGRAPHIC	Total	Geographic boundaries of	(1) Pakistan Bureau of Statistics -	Census Data	Boundary extraction; union	✓																VULN INTO RISK
1989	1375	Art. 111	Exposure	Exposure	Persons per km²	Population density	Population Density (PD)	Population Distribution			FLOOD	Analytical	Population density in the	(1) Beijing Municipal Statistics	Census Data; Official data	Data collection; normalization (0-	✓	✓															VULN INTO RISK
2114	1425	Art. 115	Exposure	Exposure	Total population	TPOP	Population Density (PD)	Population Distribution			Total Social	Hierarchical	The total number of	Spanish Statistics Institute	Census Data	Variables were normalized to	✓																VULN INTO RISK
2123	1425	Art. 115	Exposure	Exposure	Population per	POP_SETL	Population Density (PD)	Population Distribution			Exposure in	HSA; PCA; ISVI	Population density per	Spanish Cadastre (Catastro).	Official data	Variables were normalized. HSA		✓															VULN INTO RISK
2189	1428	Art. 117	Exposure	Exposure	State-level	Population (POP)	Population Density (PD)	Population Distribution			Exposure	Multivariate	The total population of	United States Department of	Census Data	Population data aggregated to	✓																VULN INTO RISK
2227	1433	Art. 119	Socio-Environmental	Exposure	Inhabitants per	Population density	Population Density (PD)	Population Distribution			Socio-	Spatial	The number of	National census (Instituto	Census Data	Census data processed using	✓																VULN INTO RISK
2265	1455	Art. 121	Sensitivity	Exposure	Persons per	Density of population (m.)	Population Density (PD)	Population Distribution			Sensitivity	SPRC	The population density	Shanghai Statistical Yearbook	Census Data; Official data	Population density mapped at	✓	✓															VULN INTO RISK
2309	1461	Art. 124	Exposure	Exposure	Number of	Population density	Population Density (PD)	Population Distribution			Exposure	Multi-criteria	The density of population	Census of India 2011 - Primary	Census Data	Village geo-centers plotted as	✓																RISK
2356	1478	Art. 127	Demographic	Exposure	Persons per	Population density	Population Density (PD)	Population Distribution			Demographic	Multi-criteria	The number of people	Census of India 2001 data for	Census Data	Demographic database (.dbf)	✓																VULN
2370	1480	Art. 128	Vulnerability	Exposure	Persons per	Population density	Population Density (PD)	Population Distribution			Loss	Factor	The total population	Statistics Korea - population	Census Data	Population data collected per	✓																VULN INTO RISK
2388	1492	Art. 129	Elements at Risk	Exposure	Number of people	Population	Population Density (PD)	Population Distribution			Elements at	GIS analysis;	The total number of	Chilean National Statistics	Census Data	Population counts extracted per	✓																VULN INTO RISK
2410	1505	Art. 130	Social Risk	Exposure	Affected	Population	Population Density (PD)	Population Distribution			Social Risk	Multicriteria	Total population affected	Kubal et al. (2009). City of	Scientific Literature; Census Data	Population per residential	✓										✓						VULN INTO RISK
2433	1508	Art. 131	Vulnerability	Exposure	People per	Population distribution (top-	Population Density (PD)	Population Distribution			Istanbul.	Proportional	Spatial distribution of	(1) Statistical population data	Census Data; Satellite Imagery	Top-down approach: total	✓									✓							RISK
2434	1508	Art. 131	Vulnerability	Exposure	People per	Population distribution	Population Density (PD)	Population Distribution			Istanbul.	Bottom-up	Local distribution of	(1) Punctual population	Survey/questionnaire; Satellite	Bottom-up approach:							✓			✓							RISK
58	46	Art. 004	Vulnerability	Exposure	population (per	Population (future)	Population Growth - Future scenario	Population Distribution			Vulnerability	Cellular	An average population	European Environment Agency	Official data	Urban flood simulations		✓															VULN INTO RISK
265	200	Art. 014	population growth (2007)	Exposure	population in	population growth (2007)	Population Growth - Future scenario	Population Distribution			population	modified	The population of the	(1) Government of Pakistan	Census Data: scientific literature.	Supervised classification using	✓										✓						VULN INTO RISK
267	200	Art. 014	population growth (2018)	Exposure	population in	population growth (2018)	Population Growth - Future scenario	Population Distribution			population	modified	The population of the	(1) Government of Pakistan	Census Data: scientific literature.	Supervised classification using	✓										✓						VULN INTO RISK
358	278	Art. 017	Sensitivity	Exposure		Expected population growth	Population Growth - Future scenario	Population Distribution			Vulnerability -	Normalization	Indicates the potential	(1) Jordanian Department of	Census Data		✓																VULN INTO RISK
860	765	Art. 043	Vulnerability	Exposure	Same as above.	Population density -	Population Growth - Future scenario	Population Distribution			FLOOD	Census data	Same as above, for	(1) Census of India - Population	Census Data	Extraction of population	✓																VULN INTO RISK
2002	1377	Art. 112	Exposure	Exposure	Percentage of	Growing coastal population	Population Growth - Future scenario	Population Distribution			SOCIOECONO	CCFVI:	Percentage of population	(1) Hellenic Statistical Authority	Census Data; Official data	Data collection for 6 study areas;	✓	✓															VULN INTO RISK
929	771	Art. 046	Sensitivity	Sensitivity	No. of stunted	No. of stunted children	Age and Health (people -5 years mortality)	Sensitivity Composites			Social	Principal	Bihar has seen a sharp	Household Survey Constructed	On-Site; Survey/questionnaire	0 (1); 1 (2); >1 (3)							✓	✓									VULN INTO RISK
1004	785	Art. 051	Adaptive capacity	Sensitivity	Infant mortality	Infant mortality	Age and Health (people -5 years mortality)	Sensitivity Composites			Adaptive	Statistical	Infant mortality rate per	Instituto Nacional de Estadística	Census Data; Official data; Health	Infant mortality rate calculation;	✓	✓			✓												VULN
1547	1058	Art. 084	Adaptive capacity	Sensitivity	SEGE index value	The level of socio-economic	Employment, and education	Sensitivity Composites			Adaptive	SEGE	Level of socio-economic	(1) Turkish Ministry of Industry	Official data	SEGE index value extraction per		✓															VULN INTO RISK
1194	862	Art. 062	Economic	Sensitivity	Female	Female labor force	Employment, and Gender	Sensitivity Composites			Resilience -	Subjective	Whether women in	Household survey (N=600)	Survey/questionnaire	Percentage calculation per							✓										VULN INTO RISK
1853	1267	Art. 103	Social	Sensitivity	Female labor	Female Labor Force Ratio	Employment, and Gender	Sensitivity Composites			SOCIAL	Principal	Percentage of women in	(1) Nanjing Statistical Yearbook,	Official data; Census Data	Data extraction; missing data	✓	✓															VULN INTO RISK
1268	907	Art. 067	Socioeconomic	Sensitivity	Education level (1-	Household head's education	Employment, Education and Household	Sensitivity Composites			Socioeconom	In this study, a	Educational attainment	Household survey (N=600) - Face	Survey/questionnaire	Data cleaning; descriptive							✓										VULN INTO RISK
2393	1492	Art. 129	Vulnerability	Sensitivity	Proportion of	Level of education	Employment, Education and Household	Sensitivity Composites			Vulnerability	Multi-criteria	The proportion of heads	Chilean National Statistics	Census Data;	Variables transformed into ratio	✓						✓										VULN INTO RISK
616	710	Art. 031	Sensitivity	Sensitivity	Lone Parents	Female lone parent	Employment, Gender and Social Network	Sensitivity Composites			Health, Self		Percentage of female	UK Office for National Statistics	Census Data		✓																VULN INTO RISK
617	710	Art. 031	Sensitivity	Sensitivity	Lone Parents	Female lone parent	Employment, Gender and Social Network	Sensitivity Composites			Health, Self		Percentage of female	UK Office for National Statistics	Census Data		✓																VULN INTO RISK
414	483	Art. 022	Regional Vulnerability	Sensitivity	Female education	Female education	Gender and Education	Sensitivity Composites			Regional	Deterministic	It is concerned with the	(1) Indian Census 2011; (2)	Census Data, Official data	The socio-economic data used	✓	✓															VULN INTO RISK
918	771	Art. 046	Sensitivity	Sensitivity	Female illiterates	Female illiterates	Gender and Education	Sensitivity Composites			Social	Principal		(1) Scientific Literature [19]	Scientific Literature												✓						VULN INTO RISK
937	771	Art. 046	Adaptive capacity	Sensitivity	Female literates	Female literates	Gender and Education	Sensitivity Composites			Adaptive	Principal		(1) Scientific Literature [19];	Scientific Literature												✓						VULN INTO RISK
962	774	Art. 048	Vulnerability	Sensitivity	Dependent	Gender gap in literacy rate	Gender and Education	Sensitivity Composites			SOCIOECONO	PCA with	Difference in literacy	Census of India - 1991, 2001,	Census Data	Data extraction; calculation of	✓																VULN INTO RISK
930	771	Art. 046	Sensitivity	Sensitivity	No. of pregnant	Pregnant women	Gender and Health	Sensitivity Composites			Social	Principal	Nutrition of	Household Survey Constructed	On-Site; Survey/questionnaire								✓	✓									VULN INTO RISK
931	771	Art. 046	Sensitivity	Sensitivity	No. of lactating	Lactating women	Gender and Health	Sensitivity Composites			Social	Principal	Nutrition of	Household Survey Constructed	On-Site; Survey/questionnaire	0 (1); 1 (2); >1 (3)							✓	✓									VULN INTO RISK
817	761	Art. 041	Health & Mobility	Sensitivity	Electricity-	Electricity-Dependent	Health, and Eletricity dependence	Sensitivity Composites			Health &		Percentage of civilian	U.S. Department of Health and	Official data			✓															VULN
1965	1356	Art. 110	Vulnerability	Sensitivity	Gender of	Household Head	Household, Employment and Gender	Sensitivity Composites			SOCIAL	Analytic	Gender of household	(1) Household survey (300	Survey/questionnaire	Survey data collection; pairwise							✓										VULN
621	710	Art. 031	Sensitivity	Sensitivity	Dependent	Unemployed households	Household, Employment and People -5 years	Sensitivity Composites			Health, Self		Percentage of households	UK Office for National Statistics	Census Data		✓																VULN INTO RISK
2139	1425	Art. 115	Sensitivity	Sensitivity	Dependency ratio:	DEPRAT_F	Household, gender and age (-5 and 65+years	Sensitivity Composites			Social	HSA; PCA; ISVI	The ratio of dependent	Spanish Statistics Institute	Census Data	Variables were normalized. HSA	✓																VULN INTO RISK
2138	1425	Art. 115	Sensitivity	Sensitivity	Dependency ratio:	DEPRAT_M	Household, gender and age (-5 and 65+years	Sensitivity Composites			Social	HSA; PCA; ISVI	The ratio of dependent	Spanish Statistics Institute	Census Data	Variables were normalized. HSA	✓																VULN INTO RISK
1890	1271	Art. 104	Socioeconomic	Sensitivity	Demographic	Household Representative's	Household, Gender, Ethnicity	Sensitivity Composites			Control	Structural	Age, marital status, race,	(1) Household survey (231 valid	Survey/questionnaire	Survey data collection;							✓										VULN INTO RISK
1185	862	Art. 062	Social	Sensitivity	Household head	Age of household head	Household, income, age (Household +65	Sensitivity Composites			Resilience -	Subjective	Age of household head	Household survey (N=600)	Survey/questionnaire	Percentage calculation per							✓										VULN INTO RISK
1622	1066	Art. 086	Demographic	Sensitivity	Age (years)	Age	Household, income, age (Household +65	Sensitivity Composites			DEMOGRAPH	Chi-square	Age of household head	(1) Structured field survey; (2)	Survey/questionnaire	Age data collection; statistical							✓										VULN INTO RISK
613	710	Art. 031	Sensitivity	Sensitivity	Lone Parents	Lone parent households	Household, Network: Lone parent	Sensitivity Composites			Health, Self		Percentage of households	UK Office for National Statistics	Census Data		✓																VULN INTO RISK
614	710	Art. 031	Sensitivity	Sensitivity	Lone Parents	Lone parents full-time	Household, Network: Lone parent	Sensitivity Composites			Health, Self		Percentage of lone-	UK Office for National Statistics	Census Data		✓																VULN INTO RISK
615	710	Art. 031	Sensitivity	Sensitivity	Lone Parents	Lone parents with	Household, Network: Lone parent	Sensitivity Composites			Health, Self		Percentage of lone-	UK Office for National Statistics	Census Data		✓																VULN INTO RISK
804	761	Art. 041	Housing & Demographic	Sensitivity	Single Parent	Single Parent Homes	Household, Network: Lone parent	Sensitivity Composites			Housing &		Percentage of households	U.S. Census Bureau - American	Census Data		✓																VULN
2121	1425	Art. 115	Exposure	Sensitivity	Retirement homes	RET_HOME	Household: People 65+ years: Retirement	Sensitivity Composites			Total Social	HSA; PCA; ISVI	The number of	Spanish Ministry of Health,	Official data	Variables were normalized to		✓															VULN INTO RISK
626	710	Art. 031	Sensitivity	Sensitivity	Deprivation	Two or more deprivation	Index of Multiple Deprivation (IMD)	Sensitivity Composites			Hazards and		Households experiencing	UK Department for Communities	Official Data			✓															VULN INTO RISK
627	710	Art. 031	Sensitivity	Sensitivity	Index of Multiple	IMD >50% national score	Index of Multiple Deprivation (IMD)	Sensitivity Composites			Hazards and		Areas with deprivation	UK Department for Communities	Official Data			✓															VULN INTO RISK
628	710	Art. 031	Sensitivity	Sensitivity	Index of Multiple	IMD >50% Norfolk score	Index of Multiple Deprivation (IMD)	Sensitivity Composites			Hazards and		Areas with deprivation	UK Department for Communities	Official Data			✓															VULN INTO RISK
608	710	Art. 031	Sensitivity	Sensitivity	Health and Special	Unhealthy children	people -5 years with disability	Sensitivity Composites			Health, Self		Percentage of children	(1) UK National Health Service	Health Data						✓												VULN INTO RISK
433	524	Art. 023	Vulnerability	Adaptive	Awareness Raising	Awareness Raising Programs	Ability to Organize and Coordinate (AOC)	Social Capital and			Social	social	Risk awareness level	Central Agency for Public	Census Data	ArcMap GIS	✓																VULN INTO RISK
655	712	Art. 032	Adaptive capacity	Adaptive	Number of trained	Training programmes on	Ability to Organize and Coordinate (AOC)	Social Capital and			Information		Preparedness improves	(1) Iloilo City. (2014). Iloilo city	Official Data; Survey/	ArcGIS software		✓					✓										VULN
670	712	Art. 032	Adaptive capacity	Adaptive	Participation rate	Participation in planning and	Ability to Organize and Coordinate (AOC)	Social Capital and			Equity		Improves inclusion and	(1) Iloilo City. (2014). Iloilo city	Official Data; Survey/	ArcGIS software		✓					✓										VULN
1196	862	Art. 062	Institutional	Adaptive	DRR program	Participation in hazard	Ability to Organize and Coordinate (AOC)	Social Capital and			Resilience -	Subjective	Whether household	Household survey (N=600)	Survey/questionnaire	Percentage calculation per							✓										VULN INTO RISK
1200	862	Art. 062	Institutional	Adaptive	First aid training	First aid training	Ability to Organize and Coordinate (AOC)	Social Capital and			Resilience -	Subjective	Whether household	Household survey (N=600)	Survey/questionnaire	Percentage calculation per							✓										VULN INTO RISK
1202	862	Art. 062	Institutional	Adaptive	PHAST training	Water sanitation and	Ability to Organize and Coordinate (AOC)	Social Capital and			Resilience -	Subjective	Whether household	Household survey (N=600)	Survey/questionnaire	Percentage calculation per							✓										VULN INTO RISK
1286	907	Art. 067	Risk Perception Indicator	Adaptive	Adaptation	RP9: Knowledge about	Ability to Organize and Coordinate (AOC)	Social Capital and			Risk	In this study, a	Level of awareness and	Household survey (N=600) - Face	Survey/questionnaire	Data cleaning; descriptive							✓										VULN INTO RISK
1580	1066	Art. 086	Adaptive capacity	Adaptive	Adaptive capacity	Strengthening Availability of	Ability to Organize and Coordinate (AOC)	Social Capital and			PHYSICAL	Qualitative	Adaptive measure to	(1) Structured field survey; (2)	Survey/questionnaire	Adaptive capacity assessment;							✓										VULN INTO RISK
1582	1066	Art. 086	Adaptive capacity	Adaptive	Adaptive capacity	Empower Locals on Flood	Ability to Organize and Coordinate (AOC)	Social Capital and			PHYSICAL	Qualitative	Adaptive measure to	(1) Structured field survey; (2)	Survey/questionnaire	Community capacity assessment;							✓										VULN INTO RISK
1584	1066	Art. 086	Susceptibility	Adaptive	Organizational	Ability to Organize and	Ability to Organize and Coordinate (AOC)	Social Capital and			SOCIAL	Binomial	Household and	(1) Structured field survey; (2)	Survey/questionnaire	Household survey data							✓										VULN INTO RISK
1589	1066	Art. 086	Susceptibility	Adaptive	Training access (%	Access to Training and	Ability to Organize and Coordinate (AOC)	Social Capital and			SOCIAL	Binomial	Household access to	(1) Structured field survey; (2)	Survey/questionnaire	Household survey data							✓										VULN INTO RISK
1601	1066	Art. 086	Adaptive capacity	Adaptive	Adaptive capacity	Strengthen Diversification	Ability to Organize and Coordinate (AOC)	Social Capital and			ECONOMIC	Qualitative	Adaptive measure to	(1) Structured field survey; (2)	Survey/questionnaire	Adaptive capacity assessment;							✓										VULN INTO RISK
1602	1066	Art. 086	Adaptive capacity	Adaptive	Adaptive capacity	Strengthen Livelihood	Ability to Organize and Coordinate (AOC)	Social Capital and			ECONOMIC	Qualitative	Adaptive measure to	(1) Structured field survey; (2)	Survey/questionnaire	Adaptive capacity assessment;							✓										VULN INTO RISK
2011	1377	Art. 112	Risk	Adaptive	Vulnerability	CCFVI Socioeconomic	Ability to Organize and Coordinate (AOC)	Social Capital and			MODEL	Coastal City	Composite vulnerability	Derived from 8 socioeconomic	Scientific Literature	Normalization of indicator											✓						VULN INTO RISK
2047	1394	Art. 113	Vulnerability	Adaptive	Access to	Availability and circulation	Ability to Organize and Coordinate (AOC)	Social Capital and			Institutional	Index-based	Whether emergency	(1) Primary data collected	Survey/questionnaire	Raw survey responses (Yes/No)							✓										VULN
2048	1394	Art. 113	Vulnerability	Adaptive	Familiarity with	Household's knowledge of	Ability to Organize and Coordinate (AOC)	Social Capital and			Institutional	Index-based	The household's self-	(1) Primary data collected	Survey/questionnaire	Raw survey responses were							✓										VULN
2049	1394	Art. 113	Vulnerability	Adaptive	Participation in	Frequency of public	Ability to Organize and Coordinate (AOC)	Social Capital and			Institutional	Index-based	The number of public	(1) Primary data collected	Survey/questionnaire	Raw survey responses were							✓										VULN
2075	1408	Art. 114	Exposure	Adaptive	Comprehension	Household's level of	Ability to Organize and Coordinate (AOC)	Social Capital and			Exposure	Index-based	The household's self-	(1) Primary data collected	Survey/questionnaire	Raw survey responses were							✓										VULN INTO RISK
2097	1408	Art. 114	Adaptive capacity	Adaptive	First aid training	Households having family	Ability to Organize and Coordinate (AOC)	Social Capital and			Capacity	Index-based	Whether a household	(1) Primary data collected	Survey/questionnaire	Raw survey responses (Yes/No)							✓										VULN INTO RISK
2112	1408	Art. 114	Adaptive capacity	Adaptive	Participation in	Frequency of public	Ability to Organize and Coordinate (AOC)	Social Capital and			Capacity	Index-based	The number of public	(1) Primary data collected	Survey/questionnaire	Raw survey responses were							✓										VULN INTO RISK
2113	1408	Art. 114	Adaptive capacity	Adaptive	Access to	Availability and circulation	Ability to Organize and Coordinate (AOC)	Social Capital and			Capacity	Index-based	Whether emergency	(1) Primary data collected	Survey/questionnaire	Raw survey responses (Yes/No)							✓										VULN INTO RISK

646	712	Art. 032	Adaptive capacity	Adaptive	Investment	Community-level leadership	Social Networks	Social Capital and	Institutions		Enhances local	(1) Iloilo City. (2014). Iloilo city	Official Data: Survey/	ArcGIS software
659	712	Art. 032	Adaptive capacity	Adaptive	Strong community	Neighbourliness	Social Networks	Social Capital and	Social capital		Strong women's groups.	(1) Iloilo City. (2014). Iloilo city	Official Data: Survey/	ArcGIS software
661	712	Art. 032	Adaptive capacity	Adaptive	Mutual aid	Family and relatives	Social Networks	Social Capital and	Social capital		Helps early recovery.	(1) Iloilo City. (2014). Iloilo city	Official Data: Survey/	ArcGIS software
674	712	Art. 032	Sensitivity	Adaptive	Community	Dependency ratio	Social Networks	Social Capital and	Demographic		High dependency	Philippine Statistics Authority	Census Data	ArcGIS software
800	761	Art. 041	Housing & Demographic	Adaptive	Housing Stability	Housing Stability	Social Networks	Social Capital and	Housing &		Percentage of the	U.S. Census Bureau - American	Census Data	
1111	821	Art. 057	Adaptive capacity	Adaptive	Relative built-up	Newcomers	Social Networks	Social Capital and	Coping	Remote	Percentage growth of	German Aerospace Center (DLR) -	Satellite Imagery	Built-up area extraction for each
1181	862	Art. 062	Adaptive capacity	Adaptive	Social network	Social networks	Social Networks	Social Capital and	Vulnerability -	Subjective	Whether household has	Household survey (N=600)	Survey/questionnaire	Percentage calculation per
1585	1066	Art. 086	Susceptibility	Adaptive	Community	Communal Strategic Grains	Social Networks	Social Capital and	SOCIAL	Binomial	Community-based	(1) Structured field survey: (2)	Survey/questionnaire	Household survey data
1709	1103	Art. 092	Adaptive capacity	Adaptive	Integration	Social inclusion	Social Networks	Social Capital and	ADAPTIVE	Analytic	Respondent's perception	(1) Questionnaire survey (599	Survey/questionnaire	Survey data collection:
1712	1103	Art. 092	Adaptive capacity	Adaptive	Social support	Social capital	Social Networks	Social Capital and	ADAPTIVE	Analytic	Respondent's evaluation	(1) Questionnaire survey (599	Survey/questionnaire	Survey data collection:
1748	1118	Art. 094	Adaptive capacity	Adaptive	Social network	Social ties	Social Networks	Social Capital and	Adaptive	Analytic	Social networks and	(1) Household survey (n=359):	Survey/questionnaire	Social ties assessment:
1887	1271	Art. 104	Socioeconomic	Adaptive	Social isolation	Loss of community	Social Networks	Social Capital and	Indirect	Structural	Loss of social contact.	(1) Household survey (231 valid	Survey/questionnaire	Survey data collection: 4-point
1953	1349	Art. 108	Resilience	Adaptive	Percentage of	Social security/network	Social Networks	Social Capital and	RESILIENCE	MOVE	Indicator measuring	(1) Household survey (210	Survey/questionnaire	Survey data collection: social
1968	1356	Art. 110	Vulnerability	Adaptive	Type of social	Social Network	Social Networks	Social Capital and	SOCIAL	Analytic	Social network type:	(1) Household survey (300	Survey/questionnaire	Survey data collection: pairwise
2019	1394	Art. 113	Vulnerability	Adaptive	Length of	Years living in the	Social Networks	Social Capital and	Social	Index-based	The duration (in years) a	(1) Primary data collected	Survey/questionnaire	Raw survey responses were
2052	1394	Art. 113	Vulnerability	Adaptive	Perceived social	Community cooperation in	Social Networks	Social Capital and	Attitudinal	Index-based	The household's	(1) Primary data collected	Survey/questionnaire	Raw survey responses were
2080	1408	Art. 114	Sensitivity	Adaptive	Length of	Household living in	Social Networks	Social Capital and	Sensitivity	Index-based	The duration a household	(1) Primary data collected	Survey/questionnaire	Raw survey responses were
2105	1408	Art. 114	Adaptive capacity	Adaptive	External social	Households having relatives	Social Networks	Social Capital and	Capacity	Index-based	Whether the household	(1) Primary data collected	Survey/questionnaire	Raw survey responses (Yes/No)
2107	1408	Art. 114	Adaptive capacity	Adaptive	Perceived social	Strength of community	Social Networks	Social Capital and	Capacity	Index-based	The household's	(1) Primary data collected	Survey/questionnaire	Raw survey responses were
2153	1425	Art. 115	Sensitivity	Adaptive	New residents	NRESID	Social Networks	Social Capital and	Not retained	HSA: PCA: ISVI	The number of recent	Spanish Statistics Institute	Census Data	Variables were normalized to
2246	1433	Art. 119	Adaptive capacity	Adaptive	Diversity of	Social networks	Social Networks	Social Capital and	Coping	Ego-centered	The diversity of social	Ego-centered network analysis	Survey/questionnaire	56% of networks totally
2297	1460	Art. 123	Adaptive capacity	Adaptive	Strength of social	Community cohesiveness	Social Networks	Social Capital and	Social	Focus group	The degree of social	Community workshops with 33	Survey/questionnaire	Questions answered using binary
2424	1505	Art. 130	Adaptive capacity	Adaptive	Social network	Social networks	Social Networks	Social Capital and	Coping	Multicriteria	SN =	City of Leipzig household type	Census Data	Weighted sum calculated per
1188	862	Art. 062	Social	Adaptive	Belief that flood is	Religious beliefs	Traditional and minorities Knowledge	Social Capital and	Resilience -	Subjective	Household heads	Household survey (N=600)	Survey/questionnaire	Percentage calculation per
1592	1066	Art. 086	Susceptibility	Adaptive	Knowledge	Use of Indigenous and	Traditional and minorities Knowledge	Social Capital and	WARNING	Binomial	Integration of indigenous	(1) Structured field survey: (2)	Survey/questionnaire	Household survey data
1597	1066	Art. 086	Cultural Vulnerability	Adaptive	Cultural practices	Cultural Beliefs and	Traditional and minorities Knowledge	Social Capital and	WARNING	Multiple	Cultural beliefs	(1) Structured field survey: (2)	Survey/questionnaire	Household survey data
1598	1066	Art. 086	Cultural Vulnerability	Adaptive	Flood myths	Myths about Floods (MaF)	Traditional and minorities Knowledge	Social Capital and	WARNING	Binomial	Cultural myths about	(1) Structured field survey: (2)	Survey/questionnaire	Household survey data
629	710	Art. 031	Sensitivity	Sensitivity	Crime	Crime rate above national	Crime rate	Social Equity	Hazards and		Areas reporting crime	UK Home Office Crime Statistics	Official Data	
15	24	Art. 001	Vulnerability	Sensitivity	Racial	Racial composition	Ethnicity minorities	Social Equity	Social	Fuzzy rating	Proportion of visible	(1) H. Nasiri, M.J.M. Yusof,	Scientific Literature	Importance level x Fuzzy number
582	709	Art. 030	Social vulnerability	Sensitivity		Percentage of (non-Saudi	Ethnicity minorities	Social Equity	Social		Percentage of non-Saudi	(1) 2006 census data; (2) 2013	Census Data:	
583	709	Art. 030	Social vulnerability	Sensitivity		Percentage of Asians per	Ethnicity minorities	Social Equity	Social		Percentage of Asian	(1) 2006 census data; (2) 2013	Census Data:	
603	710	Art. 031	Sensitivity	Sensitivity	Ethnicity/Race	Non-white population	Ethnicity minorities	Social Equity	Health, Self		Percentage of residents	UK Office for National Statistics	Census Data	
671	712	Art. 032	Adaptive capacity	Sensitivity	Inclusion of	Minority groups	Ethnicity minorities	Social Equity	Equity		Helps ensure fair	(1) Iloilo City. (2014). Iloilo city	Official Data: Survey/	ArcGIS software
802	761	Art. 041	Housing & Demographic	Sensitivity	Communities of	Communities of Color	Ethnicity minorities	Social Equity	Housing &		Percentage of total	U.S. Census Bureau - Decennial	Census Data	
864	766	Art. 044	Vulnerability	Sensitivity	Vector (Grid)	Number of foreigners	Ethnicity minorities	Social Equity	SOCIAL	Entropy	Count of foreign	City of Calgary Open Data Portal	Census Data	Distribution across 500m grid
912	771	Art. 046	Sensitivity	Sensitivity	Scheduled Caste	Minorities: dalits	Ethnicity minorities	Social Equity	Social	Principal	Scheduled Caste (SC) and	(1) Scientific Literature: [19]	Scientific Literature	
913	771	Art. 046	Sensitivity	Sensitivity	Scheduled Tribe	Minorities: indigenous	Ethnicity minorities	Social Equity	Social	Principal	Scheduled Caste (SC) and	(1) Scientific Literature: [19]	Scientific Literature	
932	771	Art. 046	Sensitivity	Sensitivity	No. of minorities	Minorities: muslins	Ethnicity minorities	Social Equity	Social	Principal	Muslim communities (the	Household Survey Constructed	On-Site: Survey/questionnaire	
960	774	Art. 048	Vulnerability	Sensitivity	Marginalized	Percentage of marginalized	Ethnicity minorities	Social Equity	SOCIOECONO	PCA with	Proportion of Scheduled	Census of India - 1991, 2001,	Census Data	Data extraction: normalization:
1116	821	Art. 057	Adaptive capacity	Sensitivity	Non-EU immigrant	Foreigners	Ethnicity minorities	Social Equity	Coping	Census data	Percentage of non-EU	Italian National Institute of	Census Data	Extraction of citizenship
1167	856	Art. 061	Socio-Economic	Sensitivity	Number of non-	Country of Birth	Ethnicity minorities	Social Equity	Socio-	Census data	Foreign-born population	2011 UK National Census -	Census Data	Country of birth data extraction:
1590	1066	Art. 086	Susceptibility	Sensitivity	Human rights	Lack of Human Rights (LHR)	Ethnicity minorities	Social Equity	SOCIAL	Binomial	Limited human rights	(1) Structured field survey: (2)	Survey/questionnaire	Household survey data
1855	1267	Art. 103	Social	Sensitivity	Floating	Migrant Population	Ethnicity minorities	Social Equity	SOCIAL	Principal	Number of migrants and	(1) Nanjing Statistical Yearbook,	Official data: Census Data	Data extraction: missing data
2152	1425	Art. 115	Sensitivity	Sensitivity	Foreigners	FOREIG	Ethnicity minorities	Social Equity	Not retained	HSA: PCA: ISVI	The number of foreign-	Spanish Statistics Institute	Census Data	Variables were normalized to
13	24	Art. 001	Vulnerability	Sensitivity	Gender ratio	Gender ratio	Gender	Social Equity	Social	Fuzzy rating	Y/N. Localized Flood	(1) H. Nasiri, M.J.M. Yusof,	Census data; Scientific Literature	Importance level x Fuzzy number
394	363	Art. 020	Vulnerability	Sensitivity		Female population	Gender	Social Equity	Flood	multi-criteria	Flood resilience roles:	District Census Handbook (DCH)	Census Data	GIS Modelling
432	524	Art. 023	Vulnerability	Sensitivity	proportion of	Women Ratio	Gender	Social Equity	Social	social	Women's ratio which	Central Agency for Public	Census Data	ArcMap GIS
602	710	Art. 031	Sensitivity	Sensitivity	Gender	Female population	Gender	Social Equity	Health, Self		Percentage of residents	UK Office for National Statistics	Census Data	
865	766	Art. 044	Vulnerability	Sensitivity	Vector (Grid)	Number of females	Gender	Social Equity	SOCIAL	Entropy	Count of female	City of Calgary Open Data Portal	Census Data	Distribution across 500m grid
917	771	Art. 046	Sensitivity	Sensitivity		Female population	Gender	Social Equity	Social	Principal		(1) Census of India, 2011; (2)	Census Data; Scientific literature	0–2 (1); 4–7 (2); 7–13 (3)
935	771	Art. 046	Adaptive capacity	Sensitivity	Female work	Female work participation	Gender	Social Equity	Adaptive	Principal		Jha & Gundimeda (2019)	Scientific Literature	
959	774	Art. 048	Vulnerability	Sensitivity	Dependent	Percentage of female to	Gender	Social Equity	SOCIOECONO	PCA with	Proportion of females in	Census of India - 1991, 2001,	Census Data	Data extraction: normalization:
965	774	Art. 048	Vulnerability	Sensitivity	Dependent	Gender gap in work	Gender	Social Equity	SOCIOECONO	PCA with	Difference in work	Census of India - 1991, 2001,	Census Data	Data extraction: calculation of
1166	856	Art. 061	Socio-Economic	Sensitivity	Number of	Gender	Gender	Social Equity	Socio-	Census data	Female population count	2011 UK National Census -	Census Data	Female population extraction:
1270	907	Art. 067	Socioeconomic	Sensitivity	Female count	Number of females in a	Gender	Social Equity	Socioeconom	In this study, a	Number of female	Household survey (N=600) - Face	Survey/questionnaire	Data cleaning: descriptive
1383	928	Art. 073	Vulnerability	Sensitivity	Percentage (%)	Female Population (FP)	Gender	Social Equity	Vulnerability	Analytical	Females are generally	Census of India, 2011.	Census Data; Official data	Female population percentage
1496	988	Art. 080	Socio-economic	Sensitivity	female population	Vulnerability indicators	Gender	Social Equity	socioeconom	Principal	Selected vulnerability	(1) Census of India, 2011 -	Census Data	Indicator extraction per ward:
1623	1066	Art. 086	Demographic	Sensitivity	Gender	Gender	Gender	Social Equity	DEMOGRAPH	Chi-square	Gender of household	(1) Structured field survey: (2)	Survey/questionnaire	Gender data collection: statistical
1803	1165	Art. 099	Vulnerability	Sensitivity	Female	Part of residents that are	Gender	Social Equity	DEMOGRAPH	Principal	Percentage of female	(1) eStat - Japan national census.	Census Data	Gender data extraction:
2016	1394	Art. 113	Vulnerability	Sensitivity	Ratio of females	Female–male ratio	Gender	Social Equity	Social	Index-based	The proportion of	(1) Primary data collected	Survey/questionnaire	Raw survey responses were used
2078	1408	Art. 114	Sensitivity	Sensitivity	Ratio of females	Female-male ratio	Gender	Social Equity	Sensitivity	Index-based	The proportion of	(1) Primary data collected	Survey/questionnaire	Raw survey responses were used
2315	1464	Art. 125	Population	Sensitivity	Percentage of	Male residents	Gender	Social Equity	Population	GIS-MCDA:	The proportion of male	National Statistics Institute (INE)	Census Data	Data standardized using linear
2316	1464	Art. 125	Population	Sensitivity	Percentage of	Female residents	Gender	Social Equity	Population	GIS-MCDA:	The proportion of female	National Statistics Institute (INE)	Census Data	Data standardized using linear
2358	1478	Art. 127	Demographic	Sensitivity	Females per	Female population density	Gender	Social Equity	Demographic	Multi-criteria	The density of female	Census of India 2001 data for	Census Data	Demographic database (.dbf)
2399	1492	Art. 129	Vulnerability	Sensitivity	Proportion of	Gender	Gender	Social Equity	Vulnerability	Multi-criteria	The proportion of female	Chilean National Statistics	Census Data:	Variables transformed into ratio
612	710	Art. 031	Sensitivity	Sensitivity	Language	Limited English proficiency	Language barrier	Social Equity	Health, Self		Percentage of residents	UK Office for National Statistics	Census Data	
826	761	Art. 041	Infrastructure.	Sensitivity	Language Barriers	Language Barriers	Language barrier	Social Equity	Infrastructure		Percentage of total	U.S. Census Bureau - American	Census Data	
862	766	Art. 044	Vulnerability	Sensitivity	Vector (Grid)	Number of non-official	Language barrier	Social Equity	SOCIAL	Entropy	Count of individuals who	City of Calgary Open Data Portal	Census Data	Distribution across 500m grid
1160	856	Art. 061	Socio-Economic	Sensitivity	Number of non-	Proficiency in Local	Language barrier	Social Equity	Socio-	Census data	Residents with limited	2011 UK National Census -	Census Data	Language proficiency data
114	84	Art. 008	none	Exposure	(DEM)	Aspect	Aspect / Direction	Topography and Terrain		Integrate	Describes terrain	(1) United States Geological	Satellite imagery	Derived from a 30 m SRTM DEM
301	215	Art. 015	Hazard	Exposure	Aspect	Aspect	Aspect / Direction	Topography and Terrain	Topographic	Comparative	The aspect (Fig. 2e) map	(1) JAXA ALOS World 3D-Res.:	Satellite imagery: Software	GIS Modelling
682	722	Art. 033	Flood inventory	Exposure	Raster	Aspect	Aspect / Direction	Topography and Terrain	Flood		Direction of the terrain	United States Geological Survey	satellite imagery	
1209	863	Art. 063	Flood Hazard Index (FHI)	Exposure	Aspect (degrees)	Aspect	Aspect / Direction	Topography and Terrain	Flood	Fuzzy Analytic	Direction of slope face.	United States Geological Survey	Satellite Imagery: Software	Aspect calculation from DEM:
1244	886	Art. 065	Flood Conditioning Factor	Exposure	Aspect (degrees)	Aspect	Aspect / Direction	Topography and Terrain	Flood	GIS terrain	Direction of slope face	Alaska Satellite Facility (ASF) -	Satellite Imagery	Aspect calculation: classification
1683	1097	Art. 091	Hazard	Exposure	Compass direction	Aspect (As)	Aspect / Direction	Topography and Terrain	TOPOGRAPHI	K-Nearest	Direction the physical	(1) United States Geological	Satellite Imagery: Software	Aspect calculation from DEM:
38	25	Art. 002	Thematic mapping	Exposure	Bathymetric	Bathymetric data	Bathymetry (m)	Topography and Terrain	Thematic	Monitoring	Thematic validation using	(1) United States Geological	Satellite imagery: Software	(i) data acquisition, (ii)
190	164	Art. 012	Hazard (Flood)	Exposure	River bank	River bank elevation (m)	Bathymetry (m)	Topography and Terrain	Flood	1D-2D	Elevation of the river	(1) GRWL Database (Allen and	Satellite Imagery	Bank elevation derived from
191	164	Art. 012	Hazard (Flood)	Exposure	River bed	River bed elevation (m)	Bathymetry (m)	Topography and Terrain	Flood	1D-2D	Elevation of the river bed	(1) GRWL Database (Allen and	Satellite Imagery	Bed elevation extracted from
117	84	Art. 008	none	Exposure	(DEM)	Roughness	Manning roughness coefficient	Topography and Terrain		Integrate	Expresses terrain surface	(1) United States Geological	Satellite imagery	Derived from a 30 m SRTM DEM
211	164	Art. 012	Hazard (Flood)	Exposure	Manning's n	Bed roughness	Manning roughness coefficient	Topography and Terrain	Flood	1D-2D	Roughness coefficient for	(1) LULC map, (2) Literature-	Satellite Imagery: Scientific	LULC classes assigned Manning's
307	215	Art. 015	Hazard	Exposure	Overland flow	Overland flow time	Manning roughness coefficient	Topography and Terrain	Hydrologic	Comparative	The length of overland	(1) ESA CORINE LULC 2018 level	Satellite imagery: Software	GIS Modelling
1344	927	Art. 072	Performance assessment	Exposure	N_Imperv	Manning roughness	Manning roughness coefficient	Topography and Terrain	Performance	EPA's Storm	Manning's roughness	(1) MRLC: U.S. Multi-Resolution	Satellite Imagery: Official data:	Land use classification per sub-
1345	927	Art. 072	Performance assessment	Exposure	N_Perv	Manning roughness	Manning roughness coefficient	Topography and Terrain	Performance	EPA's Storm	Manning's roughness	(1) MRLC: U.S. Multi-Resolution	Satellite Imagery: Official data:	Land use classification per sub-
1997	1377	Art. 112	Exposure	Exposure	Area decrease	Soil subsidence (SL)	Soil erosion	Topography and Terrain	NATURAL	CCFVI:	Rate of soil	(1) WWF Hellas, web mapping	Satellite Imagery: Official data	Data collection for 6 study areas:
2415	1505	Art. 130	Ecological Risk	Exposure	Non-sealed	Erodibility	Soil erosion	Topography and Terrain	Ecological	Multicriteria	Areas with erosion	Kubal et al. (2009), City of	Scientific Literature; Official data	Erodible areas intersected with
78	51	Art. 005	Sensitivity	Exposure	Soil type	Soil type	Soil type	Topography and Terrain	Sensitivity	H–S–V–R flood	Soil type classified from	FAO and IIASA. (2023).	Official data	
104	83	Art. 007	none	Exposure	Geomorphology	Geomorphology (km/km²)	Soil type	Topography and Terrain		Multi-criteria	Describes landform	United States Geological Survey	Satellite imagery	Geomorphological units were
130	84	Art. 008	none	Exposure	Geology layer	Geology	Soil type	Topography and Terrain		Integrate	Controls subsurface	Geological data provided by the	Official data	Geology layer acquired from the
131	84	Art. 008	none	Exposure	Soil data shapefile	Soil	Soil type	Topography and Terrain		Integrate	Represents soil physical	Soil data obtained from the FAO	Official data	Soil data acquired from the FAO
330	215	Art. 015	Hazard	Exposure	Texture ratio	Morphometric risk	Soil type	Topography and Terrain	Morphometri	Comparative	The morphometric	(1) JAXA ALOS World 3D-Res.:	Satellite imagery: Software	GIS Modelling
343	222	Art. 016	none	Exposure	soil	soil	Soil type	Topography and Terrain		The analytical	The type of soil has a	FAO/UNESCO Soil Map of the	Official Data: Open Urban Data	
373	278	Art. 017	Sensitivity	Exposure		Soil Textures	Soil type	Topography and Terrain			SCS divides soil into four	(1) Hunting Technical Services	Official data: Scientific Literature	
402	363	Art. 020	Hazard	Exposure		Soil	Soil type	Topography and Terrain	Flood hazard	multi-criteria	Flood hazard mitigation	National Bureau of Soil Survey	Official data	GIS Modelling
687	722	Art. 033	Flood inventory	Exposure	Shapefile	Lithology	Soil type	Topography and Terrain	Flood		Rock type and	Geological Survey of Pakistan	Official Data	
701	725	Art. 034	Salinization	Exposure	Raster	Normalized Difference	Soil type	Topography and Terrain	Multi-hazard		Identifies soil salinity	(1) United States Geological	satellite imagery	
702	725	Art. 034	Soil Erosion	Exposure	Raster	Soil Erosion (RUSLE)	Soil type	Topography and Terrain	Multi-hazard		Estimates soil loss	Derived from multiple inputs:	Official Data: Scientific Literature	
756	739	Art. 038	Soil / Flood Conditioning	Exposure	Soil Type	Soil Type	Soil type	Topography and Terrain	Soil / Flood	Reclassificatio	Soil classification	Bangladesh Agricultural	Official Data	ArcGIS
946	772	Art. 047	Exposure	Exposure	NBSSLUP Soil	Soil Map	Soil type	Topography and Terrain	GEOPHYSICA	Soil	Regional soil	Indian National Bureau of Soil	Official data: Scientific Literature	Extracted and processed in
986	780	Art. 050	Susceptibility	Exposure	Soil Data	Soil Type	Soil type	Topography and Terrain	FLOOD	Soil	Soil classification based	FAO Map Catalog - Food and	Official data	Soil data extraction: classification
1064	805	Art. 054	Water related	Exposure	Soil type	Soil texture	Soil type	Topography and Terrain	Water	Analytic	30 soil types classified	Masovian Geodesy and	Official data: Scientific Literature	Digitization: classification:
1128	831	Art. 059	Physical	Exposure	Coastal landform	Geomorphology	Soil type	Topography and Terrain	Physical	Equal	Classification of coastal	(1) Geological Survey of	Official data: Scientific Literature	Classification of
1232	880	Art. 064	Susceptibility	Exposure	Soil permeability	Soil type	Soil type	Topography and Terrain	Susceptibility	Multi-Criteria	Classification of soil types	Geomorphological/soil maps:	Official data: Scientific Literature	Soil classification: scoring based
1305	921	Art. 070	Current Flood Risk	Exposure	Soil type	Soil type data	Soil type	Topography and Terrain	Current Flood	Soil	Soil types classified	Soil and Terrain Database	Official data: Scientific Literature	Soil type extraction: classification
1368	928	Art. 073	Hazard	Exposure	Soil type /	Soil	Soil type	Topography and Terrain	Hazard	Analytical	Soil permeability directly	Bhukosh, the Geoscience	Official data	Soil type classification:
1388	938	Art. 074	Hazard	Exposure	Soil classification	Soil Type	Soil type	Topography and Terrain	Hazard	Analytical	Soil types classified by	Ethiopian Ministry of Agriculture	Official data	Soil type extraction: classification
1403	944	Art. 075	Hazard	Exposure	Rock type /	Lithology	Soil type	Topography and Terrain	Hazard	Radial Basis	Geological units	Geology Survey of Iran (GSI) -	Official data	Lithology unit classification:
1407	944	Art. 075	Hazard	Exposure	Clay content	Clay Content	Soil type	Topography and Terrain	Hazard	Radial Basis	Soil clay content	(1) Geology Survey of Iran (GSI) -	Official data: On-site	Clay content classification:
1408	944	Art. 075	Hazard	Exposure	Sand content	Sand Content	Soil type	Topography and Terrain	Hazard	Radial Basis	Soil sand content	(1) Geology Survey of Iran (GSI) -	Official data: On-site	Sand content classification:
1498	995	Art. 081	Hazard	Exposure	Soil	Soil type classification	Soil type	Topography and Terrain	Hazard	Modified	Soil Map of the World at	(1) Food and Agricultural	Official data	Soil type extraction: permeability
1519	1001	Art. 082	Hazard	Exposure	Soil type	Soil Texture (ST)	Soil type	Topography and Terrain	Hazard	Fuzzy	Soil texture data	(1) National Bureau of Soil	Official data	Soil type classification (sand, clay
1520	1001	Art. 082	Hazard	Exposure	Geological unit	Geology (G)	Soil type	Topography and Terrain	Hazard	Fuzzy	Geological units from	(1) Geological Survey of India	Official data	Geological unit classification
1521	1001	Art. 082	Hazard	Exposure	Landform	Geomorphology (GM)	Soil type	Topography and Terrain	Hazard	Fuzzy	Landform mapping	(1) Geological Survey of India	Official data	Landform classification (Young
1561	1062	Art. 085	Vulnerability	Exposure	Foundation	Soil and lithological context	Soil type	Topography and Terrain	Vulnerability	Indicator-	Soil and lithological	(1) Portuguese Census 2011 -	Census Data; Official data	Soil and lithological context
1645	1073	Art. 088	Hazard	Exposure	Hydrologic Soil	Soil Type	Soil type	Topography and Terrain	GEOTECHNIC	Analytical	Soil texture impacts	(1) National Bureau of Soil	Official data	Soil group extraction:
1654	1076	Art. 089	Hazard	Exposure	Rock type	Lithology	Soil type	Topography and Terrain	Waterlogging	Analytical	Lithology type affecting	(1) Bhukosh - Geological Survey	Official data	Lithology classification:
1655	1076	Art. 089	Hazard	Exposure	Landform type	Geomorphology	Soil type	Topography and Terrain	Waterlogging	Analytical	Geomorphological origins	(1) Bhukosh - Geological Survey	Official data	Geomorphology classification:
1672	1090	Art. 090	Hazard / Suitability	Exposure	Soil type	Soil Texture	Soil type	Topography and Terrain	GEOTECHNIC	Analytical	Soil characteristics	(1) Food and Agriculture	Official data	Soil texture classification:
1692	1097	Art. 091	Hazard	Exposure	Soil type	Soil Texture (ST)	Soil type	Topography and Terrain	GEOTECHNIC	K-Nearest	Influences subsurface	(1) Food and Agriculture	Official data	Soil texture classification:
1693	1097	Art. 091	Hazard	Exposure	Rock type	Lithology (Lg)	Soil type	Topography and Terrain	GEOTECHNIC	K-Nearest	Influences hydrological	(1) Commission for the	Official data	Lithology classification:
1694	1097	Art. 091	Hazard	Exposure	Landform type	Geomorphology (Gm)	Soil type	Topography and Terrain	GEOMORPH	K-Nearest	Critical element for flood	(1) Geological Survey of India	Official data	Geomorphology classification:
1731	1116	Art. 093	Hazard	Exposure	Soil classification	Soil Type	Soil type	Topography and Terrain	GEOTECHNIC	Analytical	Soil type affecting	(1) National Bureau of Soil	Official data	Soil classification into 5 classes
1735	1118	Art. 094	Exposure	Exposure	Soil type	Nature of soil	Soil type	Topography and Terrain	Exposure	Analytic	Soil characteristics	(1) eThekwini Municipality - Soil	Official data: On-site	Soil classification: reclassification
1756	1128	Art. 095	Hazard	Exposure	Soil type	Soil Texture	Soil type	Topography and Terrain	GEOTECHNIC	GIS weighted	Soil texture classification	(1) World Soil Information	Official data: Software Simulation	Data download: resampling to 30
1789	1149	Art. 098	Suitability	Exposure	Soil type	Soil Texture	Soil type	Topography and Terrain	GEOTECHNIC	CRITIC	Soil texture type from	(1) National Bureau of Soil	Official data	Soil texture extraction:
1830	1228	Art. 101	Hazard	Exposure	Rock type	Lithology (C6)	Soil type	Topography and Terrain	GEOTECHNIC	AHP: TF-AHP:	Geological formation	(1) Department of Mineral and	Official data	Lithological unit extraction:
1930	1318	Art. 107	Vulnerability	Exposure	Soil classification	Soil Type	Soil type	Topography and Terrain	PHYSICAL	Weighted	Soil texture classes	(1) Dames and Moore (1981,	Official data	Soil type extraction: classification
1931	1318	Art. 107	Vulnerability	Exposure	Landform type	Geomorphological Features	Soil type	Topography and Terrain	PHYSICAL	Weighted	Geomorphological units	(1) Mohamed et al. (2014) -	Official data	Geomorphological unit
2205	1432	Art. 118	Physical System	Exposure	Soil classification	Soil type map	Soil type	Topography and Terrain	Physical	GIS	Classification of soil types	United States Department of	Official data	Soil type raster converted to
115	84	Art. 008	none	Exposure	(DEM)	Plan Curvature	Surface Curvature	Topography and Terrain		Integrate	Indicates the lateral	(1) United States Geological	Satellite imagery	Derived from a 30 m SRTM DEM
116	84	Art. 008	none	Exposure	(DEM)	Profile Curvature	Surface Curvature	Topography and Terrain		Integrate	Represents curvature	(1) United States Geological	Satellite imagery	Derived from a 30 m SRTM DEM
299	215	Art. 015	Hazard	Exposure	Profile	Profile	Surface Curvature	Topography and Terrain	Topographic	Comparative	Profile curvature (Fig. 2f)	(1) JAXA ALOS World 3D-Res.:	Satellite imagery: Software	GIS Modelling
302	215	Art. 015	Hazard	Exposure	Plan Curvature	Plan Curvature	Surface Curvature	Topography and Terrain	Topographic	Comparative	Plan curvature indicates	(1) JAXA ALOS World 3D-Res.:	Satellite imagery: Software	GIS Modelling
683	722	Art. 033	Flood inventory	Exposure	Raster	Profile curvature	Surface Curvature	Topography and Terrain	Flood		Curvature of the terrain	United States Geological Survey	satellite imagery	
684	722	Art. 033	Flood inventory	Exposure	Raster	Plan curvature	Surface Curvature	Topography and Terrain	Flood		Curvature of the terrain	United States Geological Survey	satellite imagery	
708	726	Art. 035	Exposure	Exposure	Spatial analysis:	Curvature (κ)	Surface Curvature	Topography and Terrain	Morphometri	GIS-based	Terrain curvature	Derived from INCAS LiDAR DTM	Other (Aerial Survey Data):	GIS software (ArcGIS / QGIS)
989	780	Art. 050	Susceptibility	Exposure	DEM	Curvature	Surface Curvature	Topography and Terrain	FLOOD	Terrain	Represents contour and	United States Geological Survey	Satellite Imagery	Curvature calculation from DEM
1069	805	Art. 054	Topographic	Exposure	Curvature	Curvature	Surface Curvature	Topography and Terrain	Topographic	Analytic	Indicates divergence and	(1) United States Geological	Satellite Imagery: Software	Curvature calculation:
1247	886	Art. 065	Flood Conditioning Factor	Exposure	Curvature	Curvature	Surface Curvature	Topography and Terrain	Flood	GIS terrain	Surface shape (convex or	Alaska Satellite Facility (ASF) -	Satellite Imagery	Curvature calculation using
1397	944	Art. 075	Hazard	Exposure	Curvature	Curvature	Surface Curvature	Topography and Terrain	Hazard	Radial Basis	Surface curvature Digital	(1) United States Geological	Satellite Imagery: Software	Curvature calculation using
1457	978	Art. 078	Hazard	Exposure	Curvature	Curvature	Surface Curvature	Topography and Terrain	Hazard	XGBoost:	Surface curvature derived	(1) General Directorate of	Satellite Imagery: Software	Curvature calculation from
1684	1097	Art. 091	Hazard	Exposure	Curvature	Curvature (Cu)	Surface Curvature	Topography and Terrain	TOPOGRAPHI	K-Nearest	Shape of surface	(1) United States Geological	Satellite Imagery: Software	Curvature calculation from DEM:
30	24	Art. 001	Vulnerability	Exposure	Topography	Topography	Terrain elevation (m)	Topography and Terrain	Environment	Fuzzy rating	High/Medium/Low.	(1) City of Kelowna Interactive	Official data	Importance level x Fuzzy number
31	25	Art. 002	Mapping Flood-	Exposure	(DEM) (SRTM-	Topography (elevation,	Terrain elevation (m)	Topography and Terrain	Mapping	SRTM-DEM	The digital raster	(1) United States Geological	Satellite imagery: Software	Prediction of Flood-Susceptible
42	35	Art. 003	flood hazard and	Exposure	Elevation	Elevation	Terrain elevation (m)	Topography and Terrain	flood hazard	The study	Raster elevation values	(1) Vietnam Department of	Official data	
56	35	Art. 003	Built Environment	Exposure	Building Site	Building Site Elevation (BSE)	Terrain elevation (m)	Topography and Terrain	Built		Surface elevation at	(1) Vietnam Department of	Official data	
76	51	Art. 005	Sensitivity	Exposure	DEM	DEM (m)	Terrain elevation (m)	Topography and Terrain	Sensitivity	H–S–V–R flood	(DEM) derived from	United States Geological Survey	Satellite imagery	
89	73	Art. 006	Exposure	Exposure	Digital elevation	Digital Elevation Model	Terrain elevation (m)	Topography and Terrain	Exposure	Spatial Multi-	Digital Elevation Model	Chinese Resource and	Official data	Lower elevation areas (< 151.84
112	84	Art. 008	none	Exposure	(DEM)	Elevation	Terrain elevation (m)	Topography and Terrain		Integrate	Represents terrain height.	(1) United States Geological	Satellite imagery	Derived from a 30 m SRTM DEM
152	104	Art. 010	hazard	Exposure	(DEM)	Elevation	Terrain elevation (m)	Topography and Terrain	Waterlogging	Analytical	Represents terrain height	(1) United States Geological	Satellite imagery: Software	30-m resolution SRTM DEM
192	164	Art. 012	Hazard (Flood)	Exposure	Digital Elevation	DEM	Terrain elevation (m)	Topography and Terrain	Flood	1D-2D	Topographic elevation	(1) MERIT DEM (Yamazaki et al.,	Satellite Imagery	DEM resampled to model
215	196	Art. 013	vulnerability and baseline	Exposure	DEM file	DEM file	Terrain elevation (m)	Topography and Terrain	3.1.	An Integrated	(1) DEM file from the ESRI	(1) DEM file from the ESRI	satellite imagery: Software	The ArcMap 10.41 software was
284	200	Art. 014	Physical Vulnerability	Exposure	Location/Distance	Location/Distance (m)	Terrain elevation (m)	Topography and Terrain	Physical	modified	A reconnaissance survey	(1) United States Geological	Satellite Imagery: On-Site	statistical and GIS platforms
286	200	Art. 014	Physical Vulnerability	Exposure	DEM	Elevation (m)	Terrain elevation (m)	Topography and Terrain	Physical	modified	A reconnaissance survey	United States Geological Survey	Satellite Imagery	statistical and GIS platforms
298	215	Art. 015	Hazard	Exposure	Digital elevation	Digital elevation model	Terrain elevation (m)	Topography and Terrain	Topographic	Comparative	The topographic factors	(1) JAXA ALOS World 3D-Res.:	Satellite imagery: Scientific	GIS Modelling
319	215	Art. 015	Hazard	Exposure	Topographic	Topographic parameters	Terrain elevation (m)	Topography and Terrain	Morphometri	Comparative	The morphometric	(1) JAXA ALOS World 3D-Res.:	Satellite imagery: Software	GIS Modelling
320	215	Art. 015	Hazard	Exposure	Total basin relief	Total basin relief (m)	Terrain elevation (m)	Topography and Terrain	Morphometri	Comparative	The morphometric	(1) JAXA ALOS World 3D-Res.:	Satellite imagery: Software	GIS Modelling
321	215	Art. 015	Hazard	Exposure	Relief ratio	Relief ratio	Terrain elevation (m)	Topography and Terrain	Morphometri	Comparative	The morphometric	(1) JAXA ALOS World 3D-Res.:	Satellite imagery: Software	GIS Modelling

323	215	Art. 015	Hazard	Exposure	Form factor	Form factor	Terrain elevation (m)	Topography and Terrain	Morphometri	Comparative	The morphometric	(1) JAXA ALOS World 3D-Res.:	Satellite imagery: Software	GIS Modelling	VULN INTO RISK
326	215	Art. 015	Hazard	Exposure	Elongation ratio	Elongation ratio	Terrain elevation (m)	Topography and Terrain	Morphometri	Comparative	The morphometric	(1) JAXA ALOS World 3D-Res.:	Satellite imagery: Software	GIS Modelling	VULN INTO RISK
334	222	Art. 016	none	Exposure	Elevation	Elevation	Terrain elevation (m)	Topography and Terrain		The analytical	Elevation gave the spatial	(1) ESA Copernicus GLO 30	Satellite imagery		VULN INTO RISK
348	278	Art. 017	Exposure	Exposure	DEM (m)	DEM (m)	Terrain elevation (m)	Topography and Terrain		Normalization	DEM is derived from	(1) United States Geological	Satellite imagery	To generate Watershed	VULN INTO RISK
382	302	Art. 018	Exposure	Exposure	DEM (m)	Elevation (m)	Terrain elevation (m)	Topography and Terrain	Physical		The low Elevation, the	(1) United States Geological	Satellite imagery: Software		VULN INTO RISK
397	363	Art. 020	Hazard	Exposure	SRTM DEM	Elevation	Terrain elevation (m)	Topography and Terrain	Flood hazard	multi-criteria	Elevation is considered as	(1) United States Geological	Satellite imagery	GIS Modelling	VULN INTO RISK
420	483	Art. 022	Regional Vulnerability	Exposure	Elevation	Elevation	Terrain elevation (m)	Topography and Terrain	Regional	Deterministic	The settlements at higher	United States Geological Survey	Satellite imagery	The physical factor such as	VULN INTO RISK
446	524	Art. 023	Vulnerability	Exposure		Digital elevation model	Terrain elevation (m)	Topography and Terrain			The data used in the DEM	(1) General Organization for	Official data: Software simulation		VULN INTO RISK
571	697	Art. 029	Exposure	Exposure	DEM	Elevation	Terrain elevation (m)	Topography and Terrain	Topography	PCA: SOM	Average elevation (m) of	(1)RGPH spatial sector database	Official data: Software Simulation		VULN
575	709	Art. 030	Physical vulnerability	Exposure	DEM	Elevation	Terrain elevation (m)	Topography and Terrain	Physical		Surface elevation used to	30-m (DEM), likely United	Satellite imagery: Software		VULN INTO RISK
680	722	Art. 033	Flood inventory	Exposure	Raster	Elevation	Terrain elevation (m)	Topography and Terrain	Flood		Height of the terrain	United States Geological Survey	satellite imagery		RISK
705	725	Art. 034	Exposure	Exposure	DEM	(DEM)	Terrain elevation (m)	Topography and Terrain	Model		In this analysis, Cartosat	United States Geological Survey	satellite imagery		VULN INTO RISK
706	726	Art. 035	Exposure	Exposure	Terrain analysis:	Digital Terrain Model (DTM)	Terrain elevation (m)	Topography and Terrain	Topography	GIS-based	High-precision elevation	INCAS - National Institute for	Other (Aerial Survey Data):	Standard LiDAR processing	VULN INTO RISK
715	726	Art. 035	Exposure	Exposure	Generation of	Digital Surface Model (DSM)	Terrain elevation (m)	Topography and Terrain	Topography	GIS-based	Surface model including	INCAS LiDAR	Other (Aerial Survey Data):	Standard LiDAR processing	VULN INTO RISK
728	727	Art. 036	Flood hazard	Exposure	Elevation	Elevation	Terrain elevation (m)	Topography and Terrain	Flood hazard		Low elevation areas are	(1)United States Geological	satellite imagery	ArcGIS	RISK
734	728	Art. 037	Topography	Exposure	ALOS PALSAR	DEM	Terrain elevation (m)	Topography and Terrain	Topography	Topographic	High-resolution Digital	Japan Aerospace Exploration	satellite imagery	ArcGIS 10.8.2	RISK
747	739	Art. 038	Topography / Flood	Exposure	(DEM)	Elevation (m)	Terrain elevation (m)	Topography and Terrain	Topography	Terrain	Height of terrain above	United States Geological Survey	Satellite imagery	ArcGIS	RISK
757	740	Art. 039	Base Mapping	Exposure	Orthophotos	Orthophotos	Terrain elevation (m)	Topography and Terrain	Base	Visual	High-resolution aerial	Douala City Council (DCC) -	Other (Aerial imagery): Satellite	ArcGIS 10.5	RISK
758	740	Art. 039	Topography	Exposure	Topographic Data	Topographic Data	Terrain elevation (m)	Topography and Terrain	Topography	Topographical	Planimetric (latitude,	(1) Field collection: (2)	On-site: GPS data	ArcGIS 10.5, Maqit GIS	RISK
759	740	Art. 039	Topography	Exposure	Digital Elevation	Digital Elevation Model	Terrain elevation (m)	Topography and Terrain	Topography	Geostatistical	Interpolated elevation	(1) Field collection: (2)	On-site: GPS data	ArcGIS 10.5	RISK
830	762	Art. 042	Hazard	Exposure	LECZ area (%)	Low Elevation Coastal Zone	Terrain elevation (m)	Topography and Terrain		Multi-error	Low Elevation Coastal	(1)(Yamazaki et al., 2017) MERIT	Scientific Literature: Satellite	Elevation thresholding (<10 m	VULN INTO RISK
846	765	Art. 043	Hazard	Exposure	Determines the	Elevation (m)	Terrain elevation (m)	Topography and Terrain	FLOOD	Geographic	Determines the likelihood	(1) United States Geological	Satellite imagery	Extraction of elevation values:	VULN INTO RISK
882	766	Art. 044	Hazard	Exposure	Raster	Elevation	Terrain elevation (m)	Topography and Terrain	PHYSICAL	Terrain	Ground elevation data	City of Calgary Open Data Portal	Official data: Software simulation	Arithmetic mean calculation for	VULN INTO RISK
896	769	Art. 045	Hazard	Exposure	Raster	Elevation	Terrain elevation (m)	Topography and Terrain	Flood Hazard	Terrain	Provides essential	United States Geological Survey	Satellite imagery	Extracted and processed in GEE	RISK
897	769	Art. 045	Hazard	Exposure	Raster	Topographic Position Index	Terrain elevation (m)	Topography and Terrain	Flood Hazard	Topographic	Created using elevation	(1) United States Geological	Satellite imagery: Software	TPI calculation from DEM in GEE	RISK
906	771	Art. 046	Physical	Exposure	DEM	Elevation	Terrain elevation (m)	Topography and Terrain	Physical	Principal		United States Geological Survey	Satellite imagery		VULN INTO RISK
947	772	Art. 047	Exposure	Exposure	ALOS PALSAR	Elevation	Terrain elevation (m)	Topography and Terrain	GEOPHYSICA	Terrain	Surface elevation model	(1) Alaska Satellite Facility (ASF)	Satellite Imagery: Software	Extracted and classified into 5	VULN INTO RISK
976	777	Art. 049	Vulnerability	Exposure	Raster	Elevation	Terrain elevation (m)	Topography and Terrain	VULNERABILI	Terrain	Digital Elevation Model	Resources and Environment	Satellite Imagery: Official data	Extracted and processed in GIS:	VULN INTO RISK
984	780	Art. 050	Susceptibility	Exposure	DEM	Elevation	Terrain elevation (m)	Topography and Terrain	FLOOD	Terrain	Height above sea level.	United States Geological Survey	Satellite Imagery	Elevation extraction from DEM:	RISK
1010	790	Art. 052	hazard	Exposure	DEM (m)	DEM (m)	Terrain elevation (m)	Topography and Terrain	HAZARD (risk	Pressure-state-	DEM (m). The applied	(1) DEM res. 30 m by Hawker et	Scientific Literature	The spatial pattern of Flood	VULN INTO RISK
1061	805	Art. 054	Topographic	Exposure	Elevation (m)	Land elevation	Terrain elevation (m)	Topography and Terrain	Topographic	Analytic	Basic morphometric	United States Geological Survey	Satellite Imagery	DEM extraction: elevation	RISK
1078	816	Art. 055	Hazard	Exposure	Low-lying areas	Elevation with reference to	Terrain elevation (m)	Topography and Terrain	Hazard	GIS-based	Elevation relative to	(1) ISRO CartoDEM Res.:2.5m -	Satellite Imagery: Official data	Elevation classification:	RISK
1103	819	Art. 056	Natural	Exposure	Elevation (E)	Elevation (m)	Terrain elevation (m)	Topography and Terrain	Natural	GIS terrain	Lands with low elevation	Advanced Spaceborne Thermal	Satellite Imagery	DEM extraction: elevation	VULN
1129	831	Art. 059	Physical	Exposure	Elevation (m)	Coastal elevation	Terrain elevation (m)	Topography and Terrain	Physical	Equal	Terrain elevation above	(1) United States Geological	Satellite Imagery: Official data	Elevation extraction from DEM:	VULN
1208	863	Art. 063	Flood Hazard Index (FHI)	Exposure	Elevation (m)	Elevation	Terrain elevation (m)	Topography and Terrain	Flood	Fuzzy Analytic	Height above sea level.	United States Geological Survey	Satellite Imagery	DEM extraction: reclassification	VULN INTO RISK
1242	886	Art. 065	Flood Conditioning Factor	Exposure	Elevation (m)	Elevation	Terrain elevation (m)	Topography and Terrain	Flood	Grid search:	Height above sea level	Alaska Satellite Facility (ASF) -	Satellite Imagery	DEM extraction: resampling to	VULN INTO RISK
1255	904	Art. 066	none	Exposure	Elevation (m)	SRTM (DEM)	Terrain elevation (m)	Topography and Terrain		GIS terrain	30-meter resolution	(1) United States Geological	Satellite Imagery	Mosaic using ENVI 5.3:	VULN INTO RISK
1295	918	Art. 069	none	Exposure	Elevation (m)	Digital Elevation Model	Terrain elevation (m)	Topography and Terrain		Multi-Criteria	20 m resolution digital	Taiwan Ministry of the Interior	Official data	DEM extraction: grid-based	VULN INTO RISK
1303	921	Art. 070	Current Flood Risk	Exposure	Elevation (m)	Spot heights and contour	Terrain elevation (m)	Topography and Terrain	Current Flood	GIS terrain	Spot heights (731 points)	National Geo-spatial Information	Official data	Topo to Raster tool in ArcMap	RISK
1318	924	Art. 071	Hazard	Exposure	Elevation (m)	(DEM)	Terrain elevation (m)	Topography and Terrain		Automated	SRTM1 (DEM) at 30 m	United States Geological Survey	Satellite Imagery	Mosaic and clip to study area:	VULN INTO RISK
1354	927	Art. 072	Floodplain determination	Exposure	Elevation (m)	(DEM)	Terrain elevation (m)	Topography and Terrain	Floodplain	EPA's Storm	High-resolution (1.0m)	United States Geological Survey	Satellite Imagery	Conversion to Triangulated	VULN INTO RISK
1366	928	Art. 073	Hazard	Exposure	Elevation (m)	Elevation (E)	Terrain elevation (m)	Topography and Terrain	Hazard	Analytical	SRTM (DEM) representing	United States Geological Survey	Satellite Imagery	Mosaic and clip to study area:	VULN INTO RISK
1390	938	Art. 074	Hazard	Exposure	Elevation (m)	Elevation	Terrain elevation (m)	Topography and Terrain	Hazard	Analytical	Terrain height. Digital	(1) United States Geological	Satellite Imagery: Software	DEM from TIN, Digital Elevation	RISK
1395	944	Art. 075	Hazard	Exposure	Elevation (m)	Elevation	Terrain elevation (m)	Topography and Terrain	Hazard	Radial Basis	Terrain height (1) United	(1) United States Geological	Satellite Imagery	(1) United States Geological	RISK
1414	957	Art. 076	Hazard	Exposure	Elevation (m)	Elevation	Terrain elevation (m)	Topography and Terrain	Hazard	UFResi-Mm	Terrain height above sea	(1) United States Geological	Satellite Imagery	Elevation classification:	VULN INTO RISK
1444	977	Art. 077	Hazard	Exposure	Elevation (m)	(DEM)	Terrain elevation (m)	Topography and Terrain		Analytic	Terrain elevation data	(1) United States Geological	Satellite Imagery	Elevation extraction:	VULN INTO RISK
1445	977	Art. 077	Hazard	Exposure	Depression index	Depression	Terrain elevation (m)	Topography and Terrain		Analytic	Topographic depressions	United States Geological Survey	Satellite Imagery: Software	Depression extraction from DEM	VULN INTO RISK
1455	978	Art. 078	Hazard	Exposure	Elevation (m)	Digital Elevation Model	Terrain elevation (m)	Topography and Terrain	Hazard	XGBoost:	Terrain elevation data	(1) General Directorate of	Official data	Contour map interpolation (Topo	RISK
1483	988	Art. 080	Hazard	Exposure	(DEM)	Elevation (m)	Terrain elevation (m)	Topography and Terrain	Hazard	2D	Terrain elevation data	(1) Municipal Corporation of	Satellite Imagery: Official data	Bathymetry extraction: land and	VULN INTO RISK
1497	995	Art. 081	Hazard	Exposure	(DEM)	Elevation (m)	Terrain elevation (m)	Topography and Terrain	Hazard	Geographic	30 m resolution (DEM)	(1) United States Geological	Satellite Imagery	DEM extraction: sub-catchment	VULN INTO RISK
1516	1001	Art. 082	Hazard	Exposure	(DEM)	Elevation (m)	Terrain elevation (m)	Topography and Terrain	Hazard	Fuzzy	30 m resolution DEM	(1) United States Geological	Satellite Imagery	DEM extraction: elevation	VULN INTO RISK
1524	1050	Art. 083	Hazard	Exposure	Elevation (m)	Digital Elevation Model (1)	Terrain elevation (m)	Topography and Terrain	Hazard	Analytical	Terrain elevation	(1) National Institute for Space	Satellite Imagery	DEM extraction: elevation	RISK
1534	1058	Art. 084	Sensitivity	Exposure	Elevation (m)	The elevation of coastal	Terrain elevation (m)	Topography and Terrain	Sensitivity -	Geographic	Elevation of coastal	(1) United States Geological	Satellite Imagery: Official data	Coastal settlement extraction:	VULN INTO RISK
1610	1066	Art. 086	Adaptive capacity	Exposure	Adaptive capacity	Elevating House Location	Terrain elevation (m)	Topography and Terrain	LAND	Qualitative	Adaptive measure to	(1) Structured field survey: (2)	Survey/questionnaire	Adaptive capacity assessment:	VULN INTO RISK
1643	1073	Art. 088	Hazard	Exposure	Elevation above	Elevation	Terrain elevation (m)	Topography and Terrain	TOPOGRAPHI	Analytical	Higher elevations affect	(1) ISRO CartoDEM Res.: 2.5m -	Satellite Imagery	DEM extraction: elevation	RISK
1650	1076	Art. 089	Hazard	Exposure	Elevation above	Elevation	Terrain elevation (m)	Topography and Terrain	Waterlogging	Analytical	Terrain elevation	(1) Alaska Satellite Facility -	Satellite Imagery	DEM extraction: elevation	VULN INTO RISK
1669	1090	Art. 090	Hazard / Vulnerability /	Exposure	Elevation (m)	Elevation	Terrain elevation (m)	Topography and Terrain	TOPOGRAPHI	Analytical	Terrain elevation	(1) United States Geological	Satellite Imagery	DEM extraction: elevation	VULN INTO RISK
1681	1097	Art. 091	Hazard	Exposure	Elevation (m)	Elevation (El)	Terrain elevation (m)	Topography and Terrain	TOPOGRAPHI	K-Nearest	Terrain elevation above	(1) United States Geological	Satellite Imagery	DEM extraction: elevation	VULN INTO RISK
1753	1128	Art. 095	Hazard	Exposure	Elevation (m)	Elevation	Terrain elevation (m)	Topography and Terrain	TOPOGRAPHI	GIS weighted	Terrain elevation derived	(1) United States Geological	Satellite Imagery: Software	DEM download: projection from	RISK
1763	1139	Art. 096	Exposure	Exposure	Geographic	Geographic elevation (m)	Terrain elevation (m)	Topography and Terrain	Exposure	AHP-entropy	Terrain elevation data	(1) Digital Elevation Model	Satellite Imagery	Elevation extraction:	VULN INTO RISK
1787	1149	Art. 098	Suitability	Exposure	Elevation (m)	Elevation	Terrain elevation (m)	Topography and Terrain	TOPOGRAPHI	CRITIC	Terrain height above sea	(1) United States Geological	Satellite Imagery	DEM extraction: classification	VULN INTO RISK
1836	1256	Art. 102	Hazard	Exposure	Elevation (m)	Digital Elevation Model	Terrain elevation (m)	Topography and Terrain	TOPOGRAPHI	Artificial	Terrain elevation data	(1) Sari municipality - Elevation	Official data: Software Simulation	Kriging interpolation: DEM	RISK
1932	1318	Art. 107	Vulnerability	Exposure	Elevation (m)	Elevation	Terrain elevation (m)	Topography and Terrain	PHYSICAL	Weighted	Terrain height derived	(1) United States Geological	Satellite Imagery: Official Data	DEM extraction: elevation	VULN INTO RISK
1958	1353	Art. 109	Hazard	Exposure	Elevation (m)	Height	Terrain elevation (m)	Topography and Terrain	TOPOGRAPHI	GIS-MCDA:	The elevation of the land	(1) Ministry of Gaza (MoG) -	Official data: GPS data	DEM resampled to 70 m × 70 m	RISK
2203	1432	Art. 118	Study Area Delineation	Exposure	Ground elevation	Digital Elevation Model	Terrain elevation (m)	Topography and Terrain	Physical	GIS	The elevation of the land	United States Department of	Satellite imagery	DEM resampled to 70 m × 70 m	RISK
2215	1432	Art. 118	Model Validation	Exposure	Ground elevation	Point 1: Battery Park	Terrain elevation (m)	Topography and Terrain	Validation	GSSHA	Location at the southern	Field observations: Google	On-site: Open Urban data: Official	Simulated flood depths extracted	RISK
2216	1432	Art. 118	Model Validation	Exposure	Subway station	Point 2: South Ferry St.	Terrain elevation (m)	Topography and Terrain	Validation	GSSHA	Critical transportation	Field observations: Google	On-site: Open Urban data: Official	Simulated flood depths extracted	RISK
2217	1432	Art. 118	Model Validation	Exposure	Ground elevation	Point 3: Whitehall St.	Terrain elevation (m)	Topography and Terrain	Validation	GSSHA	Location in lower	Field observations: Google	On-site: Open Urban data: Official	Simulated flood depths extracted	RISK
2218	1432	Art. 118	Model Validation	Exposure	Subway station	Point 4: Wall St. subway	Terrain elevation (m)	Topography and Terrain	Validation	GSSHA	Critical financial district	Field observations: Google	On-site: Open Urban data: Official	Simulated flood depths extracted	RISK
2219	1432	Art. 118	Model Validation	Exposure	University campus	Point 5: Pace University	Terrain elevation (m)	Topography and Terrain	Validation	GSSHA	Educational institution	Field observations: Google	On-site: Open Urban data: Official	Simulated flood depths extracted	RISK
2220	1432	Art. 118	Model Validation	Exposure	Heliport/transport	Point 6: New York Skyports	Terrain elevation (m)	Topography and Terrain	Validation	GSSHA	Transportation	Field observations: Google	On-site: Open Urban data: Official	Simulated flood depths extracted	RISK
2221	1432	Art. 118	Model Validation	Exposure	Financial center	Point 7: World Financial	Terrain elevation (m)	Topography and Terrain	Validation	GSSHA	Critical financial	Field observations: Google	On-site: Open Urban data: Official	Simulated flood depths extracted	RISK
2222	1432	Art. 118	Model Validation	Exposure	Subway station	Point 8: Canal St. subway	Terrain elevation (m)	Topography and Terrain	Validation	GSSHA	Transportation	Field observations: Google	On-site: Open Urban data: Official	Simulated flood depths extracted	RISK
2223	1432	Art. 118	Model Validation	Exposure	Subway station	Point 9: Canal St. subway	Terrain elevation (m)	Topography and Terrain	Validation	GSSHA	Transportation	Field observations: Google	On-site: Open Urban data: Official	Simulated flood depths extracted	RISK
2224	1432	Art. 118	Model Validation	Exposure	Redevelopment	Point 10: Hudson Yards	Terrain elevation (m)	Topography and Terrain	Validation	GSSHA	Major redevelopment	Field observations: Google	On-site: Open Urban data: Official	Simulated flood depths extracted	RISK
2225	1432	Art. 118	Model Validation	Exposure	Subway station	Point 11: Rector St. (line 1)	Terrain elevation (m)	Topography and Terrain	Validation	GSSHA	Transportation	Field observations: Google	On-site: Open Urban data: Official	Simulated flood depths extracted	RISK
2272	1457	Art. 122	Pathway	Exposure	GIS height above	Elevation	Terrain elevation (m)	Topography and Terrain	Pathway	GIS analysis	The height of each	Digital Elevation Model (DEM)	Satellite imagery	DEM processed to calculate	RISK
2354	1478	Art. 127	Physical Vulnerability	Exposure	Height above	Elevation	Terrain elevation (m)	Topography and Terrain	Physical	Multi-criteria	The elevation of the land	Shuttle Radar Topography	Satellite Imagery	SRTM DEM processed in ArcGIS	VULN
1292	914	Art. 068	none	Exposure	Elevation (m)	Elevation	Terrain elevation (m)	Topography and Terrain		Multi-Criteria	Terrain height above sea	(1) Department of Survey and	Satellite Imagery	DEM extraction: reclassification	VULN
1826	1228	Art. 101	Hazard	Exposure	Elevation (m)	Elevation (C2)	Terrain elevation (m)	Topography and Terrain	TOPOGRAPHI	AHP: TF-AHP:	Terrain height above sea	(1) German Aerospace Center	Satellite Imagery: Software	DEM extraction: reclassification	RISK
1913	1317	Art. 106	Hazard	Exposure	Elevation (m)	Digital Surface Model (DSM)	Terrain elevation (m)	Topography and Terrain	TOPOGRAPHI	FloodMap-	Topographic data	(1) Shanghai Municipal Institute	Satellite Imagery: Official data	Aerial image stereo pair	VULN INTO RISK
41	35	Art. 003	Flood hazard and	Exposure	Slope	Slope	Terrain Slope (%)	Topography and Terrain	flood hazard	The study	Slope derived from DEM using	GIS slope tool	Software Simulation		RISK
66	46	Art. 004	Land Cover	Exposure	terrain slope (%)	terrain slope (%)	Terrain Slope (%)	Topography and Terrain	Land Cover	Cellular	Land cover maps for	(1) European Environment	Satellite imagery: Official data:	Urban flood simulations	VULN INTO RISK
77	51	Art. 005	Sensitivity	Exposure	(DEM)	Slope	Terrain Slope (%)	Topography and Terrain	Sensitivity	H–S–V–R flood	Controls surface flow	United States Geological Survey	Satellite imagery		VULN INTO RISK
90	73	Art. 006	Exposure	Exposure	Elevation	Slope	Terrain Slope (%)	Topography and Terrain	Exposure	Spatial Multi-	"Slope" is no indicator of	Chinese Geographic Remote	Satellite imagery	Flat or mild slope (< 1.64 %)	VULN
107	83	Art. 007	none	Exposure	Slope (degrees)	Slope (degrees)	Terrain Slope (%)	Topography and Terrain		Multi-criteria	Controls surface water	United States Geological Survey	Satellite imagery	Slope was classified into five	VULN INTO RISK
113	84	Art. 008	none	Exposure	(DEM)	Slope	Terrain Slope (%)	Topography and Terrain		Interrate	Controls surface runoff	(1) United States Geological	Satellite imagery	Derived from a 30 m SRTM DEM	VULN INTO RISK
143	85	Art. 009	Flood Inundation Extent	Exposure	DEM	Slope	Terrain Slope (%)	Topography and Terrain	Flood	Overall Kappa	Digital Elevation Data	(1) GEE Google: United States	Satellite imagery	Terrain elevation used for slope	RISK
153	104	Art. 010	hazard	Exposure	(DEM)	Slope	Terrain Slope (%)	Topography and Terrain	Waterlogging	Analytical	Influences runoff velocity	(1) United States Geological	Satellite imagery: Software	30-m resolution SRTM DEM	VULN INTO RISK
300	215	Art. 015	Hazard	Exposure	Slope	Slope	Terrain Slope (%)	Topography and Terrain	Topographic	Comparative	Slope was observed to	(1) JAXA ALOS World 3D-Res.:	Satellite imagery: Software	GIS Modelling	VULN INTO RISK
335	222	Art. 016	none	Exposure	Slope	Slope	Terrain Slope (%)	Topography and Terrain		The analytical	The velocity at which	(1) ESA Copernicus GLO 30	Satellite imagery		VULN INTO RISK
360	278	Art. 017	Sensitivity	Exposure	DEM (m)	Slope (SL)	Terrain Slope (%)	Topography and Terrain	Vulnerability	Normalization	Mean slope was	(1) United States Geological	Satellite imagery		VULN INTO RISK
384	302	Art. 018	Exposure	Exposure	DEM (m)	Slope (%)	Terrain Slope (%)	Topography and Terrain	Physical		The low Slope, the high	(1) United States Geological	Satellite imagery: Software		VULN INTO RISK
398	363	Art. 020	Hazard	Exposure	SRTM DEM	Slope	Terrain Slope (%)	Topography and Terrain	Flood hazard	multi-criteria	Elevation is considered as	(1) United States Geological	Satellite imagery	GIS Modelling	VULN INTO RISK
418	483	Art. 022	Regional Vulnerability	Exposure	Slope	Slope	Terrain Slope (%)	Topography and Terrain	Regional	Deterministic	Areas with lower slope	United States Geological Survey	Satellite imagery	The physical factor such as	VULN INTO RISK
681	722	Art. 033	Flood inventory	Exposure	Raster	Slope	Terrain Slope (%)	Topography and Terrain	Flood		Angle of the terrain	United States Geological Survey	satellite imagery		RISK
707	726	Art. 035	Exposure	Exposure	Spatial analysis:	Slope (%)	Terrain Slope (%)	Topography and Terrain	Morphometri	GIS-based	Angle of terrain surface	Derived from INCAS LiDAR DTM	Other (Aerial Survey Data):	GIS software (ArcGIS / QGIS)	VULN INTO RISK
748	739	Art. 038	Topography / Flood	Exposure	(DEM)	Slope (%)	Terrain Slope (%)	Topography and Terrain	Topography /	Slope	Terrain steepness	United States Geological Survey	Satellite imagery	ArcGIS	RISK
847	765	Art. 043	Hazard	Exposure	Influences where	Slope (%)	Terrain Slope (%)	Topography and Terrain	FLOOD	Geographic	Influences where water	(1) United States Geological	Satellite imagery	Slope calculation from DEM:	VULN INTO RISK
881	766	Art. 044	Hazard	Exposure	Raster (derived)	Average ground slope	Terrain Slope (%)	Topography and Terrain	PHYSICAL	Terrain	Terrain steepness	City of Calgary Open Data Portal	Official data: Software simulation	Slope calculation at cell center	VULN INTO RISK
898	769	Art. 045	Hazard	Exposure	Raster	Slope Analysis	Terrain Slope (%)	Topography and Terrain	Flood Hazard	Terrain	Measures terrain	(1) United States Geological	Satellite Imagery: Software	Slope calculation from DEM in	RISK
907	771	Art. 046	Physical	Exposure	DEM	Slope	Terrain Slope (%)	Topography and Terrain	Physical	Principal		United States Geological Survey	Satellite imagery		VULN INTO RISK
948	772	Art. 047	Exposure	Exposure	ALOS PALSAR	Slope	Terrain Slope (%)	Topography and Terrain	GEOPHYSICA	Terrain	Surface inclination. DEM	(1) Alaska Satellite Facility (ASF)	Satellite Imagery: Software		RISK
977	777	Art. 049	Vulnerability	Exposure	Raster (derived)	Slope	Terrain Slope (%)	Topography and Terrain	VULNERABILI	Terrain	Measure of terrain	elevation data (Resources and	Satellite Imagery: Official data	Slope calculation from DEM:	VULN INTO RISK
985	780	Art. 050	Susceptibility	Exposure	DEM	Slope	Terrain Slope (%)	Topography and Terrain	FLOOD	Terrain	Terrain steepness	United States Geological Survey	Satellite Imagery	Slope calculation from DEM	RISK
995	785	Art. 051	Exposure	Exposure	Flood risk - flat	Flood risk - flat slope	Terrain Slope (%)	Topography and Terrain	Exposure	Terrain	Binary indicator of pixels	United States Geological Survey	Satellite imagery	Slope calculation (<2% flat)	VULN
1011	790	Art. 052	hazard	Exposure	Slope (degree)	Slope (degree)	Terrain Slope (%)	Topography and Terrain	HAZARD (risk	Pressure-state-	Slope (degree).The slope	Slope (degree) derived from	Software Simulation	The spatial pattern of Flood	VULN INTO RISK
1072	805	Art. 054	Topographic	Exposure	Slope (degrees)	Slope	Terrain Slope (%)	Topography and Terrain	Topographic	Analytic	Rate of elevation changes	United States Geological Survey	Satellite Imagery	Slope calculation: resampling to	RISK
1130	831	Art. 059	Physical	Exposure	Slope (% rise)	Coastal slope	Terrain Slope (%)	Topography and Terrain	Physical	Equal	Terrain steepness	(1) United States Geological	Satellite Imagery	Slope calculation from DEM:	VULN
1210	863	Art. 063	Flood Hazard Index (FHI)	Exposure	Slope (degrees)	Slope	Terrain Slope (%)	Topography and Terrain	Flood	Fuzzy Analytic	Terrain steepness. Flatter	United States Geological Survey	Satellite Imagery	Slope calculation from DEM:	VULN INTO RISK
1231	880	Art. 064	Susceptibility	Exposure	Slope (%)	Slope	Terrain Slope (%)	Topography and Terrain	Susceptibility	Multi-Criteria	Terrain steepness (%).	Digital Elevation Model (DEM) -	Satellite Imagery: Software	Slope calculation: classification:	VULN INTO RISK
1243	886	Art. 065	Flood Conditioning Factor	Exposure	Slope (degrees)	Slope	Terrain Slope (%)	Topography and Terrain	Flood	GIS terrain	Terrain steepness derived	Alaska Satellite Facility (ASF) -	Satellite Imagery	Slope calculation: resampling to	VULN INTO RISK
1256	904	Art. 066	none	Exposure	Slope (degrees)	Slope	Terrain Slope (%)	Topography and Terrain		GIS terrain	Terrain steepness derived	(1) United States Geological	Satellite Imagery	Slope calculation using ArcGIS	VULN INTO RISK
1296	918	Art. 069	none	Exposure	Slope (degrees)	Slope	Terrain Slope (%)	Topography and Terrain		Multi-Criteria	Terrain steepness derived	(1) Taiwan Ministry of the	Satellite Imagery: Official data	Slope calculation using surface	RISK
1304	921	Art. 070	Current Flood Risk	Exposure	Slope (degrees)	Slope	Terrain Slope (%)	Topography and Terrain	Current Flood	GIS terrain	Derived from NGI spot heights	Derived from NGI spot heights	Official data: Software Simulation	Slope calculation from DEM:	RISK
1319	924	Art. 071	Hazard	Exposure	Slope (degrees)	Slope	Terrain Slope (%)	Topography and Terrain		AutoML:	Terrain steepness. DEM.	(1) United States Geological	Satellite Imagery	Slope calculation from DEM:	VULN INTO RISK
1343	927	Art. 072	Performance assessment	Exposure	Slope of area (%)	Watershed slope	Terrain Slope (%)	Topography and Terrain	Performance	EPA's Storm	Sub-watershed slope.	(1) United States Geological	Satellite Imagery: Scientific	Slope calculation per sub-	VULN INTO RISK
1367	928	Art. 073	Hazard	Exposure	Slope (degrees)	Slope (S)	Terrain Slope (%)	Topography and Terrain	Hazard	Analytical	Terrain steepness. DEM.	United States Geological Survey	Satellite Imagery	Slope calculation from DEM:	VULN INTO RISK
1387	938	Art. 074	Hazard	Exposure	Slope (degrees)	Slope	Terrain Slope (%)	Topography and Terrain	Hazard	Analytical	Terrain steepness. Digital	(1) United States Geological	Satellite Imagery: Software	Slope calculation using Spatial	RISK
1396	944	Art. 075	Hazard	Exposure	Slope (degrees)	Slope	Terrain Slope (%)	Topography and Terrain	Hazard	Radial Basis	Terrain steepness. Digital	(1) United States Geological	Satellite Imagery	Slope calculation using Digital	RISK
1405	944	Art. 075	Hazard	Exposure	LS factor (unitless)	Slope Length (LS)	Terrain Slope (%)	Topography and Terrain	Hazard	Radial Basis	Slope length and	(1) United States Geological	Satellite Imagery	Slope Length (LS) factor	RISK
1417	957	Art. 076	Hazard	Exposure	Slope (degrees)	Slope	Terrain Slope (%)	Topography and Terrain	Hazard	UFResi-Mm	Terrain steepness. Ranges	(1) United States Geological	Satellite Imagery	Slope calculation using (DEM):	VULN INTO RISK
1446	977	Art. 077	Hazard	Exposure	Slope (degrees)	Slope	Terrain Slope (%)	Topography and Terrain		Analytic	Terrain steepness derived	United States Geological Survey	Satellite Imagery	Slope calculation from DEM:	VULN INTO RISK
1456	978	Art. 078	Hazard	Exposure	Slope (degrees)	Slope	Terrain Slope (%)	Topography and Terrain	Hazard	XGBoost:	Terrain steepness. Digital	(1) General Directorate of	Official data	Slope calculation from DEM:	RISK
1517	1001	Art. 082	Hazard	Exposure	Slope (degrees)	Slope (SL)	Terrain Slope (%)	Topography and Terrain	Hazard	Fuzzy	Slope gradient. (1) United	(1) United States Geological	Satellite Imagery	Slope calculation from DEM:	VULN INTO RISK
1525	1050	Art. 083	Hazard	Exposure	Slope (%)	Slope	Terrain Slope (%)	Topography and Terrain	Hazard	Analytical	Terrain slope percentage	(1) National Institute for Space	Satellite Imagery	Slope calculation from DEM:	RISK
1644	1073	Art. 088	Hazard	Exposure	Slope (degrees)	Slope	Terrain Slope (%)	Topography and Terrain	TOPOGRAPHI	Slope analysis:	Areas with gentle slopes	(1) ISRO CartoDEM Res.: 2.5m -	Satellite Imagery	Slope calculation from DEM:	RISK
1649	1076	Art. 089	Hazard	Exposure	Slope (degrees)	Slope	Terrain Slope (%)	Topography and Terrain	Waterlogging	Analytical	Terrain slope derived	(1) Alaska Satellite Facility -	Satellite Imagery: Software	DEM processing: slope	VULN INTO RISK
1670	1090	Art. 090	Hazard / Suitability	Exposure	Slope (%)	Slope	Terrain Slope (%)	Topography and Terrain	TOPOGRAPHI	Analytical	Terrain steepness	(1) United States Geological	Satellite Imagery	Slope calculation from DEM:	VULN INTO RISK
1682	1097	Art. 091	Hazard	Exposure	Slope (%)	Slope (Sl)	Terrain Slope (%)	Topography and Terrain	TOPOGRAPHI	K-Nearest	Steepness of slope	(1) United States Geological	Satellite Imagery	Slope calculation from DEM:	VULN INTO RISK
1726	1116	Art. 093	Hazard	Exposure	Slope (m)	Slope	Terrain Slope (%)	Topography and Terrain	TOPOGRAPHI	Analytical	Slope percentage derived	(1) Shuttle Radar Topography	Satellite Imagery	Slope calculation from DEM:	VULN INTO RISK
1740	1118	Art. 094	Exposure	Exposure	Slope (degrees)	Slope	Terrain Slope (%)	Topography and Terrain	Exposure	Analytic	Terrain slope affecting	(1) Digital Elevation Model	Satellite Imagery: Software Simulation	Slope calculation from DEM:	VULN INTO RISK
1754	1128	Art. 095	Hazard	Exposure	Slope (%)	Slope	Terrain Slope (%)	Topography and Terrain	TOPOGRAPHI	GIS weighted	Terrain slope derived	(1) United States Geological	Satellite Imagery: Software	Slope calculation from DEM:	RISK
1764	1139	Art. 096	Exposure	Exposure	Slope (degrees)	Slope (°)	Terrain Slope (%)	Topography and Terrain	Exposure	AHP-entropy	Terrain slope derived	(1) Digital Elevation Model	Satellite Imagery	Slope calculation: normalization	VULN INTO RISK
1780	1146	Art. 097	Exposure	Exposure	Slope (%)	Terrain slope	Terrain Slope (%)	Topography and Terrain	Exposure	Multiple linear	Mean terrain slope in	(1) Digital Elevation Model	Satellite Imagery	Slope calculation: mean slope	VULN INTO RISK
1788	1149	Art. 098	Suitability	Exposure	Slope (degrees)	Slope	Terrain Slope (%)	Topography and Terrain	TOPOGRAPHI	CRITIC	Terrain steepness derived	(1) United States Geological	Satellite Imagery	Slope calculation: classification	VULN INTO RISK
1837	1256	Art. 102	Hazard	Exposure	Slope (%)	Slope	Terrain Slope (%)	Topography and Terrain	TOPOGRAPHI	ANN-SGW: RF:	Terrain steepness. DEM.	(1) United States Geological	Satellite Imagery	Slope calculation from DEM (5 m	RISK
1933	1318	Art. 107	Vulnerability	Exposure	Slope (degrees)	Slope	Terrain Slope (%)	Topography and Terrain	PHYSICAL	Weighted	Terrain steepness derived	(1) United States Geological	Satellite Imagery	Slope calculation from DEM:	RISK
1942	1349	Art. 108	Exposure	Exposure	Slope of the area	Slope	Terrain Slope (%)	Topography and Terrain	EXPOSURE	MOVE	Terrain slope derived	(1) United States Geological	Satellite Imagery	Slope calculation from DEM:	VULN INTO RISK
1959	1353	Art. 109	Hazard	Exposure	Slope (%)	Slope	Terrain Slope (%)	Topography and Terrain	TOPOGRAPHI	GIS-MCDA:	(1) Derived from Digital	(1) Derived from Digital	Official data: Software Simulation	Slope calculation from DEM:	RISK
1996	1377	Art. 112	Exposure	Exposure	Average slope of	Foreshore slope (FS)	Terrain Slope (%)	Topography and Terrain	NATURAL	CCFVI:	Average slope of	(1) www.bathingwaterprofiles.gr	Official data	Data collection for 6 study areas:	VULN INTO RISK
2169	1425	Art. 115	Hazard (Study Area	Exposure	River slope (m/m)	Longitudinal slope	Terrain Slope (%)	Topography and Terrain	Flash Flood	GIS analysis	The longitudinal slope of	Spanish National Geographic	Satellite Imagery	DTM processed using Geospatial	VULN INTO RISK
2276	1457	Art. 122	Susceptibility	Exposure	Inclination of	Coastal slope	Terrain Slope (%)	Topography and Terrain	Susceptibility	GIS analysis	The inclination of the	Digital Elevation Model (DEM)	Satellite Imagery: Official data	Slope calculated from DEM using	VULN INTO RISK
2376	1480	Art. 128	Vulnerability (Physical)	Exposure	Average slope	Basin average slope	Terrain Slope (%)	Topography and Terrain	Basin	Factor	The average slope of the	Digital Elevation Model (DEM)	Satellite Imagery	Slope calculated from DEM	VULN INTO RISK
1293	914	Art. 068	none	Exposure	Slope (degrees)	Slope	Terrain Slope (%)	Topography and Terrain		Multi-Criteria	Terrain steepness derived	(1) Department of Survey and	Satellite Imagery	Slope calculation using surface	VULN
1828	1228	Art. 101	Hazard	Exposure	Slope (%)	Slope (C4)	Terrain Slope (%)	Topography and Terrain	TOPOGRAPHI	AHP: TF-AHP:	Terrain steepness. Gentle	(1) German Aerospace Center	Satellite Imagery: Software	Slope calculation from DEM:	RISK
248	200	Art. 014	Physical Vulnerability	Exposure	Watershed Area	Watershed Area	Watershed Area	Topography and Terrain	Physical	modified	The indexing is an up-	(1) United States Geological	Satellite Imagery: Software	This indexing assigns weightage	VULN INTO RISK
309	215	Art. 015	Hazard	Exposure	a) Scale	Morphometric risk	Watershed Area	Topography and Terrain	General (G)	Comparative	The morphometric	(1) JAXA ALOS World 3D-Res.:	Satellite imagery: Software	GIS Modelling	VULN INTO RISK
310	215	Art. 015	Hazard	Exposure	Basin area (km²)	Basin area (km²)	Watershed Area	Topography and Terrain	Morphometri	Comparative	The morphometric	(1) JAXA ALOS World 3D-Res.:	Satellite imagery: Software	GIS Modelling	VULN INTO RISK
316	215	Art. 015	Hazard	Exposure	Perimeter (km)	Perimeter (km)	Watershed Area	Topography and Terrain	Morphometri	Comparative	The morphometric	(1) JAXA ALOS World 3D-Res.:	Satellite imagery: Software	GIS Modelling	VULN INTO RISK
317	215	Art. 015	Hazard	Exposure	Basin length (km)	Basin length (km)	Watershed Area	Topography and Terrain	Morphometri	Comparative	The morphometric	(1) JAXA ALOS World 3D-Res.:	Satellite imagery: Software	GIS Modelling	VULN INTO RISK
318	215	Art. 015	Hazard	Exposure	Width/length	Width/length ratio	Watershed Area	Topography and Terrain	Morphometri	Comparative	The morphometric	(1) JAXA ALOS World 3D-Res.:	Satellite imagery: Software	GIS Modelling	VULN INTO RISK
325	215	Art. 015	Hazard	Exposure	Morphology:	Morphology: Watershed	Watershed Area	Topography and Terrain	Morphometri	Comparative	The circularity ratio tells	(1) JAXA ALOS World 3D-Res.:	Satellite imagery: Software	GIS Modelling	VULN INTO RISK
347	278	Art. 017	Exposure	Exposure	DEM (m)	Watershed Delineation	Watershed Area	Topography and Terrain	Sakib Flash	Normalization	Watershed delineation is	(1) United States Geological	Satellite imagery	Modelling	VULN INTO RISK
739	728	Art. 037	Topography	Exposure	DEM	Topography	Watershed Area	Topography and Terrain	Topography		Watershed delineation	United States Geological Survey	satellite imagery	ArcGIS	RISK
1819	1222	Art. 100	Natural watershed	Exposure	Natural watershed	InVEST Modeled Water	Watershed Area	Topography and Terrain	HYDROLOGIC	InVEST	Natural water network	(1) Regione Piemonte - Digital	Satellite Imagery: Software	DTM processing: InVEST	RISK
97	73	Art. 006	Vulnerability	Adaptive	Number of	Educational Institutions	Access to public Transport	Transportation and	Waterlogging	Spatial Multi-	Educational Institutions	AMAP: https://amap.com/	Open Urban data		VULN
154	104	Art. 010	vulnerability	Adaptive	Google Earth's	Distance to rail station	Access to public Transport	Transportation and	Waterlogging	Analytical	Measures access to	(1) GEE Google Earth https://	Satellite imagery	Attribute data digitized using	VULN INTO RISK
173	117	Art. 011	Vulnerability	Adaptive	Railways	Railways	Access to public Transport	Transportation and			Projected coverage	(1) NUD (2016) Land Utilization	Official data: Scientific literature	Aggregated to ~1 km × 1 km	VULN INTO RISK
490	559	Art. 026	Sensitivity	Adaptive	River terminal	River transport terminal	Access to public Transport	Transportation and	Physical		Presence or absence of a	Câmara Municipal de Lisboa	Official data: Open Urban data		VULN
491	559	Art. 026	Sensitivity	Adaptive	Underground	Underground station	Access to public Transport	Transportation and	Physical		Presence, adjacency, or	Câmara Municipal de Lisboa	Official data: Open Urban data		VULN
492	559	Art. 026	Sensitivity	Adaptive	Bus and tram	Bus and tram stations	Access to public Transport	Transportation and	Physical		Presence, adjacency, or	Câmara Municipal de Lisboa	Official data: Open Urban data		VULN
647	712	Art. 032	Adaptive capacity	Adaptive	Public transport	Transport	Access to public Transport	Transportation and	Infrastructure		Road evacuation	(1)Iloilo CPDO. (2022). Iloilo city	Official Data: Survey/	ArcGIS software	VULN
1017	790	Art. 052	Vulnerability	Adaptive	Railway density	Railway density (RYD) (km2)	Access to public Transport	Transportation and	VULNERABILI	Pressure-state-	Railway density (RYD)	OpenStreetMap	Open Urban data	The spatial pattern of Flood	VULN INTO RISK
1538	1058	Art. 084	Sensitivity	Adaptive	Percentage (%)	Percentage of	Access to public Transport	Transportation and	Sensitivity -	Geographic	Percentage of	(1) OpenStreetMap (OSM) -	Open Urban Data: Software	Overlay of transportation lines	VULN INTO RISK
1551	1058	Art. 084	Adaptive capacity	Adaptive	Binary indicator (0	The existence of tram lines	Access to public Transport	Transportation and	Adaptive	Indicator-	Existence of tram lines in	(1) Izmir Metropolitan	Official data: Open Urban data	Tram line extraction per	VULN INTO RISK
1779	1146	Art. 097	Exposure	Adaptive	Infrastructure	Proportion of infrastructure	Access to public Transport	Transportation and	Exposure	Multiple linear	Indicates extent of paved	(1) Database of General	Official data: Satellite imagery	Land use classification:	VULN INTO RISK
1862	1267	Art. 103	Physical	Adaptive	Public transport	Number of Urban Public	Access to public Transport	Transportation and	PHYSICAL	Analytical	Number of urban public	(1) Nanjing Statistical Yearbook	Official data	Data extraction: missing data	VULN
1882	1271	Art. 104	Socioeconomic	Adaptive	Transportation	Limited access to	Access to public Transport	Transportation and	Direct	Structural	Limited access to	(1) Household survey (231 valid	Survey/questionnaire	Survey data collection: 4-point	VULN INTO RISK
1893	1276	Art. 105	Adaptive capacity	Adaptive	number of public	BA1 – Public Transportation	Access to public Transport	Transportation and	Post-Flood	VIKOR-GRA	Public transportation	China City Statistical Yearbook	Official data	BA1 = number of public	VULN INTO RISK
1979	1356	Art. 110	Vulnerability	Adaptive	Transportation	Transport condition	Access to public Transport	Transportation and	STRUCTURAL	Analytic	Transport condition	(1) Household survey (300	Survey/questionnaire	Survey data collection: pairwise	VULN INTO RISK
2091	1408	Art. 114	Sensitivity	Adaptive	Access to vehicle	Households having no	Access to public Transport	Transportation and	Sensitivity	Index-based	Whether the household	(1) Primary data collected	Survey/questionnaire	Raw survey responses (Yes/No)	VULN INTO RISK
2362	1478	Art. 127	Infrastructure	Adaptive	Railway network	Railway lines	Access to public Transport	Transportation and	Infrastructure	GIS analysis	The railway network in	(1) Survey of India toposheets at	Satellite Imagery: Official data	Railway lines digitized from	VULN
2425	1506	Art. 131	Adaptive capacity	Adaptive	Binary (within	Accessibility: stop of public	Access to public Transport	Transportation and	Coping	Multicriteria	1 if within 500m of public	City of Leipzig public transport	Open Urban data	500m buffer created. Overlay to	VULN INTO RISK
2390	1492	Art. 129	Elements at Risk	Adaptive	Number of	Infrastructure	Access to public Transport	Transportation and	Elements at	Direct	Number of infrastructure	(1) Maxar Technologies	Satellite imagery: On-site	Infrastructure elements mapped	VULN INTO RISK
1552	1058	Art. 084	Adaptive capacity	Adaptive	Binary indicator (0	Electric bus use in the city	Access to public Transport (electric)	Transportation and	Adaptive	Indicator-	Use of electric buses in	(1) Izmir Metropolitan	Official data	Electric bus use assessment per	VULN INTO RISK
268	200	Art. 014	Social Vulnerability	Adaptive	Accessibility	Accessibility	Public mobility	Transportation and	Social	Modified	The primary data were	(1) Key Informant Interviews	Survey/questionnaire: on-site	The results of qualitative analysis	VULN INTO RISK
432	483	Art. 022	Regional Vulnerability	Adaptive	Accessibility	Accessibility	Public mobility	Transportation and	Regional	Deterministic	Accessibility within a	(1) Central region development	Official data	The socio-economic data used	VULN INTO RISK
766	740	Art. 039	Socioeconomic and	Adaptive	ES: Roads and	ES: Roads and paths length	Public mobility	Transportation and	Socioeconom	Linear feature	Total length (in meters)	(1) Orthophotos (Douala City	Satellite Imagery: On-site: GPS	ArcGIS 10.5	RISK
1550	1058	Art. 084	Adaptive capacity	Adaptive	Binary indicator (0	The existence of bikeways in	Public mobility	Transportation and	Adaptive	Indicator-	Existence of bikeways in	(1) Izmir Metropolitan	Official data: Open Urban data	Bikeway extraction per	VULN INTO RISK
2392	1492	Art. 129	Vulnerability	Adaptive	Proportion of	Position of building in	Public mobility	Transportation and	Vulnerabilit	Multi-criteria	The proportion of	Chilean National Statistics	Census Data: Official data: On-	Variables transformed into ratios	VULN INTO RISK
6	24	Art. 001	Vulnerability	Adaptive	Road network	Road network	Road infrastructure	Transportation and	Physical	Fuzzy rating	Major road 1/3, but carry	City of Kelowna Kelowna	Official data: Scientific literature	Importance level x Fuzzy number	VULN
52	35	Art. 003	Built Environment	Adaptive	Road Network	Road Network Density (RND)	Road infrastructure	Transportation and	Built	The study	Euclidean distance to	OpenStreetMap (OSM)	Open Urban data		RISK
53	35	Art. 003	Built Environment	Adaptive	Distance to Major	Distance to Major Roads	Road infrastructure	Transportation and	Built	The study	Euclidean distance to	OpenStreetMap (OSM)	Open Urban data		RISK
67	46	Art. 004	Land Cover	Adaptive	road density	road density	Road infrastructure	Transportation and	Land Cover	Cellular	Land cover maps for	(1) European Environment	Satellite imagery: Official data:	Urban flood simulations	VULN INTO RISK
91	73	Art. 006	Exposure	Adaptive	Road Network	Road Network Density (RND)	Road infrastructure	Transportation and	Exposure	Spatial Multi-	The pervasiveness and	OpenStreetMap	Open Urban data	Sparse road network (≤ 0.43 % of	VULN
162	104	Art. 010	vulnerability	Adaptive	Open street map	Road density	Road infrastructure	Transportation and	Waterlogging	Analytical	Indicates extent of paved	OpenStreetMap road networks	Open Urban data	Road network extracted from o	VULN INTO RISK
163	104	Art. 010	vulnerability	Adaptive	Google Earth's	Distance to roads	Road infrastructure	Transportation and	Waterlogging	Analytical	Represents accessibility	(1) GEE Google Earth https://	Satellite imagery	Attribute data digitized using	VULN INTO RISK
172	117	Art. 011	Vulnerability	Adaptive		Roads	Road infrastructure	Transportation and	Exposure /		Projected coverage	(1) NUD (2016) Land Utilization	Official data: Scientific literature	Aggregated to ~1 km × 1 km	VULN INTO RISK
313	215	Art. 015	Vulnerability	Adaptive	distance from	Road vulnerability index	Road infrastructure	Transportation and	Vulnerability	Comparative	The road network was	(1) OpenStreetMap (OSM) 2022	Open Urban data: Software	GIS Modelling	VULN INTO RISK
339	222	Art. 016	none	Adaptive	Distance to roads	distance to roads	Road infrastructure	Transportation and		The analytical	Road is an important	(1) Euclidean Distance tool in	Software Simulation: Satellite		VULN INTO RISK
359	278	Art. 017	Sensitivity	Adaptive		Distance to Roads (DtR)	Road infrastructure	Transportation and	Vulnerability	Normalization	Distance to Roads (DtR)	(1) Greater Amman	Software Simulation		VULN INTO RISK
361	278	Art. 017	Sensitivity	Adaptive		Road Density Ratio (RD)	Road infrastructure	Transportation and	Sakib Flash	Normalization	(1) Road network data -	(1) Greater Amman Municipality	Official data: Software simulation		VULN INTO RISK
393	363	Art. 020	Vulnerability	Adaptive		Road network density	Road infrastructure	Transportation and	Flood	multi-criteria	Road network density	(1) United States Geological	Satellite Imagery: Software	GIS Modelling	VULN INTO RISK
447	524	Art. 023	Vulnerability	Adaptive		Road density	Road infrastructure	Transportation and			The ancient town	(1) General Organization for	Official data: Software simulation		VULN INTO RISK
473	547	Art. 025	Flood Event Classification	Adaptive	Railway, highway	Road damage	Road infrastructure	Transportation and	Flood Event		Flood damage affecting	Flood impact reports compiled	Meteorological Data: Official	Arc-Info GIS	VULN INTO RISK
489	559	Art. 026	Sensitivity	Adaptive	Road	Road infrastructure	Road infrastructure	Transportation and	Physical		Road infrastructure	Câmara Municipal de Lisboa	Official data: Open Urban data:		VULN
526	606	Art. 027	Elements of city	Adaptive	City infrastructure	Area of road	Road infrastructure	Transportation and	Elements of		Total spatial extent of	MLTM, 2011; Shim, 2013	Official data: Open Urban data		VULN INTO RISK
579	709	Art. 030	Physical vulnerability	Adaptive		Street and road network	Road infrastructure	Transportation and	Physical		Streets and road	Street and road network GIS	GIS Data		VULN INTO RISK
685	722	Art. 033	Flood inventory	Adaptive	Shapefile	Distance to roads	Road infrastructure	Transportation and	Flood		Proximity to roads	OpenStreetMap (OSM) shapefile	Open Urban data		RISK
739	728	Art. 037	Infrastructure and Urban	Adaptive	Infrastructure	Roads	Road infrastructure	Transportation and	Infrastructur	Spatial	Vector datasets detailing	OpenStreetMap (OSM)	Open Urban data	ArcGIS 10.8.2	RISK
749	739	Art. 038	Infrastructure / Flood	Adaptive	Infrastructure	Distance to Roads (m)	Road infrastructure	Transportation and	Infrastructur	Euclidean	BBBike extracts -		Open Urban data	ArcGIS	RISK
767	740	Art. 039	Socioeconomic and	Adaptive	ES: Roads and	ES: Roads and paths length	Road infrastructure	Transportation and	Socioeconom	Linear feature	Total length (in meters)	(1) Orthophotos (Douala City	Satellite Imagery: On-site: GPS	ArcGIS 10.5	RISK
789	744	Art. 040	Exposure	Adaptive	Road and railway	Road and railway networks	Road infrastructure	Transportation and	Exposure	SCORE	Exposure data for roads	OpenStreetMap (https://	Gov. Agency data: Open Urban		VULN INTO RISK
888	766	Art. 044	Vulnerability	Adaptive	Vector (Grid)	Road length	Road infrastructure	Transportation and	PHYSICAL	Entropy	Total length of road	City of Calgary Open Data Portal	Official data	Direct assignment to 500m grid	VULN INTO RISK
940	771	Art. 046	Adaptive capacity	Adaptive	Road density	Road density (Km/Sq. Km)	Road infrastructure	Transportation and	Adaptive	Principal		(1) Scientific Literature [515	Scientific Literature		VULN INTO RISK
1005	785	Art. 051	Vulnerability	Adaptive	Road network	Road density	Road infrastructure	Transportation and	Vulnerability	Network	Intersection operation to	ArcGIS Online - Carreteras de	Open Urban data: GPS data	Intersection operation to obtain	VULN
1016	790	Art. 052	Vulnerability	Adaptive	Road density	Road density (RDD) (km2)	Road infrastructure	Transportation and	VULNERABILI	Pressure-state-	Road density (RDD)	OpenStreetMap	Open Urban data	The spatial pattern of Flood	VULN INTO RISK
1152	846	Art. 060	Physical Vulnerability	Adaptive	Length of roads	Transport network length	Road infrastructure	Transportation and	PHYSICAL	Analytical	Total road network length	Ordnance Survey (OS)	Official data	Road network extraction: length	VULN INTO RISK
1222	880	Art. 064	Exposure	Adaptive	Infrastructure	Road and railway network	Road infrastructure	Transportation and	Exposure	Multi-Criteria	Linear infrastructure	Road and railway atlas:	Official data: GPS data	Linear feature extraction: length	VULN INTO RISK
1253	886	Art. 065	Flood Conditioning Factor	Adaptive	Distance to road	Distance to Road (DTRoad)	Road infrastructure	Transportation and	Flood	GIS proximity	Euclidean distance to the	(1) Saqa's Municipality road	Official data: Open Urban data	Euclidean distance calculation	VULN INTO RISK
1376	928	Art. 073	Vulnerability	Adaptive	Distance to road	Distance to Road (DRO)	Road infrastructure	Transportation and	Vulnerability	Analytical	Road network as local	(1) OpenStreetMap (OSM) - Road	Open Urban Data: Software	Euclidean distance calculation	VULN INTO RISK
1380	928	Art. 073	Vulnerability	Adaptive	Road length per	Road Density (RD)	Road infrastructure	Transportation and	Vulnerability	Analytical	Denser road networks	(1) OpenStreetMap (OSM) - Road	Open Urban Data: Software	Road network extraction: line	VULN INTO RISK
1448	977	Art. 077	Vulnerability	Adaptive	Distance to road	Distance to Road	Road infrastructure	Transportation and		Analytic	Proximity to road	(1) OpenStreetMap (OSM) -	Open Urban Data	Road network extraction: buffer	VULN INTO RISK
1459	978	Art. 078	Hazard	Adaptive	Distance to road	Distance to Road	Road infrastructure	Transportation and	Hazard	XGBoost:	Road network	(1) General Directorate of	Official data	Euclidean distance calculation	RISK
1473	987	Art. 079	Organizational	Adaptive	Road networks	Road Network	Road infrastructure	Transportation and	Organization	Territorial	Road network density	(1) French Polynesia	Official data	Road network extraction:	VULN
1502	995	Art. 081	Socio-economic	Adaptive	Distance from	Road proximity (m)	Road infrastructure	Transportation and	Socio-	Cellular	Distance from road	(1) OpenStreetMap (OSM) -	Open Urban Data	Road network extraction:	VULN INTO RISK
1662	1076	Art. 089	Hazard	Adaptive	Road length per	Road Density	Road infrastructure	Transportation and	Waterlogging	Analytical	Density of road network	(1) Bhuknosh - Geological Survey	Official data: Software Simulation	Road density calculation:	VULN INTO RISK
1666	1076	Art. 089	Vulnerability	Adaptive	Road length per	Road Network	Road infrastructure	Transportation and	Flood	Analytical	Road network density	(1) Bhuknosh - Geological Survey	Official data: Software Simulation	Road density calculation:	VULN INTO RISK
1675	1090	Art. 090	Hazard / Suitability	Adaptive	Distance to road	Distance to Road	Road infrastructure	Transportation and	INFRASTRUCT	Analytical	Proximity to road	(1) Rwanda Road and Transport	Official data	Road network extraction:	VULN INTO RISK
1690	1097	Art. 091	Hazard	Adaptive	Distance to road	Proximity to Road (Pro)	Road infrastructure	Transportation and	INFRASTRUCT	K-Nearest	Distance to road network	(1) OpenStreetMap (OSM) -	Open Urban Data	Road network extraction:	VULN INTO RISK
1738	1118	Art. 094	Exposure	Adaptive	Distance to road	Proximity to roads	Road infrastructure	Transportation and	Exposure	Analytic	Distance of households to	(1) Household survey (n=359):	Survey/questionnaire: GPS data	GPS data capture: spatial join to	VULN INTO RISK
1793	1149	Art. 098	Suitability	Adaptive	Distance to road	Distance to roads	Road infrastructure	Transportation and	INFRASTRUCT	CRITIC	Distance from road	(1) Google Earth images: (2)	Open Urban data: Official data	Road network extraction:	VULN INTO RISK
1883	1271	Art. 104	Socioeconomic	Adaptive	Mobility	Mobility	Road infrastructure	Transportation and	Indirect	Structural	Additional travel costs	(1) Household survey (231 valid	Survey/questionnaire	Survey data collection: 4-point	VULN INTO RISK
1897	1276	Art. 105	Adaptive capacity	Adaptive	road area	B2: Infrastructure exposure	Road infrastructure	Transportation and	Pre-Flood	VIKOR-GRA	Infrastructure exposure is	(1) Scientific Literature: 140 M	Scientific Literature: Software	B2 = road area/urban area *	VULN INTO RISK
1917	1317	Art. 106	Exposure	Adaptive	Street geometry	Road Network	Road infrastructure	Transportation and	INFRASTRUCT	GIS network	GIS dataset of city street	(1) AMAP Data Portal - Street	Open Urban Data: Official data	Road network extraction: buffer	VULN INTO RISK
1978	1356	Art. 110	Vulnerability	Adaptive	Road condition	Road condition	Road infrastructure	Transportation and	STRUCTURAL	Analytic	Road condition	(1) Household survey (300	Survey/questionnaire	Survey data collection: pairwise	VULN INTO RISK
2165	1425	Art. 115	Sensitivity	Adaptive	Non-accessible	NONACCPS	Road infrastructure	Transportation and	Not retained	HSA: PCA: SVI	The number of	Population and Housing Census	Census Data	Variables were normalized to	VULN INTO RISK
2288	1460	Art. 123	Physical Vulnerability	Adaptive	Road surface type	Roads	Road infrastructure	Transportation and	Physical	Field survey	Type of surface of roads	(1) Field survey by student	On-site: Official data	Roads classified into three types	VULN INTO RISK
2361	1478	Art. 127	Infrastructure	Adaptive	Road network	Roads	Road infrastructure	Transportation and	Infrastructure	GIS analysis	The road network of	(1) Survey of India toposheets at	Satellite Imagery: Official data	Roads digitized from toposheets	VULN
2373	1480	Art. 128	Vulnerability (Economic)	Adaptive	Infrastructure	Social infrastructure density	Road infrastructure	Transportation and	Loss	Factor	The total value of roads	Statistics Korea - Infrastructure	Census Data: Official data	Total value of roads and bridges	VULN INTO RISK
2404	1505	Art. 130	Economic Risk	Adaptive	Streets, rails	Transport	Road infrastructure	Transportation and	Economic	Deterministic	Transportation	Kubal et al. (2009), City of	Scientific Literature: Official data	Classification on the	VULN INTO RISK
889	766	Art. 044	Vulnerability	Adaptive	Vector (Grid)	Traffic volume	Traffic dynamics / speed	Transportation and	PHYSICAL	Entropy	Average daily traffic	City of Calgary Open Data Portal	Official data	Direct assignment to 500m grid	VULN INTO RISK
1921	1317	Art. 106	Exposure	Adaptive	Drive speed	Travel Speeds	Traffic dynamics / speed	Transportation and	TRAFFIC	GIS network	Four temporal scenarios	(1) AMAP Navigation - GPS big	Open Urban Data: GPS data	Travel speed extraction per road	VULN INTO RISK
635	710	Art. 031	Sensitivity	Adaptive	Access to a Car	No car access	Vehicle Access and Ownership	Transportation and	Accessibility		Percentage of households	UK Office for National Statistics	Census Data		VULN
667	712	Art. 032	Adaptive capacity	Adaptive	Car ownership	Car ownership	Vehicle Access and Ownership	Transportation and	Economic		Limits evacuation and	(1) Iloilo City. (2014). Iloilo city	Official data: Survey/	ArcGIS software	VULN
820	761	Art. 041	Health & Mobility	Adaptive	Access to	Access to Vehicle(s)	Vehicle Access and Ownership	Transportation and	Health &		Percentage of occupied	U.S. Census Bureau - American	Census Data		VULN
939	771	Art. 046	Adaptive capacity	Adaptive	Ownership of type	Type of vehicle owned by	Vehicle Access and Ownership	Transportation and	Adaptive	Principal	The indicator in the cited	Modified by the authors from	Scientific Literature	Including four-wheelers avoids	VULN INTO RISK
1171	856	Art. 061	Limited Resilience	Adaptive	Number of	Car Ownership	Vehicle Access and Ownership	Transportation and	Limited	Census data	Households with no car	2011 UK National Census -	Census Data	Car ownership data extraction	VULN INTO RISK
1190	862	Art. 062	Social	Adaptive	Vehicle ownership	Vehicle ownership	Vehicle Access and Ownership	Transportation and	Resilience -	Subjective	Whether household owns	Household survey (N=600)	Survey/questionnaire	Percentage calculation per	VULN INTO RISK
1975	1356	Art. 110	Vulnerability	Adaptive	Vehicle ownership	Ownership of Vehicle	Vehicle Access and Ownership	Transportation and	ECONOMIC	Analytic	No vehicle (0.558)	(1) Household survey (300	Survey/questionnaire	Survey data collection: pairwise	VULN INTO RISK
2029	1394	Art. 113	Vulnerability	Adaptive	Access to vehicle	Household with means of	Vehicle Access and Ownership	Transportation and	Economic	Index-based	Whether the household	(1) Primary data collected	Survey/questionnaire	Raw survey responses (Yes/No)	VULN
2347	1467	Art. 126	Exposure	Adaptive	Number of sedan	Vehicles	Vehicle Access and Ownership	Transportation and	Exposure	Integrated	Mobile assets (sedan	Bangladesh Road Transport	Official data	Average cars per household	VULN INTO RISK

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