Resilient
Central Asia

Strengthening Disaster Resilience
and Accelerating Implementation
of the Sendai Framework
Programme

Укрепление устойчивости
к бедствиям и ускорение
выполнения Сендайской
программы

National Disaster Loss Databases implementation in Central Asia
Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan

Country Disaster Risk Profile of the Republic of Tajikistan

adpc

cima
RESEARCH
FOUNDATION

**Funded by the
European Union**

UNDRR
UN Office for Disaster Risk Reduction

Description of the project

The "National Disaster Loss Databases implementation in Central Asia" project that covers Kazakhstan, Kyrgyz Republic, Tajikistan, Turkmenistan, and Uzbekistan from July 2020 to January 2023, supports the participating countries in the development of damage and loss data and information collection, in accordance with the Sendai Framework for Disaster Risk Reduction 2015-2030 and in alignment to the requirements of the Sustainable Development Goals Agenda 2030.

The project is coordinated by the United Nations Office for Disaster Risk Reduction (UNDRR) within the framework of the "Strengthening disaster resilience and accelerating implementation of the Sendai Framework for Disaster Risk Reduction in Central Asia" initiative, funded by the European Union.

The focus of the project is the establishment of the DesInventar Sendai[1] at National Disaster Management Organizations in Central Asia. The DesInventar Sendai enables the collection of disaster losses and damages data

and the analysis of such information associated to natural and technogenic hazards. The system further facilitates the countries in their reporting on Sendai Framework Targets. DesInventar Sendai is an updated version of the widely used software that simplifies damage and loss data collection and provides structured recording of damage and loss indicators that are required for the Sendai Framework reporting for Targets A to D. DesInventar Sendai allows definition and the use of Sendai Framework metadata to describe several indicators that includes a finer disaggregation of data. One of the main benefits of DesInventar Sendai is the full compliance with the Sendai Framework Monitor (SFM) to support and facilitate the annual Sendai Framework reporting through the SFM. On this link[2] official values of Sendai Framework Targets are reported for different years.

Both the SFM and the DesInventar Sendai are UNDRR's initiatives to accelerate the implementation of the Sendai Framework priorities to achieve the 7 global targets.
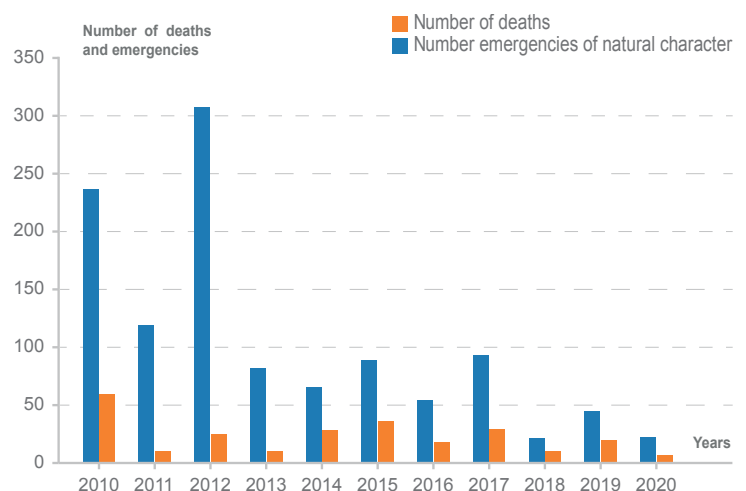
Historical records on disasters

The Republic of Tajikistan is a landlocked country in Central Asia with an area of 138 790[3] (2020) square kilometers and an estimated population of 9 749 625[4] people (2021). Mountains cover over 90% of Tajikistan's land area with more than half of the country sitting above an elevation of 3 000 meters. The varied geological, topographic, and climatologic conditions make this country highly susceptible to natural hazards; namely, earthquakes, floods, landslides, and avalanches. Natural hazards cause both short and long-lasting damage to infrastructure, economic activity, and social wellbeing. For example, according to the World Bank study[5] between 1992 and 2016, economic losses from natural hazards in Tajikistan exceeded 1800 million US dollars and affected almost 7 million people.

With the help of Agency on Statistics, the Committee of

Emergency Situations and Civil Defense (CoESCD) under the Government of the Republic of Tajikistan keeps historical records on emergencies of natural, technogenic, and biological events. The table below provides the summary of emergencies of natural character and related to them deaths for the period 2010-2020 based on available statistics from CoESCD[6]. In total, there were 1 148 emergencies of natural character and 271 deaths.

According to the report of the CoESCD (2020), from 2012 to 2020 there has been a decrease in the number of emergencies of natural character resulting in economic loss. This trend is associating with the strengthening of preventive and warning measures by the Government of the Republic of Tajikistan to ensure preparedness and reduce the risk of disasters.

YEAR	NUMBER OF EMERGENCIES OF NATURAL CHARACTER	NUMBER OF DEATHS
2010	236	61
2011	121	11
2012	308	26
2013	83	11
2014	67	31
2015	90	38
2016	55	20
2017	94	31
2018	23	12
2019	46	22
2020	25	8
Total number	1148	271

Statistics of the Committee of Emergency Situations and Civil Defense of the Republic of Tajikistan on emergency situations 2020[7]

BACKGROUND STUDIES INFORM Risk Index

Since 2021 the INFORM Risk Index[8] for Central Asia is maintained by the Center on Emergency Situations and Disaster Risk Reductions (CESDRR)[9] in collaboration with UNDRR Regional Office for Europe and Central Asia and with financial support from United States Agency for International Development (USAID) Bureau for Humanitarian Assistance (BHA). The regional subnational INFORM model Central Asia is developed at the first administrative level (corresponding to the provinces/oblasts/regions and few independent cities) in Central Asia.

The INFORM risk concept[10] envisages three dimensions of risk:

*   **Hazards & Exposure** - events that could occur and the exposure to them.
*   **Vulnerability** - the susceptibility of communities to those hazards.
*   **Lack of coping capacity** - lack of available resources that can alleviate the impact.

In the 2022 INFORM risk index, the overall Republic of Tajikistan risk score was defined as High (6,2).
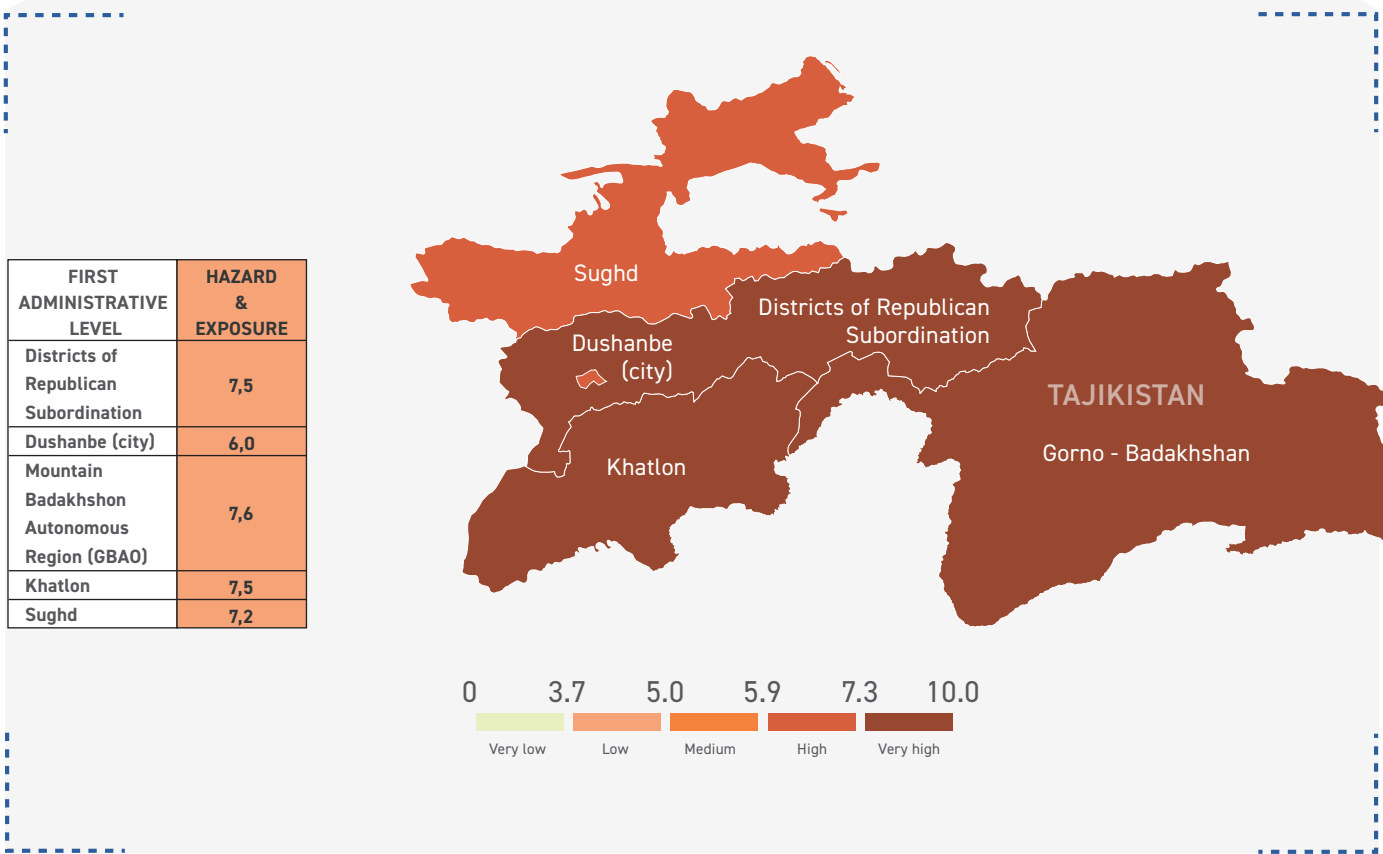

HAZARD & EXPOSURE INDEX

The Hazards & Exposure dimension consists of Natural and Human categories. The Natural category includes four components related to natural hazards: earthquake, flood, landslide, and drought. The maximum indexes at regional level were defined for hazards as follow:

*   For **earthquake** it is Very high for the Districts of Republican Subordination (9,5), for Khatlon region 9,3, and for Dushanbe city 9,3.
*   For **flood** it is Very High for Mountain Badakhshon Autonomous region (GBAO) 9,1, and for the Khatlon region 7,2.
*   For **landslide** it is Very High for Mountain Badakhshon Autonomous region (GBAO) 10,0, for Districts of Republican Subordination 9,8, and for Sughd region 9,9.
*   For **drought** it is Very high for the Khatlon region 9,0.

FIRST ADMINISTRATIVE LEVEL	HAZARD & EXPOSURE
Districts of Republican Subordination	7,5
Dushanbe (city)	6,0
Mountain Badakhshon Autonomous Region (GBAO)	7,6
Khatlon	7,5
Sughd	7,2

0	3.7	5.0	5.9	7.3	10.0
Very low	Low	Medium	High	Very high	
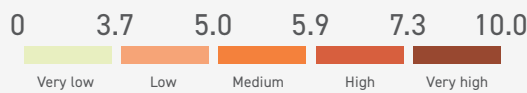
VULNERABILITY INDEX

The Vulnerability dimension at regional level is provided on the map below and is considered as High and Very High (between 5.5 – 6.3) for all regions.
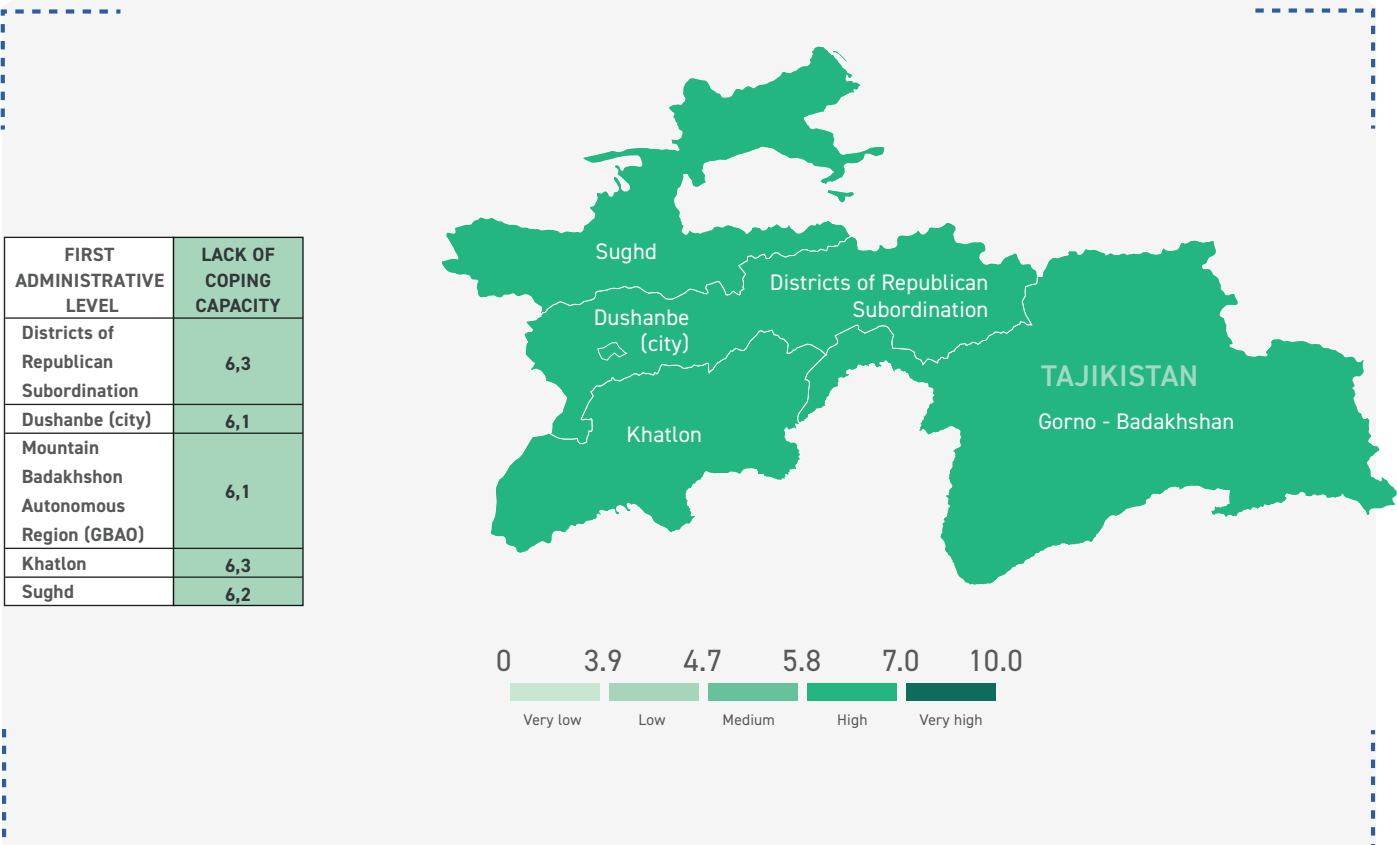

FIRST ADMINISTRATIVE LEVEL	VULNERABILITY
Districts of Republican Subordination	5,6
Dushanbe (city)	5,2
Mountain Badakhshon Autonomous Region (GBAO)	6,5
Khatlon	5,3
Sughd	4,4

KAZAKHSTAN

UZBEKISTAN

TURKMENISTAN

KYRGYZSTAN

TAJIKISTAN

Sughd
Lack of coping
capacity : 6.2

DRS
Lack of coping
capacity : 6.3

Khatlon
Lack of coping
capacity : 6.3

GBAO
Lack of coping
capacity : 6.1

Jalal-Abad
Lack of coping
capacity : 5.9

Dushanbe
Lack of coping
capacity : 6.1

200 km

LACK OF COPING CAPACITY INDEX

The Lack of coping capacity dimension at regional level is provided on the map below
and is at High (between 6.7 – 7.0) for all regions.

FIRST ADMINISTRATIVE LEVEL	LACK OF COPING CAPACITY
Districts of Republican Subordination	6,3
Dushanbe (city)	6,1
Mountain Badakhshon Autonomous Region (GBAO)	6,1
Khatlon	6,3
Sughd	6,2

Sughd

Dushanbe (city)

Districts of Republican Subordination

TAJIKISTAN

Khatlon

Gorno - Badakhshan

0	3.9	4.7	5.8	7.0	10.0
Very low	Low	Medium	High	Very high	

"ThinkHazard!" hazards likelihood

The ThinkHazard! web-based tool is developed and maintained by the Global Facility for Disaster Reduction and Recovery (GFDRR) providing a general view of hazards, for a given location to promote disaster and climate resilience. The tool highlights the likelihood of different natural hazards affecting an area (very low, low, medium, and high)[11] and is based on published hazard data, provided by a range of private, academic, and public organizations[12].

The High level of the likelihood was defined for following hazards[13]: river flood, urban flood, earthquake, landslide, and wildfire. The Medium level of the likelihood was defined for water scarcity and extreme heat. The Very low level of the likelihood was defined for cyclone.
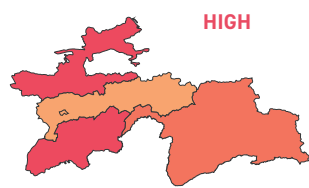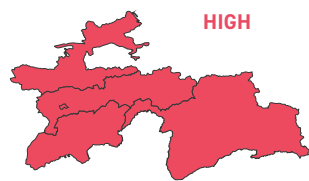
HIGH

RIVER FLOOD
Potentially damaging and life-threatening river floods are expected to occur at least once in the next 10 years.
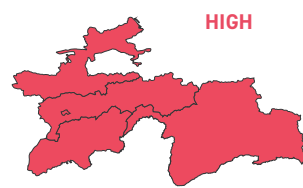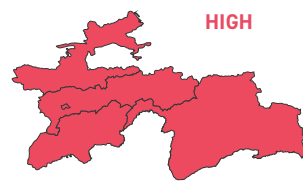
HIGH

URBAN FLOOD
Potentially damaging and life-threatening river floods are expected to occur at least once in the next 10 years.
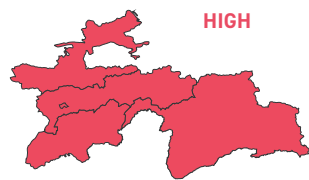
HIGH

EARTHQUAKE
This means that there is more than a 20% chance of potentially-damaging earthquake shaking in the next 50 years.

HIGH

LANDSLIDE
In this area has rainfall patterns, terrain slope, geology, soil, land cover and (potentially) earthquakes make localized landslides a frequent hazard phenomenon.

HIGH

WILDFIRE
There is greater than a 50% chance of encountering weather that could support a significant wildfire that is likely to result in both life and property loss in any given year. The damage can not only occur due to direct flame and radiation exposure but may also include ember storm and low level surface fire. In extreme fire weather events, strong winds and wind born debris may weaken the integrity of infrastructure.
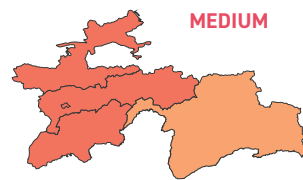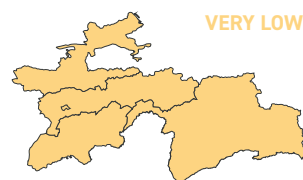
MEDIUM

WATER SCARCITY
There is up to a 20% chance droughts will occur in the coming 10 years.
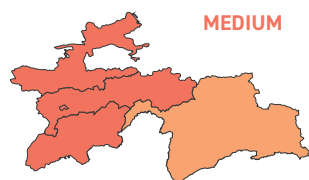
MEDIUM

EXTREME HEAT
There is more than a 25% chance that at least one period of prolonged exposure to extreme heat, resulting in heat stress, will occur in the next five years.

VERY LOW

CYCLONE
There is less than a 1% chance of potentially-damaging cyclone-strength winds in your project area in the next 10 years.

Legend:

HIGH
Severe damage expected within project\ or human lifetime, mitigation measures essential.

MEDIUM
Damaging effects expected within project or human lifetime, consider mitigation measures.

LOW
Less likely, but damaging events still possible, prudence in critical locations.

VERY LOW
Unlikely damaging effects, but potential still exists.

NO DATA AVAILABLE
No dataset for chosen location in ThinkHazard.

Establishment of DesInventar Sendai in the Republic of Kazakhstan

The Republic of Tajikistan has taken great efforts to strengthen the country's capacity in disaster risk reduction by developing the National Strategy for Disaster Risk Reduction in 2019 and National Platform for Disaster Risk Reduction[14]. Moreover, the Committee of Emergency Situations and Civil Defense[15] (CoESCD) under the Government of the Republic of Tajikistan has adapted and tested the DesInventar Sendai system tools.

The DesInventar Sendai system is configured based on national damage and loss priority. The list contains 22 hazards of natural, technogenic, and biological events. Moreover, in addition to the predefined DesInventar Sendai indicators, the disaggregation for housing, educational, health, infrastructure, basic services, agricultural sector has been well elaborated.

DesInventar Risk Profile

The risk profile template provided below has been prepared by collecting disaster loss data using the DesInventar Sendai system since July 2022. It is based on information collected for the period of 1990-2022. However, the data entry process on historical disasters is ongoing. This Risk Profile template is the starting point and requires improvement to reflect the real situation of disasters in the country.

To further strengthen the loss data collection on past disasters, the DesInventar Sendai system will specify the country risk profile and make it reliable. As an official tool for disaster loss data accounting, the DesInventar Sendai system will strength capabilities in systematic collection and analysis of information on disasters, Sendai Framework reporting and in taking adaption measures on disaster risk reduction.

Country overview

At the moment the current DesInventar Sendai database contains limited number of data cards collected mainly during the technical trainings. The risk profile provided below is based on available records, in total 56 data cards for the period 1990-2022, providing information on human losses, economic losses and damage in relation to different hazards. Since the data entry in DesInventar Sendai database is still in progress, the risk profile provided below cannot be considered as a final one.

Reported data in DesInventar for the period 1992-2022

- **TOTAL NUMBER OF DATA CARDS: 56** DATA CARDS
- **NUMBER OF DEATHS*: 342**
- **NUMBER OF PEOPLE AFFECTED** DIRECTLY AND INDIRECTLY: **161 979**
- **NUMBER OF HOUSES AFFECTED** DAMAGED AND DESTROYED: **4 885**
- **TOTAL ECONOMIC LOSS: 2 693 297 $** THE EXCHANGE RATE VARIES FOR EACH YEAR

The total economic loss is only considered for the records where the information was reported. No estimation has been made for damages to assets as the methodology for economic loss assessment is in development.

* In addition to the number of deaths, the count does not include the number of missing persons.

Hazard frequency:

MUDFLOW **26%**	EARTHQUAKE **8%**
FLOOD **17%**	EPIDEMIC **5%**
LANDSLIDE **12%**	AVALANCHE **5%**
FLASH FLOOD **8%**	OTHER **19%**

Mudflows are the most common registered hazard, followed by floods, landslides, flash floods, and earthquakes. Together these five hazards cover 71% of available records in the database.

Geographical distribution of events

All maps were developed based on geographical boundaries provided by the Database of Global Administrative Areas (GADM) project[16]. The maps illustrate the geographical distribution of disasters across regions and provinces in the country. The spatial distribution of disaster ranges from more than 14 to less than 4 at regional level. The most affected provinces are Tursunzoda (Districts of Republican Subordination), Asht (Sughd region), and Khuroson, Vose (Khatlon region).
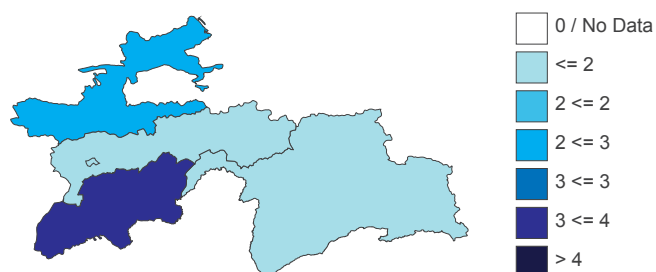

	0 / No Data
	<= 50
	50 <= 150
	150 <= 300
	300 <= 500
	500 <= 800
	> 800
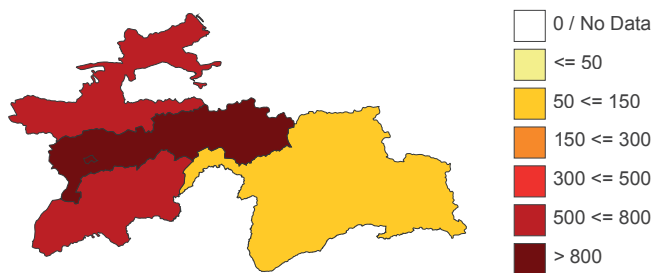
Geographical distribution of events by regions
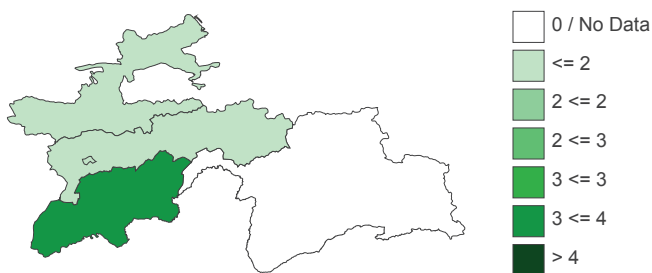
Geographical distribution of the main hazards

	0 / No Data
	<= 2
	2 <= 2
	2 <= 3
	3 <= 4
	4 <= 4
	> 4
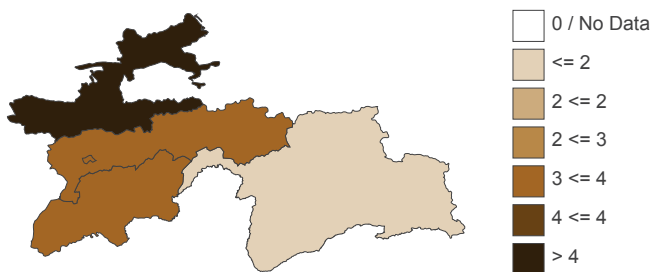
MUDFLOW by regions
Most affected regions: Sughd, District of republican Subord and Khatlon

	0 / No Data
	<= 2
	2 <= 2
	2 <= 3
	3 <= 3
	3 <= 4
	> 4

FLOOD by regions
Most affected regions: Khatlon, Sughd and Districts of Republican Subordination

	0 / No Data
	<= 2
	2 <= 2
	2 <= 3
	3 <= 3
	3 <= 4
	> 4

LANDSLIDE by regions
Most affected regions: Khatlon

	0 / No Data
	<= 2
	2 <= 2
	2 <= 3
	3 <= 3
	3 <= 3
	> 3
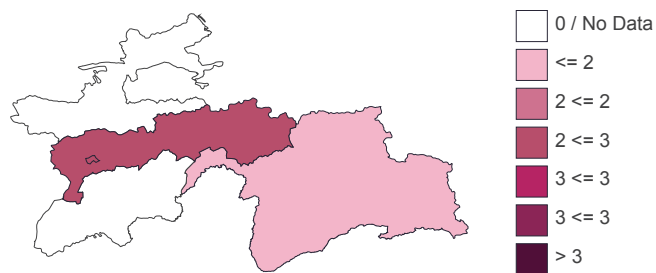
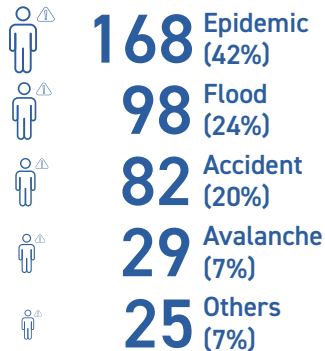**EARTHQUAKE by regions**
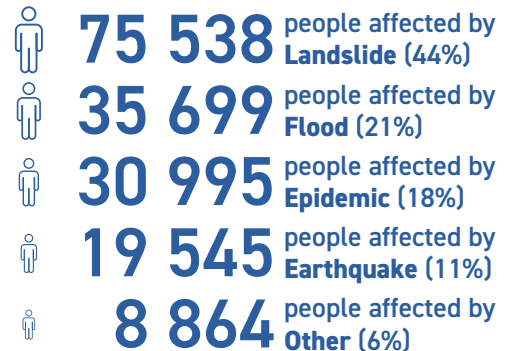Most affected regions: District of republican Subord and Gorno-Badakhshan

People affected, economic loss and damage related to the Sendai Framework Targets A, B, C, and D

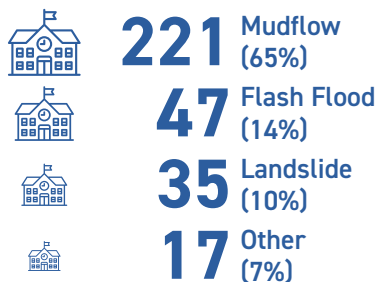## NUMBER OF DEATHS AND MISSING BY HAZARD (TARGET A)*

168 Epidemic (42%)

98 Flood (24%)

82 Accident (20%)

29 Avalanche (7%)

25 Others (7%)

* The number of deaths is augmented by the inclusion of the number of missing persons.

NUMBER OF PEOPLE AFFECTED BY HAZARD (TARGET B)

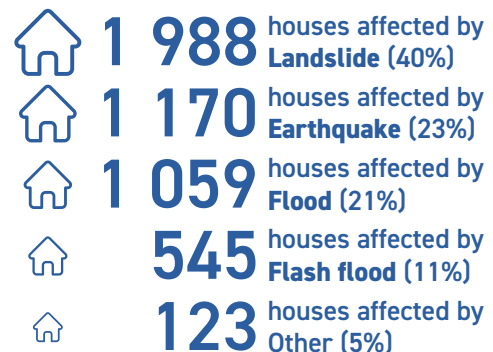**75 538** people affected by **Landslide (44%)**

35 699 people affected by **Flood (21%)**

30 995 people affected by **Epidemic (18%)**

19 545 people affected by **Earthquake (11%)**

8 864 people affected by **Other (6%)**

DAMAGE TO INFRASTRUCTURE BY HAZARD (TARGET D)*

221 Mudflow (65%)

47 Flash Flood (14%)

35 Landslide (10%)

17 Other (7%)

* list of infrastructures: education, health, agriculture, water supply, sewerage, industries, communication, transportation, power and energy, relief.

NUMBER OF HOUSES AFFECTED BY HAZARD*

1 988 houses affected by **Landslide (40%)**

1 170 houses affected by **Earthquake (23%)**

1 059 houses affected by **Flood (21%)**

545 houses affected by **Flash flood (11%)**

123 houses affected by **Other (5%)**

* according to currently available data 63% of damages to houses are caused by Landslides and Earthquakes.

TOTAL ECONOMIC LOSS (US dollars) BY HAZARD (TARGET C)

1 533 275 US$ lost by **Mudflow**

660 431 US$ lost by **Landslide**

428 797 US$ lost by **Flood**

70 794 US$ lost by **Avalanche**

Conclusions

The elaborated template of the country risk profile is based on currently available data in the DesInventar Sendai database collected during technical trainings, and provided to demonstrate the utility of disaster damage and loss data collection.

In Republic Tajikistan, the national Technical Working Group, supported by UNDRR, developed capacity in collecting and entering data, data storage, and in using the data format for managing general and detailed information of losses caused by disasters of different character.

References

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7. Statistics of the Committee for Emergency Situations and Civil Defense on natural emergencies and deaths, 2020: https://www.osce.org/files/f/documents/3/3/503965.pdf

8. UNDRR INFORM Central Asia Subnational Risk Index: https://drmkc.jrc.ec.europa.eu/inform-index/INFORM-Subnational-Risk/Central-Asia

9. Center for Emergency Situations and Disaster Risk Reduction (CESDRR): https://cesdrr.org/

10. UNDRR INFORM 2022 Central Asia Infographic https://drmkc.jrc.ec.europa.eu/inform-index/Portals/0/InfoRM/2022/Subnational/CA/UNDRR_INFORM_CA_2022_Central_Asia_infographic_en.pdf

11. GFDRR ThinkHazard! Global Facility for Disaster Reduction and Recovery: https://gfdrr.github.io/thinkhazardmethods/#about-thinkhazard

12. GFDRR ThinkHazard! Global Facility for Disaster Reduction and Recovery: https://thinkhazard.org/en/

13. GFDRR ThinkHazard! Global Facility for Disaster Risk Reduction and Recovery: https://thinkhazard.org/en/report/239-tajikistan

14. National platform of the Republic of Tajikistan for disaster risk reduction: https://www.preventionweb.net/national-platform/tajikistan-national-platform

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16. Maps and Data Database of Global Administrative Regions: GADM https://gadm.org/

UNDRR
UN Office for Disaster Risk Reduction