



# Spatial Planning Tutorial in ArcGIS Pro

Tutorial Report  
of  
Cerknje na Gorenjskem Municipality

To  
Tch. Asst. Jana Breznik

By Noor Ahmad Yaqubi

Ljubljana, January 2024

### **Map 1: An Overview of the Municipality**

The map represents an overview of the Cerklje na Gorenjskem municipality with an area of 7,800 hectares. Within this area, there are approximately 30 distinct settlements, comprising roughly above 5,000 buildings. Cerklje na Gorenjskem settlement is the largest town in this municipality, and the main highway crosses the south of the municipality from east to west side of the municipality.

### **Map 2: Protected Areas of Cerklje na Gorenjskem Municipality**

The map 2 illustrates protected areas designated under local Slovenian and European Union laws, including Nature2000 sites safeguarded by the EU bird directive, national infrastructure like highways, ecologically significant zones, and protective forests vital for landslide, sedimentation, and erosion prevention. Additionally, there are forest reserves serving various purposes such as research, with lands for agriculture purposes closed for developments. Cultural heritage sites and registered natural landmarks such as caves and riverbanks hosting exceptional plant and animal life are also highlighted and closed for developments. Furthermore, four categories of protected drinking water bodies are identified to prevent pollution. The developed areas in the municipality face flood risks, necessitating careful town planning considerations.

### **Map 3: Actual Land Use of Cerklje na Gorenjskem Municipality**

The map 3 shows the actual land use characteristics inside the Cerklje na Gorenjskem municipality. It is shown that about 47.3 % of the municipality is covered by forest, 42.2 % is agriculture lands and 9.9% of it is surface area is built land. There is about 7.5 ha or about 0.1% of the area of this municipality is covered by water.

### **Map 4: Planned Land Use of Cerklje na Gorenjskem Municipality**

The map 4 shows the planned land use that is developed considering the population growth and other factors. As per the planned land use map, the portion designated for built-up areas is projected to rise from 9.9% to 12.2% in comparison to the current land use of the total area. Meanwhile the agriculture land reduces to 40.7% and the forest land slightly decreases to 46.1% of the total area.

### **Map 5: Planned Land Use and Floods of Cerklje na Gorenjskem Municipality**

Map 5 displays differ land use types with varying degrees of flood hazard within the Cerklje na Gorenjskem municipality. A significant portion of the land use type, approximately 3.11%, is exposed to residual flood risk hazard. Primarily, agricultural land stands out as the major land use type vulnerable to flooding. Additionally, approximately 2% of all planned built-up areas are identified as being at risk of residual floods, suggesting a notable flood hazard within the municipality's built-up zones.

### **Map 6: Buildings affected by floods in Cerknje na Gorenjskem Municipality**

Map 6 shows that a considerable part of the Cerknje na Gorenjskem municipality is vulnerable to flood hazards. The map shows that both residential and non-residential building types are at direct risk of inundation. According to data provided, approximately 361 non-residential buildings, representing around 15% of all non-residential structures, are positioned in areas with major-medium flood hazards. Similarly, about 315 residential buildings, accounting for 14% of all residential structures, face comparable risks. Furthermore, a higher percentage of non-residential buildings (764, comprising 31%) and residential buildings (764, constituting 35%) are situated in residual flood hazard zones. Additionally, approximately 3.7% of non-residential buildings and 3% of residential buildings fall within flood warning zones.

### **Map 8: Buildings affected by flood zones by years of construction in Cerknje na Gorenjskem town.**

The map 8 shows the buildings shown in accordance to their construction year in Cerknje na Gorenjskem town. Most of the structures are constructed between 1946 to 1990, however there are few large buildings built after 1990. The majority of these buildings occupy zones with minimal flood risk. Overall, approximately 714 buildings are situated in flood-prone areas. Among these, around 30% of structures which are facing residual flood risk were built between 1971 and 1990. Additionally, approximately 125 buildings constructed from 1991 to 2020 are located in similar risk zones. Moreover, out of the total 78 buildings positioned in major to medium flood-risk areas, roughly 30.7% were built after 1991.

### **Map 9: Undeveloped built land of Cerknje na Gorenjskem town**

The map 9 shows the developed and undeveloped built land area in planned land use map of the Cerknje na Gorenjskem municipality. The map indicates that approximately 97.47 hectares of land in Cerknje na Gorenjskem town are designated for built land. Presently, around 78.3% or 76.36 hectares of this land have been developed, leaving the remaining 21.6% or 21.1 hectares still undeveloped.

### **Map 10: Draft Proposal for the Development - Cerknje na Gorenjskem town**

The map 10 illustrates the proposed new development area. Approximately 15.24 hectares, equivalent to 15.6% of the current built land area in Cerknje na Gorenjskem town as depicted in map 10, are proposed for development.

## **Map 11: Draft Proposal for the development – Restrictions Cerknje na Gorenjskem town**

Map 11 depicts the placement of the newly proposed development area in relation to existing area restrictions in the Cerknje na Gorenjskem municipality. The proposal considers various restrictions such as cultural heritage sites, agricultural lands, and flood-prone areas. The proposed development area already has roads connecting it to the main town and is situated at a considerable distance from flood-prone zones, making it an ideal location for further development. Additionally, this area is not subject to any other protective measures that would limit its use or restrict construction activities.

### **Conclusion**

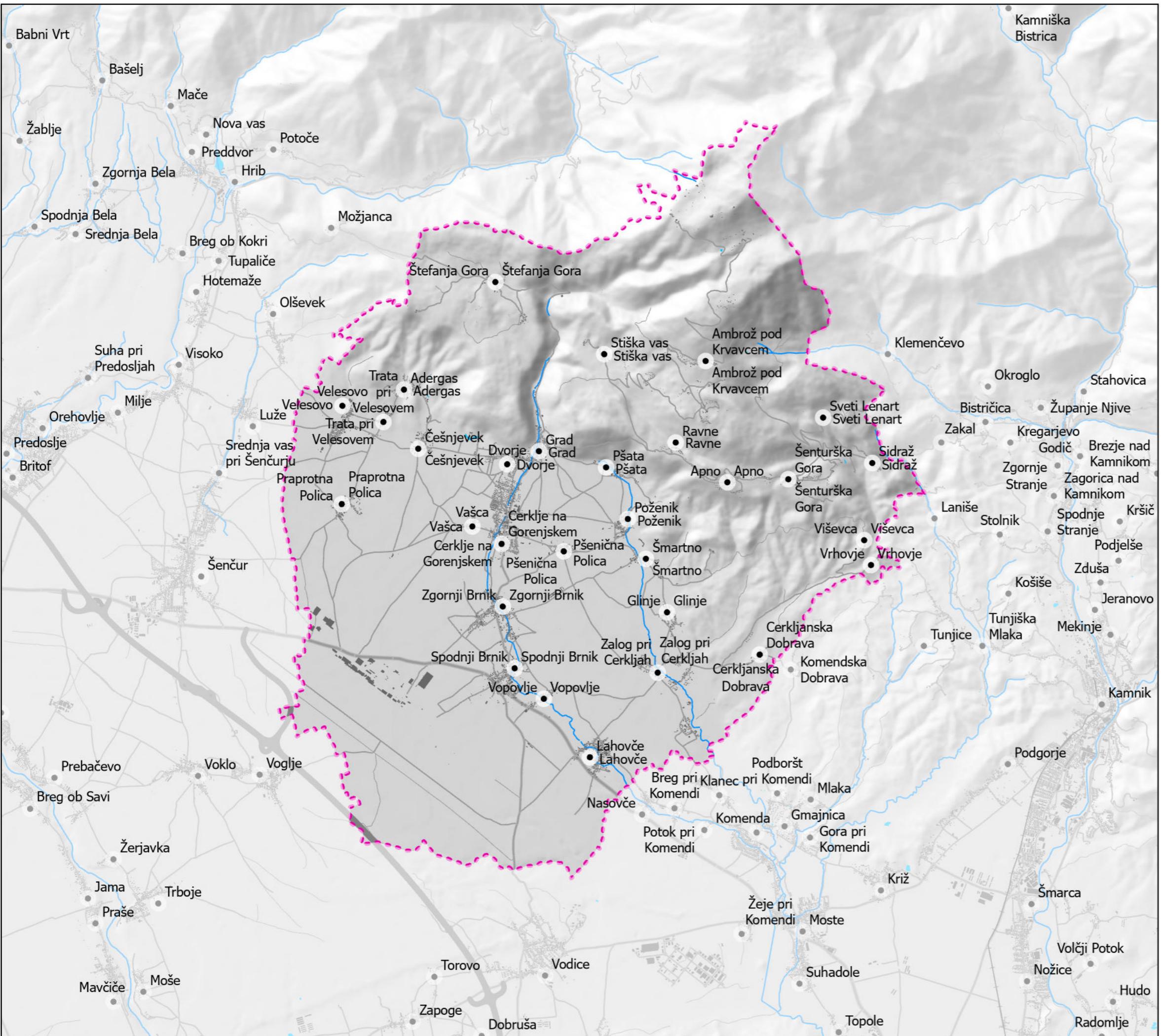
Efficient spatial planning requires careful consideration of various constraints and factors to facilitate proper development planning. The Cerknje na Gorenjskem municipality, situated north of Ljubljana, holds significant importance due to its proximity to the capital. Despite not being densely populated, the municipality faces challenges due to several constraints, including extensive areas of cultural and natural heritage, protective forests, and best agricultural land.

The land use map indicates that forested areas occupy the majority of land, followed by agricultural land, posing challenges for development due to the value of agricultural land. On the other hand, although a large part of the municipality is at risk of flooding, the risk primarily affects agricultural land, which result in having minimal flood threat to buildings and residential areas. Notably, buildings constructed in Cerknje na Gorenjskem town after 1971 are predominantly situated in flood-prone areas, suggesting either an underestimation of flood risk or an acceptance of some level of risk due to spatial development restrictions.

Map 9 reveals that only 21% of the town area remains undeveloped, underscoring the need for caution in future development. Given the increasing population trend for both the town and municipality, new development areas are proposed while considering existing limitations such as flood risk management, preservation of cultural and natural heritage, and the preservation of prime agricultural lands.

Based on demographic assessments and the limited undeveloped area in the town, there is a clear demand for development. It is suggested that a 15% expansion in development would address the growing housing needs. However, considering the growth in the aging index, there may be a need for additional healthcare facilities, particularly for senior citizens.

Based on the demographic assessment of the data, and limited undeveloped area in the town there is a clear need for development. It is recommended that 15% expansion in the development would meet the growing need for housing in the town. However, considering the age index growth there maybe need for more healthcare facilities, especially for senior citizens.



## **Map 1: Overview of the Cerknica Gorenjskem Municipality**

## Legend

- Settlements
  - Buildings
  - Municipality Border
  - Rivers
  - Rail
  - Water Stagnant

## Road Categories

- Highway
  - Main roads
  - Regional roads
  - Local roads
  - else

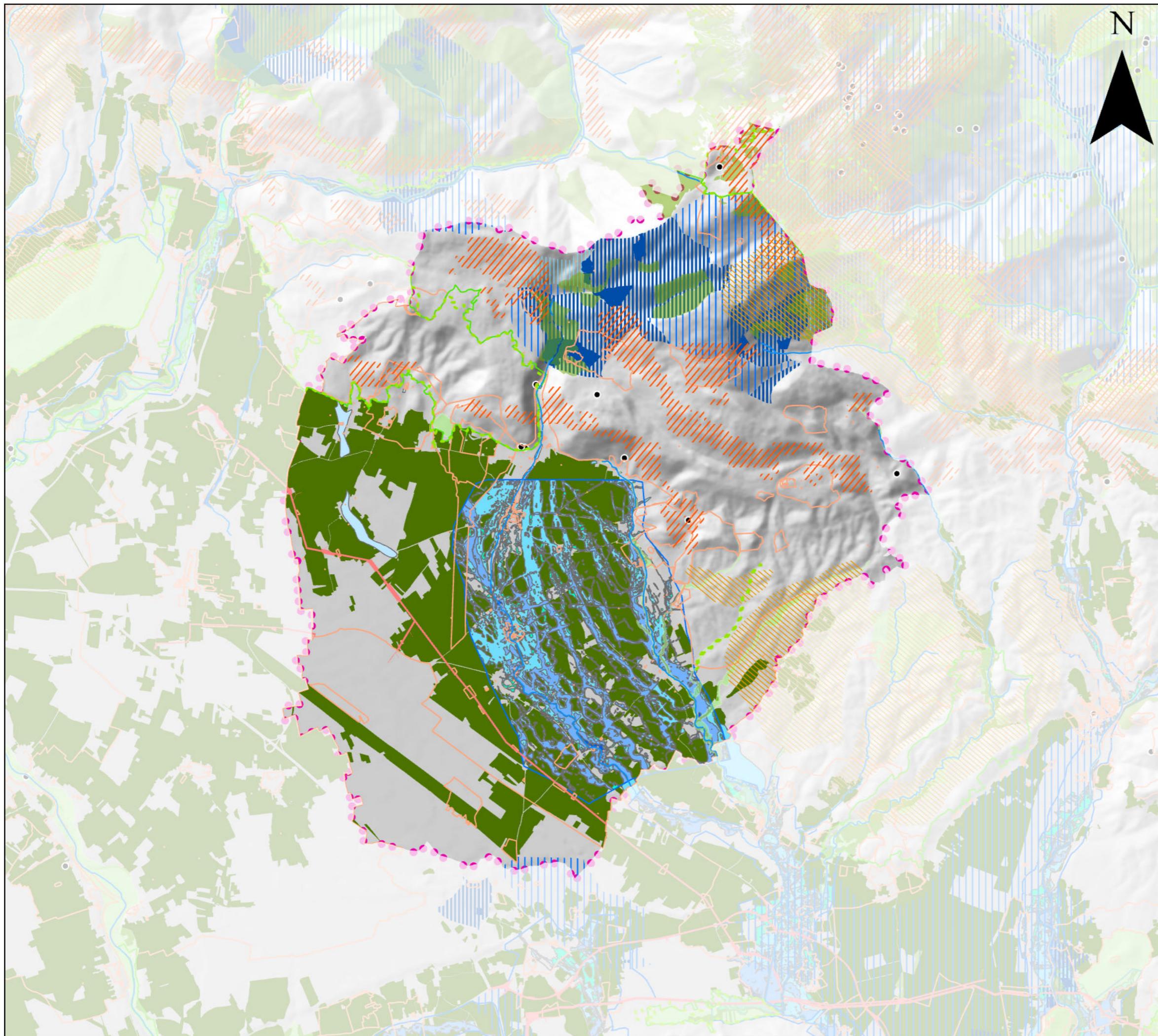


A horizontal scale bar with numerical markings at 0, 1, 2, and 4. The label 'Km' is positioned at the right end of the bar.



 Erasmus Mundus FLOODRisk Master  
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Source: GURS; 2023  
Noor Ahmad Yaqubi  
SPFP, FRM, DEC-2023  
2022-2024



**Map 2: Protect Areas of Cerknica na Gorenjskem Municipality**

**Legend**

- Rivers
- Nature 2000
- Ecologically important areas
- National Infrastructure projects
- Areas at risk of erosion
- Areas at risk of Avalanche
- Cultural Heritage
- Protective forest
- Best Agriculture Land

**Register of Natural Heritage**

- Natural Cave
- Natural Heritage

**Water Protection**

- 1st protection area
- 2nd protection area
- 3rd protection area
- 4th protection area

**Integral Maps of Flood Hazard Classes**

- IMFHC Area of validity of the results
- IMFHC Residual Flood Risk Hazard
- IMFHC Major Flood Risk Hazard
- IMFHC Medium Flood Risk Hazard
- IMFHC Minimal Flood Risk Hazard

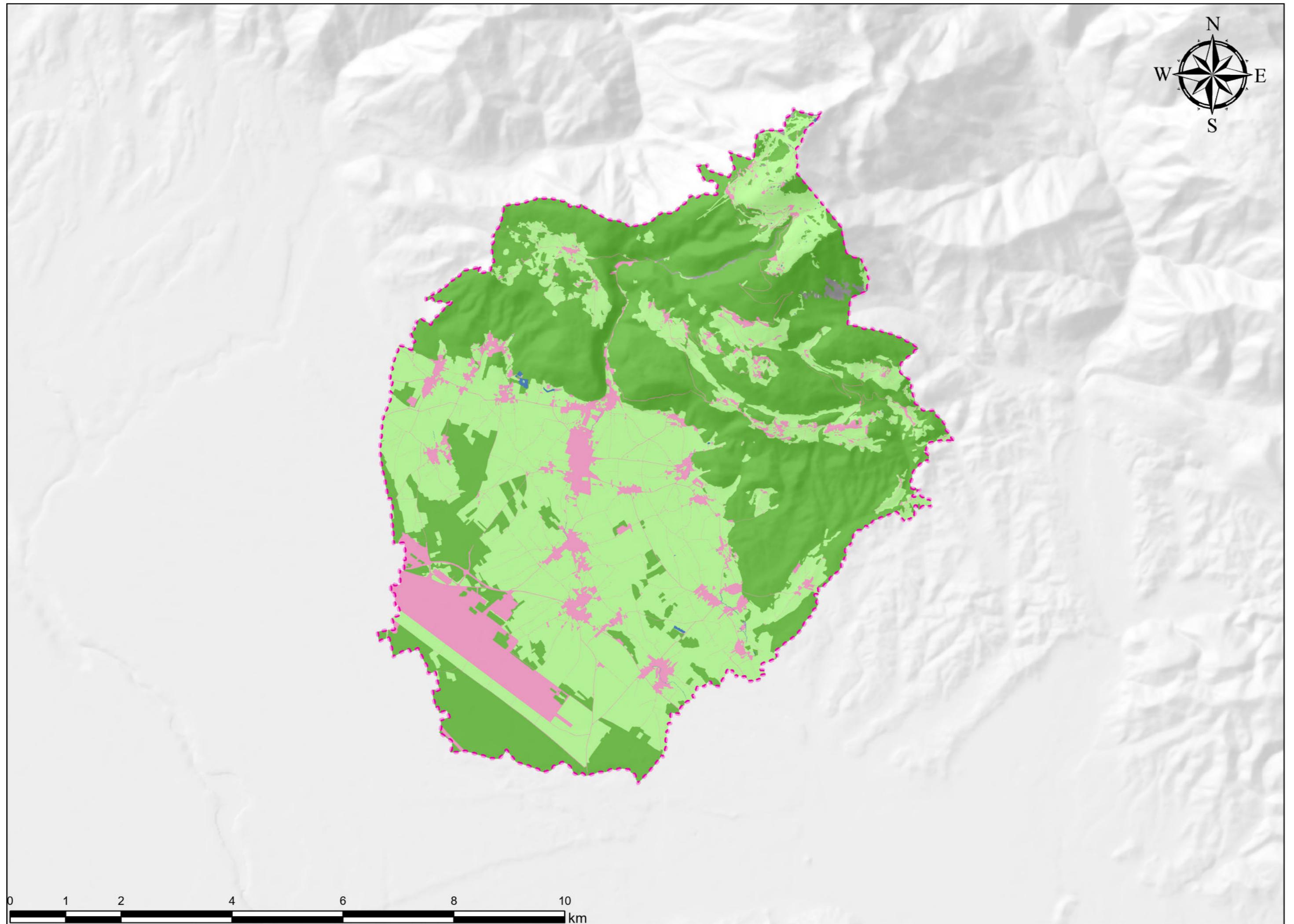
**Flood Warning Map**

- Frequent
- Rare
- Very rare
- Municipality border

0 0,5 1 2 3 4 km



Source: GURS; 2022, 2023 DRSV; 2023, ARSO; 2020, MNVP; 2023, ZGS; 2022, MK; 2022  
Noor Ahmad Yaqubi  
SPFP, FRM, DEC-2023



**Map 3: Actual Land Use of Cerknica Gorenjskem Municipality**

### Legend

Actual land use groups

Forest Land

Agriculture Land

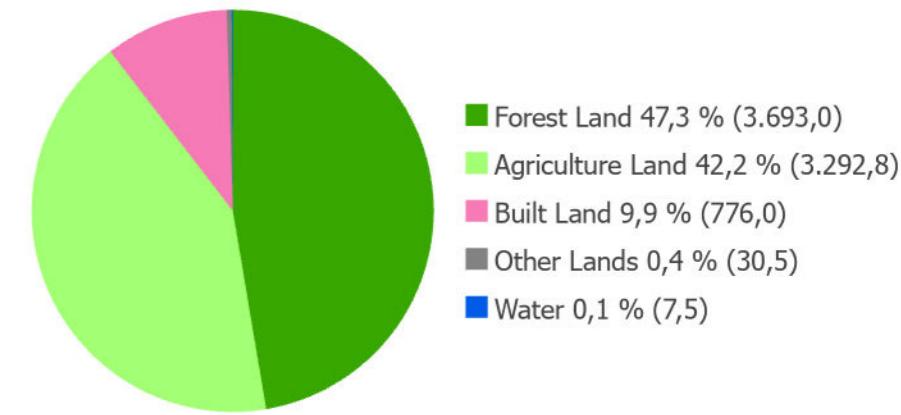
Built Land

Water

Other Lands

Municipality border

Actual land use group - Area (ha)

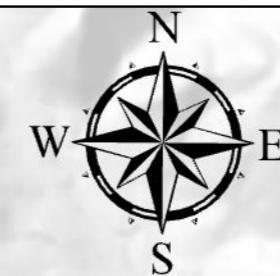


ALU Group	Shape_Area	Area (ha)
Agriculture Land	32923080,116373	3292,844
Forest Land	36923575,748989	3692,964
Built Land	7759013,261528	776,026
Other Lands	304651,311013	30,47
Water	74958,498168	7,497



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**Map 4: Planned Land Use of Cerknje na Gorenjskem Municipality**

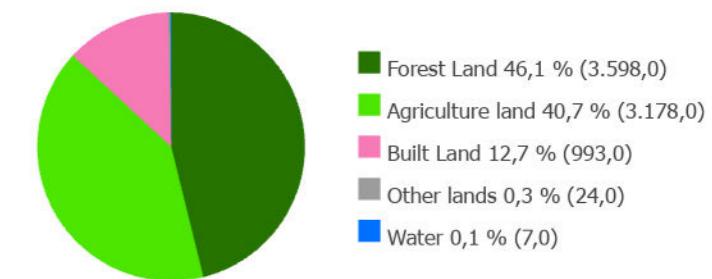


### Legend

#### Planned Land Use Group

- Agriculture land
- Built Land
- Forest Land
- Water
- Other land
- Municipality border

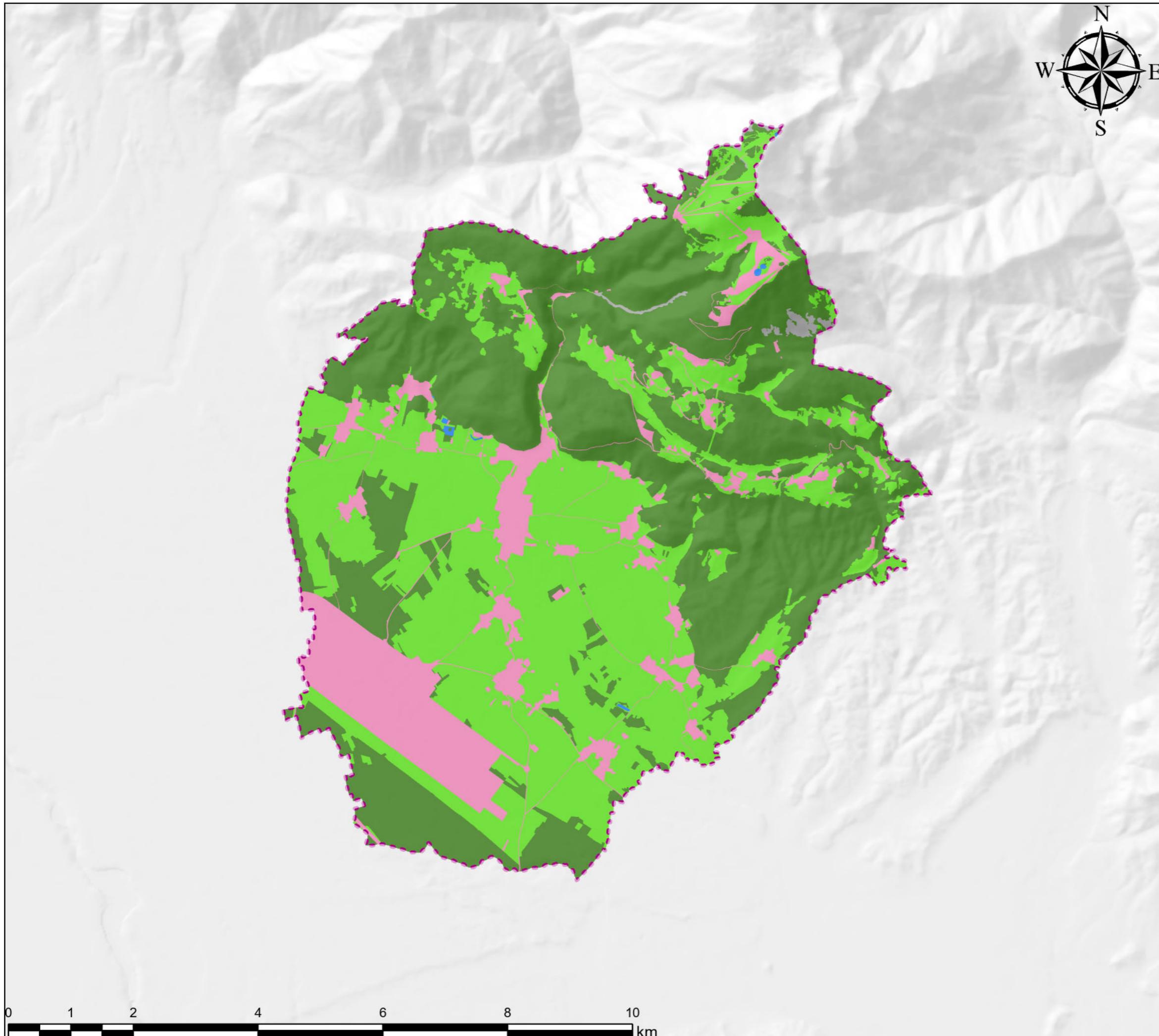
#### Planned Land Use Group Area-(ha)



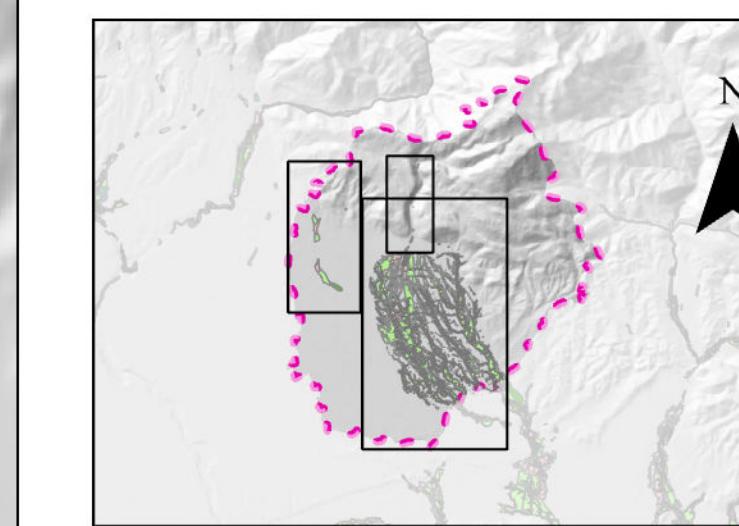
PLU Group	Area (ha)
Built Land	993
Agriculture land	3178
Forest Land	3598
Water	7
Other lands	24



Source: GURS, 2022; MOP;2022  
Noor Ahmad Yaqubi  
SPFP, FRM, DEC-2023  
2022-2024



**Map 5: Planned Land Use and Floods of Cerknje na Gorenjskem Municipality**



**Legend**

**Planned Land Use**

- Build Land
- Agriculture Land
- Forest Land
- Water
- Other Lands

**IMFHZ Area of Variability of the Results**

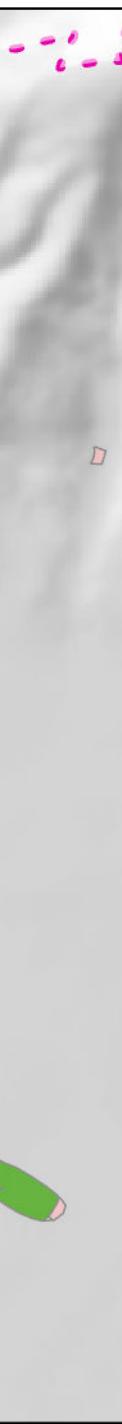
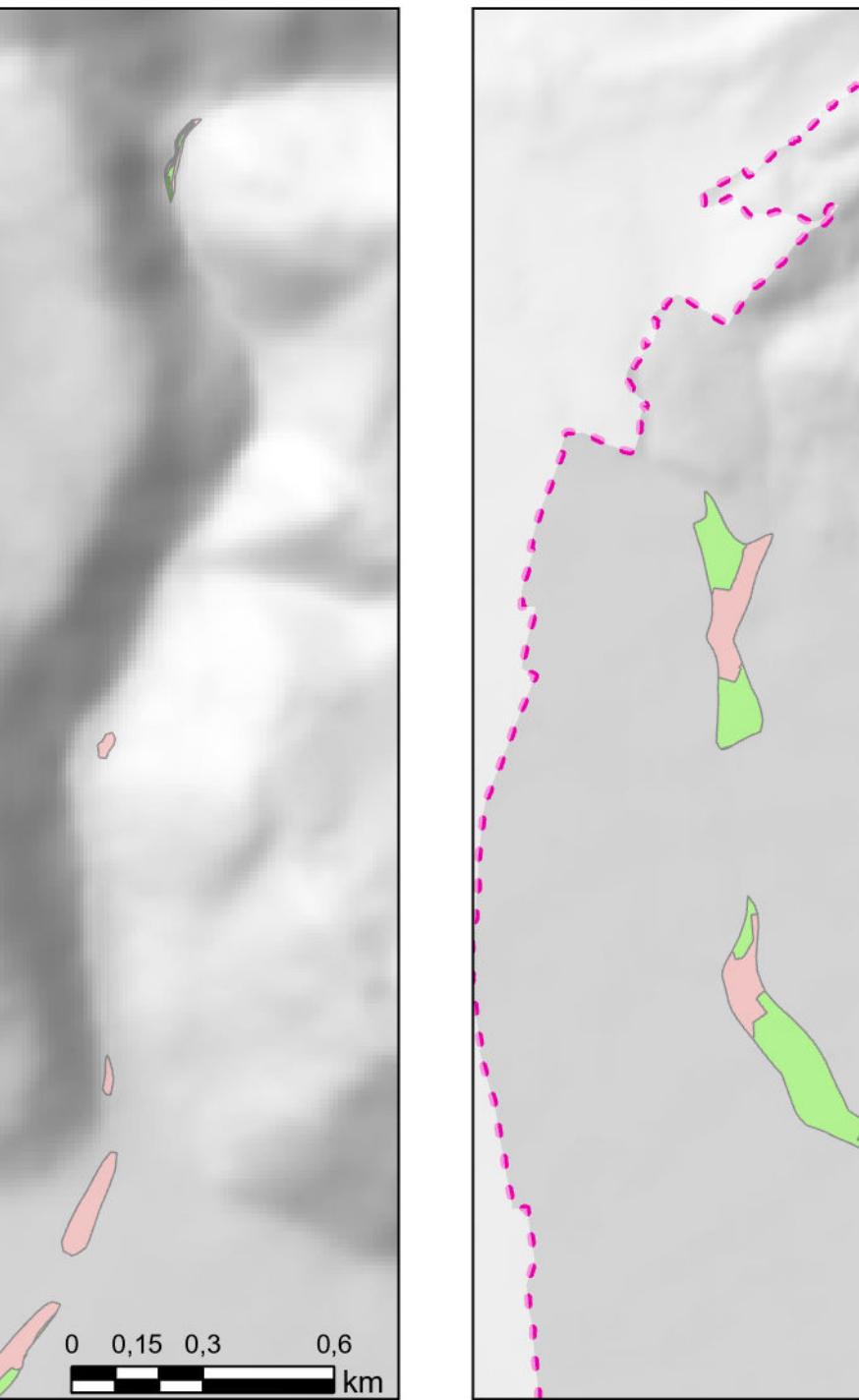
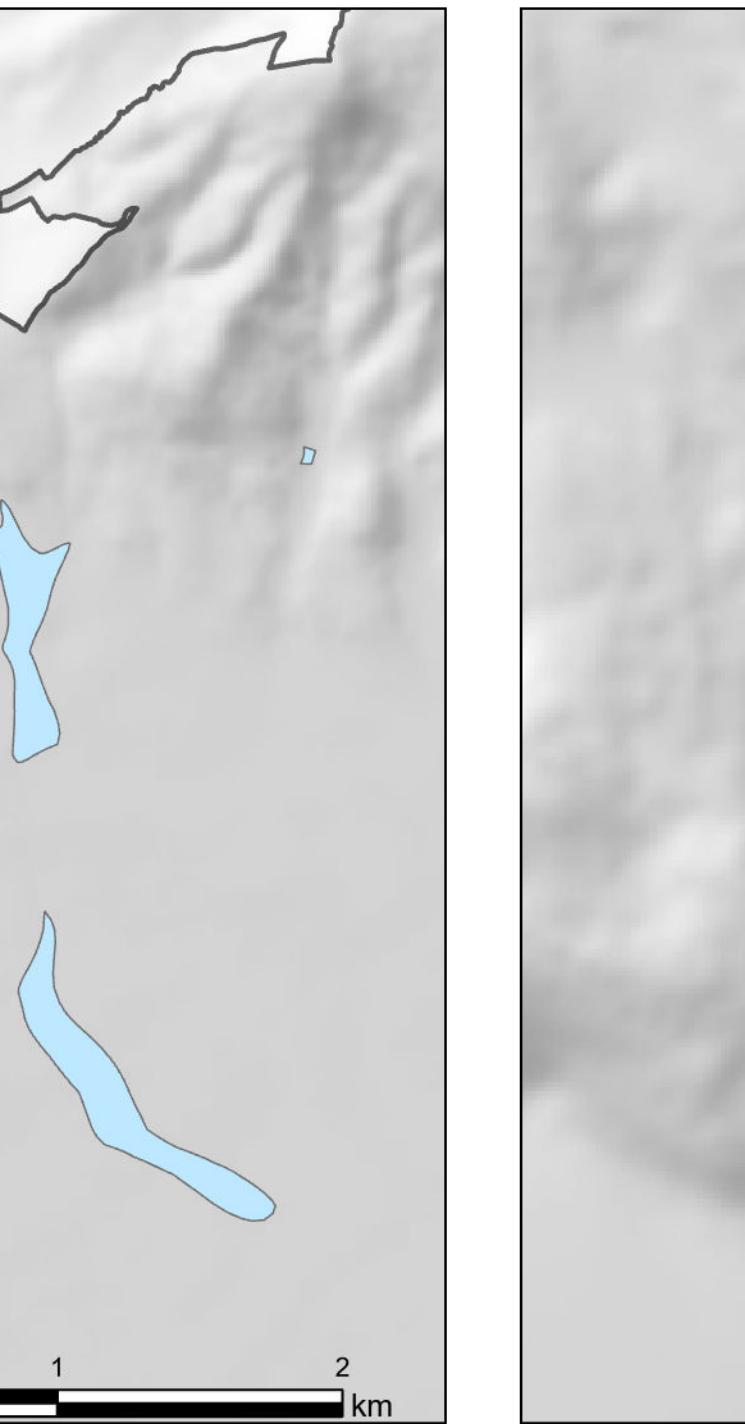
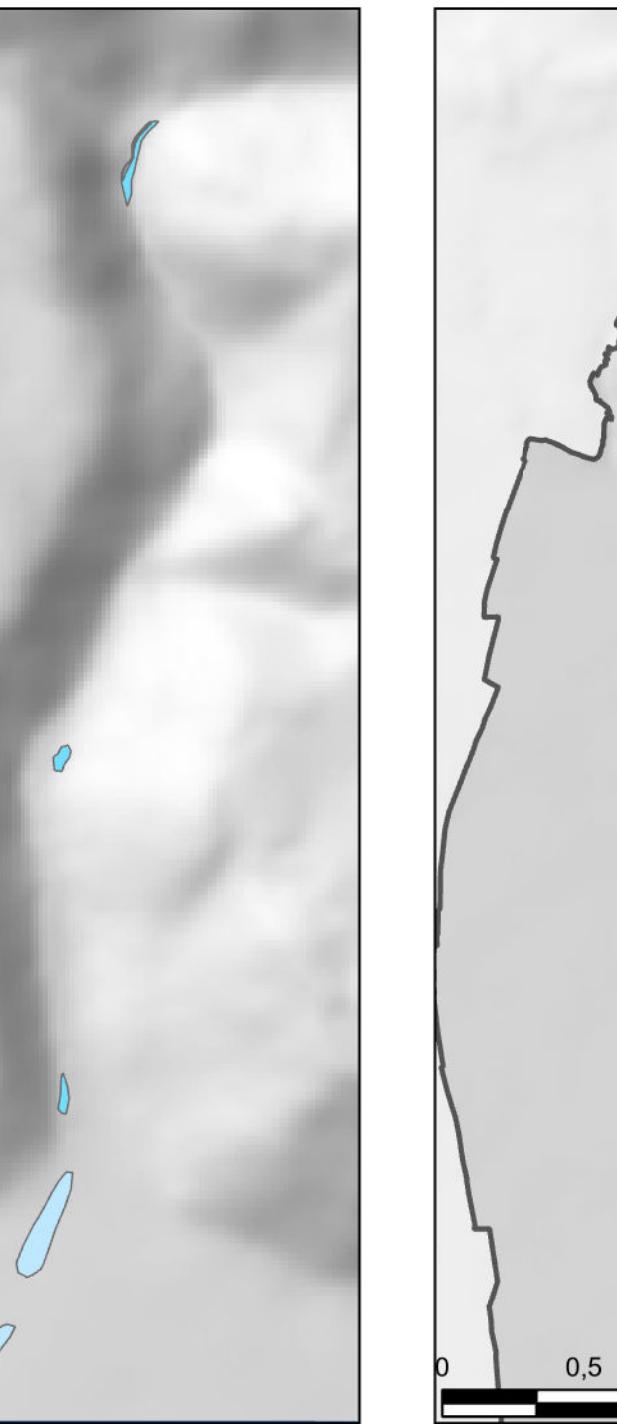
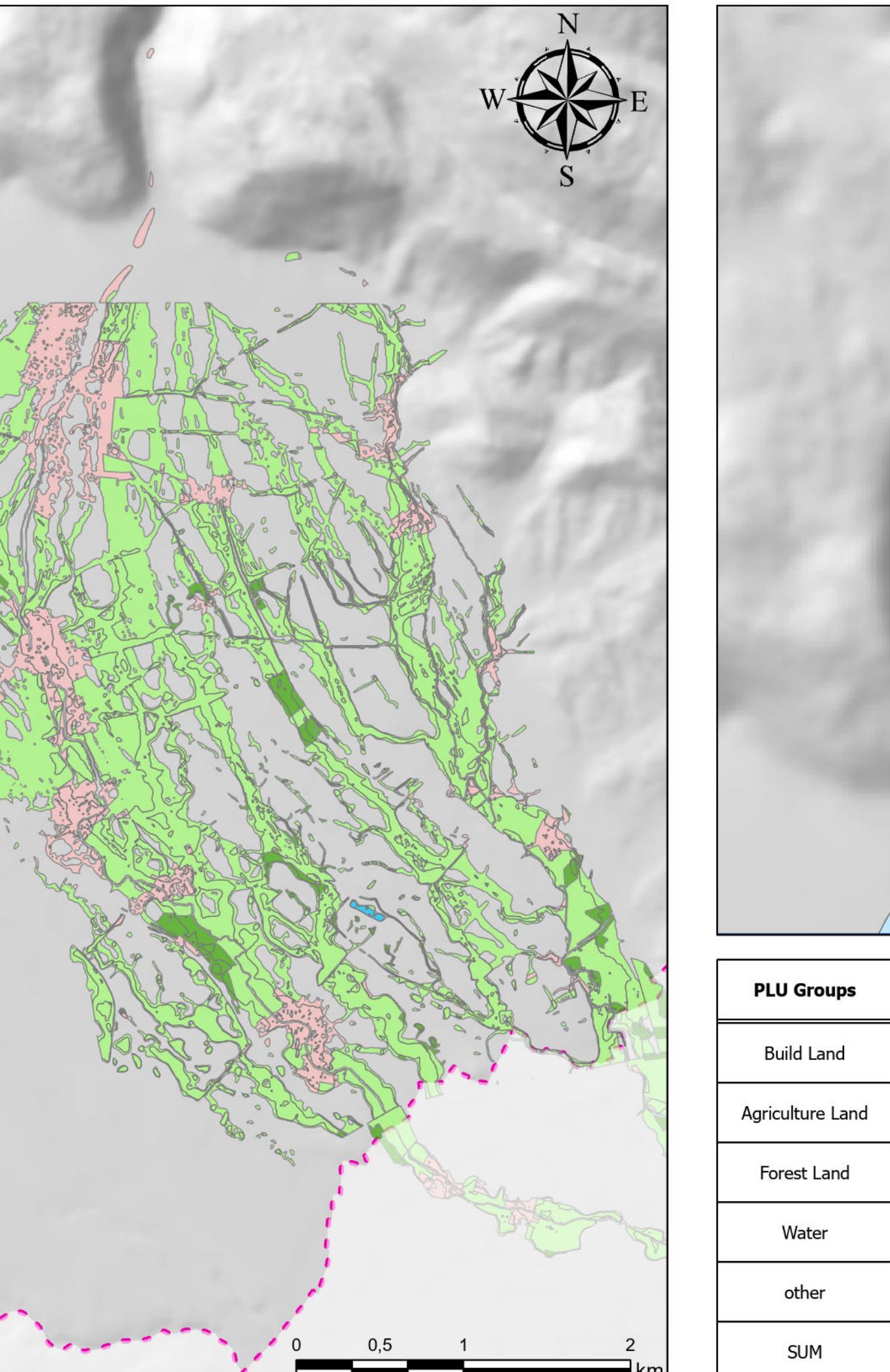
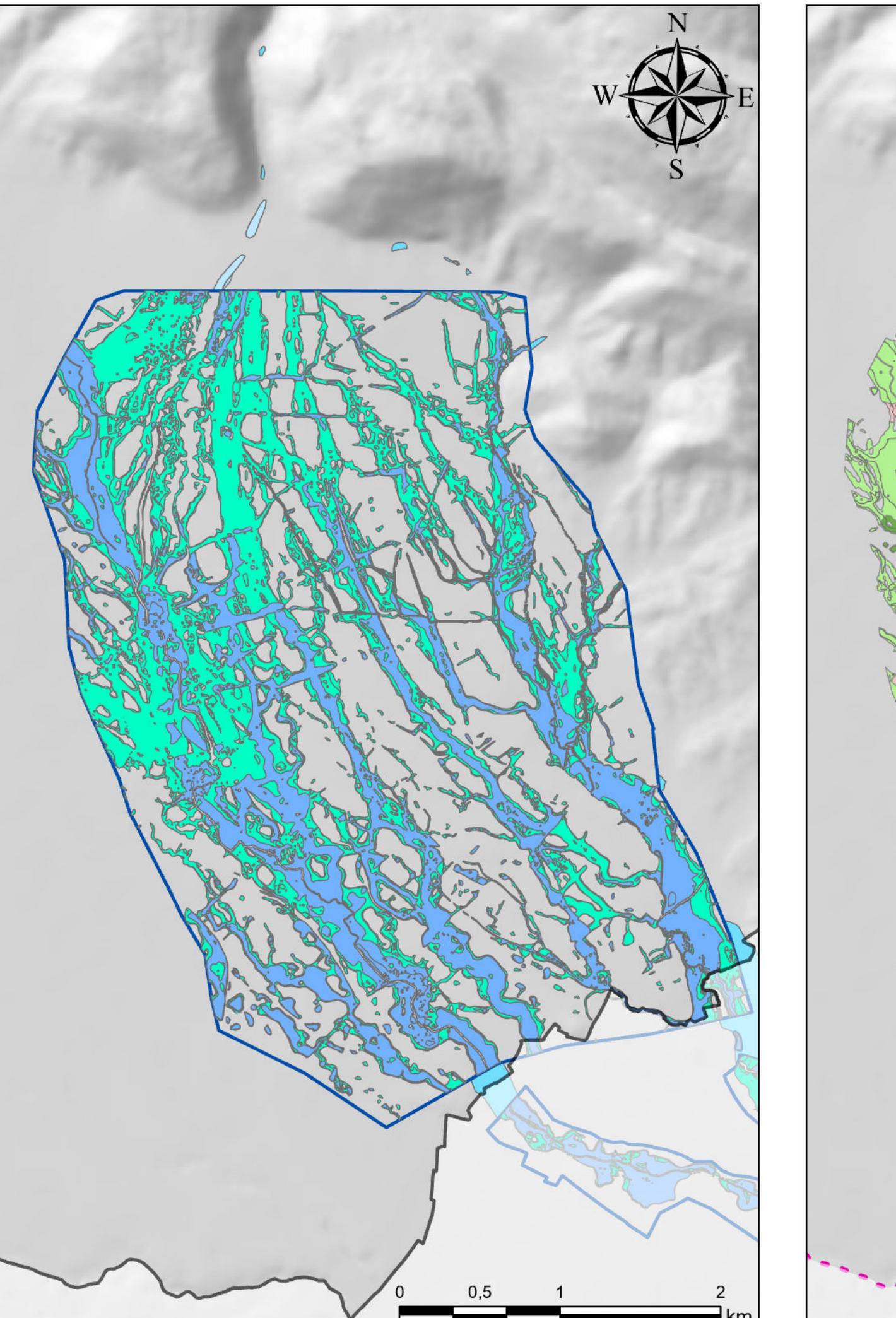
- IMFHZ Area of validity of the results
- IMFHZ Minimal Flood Risk Hazard
- IMFHZ Medium Flood Risk Hazard
- IMFHZ Major Flood Risk Hazard
- IMFHZ Residual Flood Risk Hazard

**Flood Warning Map**

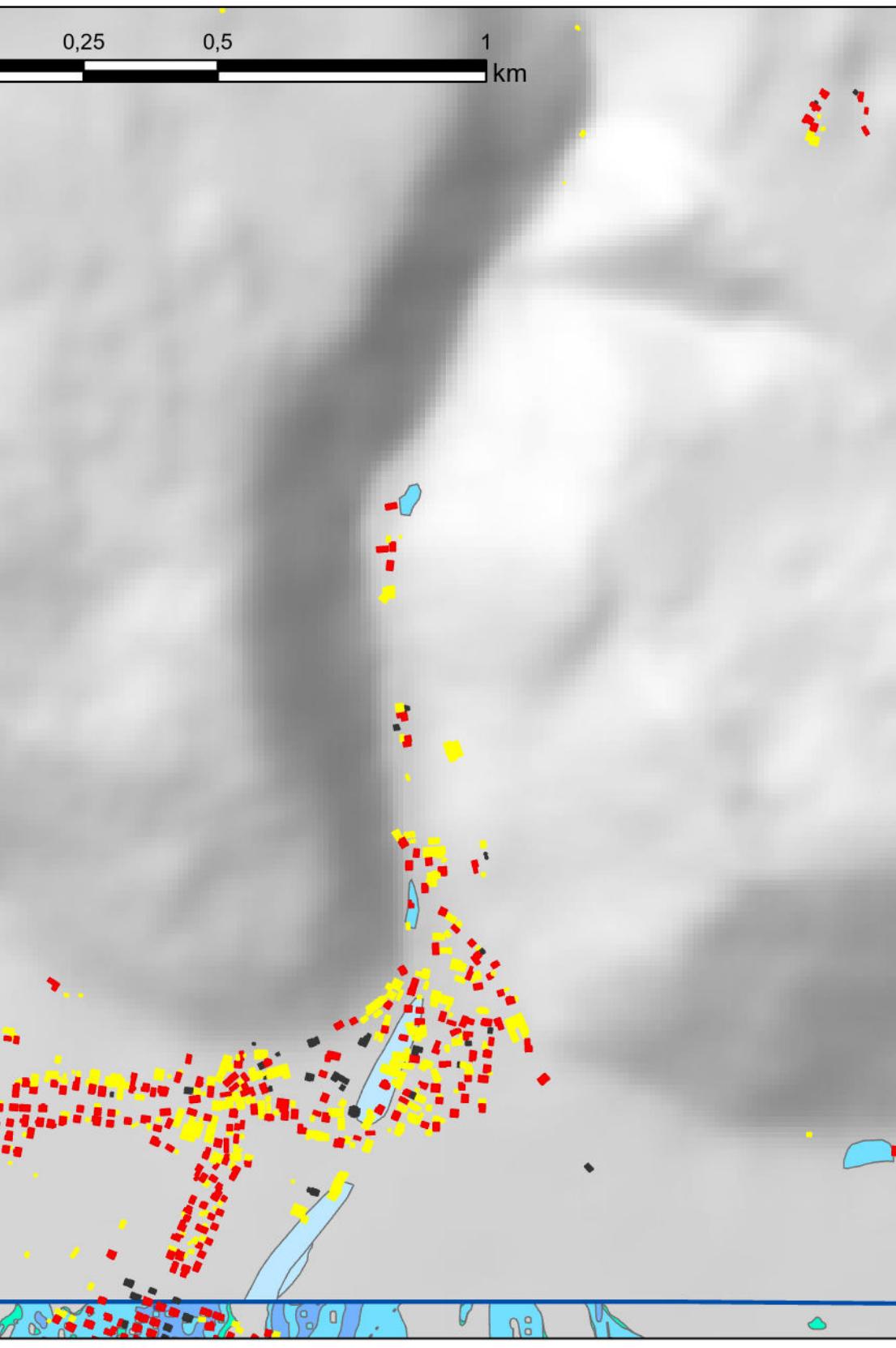
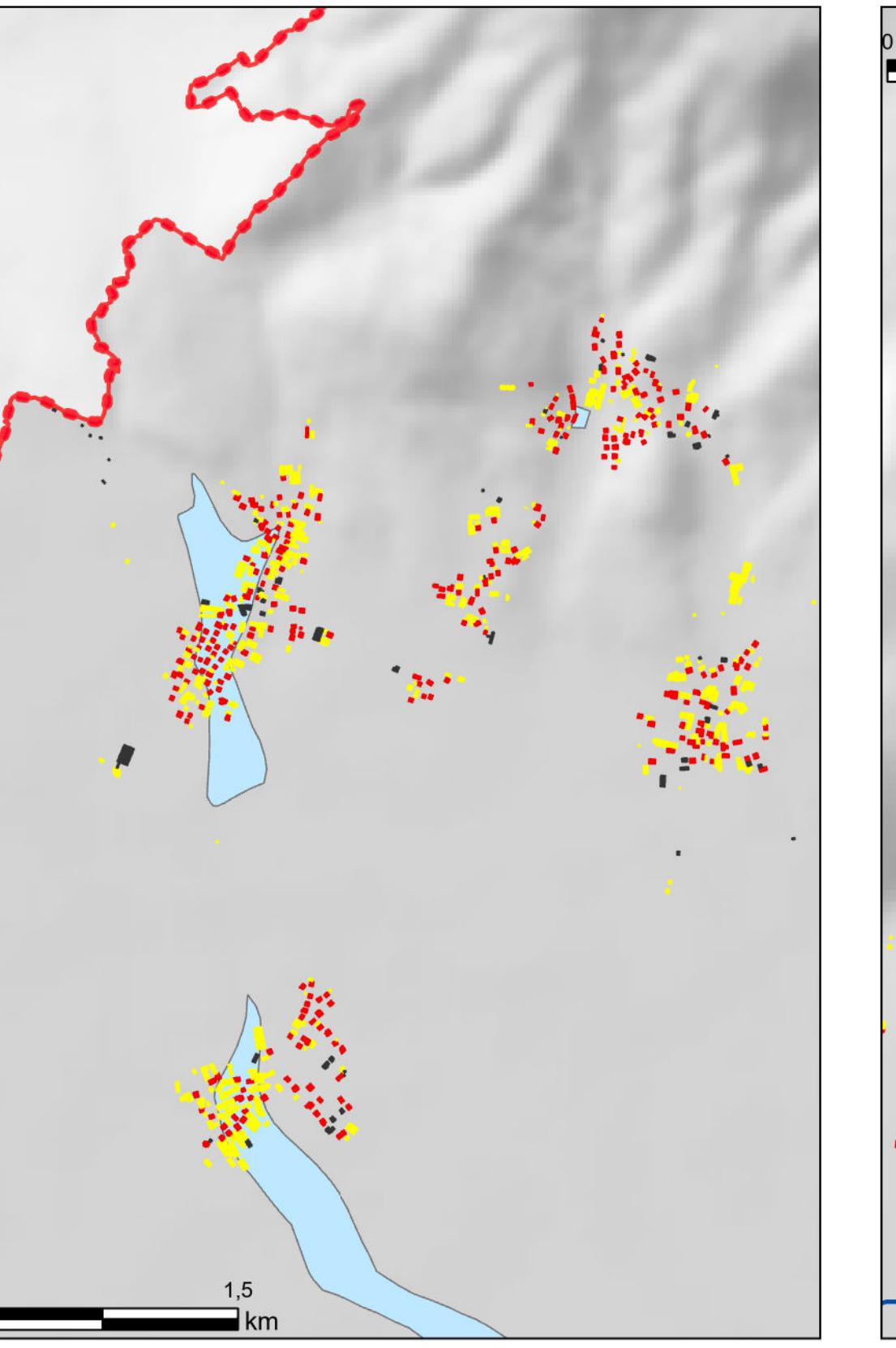
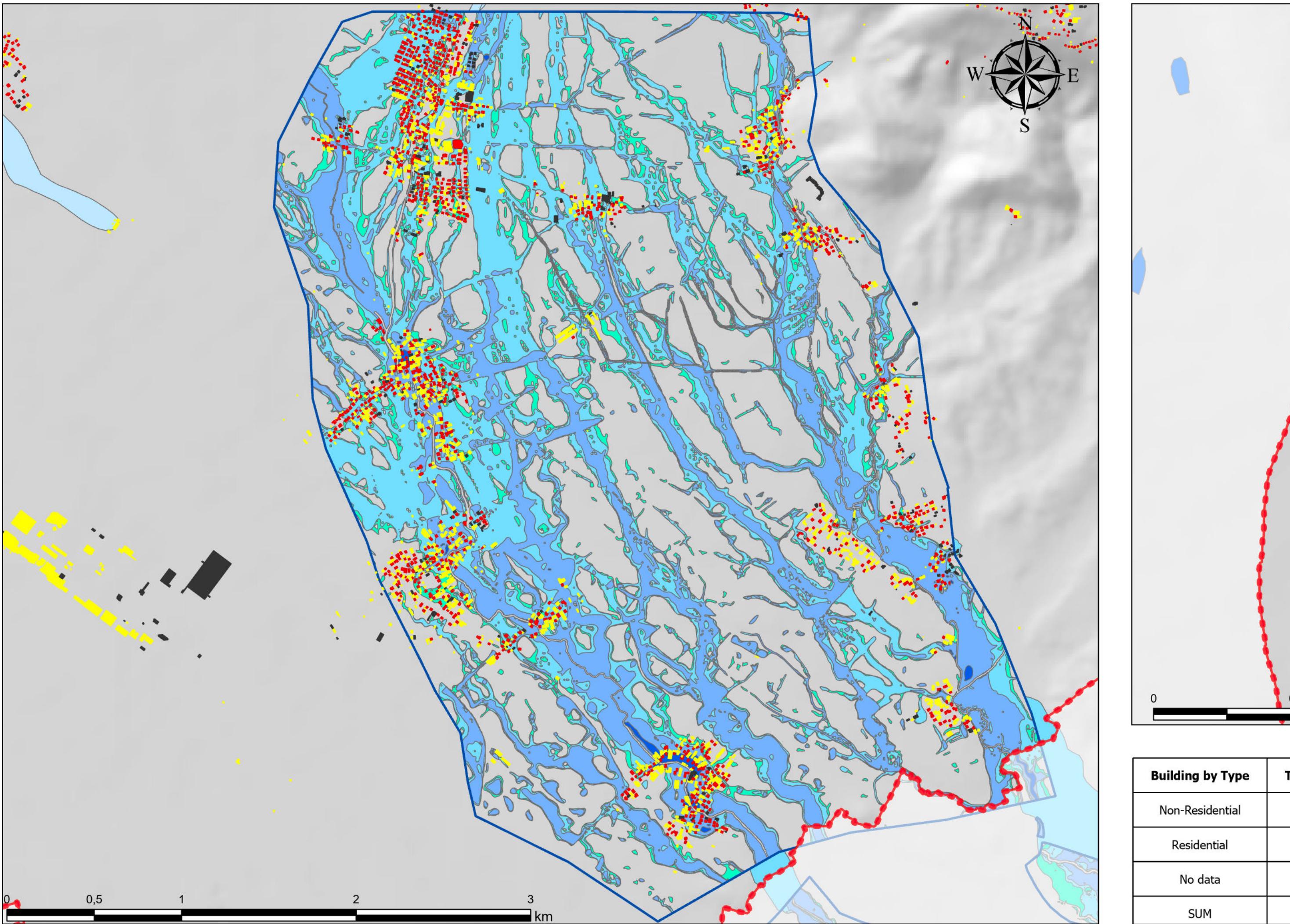
- Frequent
- Rare
- Very rare
- Municipality border



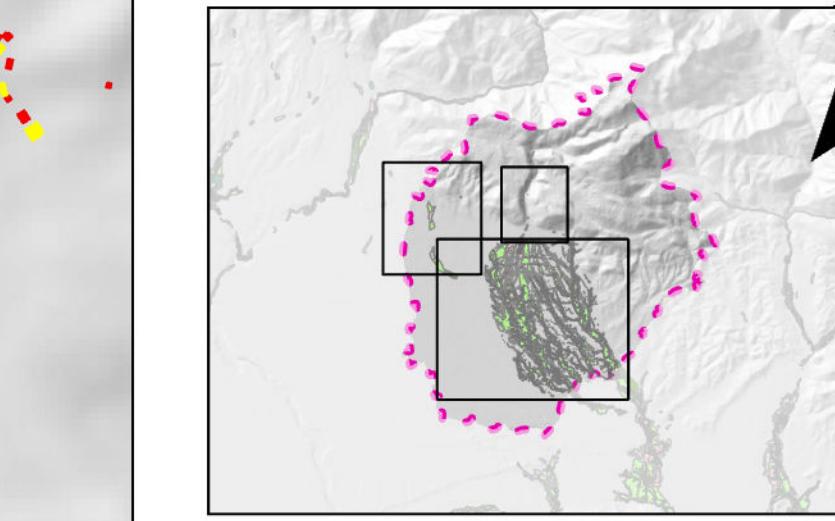
Source: GURS, 2022; MOP 2022; DRSV; 2022  
Cartographer: Noor Ahmad Yaqubi  
SPFP, FRM, JAN-2024  
FRM - 2022-2024



PLU Groups	Municipality Total	FWM Area (ha)	Share FWM (%)	Residual Small Area (ha)	Share Residual Small (%)	Medium Major Area (ha)	Share Medium Major (%)	SUM
Build Land	10397,75	80,97	0,092821	757,57	0,868446	185,63	0,212798	1024,17
Agriculture Land	26607,28	274,88	0,315111	1711,2	1,961646	1053,24	1,207389	3039,32
Forest Land	46409,6	123,44	0,141506	226,98	0,2602	282,29	0,323605	632,71
Water	674,91	29,6	0,033932	19,09	0,021884	57,66	0,066099	106,35
other	3143,31							
SUM	87232,85	508,89	0,58337	2714,84	3,112176	1578,82	1,809892	4802,55



**Map 6: Buildings affected by floods in Cerknica Municipality**



**Legend**

**Building by Type**

- Non-Residential
- Residential
- No data

**IMFHZ Area of Variability of the Results**

- IMFHC Area of validity of the results
- IMFHC Residual Flood Risk Hazard
- IMFHC Minimal Flood Risk Hazard
- IMFHC Medium Flood Risk Hazard
- IMFHC Major Flood Risk Hazard

**Flood Warning Map**

- Frequent
- Rare
- Very rare
- Municipality border

Building by Type	Total Number	In FWM	Percentage in FWM	In Major Medium Flood Hazard	Percentage Major Medium	In Residual Flood Hazard	Percentage in Residual Hazard
Non-Residential	2435	90	3,696099	361	14,825462	764	31
Residential	2198	68	3,093722	315	14,33121	759	35
No data	444	7	1,576577	59	13,288288	129	29
SUM	5077	165	3,249951	735	14,477053	1652	33



**Map 8: Buildings affected By flood zones by years of construction in Cerknje na Gorenjskem town**

**Legend**

**Year of construction**

- Until 1900
- Between 1901 and 1945
- Between 1946 and 1970
- Between 1971 and 1990
- After 1991
- No data

**Integral Maps of Flood Hazard Classes**

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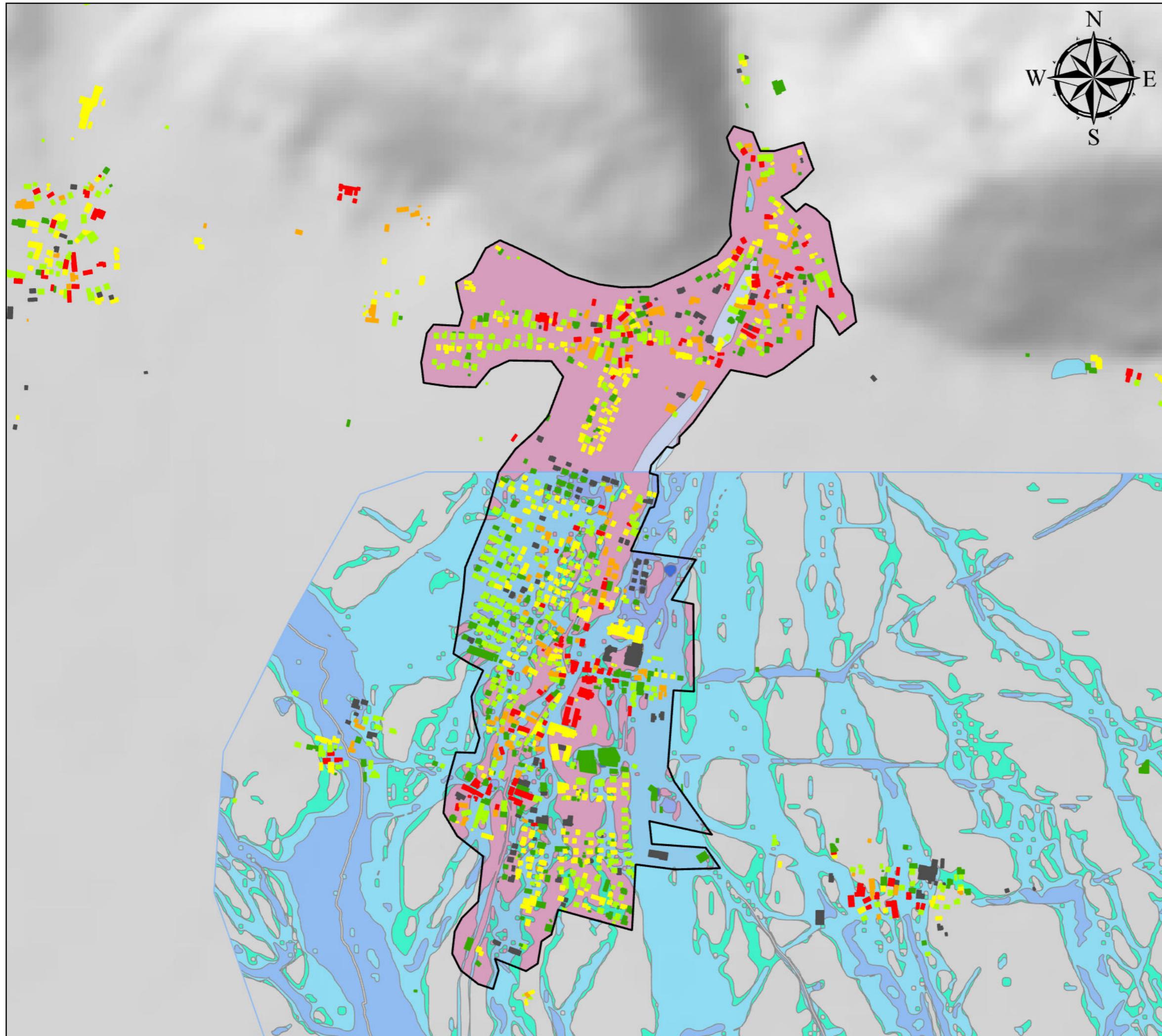
**Flood Warning Map**

- Frequent
- Rare
- Very rare
- Town Extent
- Built Land

Build By Year	FWM	MM	RS	Total
Until 1900	2	5	47	54
Between 1901 and 1945	4	5	52	61
Between 1946 and 1970	4	7	130	141
Between 1971 and 1990	5	19	211	235
Between 1991 and 2020	6	24	125	155
No data	1	18	49	68



Source: GURS; 2022; MOP 2022;  
DRSV  
Noor Ahmad Yaqubi  
SPFP, FRM, JAN-2024



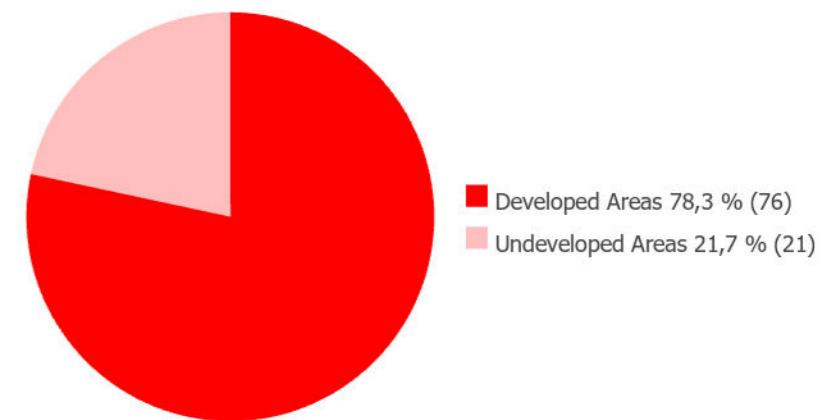
**Map 9: Undeveloped Built Land of Cerknje na Gorenjskem Town**



**Legend**

- Buildings (white)
- Developed Built Up Areas (red)
- Undeveloped Built Up Areas (pink)

Built Up Type Area (ha) & Percentage (%)



Buil up Type	Area (ha)	Percentage (%)
Developed Areas	76,36	78,35
Undeveloped Areas	21,11	21,65



Source: GURS; 2022, 2023 MOP; 2023; MKGP 2023  
Noor Ahmad Yaqubi  
SPFP, FRM, JAN-2024

## Map10: Draft Proposal for The Development - Cerknje na Gorenjskem Town

### Legend

- Development Area
- Buildings
- Built Land
- Best Agriculture Land
- Town Extent

Existing Built Land: 97,42 ha  
Development Areas: 15,24 ha  
Expansion Percentage: 15,63 %



Source: GURS; 2023; MOP 2023;  
Noor Ahmad Yaqubi  
SPFP, FRM, JAN-2024  
2022-2024



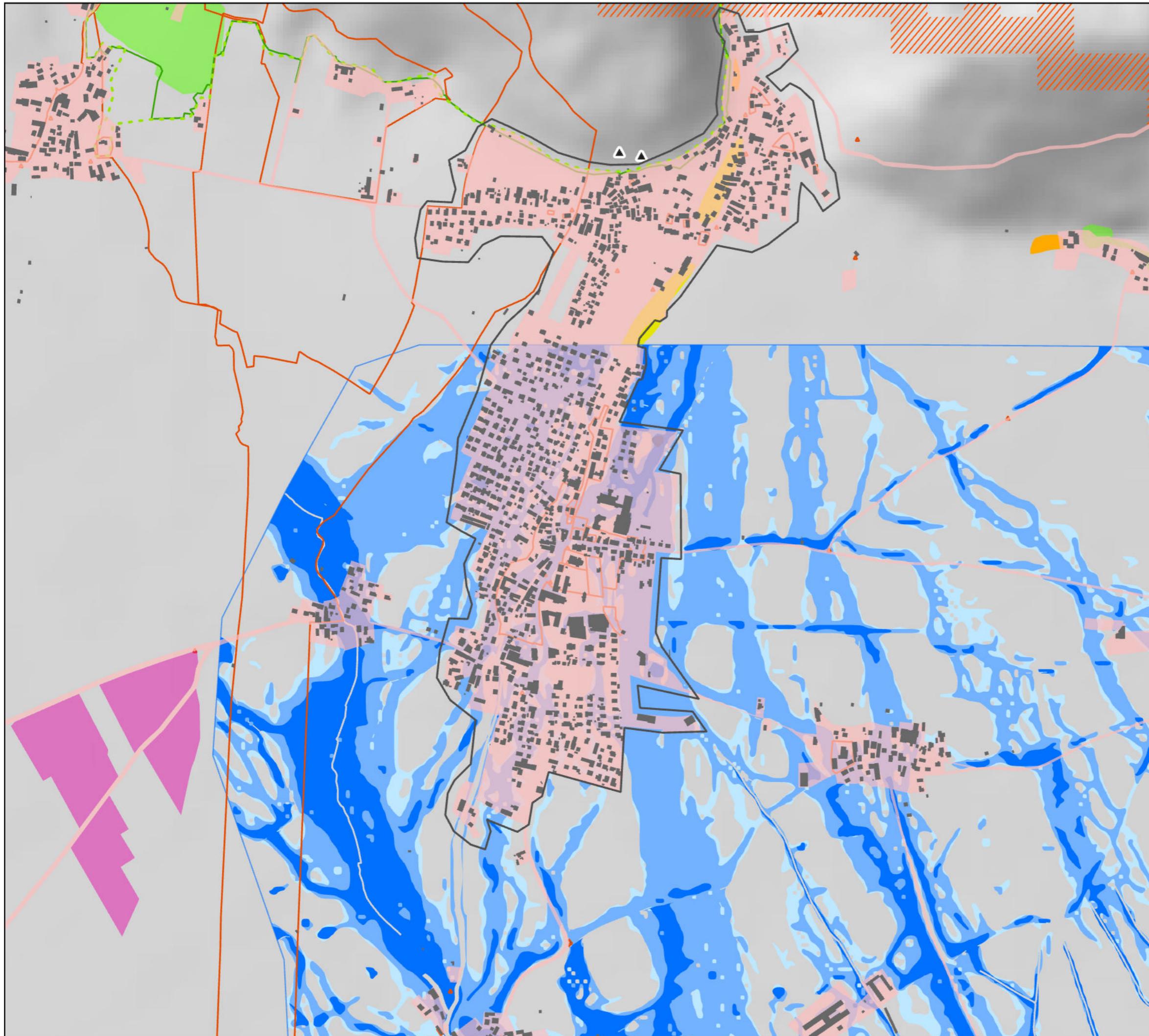
## Map11: Draft Proposal for The Development - Restrictions Cerknje na Gorenjskem Town

### Legend

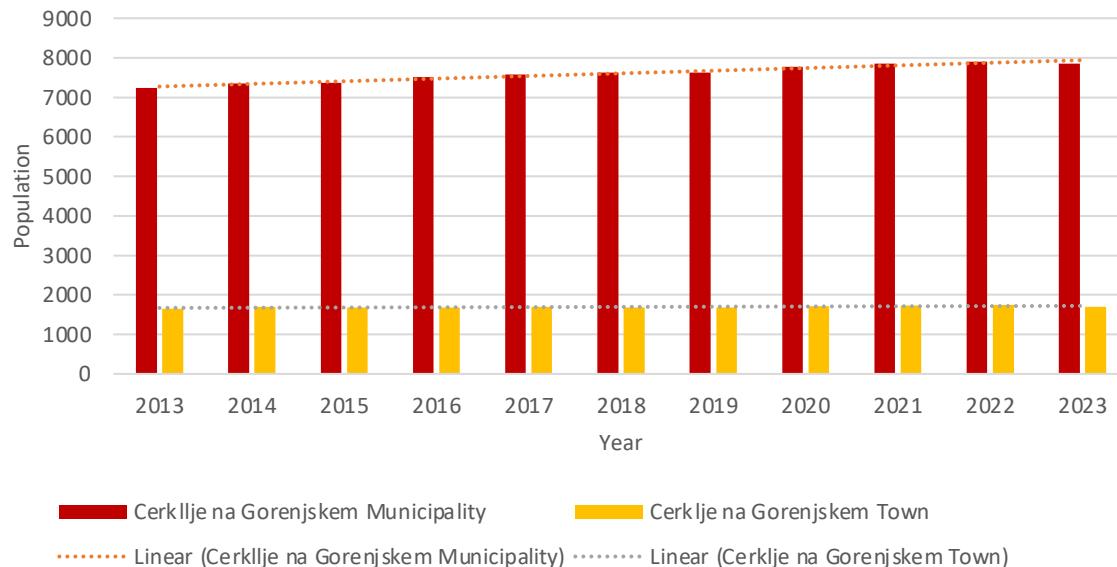
- Development Area
- Buildings
- Built Land
- Nature 2000
- ▲ Natural Cave
- Natural Heritage
- Areas at Risk of Avalanche
- Cultural Heritage
- Ecologically Important Areas
- Integral Maps of Flood Hazard Classes
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- IMFHC Minimal Flood Risk Hazard
- IMFHC Medium Flood Risk Hazard
- IMFHC Major Flood Risk Hazard
- Flood Warning Map
- Frequent
- Rare
- Very rare
- Town Extent



Source: GURS; 2023; MOP 2023;  
ARSO 2023, MK 2023, DRSV 2023  
Noor Ahmad Yaqubi  
SPFP, FRM, JAN-2024  
2022-2024

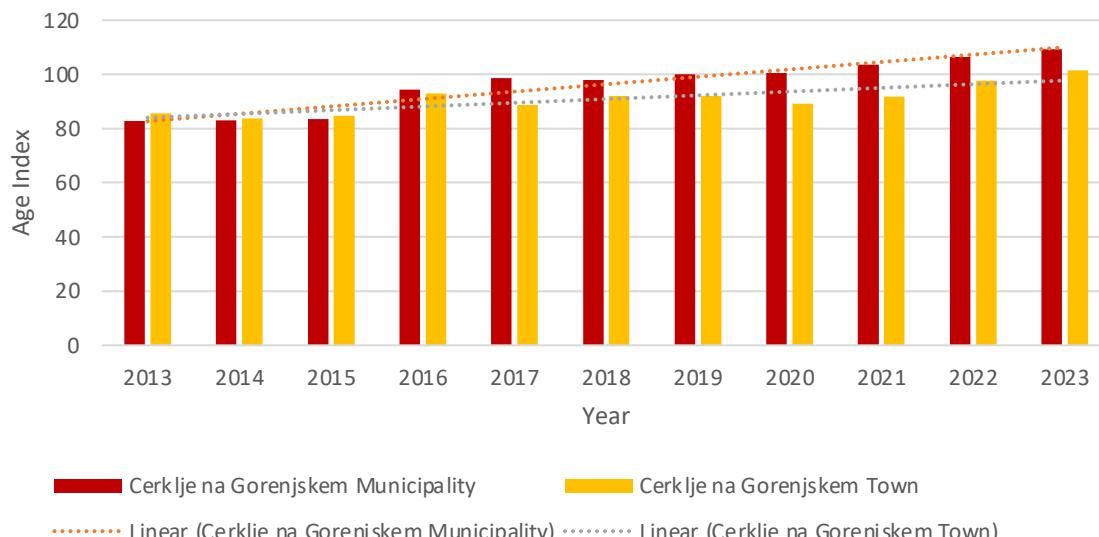


### Population in Cerknje na Gorenjskem Municipality and Town



The data depicts an increase in the population of Cerknje na Gorenjskem Municipality from around 7,240 to 7,854 over the last decade (2013-2023). However, the growth in the town of Cerknje na Gorenjskem, rising from 1,656 to 1,696 during the same period, is less prominent. This discrepancy may be attributed to various factors, including natural population growth, inward migration, economic opportunities, and improvements in infrastructure and amenities, which collectively contribute to the attractiveness of the area for residents.

### Ageing index in Cerknje na Gorenjskem Municipality and Town



Upon analysing the ageing index given in the figure, it was observed that both the main town and the municipality had indexes below 100 until 2019, indicating a predominantly young population. However, the index for the entire municipality surpassed 100 and continued to rise, reaching its current figure of 110, while it remained relatively low for the town until 2023 when it reached 101. This trend could be attributed to a declining birth rate and an increase in life expectancy due to improvements in the healthcare system. It underscores a potential growing demand for healthcare facilities for the elderly in both the municipality and the town in the near future.