2024 DIAMOND ANNIVERSARY

ISOCARP

CONFERENCE PROCEEDINGS

1st INTERNATIONAL CONFERENCE FOR NEW CITIES

PLANNING NEW REGENERATIVE CITIES

10-13 SEPTEMBER | NEW CLARK CITY TARLAC | PHILIPPINES



for New Cities

for New Cities
Cities
3 September 2024

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BCDA
Bases Conversion and Development Authority

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Flood Disaster Through Plans at e in Türkiye: Lessons for Urban loodproofing and Planning

AŞ, Istanbul Technical University, Türkiye
ARYA, Yildiz Technical University, Türkiye

e vulnerabilities of floods in the central district of Kayseri province op suggestions for floodproofing approaches under the headings "sharing". As a result, risk mitigation/floodproofing for flood risk f "avoidance", "mitigation" and "sharing". While dry valley areas luated within the scope of prevention proposals, afforestation into channels in case of flood, green streets, water plazas, bio-es, increasing urban permeable surfaces, reducing surface flows, within the scope of reduction recommendations. The risks cannot reduced by early warning systems, intervention plans, insurance, ctors suggested under the heading of sharing with interventions. acity were developed within the scope of the transformational e most beneficial against high-risk levels.

itigation, floodproofing, urban resilience, urban planning.

ter on risk factors in Kayseri, Türkiye. In the study area, there have affected life significantly from the past to the present. When the occurred since 1950 is examined, it is seen that Kayseri ranks fifth in erefore, it is important to investigate the city that has flood risk from me into prominence with innovative adaptation and risk-reducing in the future.

e vulnerability to flooding in the central district of Kayseri province proposals for floodproofing approaches under the headings of ". In the related literature, it is determined that the main reason for

and 'sharing'. While dry valley areas and flood hazard zones are e proposals, afforestation works, flood roads that can be converted green streets, water plazas, bio-retention, rain gardens, rain ditches reducing surface flows, flood elevations, etc. are evaluated in the co The risks cannot be reduced to zero, but they can be reduced throug plans, insurance, taxes, funds, etc. These are the factors propose interventions. Suggestions for adaptive capacity have been devel adaptation approach, which is most useful for high levels of risk.

As climate change intensifies, urban areas face increasing risks of floods. Kayseri, being highly susceptible to flood events due to bot serves as an exemplary site to explore urban resilience strategies. factors and the efficacy of floodproofing measures in Kayseri contri can adapt to and mitigate the impacts of climate change. By ide adaptive measures such as improved land use planning, green infra this research supports the development of resilient urban environ from climate-related disruptions.

The research first explains the relationship between climate change in the field studies section, seeks to answer the question of whethe in Kayseri.

2. Climate Change, Urbanization and Flood Risk

There is a mutual interaction between climate change, urbanization between urbanization and climate change is an important issue th frequency. These three factors mutually affect each other and can ca in urban areas.

Climate change, together with the increase in greenhouse gases in average temperatures and an increase in the magnitude, freque events. This leads to more frequent heavy rainfall and storms, increas weather events caused by climate change disrupt the natural infiltrating into underground reserves and causing water to ac accelerate the occurrence of floods (IPCC, 2021). Increasing imperv runoff and negatively affect flood risks.

The impact of the relationship between climate change and urbaniza through two basic variables, namely changing precipitation r urbanization. One of the important factors that increase the risk precipitation regime. Due to the decrease in vegetation as a result of

lopment further increase the risk of flooding (Dale, 1997; Chang &

te change and urbanization is assessed, the impacts on flood risk
fall caused by climate change can lead to greater flooding due to the
t in urban areas (Kundzewicz et al., 2014). For example, floods in
d to be a result of both climate change impacts and unplanned

nning in cities makes it difficult to manage the combined impacts of
ecting natural watersheds, developing blue green infrastructure and
gainst climate change are important steps to reduce flood risk.

hange and urbanization on flood risk should be addressed with a
oach. Combining urban planning and climate change adaptation
lood risk in urban areas. In this process, sustainable blue green
sed strategies are critical for effective risk management.

ces in case of flood disaster in Türkiye. For the last year, it ranks fifth
The province center of Kayseri is examined in this study.

sinan, Melikgazi and Talas district. The population of these districts
udy area, there are 172,723 buildings.

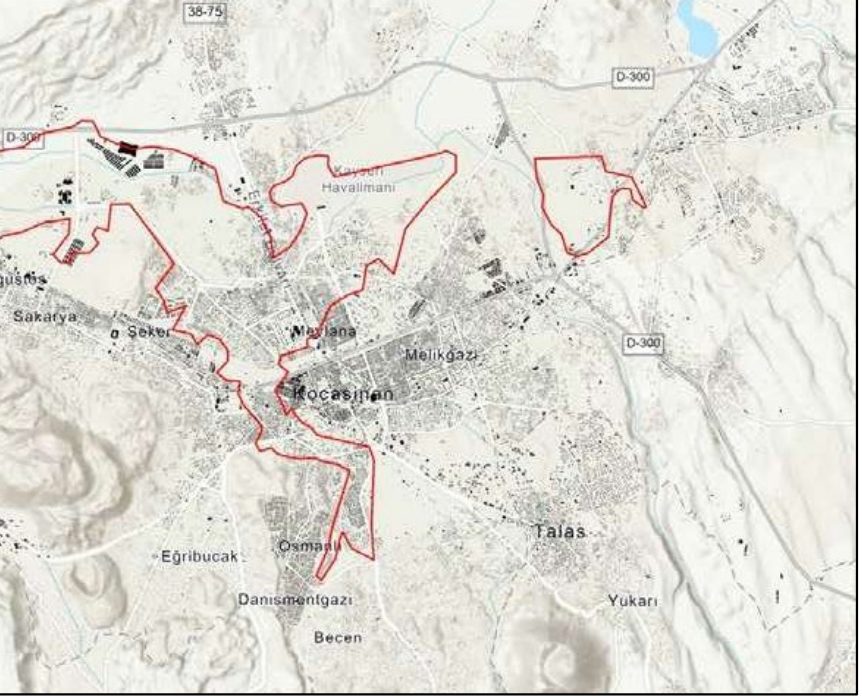


Figure 1. Study Area.

The flood risk in Türkiye is analyzed and determined by the Ministry
Q100- Q500 data is used for determining the flood risk area, and t
level.

In the study area, there is a generally moderate level of risk. Addi
airport. There are rivers that may cause flood risk in these areas.





eas.

d risk in Kayseri province district. For resilient city, urban plans should e the risk.

n Kayseri approved in 2018. In the study area, housing, housing , industry and other functions were planned.

	Area (ha)
	586
ure	82
ment Area	34431
	22035
ea	6882
	701
	6940
ructure	71
	4749
	1021

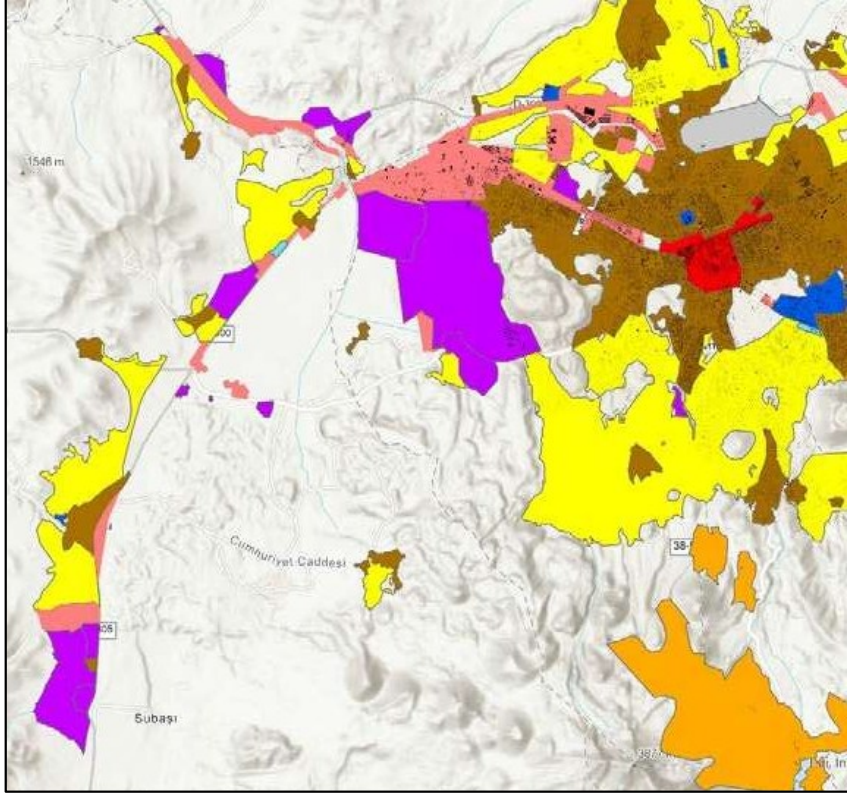
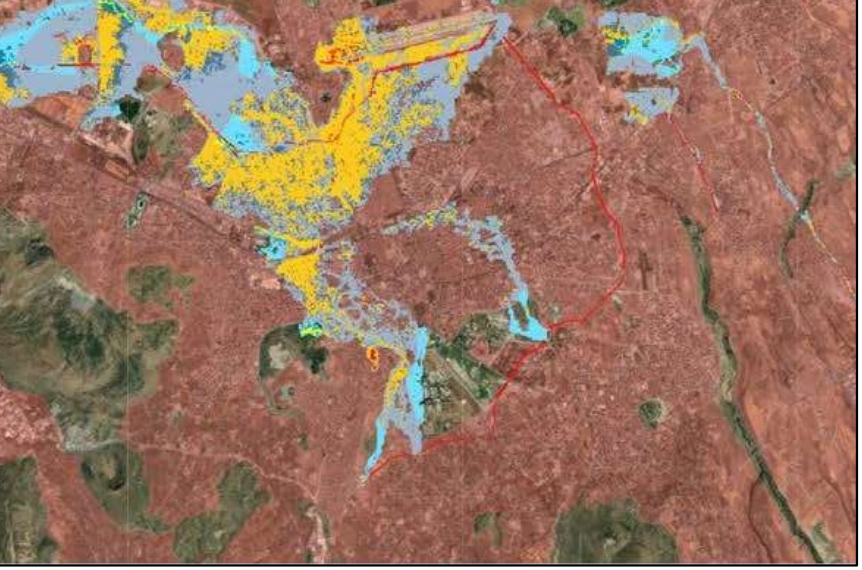


Figure 3. Top-level Land Use Plan in Kayseri.

The land use decisions and flood risk area were superimposed. The are overlaps the flood risk area. In this sense, it may be said that development in the area.



lood Risk Area in Kayseri (light red areas show the buildig area in the

area is defined at top-level land use plan under the flood risk, it is 20
the airport. On the other hand, the 2680 ha of housing and housing
risk.

(ha) in Risky Area (X)	Area (ha) in Plan (Y)	X/Y (%)
399	586	**68%**
0	82	0%
827	34431	2%
1853	22035	8%
1389	6882	**20%**
120	701	**17%**
621	6940	9%
0	71	0%
0	4749	0%
36	1021	4%

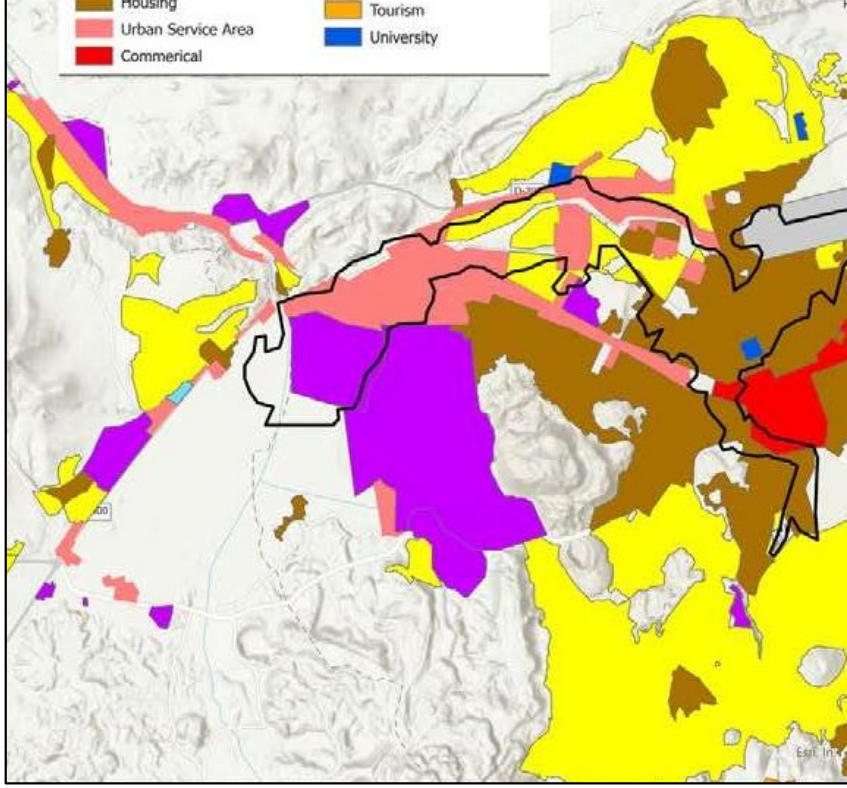


Figure 4. Top-level Land Use Plan and Flood Risk Area in Kayseri

4. Result

This study contributes significantly to planning and policy-making pra
of flood risk management in urban areas, using Kayseri as a case s
there is an analysis for the flood risk areas, the plans did not devel
this analysis. The housing, housing development, airport, and urban
land use plan are at risk of flooding. Therefore, the results highligh
risk considerations into urban planning processes. The unplanned a
areas of Kayseri underscore the importance of incorporating adaptiv
risks. Recommendations such as the designation of flood haza
infrastructure (e.g., rain gardens, permeable surfaces), and the dev
tailored to local contexts are essential for reducing vulnerabilities.

Moreover, this study advocates for a shift in policy from reactive to p
It emphasizes the need for comprehensive disaster risk reduction p
the local level. By suggesting measures under the categories of "av
the research provides a framework for policy-makers to develop hol

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