MICROCLIMATE BEHAVIOR OF SUSTAINABLE URBAN SCHEMES PROPOSED FOR HILLSIDE AREAS VERSUS EXISTING NEIGHBORHOODS IN THE MENDOZA METROPOLITAN AREA, ARGENTINA

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The Mendoza Metropolitan Area – Argentina, urban development spread to the periphery, in this case towards the hillside area.

This growth model generated anthropic pressure on the territory as it continued with urban models with homogeneous settlement patterns characteristic of the consolidated areas of the city [1] [2] [3].

Figure 1. Comparison between both urban models (hillside vs. flatlands)
METHODS

Figure 2. Identification of different sectors suitable for hillside urbanization with the incorporation of land level

Figure 3. Adjustment curve of simulated case

$R^2 = 0.93$
Maximum temperature

The schemes located on the 15% slope are those that reach the lowest maximum temperature values.

The organic linear grid with green space distributed over the 15% slope has the best behavior.

Figure 4. Box-plot graph for maximum temperatures of the seven proposed schemes
Minimum temperature

Schemes located on a 15% slope have the highest minimum temperature values and the lowest variability.

The linear organic grids with distributed green space are those with the greatest value variability, but with the lowest minimum temperature.

Figure 5. Box-plot graph for minimum temperatures of the seven proposed schemes
**Average temperature**

Linear organic grid with distributed green space located at the 15% slope reaches the lowest temperatures.

The linear organic grid with distributed green space located in slopes of 30% and the Cul-de-Sac grid in all slopes show the highest average temperature variability.

**Figure 6.** Box-plot graph for average temperatures of the seven proposed schemes.

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**FINDINGS AND DISCUSSION**

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The improvements are more significant in the proposed linear organic grid with distributed green space on a 15% slope.

The incorporation of green spaces favors the infiltration of water from summer storms.

The better thermal behavior in the lower slope hillside areas is also related to the higher patterns of land use intensity.

The adoption of this design for future urban developments would favor the micro-climatic performance of most of the hillside since 70% of the developable land in the piedmont corresponds to slope values less than or equal to 15%.


Thank You