Food and Agriculture Organization of the United Nations

Assessing water demand in Kabul River Basin during winter season

Source: Global Administrative Unit Layers from Natural Earth with disputed areas.

Better understanding of cropland water demand provides useful guidance for efficient irrigation practices. Cropland water demand is defined as the potential evapotranspiration, i.e., the amount of water that can be transferred to the air from land[1]. Potential evapotranspiration was retrieved from MODIS remote sensing imagery, and cropland extent was collected from ESA WorldCover, a land cover dataset based on Sentinel-1 and Sentinel-2 data[2,3]. A bivariate map with a hexagon grid (cells of 90 square kilometers) is shown to analyze the water demand and the cropland distribution in the Kabul River Basin. The map can help policy-makers and stakeholders to gain valuable insights into the cropland water demand, aiding in effective water resource management and sustainable agriculture practices. This analysis contributes to the objectives of the Afghanistan Emergency Food Security Project.

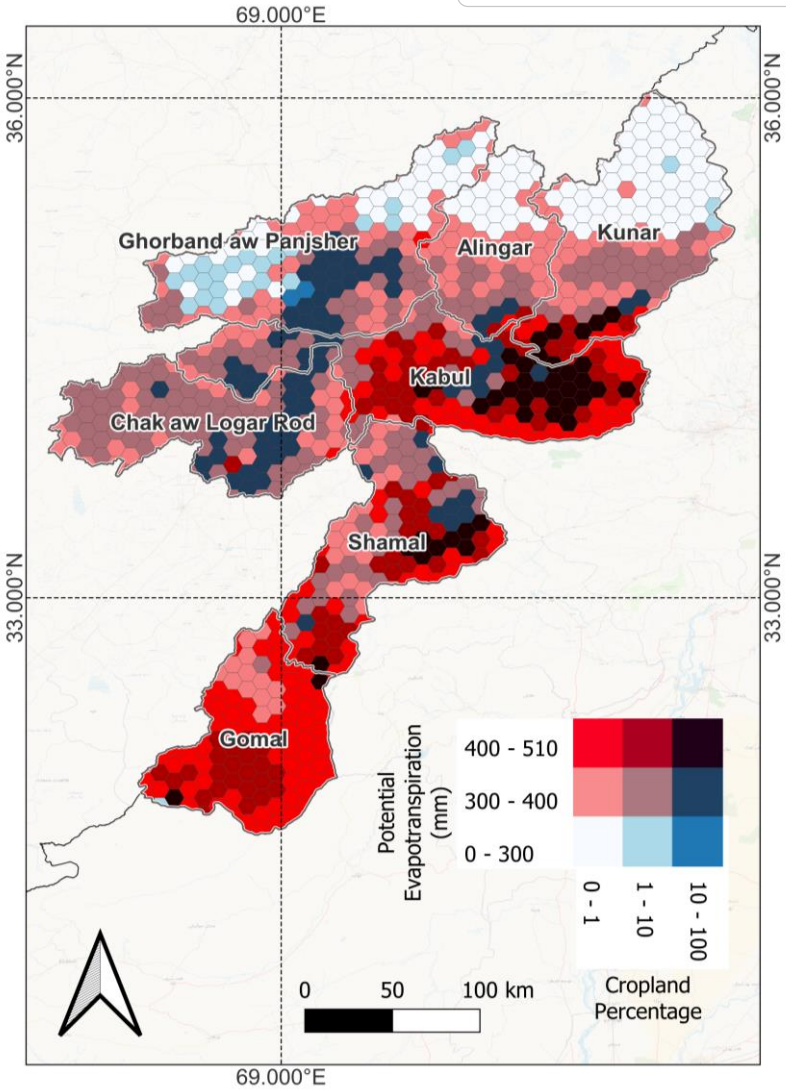

Figure 1: Bivariate map of monthly potential evapotranspiration average (mm) and cropland extent (percent of land area) during winter (October 2021-April 2022) in Kabul River Basin.

Results

The results of the analysis indicate the presence of critical sub-basin areas, such as Shamal and Kabul, having large cropland extent and high water demands associated to high potential evapotranspiration values. As a result, these areas require more water and irrigation facilities compared to others.

Table 1: Mean values of monthly potential evapotranspiration average (mm) and cropland extent (percent of land area) during October 2021-April 2022 by sub-basins.

Sub-basin	Potential evapo-transpiration (mm)	Cropland extent (percent)
Gomal	421.45	1.18
Kunar	405.65	2.54
Shamal	401.79	6.09
Kabul	358.49	7.78
Alingar	312.08	1.97
Chak aw Logar Rod	309.34	7.53
Ghorband aw Panjsher	306.27	8.30

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