Food and Agriculture Organization of the United Nations

Assessing water demand in Kabul River Basin during summer season 2022

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

Better understanding of cropland water demand provides useful guidance for efficient irrigation practices. Potential evapotranspiration can be defined as a proxy of cropland water demand, 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 from 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 (OSRO/AFG/213/WBK).

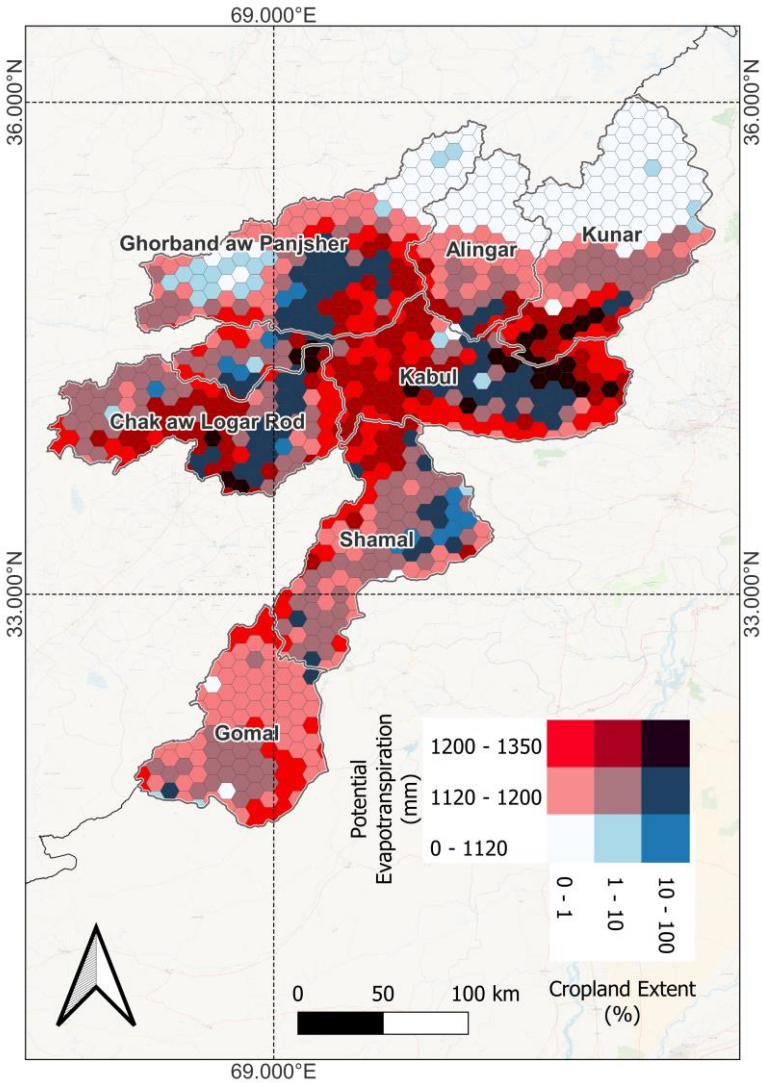

Figure 1: Bivariate map of seasonal cumulative potential evapo-transpiration (mm) and cropland land area extent (%) during summer season (05 to 09, 2022) in Kabul River Basin.

Results

The results of the analysis indicate the Cropland area extent was higher in Ghorband aw Panjsher, covering 10 percent of the sub-basin area, followed by Kabul and Chak aw Logar Rod with 9 percent each.

The higher cumulative water demand in cropland was found 1210 mm in Kabul, followed by Chak aw Logar Rod with 1193 mm and Gomal with 1174 mm.

The results highlights the importance to maintain irrigation infrastructure and access to water in high water demanding basins (Kabul, Chak aw Logar Rod and Ghorband aw Panjsher) as compared to others.

Table 1: Mean values of seasonal cumulative potential evapotranspiration (mm) and cropland area extent (percentage of the sub-basin area and extent in km²) during summer season (05 to 09, 2022) by sub-basins.

Sub-basin	Potential evapo-transpiration (mm)	Cropland extent (%)	Cropland extent (km2)
Gomal	1174	1	126
Kunar	1086	3	364
Shamal	1173	7	720
Kabul	1210	9	1227
Alingar	1112	2	151
Chak aw Logar Rod	1193	9	908
Ghorband aw Panjsher	1139	10	1318

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