



Groundwater resources and sustainable agriculture in Punjab

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Covid-19 effect and challenges for Sustainable Agriculture and Water Management

Introduction

The state of Punjab comprising 1.5% (50,362 km²) area of the country has been contributing 40–50% rice and 60–65% wheat to the central pool since last three decades^[1].

It has 3 perennial rivers namely Satluj, Beas and Ravi and one seasonal river, Ghaggar. The water potential of all the rivers was 14.54 Million Acre Feet (MAF) which fully managed through well-organized canal irrigation system.

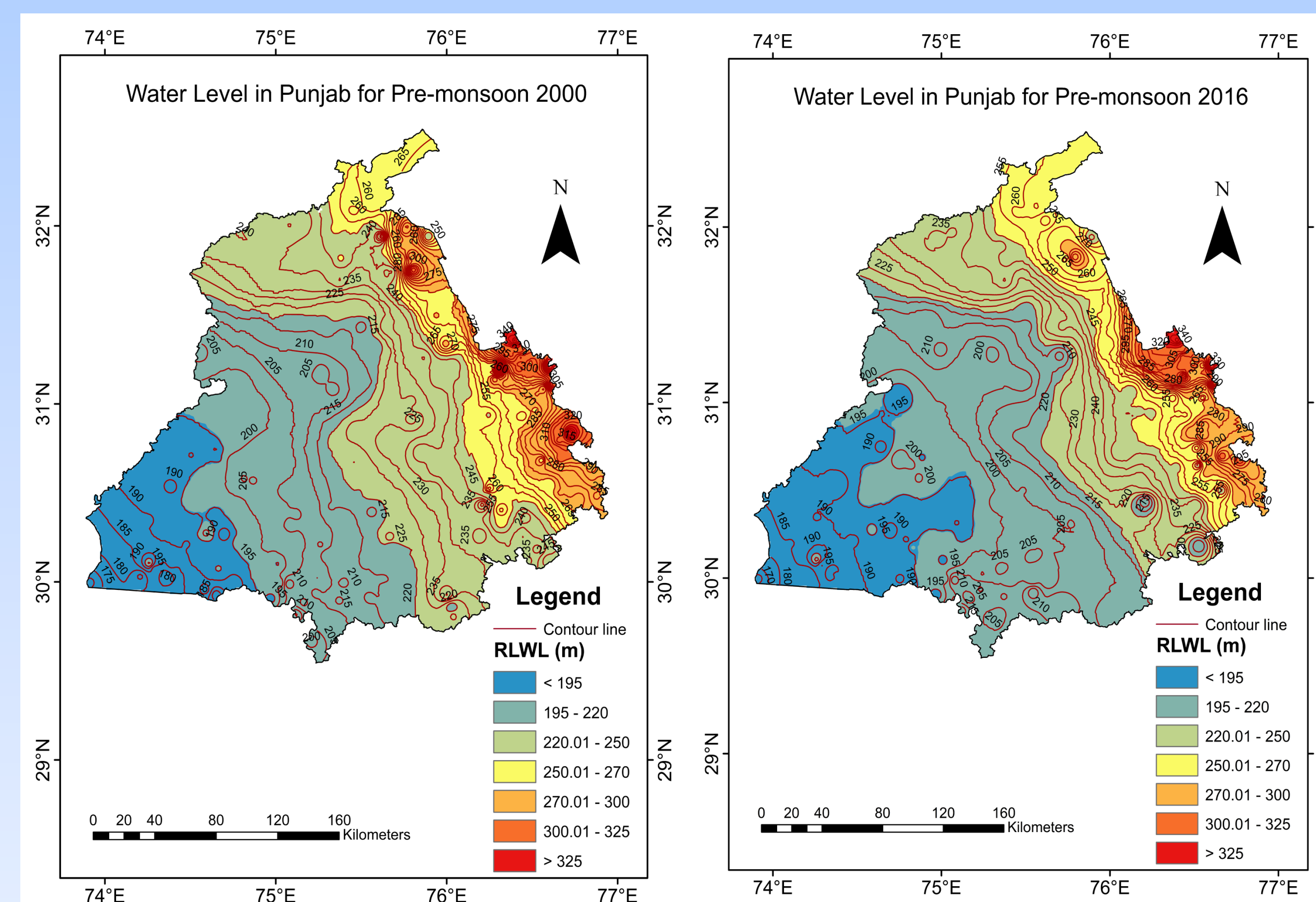
However, the available surface water resources of the state are fully committed even though unable to meet further demand of water in irrigation for agriculture consequently increase the pressure on groundwater resources.

RAINFALL

Mean annual rainfall of Punjab ranges between 800–1200 mm in the Siwalik Hills, 74% of which is received during July to September. Mean annual rainfall in the foreland basin is 400–800 mm but decreases to less than 400 mm in the southwestern part of the Punjab^[2].

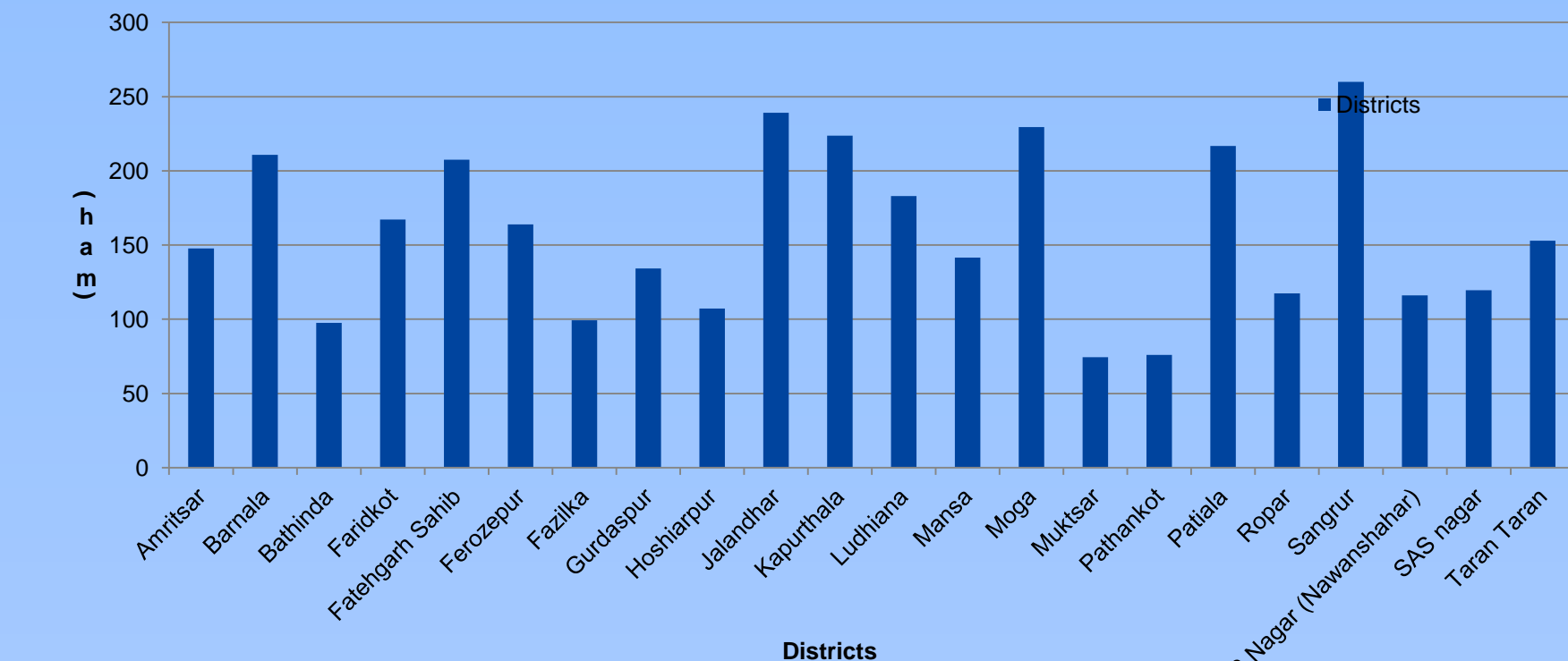
GROUNDWATER LEVEL

From the groundwater levels of 2000-2016, it has been found that water level is declining in all the states except for Fazilka and Muktsar districts, while the increase in groundwater level is found.



The contour maps of pre monsoon season for the years 2000 and 2016 decline in water level in central Punjab due to the higher extraction.

Stage of Ground water development in Punjab(%)



Conclusion

According to the CGWB data, there will no net groundwater available for future irrigation in the 12 districts (Amritar, Barnala, Faridkot, FatehgarhSahib, Ferozepur, Jalandhar, Kapurthala, Moga, Sangrur and Taran Taran) of Punjab. Groundwater available in Muktsar and Fazilka districts are saline and not fit for irrigation.

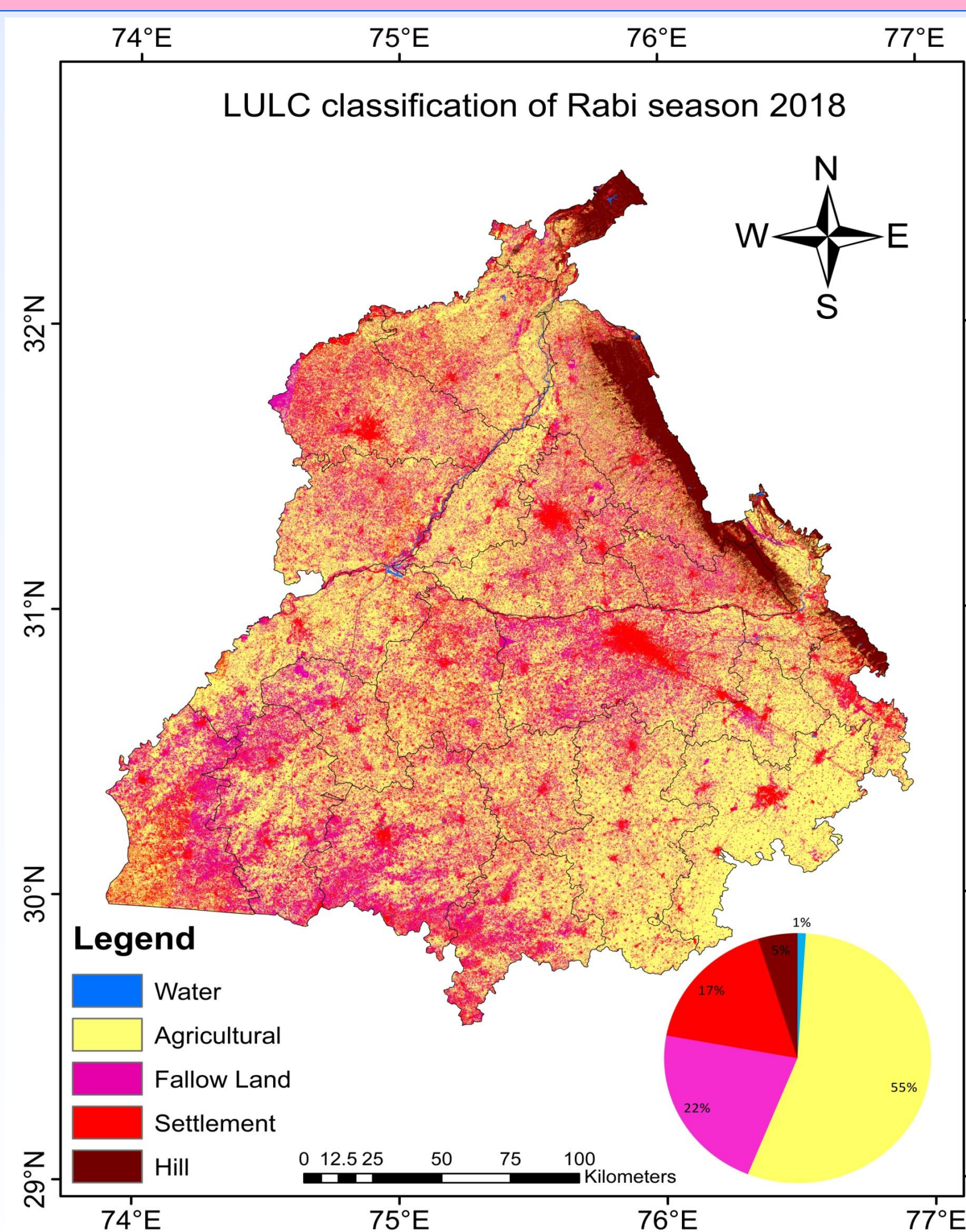
Keeping in view the present scenario, there is urgent need to shift at least 5–10% of the area under paddy crop, adopt efficient water management practices and adopt groundwater augmenting techniques on mass scale for sustainability of agriculture.

Acknowledgement

Funding received from Punjab State Farmer's Commission is duly acknowledged.

References

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2. Joshi S, Rai S, Sinha R, Gupta S, Densmore A, Rawat Y and Shekhar S, 2018. Tracing groundwater recharge sources in the northwestern Indian alluvial aquifer using water isotopes ($\delta^{18}O$, δ^2H and 3H). *Journal of Hydrology*, Vol.559, pp.835-847.
3. CGWB 2017, Aquifer Mapping and Management Plan, North Western Region. Central Groundwater Board, Ministry of Water Resources, Government of India, Chandigarh.



Only 24% of area in shallow aquifer and 33% of area in deep aquifer has the TDS within acceptable limit. Moreover, nearly 32% of area in shallow aquifer and 25% of area in deep aquifer has TDS more than 1000(mg/l), hence not suitable for drinking purposes.

GROUNDWATER QUALITY OF PUNJAB

