WATER AVAILABILITY UNDER FUTURE CLIMATE CHANGE IN THE SEMAN RIVER BASIN, ALBANIA

Olivia Kirby, Institute for Environmental Sciences and Geography, University of Potsdam

Short Report – DHG Field Study, Albania (21–24 July 2025)

As part of the Master's thesis research on water availability and hydrological processes in the Seman River Basin, a four-day field campaign was conducted in Albania. The field study focused on ground-truthing hydrometric and meteorological station data, observing current river and reservoir conditions, and assessing agricultural water use in the basin's tributaries. The temperatures during the field campaign ranged from approximately 18 °C to 35 °C, with minimal cloud coverage and mainly sunny skies. *Figure 1* below illustrates the Seman River basin (in yellow), which is located in central/southern Albania.

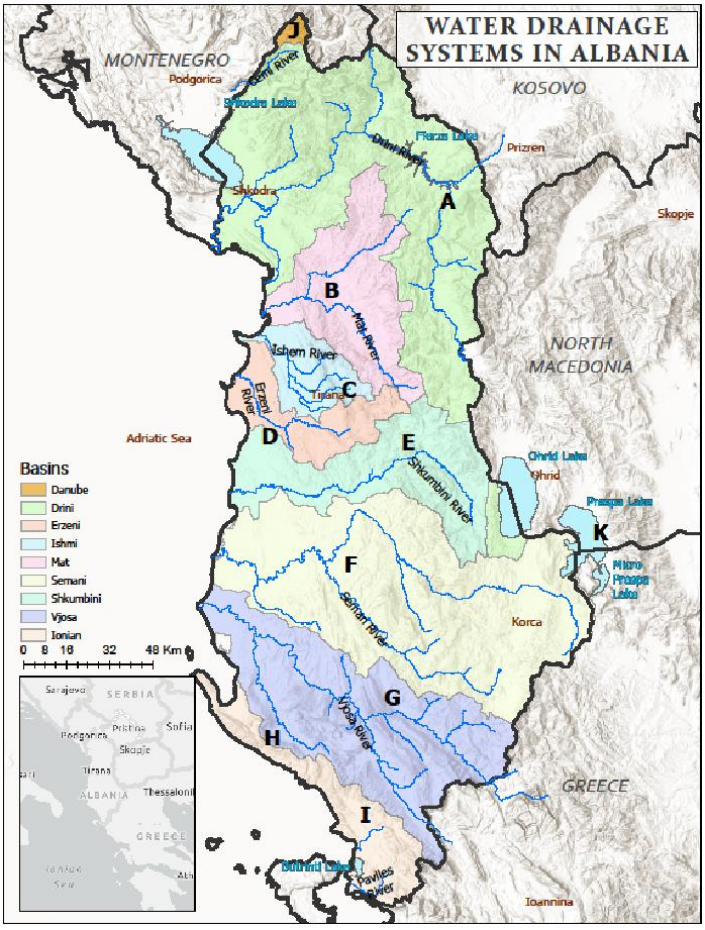

Figure 1. Seman River Catchment (Shumka et al., 2023).

Day 1 (21 July 2025)

The journey from Tirana to Korçë followed the Devoll River valley, the main tributary in the east region of the Seman River basin, and the primary focus for the purpose of this master's thesis. The route followed the Devoll River and provided an overview of the basin's agricultural and hydrological conditions. Numerous small agricultural intakes and irrigation structures were observed along the river, supporting extensive but small-scale corn and grain cultivation across the broad alluvial plains. The Devoll River exhibited relatively low flows, and in some places water appeared pooled and stagnant, with evidence of channelization and excavation. Site visits included the hydrometric station at Miras, and meteorological stations in both Miras and Voskopojë. At these sites, local observers conduct manual rainfall and temperature measurements three times daily, which are compiled and submitted monthly to the national institute. *Figures 2 – 5* illustrate key observations made during the day.

Figure 2. Agricultural intake along the Devoll River in Sheqeras.

Figure 3. Stagnant water along the Devoll River in Sheqeras.

Figure 4. Hydrometric station in Miras.

Figure 5. Meteorological station in Bilisht.

Day 2 (22 July 2025)

The route began in Korçë and continued along the Devoll River through a steep-walled canyon, leading to the Moglicë and Banja reservoirs. Upstream sections of the river displayed slow-moving, high sediment. The team followed the length of the Moglicë Reservoir and conducted site observations at the Banja Reservoir, which has a storage capacity of 400 million m^3. Further downstream, the Kozare hydrometric station was visited, where several monitoring stations previously used for hydrological model calibration are now non-operational. The day concluded in Berat with an inspection of the Osum River, another tributary to the Seman River, followed by an overnight stay in the city. *Figures 6 – 10* present the key observations from this stage of the fieldwork.

Figure 6. Devoll River west of Maliq.

Figure 7. Moglicë Reservoir from above.

Figure 8. Banja Reservoir.

Figure 9. Kozare Hydrometric Station from bridge.

Figure 10. Osum River and floodplain in Berat.

Day 3 (23 July 2025)

The final day focused on visits to hydrometric stations in Berat, Çorovodë, and Ura Vajgurore. At the Berat station, it was observed that extremely low summer flows can drop below the detection threshold of the installed water level meters, making accurate low-flow monitoring difficult. In Ura Vajgurore, manual gauging is employed, with twice-daily rope measurements from a bridge to record water levels. While useful for general trends, this approach cannot capture short-term peak flow variability. The route continued through the Seman River catchment, including sections of the Osum River, which traverses deep canyons before passing through the city of Berat. In Vlashuk, a major agricultural water intake from the river was observed, which services many small-scale farms within the valley. Agriculture in this region is primarily grain, corn, and olive tree cultivation. The day concluded with a visit to the karst lakes near Belsh, followed by the team returning to Tirana and completing the field campaign. *Figures 11 - 15* indicate key observations made during the day.

Figure 11. Osum River flowing through canyon southeast of Berat.

Figure 12. Osum River in Corovode.

Figure 13. Hydrometric station in Osum River in Corovode.

Figure 14. Hydrometric station in Ura Vajgurore.

Figure 15. Irrigation intake in Vlashuk.

Overall, the fieldwork provided critical context for hydrological modelling by documenting current river morphology, agriculture, flow conditions, weather conditions, and human water use pressures in the Seman River basin. It highlighted the seasonal scarcity of surface water, sediment transport issues, infrastructure limitations in hydrometric monitoring, and the strong influence of agricultural abstraction on river flows. These insights will inform the WASA-SED model and support the interpretation of climate change impact projections for the region.

References:

Shumka, Spase & Mucaj Lalaj, Suada & Sanda, Radek & Shumka, Laura & Meulenbroek, Paul. (2023). Recent Data on the Distribution of Freshwater Ichthyofauna in Albania. Croatian Journal of Fisheries. 81. 33-44. 10.2478/cjf-2023-0004.