

Water cycle: possible field investigations

There are several opportunities for fieldwork associated with investigating components of the water cycle both in the UK and in Morocco. It is perfectly reasonable to undertake a small study in Morocco to enable comparisons to be made with the UK.

1. Investigating the role of interception by vegetation

This involves using rain gauges placed under the canopy of different types of vegetation to be compared with one or more 'control' rain gauges placed in the open. In the Imlil area, students could investigate interception beneath walnut, apple and cherry trees. There are also areas of planted pine trees that are easily accessible from the village. The main limiting factor is rainfall, which is very variable.

2. Investigating infiltration

Infiltration rates can be measured using open-ended cylinders sunk into the ground. The rate of water absorption can be measured, and comparisons made. These can be placed in different localities, for example to enable comparisons to be made between the valley floor and the valley side slopes.

To find out more about measuring interception see the Field Studies Council at

<https://www.geography-fieldwork.org/a-level/water-carbon/hydrology/method/>

3. Investigating river discharge

The Rehraya River is easily accessible in the flat valley above the village of Imlil. Here the river is braided and, in places, diverted by the actions of local people to irrigate small gardens on the river's floodplain. The individual channels are generally of an appropriate size to enable velocity and cross-sectional area to be measured, though a risk assessment should be conducted beforehand particularly after heavy rain. Calculations can be conducted to enable an overall discharge value to be calculated. Students should be aware, for evaluative purposes, that some river water flows below the surface through the sediment on the valley floor so overall discharge will be somewhat higher than the calculated value.

Closer to Imlil, the river is less accessible, narrower and faster flowing. Field work is not recommended here.

Type of data	Primary data collection technique	Secondary data collection source
Precipitation		Weather data
Interception	Interception measurements Stemflow measurements	Weather data Drainage basin characteristics
Evaporation	Evaporation pans Potometers	Weather data
Soil water	Infiltration rings Estimating field capacity	Weather data Drainage basin characteristics
Runoff	Measuring overland flow Measuring throughflow River velocity measurements using a hydro-prop River velocity measurements using a float Measuring channel geometry Calculating discharge	Weather data Runoff data Drainage basin characteristics
Modelling the water cycle	Storm simulations	Weather data Runoff data

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