

Estimating the head for micro hydropower

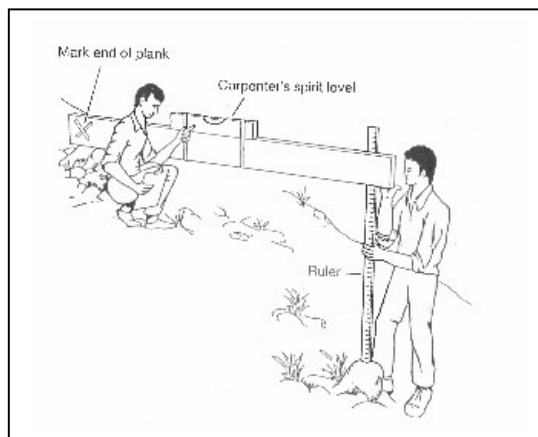
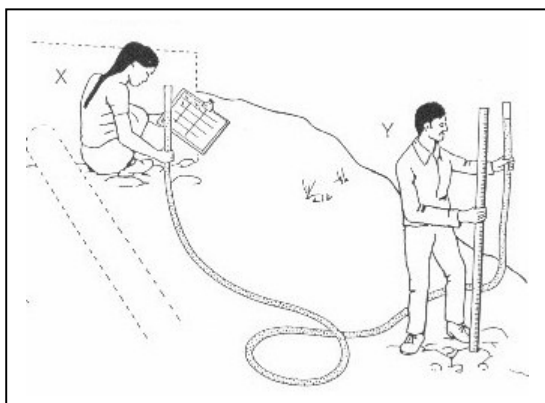


The **head** is the maximum vertical distance from the upstream water level to the downstream water level. The higher the head the more power you will be able to generate. The head also helps to determine which type of turbine would be most suitable.

There are various methods of measuring the available head:

1. If there is a leat then the head will usually increase the further down the leat and away from the weir. Try to use the original leat water level for the upstream head measurement as in some cases the leat water level will have been reduced.
2. An accurate method of measuring the head is to use a Theodolite or engineer's level. If this is unavailable, it is possible to improvise with other equipment such as a straight plank and spirit level or a clear plastic tube filled with water (see diagrams).
3. If the head is more than 20 metres, a crude estimate can be made by counting the contour lines on an ordnance survey map or by using a digital altimeter.

Low cost methods of head measurement

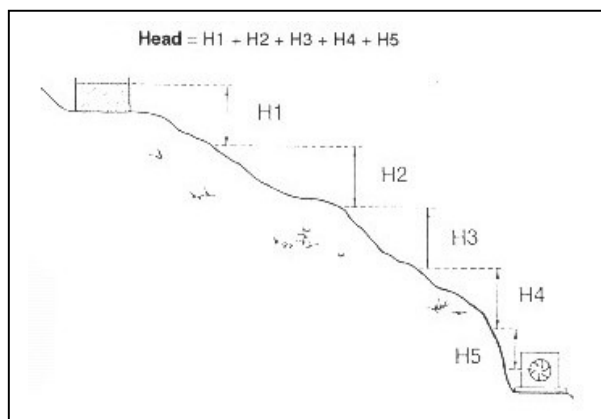


The head can be measured using a water filled tube or with a plank and spirit level as shown

Add the measurements to obtain the total head.

Head duration data

A low head site may have a large variation in head depending on water levels throughout the year. Some low head technologies are designed to operate over a range of heads. If this is the case the accuracy of energy calculations may be improved by uploading a head duration curve to Hydromatch. Level data for gauged rivers can be found on the Environment Agency website. Data can also be obtained by taking measurements and correlating to flow duration data.



www.environment-agency.gov.uk/homeandleisure/floods/riverlevels/