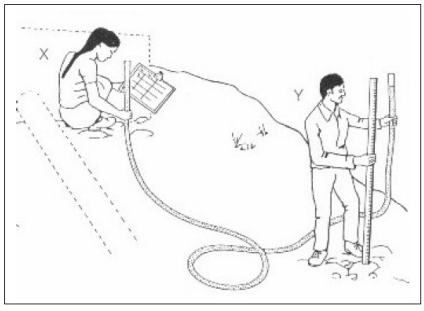
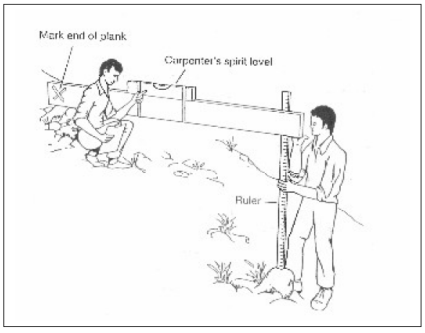
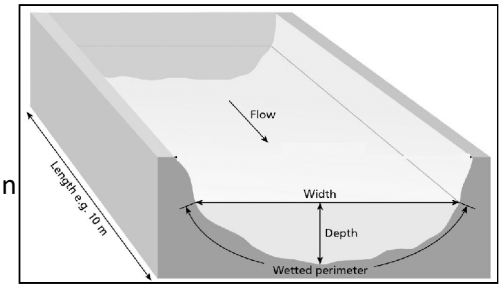
28.01.2021

Free-feasibility

HALLIDAYS HYDROPOWER INTERNATIONAL
REVENUE FROM RIVERS

Please fill in as much as you can and email a copy to us at: hydro@hallidays.com

Step 1: Measure your HEAD + FLOW		
Head *(Hallidays Hydropower will measure your head and flow accurately using specialist equipment, however you can use the following methods yourself to estimate the potential power generation from your site.)*	The Head is the difference in height between the upper and lower levels of water. 1) Water Filled Tube Method  2) Plank and Spirit Level Method  	Head = ...m
Flow	Flow rates depend on the size of the catchment area, the local rainfall, the rate of evaporation and the geology of the area. However approximate flow rates can be determined by yourself on an average day by using the 'Orange' method:  – Buy some oranges! – Find an straight & even stretch of river – Use a tape measure to mark out two points χ meters apart (e.g. 5m) along the length of your stream. – Gently release an orange at the first mark and time it between the two points. Do this a few times to get an average. – Divide χ by the average time to give the distance travelled each second, hence meter per second (m/s) – Multiply this by the area (width x depth) of your river section and we get our flow rate in m^3/s	Flow =.....m^3/s

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Step 2 - Calculate how much POWER you can generate		
Calculate your Hydropower Potential	Once you have your approximate head and flow rate you can work out the peak power (in kilowatts) your site may produce using the following equation: **Power (kW) = Head (m) x Flow (m^3/s) x 6.5**	Energy = ... kW
To change the kilowatts into kilowatt hours, multiply by 8,760 (no. of hours in a year)		..... kWh
We can expect a 45% annual operational efficiency so multiply the answer by 0.45		**..... kWh** *(a)*
Let's assume that your property consumes half of what the turbine produces (e.g. at night when lights / equipment is off). So divide *(a)* by 2. Your revenue from sale of this surplus (exported) electricity is then this number multiplied by £0.055. (In line with the Smart Export Guarantee (SEG), electricity suppliers make a payment to small-scale low-carbon generators for electricity exported to the National Grid).		Exported Energy *(b)* £ .....
Because you will now be generating your own electricity, you will be making a saving. This can be calculated as the electricity consumed by your property (e.g. during the day) for now we can estimate this as half of what's produced by the turbine. So divide *(a)* by 2 and multiply by your current electricity rate found on your electricity bill (average domestic rate is £0.16/kWh and rising!). NB - if you can gather an entire year's worth of electricity bills you can see more accurately how much energy you consume in a year		Displaced Energy *(c)* £ .....
Total revenue/ savings per year *(b)+(c)*:		**£ .....**

Step 3 - Provide your site details		Comments
Access	Consider access of heavy plant and machinery to your site. Will trees need to be removed? Bridges built across additional waterways?	
Ownership	Is the site privately owned? Will you need approval from an external party to cross/carry out works from their land? Who owns the banks and existing structures?	
Flooding	Does your watercourse tend to flood? When did it last flood? How high?	
Animals	Which species of fish are present in your waterway? Any other animals? Protected water voles, otters etc?	
Grid connection position	Establish the location of your Grid connection in your property. Do you know if it is Single phase or 3 phase?	
Cabling	Cabling will need to be run to this connection point. How far? Any obstacles?	