# WATER CONSUMPTION METER

## How Does the Flow Rate Sensor Work?

The Arduino flow meter works on the principle of the Hall Effect. According to the Hall Effect, a voltage difference is induced in a conductor transverse to the electric current and the magnetic field perpendicular to it. Here, the Hall Effect is utilized in the flow meter using a small fan/propeller-shaped rotor, which is placed in the path of the liquid flowing.

The liquid pushes against the fins of the rotor, causing it to rotate. The shaft of the rotor is connected to a Hall Effect sensor. It is an arrangement of a current flowing coil and a magnet connected to the shaft of the rotor, thus a voltage/pulse is induced as this rotor rotates. In this flow meter, for every litre of liquid passing through it per minute, it outputs about 4.5 pulses. This is due to the changing magnetic field caused by the magnet attached to the rotor shaft.

## In-depth functioning of the Arduino

The code done by me uses an external interrupt on one of the Arduino's analog pins. This is used to read the pulses coming from the flow meter. When the Arduino detects the pulse, it immediately triggers a function. This function then counts the total number of pulses.

Dividing the total pulse count by 4.5 will give the total amount of liquid passing through it in litres per minute. Dividing that by 60 will give the flow rate in litres per hour, which by constantly adding, gives us the total quantity of water/liquid that has passed through it and multiplying this total with the cost of one litre will give us the cost of water consumed.

## Getting the Price of Water Consumed

I have done some research and I've noted that:

Average **Indian Households** pay **INR 111.6592** for **2830 L** of water.

Therefore, each **Litre** of water costs **INR 0.039455547**.

With the addition of taxes and other sums, each **Litre** of water will cost approx. **INR 0.04**.