

Fact Sheet Borehole

Definition

Boreholes are defined as tubewells penetrating bedrock, with casing not extending below the interface between unconsolidated soil and bedrock. Boreholes require a drilling method with an external power source.

Three major strategies are employed for increasing borehole water supply during drought:

- **Drilling new boreholes/deepening existing boreholes:** These strategies form the basis of conventional approaches to improving groundwater access in rural areas during drought. They are frequently appropriate for mitigating extreme symptoms of drought. However, they are often not the most efficient use of limited resources. Additionally, groundwater surveys and proper siting of boreholes are necessary for achieving maximum impact.
- **Repairing damaged boreholes:** In many droughts, regional groundwater depletion is not the main factor affecting domestic access to water. When individual boreholes fail during drought, the cause is often local drawdown or mechanical failure. During a recent drought in southern Africa, a survey of water points by Oxfam revealed that most non-functional boreholes had failed because of problems with hardware (e.g. pump failure) or demand management (e.g. localized drawdown). The failure of a water point (including traditional sources) increases pressure on boreholes, increasing demand, local drawdown and hardware failure. Repairing damaged boreholes is a quick and inexpensive way to prevent this cascade of water point failure.
- **Relief boreholes with use restricted to drought periods:** Many authors have proposed developing deep “relief boreholes” that remain capped when water supplies are adequate and are uncapped for use during drought.

How does the technology/practice contribute to climate change adaptation?

A warmer climate is highly likely to result in more frequent drought. Deep tubewells, usually defined by engineers as those that penetrate at least one impermeable layer, generally have much greater resilience to drought than traditional water supplies including springs, and surface water sources.

Costs and financial requirements?

The costs of drilling new boreholes vary widely depending many factors, so quoting ‘typical’ costs can be misleading. However, the average cost in much of Africa is \$10,000-15,000; in contrast, the average cost in India is less than one-tenth as much. 70, 74 A detailed methodology for costing borehole drilling operations in Ethiopia is available, incorporating (i) mobilisation/demobilisation, (ii) drilling, (iii) casing and completion, and (iv) development and test pumping. Repairing damaged wells can cost far less (sometimes by three or more orders of magnitude) than drilling new boreholes.

Status of the technology in Grenada

The national water authority currently operates seven boreholes (wells) six in Grenada and one in Carriacou.