

# Environmental Studies

# FACT SHEET



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Number 177

## Where to build new reservoirs

### New reservoirs: where and why?

Reservoirs are great aren't they? Well, there are serious arguments both for and against them.....

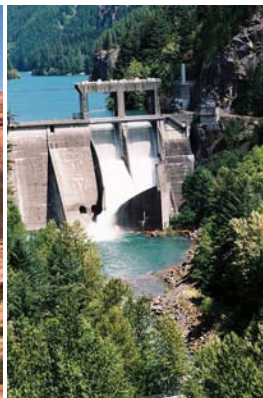
This Factsheet provides a revision summary of the main points. Future *Geography Factsheets* will consider some of them in much greater detail...Before that, let's summarise where we should and probably shouldn't put them! Remember the dam is the massive wall that holds the water back; the reservoir is the actual water - be clear which you are talking about in the exam.

### Advantages:

- the water is readily accessible / available and may allow for double cropping – more money for local farmers
- it's easy to extract
- it's cheap to extract
- usually it doesn't take long to refill
- the dam and reservoir can be used for other purposes, e.g. recreation both at the reservoir and upstream
- HEP generation
- creation of new habitats
- reduction of flooding e.g. the Aswan dam now means that the Nile no longer floods on an annual basis
- provision of cleaner water, reducing diseases such as cholera
- allows control of the volume of water released e.g. in summer months irrigating crops and supplying the necessary water for irrigation and to cities e.g. Las Vegas



George dam



Glen Canyon dam



Hoover dam



Kielder dam

### Disadvantages:

- the water may be polluted e.g. with sediment or nitrates that have runoff fields or phosphates that have eroded off fields
- upstream rivers may suffer siltation which may result in flooding or reduction in fish productivity
- treatment might be expensive
- it needs sufficient rainfall in the catchment to replace the volume we remove or that is lost through evaporation
- the water supply/rainfall may be seasonal
- dams are expensive to build
- often rely on Foreign Aid which can lead to debt
- they can disrupt main communication links
- reservoirs silt up so they can hold less
- may cause meander migration
- can result in unintended mini - dams upstream as a result of uprooted trees and washed-away vehicles etc
- large areas of land -including entire villages and habitats - may be flooded to build the dam and reservoir
- downstream river flow may be severely reduced causing problems for soil fertility and irrigation and even the water supply to other countries
- the weight of the water might trigger earthquakes
- local people may be forced to leave homes e.g. Three Gorges in China
- may result in an increase in water-borne disease such as Bilharzia
- wetter local climate as a result of evaporation and cloud formation
- may restrict migration
- may restrict river navigation

**Exam Hint:-** Learn all these advantages & disadvantages

So, as you can hopefully see, there are a lot of advantages and disadvantages to weigh up!

**Exam Hint:** Convert these advantages and disadvantages into a table - learn them and try and form an opinion!

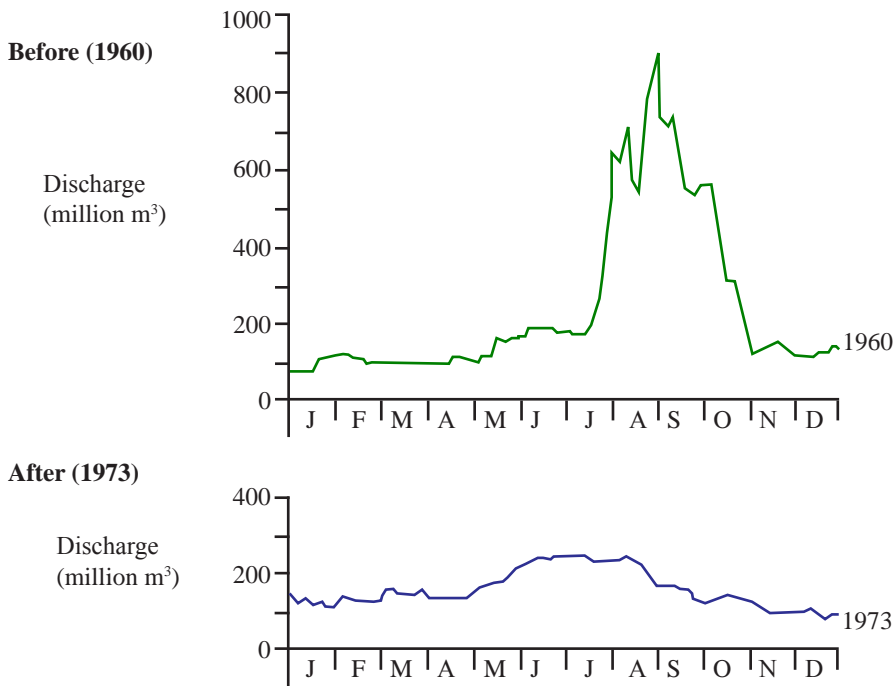
Advantages	Disadvantages

**Suitable places for dams and reservoirs**

- narrow cross-section to reduce dam length
- large, deep valley to flood behind the dam but not those prone to subsidence
- solid foundations for dams with high load-bearing strength
- avoidance of volcanic and earthquake zones
- impermeable rock below reservoir e.g. avoid permeable limestone
- sufficient water supply from catchment area but not streams or rivers with heavy sediment
- avoid incoming water near toxic mineral veins e.g. lead/zinc
- sites with low evaporation rates
- proximity to areas of demand for water, electricity
- sites with little effect on communications

**Practice Question**

Study the diagram which shows the annual regime of the River Nile at Aswan, before and after the construction of the High Dam.



- (a) State the maximum discharge in 1960 (1)
- (b) Describe and explain the effect of the High Dam (2)

Mark scheme  
 (a) 900 million m<sup>3</sup>  
 (b) Dam controls/regulates flow;  
 1973 is less variable;  
 Higher mean discharge in 1960;