# Techniques for providing water to arid regions an environmental sciences essay

# Introduction

About 30% of entire worldwide land area includes populated arid and semi-arid areas. The major obstacle to socio economic development in these areas is Water shortages. The essential ideology for the allocation of water resources are effectiveness, equity, and sustainability, with the endeavor of give the utmost advantage for society, environment and economy, at the same time as to maintain reasonable allocation amid various areas and people. Sustainable economic development in arid and semi-arid areas relies a lot on sustainable water resource management.

The lucid allocation of water resources needs a multifaceted balance between demand and supply, in various economic sectors particularly athwart sub-areas in arid and semi-arid climate areas. Regional development planning needs to incorporate economic objectives with issue including historical, technological, and natural resource constraints. Jointly, these factors effect populace distribution, economic structure and prototype of ecology and therefore, the extent of water distributed for these purposes in arid and semi-arid areas. Regional community, economic and ecological dissimilarity necessitate special sustainable development strategies in province of water scarcity. This study assesses the feasibility of different techniques for providing fresh water to arid regions of the world.

# Background

Brisk industrialization, urbanization, and population growth in arid countries are wielding rising pressure on local water authorities and water planners to gratify the emergent urban water demand. Since accessibility of

conventional sources of fresh water lacks for drinking use, seawater water desalination, in accumulation to partial groundwater resources, are the chief water supply sources for urban utilization. In last two decades, urban water stress has increased considerably, owing to fast urbanization and industrialization, population growth and development in living standards.

## Facts and Figures

With a soaring average growth rate of over 3. 4% the population amplified from around 17. 688 million in 1970 to 38. 52 million in 1995. It is predicted to get to 81. 25 million in 2025. The urban population is anticipated to ascend from 60% in 1995 to over 80% in 2025. Curriculum has been made for improved leakage control in networks of domestic water. They have been also incorporated for wastewater treatment and use again for industrial and irrigation use. Water management-related regulations and laws have been designed, counting those to decrease water demands and losses. Uncontrolled leakages add considerably to shallow water-table formation and contagion of shallow and deep aquifers. The extreme pumping from local aquifers to suit the growing urban water demand consequences in substantial turn down in water levels. This is worsening in groundwater quality. At adequately hefty pumping rates the demand is tried to be fulfilled, leads to stream flow depletion.

With a constant increase in urban demand for water and sanitation, confront to suit these demands are rising. To construction more, costly desalination plants would be difficult. The dispute can be resolve with the preliminary part of new and modern legislation and institutional actions. This can also be done by taking on advanced techniques in water-demand reduction,

wastewater reuse enhancement and reduction of water production, treatment and distribution costs.

## Ground Water Pumping through Water privatization

Water privatization was taken on in 1989 by Margaret Thatcher’s government. It privatized ten formerly public regional water and sewerage companies in Wales and England in the course of disinvestment. in chorus the economic regulatory agency OFWAT was shaped. The Drinking Water Inspectorate (DWI) was positioned in 1990 to check water safety and quality. Water privatization since then is a controversial issue in England and Wales. A study by the Public Services International Research Unit (which is affiliated with trade unions), that opposes privatization in 2001 declared that

tariff amplified by 46% in actual terms in the first nine years and investments were reduced

Operating profits have doubled (i. e.+142%) in eight years and public health was endangered by cut-offs for non-payment.

Privatization helped sign off the industry’s £4. 95 billion debt. Privatization columnist disputed in 1997 that infrastructure-mainly sewers-were not adequate. Also, OFWAT was blamed of not evaluating company performance with targets. The critics said that OFWAT has chosen profit over providing a assured level of services.

Conversely, a World Bank article disagree that the reforms

six years after and before privatization investments were $17b and £9. 3bn respectively which has surely risen after privatization

brought about conformity with rigorous drinking water standards

Also headed to a higher quality of river water.

There are also 16 mostly smaller water only companies in England and Wales that have been privately owned since the 19th century.
In Scotland and Northern Ireland water and sewerage services have remained in public ownership

## Desalination

To turn seawater into drinking water , the first large-scale desalination plant for domestic and industry use in the UK opened on Wednesday 2 June 2010.

Facts and Figures

The desalination plants' capacities vary from 1000 to 789 864 m3/day. In 1990 and 1997, the world desalinated water production was about 33% for the total domestic and 38% for industrial requirement. By 2025, desalination production is predictable to be around 54% of the total domestic and industrial claim. The RO plants need mechanical energy formed by pumps those work on electricity. About 3. 5-9 kWh is necessary to manufacture 1 m3 of desalinated seawater. The energy requirement depends on the salinity level of the water input. Also depends on efficiency of pump and the process design. A single-stage plant of high efficiency level, needs around 4 kWh/m3 and 0. 5-2. 5 kWh/m3 to produce 1 m3 of reasonable quality water from

seawater and salty groundwater. The use of a low-pressure membrane reduces the energy consumption by 25-40%, especially when using low-salinity water.

## DAMS

Dams are made to contain water, stop flooding and produce hydroelectric power. Dams make available a water supply for irrigation, domestic needs and industrial application. Lakes and reservoirs are made since 19thcentury in UK. The most significant resource for building a dam is funding. In the UK, the figure of huge dams grew speedily during the 19th century from around 10 to 175. By 1950, the rate of growth nearly doubled. After 1950, edifice positioned itself at a rate of  5. 4 dams per year. the UK today has a sum of 486 dams. In Europe, the totality of dams is rising slowly. The basic reason being that appropriate sites are becoming less and environmental concerns become growing.

## Large dams

The six biggest reservoirs are positioned in the Volga river system in Russia. The two largest are Kuybyshevskoye (6450 km2) and Rybinskoye (4450 km). Spain (approx. 1200), Turkey (approx. 610), Norway (approx. 364) and the UK (approx. 570) have largest number of reservoirs.

## Environmental Issues

a number of environmental issues are raised by Reservoir construction in both building and completion stages. On closing the dam, the water level in the reservoir rises, resulting in key changes in the area inundated with the water. Like loss of farmland, flooded settlements and the groundwater table

raised. Once the reservoirs are made, two kinds of environmental problems take place:

Make the reservoir inappropriate for its purpose. Algae and toxic substances in them make drinking water inappropriate.

Evoke ecological weakening of the river system, particularly downstream of these reservoirs.

Big dams break off the natural permanence of a river.  Reservoirs change the hydrological cycle, thus raising many other ecological consequences like leaving fewer spawning sites for migratory fish. Additionally, reservoirs grasp suspended matter mostly sand flowing into them. This decreases the suspended matter weight to reach downstream and in the end to the sea. Lack of sand at the sea pilots coastal erosion.

## Conclusion

Building dams is very costly and also gives rise to a number of environmental issues as discussed above. Ground water pumping and water privatizing also has risen many questions pertaining to water level and environment concerns vis-à-vis profit making. The best option which should be taken ahead by government is water Desalination. Though the one time investments are high but the problem of water allocation can be limited with its supplies. Provisions to produce biofuels for the Thames desalination plant have been done, still till they are place energy consumption will remain an issue.

## Recommendation

All the above discussions focus on fulfilling the demand by one method or the other. Still other way is to bring down the domestic and industrial demand. Legislation ought do more work to discontinue leaking pipes and decrease the average water use of customers by fixing more water meters and better promotions activities.