

# The feasibility of different techniques for providing fresh water to arid regions...

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The feasibility of different techniques for providing fresh water to arid regions in the world

## 1. 0 Introduction

Water is the most valuable and indispensable resource for all forms of life. People need it for every activity: domestic use, agriculture and industry. Access to fresh water is regarded as a universal human right (United Nations Committee in Economics, Social and Cultural Rights, 2003). Drought has become an increasingly important problem in many parts of the world. Water scarcity is most common in arid and semiarid regions of the world, which cover one third of the Earth's land surface (Smallwood, 2011).

UNESCO and the Italian Ministry for the Environment and Territory (IMET) have launched “ The Water Programme for Africa, Arid and Water Scarce Zones”, which seeks to develop the potential management of water resources to protect the fragile environment of water scarce regions. Additionally, limited fresh water resources available in these regions are also threatened with deterioration in quality due to hydrological changes. The accessible water in arid regions are often restricted to groundwater. Surface flows are usually limited to flash floods due to short duration and high intensity rainfall events.

The purpose of this report to describe the feasibility of different techniques for providing fresh water to arid region, like Africa. Firstly, this report will consider the background to this problem and then it will compare and analyze two water provision methods in Africa, desalination and dams. Finally, this report will offer some recommendations.

## 2. 0 Background

Water is not only a physical resource: in every culture it is spread among social,

spiritual, political and environmental meanings. So, solving the water problem means progress across all of these developments.

This is mostly relevant in countries with no perennial rivers, streams, or permanent surface fresh water. Also, people in arid regions are uniquely vulnerable to economic and social changes. Achieving sustainable development has dramatic implications for reducing poverty and hunger. Today, millions of people still lack access to basic sanitation and every year many of them die from diseases related with inadequate water supply, sanitation and hygiene. According to The Water Project statistic's, nearly 1 out of every 5 deaths under the age of 5 is due to water-related disease, such as cholera, diarrhoea and malaria.

Current predictions (UNWWAP, 2003) show that more than 20 developing countries will experience water shortage by 2025. Most of these countries are found in Africa and the Middle East. 2. 1 Water problems in Africa Water problems mostly take place in Africa, where it is predicted that 300 million people are affected by water shortages. (UNWWAP, UNESCO 2003) The University of Cape Town studied that climate change has a huge impact on Africa. For example, rain shortages have already caused many problems there.

In East Africa more than 3 million people face hunger this year, because there hasn't been any rain for three months. (BBC, 2011) Most people in Africa live in rural areas and they are still dependent on agriculture for their livelihoods. Internal renewable freshwater resources average about 3 950 km<sup>3</sup> per year. This amounts to about 10 per cent of the freshwater resources

available globally and closely resembles Africa's share of the world population at 12 per cent (Donkor, 2003). Three of four Africans use the ground water as their main water supply.

The ground water is not always available, it accounts for only 15% of the continent's water. Perhaps the greatest cause of Africa's problem of a lack water is that they can't effectively utilize its resources. Approximately 4 trillion cubic meters of water is available every year, and only 4% of that is used. The continent and people lack the technical knowledge and financial resources. In Africa is the greatest percentage of people lacking access to safe drinking water, there are 25 nations in the world and 19 are in Africa.

The global challenge, 2011) So adequate management of its water resources is crucial for the future of the African continent. 3. 0 Comparison of Options

3. 1 Dams In meeting critical water needs, there is some alternative technologies, such as dams and desalination. According to ICOLD (International Commission on Large Dams), a large dam is dam with the height of 15 m or more. Regional inventories include nearly 1300 large and medium-size dams in Africa, 40 % of them are located in South Africa. Most of these were constructed in past 30 years, the reason is rising demand for water from growing population.

The majority of dams in Africa have been constructed to facilitate irrigation (52%) and to supply water to municipalities (20%). Although only 6% of dams were built primarily for electricity generation, hydroelectric power accounts for more than 80% of total power generation in 18 African countries. Only 1% of African dams have been constructed to provide

flooding control, according to the World Commission on Dams. Sudan's president, Omar al-Bashir, is so proud of the new Merowe dam in the north of his country. Costing \$1. billion, it will produce 1, 250 megawatts and create a lake 108 miles long, above the Nile's fourth cataract. (The Economist, 2010) However, if dam construction is predicted, then not only technically feasible options should be considered, but also economical viability, social acceptance and environment stability.

### 3. 2 Desalination

In Africa, where water shortages are particularly severe, desalination technology has been developed to a point where it can serve as a reliable water source at a price almost comparable to that of the conventional sources.

Desalination techniques are one of the available tools to avoid stressing freshwater resources. Nevertheless, they should always be considered as just one of the components of an integrated water resources management process developed in conjunction with water conservation strategies (UNESCWA). South Africa is considering a major desalination programme for its coastal cities. Cornelius Ruiters, deputy director general of national water resources and infrastructure, told GWI that " At the moment, less than 1% of our water comes from desalination. We need to increase that by 7% and 10% by 2030.

We are mostly dependent on surface water, and there is obviously a limit to that - we need to diversify our mix. " The cities of Cape Town and Ethekewini (Durban) are at the beginning of investigating desalination, but not decision have yet been taken on what technology would be used. Ruiters told " We have to examine all the options, both financial and technological, and look

what are they doing in the Middle East, Singapore and China. Public – private partnerships are a possibility. ” (Global Water intelligence, 2009) 4. 0

## Conclusion and Recommendation

Developing suitable policy and management system is essential to improve the value obtained from fresh water resources. This includes interventions to strengthen governance, improve knowledge and information systems including data collection and monitoring and evaluation, enhance human and institutional capacity, develop IWRM systems which focus on catchment and basins as the management unit, and mainstream gender. Cooperation and partnership, between multiple stakeholders and at multiple levels, from the local to the sub-regional to the regional, are at the core of successful interventions.

These responses should improve the opportunities to meet urgent needs for potable water, sanitation, irrigation and hydropower, among others. A critical issue that will need to be addressed systematically in Africa is financing.

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