

## **Technology Fact Sheet for Adaptation**

### **B.4. Technology: Pipeline for Fresh Water Supply<sup>i</sup>**

**Sector: Water Resources.**

**Subsector: Permanent Water Resources**

#### **B.4.1 Introduction**

The pipe line technology/project could be adopted for drinking water production right away from the River Nile and its attributes to supply those who live in remote areas and suffer from droughts and insufficient drinking water, such as west and east Sudan. Drinking water scarcity has been identified as one of the most urgent needs to climate change adaptation. Farmers could adapt to current and expected changes in climate which affect the fresh water supply by adopting a pipeline network.

#### **B.4.2 Technology Characteristics**

- Construction of a new water PVC pipeline network from the River Nile and its tributaries across the country's states to provide clean water for people and irrigation to agriculture in East and West Sudan.
- Simple pipeline design of reachable technology input.
- Low cost technology and maintenance.

#### **B.4.3 Country Specific Applicability and Potential**

For the adoption of this technology, the following steps are to be taken:

- Development of a technical and economic feasibility study for Sudan water pipeline project.
- Design of a national pipeline network running from the Nile to the targeted areas.
- Construction of regional water tanks and pumping stations for water storage and distribution.
- Coordination with the African pipeline projects application of capacity building programs
- International cooperation to benefit from Chinese pipeline technology *i.e.*, cost-effective and sufficient expertise, minimum capacity building requirements, easy to operate with minimum training requirements for local technical personnel
- Easy to maintain

#### **B.4.4 Status of Technology in Country**

The technology of connecting rural areas with a water pipe line has not yet implemented in Sudan, and is now under study phase.

#### **B.4.5 Opportunities and Barriers**

Sudan possesses many sources of fresh water in addition to its plane topography. This facilitates the establishment of connecting remote areas with a pipeline network to provide water for domestic and animal uses. The application of this technology is challenging due to the following factors:

- Special technical requirements
- Water extension to different locations in the same area may become difficult and costly to maintain
- Nile basin agreement may be in conflict with the pipeline project
- High initial costs

## **B.4.6 Benefits to Economic/Social and Environmental Development**

### **Economical benefits:**

- Perpetual accessibility of drinking water for both human and animals population
- Secure food productivity
- Offers job opportunities
- Income generation

### **Environmental Benefits**

- Provision of fresh drinking water
- Reduction of water-borne diseases

### **Social Benefits:**

- Improvement of livelihoods
- Elimination of tribal conflicts over water issues
- Improvement of know-how and capacity building

## **B.4.7 Climate Change Adaptation Benefits**

Beside water scarcity in these areas, Sudan is subjected to desertification due to climate change. Hence, there is a crucial need for this technology to minimize current and future effects of climate change. This technology allows different systems to adapt to expected drought due to climate change and prevention of severe desertification.

## **B.4.8 Financial Requirements and Costs**

Cost to implement adaptation technology:

The application of this technology in Sudan in the presence of the River Nile and its tributaries will cut down the costs to the minimum. This is because there is no need for submarine pipeline and desalination plants. The costs of implementing this technology are not estimated yet in Sudan. However, hereunder are estimated costs of implementing pipe line projects:

- The initial cost of a 40-mile long upgraded PVC pipeline in South United States, with initial capacity of about 16,000 barrels of water a day, is \$2.1 million for start-up. However, the labor cost in US compared to that of Sudan is fairly high.
- Construction of a major water supply pipeline to a group of Islands in Abu Dhabi cost US\$27bn; with capacity for 76 million gallon of water a day the pipeline project started in 2008 and will be completed in 2018. In this case, the high cost is due to the marine pipeline and water desalination costs.
- A 600 mile subsea pipeline for fresh water in Chile will cost about US\$3.85bn, planned for three construction phases over five years.

---

<sup>i</sup> **This fact sheet has been extracted from TNA Report – Technology Needs Assessment for Climate Change Adaptation - Sudan. You can access the complete report from the TNA project website <http://tech-action.org/>**