THE GREAT MAN-MADE RIVER PROJECT
Only 5% of the entire area of Libya exceeds 100 mm (4 in) annually. Evaporation rates are also high ranging from 700 mm (28 in) in the north to 6000 mm (236 in) in the south.
In a recent study conducted under the supervision of the UN Centre for Environment & Development in the Arab Region & Europe CEDARE, the Nubian Basin (of which Kufra is part) was estimated at containing $373.3 \times 10^{12} \text{ m}^3$.

If the neighboring countries extract water at a rate of 1380 MCMY it is calculated that the reserve would last 4860 years.
Cost Comparison Between Different Water Supply Alternatives

- **Great Man-Made River Project**: 9.00 m³
- **Transportation by ships**: 1.05 m³
- **Desalination**: 0.79 m³
- **Pipeline from South Europe to Tripoli**: 0.74 m³

Quantity of water per One Libyan Dinar
03 October 1983
The General People's Congress held an extraordinary session to draft the resolutions of the basic people's Congresses, which decided to fund and execute the Great Man-Made River Project.

28 August 1984
The leader of the Revolution lays the foundation stone in Sarir area for the commencement of the construction of the Great Man-Made River Project.
**The Great Man-Made River Project**

**Gedamess Wellfield**
- No. of Wells: 144
- Total Production: 90 MCMY

**Jaghboub Wellfield**
- No. of Wells: 40
- Total Production: 50 MCMY

**Sarir & Tazerbo Well Fields**
- **Kufra Wellfield**
  - No. of Wells: 285
  - Total Production: 1.68 MCMD
  - Of mainly 4.0 m (13 ft.) diameter pipes

**East & NEJebel Hasouna Wellfields**
- No. of Wells: 586
- Total Production: 2.5 MCMD
- Length of 1.732 Km (1,083 Miles)
  - Of mainly 4.0 m (13 ft.) diameter pipes
The Great Man-Made River Project

**Ghadames / Al Zawia System**

- **144 wells**
  - 209 Km (130 miles) wellfield collector pipe line.
- **626 Km (389 miles) main conveyance and distribution line**
  - 4 no’s pump stations
  - 4 no’s storage tanks
  - 3 no’s pressure breaking tanks.
  - 1 no elevated tanks.
  - 25 no’s turnouts.
- **Communication and control system.**
- **3 operation and maintenance centres.**
- **Electrical distribution system for the wellfield.**
- Add 1.68 MCMD to existing phase I conveyance.
- 300 wells in Kufra well field.
- 383 Km (238 miles) conveyance.
- Mainly 4.0 m (13 ft.) diameter pipes.
- 7 no. inline booster pumping station.
- 402 Km (250 miles) hall road.
- Permanent communication & control system.
- Cathodic protection system.
- Operation, support and maintenance facilities.
# Reservoirs

<table>
<thead>
<tr>
<th>Reservoir Name</th>
<th>Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ajdabiya Holding Reservoir</td>
<td>4.0 mcm</td>
</tr>
<tr>
<td>Al Gardabiya Reservoir</td>
<td>6.8 mcm</td>
</tr>
<tr>
<td>Omar Mukhtar Reservoir</td>
<td>4.7 mcm</td>
</tr>
<tr>
<td>The Grand Al Gardabiya Reservoir</td>
<td>15.4 mcm</td>
</tr>
<tr>
<td>The Grand Omar Mukhtar Reservoir</td>
<td>24.0 mcm</td>
</tr>
</tbody>
</table>

**Total Storage Capacity** = 54.9 mcm
Two Pipe Manufacturing Plants

• Sarir Plant
  Three lines producing 120 pipes daily
• Brega Plant
  Two lines producing 80 pipes daily
Cut-away Section of a Pre-stressed Concrete Cylinder Pipe (PCCP)

PIPE MAKE-UP

MORTAR COATING  STEEL PRE-STRESSING WIRE

OUTER CONCRETE CORE  STEEL LINER

INNER CONCRETE CORE

Length of Pipe = 7.52 meters
Pipe Diameters  1.6-4.0 meters
Weight of Pipe = 75-83 tonnes
Pressure Rates  6-26 bar
17-18 km of prestressed Wire
12-16 tonnes of Cement
Haul Roads

• Phase I Total Length 1,600 Km (1,000 Miles).
• Phase II Total Length 2,155 km (1,340 Miles).
Pipe Laying

Depth of Trench 7.0 m (23 ft.).
Capacity of Cranes Used up to 450 tons
**Water Allocation in M³/Day**

6.57 Million Cubic Metres Water per Day Transfer
2,398 Million Cubic Metres per Year

All Phases in M³/Day

- 1,838,480 M³ Municipal --> (28 %)
- 4,596,200 M³ Agricultural --> (70 %)
- 131,320 M³ Industrial --> (2 %)
The agricultural development projects are being carried out in three regions in Libya:

American Companies have already invested in the development of Large Farm Projects:

- 1300 Hectares – Benghazi Plains Region  
  (this will be increased to 14,000 Hectares in the future)
- 800 Hectares – Tarhouna
- Valmont Valley supplying Irrigation equipment
- Case supplying agricultural equipment

Agricultural Land Developed  130,000 hectares
19.58 Billion Dollars Project Cost

- Capital Cost: $19.58 Billion
- Operation & Maintenance Cost: $14.11 Billion
- Total Investment Cost (50 Years): $33.69 Billion
- Expected Production Quantity: 120 Billion m³

Unit rate/m³ water to recover investment cost over 50 years: $0.28/m³
PROJECT STATISTICS

Total Weight of Cement: 6.9 Million Tonnes
Volume of Trench Excavation: 240 Million M³

The length of pre-stressing wire used in the project is equivalent to 220 times the circumference of the earth.

The amount of aggregate used in the project is sufficient to build 16 pyramids the size of the Great Pyramid.

The cement used in the project is sufficient to construct a concrete road from Tripoli to Bombay.
THE GREAT MAN-MADE RIVER PROJECT

Projected Scale

0 150 300 450 600 Km

Mediterranean Sea

Tripoli

Benghazi

Sirt

Tazirbu

Ajadbya

Al Kufrah

Tobruk

France

England

Germany
Great Man-Made River Project