Situation

- Annual floods occurring in Pakistan
- The Mirani Dam discharges potable water into the ocean [1]
- UAE’s production of potable water is inefficient (Desalination)

Is importing water into the UAE a practical solution from technological, political and environmental perspectives?

Problems

The flaws of desalination:

- Environmental pollution due to emissions [2]
- Climate change due to pollution
- High cost due to the complexity of the process.
- Inefficient; input to output ratio

Lack of potable water in UAE:

- Water is scarce; only source is through desalination
- Lack of rainfall causing lack of usable water
- Lack of rivers causing lack of usable water
- Ground water is depleting
- Drawing water from aquifers leads to salinity

Solutions

First Alternative

- Suspended pipeline from Dasht river to Ras Al Khaimah
- Phase one is to enlarge the Mirani Dam
- Phase two is the transmission line [3]
- Phase three is the sea crossing [3]
- Controlling technology

Figure 1: Gulf of Oman Map

Second Alternative

- High strength concrete lined tunnel from Dasht River to Iran
- Pipeline spanning through the sea bed from Iran to Ras Al Khaimah
- Tunnel Boring Machine will be used for the underground pipeline
- Controlling technology

Figure 2: Suspended Pipeline [4]

Evaluation

<table>
<thead>
<tr>
<th>First Alternative</th>
<th>Second Alternative</th>
<th>Tankers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost</td>
<td>$2 Billion + Variable costs</td>
<td>$2.2 Billion + Variable costs</td>
</tr>
<tr>
<td>Construction Time</td>
<td>8 to 10 years</td>
<td>15 years + Maintenance time of TBM</td>
</tr>
<tr>
<td>Construction Maintenance</td>
<td>Negligible</td>
<td>Takes 12 hours when necessary</td>
</tr>
<tr>
<td>Operational Maintenance</td>
<td>On demand</td>
<td>On demand</td>
</tr>
<tr>
<td>Environmental Impact</td>
<td>1. Ships’ exhaust fumes pollute air. 2. Ships’ waste pollutes water</td>
<td>1. TBM’s exhaust fumes pollute air. 2. Destruction of the geology</td>
</tr>
<tr>
<td>Lifespan</td>
<td>100+ years</td>
<td>75 years</td>
</tr>
</tbody>
</table>

The third alternative is good for a short-term only since the cost is variable and depends on the amount of water imported. However, tankers pollute the air and the sea. Therefore, the third alternative has been excluded for its impracticality with a long-term sustainable solution to the problem of water security.

References