AquaPure

FRESHWATER SOLUTIONS

## Introduction

The northern Sinai region is a sparsely populated, arid region at the junction between Asia and North-eastern Africa. Restoring the ecosystem would help to transform the region from a dry, empty desert into a vast, green land brimming with wildlife and vegetation. This, in turn , would help to rid the region of its issues with poverty and insurgency. For this to occur, a stable freshwater supply must be found as this is the main barrier to regreening the region.

## Political & Economic factors

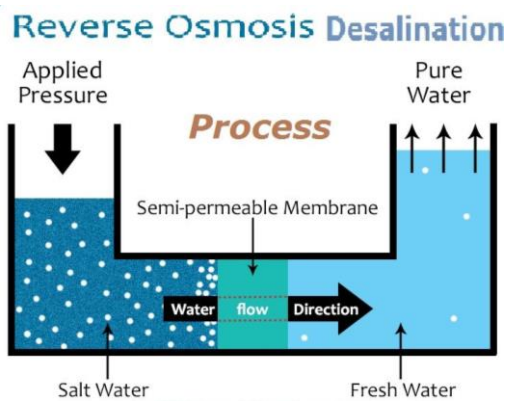
As the region lies in Egyptian territory, most of the funding will come from governments through avenues such as the Arab Fund for Economic and Social Development (AFESD). The idea will also be pitched to NGO's and IGO's with an interest in restoring the environment, with the aim of gathering further funding.

The aim of this project, in a social and economic context, is to be a driving force for a better quality of life and economic prosperity for the highly unstable region.

**How will the desalination work?**

- The water to be desalinated will be sourced from the nearby Lake Bardawil
- High pressures are used to push this water through a series of semi-permeable membranes
- This filters out the salt and contaminants, leaving pure water
- This pure water will then be transported across pipelines and stored
- To carry out this process on a large enough scale, a desalination plant must be set up near to Lake Bardawil


Visual representation of the desalination process



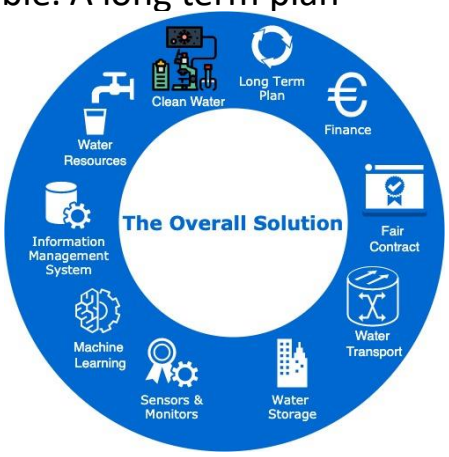

## How it will be implemented

- Regreening the entire area immediately is unrealistic; the aim is just to kickstart growth
- An estimated 16% of the total 10,000 km^2 should be irrigated to kickstart growth based on previous projects
- The estimated cost of the project is £722,439,817
- Estimates produce a buyback period of 4.78 years
- 5.7 million cubic metres will need to be desalinated daily
- Sinai, Sahl Rina and Eastern Qantara in Ismailiyah will be targeted as the main places to be irrigated
- Irrigation systems must be set up to water the land

## Solution

Desalination via reverse osmosis was chosen as the solution. The three possible solutions looked at were desalination, an underground well and collecting rainfall. The only solution that provided the vast quantity of water we needed in a sustainable manner was desalination. Key decisions were made in the process design to ensure the process is as sustainable as possible. A long term plan was devised to ensure the long-term success of the project. Some key aspects are listed below.

Local engineers will be trained on the maintenance and operation of the facilities to ensure the process can continue to operate after the project ceases. Where possible, sustainable energy sources will be used as there is a large amount of available sunlight for solar energy. Water collected will be sold to locals at a fixed rate to help cover the operation costs.




## Key Considerations

- Access to water for local communities will not be impacted by this project
- The project will aim to stay in budget as this region is still developing and therefore cannot afford to overspend
- Where possible a local workforce will be used to benefit the local economy
- The carbon footprint of this project will be kept as long as possible
- Protection measures against flooding and other natural diststeres will be put in place