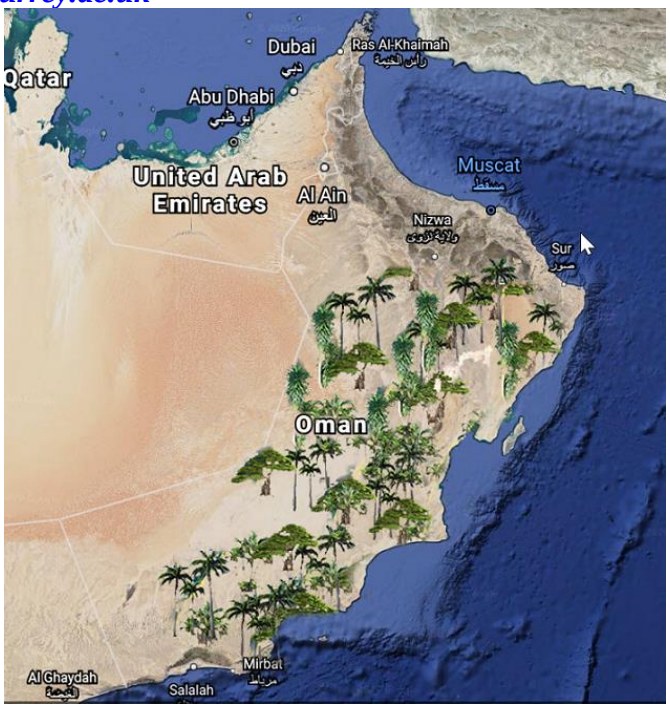
CHAMCO, Inc.
Professor Adel Sharif
31 Old Palace Road
Guildford, Surry GU2 7TU
United Kingdom
Tel: +44 7765 182217
Email: a.sharif@surrey.ac.uk

Office at Oman:



Reviving Agriculture by Renewable Energy using Gulf of Oman Water

Proposal
Kingdom of Oman

Thanks: شكراً

Natural Resources, Sea Water, Sun Power
And
People of Oman

Introduction

The ultimate goal of this proposal is to use every piece of land in this old country in the World History to become fertile and agriculture become the primary source of livelihood in Oman.

We use Sea Water for Agriculture
We use Solar Desalination for Drinking Water and Agriculture
We produce Compost and if necessary, import Compost to revive the topsoil of the arid lands.
We generate Electricity from the leftover of the Compost Plants.
We use Sewer as another Renewable Energy.

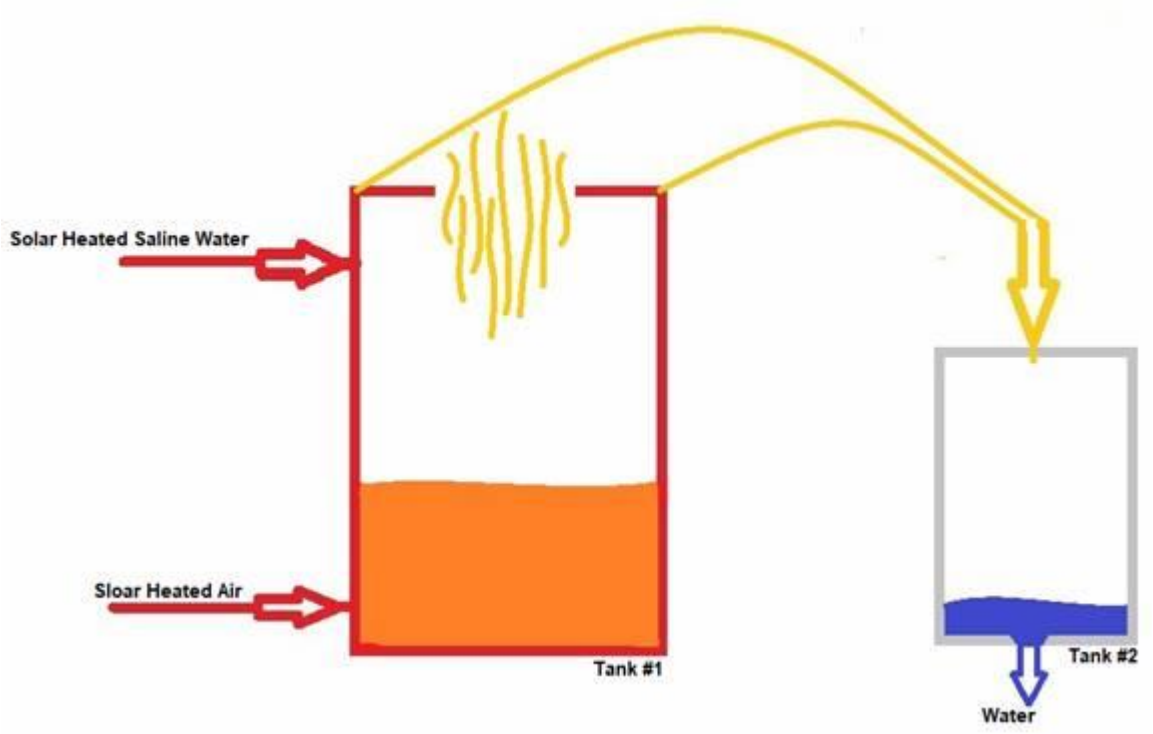
All of the above are possible if our lifelong research and development that we have done with Seawater, Municipal Solid Waste MSW (garbage) and Sewer and Algae to be implement in a large scale we propose.

1- Solar Desalination
2- Irrigation with Seawater
3- MSW of Oman for Compost
4- Leftover of Compost for Electricity
5- Sewer for Biogas and Garden Water
6- Algae

1-Solar Desalination

Solar Desalination, developed by Professor Adel Sharif
Introducing Professor Adel Sharif
Click on You-tube link here:
https://www.youtube.com/watch?v=zzeLHY8BMso

The cost of desalinated water depends on salinity level of the feed water and location.
On average the cost is about $2 per cubic meter of produced clean water.
Our system reduces this cost substantially.
This simple process picture shows how the system works, without revealing the detail of the technology involved.
In Tank #1 the Solar heated saline water enters at top, with Solar heated air blows from bottom.
Steam escapes from the top of Tank #1, entering to Tank #2 to be condensed at the bottom of the tank



How the prototype works, watch the You-tube video:

https://www.youtube.com/watch?v=GsL3HEXFGj4

2-Irrigation with Seawater

The new system will enable people without access to fresh water to irrigate their crops
The new system will enable people without access to fresh water to irrigate their crops

A new system which allows food crops to be irrigated with seawater will solve global problems of food production, according to researchers at the University of Surrey, UK. "97.5% of the world's water is salty and not usable for the great majority of agriculture," says Professor Adel Sharif, team leader. "With this approach, there is no need for investment in genetically modified crops or ongoing treatments for the soil. The technology will be accessible and will genuinely solve the problem for people without access to fresh water for agriculture."

The low-cost solution, which makes seawater irrigation on a large scale a realistic and sustainable solution to food supply problems, does not require high pressure pumps or expensive distillation units. Instead, the new approach makes use of the natural process of evaporation alongside a membrane designed to retain the impurities in the water, including the salts, allowing only pure water to reach the plants.

The project has built on Professor Sharif's work on Manipulated Osmosis Desalination (MOD), which is used in Gibraltar and Oman to produce drinking water for human consumption. MOD is currently the leading technology for desalination, reducing energy use by up to 30 per cent compared to conventional desalination plants, chemical consumption and the carbon footprint.
From water rights and desalination treatment processes to community-scale sustainable technology, the University team is continuing to work alongside governments and disaster relief NGOs worldwide to improve water for drinking, sanitation and agriculture.
Dr. Adel Sharif, University of London Professor has the Queen Medal for scientific achievement invented a new desalination system.
Dr. Sharif has been special advisor of water for Amir of Qatar.
This is the picture of Dr. Adel Sharif Desalination Plant in Oman.

The world has become a greener place than it was 20 years ago, largely thanks to China's reforestation efforts that are ambitious enough to have a significant impact on the global mission of cutting carbon emissions.

Every March 21, the United Nations (UN) raises awareness of the importance of all types of forests, offering an opportunity for countries to reflect on their afforestation efforts.

China's progress is noteworthy.

A recent Boston University study tracking NASA satellites shows that over the last two decades, "the greening of the planet represents an increase in leaf area on plants and trees equivalent to the area covered by all the Amazon rainforests," with China and India leading the charge.

The study also finds the world is getting greener overall, and China alone accounts for 25 percent of the global net increase in leaf area although the country holds only 6.6 percent of the global vegetated area.

As a country that once suffered severe desertification, China's progress is stunning and marks a significant contribution to the global community.

In 2018, China planted 7.07 million hectares of trees, and the country is home to the world's largest man-made forest


→-->


3-MSW of Oman for Compost

Production of compost from MSW:

The MSW will be sorted into three separate components:

The energy components such as plastic, paper, wood and other biomass suitable for gasification are separated from MSW.

This components after crushing and extrusion will be turned into Briquettes. Briquettes are the fuel for gasification to produce synthetic gas and ultimately electricity.

Separation and crushing

Each component are baled and sent to appropriate locations:

plastic paper wood biomass Briquette

2- Non energy components such as glass, metal and hazardous wastes, these components will be sent for recycling or safe dumping.

glass metal Aluminum

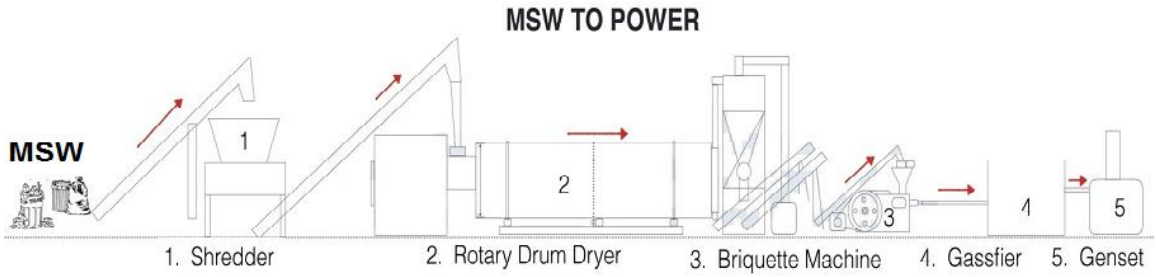
3- The organic components will be turned into compost in a traditional way.

This compost and perhaps imported compost and top soil will be transported to the project site.

Before studying the "Irrigation", which is one of the subjects under generation of electricity, we will study different trees, which grow in desert and will find the best advise on the matter from experts who have done similar projects in the deserts of Australia and the USA.

4-Leftover of Compost for Electricity

For small amount of MSW as low as 40 Tons / Day using Gasification

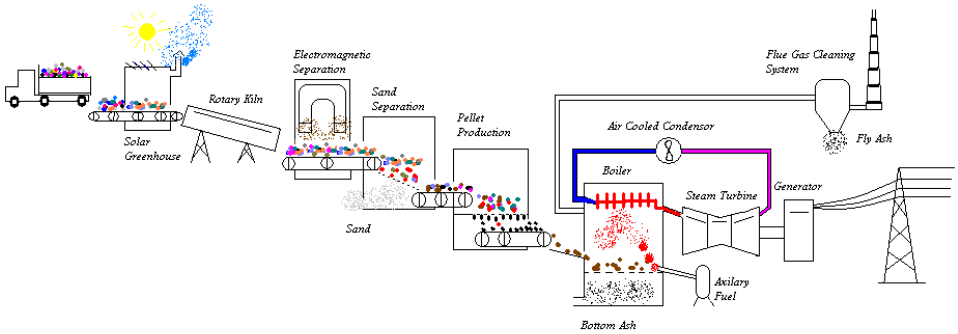


1 MW coal gasification power plant requires 10 Tons of coal / day.
Since the caloric value of MSW Briquettes is about 3000 Kcal/Kg, therefore:
1 MW MSW gasification power plant needs about 20 Tons of MSW Briquettes / day.
We assume this 20 Tons of briquettes will be derived from around 35 or 40 Tons of MSW in the proposed site at small cities
SynGas produced in our system of gasification has the following composition:
CO- 40%, H2- 30%, CH4- 11%, CO2-6 to 8%, N2-8 to 10%
which has Caloric value of 1800 Kilo Calories /cubic meter.
The Caloric value of Natural Gas is more than twice of Syn-Gas.

Pictures of our gasification unit

1 MW Gasification Unit

For big Cities with MSW more than 700 Tons / Day using Incineration
The MSW / E process by incineration after drying and sorting the garbage.
This power plant is very similar to coal power plant

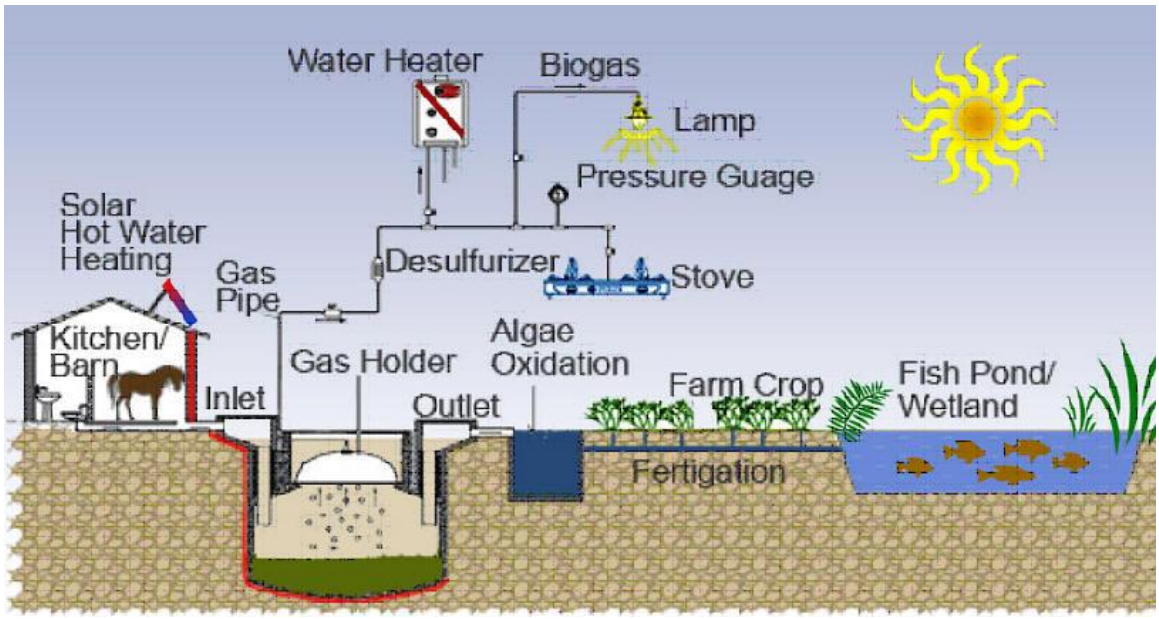


5-Biogas from Sewer

Biogas is a fuel gas made from biomass such as faeces, food waste, grass and straw etc. during the anaerobic fermentation process.

Biogas contains about 55% - 70% methane (CH4), and some carbon dioxide, some water, some hydrogen some carbon monoxide and some hydrogen sulfide (H2S).

This simple process picture shows how biogas is produced



The heat value of biogas is 5142 Kcal/m3

Conditions needed for biogas production are:

1-Strict absence of Oxygen.
2-Temperature between 8 – 65 Deg. C. Higher the temperature the more active methane bacteria, and the higher biogas production.
3-Neutral or slightly Alkaline environment, a pH value between 6.8 and 7.5

PUXIN biogas system built in Ghana

A 200M3 biogas system to treat human waste, food waste and bean residue.

Sewage treatment station of Xiaoshi town