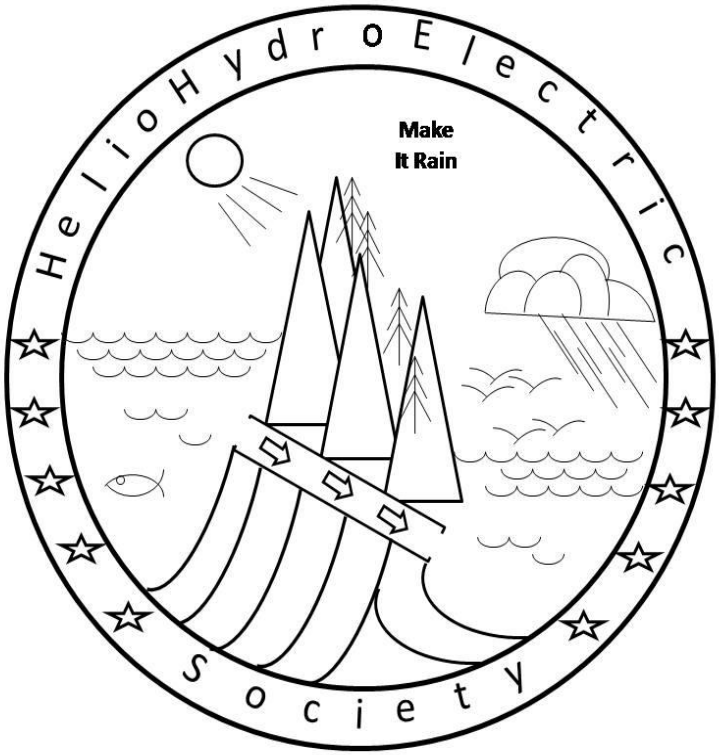
HelioHydroElectric Potential
Prefeasibility Study
MIDDLE EAST

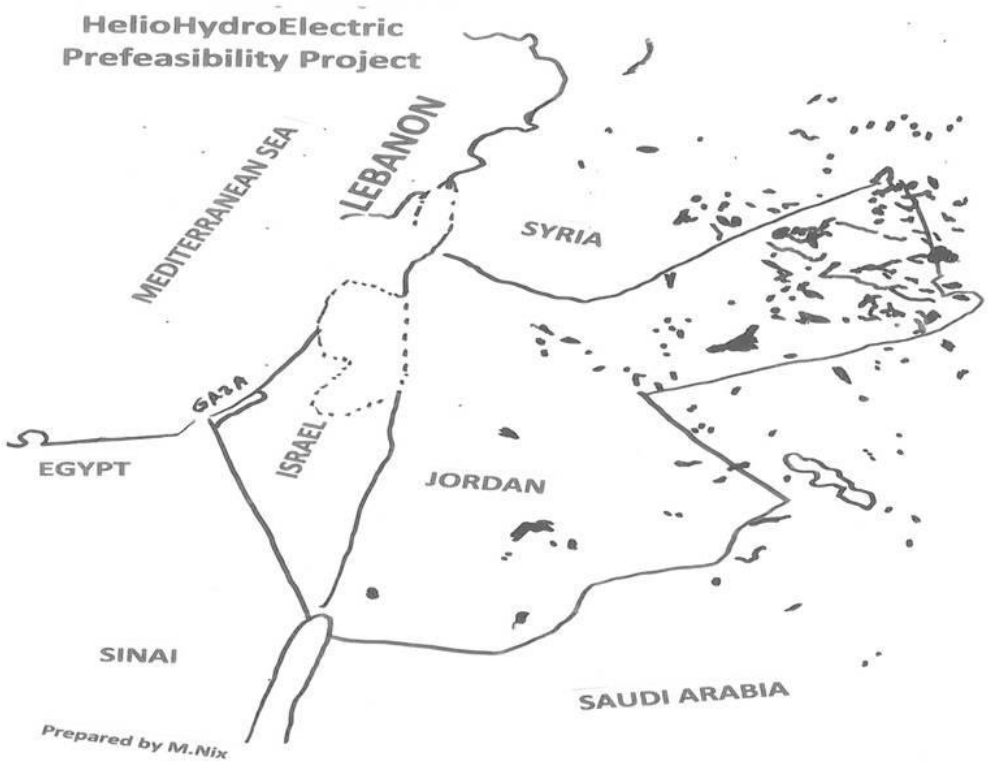
Prepared by Martin Nix B.U.S, A.A.S Seattle, WA, June, 2015

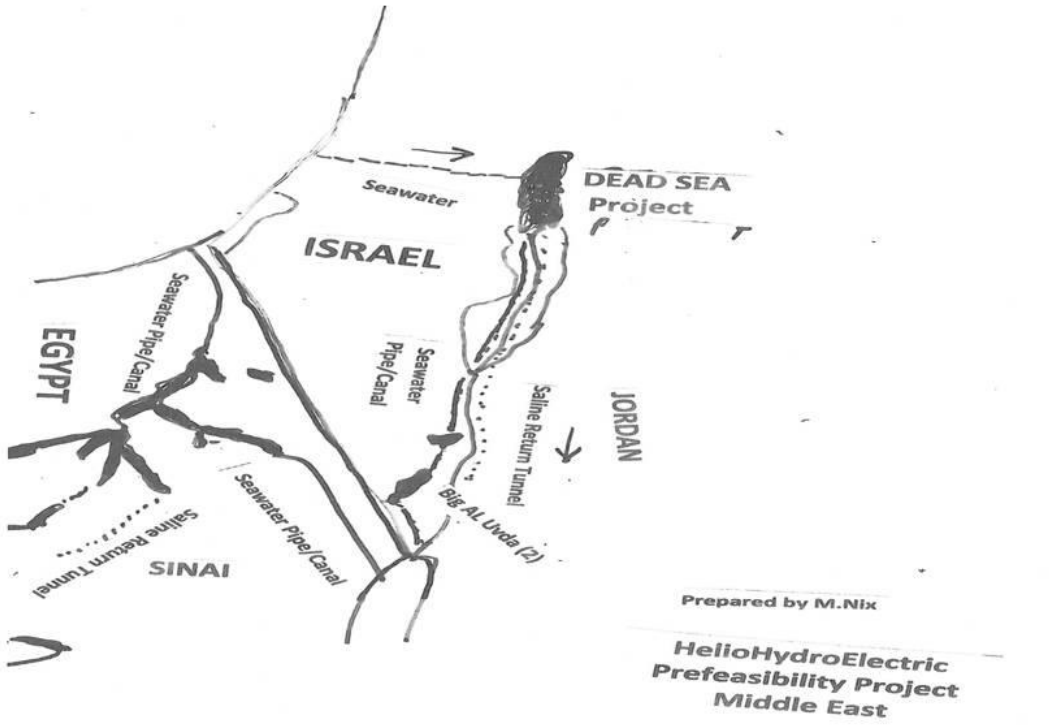
ABSTRACT: HelioHydroElectric is a little known solar engineering technology, using salt/sea water and solar power to create evaporation ponds for artificial rain in deserts. The Middle East has large HelioHydroElectric resources. Located throughout the Middle East are dry endorheic salt lakes. These can be flooded with salt/sea water to create clouds from evaporation. The additional rainfall would increase vegetation, thus removing carbon dioxide from the atmosphere. HelioHydroElectric technology is the only technology that can actually remove carbon dioxide from the atmosphere. The additional rainfall in Middle East will increase agriculture and provide new living space. Not only can salt/sea water be used, but also underground alkali aquifer water can be used to flood these dry salt lakes. It is proposed that wind and solar power be used, along with energy conservation, for water pumping. Development of HelioHydroElectric has the potential of solving the drought problem in the Sahara region. Various sites were graphed for potential. Much of the conflict in this region is caused by the drought. It is being proposed as a military solution to the Islamic State. It is hoped this paper will spur conversations and funding for a full feasibility study.



INTRODUCTION: Proposed is the pumping of salt/seawater inland to the various nations in the Middle East for flooding of existing endorheic dry salt lakes to create clouds via evaporation, and thus artificial rain. This technology, known as HelioHydroElectric technology, will create more vegetation in the desert, region and in mountains, thus reversing Global Warming. It will stimulate the economy of the Middle East nations. Solar pumping technology is now very well developed. This Prefeasibility study is mostly to study the potential for construction of such a project. It is hoped that funding for a complete Feasibility study can be located so as to determine the environmental impact, climate impact, and economic impact along with construction plans and cost. Israel, Jordan and Palestine are presently constructing the Red to Dead Sea project, so as to add additional moisture to the region. Egypt has under study the Qattara Depression project. This is being reviewed elsewhere. Iran and Pakistan are considering HelioHydroElectric projects, with HelioHydroElectric Society assistance. There has been much unrest in the Middle East, in a large part due to the drought, caused by Global Warming. It is proposed that HelioHydroElectric be a military solution to the Islamic State. By changing the climate of the region so there is more water, it should help eliminate much of the poverty created by lack of water. These graphics illustrate potential locations for HelioHydroElectric development for further study.

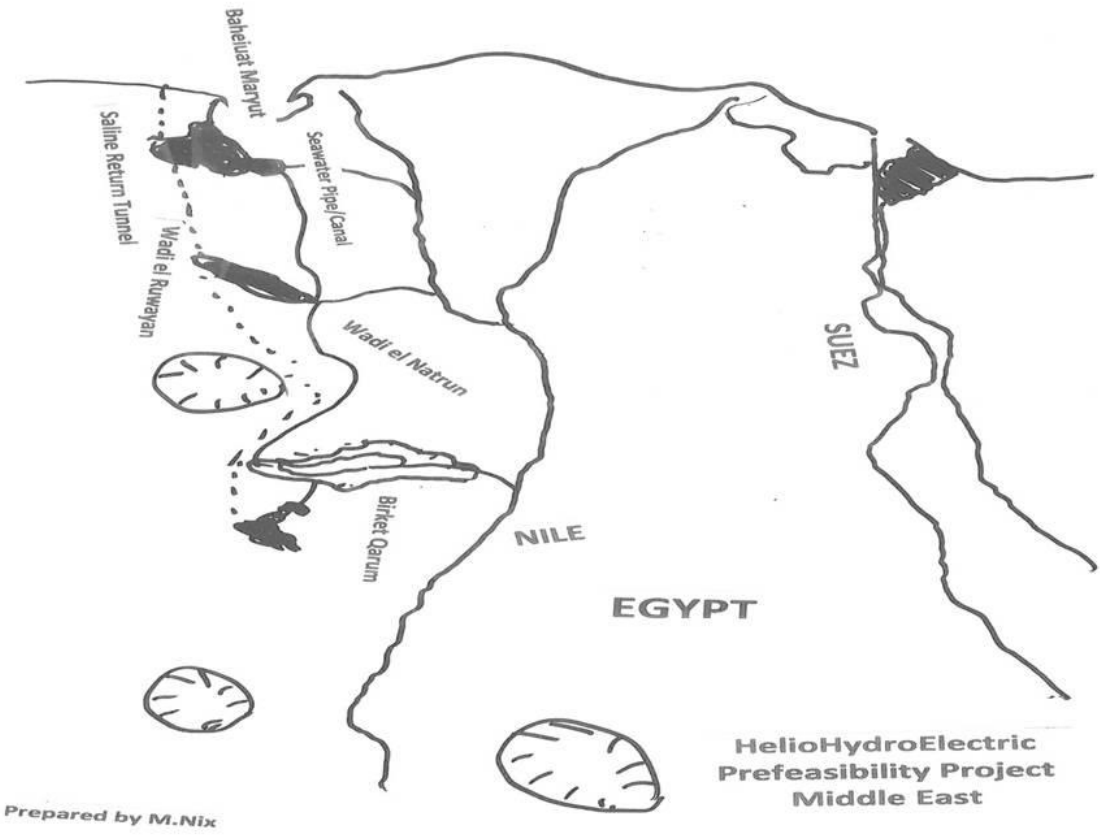
SPECIAL NOTE: The author found it exceptionally difficult to obtain accurate geologic data for the region. In some cases it was not existent. Consequently, method of estimation was used, with "best guess" data used. The Author is unfamiliar with the region, so deeply apologizes for the numerous misspellings for locations. In some cases the dry salt lakes did not have names, simply "salt lake". However, by reviewing this, it will spur a more comprehensive analysis of the region's geology.





ISRAEL

Location	Square Miles	Evaporation Rate/Day	Evaporation Rate/Second	Power
Dead Sea	233	64,956,672 Cubic Feet/Day	751 Cubic Feet/Second	-89MW
Big Al Uvda	100	27,878,400	322	-8
Total:	333	92,835,072	1,073	-97MW


Baheiuat Maryut
Saline Return Tunnel
Seawater Pipe/Canal
Wadi el Ruwayan
Wadi el Natrun
Birket Qarum
NILE
EGYPT
SUEZ
HelioHydroElectric
Prefeasibility Project
Middle East
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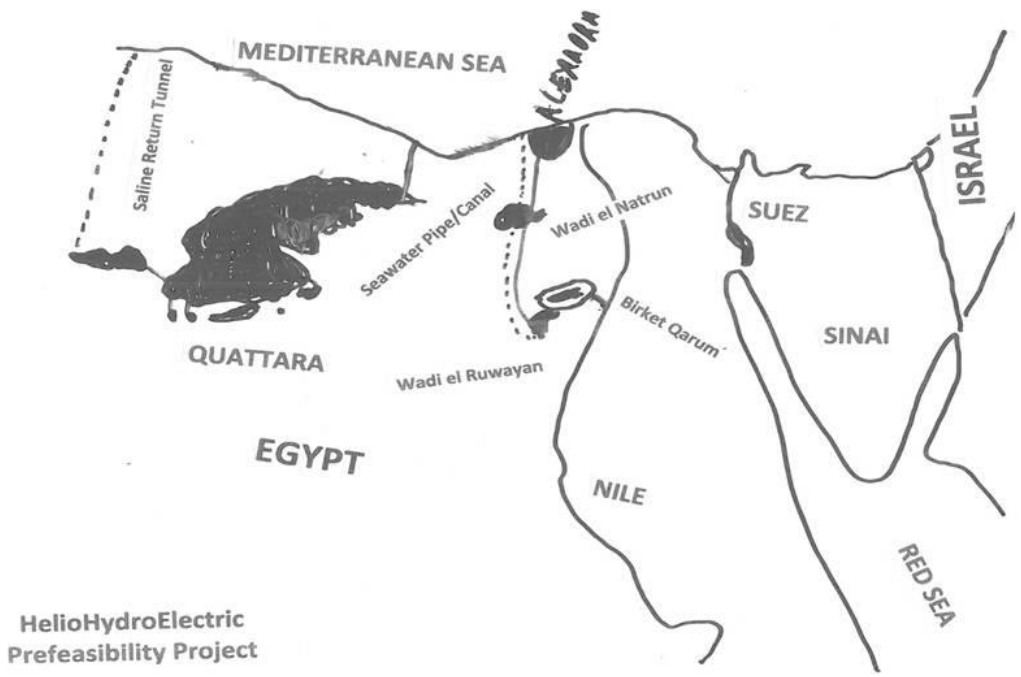


EGYPT

Location	Square Miles	Evaporation Rate/Day	Evaporation Rate/Second	Power
Toshka	502	139,949,568 Cubic Feet/Day	1,619 Cubic Feet/Second	82MW
Total:	502	139,949,568	1,619	82 MW

EGYPT (Below Sea Level)

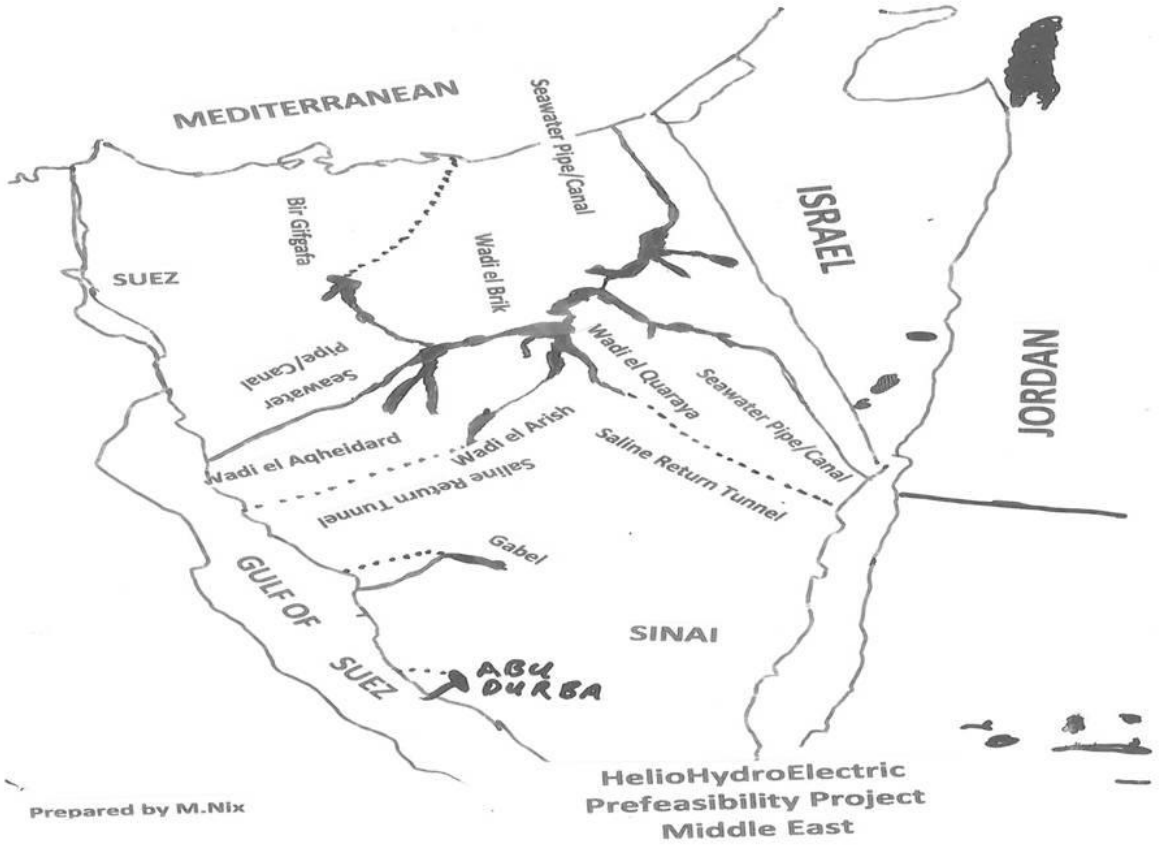
Location	Square Miles	Evaporation Rate/Day	Evaporation Rate/Second	Power
SIWA	100	27,878,400 cu/ft/day	322 cu/ft/s	-1MW
Birket Qarun	490	136,600,416	1,581	-18
Wadi Natrum	100	27,878,400	322	-2
Wadi Ruwayan	200	55,756,800	645	-1
Qattara	7,570	2,110,394,880	24,425	-901
Total:	8,460	2,135,205,890	27,295	-923MW

LIBYA

Location	Square Miles	Evaporation Rate/Day	Evaporation Rate/Second	Power
Misc.Sites	1,000	278,878,400 cu/ft/day	3,226 cu/ft/s	546MW
Total:	1,000	278,878,400	3,226	546

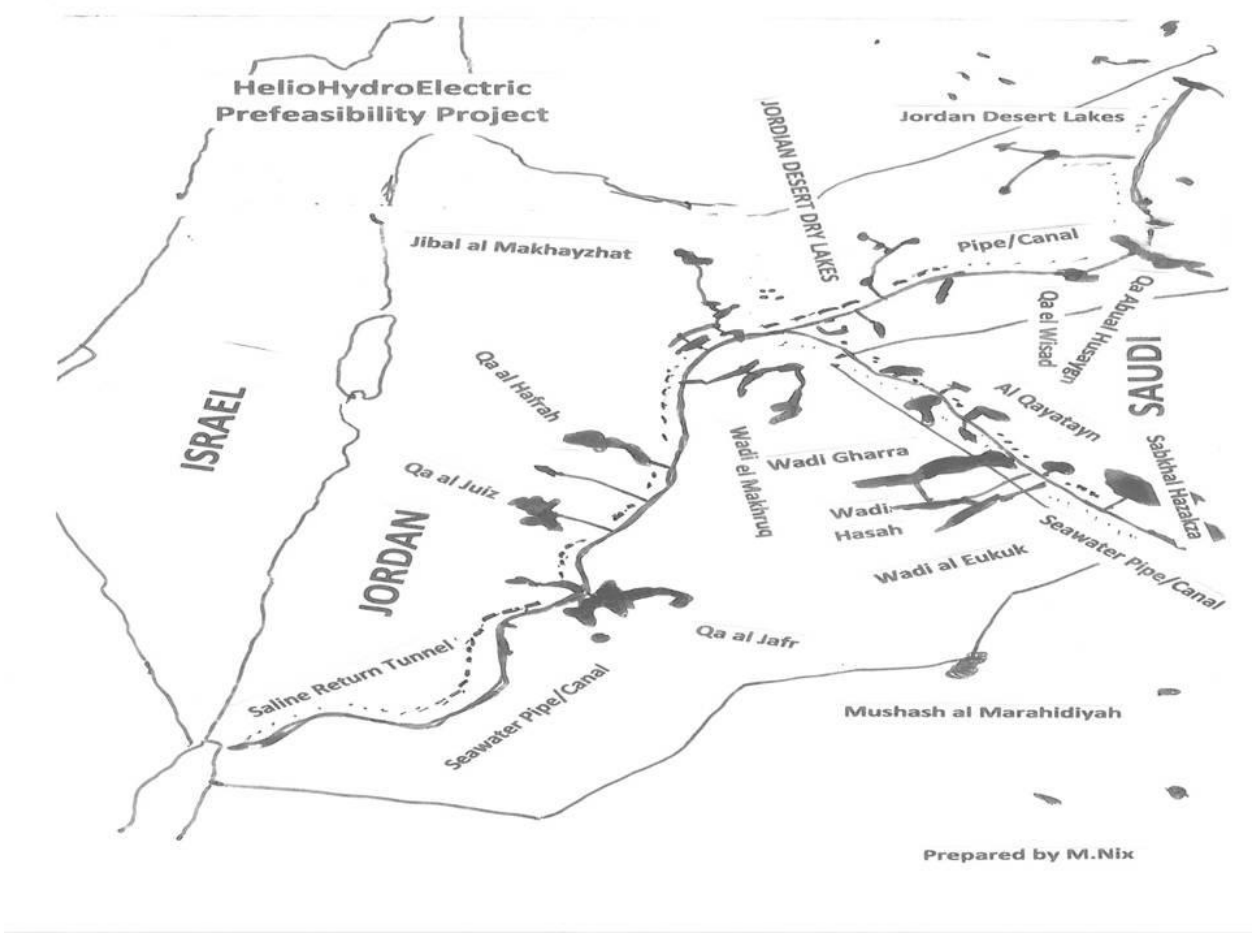
LIBYA (Below Sea Level)

Location	Square Miles	Evaporation Rate/Day	Evaporation Rate/Second	Power
Ghurzayif	100	27,878,400 cu/ft/day	322 cu/ft/s	-4MW
Jaghbub	100	27,878,400	322	-1
Total:	200	55,756,800	644	-5MW



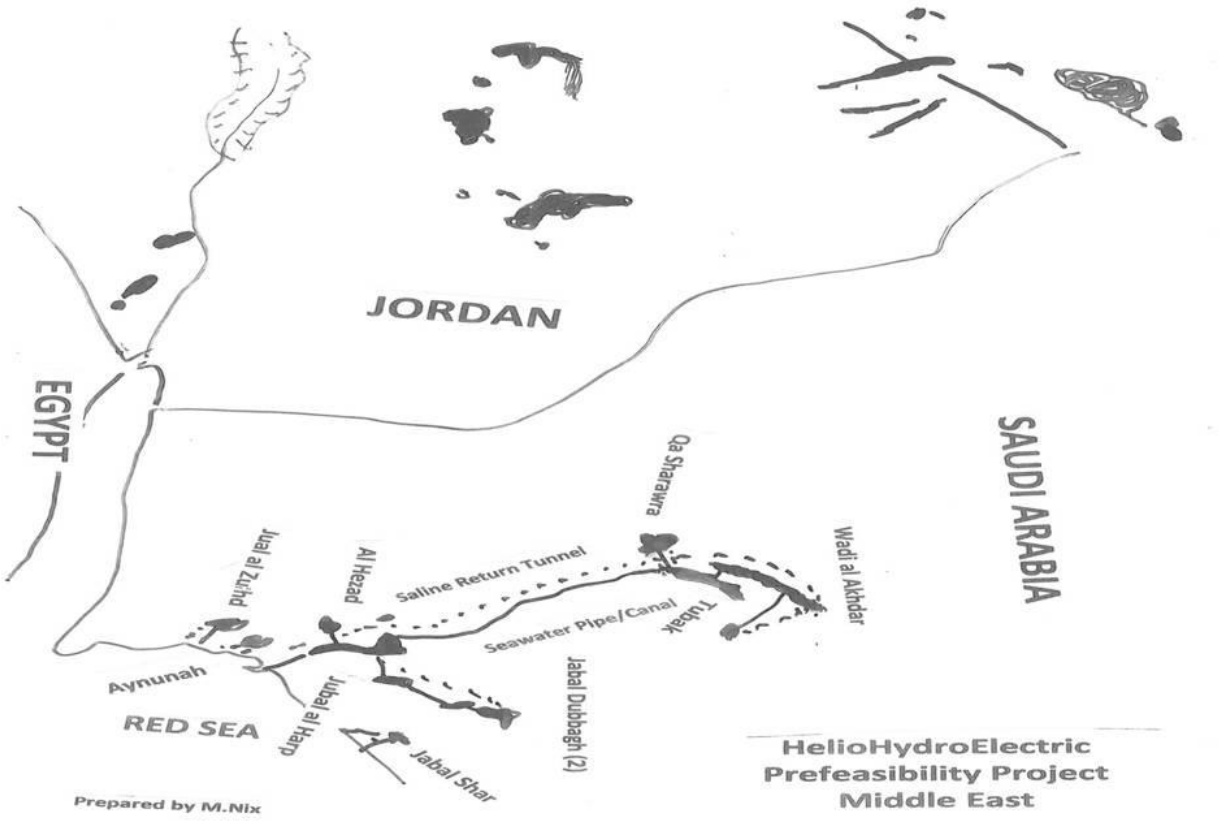
SINAI

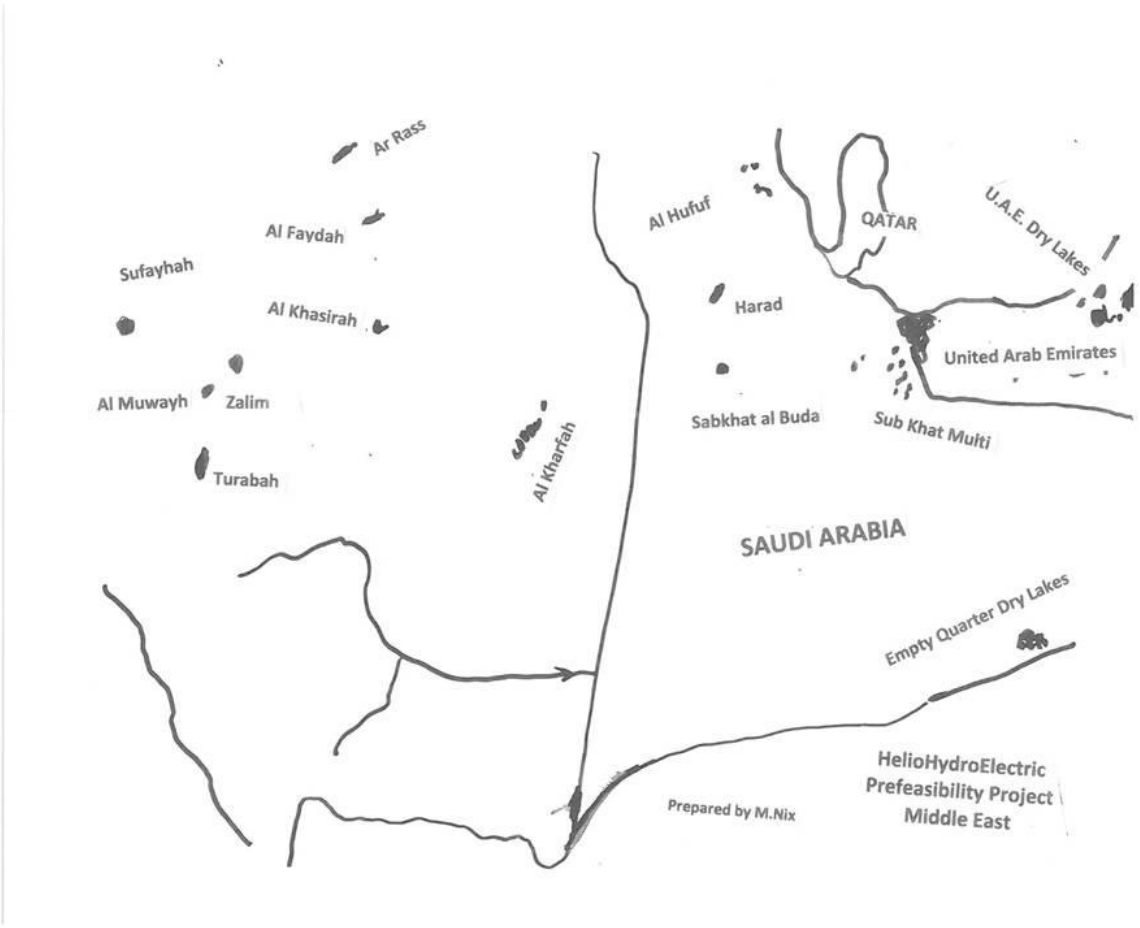
Location	Square Miles	Evaporation Rate/Day	Evaporation Rate/Second	Power
Wadi Arish	100	27,787,840	322	27
Abu Durba	100	27,787,840	322	27
Wadi Quaraya	200	55,756,800	645	54
Wadi Burk	200	55,756,800	645	54
Gabel	200	55,756,800	645	54
Bir Gifgafu	200	55,756,800	645	54
Solar Lake	500	139,392,000	1,613	1
Burdawil	270	75,271,680	871	1
Total:	**1,770**	**493,266,560**	**5,708**	**272MW**



JORDAN

Location	Square Miles	Evaporation Rate/Day	Evaporation Rate/Second	Power
Qa al Juiz	100	27,787,840 Cubic Feet/Day	322 Cubic Feet/Second	27MW
Al El Hafrah	100	27,787,840	322	27
Qa Abu Husayn	100	27,787,840	322	27
Qa al Qutaf	100	27,787,840	322	27
Qa al Wisad	100	27,787,840	322	27
Wadi Gharra	100	27,787,840	322	27
Wadi al Eukuh	100	27,787,840	322	27
Marahidiyah	100	27,787,840	322	27
Misc.Sites	1,000	278,784,000	3,226	546
Total:	1,800	501,086,720	5,802	762 MW




Ar Rass
Al Faydah
Sufayhah
Al Khasirah
Al Muwayh
Zalim
Turabah
Al Kharfah
Al Hufuf
QATAR
U.A.E. Dry Lakes
Harad
United Arab Emirates
Sabkhat al Buda
Sub Khat Multi
SAUDI ARABIA
Empty Quarter Dry Lakes
HelioHydroElectric
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Middle East
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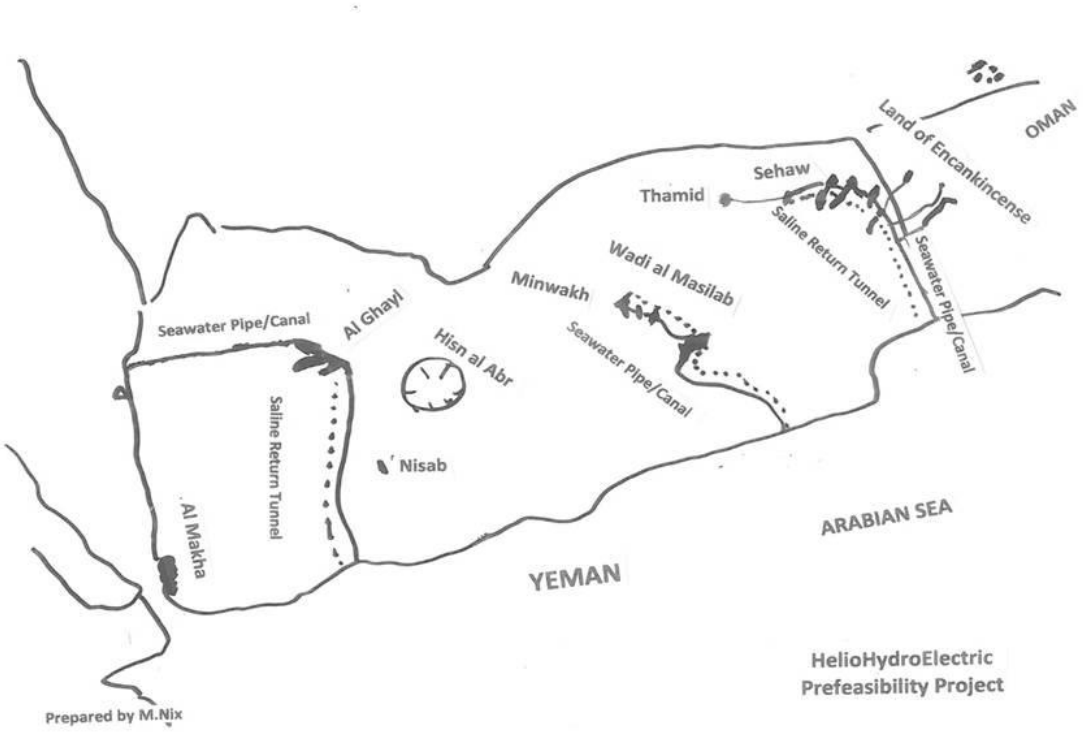
Saudi Arabia

Location	Square Miles	Evaporation Rate/Day	Evaporation Rate/Second	Power
Empty Quarter	200	55,756,800	645	100MW
Qa Sharaura	100	27,878,200	322	27
Jabal Qubbagh	100	27,878,200	322	27
Wadi Al Akhar	100	27,878,200	322	27
Wadi Tuthlith	100	27,878,200	322	27
Wadi Bishahi	100	27,878,200	322	27
Wadi Hanifa	300	83,635,200	968	81
Wadi Risha	100	27,878,400	322	27
Wadi Rummah	370	103,150,080	1,193	100
Wadi al Lith	100	27,878,400	322	27
Wadi Sadiyah	100	27,878,400	322	27
Wadi Fatimah	100	27,878,400	322	27
Wadi Rbigh	100	27,878,400	322	27
Wadi al Agig	100	27,878,400	322	27
Wadi al Jizi	100	27,878,400	322	27
Wadi as Surr	100	27,878,400	322	27
Wadi Jumi	100	27,878,400	322	27
Al Quyatay	100	27,878,400	322	54
Sabkhal Hazakza	200	55,756,800	645	109
Misc.Sites	1,000	278,878,400	3,226	546
Total:	3,570	577,177,280	6,677	1,368MW

U.A.E.

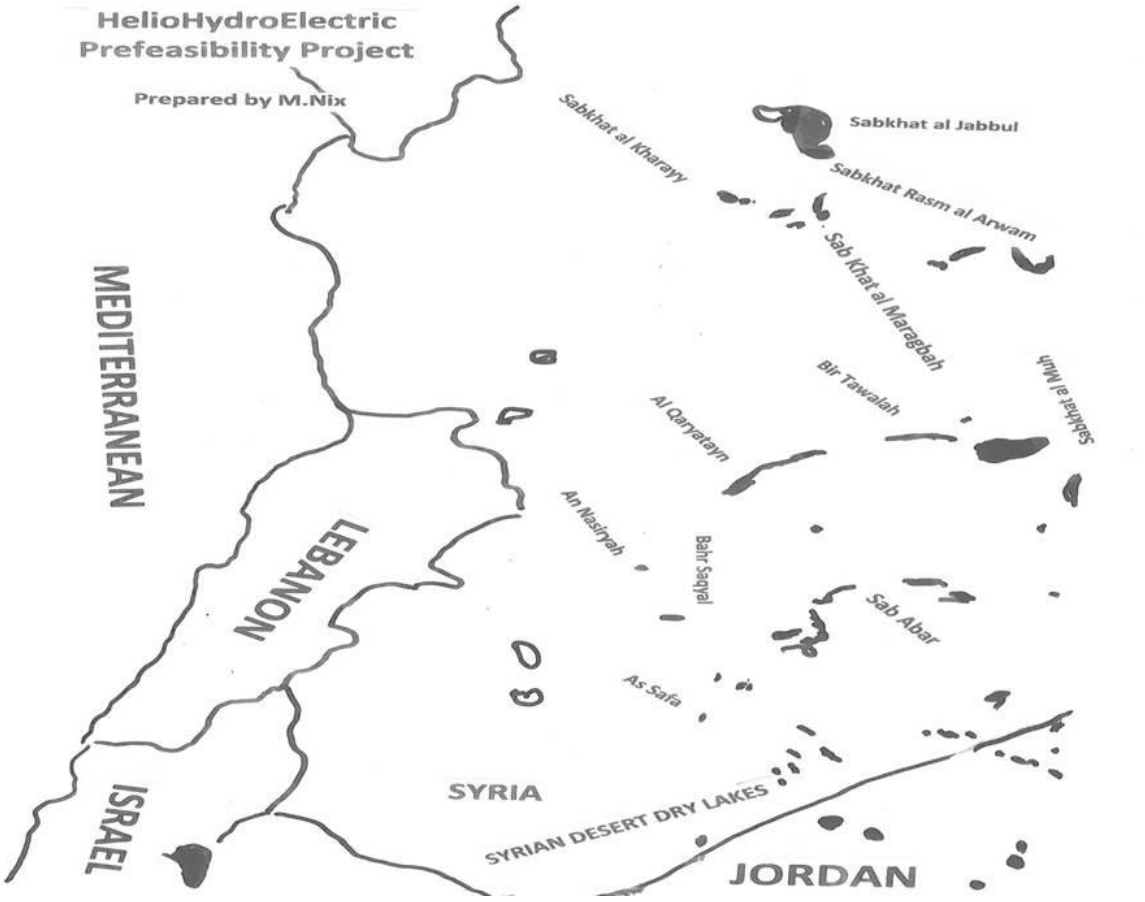
Location	Square Miles	Evaporation Rate/Day	Evaporation Rate/Second	Power
Subkhart Matti	100	27,878,400 cu/ft/day	322 cu/ft/s	1MW
Dry Lakes (East)	100	27,878,400	322	13
Total:	200	55,756,800	644	14MW



Yeman				
Location	**Square Miles**	**Evaporation Rate/Day**	**Evaporation Rate/Second**	**Power**
Al Mikha	**100**	**27,878,400 cu/ft/day**	**322 cu/ft/s**	**8MW**
Al Ghayl	**200**	**55,756,800**	**645**	**327**
Minwakh	**100**	**27,878,400**	**322**	**163**
Wadi Masilab	**300**	**83,635,200**	**968**	**491**
Thamid	**100**	**27,878,400**	**322**	**163**
Sehaw	**300**	**83,635,200**	**968**	**491**
Misc.Sites	**1,000**	**278,878,400**	**3,226**	**54**
Total:	**2,100**	**501,905,600**	**6,773**	**1,697 MW**

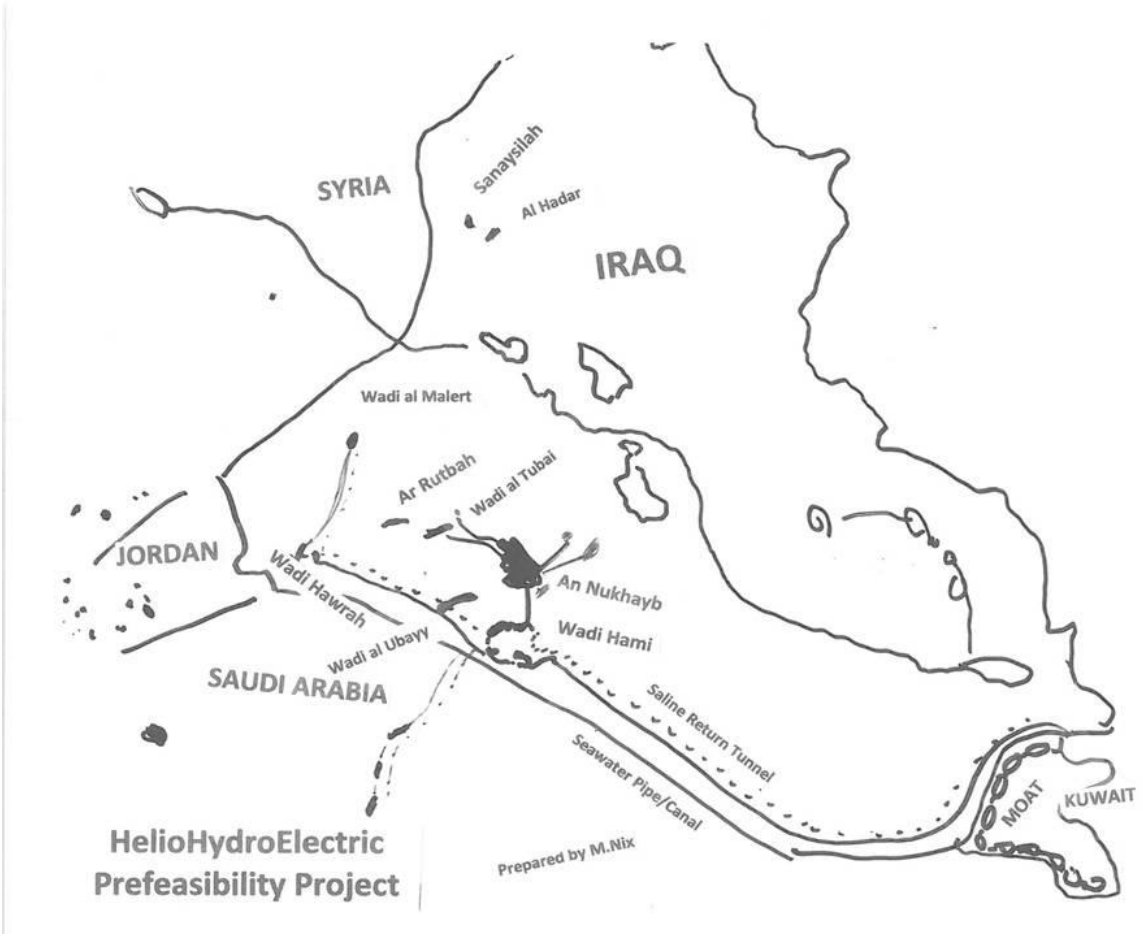
Oman				
Location	**Square Miles**	**Evaporation Rate/Day**	**Evaporation Rate/Second**	**Power**
Mazrag	**100**	**27,787,400 cu/ft/day**	**322 cu/ft/s**	**81 MW**
Rumb	**100**	**27,787,400**	**322**	**81**
Umm as Salin	**1,000**	**278,878,400**	**3,226**	**819**
Daukah	**300**	**83,652,000**	**968**	**81**
Land Encankicese	**300**	**83,652,000**	**968**	**491**
Misc.Sites	**1,000**	**278,878,400**	**3,226**	**546**
Total:	**2,800**	**780,635,600**	**9,032**	**2,099MW**


IMASA
Khor Odeb
ERITHEA
SUDAN
Danskil
DIDHAV
DJOUBOUTI
ETHIOPIA
AFAR
Lake Assab
HelioHydroElectric
Prefeasibility Project
Middle East
SOMALILAND



SYRIA

Location	Square Miles	Evaporation Rate/Day	Evaporation Rate/Second	Power
Wadi Saba	100	27,878,400 cu/ft/day	322 cu/ft/s	27MW
Wadi Fair	100	27,878,400	322	27
Wadi as Sirhan	100	27,878,400	322	27
Wadi Hamir	100	27,878,400	322	27
Wadi Arar	100	27,878,400	322	27
Wadi Batin	300	83,535,200	968	81
Sabkhat Jubbul	38	20,066,006	232	19
Misc.Sites	1,000	278,878,400	3,226	546
Total:	1,838	521,871,606	7,036	781MW



IRAQ

Location	Square Miles	Evaporation Rate/Day	Evaporation Rate/Second	Power
Wadi Hawrah	100	27,878,400	322	100MW
Wadi Hami	100	27,878,400	322	100
Wadi al Tubal	100	27,878,400	322	100
An Nukhyab	1,000	278,784,000	3,226	546
Wadi al Ubayy	200	55,575,800	645	300
Ar Rutbah	200	55,575,800	645	300
Wadi al Malert	100	27,787,400	322	100
Misc.Sites	1,000	278,784,000	3,226	546
Total:	2,800	780,233,200	9,030	2,092MW

TURKEY

Location	Square Miles	Evaporation Rate/Day	Evaporation Rate/Second	Power
Misc.Sites	1,000	278,784,000 cu/ft/day	3,226 cu/ft/s	546MW
Total:	1,000	278,784,000	3,226	546MW

SUMMARY

MIDDLE EAST (Above Sea Level)

Location	Square Miles	Evaporation Rate/Day	Evaporation Rate/Second	Power
Total:	19,301	4,909,545,329 cu/ft/day	58,773 cu/ft/s	10,277 MW

MIDDLE EAST (Below Sea Level)

Location	Square Miles	Evaporation Rate/Day	Evaporation Rate/Second	Power
Total:	8,993	2,283,797,762 cu/ft/day	29,012 cu/ft/s	-1,025MW

MIDDLE EAST (Above and Below Sea Level)

Location	Square Miles	Evaporation Rate/Day	Evaporation Rate/Second	Power
Grand Total:	28,294	7,193,343,091 cu/ft/day	87,785 cu/ft/s	10,277-1,025= 9252MW
