



The Economic and Environmental Impacts of Using the Renewable Energy Technologies for Irrigation Water Pumping and Nanoparticles Fertilizers on Agri -Food Production

Report #1

JUNE 2019

**Funded by: Conflict and Development
Foundation and the Center on Conflict and
Development at Texas A&M University**

Authored by: Shayma AL-Rubaye

Project Description: This one-year project to study into and quantify a portion of the significant benefits of using the Renewable Energy on Agri-Food production, identify the best decision agriculture economics and environmental and display management policies in agriculture in Iraq that can apply to fortify the protection of crops into their products adequately.

Project Status: On Track

Project Summary: The project is moving forward as planned and is on track. Except for some modifications that have been made and which will be explained later.

Project Start Date: Wednesday, 20 February, 2019

Planned End Date: Thursday, 25 June, 2020

Executive Summary

The first phase of the project was completed after the completion of the first season of cucumber cultivation. A farm has been selected in the Quirish village located 31.2 km south of Baghdad to carry out the project. The first phase included the installation of a solar irrigation system and irrigated the farm directly from the well. The desalination system has postponed its installation until after the completion of the first season due to technical issues will be mentioned later.

The Nanoparticles fertilizers were foliar used through four different doses; besides, to the traditional fertilization, that added to the soil as a plant supplement nutrition. There was a significant difference in production, productivity, and plant quality after the use of NPF compared to traditional fertilizers. This difference was significantly reflected in the total revenue of the crop and the costs too.



Quirish village is one of the villages that located in Al-Rasheed district in Baghdad governorate. Al- Rasheed district considered one of the most important agricultural regions in Baghdad. The total area is 24,682.5 hectares. About 18,404.75 ha are cultivation areas from the entire district area — these areas exploited by planting various vegetable crops. Cucumber is the main crop that is cultivated in the area, and its production constitutes about 90 percent of the cultivation of the total crops, as well as tomatoes, okra, eggplant, peas, melons, dates, and citrus. Most farmers are adopting the protection agriculture pattern by using the greenhouses.

Milestones and Materials

1. Preparing for the Agricultural Season

Two greenhouses (9m × 51.5m) have been selected in a farm at Quirish village in Al-Rashid district, south of Baghdad, as we mentioned previously and were prepared for agriculture operations.



¹The two selected Greenhouses with the farmer “Jasim”

¹ These pictures were taken on December 8th, 2018, two months before the season starts.



²Preparing the greenhouses for agriculture

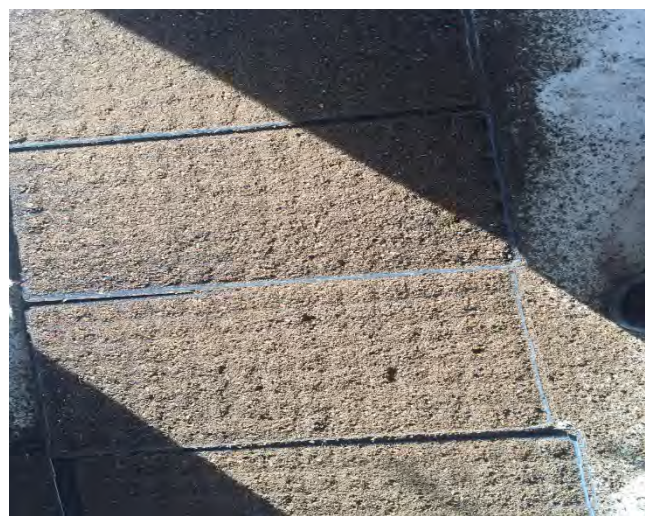
² These pictures were taken on January 17th, 2019, one month before the season starts.

Besides, another greenhouse has been selected to which would use the traditional ways for irrigation and fertilizers and will be compared with the RE methods. it used seeds type "Jamilah" species for cultivation, and it was grown in small plates before being transferred to the soil.



³Preparing the seeds small plates for agriculture

³ These pictures were taken on January 17th, 2019, one month before the season starts.



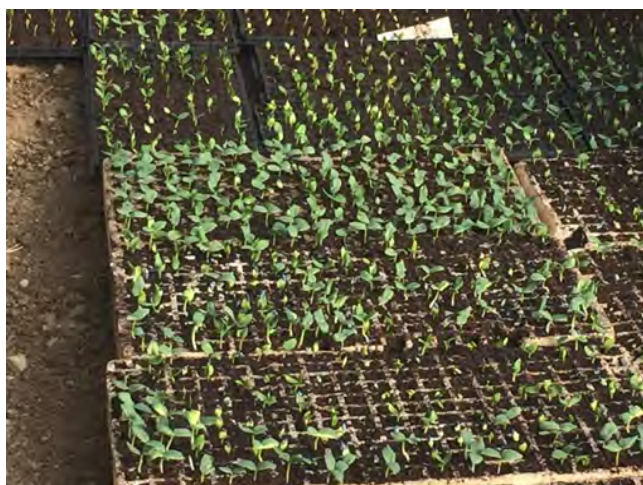
⁴Preparing the seeds small plates for agriculture

⁴ These pictures were taken on January 19th, 2019, one month before the season starts.



⁵Transferring the seeds small plates to the greenhouses

⁵ These pictures were taken on January 22^h, 2019, one month before the season starts.



⁶Preparing to transferring to the soil

⁶ These pictures were taken on January 27th, 2019, three weeks before the season starts

2. Install the Solar Irrigation System

Farmers in the village of Quirish rely on wells to irrigate their crops. Even though there is a small creek of water near the selected farm, but the farmers did not depend on it because of it is not flooding in all time of the year, just in short periods at the beginning of Winter and rapid dryness at the beginning of Spring.

The land of Iraq company, under the management of Engineer Hussein Omar Raja, was employed in installing the solar-powered irrigation system for the farm. The irrigation system can describe as detailed below.



⁷The Irrigation Well Next to The Greenhouses

⁷ These pictures were taken on February 28th, 2019.

The Pump Solar Irrigation System Descriptions



Ard Al Iraq (ICREP Co.Ltd)
Hay Al-Jameea -Baghdad-Iraq
Baghdad
www.lorentz.de

Omar Hussein Raja
Tel: 009647705353853
Fax:
omar.icrep@yahoo.com

Wednesday, December 26, 2018

Shayma Al-Rubaye

Shayma

**964 Baghdad
IRAQ**

Solar pumping project

Parameter

Location:	Iraq, Baghdad (33° North; 44° East)	Water temperature:	25 °C		
Required daily output:	20 m³; Sizing for average month	Dirt loss:	5.0 %	Motor cable:	50 m
Pipe type:	plastic, drawn/pressed, new: 0.007 mm	Static head:	40 m	Pipe length:	50 m

Products

Quantity	Details
PS2-600 C-SJ3-9	1 pc. Submersible pump system including controller with DataModule, motor and pump end
LC300-P72	4 pc. 1,200 Wp; 2 x 2 modules; 33 ° tilted
Motor cable	50 m 10 mm² 3-phase cable for power and 1-phase cable for ground
Pipeline	50 m 40 mm (inner diameter) Pipeline
Accessories	1 set Well Probe, Surge Protector, PV Disconnect 440-40-3, Sun Sensor Module

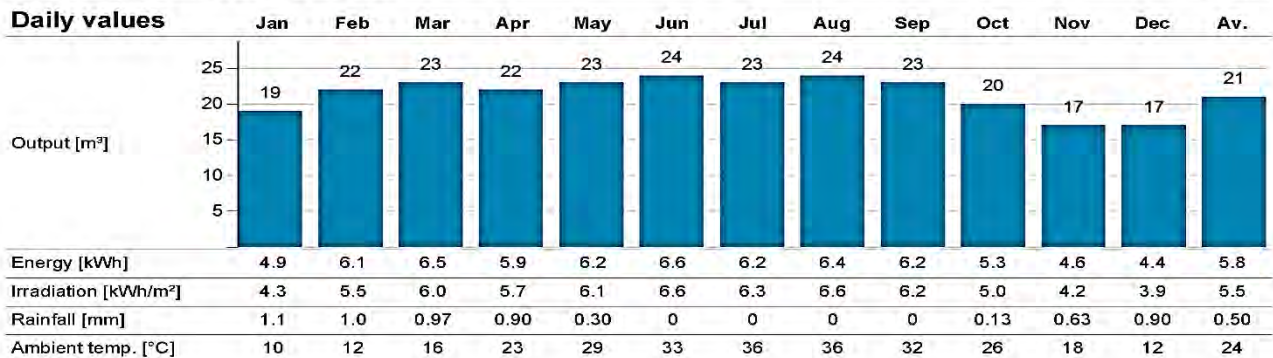
Sun Sensor setting in PumpScanner

min. 150 W/m²

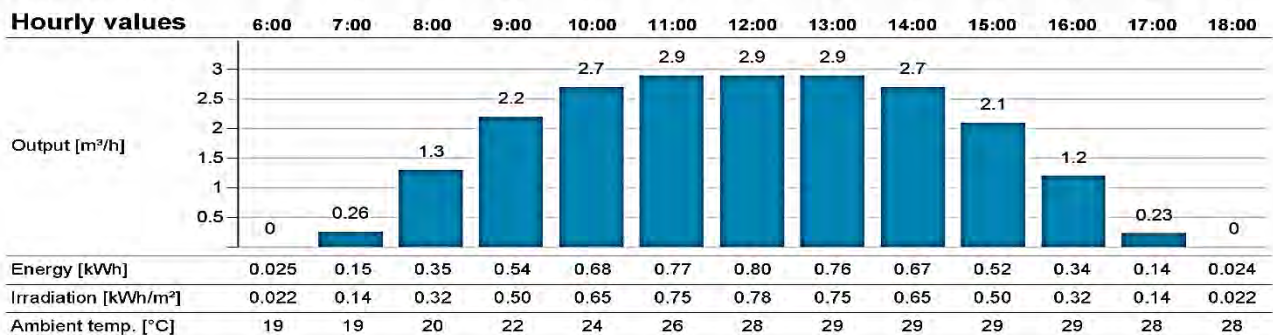
Daily output in average month

21 m³

Daily values



Hourly values



Shayma

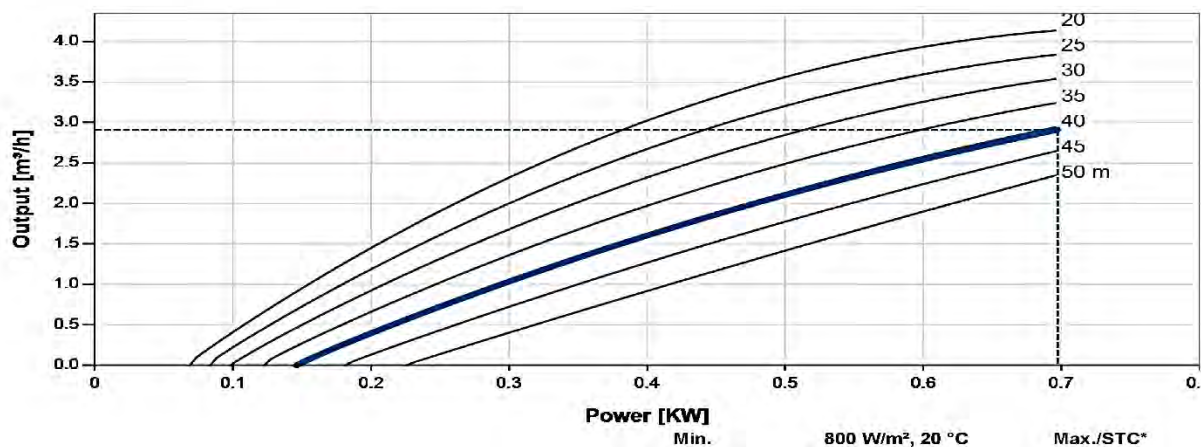
Wednesday, December 26, 2018

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IRAQ

Solar pumping project

System characteristic



		Power [KW]		
		Min.	800 W/m², 20 °C	Max./STC*
PV generator	Cell temperature	[°C]	46	25
	Temperature loss	[%]	8.8	-
	Dirt loss	[%]	5.0	-
	Pmax	[Wp]	832	1,200
	Vmp	[V]	67	73
	Imp	[A]	13	16
	Voc	[V]	82	90
	Isc	[A]	14	18
	Pout	[W]	727	-
	Vout	[V]	75	-
	Iout	[A]	9.4	-
Motor cable	Power loss	[%]	1.4	3.4
Pump systems	Motor power	[W]	146	697
	Motor voltage	[V EC]	43	59
	Motor current	[A]	3.4	12
	Motor speed	[rpm]	2,490	2,960
	Flow rate	[m³/h]	0	2.9
Pipeline	Efficiency	[%]	0	45
	Flow speed	[m/s]	0	0.64
	Friction loss	[m]	0.000	0.65

*STC: Standard test conditions for photovoltaic modules, 1000 W/m² solar irradiance, 25 °C cell temperature



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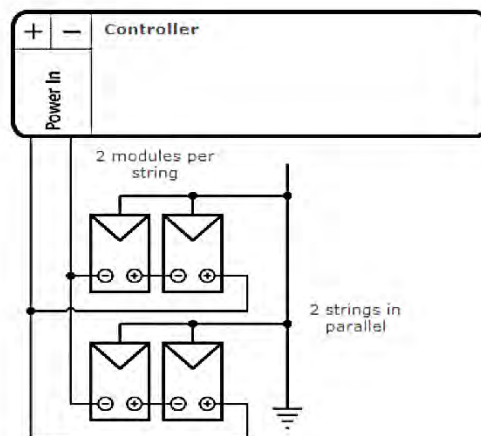
Shayma Al-Rubaye

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Solar pumping project

Wiring diagram



Grounding should be done according to the instructions of the module manufacturer.

Wednesday, December 26, 2018

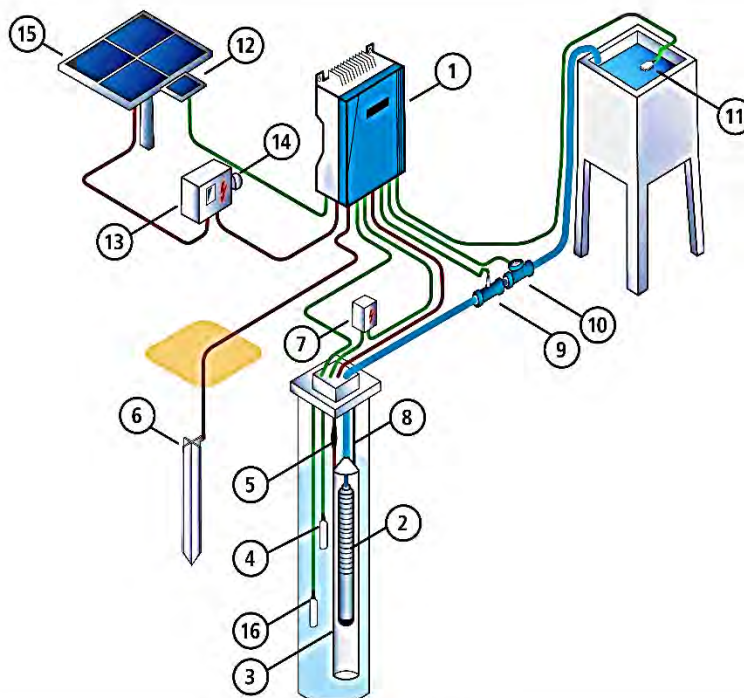
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Shayma

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IRAQ**

Solar pumping project

System Layout



1: PS2 Controller

2: Submersible Pump

3: Flow Sleeve

4: Well Probe

5: Cable Splice Kit

6: Grounding Rod

7: Surge Protector*

8: Safety Rope

9: Water Meter

10: Pressure Sensor

11: Float Switch

12: Sun Switch

13: PV Disconnect

14: Lightning Surge Protector

15: PV Generator

*It is recommended to install a Surge Protector at each controller sensor input.

Wednesday, December 26, 2018

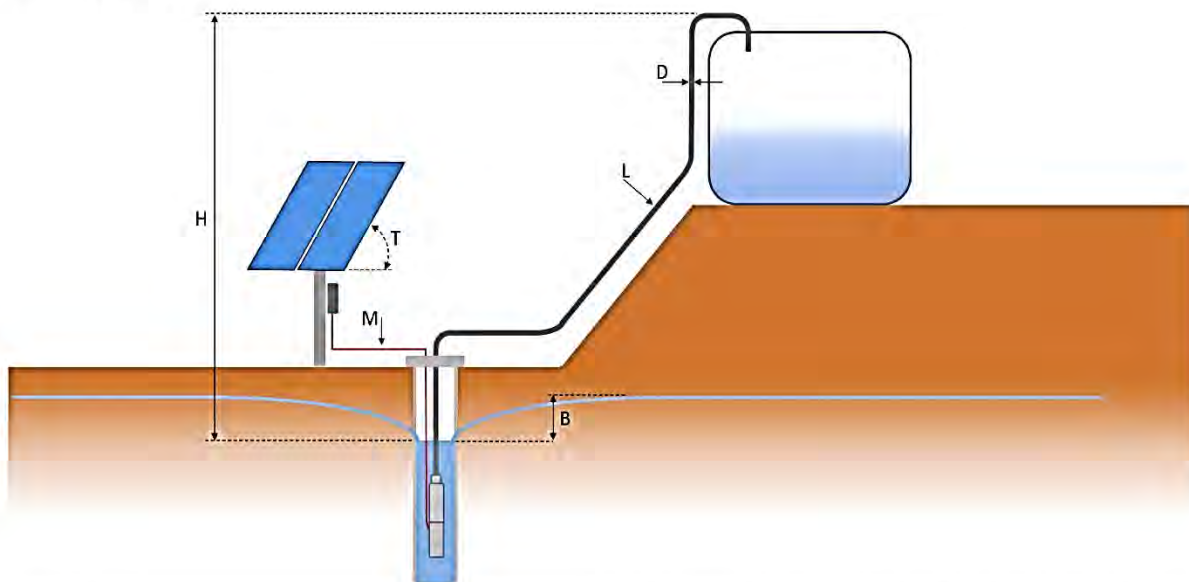
Shayma Al-Rubaye

Shayma

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IRAQ**

Solar pumping project

Sizing Layout



H (Static head):	Vertical height from the dynamic water level to the highest point of delivery.
B (Drawdown):	Lowering of water level depending on flow rate and recovery rate of the well.
D (Pipeline inner diameter)	
L (Pipe length):	Entire pipeline from the pump outlet to the point of delivery. Elbows and armatures must be added as an equivalent length of pipeline.
M (Motor cable):	The cable between controller and pump unit.
T (Tilt angle):	Angle of the PV generator surface from the horizontal plane.

PS2-600 C-SJ3-9

Solar Submersible Pump System for 4" wells

System Overview

Head	max. 50 m
Flow rate	max. 4.1 m³/h

Technical Data

Controller PS2-600

- Controlling and monitoring
- Control inputs for dry running protection, remote control etc.
- Protected against reverse polarity, overload and overtemperature
- Integrated MPPT (Maximum Power Point Tracking)
- Battery operation: Integrated low voltage disconnect

Power	max. 0.70 kW
Input voltage	max. 150 V
Optimum Vmp**	> 68 V
Motor current	max. 13 A
Efficiency	max. 98 %
Ambient temp.	-40...50 °C
Enclosure class	IP68

Motor ECDRIVE 600-C

- Maintenance-free brushless DC motor
- Water filled
- Premium materials, stainless steel: AISI 304/316
- No electronics in the motor

Rated power	0.7 kW
Efficiency	max. 92 %
Motor speed	900...3,300 rpm
Insulation class	F
Enclosure class	IP68
Submersion	max. 150 m

Pump End PE C-SJ3-9

- Non-return valve
- Premium materials, stainless steel: AISI 304
- Centrifugal pump

Efficiency	max. 53 %
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Pump Unit PU600 C-SJ3-9 (Motor, Pump End)

Borehole diameter	min. 4.0 in
Water temperature	max. 50 °C

Standards



2006/42/EC, 2004/108/EC, 2006/95/EC

IEC/EN 61702:1995

The logos shown reflect the approvals that have been granted for this product family. Products are ordered and supplied with the approvals specific to the market requirements.

**Vmp: MPP-voltage under Standard Test Conditions (STC): 1000 W/m² solar irradiance, 25 °C cell temperature

BERNT LORENTZ GmbH
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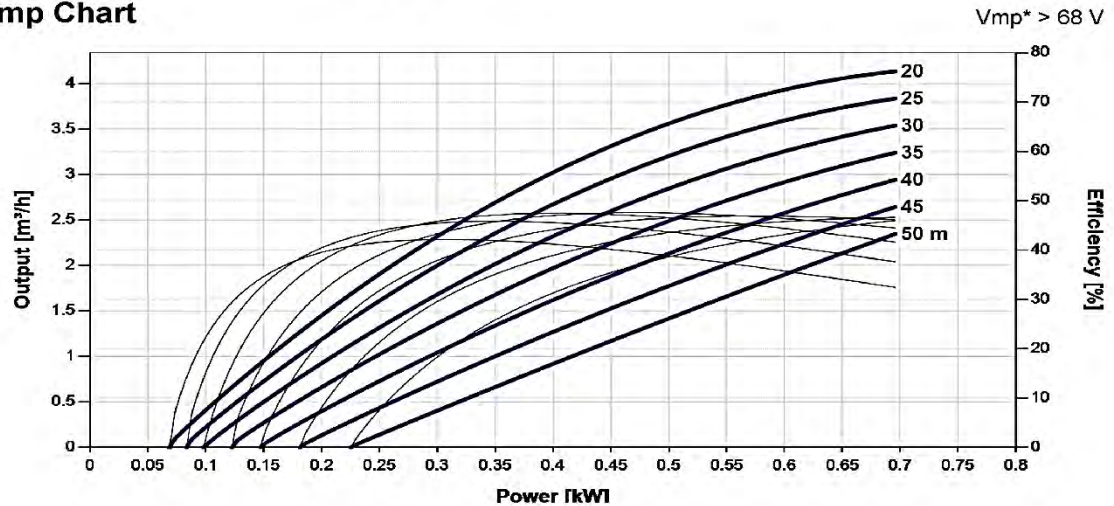
All specifications and information are given with good intent, errors are possible and products may be subject to change without notice. Pictures may differ from actual products depending on local market requirements and regulations.

Sun. Water. Life.

PS2-600 C-SJ3-9

Solar Submersible Pump System for 4" wells

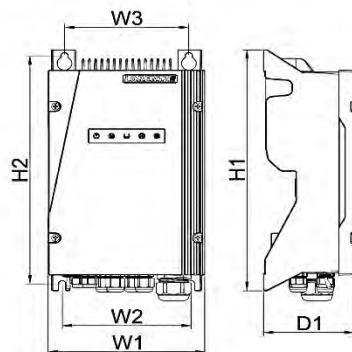
Pump Chart



Dimensions and Weights

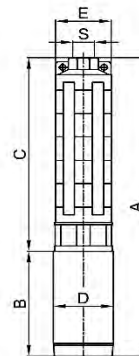
Controller

H1 = 352 mm
H2 = 333 mm
W1 = 207 mm
W2 = 170 mm
W3 = 164 mm
D1 = 124 mm



Pump Unit

A = 545 mm
B = 185 mm
C = 360 mm
D = 96 mm
E = 98 mm
S = 1.25 in



	Net weight
Controller	5.6 kg
Pump Unit	12 kg
Motor	7.0 kg
Pump End	4.5 kg

*V_{mp}: MPP-voltage under Standard Test Conditions (STC): 1000 W/m² solar irradiance, 25 °C cell temperature

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Sun. Water. Life.







⁸Installing the Solar-Powered Irrigation System in The Farm

⁸ These pictures were taken on February 28th, 2019.



3. Water Desalination System

Water Quality

The population of Quirish village depends on the wells to irrigate their farms, which are characterized by high salinity, the TDS of water ranging between 3000-4500 mg/l in Winter and more than 8000mg/l in Summer(Table 1).

The high rates of salinity of the water lead to the deterioration of the soil and the decline of fertility and therefore have a significant impact on the crops planted in it as well (low productivity and poor quality).

There is no local water distribution network for domestic use, and this is another issue facing farmers; however, they cannot use the wells to meet their daily needs due to poor water quality and high salinity.

The primary and only source of water for domestic use is the Reverse Osmosis (RO) water system, which was established by the UN in 2004 as a temporary measure of water availability until the government provides a water distribution network for the entire village. However, this measure has not yet been implemented, and the population continues to rely on this system to provide water for their domestic use.

Table 1: ⁹The Analysis Results of Testing One Sample of Water from The Well in The Selected Farm

College of Agricultural Engineering Sciences
Water, Soil, Plant Lab

Name: Shayma AL-Rubaye

No. of Samples: 1

Type of Water	SAR	TDS Mg/l	Dissolved Ions						PH	Ec Dsm ⁻¹	Sample Code
			Cl Mg/l	SO ₄ Mg/l	HCO ₃ Mg/l	Na Mg/l	Mg Mg/l	Ca Mg/l			
C ₄ S ₁	1.54	3328	46.30	2.85	2.50	7.31	23.00	21.51	7.81	5.2	1 water

C₄S₁: Very High Salinity, Low Sodium

⁹ The sample was taken on February 10th, 2019. Ten days before season starts

¹⁰Care-Free Water Conditioners

The Care Free Water Conditioner is an in-line catalytic water treatment system. It operates by a combination of the following:

1. The turbulence of the water through a specially designed catalytic chamber.
2. The creation of a small electrical field around the chamber casing.

This combination causes a separation of the mineral particles in the water, which changes their behavior. Particles, which were previously attracted to each other, now repel and separate into smaller individual particles. This allows the ‘separated’ mineral particles and salts to flow through the system with minimal interference.

This natural water treatment system has helped tens of thousands of people around the world solve their water problems and improve their water quality. They include householders, farmers, vineyards, market gardeners, golf courses, nurseries, local councils, government departments, hospitals, commercial and industrial concerns.

Care Free Water Conditioner holds several patents for its discoveries. One of these discoveries is that this system could significantly reduce salinity in the soil and greatly increase the quality of water supply. Even though this is typically way too expensive for agriculture but, since we have water problems, and most of the farmers depend on groundwater as the primary source of irrigation which has a very high level of salinity, besides, the government until now didn't provide the solutions of this problem, so this way would be a suitable chose for farmers to adopted this methods for staying in agriculture; especially, most of them don't have any other income source.

¹⁰ Visit <https://www.carefree.com.au/> to see more information about the system.

Current Challenges

The purchased had been done by the Middle East's dealer, which is located in Bahrain as it is a closer one to Iraq. The problem that faced is there are restrictions on the shipping of equipment and supplies from Bahrain to Iraq due to political matters. The only allowed to ship is the documents stuff shipment. The dealer tried many things to make the shipping happen through Bahrain, but the things are not going on as its plan. So finally, he decided to ship it to the UAE and then ship to Iraq since there are no restrictions on the shipment between Iraq and UAE.

Therefore, the carefree water conditioner has not used in the first season due to the delay receiving. It will be installed on the farm by the beginning of July. The next season will start in the middle of September, so this will be an excellent opportunity to use the water conditioner for washing the soil from the salinity and prepare it to the upcoming season.

4. Nanoparticles Fertilizers

The Nanoparticles fertilizers has been applied on the plant in the first season. The ¹¹Super micro plus is the one that it used to fertilize the plant. Super micro plus is an Iranian product and consists of 11 basic elements required by plants in the form of absorbable ions with following percentages: (N 5% + Cu 0.65% + Mg 6% + K 3% + Mn 0.7% + Zn 8% + Fe 4.5% + P 3% + Ca 6 % + B 0.1%+ MO 0.65%) Advantage This product according to the type of manufacturing can be used in all climatic conditions. The fertilizer with the appropriate amount of nutrients for plants, in a short time can show the effects and bring a significant increase in performance in horticultural products and crops, field and greenhouse. Since the availability of soil analysis in many cases is not possible. This product can provide a good balance of nutrients needed for plants in the soil at the beginning of consumption. Such a combination compensates any potential shortfall in the soil and it is an excellent

¹¹ Visit http://www.sepehrpamis.com/en_US/Pages/List/Grid/Synthetic_Fertilizers for more information.

fertilizer that provide the plant needs to be supplied, existence of elements and amount balancing of them in.

The Fertilizer was foliar spraying given after 20 days of planting with four different doses according to plant growth stages (1, 1.5, 2, 2.5 g / L). The dose duration was ten days for the first three doses and 25 days for the last one.



¹²Foliar Spraying of the NPF

¹² See more pictures in the Appendix.





The Effects of Using the NPF On the Plant

1. Qualitatively

A significant difference was observed in the quality of production of the NPF plant than the TF fertilizers production plant and at all stages of plant growth.

The NPF has improved the general characteristics of the plant from the leaf area, the stem length, the number of fruits, and weight. Also, the plant showed high resistance to diseases and insects through the decrease of the number of times of combat compared to plants used the TF fertilizers.

So, this is due to the availability of more space for the various metabolic reactions of the plant, which increases the photosynthesis and it keeps the plant from different stresses vital and non-vital. Thus, encouraging the application of metal elements and increasing the dry matter and yield of the crop.





The Plant Which
Fertilizes by The
Nanoparticles Fertilizers



The Plant Which Fertilizes by The
Traditional Fertilizers



2. Economically

Using the Nanoparticles fertilizers have a significant impact on increasing the productive efficiency of the cultivated area as it increases the profitability of farms as a result of reducing the costs of fertilization. Also helps to reduce the consumption of resources and energy. Thus, it is leading to the achievement of economic expansion with the safe environment. The application of Nanoparticles fertilizers in the agricultural field contributes to increasing productivity per unit area of different crops, increase the quality of fruits, and increase their competitiveness by reducing the residues of fertilizers and pesticides. It also preserves the soil and reduces the contamination of groundwater with the residues of different fertilizers. Then this is reflected economically by reducing the expenses and thus increasing the profitability of different crops.

After using the NPF in the first season, there was a significant difference in agricultural production between the plants used in the NPF and plants used the TF. The economic efficiency was achieved after using NPF by reducing the costs and increasing productivity, thus increasing the economic benefits of the farmer and as a result, increasing profit (Table 2).

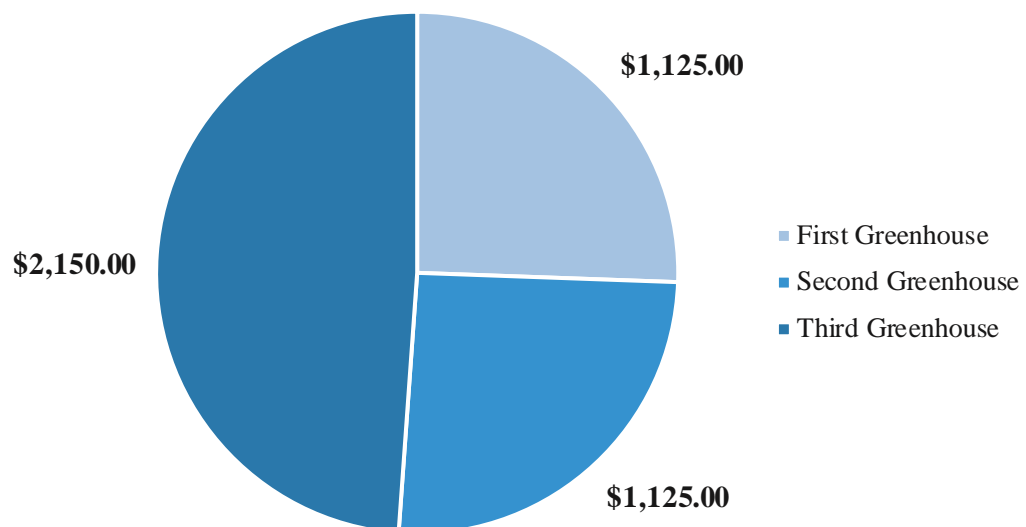
Activity-Based Cost

Season one, 20 February, 2019 to 09 June 2019

Summary

	Season one First Greenhouse	Season one Second Greenhouse	Season one Third Greenhouse
	First Greenhouse	Second Greenhouse	Third Greenhouse
Direct Costs	\$1,075.00	\$1,075.00	\$2,100.00
Indirect Costs	\$50.00	\$50.00	\$50.00
Product Cost per Unit	\$1,125.00	\$1,125.00	\$2,150.00
General Costs	\$4,534.00		\$0.00
Total Production Costs	\$6,784.00		\$2,150.00

Product Cost per Unit



Direct Costs

	First Greenhouse	Second Greenhouse	Third Greenhouse
	First Greenhouse	Second Greenhouse	Third Greenhouse
Tradition Fertilizers	\$250.00	\$250.00	\$700.00
Seeds	\$200.00	\$200.00	\$200.00
Pesticides	\$300.00	\$300.00	\$650.00
Management Cost	\$150.00	\$150.00	\$250.00
Nanoparticles Fertilizers	\$50.00	\$50.00	\$0.00
Other Direct Cost	\$125.00	\$125.00	\$300.00

Indirect Costs

	First Greenhouse	Second Greenhouse	¹³ Third Greenhouse
	First Greenhouse	Second Greenhouse	Third Greenhouse
Marketing	\$50.00	\$50.00	\$50.00

¹³ The owner himself had covered the total cost of the third greenhouse; we just have taken the data.

General Costs

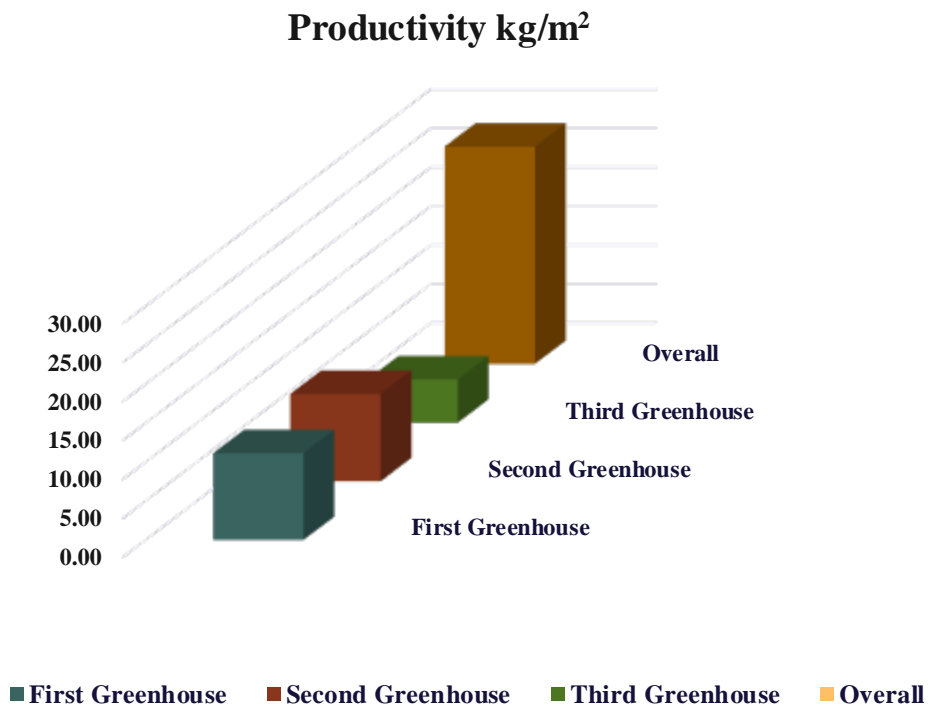
	General Cost
Solar Irrigation System	\$3,500.00
Carefree Water Conditioner	\$729.00
Transportations	\$250.00
Laboratory analysis	\$45.00

Production (kg)

Date	First Greenhouse	Second Greenhouse	Third Greenhouse	Overall
4/2/2019	200	210	120	530
4/8/2019	327	332	262	921
4/12/2019	312	302	180	794
4/16/2019	336	365	265	966
4/22/2019	362	309	170	841
4/25/2019	407	469	130	1006
4/30/2019	560	575	170	1305
5/7/2019	553	542	200	1295
5/12/2019	507	498	176	1181
5/18/2019	322	352	190	864
5/22/2019	276	291	143	710
5/27/2019	286	286	188	760
5/31/2019	263	220	157	640
6/3/2019	247	234	111	592
6/8/2019	203	217	100	520
Total	5161	5202	2562	12925

Productivity (kg/m²)

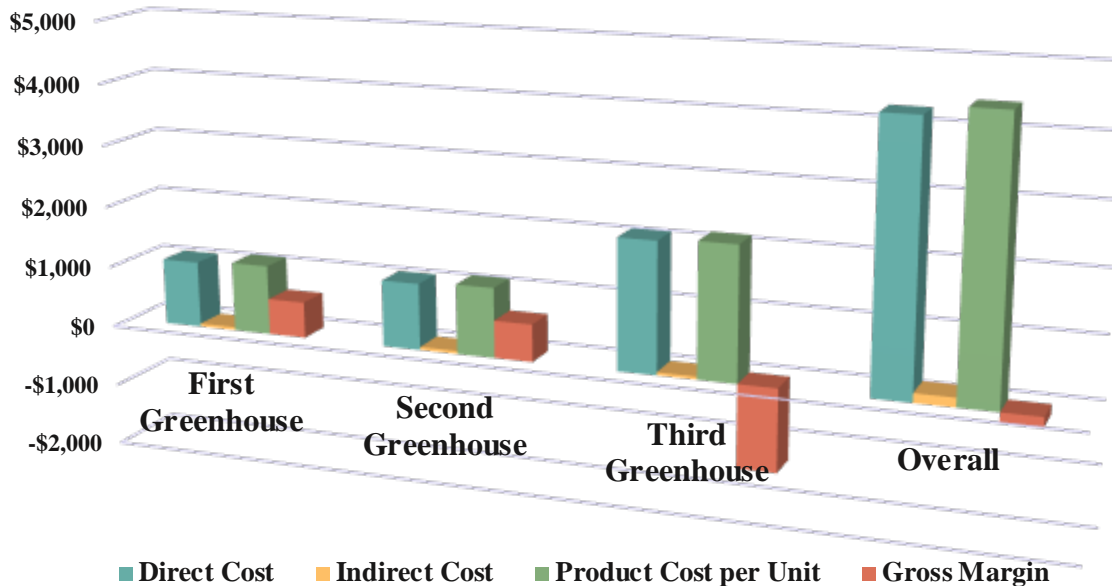
	First Greenhouse	Second Greenhouse	Third Greenhouse	Overall
Productivity	11.13	11.22	5.53	27.89
Weighting	40%	40%	20%	100%







Revenues (ID)

Price \$	First Greenhouse	Second Greenhouse	Third Greenhouse	Overall
\$0.29	\$58.33	\$61.25	\$35.00	\$154.58
\$0.29	\$95.38	\$96.83	\$76.42	\$268.63
\$0.27	\$84.50	\$81.79	\$48.75	\$215.04
\$0.25	\$84.00	\$91.25	\$66.25	\$241.50
\$0.29	\$105.58	\$90.13	\$49.58	\$245.29
\$0.33	\$135.67	\$156.33	\$43.33	\$335.33
\$0.38	\$210.00	\$215.63	\$63.75	\$489.38
\$0.42	\$230.42	\$225.83	\$83.33	\$539.58
\$0.42	\$211.25	\$207.50	\$73.33	\$492.08
\$0.42	\$134.17	\$146.67	\$79.17	\$360.00
\$0.42	\$115.00	\$121.25	\$59.58	\$295.83
\$0.29	\$83.42	\$83.42	\$54.83	\$221.67
\$0.21	\$54.79	\$45.83	\$32.71	\$133.33
\$0.25	\$61.75	\$58.50	\$27.75	\$148.00
\$0.21	\$42.29	\$45.21	\$20.83	\$108.33
Total	\$1,706.54	\$1,727.42	\$814.63	\$4,248.58

Profitability Chart



Profitability Analysis:	First Greenhouse	Second Greenhouse	Third Greenhouse	Overall
Revenue per Greenhouse	\$1,706.54	\$1,727.42	\$814.63	\$4,248.58
Weighting	40%	41%	19%	100%

Production Cost	First Greenhouse	Second Greenhouse	Third Greenhouse	Overall	Trend
Direct Cost	\$1,075	\$1,075	\$2,100	\$4,250	
Indirect Cost	\$50	\$50	\$50	\$150	
Product Cost per Unit	\$1,125	\$1,125	\$2,150	\$4,400	
Gross Margin	\$582	\$602	-\$1,335	-\$151	

Up Coming Steps

1. As mentioned before, at the beginning of July, the Carefree water conditioner will install on the farm and start washing the soil in the first and the second greenhouses.
2. The second season the NPF will apply too but this time in three greenhouses instead of two, as one of them still using the regular irrigation water, and that to see the differences after treating the irrigation water.
3. Start applying the NPF to the irrigation water and fertilize the plant and understand its impacts on soil and plant.
4. The first Open Field will be held at the end of season two, and that to show the affections of using the RE in Agriculture.
5. It will keep using the cucumber as a selected plant in this project.

Appendix

MORE PICTURES OF THE PROJECT







THE INVOICE OF THE SOLAR IRRIGATION WATER SYSTEM

Iraq Land
General Contracting &
Renewable Energy Projects Co. Ltd.



ICREP
Iraq Land

شركة شموخ ارض العراق
للمقاولات العامة و مشاريع خدمات
الطاقة المتجددة المحدودة

No.:

Date: 10 / 6 / 2019

العدد :

التاريخ :

INVOICE

ITEM	Quantity	USD
pump + controller PU600 C-SJ3-9, Rp 1 1/4", UL Item Code: 10-001045 Customs Code: 84137089 Submersible Pump Unit, Multi-stage Centrifugal Pump, ECDRIVE 600-G + (PS2-600 Controller-0.7kVA 1 pc 510.00 Item Code: 07-000520 Customs Code: 85044084 Pump Controller, Data module, Solar(PV) operation)	1 set	1368
solar modules(4 pcs. of 300w poly type)	4 pcs.	537
solar structure(set)	1 set	160
well probe for submersible pumps Item Code: 19-000000 Customs Code: 90269000 Water level sensor for dry run protection. POM protection enclosure, max. 5 bar	1 piece	44.5
cable splice kit Item Code: 19-000010 Customs Code: 90269000 Submersible cable splice kit for ECDRIVE, 2.5 to 5sqmm	1 set	10.5
water pipe	1 set	60
wiring and connections	1 set	50
PV Disconnect 440-40-3 Item Code: 19-000138 Customs Code: 85365080 PV disconnect switch 440VDC40A, 3 string, plastic box, IP54	1 piece	120
external FREIGHT COST		600
internal transport		150
INSTALLATIONS		400
TOTAL COST		3500


Executive Director
Omar Hussein Raja
 10 / 6 / 2019



07808641579 - 07705353853 موبایل - شارع الربيع - حى الجامعة - بغداد

Iraq - Baghdad - Hay Al-Jameaa Mob.: 07808641579 - 07705353853

E-mail: omar.icrep@yahoo.com

CAREFREE WATER CONDITIONERS INVOICE



WWW.CAREFREEMIDDLEEAST.COM

TOLL FREE: 8001 8090

PRO FORMA INVOICE

Invoice ID :	2002201901	Vendor Name :	CF Middle East	Customer Name :	Shayma Al-Rubaye
Invoice Date :	20 February 2019	Address :	Manama	Address :	Baghdad
Valid for :	7 Days	City/State:	Bahrain	Country:	Iraq
Quote Reference :	INT2131 - Revised	Phone :	+973 39938090	Phone :	00964 7807169100
PO Reference :	NA	Vendor POC :	Jerin George Mathew	Customer POC :	Ms. Shayma Al-Rubaye
Project Name :	Private	Email :	jerin.mathew@carefreemiddleeast.com	Email :	alrubaye35@gmail.com

Payment Terms	Payment Due Date
Bank Transfer	20 February 2018

Bank Account Details			
Bank Name :	National Bank of Bahrain	Account Name :	CF Middle East
Branch Name :	Main Branch - Manama	A/C Number:	0099634112
IBAN Number :	BH69NBOB00000099634112	Branch Address:	Main Branch
Swift Code :	NBOBBHBM	:	Manama

S.No	QTY	Units of Issue	Description of Supply or Service	Unit Price (USD)	Total Price (USD)
1	1	EACH	CF 6 MK II with power regulator	729.00	729.00
Total Amount USD Seven Hundred Twenty Nine Only					729.00

carefree®
Water Conditioners
CF Middle East W.L.L
CR. No. 116277-01
Kingdom of Bahrain

Warranty:

- Life Time Replacement warranty on the water conditioner
- One Year warranty on power adaptor

Note:

- This Invoice is the warranty Certificate

STANDARD TERMS AND CONDITIONS:

- The customer is solely responsible for determining the suitability of all products purchased
- Price quoted is on ALL or NOTHING basis.
- Unless stated, quote does not include installation, service or maintenance.
- Customs Duties and Taxes if applicable will be charged extra unless the end user provides proper customs exemption documents
- All warranties shall be per Manufacturer published terms and conditions.
- Shipping/Transportation costs for warranty claims will be charged additional wherever applicable.

Delivery To

To be confirmed by the client.

Vendor - Signature & Stamp

CF Middle East
Manama, Bahrain


carefree
Water Conditioners
CF Middle East W.L.L
CR. No. 116277-01
Kingdom of Bahrain