

World Vegetable Center



Water Scarcity and Irrigation Efficiency in Egypt

35th International Vegetable Training Course "Vegetables: From Seed to Table and Beyond" Module 1

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وزارت الزراعة واستصلاح الأراضم Ministry of Agriculture and Land Reclamation



Agricultural Research Center



I wish to express my appreciation to two our organizations AVRDC/World Vegetable Center and AARDO for giving me the opportunity to join for this training course.

□ I am deeply grateful to all stuff members of the training course.

Responsibilities

Research

Production

Extension and Training





Transplanting management of indigenous vegetable crops

Integrated pest management



Irrigation for vegetables

Water Scarcity and Irrigation Efficiency in Egypt

INTRODUCTION



Why ?!

> Population growth

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➢ Water Scarcity

Sectors competition

Food security

Pollution & emission —

Cost of new resources

Ever-increasing population led to increasing pressure on water & Land resources

Limited conventional resources and nonconventional ones, while increasing demand

Increasing sectors demand (irrigation, drinking, industry, ... etc.)

Rural poor need to withstand the limited food availability which is mainly a water dependent issue

Ever-increasing water and environment pollutants destroy the main elements in the food-chain

Lack of available financial resources required for new resources investments.



Egypt has a large and growing population currently estimated at over 95 million and expected to rise to exceed 140 million by the year 2050 if present growth rates continue. The country is almost entirely desert with virtually no rainfall.

Figure 1: Irrigated Land Use

reclaimed lands



Source: (El-Nahrawy, 2011)

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Figure 2: Centre pivot sprinkler irrigation system in Egyptian desert for field crops and vegetables and fruit trees









The country's renewable water resources are restricted to the flow of the Nile River, although there is limited exploitation of non-renewable underground water in the oases of the Western Desert. Egypt's share of the Nile River flow is governed by a treaty signed with its southern neighbour Sudan in 1959 and set at 55.5 billion cubic meters per year.

جدول (1) : الموقف الحالي للموارد المائية حتى عام 2017 بمصر (مليار م³ سنويا). Table 1: Water resources in Egypt (billion m³ / year)

المصدر	2004	2017
Source	2007	2011
نهر النيل Nile River	55.5	55.5
المياه الجوفية Ground water	6.9	8.4
إعادة استخدام مياه الصرف الزراعي Drainage water reuse	4.9	7.4
إعادة استخدام مياد الصرف الصحي المعالج Treated sewage water reuse	1.4	1.4
عائد إلى النيل Return to Nile	4	4
الأمطار Rain fall	1.3	1.3
اسماك Fisher	0.4	0.4
الإجمالي Total	74.4	78.4

Figure 2: Current and Future Water Resources Availability



Since the national water supply is fixed at this amount, continued population growth means increasing national water scarcity, and Egypt is already well under the international standard of 1,000 cubic meters per person per year. **Over 85% of the annual water** supply is devoted to agricultural production.



OBJECTIVES





Objectives

Ensure sustainable optimum use of water and land resources

➢ Increase the economic return in the project command areas by optimizing the use of available water resources

➢ Increase the agriculture productivity, hence, increasing the farmers income and improving the quality of life

- Improve the water delivery to water users through irrigation and drainage networks
- Change from surface irrigation to drip irrigation in the vegetable farms in the old lands
- Time is expected to achieve the hopeful results: Two years at least





What activity !

- Two Locations: Nile Delta
 Drip Irrigation
 - Considering:
 - Climate conditions
 - Soil Type: Texture, pH,CaCO3
 - Secondary sources
 - 1- drainage re-use
 - 2- GW level

When ?

Two seasons in the cropping cycle:

Summer season: May to August-September

Winter season: September-October to April

Winter season 10 m³/fed/day

Summer season 40 m³/fed/day **Crop rotation:** Maize - Peas

Cucurbits – Cabbage/Onion/Garlic

Yearly average 25 m³/fed/day

Who! **Target groups** Small farmers, Rural poor in Nile Delta, other Stakeholders



➤ The rate of evapotranspiration (ETveg) is necessary to sustain optimal growth vegetable crop (mm/day).

➢ For high yield crop production, the matric potential is 30 centibar and thus can be measured by tensiometer.

➢ Knowing an accurate run time will save cost, labor and energy.



- Efficiency (Ea) of drip irrigation 80-95% than surface irrigation (50-70%) and the water distribution can be checked.
- Where to obtain water for irrigation?
 - ✓ Surface irrigation X Ground water
- **How to apply drip-irrigation method to our locations?**
 - Pipes (riser, lateral, sub-mainline, main line)
 - Pipe size
 - Select the pump

Use antitranspirants/polymers/humic acid/organic amendments



Table 2: Budget

WHAT resources we need?

#	ltem	Cost
1	Tools and Equipment's	US \$ 2000
2	Materials & Operating Costs	US \$ 1000
3	Salaries & Wedges	US \$ 1500
4	Office supplies	US \$ 1000
5	Travel and Transportation	US \$ 1500
6	Other costs	US \$ 500
7	Indirect costs	US \$ 1000
8	Total	us \$ 8500
9	Total costs till finished	8500 x 2 x 2 =
		us \$ <mark>34000</mark>

Time Table

Table 3: Illustrative time schedule for activities that accomplish the project objectivesSeason 2017

Activities	J	F	м	Α	м	J	J	Α	S	0	N	D
1.Constractions												
2.Vegetable crop cultivation and definition					S				W	W		
3.Harvesting and storage				W				S	S			
4.Traning and extension												
5.Monitoring of implemented project												
6.Traning of farming												
7.Extension visit												
8.Statistical and report												
9.Workshop and exhibition arrangement												

Season 2018

Activities	1	F	м	Α	м	J	J	Α	S	0	N	D
1.Constractions												
2.Vegetable crop cultivation and definition					S				W	W		
3.Harvesting and storage				W				S	S			
4.Traning and extension												
5.Monitoring of implemented project												
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Advantages of Drip Irrigation:

- Maximum use of available water
- No water being available to weeds
- Maximum crop yield
- High efficiency in the use of fertilizers
- Less weed growth and restricts population of potential hosts
- Low labour and relatively low operation cost
- No soil erosion
- Improved infiltration in soil of low intake
- No runoff of fertilizers into ground water
- Less evaporation losses of water as compared to surface irrigation
- Improves seed germination.
- Decreased to tillage operations.

CHALLENGES/CONSTRAINS

- Population and demographic pressures,
- Climatic change,
- Rapid urbanization,
- Unsustainable water use practices, and
- Water quality deterioration

Expected Results:

- Possibility of using the saved water with a value of 4500 CM/fed/year for cultivating about 145000 fed of high-cash crops.
- Operation cost will be reduced to about 50% together with improving the water management.
- Increase the efficiency of field irrigation from 25% to 30% which means saving in irrigation water (500 MCM/year).
- Add new agriculture land as a result of changing from surface irrigation system to a pipeline ones (achieve an annual return of about (US\$ 1350/fed/year).
- Increase the main conventional summer and winter crops by about 12% as a result of the continuous flow application



Thank You and Wish You All the Best

Eat more vegetables ناکل خضروات اکثر



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