



# Impacts of climate change on agricultural productivity in selected crops



اثر التغيرات المناخية في إنتاجية بعض  
المحاصيل الزراعية

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# *Climate Change Adaptation Solutions for the Green Sectors NENA Region*

## *ACCWAM*

- This project implemented in a partnership among GIZ , FAO, ACSAD, and ESCWA



german  
cooperation  
DEUTSCHE ZUSAMMENARBEIT



ACSAD

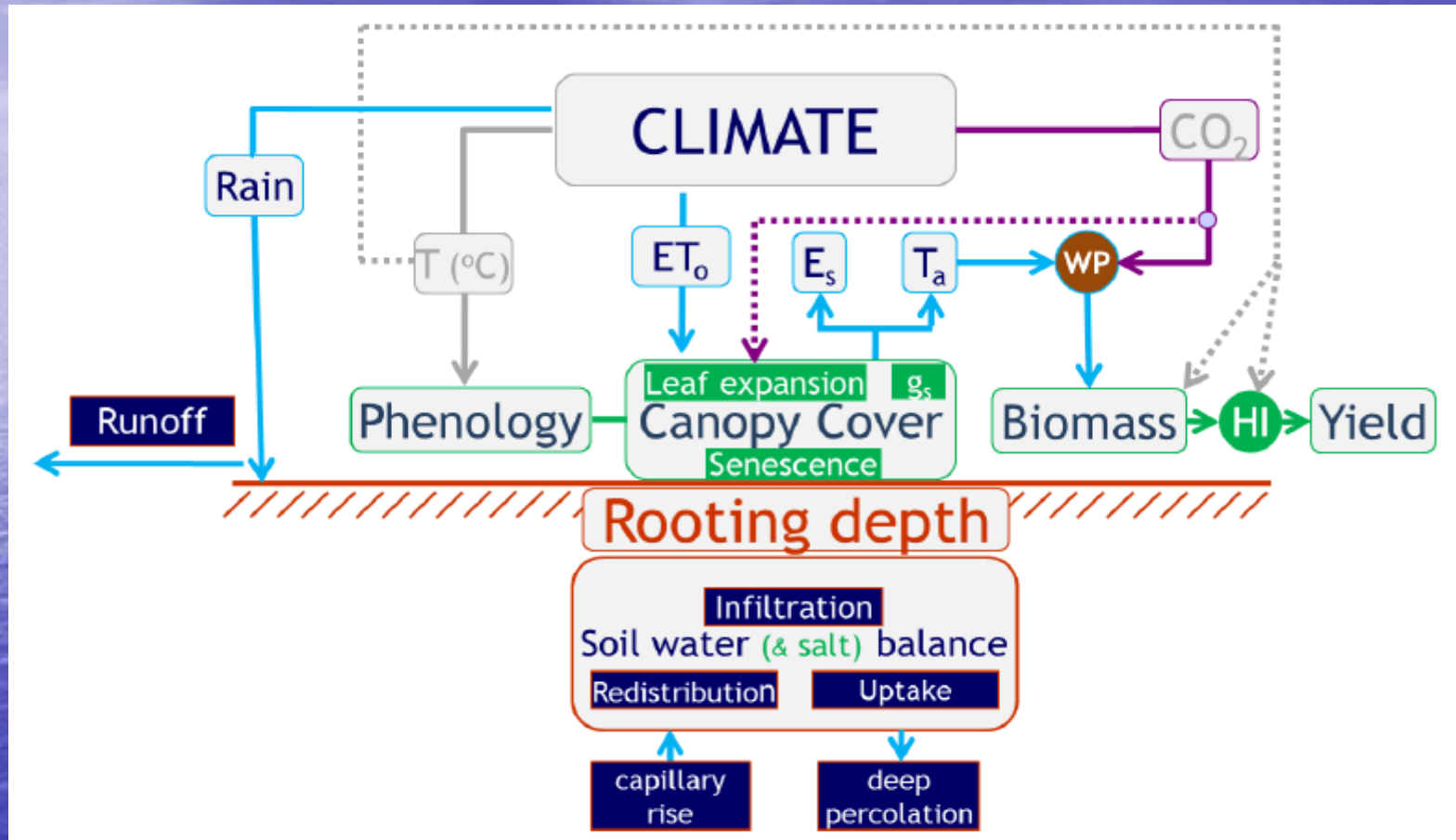


# pilot area

- North Delta of Egypt, Irrigated agriculture zone
- Karak governorate of Jordan, Rainfed agriculture
- Orontes watershed- Lebanon, Mixed agriculture



# AquaCrop model



Developed by **FAO**

**Dirk RAES, Pasquale STEDUTO, Theodore C. HSIAO, and Elias FERERES**

# Impact on the yield of eggplant



Average baseline yields of eggplant and predicted average change in it according to the **RCP4.5** scenario **without inclusion of elevated CO2 effects**

	Average change at midcentury (2046-2065)	Average change at the end of the century (2081-2100)
Baseline Yield (ton/ha)	1.42	
Absolute change (Ton/ha)	-0.1	-0.2
Relative change (%)	-9.4	-13.3

# Change in growth cycle



the duration of growth cycle of eggplant at the baseline (1986,2005) , mid centaury (2046-2065), and at the end of the century under **RCP4.5** scenario

	Baseline 1986-2005	mid centaury 2046- 2065	end of the century 2081-2100
Duration of the growth cycle (days)	118	104 ↓ 14 days	101 ↓ 17 days

# impact of climate Change on eggplant water requirement



the reference Evapotranspiration and actual Evapotranspiration of eggplant at the baseline (1986,2005) , mid centaury (2046-2065), and at the end of the century under **RCP4.5** scenarios

	Baseline 1986-2005	mid centaury 2046- 2065	end of the century 2081-2100
Reference Evapotranspiration (mm)	673.0	633.1 ↓	623.8 ↓
Actual Evapotranspiration of eggplant (mm)	465.4	-6.3% 436.0 ↓	-6.8% 426.4 ↓



# Impact on the yield of eggplant

Average baseline yields of eggplant and predicted average change in it according to the **RCP8.5** scenario **without inclusion of elevated CO2 effects**

	Average change at midcentury (2046-2065)	Average change at the end of the century (2081-2100)
Baseline Yield (ton/ha)	1.42	
Absolute change (Ton/ha)	-0.1	-0.3
Relative change (%)	-9.8	-27.3



# Change in growth cycle



the duration of growth cycle of eggplant at the baseline (1986,2005) , mid centaury (2046-2065), and at the end of the century under **RCP8.5** scenario

	Baseline 1986-2005	mid centaury 2046- 2065	end of the century 2081-2100
Duration of the growth cycle (days)	118	102 ↓ 16 days	86 ↓ 32 days

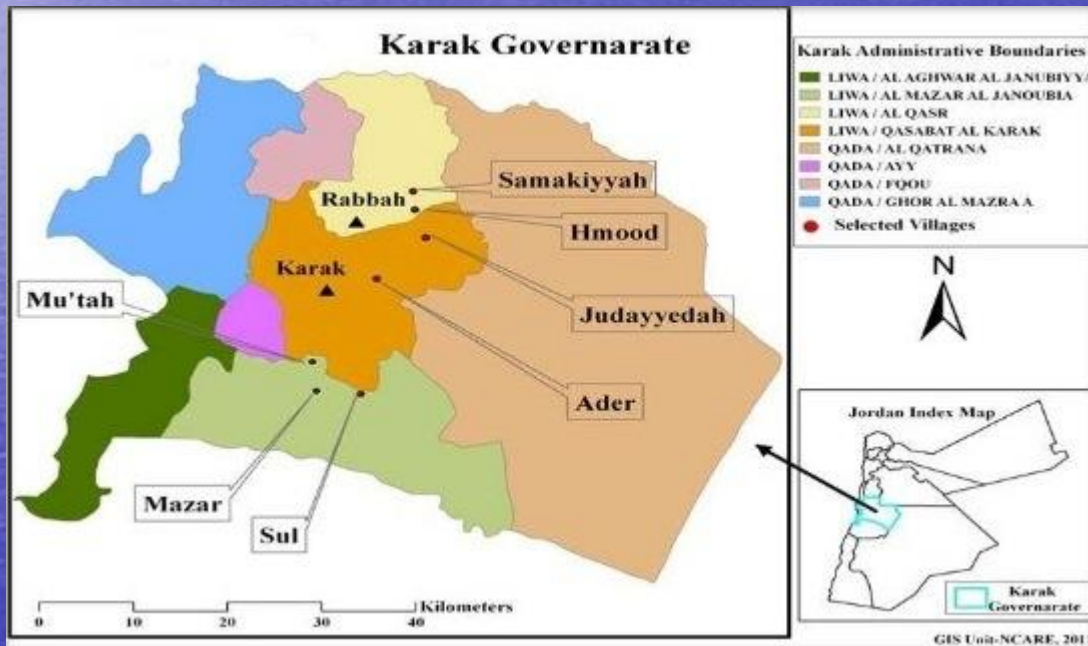
# impact of climate Change on eggplant water requirement



the reference Evapotranspiration and actual Evapotranspiration of eggplant at the baseline (1986,2005) , mid centaury (2046-2065), and at the end of the century under **RCP8.5** scenarios

	Baseline 1986-2005	mid centaury 2046- 2065	end of the century 2081-2100
Reference Evapotranspiration (mm)	673.0	622.8 ↓	592.6 ↓
Actual Evapotranspiration of eggplant (mm)	465.4	-8.6% 425.4 ↓	-18.9% 377.6 ↓

# Karak governorate of Jordan



# **Assessing the impact of climate change on Rainfed wheat at Karak governorate**





## Impact on the yield of wheat

Average baseline yields of wheat at Karack Governorate and predicted average change in it according to the **RCP4.5** scenario **without inclusion of elevated CO2 effects**

	Average change at midcentury (2046-2065)	Average change at the end of the century (2081-2100)
Baseline Yield (ton/ha)	1.41	
Absolute change (Ton/ha)	-0.02	-0.20
Relative change (%)	-1.5	-15.5

# Impact on the yield of wheat



Average baseline yields of wheat at Karack Governorate and predicted average change in it according to the **RCP8.5** scenario without inclusion of **elevated CO2** effects

cnrm	Average change at midcentury (2046-2065)	Average change at the end of the century (2081-2100)
Baseline Yield (ton/ha)	1.41	
Absolute change (Ton/ha)	-0.1	-0.8
Relative change (%)	-5.2	-55.3

# Number of failure years

	<b>Baseline 1986-2005</b>	<b>mid centaury 2046- 2065</b>	<b>end of the century 2081-2100</b>
<b>Number of failure year</b>	3	6	8



# North Delta of Egypt





# Impact on the yield of wheat



# Impact on the yield of wheat



Average baseline yields of wheat and predicted average change in it according to the **RCP4.5** scenarios **without** including elevation of atmospheric CO2 concentration

cnrm	Average change at midcentury (2046-2065)	Average change at the end of the century (2081-2100)
Baseline Yield (ton/ha)	6.50	
Absolute change (Ton/ha)	-0.3	-0.4
Relative change (%)	-4.1	-5.7

# Impact on the yield of wheat

Average baseline yields of wheat and predicted average change in it according to the **RCP8.5** scenarios **without including elevation of atmospheric CO2 concentration**

	Average change at midcentury (2046-2065)	Average change at the end of the century (2081-2100)
Baseline Yield (ton/ha)	6.25	
Absolute change (Ton/ha)	-0.4	-0.7
relative change (%)	-4.9	-10.3