



FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative

IDSS and Commercial Vegetable Home Gardens

Manny Reyes, Professor, Biological Engineering
North Carolina Agricultural and Technical State University

Presented during the External Advisory Meeting of the Innovation Lab for Small Scale Irrigation, February 9, 2016, International Water Management Institute, Accra, Ghana



USAID
FROM THE AMERICAN PEOPLE



OUTLINE

1. Progress

a. IDSS

b. Commercial Vegetable Home Gardens

2. Future Actions

a. IDSS

b. Commercial Vegetable Home Gardens





IDSS

- Recruited and Ethiopian, Ph.D. student, faculty of Bahir Dar University
Tewodros Assefa
 - Started at N.C. A&T, January 2015
 - Will finish course work by May 2016
 - Very knowledgeable of SWAT
 - Completed a paper that was submitted for publication
 - Sent to Texas A&M to have an individualized APEX training. APEX is a component of the IDSS.
 - Prepared a table of parameters needed for APEX modeling of commercial vegetable home gardens





FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative

COMMERCIAL VEGETABLE HOME GARDENS

Identified and implemented CVHG in three countries.

Criteria used for identifying CVHG:

- Feed the Future site in the country
- Site identified by IWMI
- Defined as no more than 200 m²
- Near a house
- With a water source
- Female home gardener



USAID
FROM THE AMERICAN PEOPLE



FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative

Ethiopia



USAID
FROM THE AMERICAN PEOPLE



FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative

ETHIOPIA SITES



USAID
FROM THE AMERICAN PEOPLE



FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative

COMMERCIAL VEGETABLE HOME GARDENS

Ethiopia (Amhara Region):

- Six female home gardeners – Robit Bata
- Seven female home gardeners – Dangisha

Treatments:

- Drip irrigation with conservation agriculture
- Drip irrigation with no conservation agriculture



USAID
FROM THE AMERICAN PEOPLE



RESULTS

With and without Conservation Agriculture

- First Season: Onions, Dangila

User name	Mulched production (kg)	Bare production (kg)
Woynitu Getie	19	9
Yenienesh Ewunetu	15	4
Azeneg Mengistie	9	7





RESULTS

With and without Conservation Agriculture

- First Season: Tomatoes (Robit Bata, only one farmer, no seedlings)

CA tomatoes died and conventional systems yielded 70 kg.





RESULTS

With and without Conservation Agriculture

- Second Season: Garlic, Dangila (paired t** @ alpha = 0.01)

Average Plant Height (cm) at 3rd month

Name of participants	Plant height (cm)	
	CA	NCA
1. <u>Menigistie Malede</u>	74.6	68.6
2. <u>Woynitu Gitie</u>	74.8	66.4
3. <u>Tilaye Addisu</u>	75.6	66.8
4. <u>Siraye Takele</u>	74.6	62.4
5. <u>Azeneg Menigistie</u>	72.8	58.6
6. <u>MenigistiaLake</u>	75.6	64.5
7. <u>Yenenesh Ewinetu</u>	76.8	58.8

NB: Samples were taken from 5 randomly selected plants in each plot





FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative

- Traditional System



GARLIC

- Conservation Agriculture



USAID
FROM THE AMERICAN PEOPLE



RESULTS

With and without Conservation Agriculture

- Second Season: Garlic, Dangila (paired t** @ alpha = 0.01)

Irrigation Water use (three months data)

Name of participants	First Round	
	Total amount of water Irrigated in liter	
	CA	NCA
1. <u>Menigistie Malede</u>	14800	16650
2. <u>Woynitu Gitie</u>	14800	18500
3. <u>Tilaye Addisu</u>	12950	15263
4. <u>Siraye Takele</u>	13875	16188
5. <u>Azeneg Menigistie</u>	13875	17113
6. <u>MenigistiaLake</u>	13875	16188





FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative

NOTE LESS WATER TO LIFT



USAID
FROM THE AMERICAN PEOPLE



RESULTS

With and without Conservation Agriculture

Second Season: Tomato plant height (cm), Robit (paired t^{ns} @ alpha = 0.05)

Name of participants	CA	NCA
<u>Achash Alamir</u>	62.4	60.6
<u>Mitin Tefera</u>	83.3	74.8
<u>Wibagegn Kibiret</u>	68.6	66.8
<u>Emebet Terefe</u>	72.2	74.3
<u>Chekilete Getinet</u>	76.4	77.6
<u>Amelimal Geremew</u>	82.8	83.4

NB: Samples were taken from 5 randomly selected plants in each plot





FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative

TOMATO ROBBIT

Note Difference (farmers in Robit less committed)



USAID
FROM THE AMERICAN PEOPLE



RESULTS

With and without Conservation Agriculture

Second Season: Tomato water use at Robit

Irrigation Water use for Tomato Total (Liter)

	First Round	
	Total amount of water used /Irrigated/ (in litter)	
Name of participants	CA	NCA
<u>Achash Alamir</u>	8000	9000
<u>Mitin Tefera</u>	8000	10000
<u>Wibagegn Kibiret</u>	7000	8250
<u>Emebet Terefe</u>	7500	8750
<u>Chekilete Getinet</u>	7500	9250
<u>Amelimal Geremew</u>	7500	9000





FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative

WATER LIFT (11)

Robit Bata

- Initial results home gardeners like the lift
- It will save labor
- It will minimize drudgery
- We will compare old way and new way
- Time and interview the women



USAID
FROM THE AMERICAN PEOPLE



FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative

ELEVEN PAIL LIFTERS HAVE BEEN INSTALLED NEED TWO MORE

Ethiopia (Amhara Region):

- Six female home gardeners – Robit Bata
- Seven female home gardeners – Dangisha

Treatments:

- With water pail lifter
- Without water pail lifter



USAID
FROM THE AMERICAN PEOPLE



FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative

Tanzania

(just started)



USAID
FROM THE AMERICAN PEOPLE



FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative

TANZANIA

Nine women of Mvomerro, Morogorro

- Will add six more women
- Identifying vegetables/crops that will grow during wet season
- Getting ready for dry season 2016



USAID
FROM THE AMERICAN PEOPLE



FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative

TANZANIA

Nine women of Mvomerro

- Rainy season
- Flooding
- No beds



USAID
FROM THE AMERICAN PEOPLE



FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative

TANZANIA

Nine women of Mvomorro

- Reset
- Identified wet season vegetables
 - Pumpkin
 - Sweet potato
 - Grown for leaves



USAID
FROM THE AMERICAN PEOPLE



FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative

Ghana

(just started)



USAID
FROM THE AMERICAN PEOPLE



FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative

GHANA

Five women in Nyangua

- Rope and pulley system
- Same treatment CA and non-CA



USAID
FROM THE AMERICAN PEOPLE



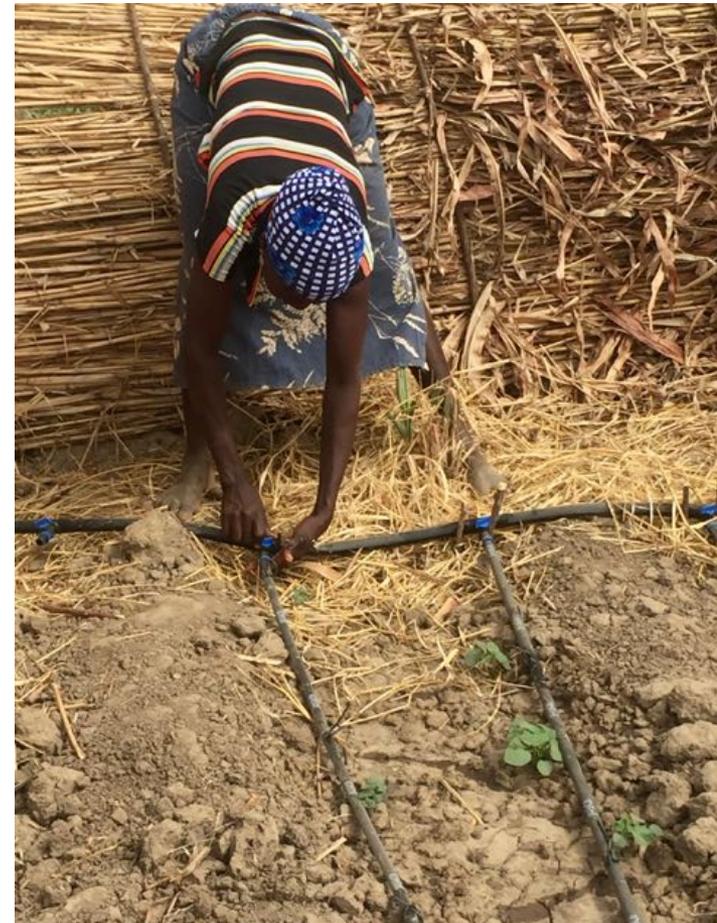
FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative

GHANA

Five women in Nyangua

- Installed drip and tank system



USAID
FROM THE AMERICAN PEOPLE



FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative

GHANA

Nine women getting water from White Volta

- Pump in White Volta



USAID
FROM THE AMERICAN PEOPLE



FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative

GHANA

Nine women getting water from White Volta

- Installed drip and tank system



USAID
FROM THE AMERICAN PEOPLE



OUTLINE

1. Progress

a. IDSS

b. Commercial Vegetable Home Gardens

2. Future Actions

a. IDSS

b. Commercial Vegetable Home Gardens





FUTURE ACTIONS

Commercial Vegetable Home Gardens, APEX, SWAT and IDSS

- Continue to collect data in three countries
- Water use
- Yield
- Residue quantity
- Plant height
- Other parameters needed in APEX





FUTURE ACTIONS

Commercial Vegetable Home Gardens, APEX, SWAT, and IDSS

- Tedy Aseffa will visit three countries
- He will do the APEX modeling in three countries
- APEX will be linked in SWAT by Texas A&M team
- Scenario analysis will be done by TAMU team and NCA&T team (Tedy, Ph.D. Dissertation)





FEED ^{THE} FUTURE

The U.S. Government's Global Hunger & Food Security Initiative

Questions and Discussion



USAID
FROM THE AMERICAN PEOPLE