# WELCOME

## TO THE DON BOSCO AGRICUTLURAL INNOVATION AND TECHNOLOGY CENTER

## AITEC -DODOMA FARM

Education is not preparation
for life; education is life itself.

JOHN DEWEY

aitec it's fresh.

WWW.AITECFARM.COM

WATER 4 MERCY

DON BOSCO TECHNICAL INSTITUTE DODOMA Excellence Through Skills and Innovations

CultivAid Knowledge based Development

ISRAEL State of Israel Ministry of Foreign Affairs









Welcome Booklet

# CONTENTS

# The Concept

aitec it's fresh.





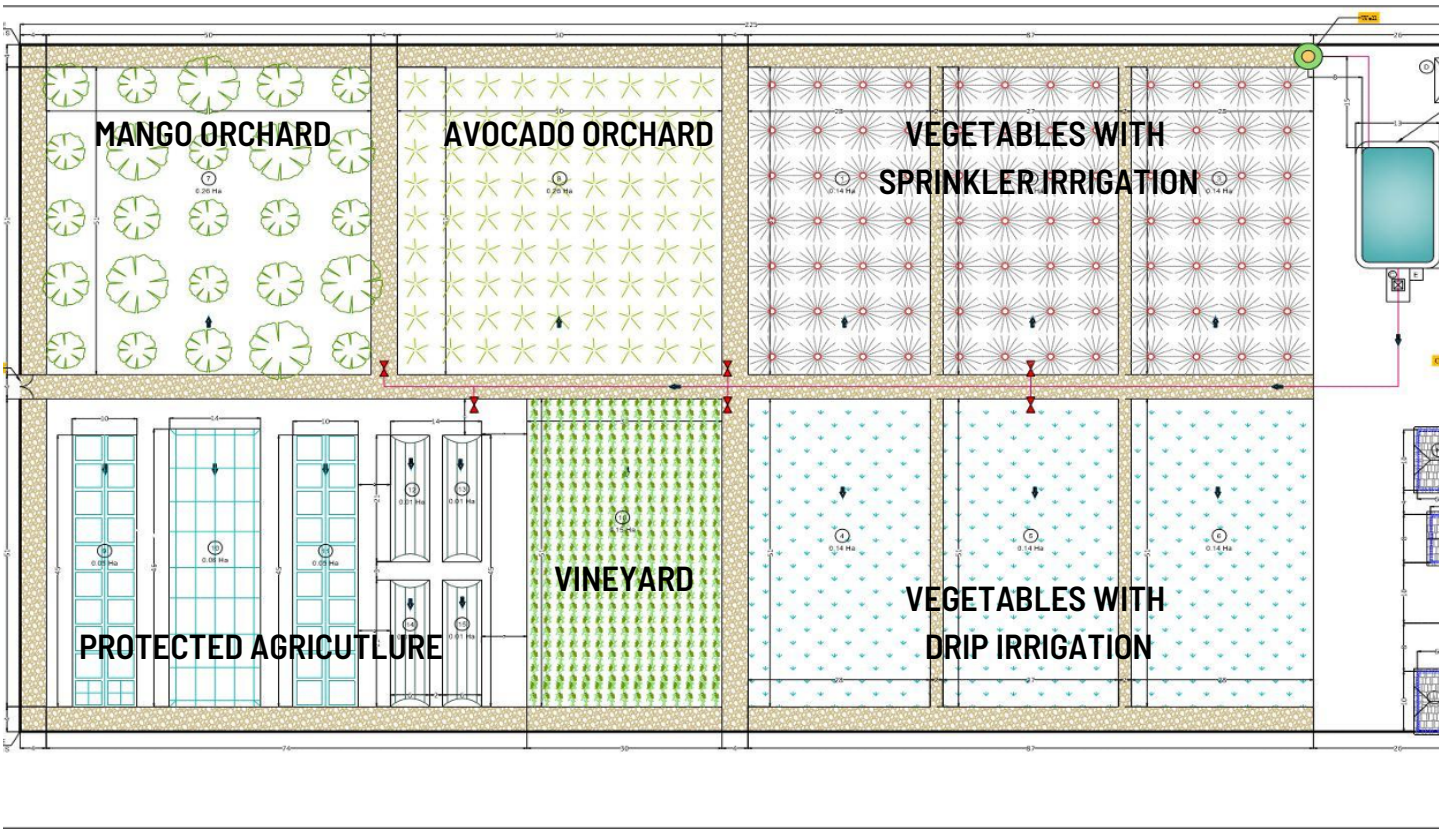
**The AITEC is a medium scale farm that operates a center of knowledge with various types of training programs, regional extension services, practical research, logistical services and market connectivity.**

5000 years ago the first agrarian societies started to form throughout the world and for thousands of years, rural agricultural societies have been the dominant way of life for the majority of the world's population. This century for the first time in human history more people are living in urban settings compared to rural areas.

Agriculture has faced growing demands from this rapidly growing urban population. Growing more food requires more energy, land and water creating a demand for commercialized food production.

The Agricultural Innovation and Technology Centers - AITeC Farms are a groundbreaking concept that targets The Sustainable Development Goal to "End hunger, achieve food security and improved nutrition and promote sustainable agriculture" (SDG2). The AITEC provides demonstration of technologies, capacity building and research based on a connection to Israel's advanced agricultural ecosystem in order to improve agricultural productivity and efficiency through.

# The Don Bosco AITEC Dodoma






## The Don Bosco AITEC in Dodoma is partnership that was established together by Don Bosco Dodoma, Water4Mercy and CultivAid.

The Site includes the following components

- 6 acre (2.4 ha) agricultural Training Demonstration and Research center
- 480m2 Polyethylene covered High tunnel vegetable nursery
- 480m2 Polyethylene Flat type Net house for vegetable production
- 0.65 Acres (0.265 Ha) Mango demonstration plot
- 0.65 Acres (0.265 Ha) Avocado demonstration plot
- 0.4 acre (0.15 Ha) vineyard for testing varieties and demonstration
- Meteorological station

## Educational Programs

- 6-month Internship program
- 1 - year TVET training program
- 1 - 3 day practical training programs

# SOME OF OUR RESULTS

Growing with a Purpose

**THE AITEC SEEKS TO SHARE OUR EXPERIENCE AND KNOWLEDGE IN ORDER TO BENEFIT FARMERS THROUGHOUT THE REGION. THE FOLLOWING ARE SOME OF THE RESULTS ATTAINED THIS PAST YEAR.**

ADD TEXT

ADD TEXT

# Tomato

## GENERAL BACKGROUND

- Tomato is a very common vegetable in Tanzania. It can be found almost everywhere and throughout the year.
- During the rainy season (October-May), the prices of tomatoes increase (1000+ TZS per kg) and during the dry season they decrease to 500 TZS for kg.
- The quality of the tomatoes also varies between the seasons when the better-quality tomatoes usually available in the dry season.

## VARIETIES AND GROWING PARAMETERS

| Variety | Area ($m^2$) | Treatment | Sowing Date | Days in Nursery | Transplant date | # Days from Sowing to Harvest | # of Harvests | First day of Harvest | Last Day of Harvest | # Growing Days |
|---|---|---|---|---|---|---|---|---|---|---|
| Zara | 510 | seedlings | 3.5.21 | 21 | 24.5.21 | 90 | 7 | 3.8.21 | 8.9.21 | 127 |
| Shanty PM | 445 | seedlings | 30.4.21 | 18 | 18.5.21 | 88 | 8 | 28.7.21 | 8.9.21 | 130 |
| Galilea | 445 | seedlings | 30.4.21 | 18 | 18.5.21 | 88 | 9 | 28.7.21 | 8.9.21 | 130 |





- Method of planting (direct/seedling): seedlings
- Depth of sowing: 15-20 mm
- Spacing of plants: 60cm
- Germination rate (%): 90 % for Shanty and Galilea. Slightly higher for Zara
- The field was irrigated with drip irrigation
- After establishment, the field was irrigated every 2 days, total of 551 m3

## PLANT PROTECTION

| Plant Pest | Pesticide used |
|---|---|
| Cut worms | Cutter 112EC |
| Fungal disease (Phytophthora blight)? | Ebony M 72 |
| Aphid, Thrips, fungal disease | Cutter 112EC+ Damka |
| Tuta, mainly prevention of fungal disease | Snowcrab 150SC+ Sabcop (Copper) |
| mainly prevention of fungal disease | Innovex 360SC |
| White fly, mainly prevention of fungal disease | Blast 60EC+ Sabcop (Copper) |
| mainly prevention of fungal disease | Othello top |
| Tuta, White fly, mainly prevention of fungal disease | Prove + Sabcop (Copper) |
| mainly prevention of fungal disease/pest | Levo 1.9EC + Ebony M 72 |
| late blight / early blight/ powdery mildew | Damka 720EC |
| late blight / early blight/ powdery mildew | Ebony M 72 |
| late blight / early blight/ powdery mildew | SALFARM (Sulfur 80%) |

## RESULTS

| Variety | Area of crop (m2) | quality B (Kg)** | quality A (Kg) | Total harvest (Kg) | Yield (ton/ha) | Price Range (TZ shillings) |
|---|---|---|---|---|---|---|
| Zara | 510 | 310 | 5412 | 5722 | 112 | **300-500** |
| Shanty PM | 445 | 90.5 | 4188 | 4279 | 96 | **300-500** |
| Galilea | 445 | 332 | 3862 | 4194 | 94 | **300-500** |

## CONCLUSIONS AND OTHER INSIGHTS ON HARVEST

- Desired weight of tomato according to the buyers is 110g-130g. most of Galilea and Shanty are in this range, Zara is a bit smaller with an average size of 90g-100g.
- .Zara variety has lower shelf life, and get soft relatively fast, what means they need to be sold immediately.
- Tomatoes are sold relatively easy. The buyers ranging from big whole sales that buys 500kg+ and small buyers that buy 20kg-200kg.
- Zara plants seemed to have a bit more endurance to fungal disease.
- Zara fruits are much less sensitive to blossom end rot and cat face.

# Hot Pepper

## GENERAL BACKGROUND

- Hot pepper is a common crop in Tanzania and in Dodoma. He is consumed everywhere, and he is served probably in every meal.
- There are different uses for the hot pepper fruits. pickles, homemade/industrial hot sauce, fresh consumption and more. For all of those uses there is a different and specific variety desired.
- The goal for this season was to learn more about this variety, to understand its properties and to examine his market.

## VARIETIES AND GROWING PARAMETERS

| Variety | Area ($m^2$) | Treatment | Sowing Date | Days in Nursery | Transplant date | #Days from Transplant to Harvest | # of Harvests | First day of Harvest | Last Day of Harvest | # Growing Days |
|---|---|---|---|---|---|---|---|---|---|---|
| Habanero | 478 | Unmulched vs mulched + 1/2 lines per bed | 3/6/21 | 37 | 9/7/21 | 72 | 8 | 20/9/21 | 10/12/21 | 153 |

- Method of planting (direct/seedling): seedlings
- Depth of sowing: 15 mm
- Germination rate (%): 90-95 %
- The field was irrigated with drip irrigation
- After establishment, the field was irrigated every 2 days, total of 360 m3

## PLANT PROTECTION

| Reason for Application | Pesticide used |
|---|---|
| Aphids | Levo 1.9EC + Ebony 80 WP |
| White fly | Blast 60EC |
| White fly | Cutter 112EC |
| Prevention of fungal diseases | Salfarm (Sulfur) |
| White fly + Thrips | Levo 1.9EC + Aquawet (Adjuvant) |
| White fly + Thrips | Pulsar + Aquawet (Adjuvant) |
| White fly + Thrips + Virus infestation (Probably CMV) | Bemic + Aquawet (Adjuvant) |
| Prevention of fungal diseases | Ebony M 72 WP + Aquawet (Adjuvant) |
| White fly + Thrips + Virus infestation (Probably CMV) | Levo 1.9EC + Aquawet (Adjuvant) |
| White fly + Spider mites + Thrips | Levo 1.9EC + Aquawet (Adjuvant) |
| White fly + Thrips | Cutter 112EC + Aquawet (Adjuvant) + Sabcop (Copper) |
| White fly + Thrips | Levo 1.9EC + Ebony WP 80 (Adjuvant) |
| White fly | Pulsar + Aquawet (Adjuvant) |
| White fly + Thrips | Levo 1.9EC + Aquawet (Adjuvant) |

## RESULTS

| Variety | Area of crop (m2) | Treatment | Total harvest (kg) | Price Range (TZ Shilling) | Yield (ton/ha) |
|---|---|---|---|---|---|
| Habanero | 68.3 | Mulched + 2 lines | 288 | 800-2000 | **47** |
| | 68.3 | Mulched + 1line | 229 | | **38** |
| | 68.3 | Raised + unmulched + 2 lines | 174 | | **30** |
| | 68.3 | Raised + unmulched + 1 line | 209 | | **35** |
| | 136.5 | Unraised + 2 lines | 562 | | **43** |
| | 68.3 | Unraised + 1 line | 152 | | **27** |
| | 478 | Total | 1944* | | **41** |

## CONCLUSIONS AND OTHER INSIGHTS ON HARVEST

- Mulched seedling established faster with higher rate.
- All fruits were sold and counted as A class fruits. We had B class but because of viral infestation they were all burned without weighing.
- Sells are relatively easy for Habanero type peppers and prices are also good compared to other crops sold in the local market.
- Fruits can be sold green, but majority of customers prefers them yellow/red.

# Onion

## GENERAL BACKGROUND

- Onions are very common in Tanzania.
- Red Bombay in a common variety in the markets.
- Red Bombay is OP variety and Neptune is a hybrid variety.
- Onions consider as a cash crop especially in the rainy season where the prices can be doubled.

## VARIETIES AND GROWING PARAMETERS

| Variety | Area ($m^2$) | Treatment | Sowing Date | Final Harvest | # Growing Days |
|---|---|---|---|---|---|
| Neptune | 733 | Direct sowing | 9.4.21 | 13.8.21 | **125** |
| Red Bombay | 666 | Direct sowing | 8.4.21 | 13.8.21 | **126** |

- Method of planting (direct/seedling): direct
- Depth of sowing (-mm): 10
- Spacing of seeds: 5cm X 12 cm
- Germination rate (%): very high for Neptune, very low for Red Bombay (exact numbers are not available)
- Neptune seedling establishment stage is much faster compared to the red Bombay.
- The field was irrigated with sprinkler irrigation, irrigation every 2 days total amount 432 m3



## PLANT PROTECTION

| Reason for Application | Pesticide used |
|---|---|
| Thrips + Worms | Levo (Prosuler Oxymatrine) |
| Fungal disease (fusarium wilt?) / Preventative | Othello Top (Azoxystrobin + Difenoconazole) |
| Thrips + Fungal disease | Prove (Emamectin Benzoate) + Ebony 72% (Mancozeb + metalaxil) |
| Thrips + Fungal disease | Cutter (Acetameprid + Emamectin Benzoate) + Innovex (Triadimefon + Carbendazim) |

.During the season, Red Bombay variety was infested much more by different diseases and pest (mainly trips). .Neptune variety was less susceptible to diseases and pest damage.

## RESULTS

| Variety | Area of crop (m2) | Total harvest (Kg) | Price Range (TZS) | Yield (Ton/Ha) | Avg price (TZS) |
|---|---|---|---|---|---|
| Red Bombay | 666 | 568 | 625-1000 | 8.5 | **737** |
| Neptune | 733 | 2533 | 625-1000 | 34.6 | **737** |

## CONCLUSIONS AND OTHER INSIGHTS ON HARVEST

- Onions were left without irrigating to dry out for one week.
- Onions are capable to stay at least two/three months after harvesting to try and achieve higher prices at sell.
- In order to extend the onion storage period, apply a post-harvest chemical application against fungal disease.
- At Nov-Dec-Jan the prices of the onions are supposed to be highest
- For next seasons beds should be 60 cm instead of 1m wide to increase plants number at the plot.
-

# OUR SERVICES

## TRAINING PROGRAMS

The AITeC Training programs are built on an integrated curriculum which focuses on 4 main pillars:

- Basic and applied Science education
- Specific agricultural topics that provide practical and theoretical knowledge.
- Learning by doing through on-site field activities at the Training, Demonstration and Research site.
- Agricultural business and entrepreneurial skills.

## EXTENSION SERVICES

ATIEC Extension Services provide outreach to farmers in the region. Through well trained extension agents, farmers are provide access to professional support who monitor farmer's fields and provide recommendations for improvement in quality and quantity of production.

## DEMONSTRATION AND VALIDATION OF TECHNOLOGIES

The Training, Demonstration and Research site is advanced Israeli Technology to demonstrate and validate them to the local context. The site demonstrates different crops, inputs, techniques and innovations as a method of introducing them to the region.

## VALUE CHAIN DEVELOPMENT

AITEC emphasizes value chain development for specialized high value crops and supports implementation and programs to ensure full operation of the value chain. In Tanzania we are focused on Vegetable production, Grapes and Avocado.

## LOGISTICAL SUPPORT

AITEC Logistical Hub promotes market linkages for value chain development. The hub serves to facilitate connections, collaboration and partnerships between local and international stakeholders. The hub promotes market access to agricultural inputs and technologies while simultaneously promoting post-harvest processing and export of local production.

## FARM DEVELOPMENT

The AITEC farm serves as a model medium scale farms, demonstrating proper planning and introducing new technologies and agro-techniques. Through the knowledge and expertise established at the ATIEC, we seek to promote the development of commercialized agricultural production.

# TRAINING PROGRAMS

## TVET TRAINIG PROGRAMS

The Training program has been collaboratively developed and is implemented by the Don Bosco Technical Institute in Dodoma with the support of CultivAid. The program provides youth (post Secondary school) with knowledge and practical skills, along with the right altitude for Horticulture Production. The 1-year course provides students an understanding of the holistic nature of agriculture production and the main principles and techniques of modernized agricultural production. The training program's curriculum is based on the national curriculum with practical hands on learning at the TDR site.

## INTERNSHIP TRAINIG PROGRAMS

The Internship training program provides recent university or technical school graduates practical hands on agricultural training. The 6 months internship is intended for young professionals and provides experience in implementation, operation and maintenance of advanced agricultural technologies that are introduced through the AITeC. The Interns will work side by side with Israeli agronomists on the implementation of programing at AITEC FARM. CultivAid's Internship program has been operational in Ethiopia since 2016 where it has demonstrated that with the right training programs, local agronomists receive the tools to become leaders of a new generation of agricultural professionals.

## PRACTICAL TRAINING PROGRAMS

The Practical training programs offer a 1-2 day practical training in various subjects. The program targets farmers, agronomists, extension workers in order to share our experience with local professionals and to build a community of experts. The program aims to provide trainings to the region, sharing knowledge and earning revenue for the farm. The trainings operate at a minimum of monthly trainings.

## Types of Trainings

- Irrigation
- Fruit trees
- Vegetable production
- Seedling development
- Fertilization and plant nutrition
- Mechanization
- Protected agriculture,
- Nutrition-sensitive agriculture and more

# EXTENSION PROGRAM

## WATER4MERCY / INNOVATION AFRICA VILLAGES

Our Extension program has established agricultural demonstration and training sites in Rural villages in Dodoma. Thus farm 5 sites have been established and are in operation.

Objectives:

- Establishment of drip irrigated plot utilizing water from the Innovation Africa tower and provide new inputs and techniques to improve the agricultural practices.
- Transfer knowledge, technologies and methods to strength farmer knowledge.
- Create self-sustainable income, job creation and economic development
- strength the food security by introducing new varieties and also increase production rate of growth available
- Establish supply chains to support regional development

HUZI VILLAGE

MASEYA VILLAGE

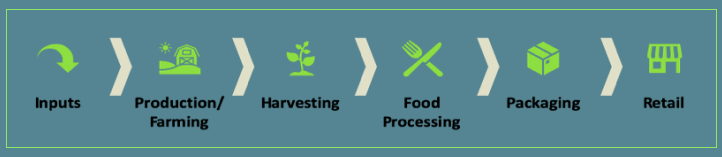
ENDEBWE VILLAGE

MAZENGO HANDALI VILLAGE

# VALUE CHAIN DEVELOPMENT

A value chain is defined as the full range of activities which are required to bring a product from production to consumption. Agricultural value chain is ideally composed of six main components

1. Agricultural inputs and services,
2. Producers,
3. Collection and aggregation,
4. Processing or other post-harvest processing
5. Packaging
6. Market/Consumption.






## VITICLTURE - UNLOCKING THE GRAPE VALUE CHAIN

The goal of the Viticulture Initiative is to modernize and improve grape production and the value chain, by strengthening agricultural productivity, building knowledge in the grape sector and by supporting the transition in the economic activity of the region from subsistence farming to commercial agriculture.

he AITEC includes a demonstration model grape plot which conducts research and training for the region. This year 3 demonstration and training sites will be established a farmer cluster areas as pilot implementation. The program seeks to support the transformation of the sector and success of the entire value chain.

AITEC is building local capacity and integrating with local partners in order to strengthen production, improve quality and quantity, supporting thousands of farmers in the Dodomaregion.

# COMMERCIAL AGRICULTURE

- The United Republic of Tanzania is an emerging economy where the agriculture sector is recognized as a key driver for economic growth.
- With a population of about 60 million today and expected to rise to 130 million by 2050, considering that ~65% of the population depend (directly or indirectly) on agriculture.
- Enhancements of the agricultural sector is critical for food security, job creation and economic grown.
- Tanzania is on the right track with impressive economic growth since the year 2000, resulting in a total GDP growth from around 11 billion USD to 70 billion USD in 2021 and expectations of reaching 130 billion by 2028, surpassing neighboring Kenya.

THE ECONOMIC GROWTH OF TANZANIA HAS COINCIDED WITH THE RISE OF MEDIUM SCALE FARMS WHICH COMPRISE OF AROUND 40% OF FARMLAND HOLDINGS. THESE FARMS ALSO PROVIDE AN IMPORTANT OPPORTUNITY FOR SMALLHOLDER FARMERS BY ADDRESSING MARKET FAILURES AND PROVIDING THEM WITH MUCH NEEDED SERVICES SUCH AS INPUT PROVISION, FINANCIAL SERVICES, INFORMATION, AND LOGISTICS.

**AITEC SEEKS TO STREGTHEN THE PRIVATE SECOTR AND THE TRANSFORMATION TO COMMEICAL AGRICUTLURE**

**AITEC FARMS OPERATE AS MODEL FARMS, DEMONSTRATING COMMERCIALIZATION AND PROVIDING A SOURCE OF INCOME TO SUSTAIN AND EXPAND ACTIVITIES.**

## PARTNERSHIP FOR ACCESS

To support the development of private sector the AITEC is seeking partnerships to address the 4 pillars required for strong private sector development.

- Access To Finance
- Access To Inputs + Israeli Technology
- Access To Knowledge
- Access To Markets.

## DON BOSCO DODOMA

Don Bosco is a private Vocational Training Center, which focuses on providing TVET training primarily among the marginalized youngsters in Dodoma city and throughout Dodoma region. The institute aims to equip student with the knowledge and experience to be successful members of society.

## WATER4MERCY

"Water4Mercy is a USA based non-profit organization that supports water and agriculture development in Africa for upholding human dignity. The organization stresses providing Water, Food, and HOPE to Remote African villages.

## CULTIVAID

is an Israeli not for profit organization, specializing in capacity building and knowledge and technology transfer initiatives with a focus on the agricultural and water sectors. CultivAid emphasizes the need to develop a knowledge-based infrastructure where technology must be accompanied by professional development.

Tomer Malchi, Co-Founder & Executive Director of CultivAid | Fr. Boniphace Mchami, Don Bosco Technical Institute, Dodoma, Tanzania | Sivan Ya'ari, Founder & CEO, Innovation: Africa | Nermine Khouzam Rubin, Founder & CEO, Water 4 Mercy

# FOUNDING PARTNERS

aitec it's fresh.

WWW.AITECFARM.COM