Caritas Lodwar

MISSIONARY COMMUNITY of SAINT PAUL the APOSTLE

St Isidore Turkana Farmers Association

מכון הערבה
Arava Institute
معهد وادي عربة

Furrows in the Desert

Agricultural development project northern Turkana, Kenya

2012 - 2018

Arava Institute for Environmental Studies (AIES), Israel

Missionary Community of Saint Paul the Apostle (MCSPA)

Saint Isidore Turkana Farmers Association (SITFA)

The Turkana People, Turkana, Kenya

“Estimates show that emergency relief in famines costs seven times as much as preventing them“

Sam Dryden, Director of the Agricultural Development Program, The Bill and Melinda Gates Foundation (2011)

Diversification

Agriculture as a complimentary or alternative way of life for a population in transition

FID central training farm, Lobur, northern Turkana, Kenya

We operate in Turkana

- Arid region in north-western Kenya
- Borders with Ethiopia, South Sudan and Uganda
- The largest yet least developed county in Kenya
- Area of county: 70,000 km^2
- Area targeted: 20,000 km^2
- Population: 1,000,000 (county)

  150,000 (targeted)

- Temperature: 20-40^{0}C
- Precipitation: 100-350 mm/y
- Two short rainy seasons, typically flash floods lost in runoff
- Evaporation: 7-12mm/day (high)

We operate in Turkana

Water quality: Poor: shallow underground & Lake Turkana: pH 8-9, EC: 2.5-3.5 dS/m

Good: surface runoff: pH: 7.8, EC: 0.9 dS/m (Natoo rock-dam)

Soil quality: Poor: 40% sand, 30% silt, 30% clay (Montmorillonite), pH 8-9

Good: floating seedbeds: 2:1 ratio dry-river-sand : compost

We work with Turkana People

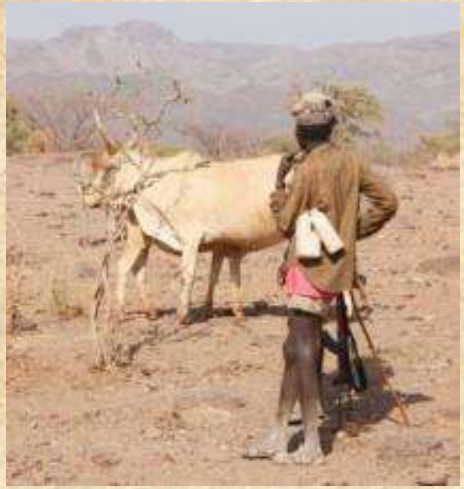
- Nilotic Tribe of **semi-nomadic pastoralists**
- Same origin and language as the Karamojong People of **Uganda**, Toposa People of **South Sudan** and Nyangatom People of **Ethiopia and South Sudan**

Traditionally the Turkana way of life evolves around their livestock for nutritional and cultural needs

They heard camels, goats, zebus and donkeys

For **food** they rely on their animals for milk, meat and blood. Occasionally they would gather wild fruits, hunt wild animals and gather honey. Often they would **trade** with neighbouring tribes for maize, beans and a very limited variety of vegetables and grains.

Traditionally, if a family lost their livestock it may choose to arm itself and raid a neighbouring tribe to restock.



Local name for drought	Year	Mortality rate (1) %
Lotiira	1952	61
Namotor	1960	55
Kimududu/kibekbek	1970	54
Kiyoto atang'aa/Lopiar	1980	65
Lokwakoyo/Alkalkal	1990	53
Logara/Epompo	2000	63

Note (1): Mean mortality rate of small stock. Source: Ebei, Oba & Atuja (2007)

Major droughts recorded:
1971, 1975, 1977
1980, 1983/1984,
1991/1992, 1995/96,
1999/2000, 2004/2005, 2009,
2011, 2017

Harsh famine in Turkana

Movie recorded by the Catholic Mission

January 2017

Recent environmental and geo-political changes across East Africa

- High survival stress
- Dependency on aid food
- Migration to urban areas
- Increasing tribal conflicts
- Population in transition from traditional life

A family that can no longer sustain the traditional way of life is "in transition"

Diversification

- A **complementary** or **alternative way of life** towards food security and community resilience
- A viable example: **Commercial fishing** on Lake Turkana since 2007
- We believe that the development of **sustainable agricultural** is the next form of **diversification available to the Turkana** People that are "in transition".

Turkana Children at one of the MCSPA mother and child nutritional centres

Temporary camp inside the protecting fence of the Todonyang Mission to families "in transition" who lost their herds to drought and raids

Former attempts to develop agriculture failed

- Harsh environmental conditions
- Lack of know-how
- Installing equipment without training and guidance
- Lack of experts presence for long time periods
- Cultural gap: herders to farmers
- Lack of infrastructure and markets

The current perception:

- Impossible to develop agriculture due to harsh environmental conditions
- Current state of infrastructure does not allow for community and private commercial development

Our development concept

- It is possible to **adapt agricultural methods** for growing a variety of crops and **sustain self subsistent and commercial agriculture**
- The pioneering Turkana that choose a farming lifestyle need **appropriate training** and **in-the-field long-term guidance**
- Local food production improves the **nutrition of the hosting communities,** is **key in the development of markets** and contributes to the **social and economical resilience** of the county
- The **success** of the pioneering Turkana **proves** that agriculture is feasible for Turkana and eventually **will drive** the public and private sectors **to invest on a larger scale** in appropriate infrastructure and the development of farming markets

FID central training, experimental and demonstration farm, Lobur, Turkana

Proving FID development concept

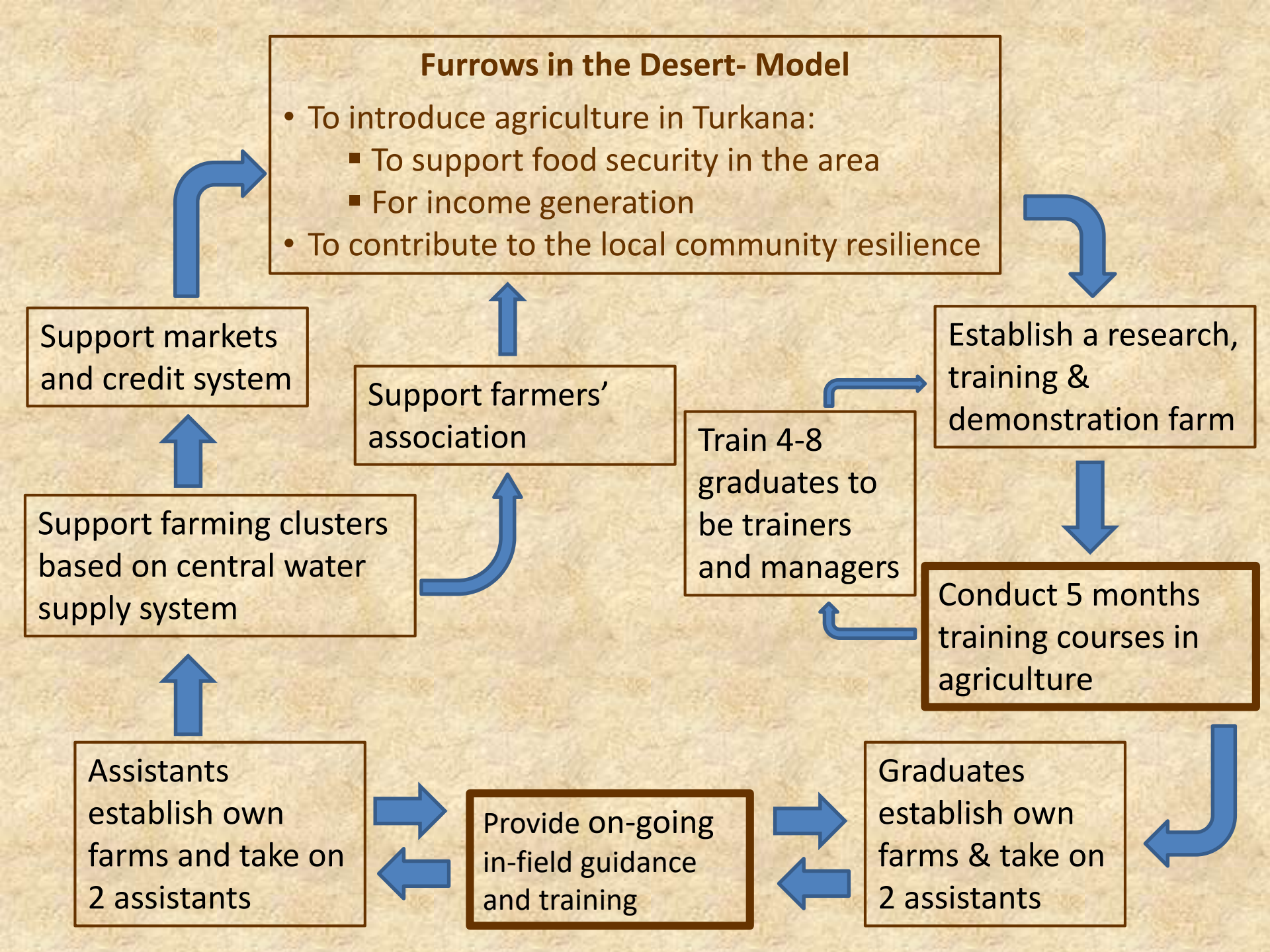
Teaching agriculture to children, Lobur

Guidance: Paulina, FID graduate farm, Kopotea

Date plantation, Lobur

Nakinomet…

Failed “installation projects” that did not provide training and on-going guidance to the Turkana participants

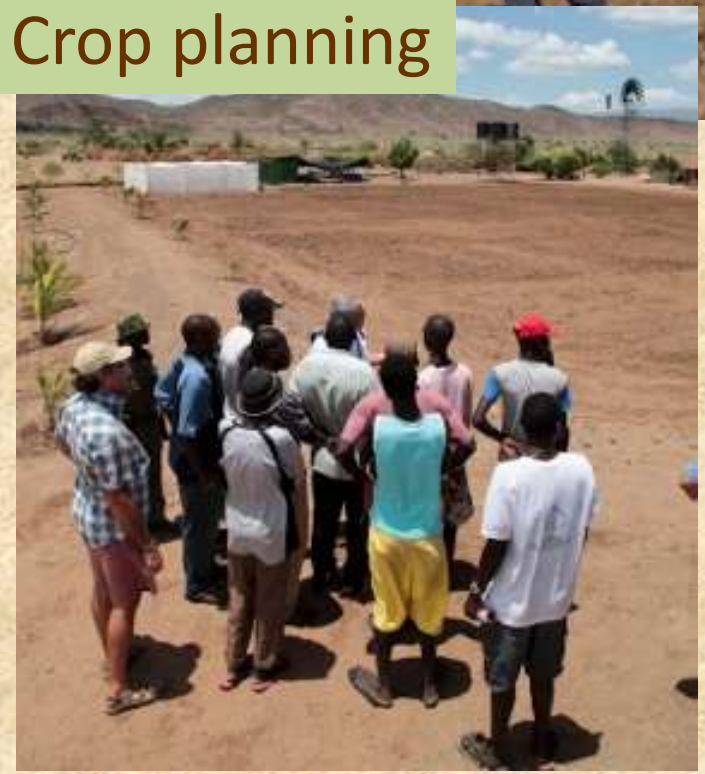

Furrows in the Desert- Model
• To introduce agriculture in Turkana:
▪ To support food security in the area
▪ For income generation
• To contribute to the local community resilience
Establish a research, training & demonstration farm
Conduct 5 months training courses in agriculture
Train 4-8 graduates to be trainers and managers
Support farmers' association
Support markets and credit system
Support farming clusters based on central water supply system
Assistants establish own farms and take on 2 assistants
Provide on-going in-field guidance and training
Graduates establish own farms & take on 2 assistants

FID central training, experimental and demonstration farm, Lobur, Turkana

- Insect proof nursery, a net-house and a Tree nursery
- 10 gravity-fed drip-irrigated open fields & 1 experimental plot
- 2 Central water distribution systems
- 2 Limans, 1 earth pan, 6 compost piles, 1 date plantation
- Storage facility for agricultural inputs and living and studying facilities
- Israeli operation manager ,Turkana agriculture school manager, local Turkana trainers & foreign trainers (volunteers), and visiting Israeli-experts

Land preparations

Crop planning



Compost preparations

Planting & Plant protection

Nursery

Gravity-fed Drip Irrigation

Growing in net-houses

Donated by Amiran Kenya in 2012

Weed and pest control

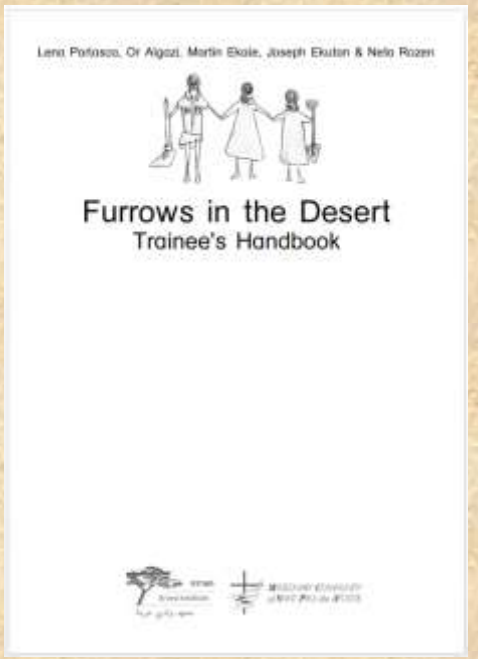
Crop management

Post-harvesting

Harvesting

Cooking

- Administration
- Planning & Marketing
- Literacy


Lena Porfasco, Or Algazi, Martin Ekale, Joseph Ekuton & Nelo Rozen

Furrows in the Desert
Trainee's Handbook

Ngadiripio ka atanki awi

Erukito a tanki, ngapopipa, afilta, ngipelcho ngusni ka ngadiripio ngitoinio ngitomon ke ngikankapei (16). Lu erai awoyau ngatomon uuni kila ipeo (erai ngidiripio amisf alokeh (100)).

achakin ngadiripio awi kon:

Eya ngakipi amakat, arimama ka asidiko na akimuj angikinyam no nesi kechi agolete ngadiripio. Ngesi erakar itemokino akilotar ngadiripio kon fik.

- Kilata afilta, togot ngakipi, tolachi afilta kingak akitoe amonyakea kori akalakat, kila akuraar.

kilata afilta

- Kituashingo ngapopes ka ngidiripio: Tongoa ngadiripio kimiek ngakipi tolekeuit, kichikichikak toropunia asidiko akwaar apei akit. Anikeiwasi ngakipi tokudak ngadiripio.

asubakin ngidiripio

- Akitoeng ngidiripio lu agolat: Tongoa ngakipi kikokongok wadio amoru elosi lowae lo nelaase ngakipi, kori tonakak kinie asidiko akituk, no cho ingolikinia nyidirip ni egolokino.

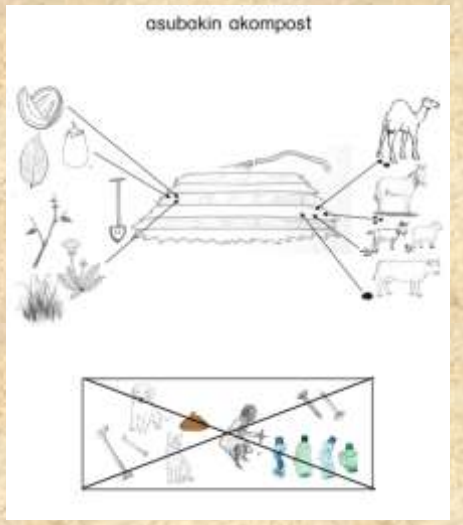
Nasar

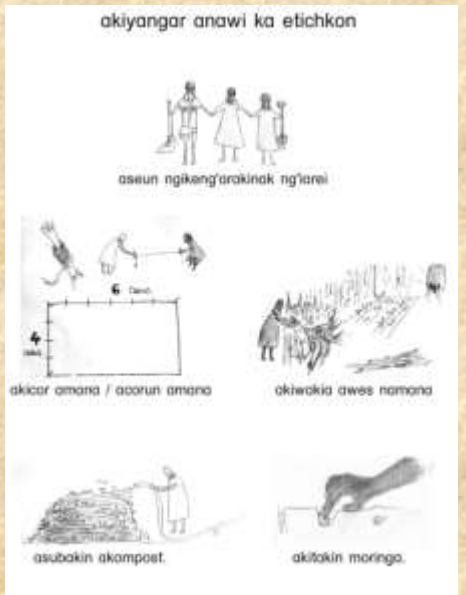
Ngichok tuuchik tonyatik itemokino akitaun ore anasar mori ekingoren. Edisiok ngichok lu nyerupunete alomono. Angikinyam ngulu kechi.

asukumo espinac enyanya kakuba beringanya ekilunguo

Asubakin Nasar:

1. Tosen ka apair ni lwoakini nasar. Kenzi kurop ekitoe kori adukakin nyigoach. Esidbed lo erai omito apei awoyankori elukuno.
2. Tolii osinyon ka akompos ani erumor kimorik ngobakita ngoorei osinyon ka apei na akompos.
3. Kitem esidbed ngosentimitae ngotomon (10cm) ikauno ariolup.
4. Kiwaak ngomoru kiriamo esidbed.
5. Ani kepedor, todukak igsoch ka akiwakin ibore ni erapit ekaworn.
6. Kitamoaik ngolup.
7. Kitak ngikinyam.
8. Kigirak, ekiro aakinyamit, ngotare no itokinio ngikinyam.
9. Kitamoaene ngzuni kori ngoomon kilo akwaar.
10. itemokino ngikinyam erupunete adounet angirus anguuni tonong ngitomon.
11. No epoisuniete kitamiakino no apeneta kori no iwaakineta ngakaai ngoomon.


asubakin akompost


akiyangar anawi ka etichkon

aseun ngikeng'arakinak ng'arei

akicar amana / acorun amana

akiwakia awes namona

asubakin akompost

akitakin moringa

Akilokony kori

Kila ekinyamit (kori ekitoe) dzong eiem: akimuj ariolup. Itemokino akibelokin aadi tokanu no ngeor ejok. Aripeelbelokin ngikinyam; epote ngaduaui lukokak, ngidekwainei ke ngiroy, kadsuride akimuj ariolup kori konkoritie. Nyilak ngikinyam lu erai awi kori ekol epoi, tobaniok, nabo wopei. Nakonemi tolem ekinyamit lo ekol kori lo awi anache.

Cucurbitaceae Family
akaidett naachi
nemunye
amelon
kakubo

Solanaceae Family
enyanya
beringanya
pili pili
pili pili oo

Amaranthaceae Family
espinac
amarant

Brassicaceae Family
asukumo
kabichi

Rosaceae Family
ekilunguo
kitungulum

Beans Family
ekunde
echoroga
soya

FID Trainee's Handbook
Written in Turkana
Used for the training and at the graduates farms

First farmers association in Turkana 18 December 2014

Saint Isidore Turkana Farmers Association (SITFA)

- Fully operating central farm
- 11th course completed December 2018
- 156 graduates and 157 assistants
- Trained 6 Turkana trainers in agriculture and 8 assistant trainers

Certificate OF

Irrigated Desert Agriculture

This is to certify that

Ms. /Mr. _____

Has successfully completed a 6 month intensive residential training

In the framework of

Furrows in the Desert

The course took place in Lobur Mission – Turkana, Kenya

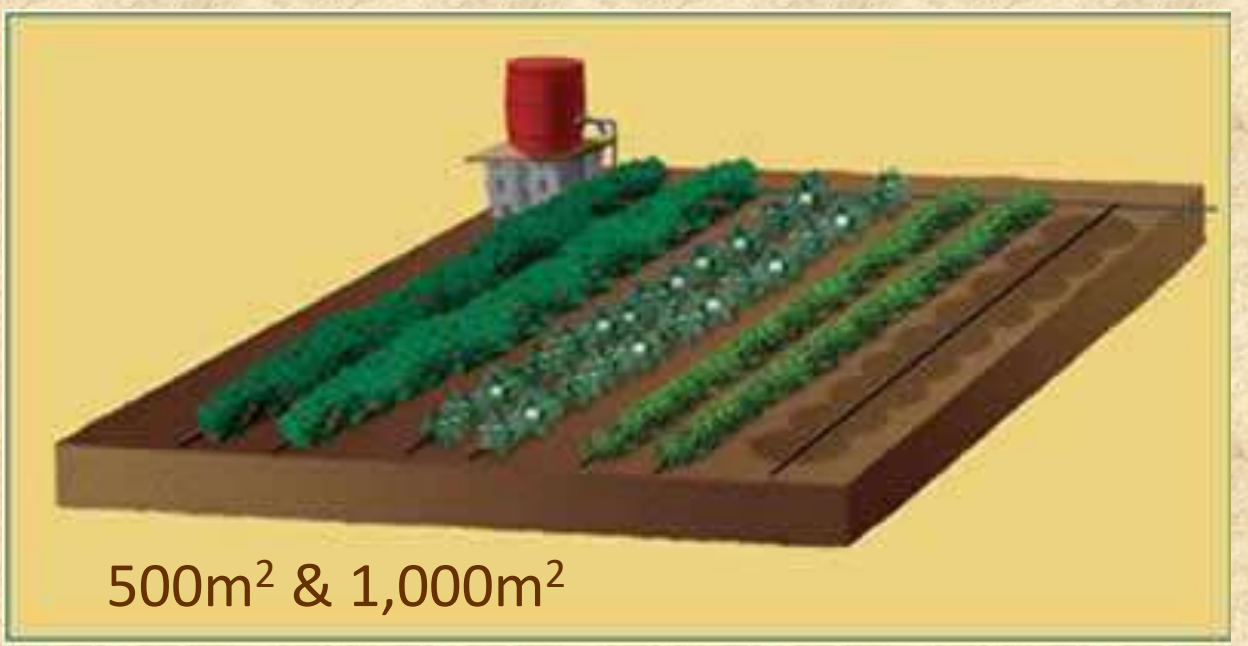
From 1st October 2012 till 31st March 2013

Course contents included:

1. Compost preparation
2. Land preparation
3. Crop planning – Market based
4. Nursery
5. Irrigation
6. Plant protection monitoring system
7. Weed control
8. Crop management
9. Post harvest
10. Record keeping

Established 193 local plots within over 38 communities

Adaptation of Israeli know-how in desert agriculture



Gravity-fed family drip-irrigation system, developed by Netafim, Israel

Providing Farmer's Kits to FID graduates through the **Rotary Israel, Rotary Kenya** and **Rotary International** TIPA initiative

Christopher, Kaikor

Atuane, Lobur

Paulina, Kokuru

Thomas & Yhoana, Nariokotome

Examples of what we grow

Location	Graduate	Types of crops seeded & planted
Kaikor	Shara	Cowpea, tomatoes, onion, watermelons
Riokomore	Joseph	Kale, okra, swiss chard, melons, gourd
Napekar	Dorcas	Onion, kale, chard, green grams, melon
Kopotea	Paulina	Onion, tomatoes, okra, gourd
Kokuro	Paulina	Okra, cowpea, squash, melon, kale
Lobur	Evelin	Tomatoes, kale, green pepper, melon, swiss chard

Sukuma, Spinach, Radish, Swiss chard, Onion, Garlic, Cucumber, Zucchini, Melon, Watermelon, Squash, pumpkin, Maize, Sorghum, Sudan Gras, Green gram, Cowpea, Soya, Peanuts, Green pepper, Hot pepper, Eggplant, Tomato, Chilli, Okra, Moringa, Papaya, Sweet potatoes, Kangkong, Cassava, Custard apple, Gourd, Pome granite, Date palms, Banana

Supporting organisations and institutional bodies

- KKL- JNF, Israel & Germany
- ROTARY International through an initiative of ROTARY Israel
- Israeli Foreign Office through MASHAV and the Israeli ambassador to Kenya
- Emalaikat Foundation (Spain)
- New Ways Charity (UK)
- DKA Austria on behalf of the Catholic Children Movement of Austria

קרן קימת לישראל
KKL - JNF

ROTARY INTERNATIONAL

MASHAV
Israel's Agency for International Development Cooperation
Ministry of Foreign Affairs

Fundación Emalaikat

NEW WAYS

Dreikönigsaktion
Hilfswerk der Katholischen Jungschar

Rotary International, Israel and Kenya

- Funding farmers' Kits and maintenance costs

Supporting volunteers & employing an Israeli operation manager: Joint project AIES-KKL-JNF Germany (2016-19)

- 1 operation manager a year
- 6 volunteers a year for 6 months of volunteering work
- One week training in Israel followed by appropriate training in Turkana
- 2 experts visits to Turkana a year

Introducing agriculture to school children

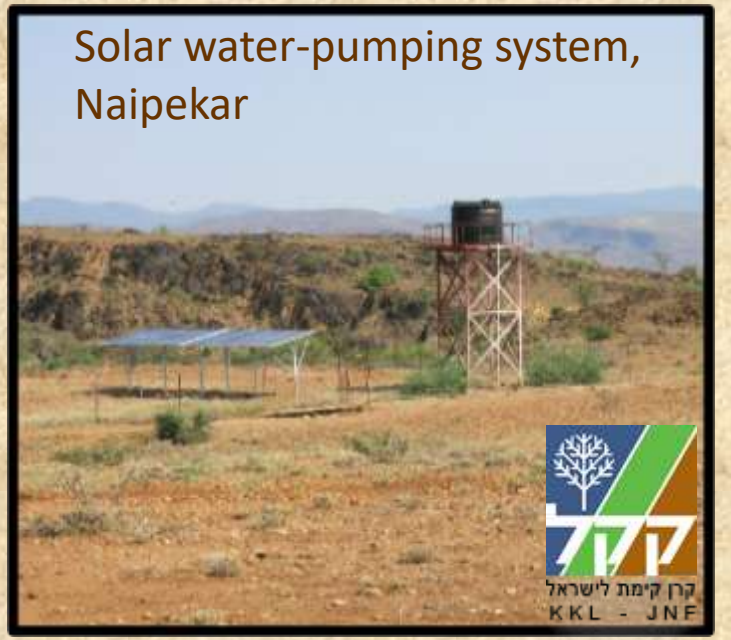
Opening the 8th course, 15 January 2017

Training the 7th course at the nursery

Adaptation of Israeli know-how in desert agriculture

Bringing Medjool Dates to Turkana & installing solar water pumping systems

Joint project FID-KKL Israel (2015-2017)

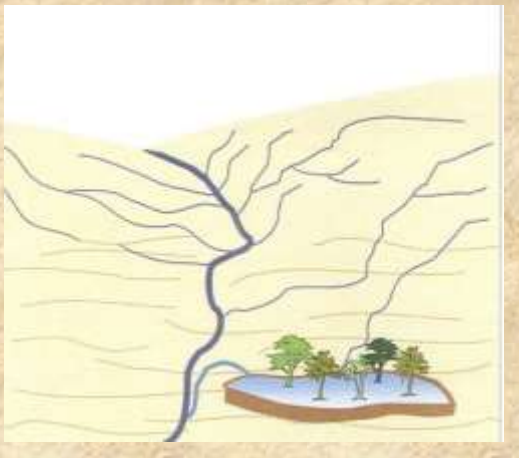


- 170 date shoots arrived from Israel, March 2017
- Installed 2 solar water pumping systems at the Kopotea and Maisa farming clusters
- Established the first medjool date plantation in Turkana using the local alkali water

Adaptation of Israeli know-how in desert agriculture

Bringing watershed management practices to Turkana for the development of agro-silvopastoral system: a joint research project for KKL-JNF and the Arava Institute for Environmental Studies (2019-2021)

Liman: diverting seasonal runoff water to an area enclosed by low retention walls for growing local trees, fruit trees and fodder, Nabataeans tribes and KKL, Negev Desert, Israel



Establish 2 tree nurseries and 2 new farming clusters with solar powered water distribution systems

KKL-JNF in Ruanda

Supporting higher education and appropriate training to FID Turkana staff member, Martin Ekaale, in Israel

- Involved with FID since 2014
- Responsible over the trainees wellbeing
- Visited and guided graduates at their farms
- Coordinated the activities of SITFA
- Studied at the **Arava Institute** for two semesters June 2016 to June 2017
- Two research projects in sustainable agriculture and in commercially oriented growing of date palms.
- **Funded through MCSPA and AIES**

At the central training farm, Lobur, Turkana

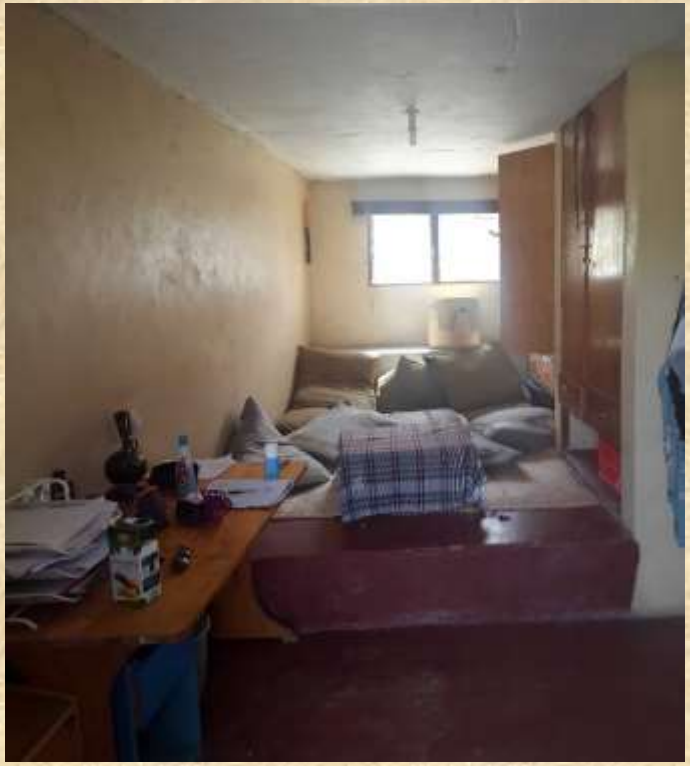
In the fields and date plantations of Yotvata

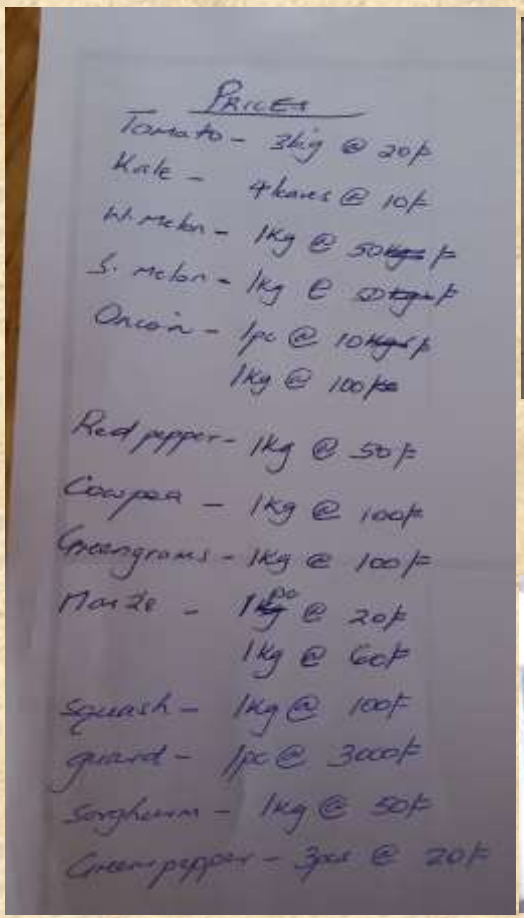
For a better tomorrow in Turkana

Be part of a change

amit.eliyahu@arava.org

In the 3rd course participated 5 women and 10 men, all Turkana People. Group photo was taken in Kokuro at the farm of Paulina, an FID graduate.




Prices
Tomato - 3kg @ 20/=
Kale - 4 kaves @ 10/=
W. melon - 1kg @ 50/=
S. melon - 1kg @
Onion - 1pc @ 10/=
1kg @ 100/=
Red pepper - 1kg @ 50/=
Cowpea - 1kg @ 100/=
Groungrams - 1kg @ 100/=
Maize - 1kg @ 20/=
1kg @ 60/=
Squash - 1kg @ 100/=
guard - 1pc @ 3000/=
Sorghum - 1kg @ 50/=
Green pepper - 3pc @ 20/=

Amiran
Amiran

C3 PLOT

	Sukuma	Spinach	Okra	Kale	Onion
1-1-2018	2.3kg	—	—	—	—
2-1-2018	—	—	—	—	—
3-1-2018	—	—	—	5kg	—
4-1-2018	—	—	—	—	—
5-1-2018	—	—	—	—	—
6-1-2018	—	—	—	3kg	—
7-1-2018	—	—	—	—	—
8-1-2018	—	—	—	—	—
9-1-2018	—	—	—	—	—
10-1-2018	—	—	—	5kg	—
11-1-2018	—	—	—	—	—
12-1-2018	—	—	—	—	—
13-1-2018	—	—	—	—	—
14-1-2018	—	—	—	4kg	—
15-1-2018	—	—	—	—	—
16-1-2018	—	—	—	—	—
17-1-2018	—	—	—	4kg	—
18-1-2018	—	—	—	—	—
19-1-2018	—	—	—	4kg	—
20-1-2018	—	—	—	—	—
21-1-2018	—	—	—	—	—
22-1-2018	—	—	—	5kg	—
23-1-2018	—	—	—	—	—
24-1-2018	—	—	—	6kg	—
25-1-2018	—	—	—	5kg	—
26-1-2018	—	—	—	—	—
27-1-2018	—	—	—	4kg	—
28-1-2018	—	—	—	2kg	—
29-1-2018	—	—	—	—	—
30-1-2018	—	—	—	—	—
31-1-2018	—	—	—	—	—

C4 PLOT

	Watermelon	Sweet Melon	Cucumber	Tomatoes
1-1-2018	10kg	20kg	—	15kg
2-1-2018	—	—	—	—
3-1-2018	—	—	—	—
4-1-2018	—	10kg	—	10kg
5-1-2018	10kg	—	—	—
6-1-2018	—	—	—	—
7-1-2018	—	20kg	—	10kg
8-1-2018	—	—	—	—
9-1-2018	—	—	—	—
10-1-2018	20kg	12kg	7kg	16kg
11-1-2018	—	—	—	—
12-1-2018	—	—	—	—
13-1-2018	10kg	—	—	—
14-1-2018	30kg	16kg	—	10kg
15-1-2018	—	—	—	—
16-1-2018	—	12kg	—	15
17-1-2018	—	15kg	—	—
18-1-2018	20kg	10kg	—	10kg
19-1-2018	5kg	32kg	—	—
20-1-2018	20kg	20kg	—	—
21-1-2018	—	20kg	—	10kg
22-1-2018	30kg	—	—	—
23-1-2018	—	30kg	—	—
24-1-2018	35kg	—	—	10
25-1-2018	15kg	60kg	—	—
26-1-2018	40kg	30kg	—	10kg
27-1-2018	25kg	25kg	—	—
28-1-2018	—	—	—	—
29-1-2018	20kg	6kg	—	5kg
30-1-2018	10kg	—	—	—
31-1-2018	—	—	—	—

CHEMICAL RECORD SPRAYING FROM FEBRUARY

DATE	CHEMICAL	AMOUNT USED	CROP	PLOT	REMARKS
1-2-2018	Prove	15 ML	Kale	B1	Aphids
2-2-2018	Crecal	25 ML	Tomatoes	C4	Blossom
3-2-2018	Crecal	25 ML	Tomatoes	Net house	Blossom
4-2-2018	Primex	5 ML	Greengram	B3	Caterpillar
5-2-2018	Prove	15 ML	Kale	B2	Aphids
6-2-2018	Prove	15 ML	Kale	C4	Aphids
7-2-2018	Crecal	25 ML	Tomatoes	C4	Blossom
8-2-2018	Avirmec	15 ML	Pumpkin	C2	Leafminer
9-2-2018	Avirmec	15 ML	Onion	A1	Leafminer
10-2-2018	Avirmec	15 ML	Greengram	B3	Leafminer
11-2-2018	Prove	15 ML	Kale	B2	Aphids
12-2-2018	Crecal	25 ML	Tomatoes	C4	Blossom
13-2-2018	Revo	15 ML	Eggplant	B2	Spotted
14-2-2018	Prove	15 ML	Maize	A2	Aphids
15-2-2018	Avirmec	15 ML	Pumpkin	B2	Leafminer
16-2-2018	Primex	10 ML	Maize	A2	Caterpillar
17-2-2018	Prove	15 ML	Spinach	B2	Aphids
18-2-2018	Revo	15 ML	Eggplant	B2	Spotted
19-2-2018	Prove	15 ML	Kale	A2	Aphids
20-2-2018	Avirmec	15 ML	Pumpkin	C2	Leafminer
21-2-2018	Prove	15 ML	Kale	B2	Aphids
22-2-2018	Primex	10 ML	Greengram	B3	Caterpillar
23-2-2018	Crecal	25 ML	Water-melon	A1	Blossom
24-2-2018	Revo	15 ML	Eggplant	B2	Spotted
25-2-2018	Prove	10 ML	Kale	A1	Aphids
26-2-2018	Primex	10 ML	Maize	A2	Caterpillar
27-2-2018	Avirmec	15 ML	Pumpkin	B2 Net house	Leafminer
28-2-2018	Avirmec	15 ML	Onion	A1	Leafminer

Arava Institute for Environmental Studies (AIES)

- Established in 1996 at Kibbutz Ketura
- To advance cross-border environmental cooperation in the face of political conflict "Nature knows no political borders"
- Main student body comprised of Jordanians, Palestinians and Israelis
- Academic programs in partnership with Ben Gurion University
- Research centers: water resource management, sustainable agriculture and renewable energy.

Field study, Turkana 2011

Establishing the farm, Lobur 2012

Beginning of Spring 2018 semester

MCSPA visiting AIES, Israel 2012

The Missionary Community of Saint Paul the Apostle (MCSPA)

A public association of Christian faithful of the Catholic Church, made up of priests and lay people from different parts of the world. It operates in north-east Turkana and in south Ethiopia since 1986.

Among its various activities MSCPA strives to develop, together with the local Turkana population, new sources of water supply, and solutions towards food security and health care in the area.

Over 25 years of activities in the field of community development MCSPA established a significant water infrastructure including:

- The construction of 107 rock dams by trained teams of Turkana people
- The construction of 92 earth pans and dams using own bulldozers
- Drilled over 165 boreholes, equipped with either hand pumps, solar-powered pumps or Kijito wind-pumps

Around some of its water projects, the MCSPA has established nutritional centers which provide daily meals and primary education for children.

Some of the missionary centers in the area also operate clinics and dispensaries providing basic medical services for the local population.