



MISSIONARY
COMMUNITY
of SAINT PAUL
the APOSTLE



Furrows in the Desert

Agricultural development program
northern Turkana, Kenya

2012 - 2020

Arava Institute for Environmental Studies (AIES), Israel
Missionary Community of Saint Paul the Apostle (MCSPA)
Caritas Lodwar, Kenya

KKL, Israel

Saint Isidore Turkana Farmers Association (SITFA)
The Turkana People, Turkana, Kenya

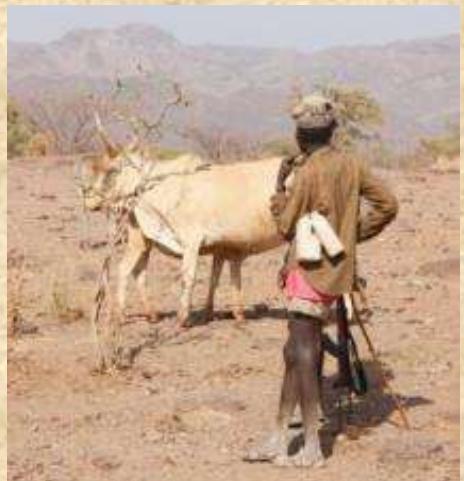
We operate in Turkana

- Arid to semi-arid region in north-western Kenya
- Temperature: 20-40°C
- Precipitation: 100-350 mm/y
- Two short rainy seasons, typically flash floods lost in runoff
- Evaporation: 7-12mm/day (high)
- Water quality: Good to poor (pH 8-9, EC: 3 dS/m)
- Soil quality: Poor in places (pH 8-9, high clay)



We work with Turkana People

- Nilotc Tribe of semi-nomadic pastoralists
- A family that can no longer sustain the traditional way of life is “in transition”



Local name for drought	Year	Mortality rate (1) %
<i>Lotiira</i>	1952	61
<i>Namotor</i>	1960	55
<i>Kimududu/kibekbek</i>	1970	54
<i>Kiyoto atang'aa/Lopiar</i>	1980	65
<i>Lokwakoyo/Alkalkal</i>	1990	53
<i>Logara/Epompo</i>	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, 2016/2017, 2018/2019

Diversification

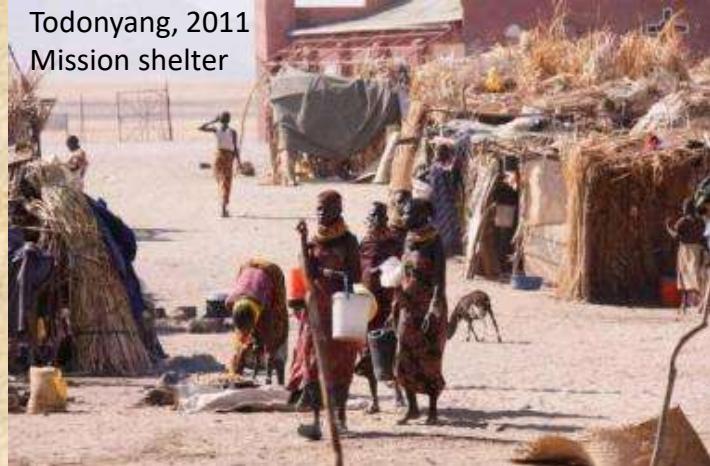
We believe that the development of **sustainable agricultural** is the next form of **diversification available to the Turkana People** that are “in transition”.

Central government perception:

- Impossible to develop agriculture due to harsh environmental conditions
- Current state of infrastructure does not allow for community and private commercial development
- Cultural gap is too big to bridge



Todonyang, 2011
Mission shelter



Kapotia, 2013



Kapotia, 2019



Nakinomet, 2016
Failed Red-Cross project



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

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

Support markets
and credit system

Support farmers'
association

Establish a research,
training &
demonstration farm

Support farming clusters
based on central water
supply system

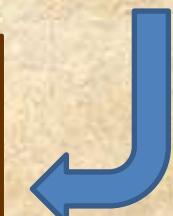
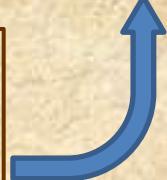
Train 4-8
graduates to
be trainers
and managers

Conduct 5 months
training courses in
agriculture

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

Proving FID development concept



Guidance: Paulina, FID graduate farm, Kapotea



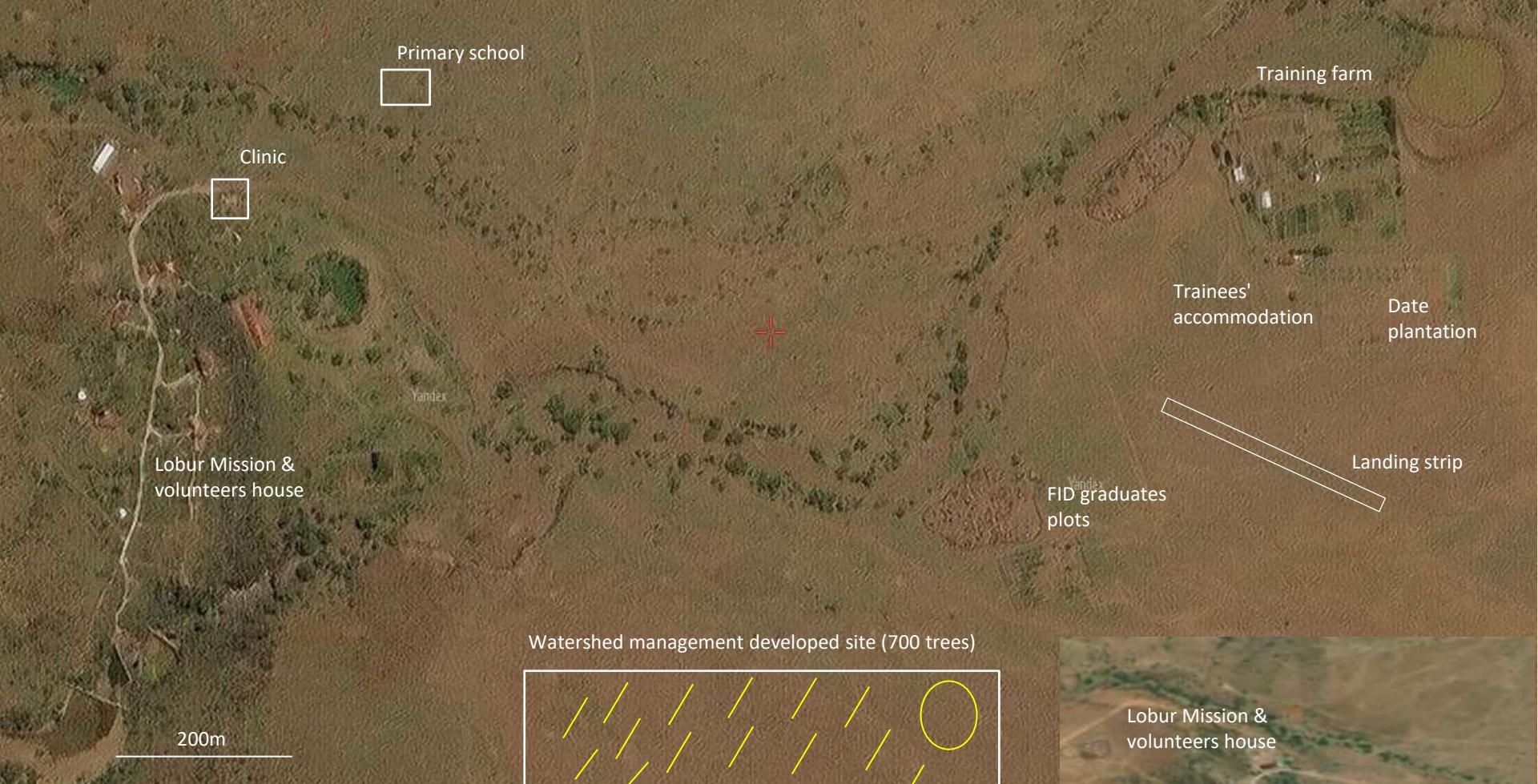
Teaching agriculture to children, Lobur



Date plantation, Lobur

- Fully operating central training farm
- 15th course commenced January 2021
- 196 graduates and 207 assistants
- Trained 6 Turkana trainers in agriculture and 8 assistant trainers
- Success rate in long term operation of graduate farms: 65% in first 5 years, 90% in last 4 years





Lobur central farm and volunteers' house



1/25/2011 10:59:24 AM



Established 228 local farms within 53 communities



Land preparations



Crop planning

Compost preparations





Planting & Plant protection



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



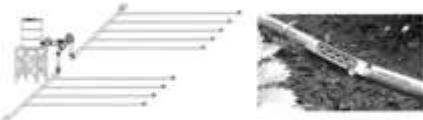


Furrows in the Desert Trainee's Handbook



Ngadidiripo ka atanki awi

Erukto a tanki, ngadipipo, ofito, njipelotu tigrani ka ngadidiripo ngotonio ngotonio ka ngakonopei (16). Lu enti awoyoi ngotonio suni kila ipoo (entu ngidipio amed otolien (160)).



atanki ngadidiripo awi kom:

Eyo ngokpi amediat, orimma ka sadiku ne akumj angkonyom na moi kechi egeote ngadidiripo. Ngesi entuk Remokino aktikor ngadidiripo kon tilik.

- Kilito ofito, togot ngokpi, totochi tilita kirkap aktikor amenyokod kori dekak, kila okuror:



- Kilitusungu ngotonio ka ngidipio: Tongoo ngadidiripo kimiek ngokpi tleinweil, kochichikok tsepuplo sadiku oikowor opei sikit. Ankesiworengokpi tokuduk ngadidiripo:

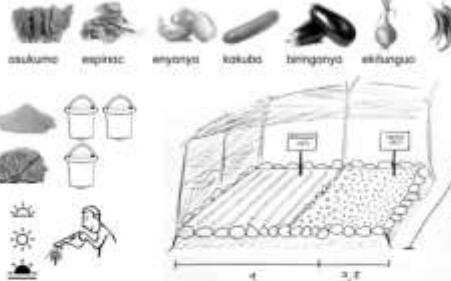


- Akiseng ngadidiripo ka egatal: Tongoo ngokpi kikakongok wedio omoru elosi lowar ka relasse ngokpi, kon tondekk kuru osiitko skitak, na cho Ingolinkia nyidip ni egotonio.



Nasor

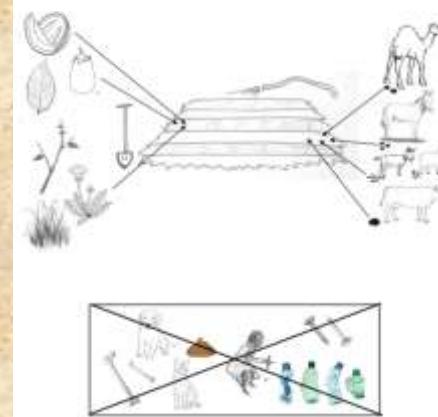
Ngichok tsuechik tonyatik Remokino aktikor ars onosor mori ekijenjer. Edisik ngichok lu nyempanute silamten. Angkinony ngula kechi.



Asubakin Nasor:

1. Taser ka opor ni kwacani nasor. Ketoi kurup ekitoe kori odukolin nyigach. Esibid lo eroi amito opor awyoyorkor elukuru.
2. Tolii osinyon ka okompos ars erumor kimokpi ngobekita ngoonei osinyon ka opor ni okompos.
3. Kitem esibid ngasentimtso ngotonio (Tlom) kuare mndup.
4. Kwaak ngomoni kimora esibid.
5. Ari kedoper, todukok iyooh ka okiwalan ibore ni eropt ekowom.
6. Kitamessik ngopup.
7. Kili ngikinyori.
8. Kirkap, ekiro osikinyamit, ngotale na itokinio ngikinyori.
9. Kitamessene ngauini kori ngoonon kila okewa:
10. Remokino ngikinyam enjuwile ozdounet engiusi anguru tanang ngotonio.
11. Ne apsuuneta kitanzinkino na apenida kori na hawakinela ngokazi ngotonio.

asubakin okompost



checklist:	akilekto	akilekto ni ngikinyamit	akilekto ni ngotonio	akilekto ni ngosom	akilekto ni ngotonio	akilekto ni ngosom	akilekto ni ngotonio	akilekto ni ngosom	akilekto ni ngotonio
kilito ofito									
kesmet resinsach									
kiteneti eluong									
okitokit nachi									
tomato									
spinach									
osakuma kale									
ekhinguo orion									
mahindi maize									
ngilmeo sorghum									
lungusum garlic									
soyo soy bean									
ekundi cowpea									
echorogi green gram									
okadett nachi squash									
kakubo cucumber									
namunye water melon									
amelon sweet melon									
biringomyo eggplant									
oko pili pili do green pepper									
pili pili hot pepper									
paw paw papaya									
okitokit moringo									
asubakin okompost									

akiyangar anawi ka etichkon



aseun ngikeng'arakinak ng'arei



Akilokony kori

Kila skinyonti (kori ekito) dossing elem: skinyum ondup. Remokino aktikotin sodi tokenu nsi ogear ejek. Antipetelokon ngikinyam, apote ngidupi lulekak, ngidekelesit ka ngoye, lasturite okimpi ondup kori kiterken. Nyitok ngikinyam tu erisi dvi kori skot ejek, tobenok, nobo wape. Nokomeni token skinyonti tu ekot kori tu awi azochi.

Cucurbitaceae Family				
emyanya				
okitokit eluong				
Antirrhinaceae Family				
espirasi				
Brassicaceae Family				
mustume				
Rosaceae Family				
ekitach				
Boots Family				
okitokit nachi				
okitokit moringo				

FID Trainee's Handbook
Written in Turkana
Used by graduates at
their farms

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	Dorcus	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

Ruth, Nakinomet



Alice, Kokuselei



Rotary International, Israel and Kenya

- Funding farmers' Kits and maintenance costs



Peter, Manalogoria



Supporting volunteers & employing an Israeli operation manager: Joint project AIES-KKL-JNF Germany (2016-19, €78,500+₪ 79,600)

- 1 operation manager a year (to 2020)
- 3-6 volunteers a year for 5-6 months (to 2021)
- Training in Israel and in Turkana
- 2 experts visits to Turkana a year

Funds cover:

- Flights, visas, insurance, vaccinations
- Food & accommodation funded by MCSPA



Introducing agriculture to school children



Opening the 8th course, 15 January 2017

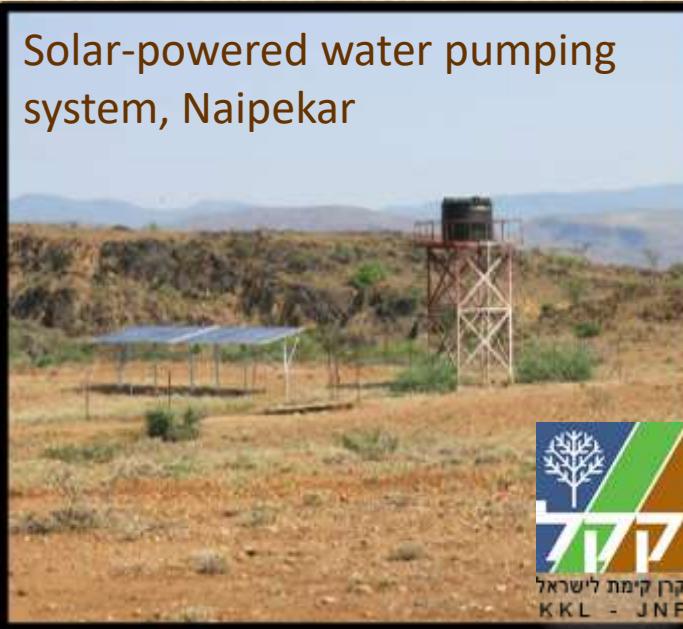


Training the 7th course at the nursery

Bringing Medjool Dates to Turkana & installing solar-powered water pumping systems

Joint project FID-KKL Israel (2015-2017, ₪195,000)

- 170 date shoots arrived from Israel, March 2017
- Installed 2 solar-powered water pumping systems at Kapotea and Naipekar farming clusters
- Established the first medjool date plantation in Turkana using the local alkali water
- Only 34 trees survived & 4 local male trees planted
- Over 40 offshoots



Bringing watershed management practices to Turkana for the development of agro-silvopastoral systems: a joint research project for KKL-JNF and the Arava Institute for Environmental Studies (2019-2023. ₪ 795,600)

- Increase the local production of pasture and other animal feed
- Prevent land degradation through erosion
- Improve soil quality through organic matter decomposition
- Increase the spatial availability of shading trees, wind breakers and the supply of fuel wood
- Increase re-charge of shallow aquifers
- Contribute to environmental education and awareness of local communities through high visibility of variable and dense plant production, especially of trees
- Produce fruits by fruit trees towards food security



Shichim



First developed site, Lobur

- Training in designing and constructing water-runoff catchment infrastructure for land reclamation
- 700 trees were planted in 2020



Fire at storage facility, Lobur, May 2020



AIES donated \$2,000
to recover lost
farming equipment



Discussing safety and way forward following the fire

Agricultural development initiative and irrigation scheme, Napuu 1, County Government project, Turkana Central

- Initiated in 2016 based on FID success
- 2,200m fenced area
- 418 plots of 500m² each
- 2,000L tanks placed 2m above the ground, each serving 2 plots
- Low pressure gravity-fed drip-irrigation system



- Napuu farmers were left to manage their affairs by themselves without appropriate knowledge, experience, guidance and access to agricultural inputs.
- No farmer in the world can succeed under such conditions whether they live in Turkana or Israel or Arizona



FID agreed with County Government to train local farmers in agriculture and County officers in providing long-term in-the-field agronomic services, Napuu 1 development project.

Covid-19 crisis delays commencement to second half of 2021



First farmers association in Turkana

- Saint Isidore Turkana Farmers Association (SITFA) founded 18 December 2014 by FID graduates
- Cooperative since January 2020



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



**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.

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





Prices

Tomato - 3kg @ 20f
Kale - 4 leaves @ 10f
M. melon - 1kg @ 50f
S. melon - 1kg @ 30f
Onion - 1pc @ 10kg/f
 1kg @ 100kg

Red pepper - 1kg @ 50f
Cowpea - 1kg @ 100f
Green grams - 1kg @ 100f
Navy beans - 1kg @ 20f
 1kg @ 60f
squash - 1kg @ 100f
guard - 1pc @ 3000f
Sorghum - 1kg @ 50f
Green pepper - 3pc @ 20f



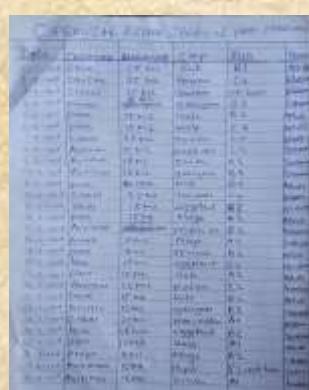
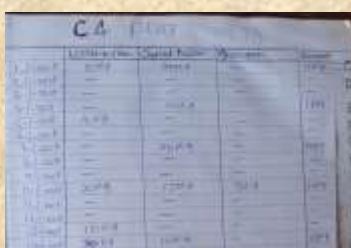
Adaptation and R&D in Agriculture



Adaptation and R&D in Agriculture



Adaptation and R&D in Agriculture



Continued education and guidance at the graduate's farms







Continued education and guidance at the graduate's farms



Teaching agriculture and environmental studies and awareness to children, Lobur primary school, 2018-2021



Long term commitment by experienced staff and volunteers, living at the central farm, supported by visiting experts





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
- Earth pan, compost piles, date plantation
- Storage facility for agricultural inputs and living and studying facilities
- Kenyan operation manager, Turkana agriculture school manager, local Turkana trainers & **foreign trainers (volunteers)**, and visiting Israeli-experts

Arava Institute for Environmental Studies (AIES)

- Established in 1996 at Kibbutz Katura
- 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



MCSA 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 MCSPA 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 30 years of activities in the field of community development MCSPA established a significant water infrastructure including:

- The construction over 120 rock dams by trained teams of Turkana people
- The construction over 100 earth pans and dams using own bulldozers
- Drilled over 200 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.

