Sustainable Land Management & Climate Change Resilience: Conservation Agriculture Experiences from Africa

by

Saidi Mkomwa, CEO
African Conservation Agriculture Network (ACT)

Email: info@act-africa.org

Presented to
International Seminar on Drought and Agriculture
Predict, Plan, Prepare: Stop Drought Becoming Famine
Sheikh Zayed Centre FAO Rome
19 June 2017

African Conservation Agriculture Network (ACT) – The Organisation

- ‘Not for profit’, voluntary membership NGO
- Built with support from GTZ, FAO, IFAD, EU, NORAD, Gvts, others
- Common vision developed in Harare in 1998
- A secretariat at the Nairobi hqts, sub-regional offices (Tanzania, Zimbabwe, Burkina Faso). CoEs.
- Board of 11 Directors, Country Focal Persons/Institutions
Smallholder (Hand Tools, Animal Traction) Conservation Agriculture (CA) Works

- Implemented several CA projects across Africa over the past 15 years ([www.act-Africa.org](http://www.act-Africa.org))

- Based on the 3 CA principles
  1. Avoiding or minimising mechanical soil disturbance,
  2. Enhancing and maintaining a permanent mulch cover with organic matter on the soil surface, and
  3. Diversification of species

- Targeting smallholders using hand tools and animal traction equipment
  - Hand rippers
  - Hand weed scrappers
  - Jab planters
  - Animal drawn rippers
  - Animal drawn mulch seeders
  - Ox ripper
  - Jab planter
  - Ox drawn seeder
CA demonstrations and training of Farmers in groups, and on-farm validation trials

- ABACO was in 6 countries, directly reached 8,000 farmers
- 250 farmers in Laikipia County Kenya, under 10 FFS
- Each FFS with 4 no-till/CA treatments compared to farmers’ practice.
  - Hand hoe or ox ploughed Farmers’ plot
  - No-till with no soil cover
  - No till + dolichos lablab cover crop
  - No till + pigeon pea cover crop
  - No till + lablab and pigeon pea cover crop
- Same seeds, fertilizer and time of planting
- Hand weed scrapping or herbicide application

The Soil Cover Crops

CA maize intercropped with pigeon peas
CA maize intercropped with lablab
**GRAIN YIELDS**

**Grain yield kg ha\(^{-1}\)**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Yr2012</th>
<th>Yr2013</th>
<th>Yr2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>FP</td>
<td>2189.4(^{a})</td>
<td>1516.8(^{b})</td>
<td>979.4(^{c})</td>
</tr>
<tr>
<td>NNC</td>
<td>1758.3(^{a})</td>
<td>2059.5(^{ab})</td>
<td>1239.0(^{ab})</td>
</tr>
<tr>
<td>NDL</td>
<td>2220.5(^{a})</td>
<td>2538.8(^{a})</td>
<td>1475.3(^{a})</td>
</tr>
<tr>
<td>NPP</td>
<td>1781.9(^{a})</td>
<td>2549.5(^{a})</td>
<td>1413.7(^{a})</td>
</tr>
<tr>
<td>NDP</td>
<td>1814.0(^{a})</td>
<td>2164.7(^{ab})</td>
<td>1152.1(^{b})</td>
</tr>
<tr>
<td>(p)</td>
<td>0.409</td>
<td>0.02</td>
<td>0.0017</td>
</tr>
</tbody>
</table>

**Net Benefit (ha\(^{-1}\)) in KSh**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Yr2012</th>
<th>Yr2013</th>
<th>Yr2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>FP</td>
<td>43,165(^{a})</td>
<td>26,569(^{b})</td>
<td>-4,215(^{b})</td>
</tr>
<tr>
<td>NNC</td>
<td>8,305(^{b})</td>
<td>27,236(^{b})</td>
<td>-21,751(^{c})</td>
</tr>
<tr>
<td>NDL</td>
<td>46,583(^{a})</td>
<td>67,301(^{a})</td>
<td>13,145(^{a})</td>
</tr>
<tr>
<td>NPP</td>
<td>32,245(^{a})</td>
<td>67,431(^{a})</td>
<td>11,304(^{a})</td>
</tr>
<tr>
<td>NDP</td>
<td>41,185(^{a})</td>
<td>61,165(^{a})</td>
<td>9,734(^{a})</td>
</tr>
<tr>
<td>(p)</td>
<td>0.009</td>
<td>0.0007</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>

**RAINFALL**

![Rainfall Chart](chart)

**Cumulative Rainfall in mm**

- Yr2012: 1200.60
- Yr2013: 955.70
- Yr2014: 724.69

**Rainfall in mm**

- Jan: 140
- Feb: 260
- Mar: 380
- Apr: 500
- May: 620
- Jun: 740
- Jul: 860
- Aug: 980
- Sep: 1100
- Oct: 1220
- Nov: 1340
- Dec: 1460
Facing Climate Change: promoting Conservation Agriculture to enhance Food Security

1. Maize yield not significantly influenced by CA treatments in Year 1.
2. More than 68% yield increases (1.5 to 2.5 tons per ha), in marginal areas, without irrigation from second season onwards
3. Yields in Farmers’ tillage plots decreasing with time. This is NOT “natural”
4. Yields in Farmers’ tilled plots endured more severe yield reductions with drought (-55% vs -21% to -36%) than the CA plot.
5. Net benefits always higher for the CA plots.
6. Legumes liked by women and provided additional food, nutrition, soil fertility improvement and income.
7. CA is being used to enhance Land Aggradation and Restores Landscapes. See Thomas Loronyo (https://www.youtube.com/watch?v=l0orM79a60o)

CA Enhances Land Aggradation and Restores Landscapes

FROM THIS  TO THIS

See Thomas Loronyo, Arusha Tanzania.
CA now adopted in more than 20 countries in Africa as a core production component of climate-smart agriculture.

Cropland under CA systems in Africa is about 2.68 Mha,

Area under CA has increased by 447% since 2008/09.

- Algeria
- Ghana
- Kenya
- Lesotho
- Madagascar
- Malawi
- Morocco
- Mozambique
- Namibia
- South Africa
- Sudan
- Swaziland
- Tunisia
- Uganda
- Tanzania
- Zambia

Challenges and Emerging Solutions

- Higher level Leadership on CA/CSA
- In spite of the Africa Unions’ Malabo Declaration with the vision of having 25M rural households practicing CSA by 2015, CA/CSA remains largely on project mode and not mainstreamed in Government programmes. A funded implementation plan for the Malabo Declaration is overdue.
- Support is needed now to unlock private sector investments into smallholder agriculture. Mechanised Entrepreneurial CA Service Provision business models hold the promise to pave the way to create employment for the youths while sending the hoe to the museum by 2025.
THANK YOU FOR LISTENING
www.act-africa.org