Implementing climate resilient innovations in cotton farms

'Cotton Value Chain: Local Innovations for Global Prosperity'

4th December 2023
Cotton’s ESG challenges

**Environment**

Heavy reliance and excessive use of:

- Pesticides significantly impacting ecosystems and farming communities
- Synthetic fertilizers reducing soil fertility and increasing soil acidification
- Water affecting supply to rivers and households especially in water-scarce areas

**Socio-economic**

Key issues facing farmers and communities:

- Poor working conditions, child labour and forced labour
- High debts due to reliance on fertilizers and pesticides
- Low incomes from macroeconomic conditions and global market volatility
- Gender inequality impeding inclusive development
Côte d’Ivoire integrated ginning - SECO

<table>
<thead>
<tr>
<th>Outgrowers Program</th>
<th>Ginning</th>
<th>Lint Trading</th>
</tr>
</thead>
<tbody>
<tr>
<td>+102,000 Ha Cotton area</td>
<td>2 Gins</td>
<td>100% AtSource+</td>
</tr>
<tr>
<td>+21,900 Cotton growers</td>
<td>100,000 tons of Seed Cotton</td>
<td>Solidaridad</td>
</tr>
<tr>
<td>45,000 Tons lint</td>
<td>40 Bales/hr each gin</td>
<td>giz</td>
</tr>
<tr>
<td><strong>Outgrower program:</strong> (Small holder rainfed farming)</td>
<td><strong>Lint</strong></td>
<td><strong>Since 2014</strong></td>
</tr>
<tr>
<td>✓ Agronomy services</td>
<td><strong>Lint Yield:</strong> From 270 kg/ha (2008) to 475 kg/ha (2021-2022)</td>
<td>CmiA &amp; BCI certified 2023</td>
</tr>
<tr>
<td>✓ Farmer engagement</td>
<td><strong>Revenue per ha:</strong> $ 336</td>
<td>Regenagri certified</td>
</tr>
<tr>
<td>✓ Farm extension services</td>
<td><strong>Traceable</strong> cotton till farmgate</td>
<td></td>
</tr>
<tr>
<td>✓ Agri-input sourcing</td>
<td><strong>Non-GMO</strong> cotton</td>
<td></td>
</tr>
<tr>
<td>✓ Ginning</td>
<td>SECO targeting to become <strong>NetZero</strong> by 2026</td>
<td></td>
</tr>
</tbody>
</table>
Our approach

Advocate for nature positive agriculture and equip farmers to implement more sustainable farming practices

Promote responsible crop management
Crop rotation, minimum tillage, cover cropping and organic matter to increase soil fertility and sequester CO$_2$

Reduce environmental impact
Encourage biodiversity and minimise use of synthetic fertilisers, pesticides and water

Improve farmer livelihoods
Secure farmer incomes and increase food security
Focus on climate smart farming techniques

<table>
<thead>
<tr>
<th>SECO Target</th>
<th>2021-22</th>
<th>2026-27</th>
<th>2029-30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lint Cotton Yield (Kg/ha)</td>
<td>475</td>
<td>588</td>
<td>672</td>
</tr>
</tbody>
</table>

### Soil Health
- Improve Organic Carbon from 0.26% to 1%
- Fertilizer use based on soil test results.
- Erosion management (Gulley treatment, stone and earth bunding, etc.)
- Soil moisture conservation.
- Contour ploughing.

### Seed
- 100% R1 and R2 generation seeds to be sown.
- Plant population >75,000 pl/ha maintained.
- Identify varieties that are tolerant to drought and pest conditions.

### Mechanization
- Address labour shortage.
- Develop service model (field preparation/sowing) in line with conservation tillage principles.

### Canopy Management
- Timely thinning.
- 75 – 80 days after sowing remove monopodial branches.
- PGR application: 75 DAG.
- Enhances light, nutrient and water use efficiencies for better yield.

### Regen Ag
- Minimum tillage.
- Agroforestry.
- Green cover crops.
- Composting.
- Crop rotation.
- Weed management.
- Livestock management.

---

**Challenges**
- Planting Seed
- Plant population
- Labour
- Climate change
- Soil fertility

**Total growth cycle**: 6 – 7 months
Farmers follow crop rotation

- This helps limit pest infestations and nourishes beneficial microbes in the soil with a more diverse diet.
- Rotating between nitrogen-fixing crops like soyabean and nitrogen-hungry crops like cotton, corn can reduce the need for synthetic fertilizers.
**Biochar**

**Pyrolysis:** is the thermal decomposition of organic matter in an oxygen-poor environment. Every ton of biochar produced, removes 2 tons of \( \text{CO}_2 \)

<table>
<thead>
<tr>
<th>Pyrolyser</th>
<th>Furnace volume (m³)</th>
<th>Cotton stalk type</th>
<th>Quantity feedstock (Kg)</th>
<th>Process duration (minutes)</th>
<th>Biochar produced (Kg)</th>
<th>Outturn (%)</th>
<th>Per day production capacity (kg)</th>
<th>To produce 1 ton biochar (Days)</th>
<th>Furnace Cost (in $)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local (SECO)</td>
<td>0.2</td>
<td>Shredded</td>
<td>20</td>
<td>60</td>
<td>6</td>
<td>30%</td>
<td>48</td>
<td>21</td>
<td>63</td>
</tr>
<tr>
<td></td>
<td>0.2</td>
<td>Whole</td>
<td>15</td>
<td>30</td>
<td>2.7</td>
<td>18%</td>
<td>43</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>ICRAF (MITSUBISHI)</td>
<td>4</td>
<td>Shredded</td>
<td>192</td>
<td>570</td>
<td>44</td>
<td>23%</td>
<td>37</td>
<td>27</td>
<td>3,005</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Whole</td>
<td>66</td>
<td>480</td>
<td>8.5</td>
<td>13%</td>
<td>9</td>
<td>118</td>
<td></td>
</tr>
<tr>
<td>Kon-tiki (ICAC)</td>
<td>1</td>
<td>Whole</td>
<td>210</td>
<td>33</td>
<td>66</td>
<td>31%</td>
<td>960</td>
<td>1</td>
<td>20</td>
</tr>
</tbody>
</table>

*Olam Agri*
Nature positive actions to regenerate Soil and Ecosystems

7,350
Cotton farmers have adopted soil erosion practices with technical support from IFC

80%
Increase in the no. of farmers using oxen for land preparation using minimum tillage technique to reduce soil disturbance

100 ha
Land in pilot to promote biochar production and use with support of ICAC & CIRAD. Another pilot is underway with ICRAF supported by Mitsubishi Corporation

12 million
Litres of rainwater collected by farmers to use for spraying agrochemicals

30,930
Trees and saplings planted by farmers in 2022 and 2023. Partnership with water & forest Ministry to provide 45,000 by 2024

1,500
Farmers trained on composting practices, crop rotation & cover crops to improve soil fertility with ACF
Regenerative agriculture

Restoring and enhancing soil health and fertility, while promoting biodiversity and mitigating climate change. Regenerating and improving ecosystems and creating resilient and sustainable farming systems to benefit both environment and the farmers’ livelihoods.

The benefits:

- Carbon sequestration
- Secure yields
- High quality produce (food & fibre)
- Resilience to extreme weather events
- Increased farm profitability
- Improved biodiversity & natural capital
- Farmer well-being
- Increased water retention & quality

Olam Agri
SECO regenagri certified

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total area regenagri certified (ha)</td>
<td>256,915</td>
</tr>
<tr>
<td>Cotton area (ha)</td>
<td>102,000</td>
</tr>
<tr>
<td>Lint cotton (MT)</td>
<td>45,000</td>
</tr>
<tr>
<td>SECO regenagri score</td>
<td>88%</td>
</tr>
</tbody>
</table>

The cultivation SECO’s sustainable cotton generates approximately half the GHG emissions than conventionally produced cotton.

![SECO regenagri certificate image]