Reconciling Poverty Eradication and Quality of the Environment: What are the Innovative Solutions?
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Conservation Agriculture: Global Perspectives and Developments

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www.fao.org/ag/ca
Ecological Sustainability: now not a desirable option but a necessity

Therefore:

• Need to link/integrate Production with Sustainability

• One new strategic goal of FAO: Sustainable Crop Production Intensification (SCPI)

• Conservation Agriculture is the core strategy of SCPI = applied sustainable agriculture
The “promised land” today: view from mount Nebo towards Jordan Valley

(suggested reading: Dirt – the erosion of civilizations by David Montgomery)
Tillage has an unacceptable environmental footprint

degradation/erosion $\Rightarrow$ natural soil formation $\Rightarrow$ NOT sustainable

therefore:

tillage is incompatible with sustainable agriculture!

Further promotion of tillage based agriculture is not a wise strategy anywhere
The Current Dominant Paradigm

Low soil carbon farming paradigm of intensive tillage (disrupting and debilitating many important soil mediated ecosystem functions) and leaving the soil and the landscape exposed/unprotected and starved of organic matter is the root cause of our degradation (loss of soil health – soil agro-biodiversity, soil structure, compaction, runoff and erosion, and weed/pest infestation).

This is being exacerbated by: (a) applying excessive mineral fertilisers on to farm land that has been losing its ability to respond to inputs due to degradation, and (b) reducing or doing away with crop diversity and rotations (which were largely in place around the time of WWII).

The above situation is leading to further problems of increased threats from pests, diseases & weeds against which we are applying even more pesticides & herbicides & further damaging agro-biodiversity and polluting the environment.
Now dangerous point: Solution for sustainable farming has been known for a long time.

**FAO definition:** [www.fao.org/ag/ca](http://www.fao.org/ag/ca)

**Conservation Agriculture (CA)**

is an approach to managing agro-ecosystems for improved and sustained productivity, increased profits and food security while preserving and enhancing the resource base & the environment. CA is characterized by three linked principles, namely:

1. **Continuous minimum mechanical soil disturbance.**
2. **Permanent organic soil cover.**
3. **Diversification of crop species grown in sequences or associations.**
Land Preparation
Conventional: regularly full tillage
CA: planting holes, ripping or mulching
CA: more than just no-till: “never till”

- with other best practices (IPM, IPNM, IC-LS, agro-forestry, ...) it is sustainable agriculture and ecosystem management with reduced inputs & costs, & higher profits
- Saves 50% labour for small farmers, less drudgery, food security
- organic matter and carbon recycling
- biodiversity
  (rotation, soil life)
- biological processes
- stops erosion, reverses degradation, aquifer recharge (bio-pores)
- improved water quality
- climate change adaptation and mitigation
History and Adoption of CA Globally

- Dustbowl: 1930
- US Soil Conservation Service conservation tillage
- First no-till in the US
- Faulkner (US) – Fukuoka (Japan)
- dustbowl Siberia/USSR
- commercial no-till/US
- first no-till demonstration in Brazil
- IITA no-till research
- Oldrieve/Zimbabwe
- Adoption Brazil plantio direto na palha
- Experiments in China, Indogangetic Plains
- Argentina, Paraguay
- New boost: Canada, Australia, Kazakhstan, Russia, China, Finland, ...; Africa
- 2000

Mill. ha

120 mill ha

100

50
CA worldwide >120 M ha (8% cropland)

>50% continental, dry
large scale Canada 13.5
<25%
temperate, moist
USA 26.5
<70%
tropical savannah
Paraguay 2.5
other LA 2 large scale

>70%
temperate, moist
Argentina 26

large scale
Brazil 26

temperate
Europe 1

large scale
Africa 0.6
Tropical savannah
smallholder

subtropical, semi-arid
Australia 17
subtropical, semi-arid
large scale

China 3.1
Smallholder
subtropical
large scale
Kazakhstan >1.5
continental, dry

subtropical, dry
large scale
up to 90%
Support to Adoption

• Intellectual hindrances – the embedded current paradigm & support structures.
• CA is knowledge and management intensive and perhaps a complex system to learn and adopt.
• It requires a facilitating learning environment for the farmer to gain experience in his/her own context.
• Farmer Field Schools/farmer associations offer an effective mechanism to set up a process of farmer discovery, adaptation
• Policy and institutional support for win-win public-private-farmer organization partnerships necessary
This is how CA actually works?