



Updates & News Alert

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Reversing agricultural land degradation worldwide



Soil compaction and loss in water infiltration ability caused by regular soil tillage leads to impeded drainage and flooding after a thunderstorm in the ploughed field (right) with sugar beet, and no flooding in the no-till Conservation Agriculture field (left). Photo Credit: Wolfgang Sturny

- **landscape ecosystem functions and services** at the farm, landscape, community and territorial level.

This new paradigm of CA is based on three linked principles:

- No or minimum mechanical soil disturbance (no-till seeding and weeding);
- Maintenance of soil mulch cover with crop residues, stubbles and cover crops; and
- Diversified cropping involving annuals and perennials, including legumes, in rotations and associations.

No-till Conservation Agriculture is one of the best climate-smart solutions to combat land degradation and desertification. It is also the best practical approach to pursue the goals of sustainable agriculture to maximize productivity with resilience and harness a wide range of ecosystem services to improve rural livelihoods, and food and nutrition security almost everywhere. It is also one of the best approaches for pro-poor agricultural development that is socially equitable and economically affordable for resource poor farmers.

Read more on [Reversing agricultural land degradation worldwide](http://goo.gl/tdydax) by Prof. Amir Kassam, *Moderator of the Global Conservation Agriculture Community of Practice (Global CA-CoP) communication platform hosted by the Food and Agriculture Organization (FAO) of the United Nations, Rome*. Available also on: <http://goo.gl/tdydax>

Agricultural land degradation and its end result of desertification have been receiving considerable attention by the international community in recent decades. However, the general lack of understanding and awareness about the root causes of land degradation persists, thus the slow progress in reversing the alarming trends of land degradation and land abandonment. Worldwide, empirical and scientific evidence clearly shows that soil degradation in agricultural land use and decreasing productivity are closely related to the prevalence of mechanical soil tillage, the agricultural method of using mouldboard ploughs, disc harrows, tines, rotavators, hoes and other mechanical tools to prepare the field for crop production.

Tillage-based agriculture globally has converted our agricultural land and soils into – for lack of a better term – ‘dirt’ and, even worse, it has led to excessive use of agrochemicals, seeds, water and energy, whilst increasing production costs, decreasing input factor productivity, and reducing overall resilience. These aspects have led to degraded ecosystems and loss of

ecosystem (and societal) services, including quality and quantity of water, loss of biodiversity, and unique landscapes. The good news is that in response to these land degradation issues, a new agricultural paradigm known as **no-till Conservation Agriculture** is emerging. An agroecological based approach to managing the natural capital base for sustainable productivity and resilience, **Conservation Agriculture** has been spreading in all continents, especially over the past three decades.

This approach maintains an ecological foundation in production systems maximizing productivity, efficiency and resilience by paying special attention to:

- **soil** as a living biological and multi-functional system, whose health and functions must be understood and managed correctly;
- **biodiversity** in the soil (microorganisms and mesofauna) and above the ground as an asset; and

Far from being a threat, Livestock is a complimenting asset to adoption of Conservation Agriculture

Philanthropist Dr. Howard G. Buffett, who is a farmer, states in a feature [article](#), “one thing that has provided consistent success on our farms and for millions of farmers, both large and small, across the world is conservation-based agricultural production techniques”. He goes further in his article and describes the ten common myths of Conservation Agriculture (CA) when applied to smallholder farmers used to dispel the use of CA and reduce its adoption. He

lists the number two myth as “Retention of high levels of crop residue for ground cover mulch is not realistic for smallholder farmers because they are not able to produce sufficient biomass or must use biomass to feed higher value livestock”. He further argues, it is true that the residue of some crops is used for feed, but this is not always a result of best practices. The bottom third of the stalks of crops such as sorghum or millet can have negative nutritional value for

animals, but offer good organic material for soil. However, without the proper training, these old habits will not change. There has also been little research in Africa to determine the value of simply leaving the root balls in place and planting between the old rows. In some cases it will be a challenge to overcome the issue of competition for residue, in other places it is not an issue at all. Therefore it is like everything else in life, you do it where it works and you make adaptations where necessary. In terms of increased biomass, as yields increase, biomass will increase - no one should be advocating for accepting current yield levels.

Most farmers and extension agents alike would ‘hide’ in this myth as the reason for non-adoption of CA. The worst hit are dairy farmers and pastoralists who would crave for any crop residue as a livestock feed. The African Conservation Tillage Network (ACT) documentary “[Feeding the Soil or Feeding the cow?](#)” is meant to provoke thoughts on the subject and strongly convey the message that if we do not take serious action to feed the soil, it will be unable to feed the cow and subsequently our steak will be at stake. Read More <http://goo.gl/CtXS2v>



Figure 1. Field day participants follow the proceedings (L) while host farmer (Anne Githinji, standing left) explains CA-Fodder pilot initiatives. Insert is forage oats produced the CA way.

Building a sustainable future: A history of conservation agriculture in southern Africa

HARARE, Zimbabwe (CIMMYT) — when practiced unsustainably, agriculture has led to environmental degradation and famine, which have plagued civilizations [through the centuries](#). Innovations such as irrigation or the plow (since circa 6,000 and 3,000 BC) increased productivity, but often deteriorated long-term soil fertility through erosion and other forms of degradation. We are now facing historically unprecedented challenges to food security. We must increase food production by [70 percent to feed nine billion people by 2050](#), without damaging our finite and often already degraded natural resource base. In addition, farmers face more frequent drought and water scarcity, which makes it increasingly difficult to grow crops, and extreme weather events such as the 2015-2016 El Niño, which has already caused large-scale crop failures and soaring maize prices in southern Africa. [Conservation Agriculture](#) (CA) practices based on the principles of minimal soil disturbance, permanent



Farmers in Shamva District, Zimbabwe, are introduced to an animal traction direct seeder which allows seeding and fertilizing directly into crop residues with minimum soil disturbance. Photo: Thierfelder/CIMMYT

soil cover and crop rotation are helping farmers combat growing environmental challenges by maintaining and boosting yields, while protecting the environment and increasing profits for smallholders globally. When CA practices are coupled with water-use efficient and drought tolerant varieties, the benefits are even greater

Based on its experience in Latin America, which began in the early 1990s, CIMMYT started its first CA project in Africa in 2004, targeting Malawi, Mozambique, Tanzania, Zambia and Zimbabwe. This initial

work focused on understanding CA systems in the context of farmers and their environmental conditions and was funded by the German government and the International Fund for Agriculture Development. Its aim was to facilitate the adoption of CA systems by smallholder farmers. This culminated in the establishment in 2009 of a large PAN-African project on Sustainable Intensification of Maize-Legume Systems in Eastern and Southern Africa (SIMLESA).

More information on the issues available@ <http://goo.gl/IFV1GB>

Nigeria has launched a “Soil Doctor” programme after decades of declining soil health and mounting malnutrition

Africa's most populous country has launched a long-overdue national program for its millions of small-scale family farmers: a soil test kit linked to the digital cloud. The program by the government of Nigeria follows decades of declining soil health and mounting malnutrition. Known as “Soil Doctor”, the test will enable farmers to quickly analyze the nutrient content of their soil. This information in turn, will allow them to determine which fertilizers to use and in what amounts. The goal: to improve food production by getting the most out of the soil.

The program is meant to address a problem that is widespread not only in Nigeria but also across sub-Saharan Africa where some 65 percent of the region's soils are degraded. Extensive land degradation is now a major driver of hunger and food insecurity, for depleted soils can neither support high yields nor grow nutrient-rich crops.

It is difficult to overestimate the importance of healthy soils. Unseen to



the naked eye, healthy soils improve the activity of soil microbes, which in turn help plants utilize nutrients; cope with water stress; and combat crop diseases and pests. For Africa to sustainably feed its growing population, many governments must emulate Nigeria's example and take action to restore soil health.

It is often a matter of reversing the damage done by “soil mining.” In many parts of Africa, poor soils are the

result of repeated farming of the same land without replenishing the soil's nutrients. Crops consume upwards of 45 kilograms of nutrients and minerals from each hectare of land every season.

Read more the article by Esther Ngumbi on <http://news.trust.org/item/20160614065602-osduy>, also available on: <http://goo.gl/2BQr4u>

Drought prompts debate on Cuba's irrigation problems

Five gargantuan modern irrigation machines water the state farm of La Yuraguana covering 138 hectares in the northeastern province of Holguín, the third largest province in Cuba. However, “sometimes they cannot even be switched on, due to the low water level,” said farm manager Edilberto Pupo. “The last three years have been very stressful due to lack of rainfall. We take our irrigation water from a reservoir that has practically run dry,” Pupo told IPS. In 2008 La Yuraguana received new irrigation equipment financed by international aid. Central pivot machines are a form of overhead water sprinkler that imitates the action of rain. The machinery is assembled in Cuba using European parts. Since late 2014 Cuba has endured the worst drought of the past 115 years. The extremely dry weather has sounded an alarm call drawing attention to the urgent need to modernize and change water management practices in response to climate challenges, and to other problems such as water wastage from leaky supply networks, inefficient water storage and conservation policies and absence of water metering at the point of use.

Agricultural scientist Theodor Friedrich, the FAO representative in Cuba, told IPS that “irrigation is not the answer to drought.” This Caribbean island “should curb the use of irrigation rather than extend it,” he warned, because exploiting water sources, especially underground aquifers, could lead to “degradation and accelerated salinization of water resources.” A better course of action, he said, is to “implement water conservation measures at once, including the reduction of leakage losses throughout the piped water distribution network, avoidance of all forms of sprinkling irrigation, watering the soil directly and irrigating according

to the particular needs of the crop, not forgetting to take into account long-range meteorological forecasts.”

In Friedrich's view, sustainable solutions must be based “on soil management” and conservation techniques. He pointed out that eco-friendly organic agriculture “achieves greater production yields with less water and opens up the soil so that rainwater can infiltrate to the fullest depths and refill aquifers.”

For information: <http://goo.gl/7OePBM>



Julio César Pérez weeds a cassava (yuca) field on a farm owned by the Eduardo R. Chibás Credit and Services Cooperative in the eastern Cuban province of Holguín. An irrigation system installed in 2010 has increased the cooperative's yields by 70 percs (Credit: Ivet González/IPS)

Are Conservation Agriculture (CA) systems productive and profitable options for smallholder farmers in different agro-ecoregions of Zimbabwe?

According to Mupangwa, W., Mutenje, M., Thierfelder, C. and Nyagumbo, I. (2016) research paper, continuous conventional tillage coupled with unsystematic cereal/legume rotations has promoted low crop productivity on smallholder farms. A multi-locational study was established in three agro-ecoregions (AEs) of Zimbabwe. The aim of the study was to determine the effect of four tillage systems (conventional plowing, planting basins, rip-line and animal traction direct seeding systems) on maize (*Zea mays* L.), cowpea [*Vigna unguiculata* (L.) Walp] and soybean [*Glycine max* (L.) Merrill] yields, and

evaluate the economic performance of the conservation agriculture (CA) systems relative to conventional plowing. Each farmer was a replicate of the trial over the three cropping seasons. In the high (750–1000 mm per annum) and low (450–650 mm) rainfall AEs, conventional practice and CA systems gave similar maize grain yield. Under medium rainfall conditions (500–800 mm) planting basins, rip-line and direct seeding systems gave 547, 548 and 1690 kg ha⁻¹ more maize yield than the conventional practice. In the high and low rainfall AEs, conventional practice and planting basins had the lowest

maize production risk. Cowpea yield was 35 and 45% higher in the rip-line and direct seeding than conventional practice. Soybean yield was higher in rip-line (36%) and direct seeding (51%) systems than conventional practice. Direct seeding system gave the highest net benefits in all AEs. A combination of long-term biophysical and socio-economic assessments of the different cropping systems tested in our study is critical in order to fully understand their performance under different AEs of Zimbabwe.

Read more on <http://goo.gl/SnEYz7> or <http://goo.gl/DITyt1>

Climate-Smart Agriculture in Action: Case study and Video



More than a billion farmers and their families around the world are on the front line of climate change. Their lives and livelihoods are directly affected by its impacts, and they are also vital to implementing many of the solutions we need to help prevent it. “Climate-smart agriculture” describes agricultural practices which contribute to increasing farm productivity and incomes; to building greater resilience; and to minimizing agriculture’s greenhouse

gas emissions – all in an equitable and sustainable manner.

Right now, farmers are putting climate-smart agriculture into action all around the world. Click on the case studies below to read their stories.

For more on the case study and video: <http://www.farmingfirst.org/climate-smart-agriculture> & <https://youtu.be/q7JnJ0oBa94>

Build on Malabo declaration, AfDB urged

ESTHER MSETEKA, Lusaka, The Food and Agriculture Organisation (FAO) says the African Development Bank (AfDB)’s feed Africa strategy programme should build on the Malabo Declaration, in particular, the commitment to ending hunger by 2025, to improve the livelihood of people.

FAO regional initiative ‘Renewed partnership to end hunger in Africa by 2025’, seeks to assist countries in strengthening their efforts and capacity to deliver programmes that contribute to eradicating hunger. The initiative also aims at adding value to ongoing work at country level by sharpening the programmatic focus on food security, and by identifying concrete windows of opportunity for promoting an integrated approach to improving nutritional outcomes.

The African Union Heads of State and Government included a specific commitment to support farmers in increasing resilience of farming systems to the impacts of climate change during the 24th Ordinary Session held in June 2014 in Malabo, Equatorial Guinea. The Malabo Declaration advanced the Vision 25 x 25, also arising from the First Africa Congress on Conservation Agriculture ([IACCA declaration](#)), that will result in 25 million farm households in Africa practicing climate smart agriculture (CSA) by 2025.

In a statement availed to the [Daily Mail](#) last week, FAO assistant director-general and representative for Africa Bukar Tijani said the organisation remains committed to enhancing youth employment in different aspects and encouraging

women participation in agriculture. “I strongly believe that it is possible in the next 10 years or less to change Africa,” Mr Tijani said.

He said it is encouraging to witness the many successes that FAO has achieved in spearheading agriculture projects around the world. Mr Tijani cited the European Union-funded conservation agriculture scaling up project being implemented by FAO and the Ministry of Agriculture in 48 districts of Zambia as among the successes the organisation has achieved.

For more details: <https://www.daily-mail.co.zm/?p=68786>

Upcoming Events

Conference on Climate Smart Agriculture in Southern Africa on 11th of August 2016 in Johannesburg, South Africa

The Centre for Coordination of Agricultural Research and Development for Southern Africa (CCARDESA) with support from Gesellschaft für Internationale Zusammenarbeit (GIZ) and working in collaboration with the Food, Agriculture and Natural Resources Policy Analysis Network (FANRPAN) will be convening a one-day conference on Climate Smart Agriculture in Southern Africa on 11th of August 2016 in Johannesburg, South Africa. The conference aims at contributing to the adoption of climate resilient agriculture through sharing best practices and innovation among agriculture extension officers and other stakeholders in the region. The conference is expected to attract senior agriculture stakeholders from SADC member states, representatives of farmer organizations and civil society, practitioners and researchers. For more details, see the [draft programme](#).

Join us as new results on climate adaptation in the agriculture sector, best practices from climate smart agriculture project implementation and scoping studies on climate smart agriculture policies in the SADC region get presented. If you are interested in participating please register before 22nd July 2016 by emailing Ms. Ellen Makotwane-Machao (ellen.makotwane@giz.de) with a copy to Dr. Wiebke Förch (wiebke.foerch@giz.de).

Advanced Course - Asia: Conservation Agriculture: Gateway for Sustainable Intensification of Smallholders



Conservation Agriculture (CA) practices are increasingly accepted across the globe and are considered as harbingers for sustainable intensification of

smallholder production systems. Its positive impact on natural resources, and adaptation to and mitigation of climate change effects are widely acknowledged. In Asia, CA is a relatively new introduction and hence capacity development is vital for adaptation and scaling-up CA-based technologies to achieve impact on smallholder farmers.

This course on CA shall offer unique capacity development opportunity to the scientific community associated with natural resource management research for development. It was initiated during 2010 and is seventh in a series being organized by CIMMYT and BISA under the aegis of CGIAR Research Programmes on WHEAT, CCAFS, and in close collaboration Indian NARS. The course links the advances and multidisciplinary approach for sustainable intensification of maize and wheat based system, restoration of natural resource degradation and climate resilient production systems with expertise across Asia, Africa and Americas. The course has become a regular flagship activity wherein selected young men and women CA researchers from NARS as well as international organizations and NGOs can benefit. It is offered at [CIMMYT-BISA Ludhiana, Punjab, India, beginning November 7th 2016](#).

For more information <http://goo.gl/BoqJwY>

The 22nd Session of the Conference of Parties to the United Nations Framework Convention on Climate Change (COP22):

Marrakech COP22/CMP12 UN Climate Change Conference 2016



The 22nd Session of the Conference of Parties to the United Nations Framework Convention on Climate Change (COP22) will be held in **Marrakech, November 7 to 18, 2016**.

COP22 will take over the reins from COP21 during which important progress was made. It will focus on action items in order to achieve the priorities of The Paris Agreement, especially related to adaptation, transparency, technology transfer, mitigation, capacity building and loss and damages.

For Salaheddine Mezouar, President of COP22, this conference is an *"opportunity to make the voices of the most vulnerable countries to climate change heard, in particular African countries and island states. It is urgent to act on these issues linked to stability and security,"* he declared. COP22 will be one of action.

The COP stands for the *"Conference of the Parties."* It is the supreme decision-making body of the United Nations Framework Convention on Climate Change (UNFCCC), opened for signature in 1992 during the Earth Summit in Rio de Janeiro and later entered into force in 1994.

Through this instrument, the United Nations has equipped itself with an action framework to fight global warming.

Get more Information: <http://www.cop22.ma/>

25th National No-Tillage Conference 2017 Dates Announced

More than 100 cutting-edge, money-making sessions over 4 days, delivering insightful learning and unlimited networking with the best of the no-till community.



Early Bird registration is open for the 25th annual conference to be held January 10-13, 2017, at the **Hilton St. Louis at the Ballpark**. It's just \$284 to **register**, which is a savings of \$85.00 off the onsite rate of \$369. Additional farm or family members can also be registered for just \$259. This rate will expire August 31, 2016!

For more information, please contact: **Executive Secretary | African Conservation Tillage Network**
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Norad

ACT acknowledges the partnership and financial support provided by the Norwegian Agency for Development Cooperation (NORAD) towards Promotion of Conservation Agriculture in Africa