



**African Conservation
Tillage Network**

CONSERVATION AGRICULTURE (CA) FOR FOOD SECURITY

INSIDE THIS ISSUE

CA:

Key in Improving Food
Security in Africa

Extending CA technologies to African Farmers:

ACT addressing the gap

News in Brief:

ACT Trains Participants
from 10 Countries in CA

Feature:

Food Security Improves
in Tanzania as Farmers
Embrace CA

Village bank motivates farmers to save for a rainy day

Australian Government Supports CA Initiatives in Africa

Farmers' Voice

CA Key in improving Food Security in Africa

ACT's Executive Secretary's Desk

Engineer Saidi Mkomwa



According to Food and Agriculture Organization (FAO), food production in sub-Saharan Africa has stagnated over the last 35 years, albeit an increasing population of 2.3% annually. However, it is unfortunate that if one continues to do the same thing over and over again, the same results will be achieved! Therefore, to improve food security in Africa a farming revolution is needed to cope with the ballooning populations, increased costs of production of agriculture inputs and threatened water resources and environmental degradation.

Conservation Agriculture (CA) plays a critical role in tackling food insecurity, which mainly affects the African small scale farmer. Besides being a sustainable approach that takes care of the environment; it is accessible and uses simple agriculture technology with low production costs. Based on the three principles on minimum mechanical soil disturbance, permanent soil cover and crop rotation/associations, CA is now used in over 117 million hectares worldwide.

Additionally, since ploughing operations are not practiced in CA, the approach becomes less costly and less labor intensive. The time saved is invested in more production of food, while at the same time small holders farmers diversify to other income generating activities and provide better care to families and communities at large.

Combined with 'No Till' approach, permanent soil cover reduces water erosion of fertile top soils and results to retention of soil-moisture and recharge of aquifers down-stream. Soil cover discourages germination of weed seeds and suffocates establishment of the few that emerge. CA embraces both the natural processes and use of external inputs (e.g. herbicides, pesticides, fertilizers) but the later need to be used cautiously as the system stabilizes.

“ *Agriculture in the next decade will have to sustainably produce more food from less land through more efficient use of natural resources and with minimal impact on the environment, (www.ecaf.org. 2011).* ”

But how will that happen? CA, while tackling issue of food security, promotes the stewardship of environment for sustainable production of food in the years to come.

Farmer to farmer extension: A case of Henry mwiti from Laikipia, Kenya

One smallholder farmer, Henry Mwiti, of Laikipia, has converted himself into a CA extensionist and provider of herbicide spraying and direct seeding (without ploughing) services. He serves other farmers not only in Laikipia but Meru and Makueni Counties of Kenya. Mwiti, who has been providing ox ploughing services for seven years, came across the technology through a workshop organized by ACT in Nanyuki, Kenya. To master the concepts of CA, Henry underwent more training both locally and regionally, and successfully graduated as a qualified CA extension provider. He is an example of one of the active extension providers, who have contributed to significant growth of CA in Kenya and Tanzania with an adoption area of about 20,000 ha (www.fao.org, 2011). Through his watch, 247 conventional farmers have adopted CA over the last four years in the areas listed above; becoming not only food secure but equipped with environmental conservation knowledge

To meet the growing demand for technology and equipment for up-scaling CA practices, ACT links the farmers to equipment manufacturers and suppliers and facilitates the acquisition process, which they hire out to farmers at a small fee. The extension providers mainly use Farmer Field Schools as information sharing approach while they use their farms as demonstration plots. CA champion farmers are trained further becoming CA trainers at the community level. Besides offering extension services to farmers, extension providers lobby for CA policy related issues. For example, Henry calls on policy makers and relevant institutions to support the transition from conventional agriculture to CA. He argues that the slow adoption of the CA technology is due to the various interests that business people and other stakeholders have in conventional agriculture that comes in form of inputs and machinery importation, among other factors.



Operating at the grass roots level, extension providers in partnership with farmers look for innovative ways of handling the challenges they come across. (above) To deter animals from feeding on the mulch while pulling CA equipment, Henry and his team designed a muzzle.



EXTENDING CA TECHNOLOGIES TO AFRICAN FARMERS: ACT ADDRESSES THE GAP

In Africa, investment in agricultural extension services, a critical component to the success of food output, has been described as low and lacking coordination. It is reported that the ratio of public extension workers to the farmers is 1:3,000 in developing countries while the ratio is 1:400 in the rest of the countries (<http://www.aiaee.org>, 2011). One of the contributing factors is the absence of a legal and policy framework for providing the extension services, including budgetary allocation (<http://knowledge.cta.com>, 2011). However, research shows that

where extension services exist, if properly designed and implemented, they improve agricultural productivity.



With that knowledge, ACT not only builds the capacity of extension providers but provides the same services to the most

remote, interior rural areas where small scale farmers access information on CA. Small scale farmers are further facilitated to form well-governed farmer groups, which play valuable role in policy advocacy and in realizing economies of scale.

In conjunction with FAO, ACT has built the capacity of about 45 CA service providers in Tanzania and Kenya under CA- SARDII project. The trained service providers and entrepreneurs are actively involved in the service provision and it is estimated that around 1,200 farmers have been reached through these model of service provision in Bungoma, Laikipia and Mbeere (Kenya), Karatu, Hanang, Arumeru and Moshi (Tanzania).

ACT is addressing Extension Services, “described as the missing link in Africa’s push towards Food Security”

(www.youtube.com/watchntv)

Through conducting Regional CA training, ACT builds the capacity of front-line agricultural extension and research staff in CA. The trainings enhance understanding of the principles of CA while providing trainees with practical knowledge in the application

Continued on page3

ACTs Capacity Building Initiatives

CA TRAINING ATTRACTS PARTICIPANTS FROM ACROSS AFRICA

In September 2011, ACT East and Horn of Africa sub region conducted an International Conservation Agriculture Training in Arusha, Tanzania, which drew 13 participants from Rwanda, Burundi, Kenya, South Sudan, Malawi and Tanzania. Newly recruited staffs within ACT were also exposed to the conservation agriculture concepts and practice through the International CA course. An essential component for ACT is building the capacity of front-line agricultural extension and research staff in Conservation Agriculture. The training contributes in the development and promotion of conservation agriculture technologies, thereby enhancing their ability to respond to farmers' needs. During the ICA training the participants practiced usage of different CA equipment. Spencer Zinyemba, a participant from Great Lakes Cotton Company, Malawi noted:

“I have learnt CA practices that are important in rehabilitation of our degraded land in Malawi. I have purchased jab planters as tools for training farmers back in Malawi”

Spencer Zinyemba, Blantyre, Malawi.)

Capacity building is one of ACT's core activities and there are several projects contributing to this. First and foremost is ACT's own initiatives of the International Training Courses, Tailor made courses for specific client interests and those through projects such as CA SARD, CA2Africa, ABACO, etc. ACT is a member of the Conservation Agriculture Regional Working Group (CARWG), and is leading two thematic groups out of six; capacity building & extension and knowledge &

Information management. The international CA trainings expose participants to theories and practices of CA. Course evaluation during the Arusha training showed that participants appreciated CA as an alternative farming system in areas where land is degraded or where there is high cost of production.

ACT PARTICIPATES IN AGRICULTURAL CARBON PROJECT WORKSHOP

Carbon markets are still tiny and depend on domestic policies in Africa, however they have the potential for up-scaling to leverage meaningful private sector investments; it was noted during Agricultural Carbon Project Development Workshop in Kisumu, Kenya. The ACT East and Horn of Africa Sub-Region Coordinator, Dr. Simon Lugandu participated in the workshop whose purpose was to build hands-on capacity on how to develop smallholder agricultural carbon finance projects that can inform respective sector initiatives. The topics covered during the workshop included: Core concepts of climate-smart agriculture; Agricultural mitigation options and related carbon measurement approaches, Carbon project development cycle, Carbon accounting methodologies for Sustainable Agricultural Land Management and step-by-step introduction to developing a carbon project.



Above: A farmer shows the International Conservation Agriculture Training participants the effect of hard pans on the growth of plants.

...Continued from page 2

of CA practices for different socio-economic and agro-ecological environments to enable participants to respond competently to farmers' needs. The training further equips trainees with methodologies for enhanced documentation and wide scale adoption of profitable CA, and participants graduate as TOTs hence their information sharing skills are also strengthened. The training involves field learning activities where participants interact with farmers and Farmer Field Schools (FFS).



NEWS IN BRIEF

ACT- NET MEMBERSHIP EFFORTS

ACT, a fast growing pan-African organization, attracts membership with an aim of bringing together stakeholders and players dedicated to improving agricultural productivity through CA, amongst other factors. Several efforts geared towards interactive and service oriented ACT-Net membership were conducted as evidenced by discussion with Director of NARI-Eritrea, Dr. Iyassu about ACT – Eritrea partnership in CA promotion in the country. Although the relationship is not formally established, Eritrea is already playing the role of CA information sharing and supports CA activities within the country.

ACT TO PIONEER PRIVATE SECTOR INVESTMENTS INTO CA IN AFRICA

To identify appropriate optimal CA technologies and scaling out models, ACT, as the CA think tank for Africa, will pioneer the first Conservation Agriculture Workshop with a difference - Bringing together farmers and investors in Africa in 2012. Scenarios of healthy returns to investments and the environment will be presented to also attract farmers to invest more in CA. In Africa in 2012. Diverse CA stakeholders including private sector (small and medium farmers), farmer organizations and cooperatives, policy makers, scientists and the media will come together to exchange ideas and share experiences. With the realization that a strong CA lobby and advocacy need to be undertaken in Africa, the workshop will propel the CA agenda further.

SOUTHERN AFRICA OFFICE OPENS:

The Southern Africa Sub-regional office started operating in June 2011, re-opening after 7 years of closure following the re-location of ACT's Office from Zimbabwe to Nairobi, Kenya. The office is situated on 5 Premium Close, Siemens House, Mt. Pleasant Business Park in Harare, Zimbabwe. The newly recruited ACT Southern Africa Sub-Regional Coordinator, Herbert Mwitah Mwanza brings to ACT years of expertise having worked with the Zambian Government and International NGOs in rural development programmes promoting sustainable resource utilization by smallholders. He holds an MSc in Agricultural Engineering from Cranfield Institute of Technology, UK. His email is herbert.mwanza@act-africa.org. The re-opening of the ACT Harare office, adds

to the Ouagadougou, Burkina Faso, West and Central Africa office and the Dar es salaam East and Horn of Africa office. Nairobi remains the organization's headquarters.

ACT TANZANIA OFFICE RE-LOCATES

The ACT office in Tanzania has re-located from Quality Plaza along Nyerere road to Mikocheni -B, plot 16, Block C. On board is a new Programme Officer, Deogratias Ngotio; who joined the ACT East and Horn of Africa team in Daresalaam."

ACT PARTICIPATES IN THE FIFTH WORLD CONGRESS ON CA

The ACT delegation to the 5th World Congress on Conservation Agriculture (5WCCA) came back satisfied with not only the visibility created for ACT but also the commitment made by the Sub-Saharan congress participants to lobby for the adoption of CA at a wider scale in Africa. The 5WCCA was held in September 2011. This is an annual congress bringing together scientists and practitioners to discuss current and future developments in the field of CA.

The African delegates made an impressive 22% of the participants, coming only second to Australia and New Zealand.

The African delegates' "take home" messages were that smallholder farmers, who constitute the greatest percentage of farmers in Africa, are not only producers of food, but also stewards of the environment. They are capable of depleting the natural resource base through exploitative farming methods with consequences to all humanity hence their role in protecting the environment needs to be identified and rewarded.

CA, they concluded, is an appropriate technology for the continent, however, the huge diversity in farming systems and farmer typologies in Africa requires CA technologies be tailored to different environments. Realizing that Africa has the lowest adoption of CA, the delegates called on policy makers and CA stakeholders to provide and link farmers to CA inputs and subsidies.

Continued on page 4



FEATURE STORY

Boosting Farm Income through Conservation Agriculture in Tanzania

Dr. Simon Lugando, Tanzania

Food security in Tanzania is improving rapidly, thanks to ACT for continuing with CA initiatives, which are increasingly being adopted, especially in the dry areas of the country. Agricultural productivity in Tanzania has been described as low, being constrained by low soil fertility, erratic and unreliable rainfall, and poor production techniques. However, CA, which mitigates on these issues, is being promoted by ACT in collaboration with other public institutions. One of the key partners has been the agricultural ministry in Tanzania, where CA initiatives are being promoted for smallholder and medium scale farmers. ACT and the Ministry of Agriculture introduced a program where the farmers were provided with the chisel ploughs and other CA technologies. The program has been introduced in 5 districts and the results have been amazing! While other surrounding farms had crops wilt due to drought, those that had applied CA were green, the yields were better and labor and input required less. Through ACT and partners, the CA technology has been introduced to over 8,000 farmers in the country.

In April, 2011, ACT joined hands with the Department of Mechanization in the Ministry of Agriculture Food Security and Cooperative (MAFC) and conducted Farmer Field Days in Kongwa and Kiteto districts with the sole aim of creating awareness towards adoption of CA. In Kongwa district, high level government officials including the Deputy Minister for MAFC Eng. Christopher Chiza attended the 150 people plus event. Mkoka Prison in Kongwa district was the pride of ACT as their 6 plots under CA were used as FFS demonstration plots. The farmer field day participants, who constituted mainly of farmers, observed that the Mkoka Prison farm plots with CA interventions performed better in comparison to the conventional crops.

“Despite the drought which affects Kongwa district there are more maize plants which survived in the CA plots and the maize cobs are many and healthier than in the conventionally tilled plots.”

A farmer from Congo

- It has been observed that the rate of soil losses in some parts of Tanzania have increased from 1.4 tons/ha/year in 1960 to 224 tons/ha/year in 1980, with the scenario expected to have deteriorated further today; (<http://betuco.be/CA/Conservation>, 2011).
- Soil losses of up to 30 tons/ha have been reported in Kilimanjaro region in conventional flat cultivated fields at a slope of 5%; (<http://betuco.be/CA/Conservation>, 2011).

The Deputy Minister called on the participants to embrace CA: saying that the Tanzania government is committed to promoting new agricultural technologies that are geared towards the country getting out of poverty.

“Let's collaborate in the provision of CA education to see increased productivity and sustainable agriculture for us and the future generation.”

Deputy Agriculture Minister, Tanzania

Continued on page 6

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The ACT Executive Secretary, Engineer Saidi Mkomwa, said that Africa and ACT featured prominently in the congress as they participated in paper presentations, booth exhibitions, and two workshops. Further, the congress platform created an opportunity for ACT, together with her African partners, to hold a side event to discuss and share experiences on **“Conservation Agriculture for Smallholder Farmers in Africa”**. Engineer Mkomwa, who was part of the International Steering Committee of the congress, presented a paper entitled: **“Research for Development: Thrusts needed for the wide scale adoption of CA in Africa.”** During the congress ACT identified opportunities in sustainable land management and conservation agriculture and the institution, which is one of the partners steering CA in Africa, came back with relevant lessons for the advancement of CA in Africa.



FARMERS' VOICES

From Conventional to Conservation Agriculture



Above: Richard inspects his CA equipment, and below is his new house and a car. **"Thanks to CA technology; I now have a nice house, small car and shop for agriculture inputs; and my family is food secure. The small track is used to supply seeds to farmers, take my kids to hospital and run other farm activities. Today I pay school fees for my kids in secondary school; all this is the benefit from CA,"** says Richard proudly.



When you visit Ekenywa village in Arumeru district in Tanzania you will be received either by heavy blowing wind carrying soil particles or big inland gully waterway caused by runoff during the rainy season. Most of the fields are bare, with no trees or water blocks leading to accelerated soil erosion, evaporation and nutrients loss from the soil hence food insecurity and environmental degradation. A daring farmer, Richard Kipara adopted conservation agriculture to combat these negative situations on his farm.

Richard Kipara 45, an early CA innovator, with his wife started farming in 1996 on their 12 acres land but food in security and a meager income was their portion every year. However, beating all the odds, he joined Farmer Field Schools (FFS) in Kilimapunda village, and immediately took initiatives to transfer the knowledge of CA back to his village. But it was not an easy road; his first CA equipment like the jab planter for planting, ripper for breaking the hard pan and direct seeder were borrowed from the Punda - punda farmer group. However, in the first year after all the hard labor and jeers from his neighbors, Richard harvested only 5 bags of maize compared to 2 bags he used to get under conventional farming method. But the story has changed today; he harvests 25 bags of maize, 60 bags of Dolicos Blah Blah and 48 bags of pigeon pea (mbaazi) per year. The yield is expected to increase over the years as the soil becomes more fertile. The biggest benefit he attributes to the technology is that it has rejuvenated his farms' productivity and is labor saving. With extra time, he attends community development initiatives and gets fodder for his 8 grade animals (four cows and four goats), amongst other activities.

...Continued from page 5

The other field day was in Kiteto district, which attracted about 80 farmers; and one of the farmers, Ally Issa Turuku, had his 5 acre plot used for CA trials. The farmer field day participants were exposed to CA technologies ranging from application of different treatments to crops such as cover crops, rotations, minimum soil disturbance and application of CA equipment. As a result the participants realized the positive contribution of CA to improved yields, reduced farm costs and rehabilitation of soil.

Village Bank Motivates Farmers to save for a Rainy Day

Besides food security, CA initiatives through ACT have had socio-economic benefits. For the Tuamke Tuamke Farmer group there is a snowball effect of saving through a Village Community Bank (VICOBA), which they initiated. The Tuamke Tuamke group (Kiswahili for Arise, Arise) started practicing CA in 2007 to overcome food insecurity and environmental degradation. However, as the group, which consists of 35 members gained the benefits of CA, they started VICOBA where they save extra income from their CA improved farm yields.

“ *We contribute a minimum amount of 1,000Tsh per week which is equal to 1 share but group members can purchase as much as 5 shares per week. It is difficult to get money in this village; through VICOBA we can access loans, says one of the farmers.* ”

(Group Member)

Group members are eligible for a loan 3 times the size of the amount of shares they own at a 10% interest rate. Loans meet different needs for members like start up for small businesses, pay school fees, purchase of seeds and so on. VICOBA is not just about credit and saving; it also works as a means of insurance in case of an emergency, says another farmer. If a person is injured, the committee may meet and decide to cover the cost of the travel and hospital fees. VICOBA encourages equal opportunities for both genders, with both men and women eligible for loans.

“ *One farmer says: Before we used to sell all our produce to earn an income, but today we sell but also keep some for the household consumption. With our savings we are ready for any eventuality like drought and as group members we also support each other.* ”

When farmers put their money into the community bank, they secure their livelihoods and establish supportive systems through each other. Prior to the VICOBA initiative, farmers were struggling in times of emergency. It was harder to imagine an improved future as an individual or as a family. VICOBA community banking has been an agent of empowerment for farmers allowing them to plan for their future, says the extension service provider.



Above: A VICOBA member explains how she has benefited from community bank as she holds the safety deposit box, used to hold the community funds. The box is secured with 3 separate locks and keys which are given to 3 different people who sit on the management committee of the elected group officials. Looking on are the International CA Training participants who visited the TuamkeTuamke Farmer group as a show case of good practices of CA and diversification of activities through farmer groups



Above: TuamkeTuamke group members and International CA Training participants in September, 2011

The products from the CA plots belong to farmers but ACT and its partners motivate farmers to save through Savings and Credit Cooperative (SACCO). This allows them to become credit worthy to access loans by being guaranteed by their SACCO members.



5TH WORLD CONGRESS ON CONSERVATION AGRICULTURE, BRISBANE

Australian Government's global response to food security in Africa through CA

“What will it take for Africa to not only feed itself but become a food bowl for the rest of the world?”

“CA is one of the newest success stories in this quest to impart Australian knowledge to help feed the world.”

The question was posed by the Minister for Agriculture in Australia, Hon. Kevin Rudd during the 5th World CA Congress in Brisbane, Australia. With 60 per cent of the world's uncultivated arable land being in Africa, the minister argued that potential productivity gains will be achieved through applying improved agricultural technologies and techniques. CA, it was noted, is one the critical technologies needed in Africa, and the minister said that Australia is working with African partners to ensure a wider scale adoption of this relatively new technology in a continent with only 1% of the land being under CA.

Hon. Rudd said that Australia, which forms the 13th largest economy in the world, will use its role in international bodies to develop a global response to food security through CA. He warned that no country is immune to global temperature and its impact to agricultural productivity. Citing the severe heat waves in Russia and Ukraine as well as devastating floods in Pakistan, China and Queensland, the minister said nature is bound to be destructive to any country's food production and its national economy. The minister declared that a new Agricultural Revolution of the 21st century is needed to feed a further 3 billion members of the human family by 2050. Tackling both the issues of climate change and food insecurity, CA is the way to go!

CA Equipment:

CA farming tools, which used to be imported from Brazil and India, are now being made locally in Tanzania, which has significantly reduced the prices of the equipment.

To cultivate an acre using conservation agriculture I spend two hours compared to two days which I used to do the work when practicing conventional agriculture **Farmer, Mr. Kitomali**

Kitomali, also pointed out that due to intercropping he earns more by using the modern CA technology.

Prices of locally made rippers and direct seeders are Tshs 140,000 and 700,000 compared to Tshs 180,000 and 800,000 for those imported from Brazil



Conservation Agriculture Pictorial

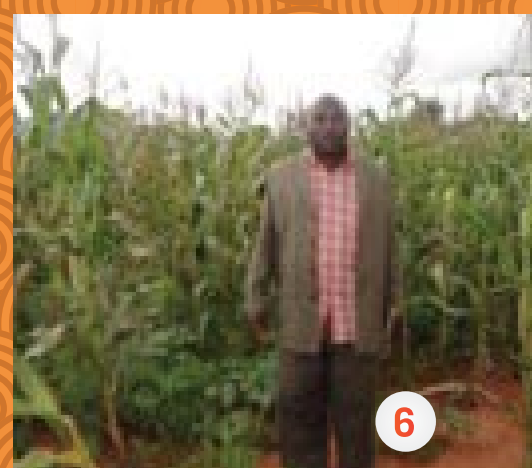
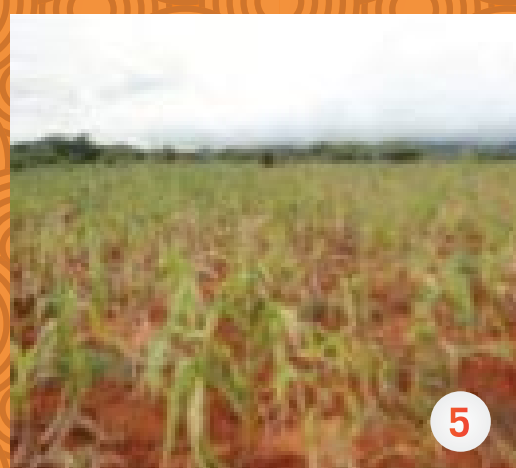


Photo 1: Farmers use mosquito net to protect crops from insects, **Photo 2:** CATraining participants on a study tour, **Photo 3:** *Gliricidia sepium* and *Brachiaria ruziziensis* for biomass and fodder production, **Photo 4:** Sorghum intercropped with cowpea, **Photo 5:** Conventional farming in the field of Mr. Msafiri Mahimbo in Kongwa district, **Photo 6:** Conservation agriculture farming in the field of Mr. Msafiri Mahimbo in Kongwa district



FACTS ABOUT CA

What is conservation agriculture?

Conservation agriculture (CA) aims to produce high crop yields while reducing production costs, maintaining the soil fertility and conserving water. It is a way to achieve sustainable agriculture and improve livelihoods. Adoption of the technology is also expanding in Africa.



Conservation agriculture has three basic principles:

a) Disturb the soil as little as possible.

The ideal is to plant direct into the soil, without hoeing or ploughing. Tillage is reduced to ripping planting lines or making holes for planting with a hoe.

b) Keep the soil covered as much as possible.

Mulch, special cover crops and/or crop residues left on the field protect the soil from erosion and limit weed growth throughout the year. This is opposed to conventional farming practices, whereby farmers remove, burn crop residues or mix them into the soil with a plough or hoe. As a consequence, the soil is left bare, so it is easily washed away by rain, or is blown away by the wind.

c) Mix and rotate crops.

Planting the same crop each season; as sometimes practiced in conventional farming is minimized by planting the right mix of crops in the same field, and rotating crops from season to season. This allows a breakdown of survival and multiplication cycles of pests, diseases and weeds resulting in higher yields and maintenance of soil fertility.

To gain the full benefit of conservation agriculture, all three principles have to be applied at the same time. This ideal is not possible everywhere, but farmers should try to go into that direction as far as possible.

The simultaneous applications of the 3 CA principles stand to boost yields, which would contribute towards meeting:

- MDG1 of eradicating extreme poverty and hunger;
- MDG7 of ensuring environmental sustainability;
- MDG8 of developing global partnership for development (www.fao.org, 2011)

Mission: To promote and facilitate information and knowledge exchange and partnerships to enhance support for the adaptation and adoption of conservation agriculture principles and practices in Africa.

Vision: That Africa is able to deplore its natural resources to support attainment of basic livelihoods needs for its peoples and provide sustainable foundation for industrialization and socio-economic growth.

Check out next issue for latest technologies
and inputs used in CA

Welcoming New Partners



**Have you registered to the
online act membership
network?**

**Have you Activated your online ACT
membership Subscription? Check your
email after Registration**



**African Conservation
Tillage Network**

FOR MORE INFORMATION:

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