



Proceedings of the First Africa Congress on Conservation Agriculture

Conservation Agriculture: Building
Entrepreneurship and Resilient Farming Systems

2014

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Preface



Eng. Saidi Mkomwa
ACT Executive Secretary

The conclusion of the 1st Africa Congress on Conservation Agriculture (1ACCA) and the promulgation of the Congress Declaration marked the end of a long journey that was started in September 2011 when ACT announced its desire to call a CA Congress for Africa with a difference in a brief presentation during the “*Making it Happen Session*” of the fifth world congress for conservation agriculture in Brisbane Australia.

We can afford to look back – two and half years down the line - with humble satisfaction at the fruits of dedication and teamwork. It was my delight and pleasure to be at the helm of such a cohesive team, a successful process and event.

Conservation Agriculture (CA) is, in our view, a higher level intervention than others such as improved seeds, fertilisers, water and machinery. Unlike most interventions, CA is defined by a concept that involves three principles namely minimum soil disturbance (or direct seeding), permanent soil cover and crop diversity / crop rotation. There is strong evidence that successful adoption of CA improves the utilisation efficiency of all other inputs and outside the CA framework use of all other inputs may not lead to optimisation of yields or sustainable utilisation of natural resources. For smallholder farmers with poor access to inputs, output markets, transport and financial infrastructure, CA (even with rudimentary hand-hoe basins or dibbler) can be an affordable low external input precision farming intervention that provides farmers with a quick and reliable way to increase and stabilize yields.. For farmers who have access to other inputs through capital investments, application of CA interventions can lead to even higher benefits. It is in this backdrop that ACT and partners in Africa and elsewhere are promoting conservation agriculture for increased productivity and sustainable development.

The broad Congress objectives were to share and showcase CA experiences and lessons and facilitate building of alliances to expand and scale-up adoption of CA especially among the smallholder farming systems and related industry in Africa. It targeted

about 400 international participants with the majority coming from Africa and composed of farmers, national governments, development partners, researchers, extension agents, financial institutions, CA equipment manufacturers and suppliers and NGOs. Putting “*farmers first*” and “*at the centre*” of all Congress discussions, farmers were given the first opportunity to share their CA experiences, articulate their visions for using CA and voice the challenges to attainment of their ambitions. All other participants – being service providers in their various disciplines and stakes – were urged to identify a niche value adding service to assist farmers adapt and adopt profitable CA in the millions. Key demanded services were under the seven sub-themes of the congress namely: 1) Growing more with less; 2) Weather proofing agriculture; 3) CA for sustained wealth creation; 4) Food sovereignty; 5) Effective research and targeting strategies for enhanced CA adoption; 6) Harnessing the power of collaboration; and 7) Increasing CA adoption.

The congress approach included peer reviewed scientific papers (presented orally and also through posters) and summarised into a condensed papers’ book (available at <http://www.africacacongress.org/presentations/book-of-condensed-papers>); keynote presentation sessions by internationally renowned persons; plenary panel discussions; six parallel thematic paper presentation sessions; CA field site visits; special events; exhibitions; a special awards and gala night; and the making it happen closing declaration session.

I was convinced that the purpose, aims and objectives of the Congress were largely achieved. What remained was to revisit all the recommendations and the Congress Declaration and translate the statements into actionable points for immediate, near future and longer-term research agenda. In the current era of climate change and variability, and the need for sustainable and climate-smart agricultural technologies and innovations, the Congress could not have been hosted at a better time. We owe it to ourselves and posterity to translate the Congress Declaration into tangible actions to enhance community food and nutritional security and improved livelihoods, for the sake of African farmers and mankind at large.

Eng. Saidi Mkomwa
ACT Executive Secretary
June 2014

Acknowledgements

We take this opportunity to thank our Foundation sponsors the Common Market for Eastern and Southern Africa (COMESA) and Norwegian Agency for Development Cooperation (NORAD) whose investment to support and financial resources have enabled this Congress to take place. We also grateful for the support received from our Platinum and Gold sponsors, the Centre for Coordination of Agricultural Research and Development for Southern Africa (CCARDESA), International Centre for Research in Dry Areas (ICARDA), Food and Agriculture Organisation (FAO) and the Alliance for a Green Revolution for Africa (AGRA).

We owe the Congress success to the dedication and volunteering spirit of the members and friends of the African Conservation Tillage Network (ACT). The partnerships with French Agricultural Research Centre for International Development (CIRAD), International Maize and Wheat Improvement Centre (CIMMYT), European Union (EU) and New Partnership for African Development (NEPAD) were vital. From the International Steering Committee and the Congress Secretariat, through the four Task Teams, namely, Technical and Programme; Finance and Resource Mobilisation; Communication, Media and Advocacy; and Logistics and Congress Operations, to the Help Desk, the teams performed their roles with a rare sense of commitment and dedication. We extend our sincere appreciation to all for their invaluable support. The support by Martin Bwalya (Congress Chairperson); Joseph Mureithi (Chair Technical and Programme Team); Lewis Hove (Chair Resource Mobilisation Team), Joyce MulilaMiti (Chair Communications, Media and Advocacy Team) and Emmanuel Sakala (Chair Logistics and Congress Operations Committee) deserve special mention.

The choice of Zambia, the country with the highest population of smallholder farmers practicing CA in Africa provided a great opportunity to explore the application of CA practices and principles for both food security and for supporting a sustainable growth agenda. The support provided by the host Zambian Government through the Ministry of Agriculture and Livestock and the lead CA institutions – Conservation Farming Unit (CFU) and Golden Valley Agricultural Research Institute (GART) is greatly appreciated.

The IACCA Secretariat is grateful to the consultancy services provided by among others, the Newmark Group as Event Manager for the well-handled logistical issues, and Mr. George Karanja, who was the Technical Consultant to oversee review of congress papers and compilation of proceedings. The Congress Secretariat is congratulated for coordinating very well efforts of the Task Teams, Consultants, Development partners and the farming community. Special thanks to the Secretariat members Philip Wanjohi, Janet Achora, Herbert Mwanza, Sepo Marongwe, Simon Lugandu and Patrice Djamen. The CA Awards and Nominations committee led by Collins Nkatiko worked independently and diligently to advertise and scrutinise the continental CA awardees for 2014. The awards were four categories namely =the CA Challenge Award; Media Award; Upcoming CA Farmer Award; and CA Champions Award. The ACT congress helpdesk composed of Weldone Mutai, Monica Buyu, Alice Gatheru, Bridget Mupeti, Peter Kuria, Martin Kimeu and Kennedy Otieno is to be applauded for handling the behind-the-scenes logistical challenges very well.

The African Conservation Tillage Network Board members under the able leadership of Reynolds Shula provided oversight to the Congress Secretariat and their stewardship role is greatly acknowledged.

List of Acronyms

ACCA	African Congress on Conservation Agriculture	FMNR	Farmer-managed Natural Regeneration
ACT	African Conservation Tillage Network	GART	Golden Valley Research Trust
AEZ	Agro-ecological Zone	GIT	Gastro-intestinal Tract
AF	Agroforestry	GMCC	Green Manure Cover Crops
AfDB	African Development Bank	GMO	Genetically Modified Organism
AGRA	Alliance for a Green Revolution for Africa	ICARDA	International Centre for Research in Dry Areas
ASAL	Arid and Semi-arid Lands	ICRAF	International Centre for Research in Agroforestry
CA	Conservation Agriculture	ICT	Information and Communication Technology
CAADP	Comprehensive African Agricultural Development Programme	MoA	Ministry of Agriculture (Zimbabwe)
CAWT	Conservation Agriculture with Trees	MDGs	Millennium Development Goals
CCARDESA	Centre for Coordination of Agricultural Research and Development for Southern Africa	MP	Member of Parliament
CIDA	Canadian International Development Agency	NEPAD	New Partnership for African Development
CFU	Conservation Farming Unit	NORAD	Norwegian Agency for Development Cooperation
CGIAR	Consultative Group for International Agricultural Research	NRM	Natural Resource Management
CIMMYT	International Maize and Wheat Improvement Centre	NFU	National Farmers Unions
CIRAD	French Agricultural Research Centre for International Development	OF	Organic Farming
COMESA	Common Market for Eastern and Southern Africa	SACAU	Southern African Confederation on Agricultural Unions
EU	European Union	SNDP	Sixth National Development Plan
FAO	Food and Agricultural Organisation	SSA	Sub-Saharan Africa
FARA	Forum for Agricultural Research in Africa	ZNFU	Zambia National Farmers Union
FISP	Farmer Input Support Programme	UN	United Nations

Executive Summary

The African Conservation Tillage Network (ACT) and the Government of the Republic of Zambia, in collaboration with partners hosted the 1st Africa Congress on Conservation Agriculture (IACCA) from 18th to 21st March 2014 at the Intercontinental Hotel, Lusaka, Zambia. Foundation sponsors were the Common Market for Eastern and Southern Africa (COMESA) and Norwegian Agency for Development Cooperation (NORAD). Platinum and Gold sponsors were Centre for Coordination of Agricultural Research and Development for Southern Africa (CCARDESA), International Centre for Research in Dry Areas (ICARDA), Alliance for a Green Revolution for Africa (AGRA) and Food and Agriculture Organisation (FAO). Partners include the Conservation Farming Unit (CFU), Golden Valley Agricultural Research Trust (GART), French Agricultural Research Centre for International Development (CIRAD), International Maize and Wheat Improvement Centre (CIMMYT), European Union (EU) and New Partnership for African Development (NEPAD).

The Congress theme was *“Conservation Agriculture (CA): Building Entrepreneurship and Resilient Farming Systems”*. The aim of the Congress was to share and expose experiences and lessons and facilitate alliances to unblock hindrances to expanded and scaled-up adoption of conservation agriculture especially among the smallholder farming systems and related industry in Africa.

The broad objectives of the Congress were:

1. To facilitate sharing of information and experiences focusing on lessons learned with regard to the contribution of CA to the attainment of Millennium Development Goals (MDGs), sustaining CA practices in smallholder farmers, identification of key issues in the development, promotion and adoption of CA in commercial and subsistence farming, and links and roles of CA to other global initiatives related to natural resource management (NRM) and rural development;
2. To showcase policy interventions that have supported and facilitated adoption of CA
3. To examine and learn from initiatives, including business/entrepreneurship models, unblocking and accelerating adoption and practicing of CA.

The Congress theme and objectives were to be achieved through seven thematic sub-themes believed to harbour the elements that hinder/accelerate adoption of CA as follows: 1) Growing more with less – the future of sustainable intensification, 2) Weather proofing agriculture, 3) CA for sustained wealth creation, 4) Food sovereignty and family farms, 5) Effective research for enhanced CA adoption, 6) Harnessing the power of collaboration, 7) How innovative technology, approaches, infrastructure support and policies can drive greater adoption of CA systems in Africa.

The Congress was officially opened by Hon. Robert Sichinga, Minister for Trade, Commerce and Industry, and outgoing Minister for Agriculture and Livestock, and officially closed by Hon. Luxon Kazabu (MP) Deputy Minister for Agriculture and Livestock. The Congress brought together 414 delegates from 42 African and other countries of the world. They included 93 women (22.5%) and came from NGOs and Extension workers (23.9%); Researchers and the Academia (22.2%); Smallholder CA Farmers (19.8%); Media (11.8%); Development partners (8.2%); National Governments (8.0%); Private-Public CA Investors (2.7%). In the minority were financial institutions and large scale CA farmers.

The methodology provided for several within-the-congress events to facilitate learning and sharing of CA information/experiences across and within the different stakeholders. Foremost, the congress put “farmers first” and at “the centre” of all congress discussions. Outputs from the “farmers’ forum” were to be addressed in all subsequent sessions. All other participants – being service providers in their various disciplines and stakes were required to identify a niche value adding service to assist farmers adapt and adopt profitable CA in their millions. During the Congress a successful Farmers’ Forum was held with speakers from Morocco, Kenya, Tanzania, Mozambique, Zimbabwe and Zambia. Twenty one keynote papers were presented in plenary sessions, 63 thematic papers presented in parallel sessions and 13 posters were presented. Fourteen exhibitors showcased their CA knowledge, information and achievements in booths. In addition Congress

proceedings were streamed live worldwide, and an award ceremony for 10 CA champions was held in a colourful gala night. Field visits involved day-long visits to 6 CA sites. Three side events dedicated to adoption of CA, CA with trees and smallholder CA were also held.

Documented impact and feedback from practicing CA farmers and scientists across Africa strongly suggested that CA is set to become a cornerstone in transforming the way farming is done in Africa. Farming would therefore be poised to become a major contributor to achieving CAADP's goal 6% annual growth in the agricultural sector which employs 80% of Africa's rural population (ACT, 2014). It was evident from Congress proceedings that CA increases soil productivity and enhances resilience to climate change and variability and can transform marginal semi-arids (of up to 400 mm rainfall) into grain baskets without the need for costly irrigation investments. These benefits are likely to give CA an edge over other technologies and therefore spur its rapid adoption by millions of smallholder farmers in Africa.

At the end of the Congress, 1ACCA Declaration was drawn, adopted and promulgated as a part of the closing ceremony. Excerpts of the 25by25 Lusaka CA Declaration available at <http://www.africacacongress.org/> are presented herein below.

- The congress recognised the African Governments' efforts in support of sustainable agriculture intensification. However, more efforts to create a more conducive environment for the adoption of CA are needed. The need to strengthen partnerships, communication and information flow within the CA community of practice at national and regional levels was evident. New knowledge and experience exchange are an important resource for uptake and spread of CA. The crucial need to upscale mainstreaming of education on the science and practice of CA in existing educational systems at all levels was highlighted. The importance of South-South cooperation, in the form of exchange of expertise, information and experience was also recognised. CA has significantly positive impact on practicing farmers across Africa in their incomes, livelihood, well-being and on empowerment of women farmers. The roles of women and the youths in the accelerated up scaling and adoption of CA needs to be recognised. CA gives farmers the choice to apply CA principles to a range of production systems including, agroforestry and crop-livestock integration amongst others.
- In order to achieve the CAADP goal of 6% growth of the agricultural sector CA stakeholders called for policy and political commitment and leadership; private sector engagement especially to proactively support up scaling of CA through further innovations and increased investments financing in appropriate CA technologies and related services and training, extension, research and innovation, and knowledge support. To realise the calls, for example, National and international stakeholders have to support the up-scaling of CA to reach at least 25 million farmers across Africa by 2025 – coined as 25by25. Governments have to create conducive environment for the adoption and development of CA. Support to CA farmers and their organizations is necessary. Governments have to create enabling policy environment to allow investment financing, and technological development. Support from development partners to CA programmes need be increased. Quality assurance system for accredited agricultural training institutions that provide CA training certificates has to be in place. CA adopter farmers have to be supported to be champions and educators for their counterparts. Agricultural training institutions have to take up CA as an integral part of their training programmes and farmer sensitization and training efforts. Research and extension on CA should be farmer-focused and responsive to the needs of farming communities. The need to supporting knowledge management by stakeholders, including the CA task force is vital.

1.0 Introduction

1.1 Background

According to the United Nations (UN) global population is projected, by 2013 basis, to increase by 33% to 9 billion people by 2050. Africa's population is projected to increase by 115% from 1.1 to 2.39 billion, within the same period; thus requiring a similar increase in food production. While worldwide hunger has decreased by 132 million people in the last 20 years, it has increased by 64 million (from 175 to 239 million) in Africa over the same period. Africa is a net importer of food, having imported, for instance, 43 million tons of food worth US\$ 50 billion in 2011. These figures point to the bitter reality that urgent efforts are needed to transform agricultural production in the continent, in line with the CAADP framework to which African governments have pledged their support.

Sub-Saharan Africa is largely characterised by smallholder subsistence farming and pastoralism, with perennial food shortages and generally low financial resource endowment. This miserable scenario has been exacerbated by recurrent droughts and occasional floods which are part of the larger climate change and variability phenomenon, which has not spared the rest of Africa. The net result has been relatively degraded, fragile and unproductive ecosystems that demand innovative and sustainable natural resource management interventions to restore and improve productivity.

It is against this background that the African Conservation Tillage Network (ACT) and the Government of the Republic of Zambia, in collaboration with partners hosted the 1st Africa Congress on Conservation Agriculture (IACCA) from 18th to 21st March 2014 at the Intercontinental Hotel, Lusaka, Zambia. Foundation sponsors of the Congress were the Common Market for Eastern and Southern Africa (COMESA) and Norwegian Agency for Development Cooperation (NORAD). Platinum and Gold sponsors were Centre for Coordination of Agricultural Research and Development for Southern Africa (CCARDESA), International Centre for Research in Dry Areas (ICARDA), Alliance for a Green Revolution for Africa (AGRA) and Food and Agriculture Organisation (FAO). Partners in organising the Congress include the Conservation Farming Unit (CFU), Golden Valley Agricultural Research Trust (GART), French Agricultural Research Centre for International Development (CIRAD), International Maize and Wheat Improvement Centre (CIMMYT), European Union (EU) and New Partnership for African Development (NEPAD).

1.2 Congress Objectives and Expected Outputs

The broad objectives of the Congress were:

1. To facilitate sharing of information and experiences focusing on lessons learned with regard to the contribution of CA to the attainment of Millennium Development Goals (MDGs), sustaining CA practices in smallholder farmers, identification of key issues in the development, promotion and adoption of CA in commercial and subsistence farming, and links and roles of CA to other global initiatives related to natural resource management (NRM) and rural development;
2. To showcase policy interventions that have supported and facilitated adoption of CA
3. To examine and learn from initiatives, including business/entrepreneurship models, unblocking and accelerating adoption and practicing of CA

Six (6) outputs were envisaged, namely:

1. Information/data/experiences and lessons highlighting issues and circumstances that enhance or hinder effective CA dissemination and adoption
2. Increased awareness and interest in CA even among non-agricultural stakeholders
3. Statement highlighting principal issues and areas of concern in widespread promotion/adoption of CA worldwide
4. Motivated Congress participants ready to play their roles in the development and promotion of sustainable NRM linked to high yields
5. Access to information that would help in future contacts and partnerships in promotions of CA
6. Establishment of a permanent continental CA knowledge hub to facilitate networking and information sharing

1.3 Congress Theme and Sub-Themes

The Congress' theme was "Conservation Agriculture: Building entrepreneurship and resilient farming systems" with the following sub-themes:

1. Growing more with less – the future of sustainable intensification
2. Weather proofing agriculture – the adaption of farming practices to address climatic variability and change
3. Conservation Agriculture for sustained wealth creation – unlocking barriers to entrepreneurship along the value chains
4. Food sovereignty – integrated CA-based systems and family farms
5. Effective research, inclusive of socio-economic challenges, targeting strategies for enhanced CA adoption
6. Harnessing the power of collaboration – networking, partnerships and communities of practice
7. Increasing CA adoption – how innovative technology, approaches and infrastructure support and policies can drive greater adoption of CA systems in Africa

The Congress aimed at putting a spotlight on CA experiences and lessons from interventions and practices such as political, policy, technical and financing areas that have worked in triggering and enhancing sustained adoption and expansion of CA. It was also intended to contribute to enhancing the promotion and adoption of CA as a way to improve farm productivity, improve resilience in the ecosystems, and optimise both short and long term productive-ability of the land-water systems. This is because adoption of CA by a critical mass of farmers is desirable in realising the core mitigation-adaptation benefits of farming in the face of climate change and variability.

1.4 Congress Organisation

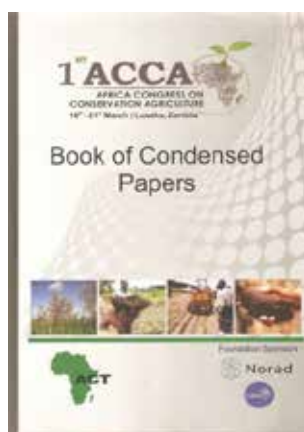
The Congress had a broad-based 30 members Steering Committee; a 7-member Secretariat; a 13-member Technical and Programme Task Team; Finance and Resource Mobilisation Committee; Communications, Media and Advocacy Committee; and a Logistics and Congress Operations Committee operating from Lusaka. Another team was the 10-member Awards Committee, assigned the task of advertising for nominations of awardees and the eventual selection of the winners based on an agreed criteria. The Secretariat was privileged to have at its disposal the services of the ACT professional members and friends from within Africa and beyond, to review the submitted papers and posters. The ACT Board provided oversight to the congress by approving holding of the event and the subsequent roadmap.



Dignitaries at the Opening Ceremony

2.0 Congress Materials

2.1 Book of Condensed Papers



The condensed papers book contains 3-page summaries of all papers reviewed and accepted for presentation at the congress and some of the keynote presentations received in good time. It was meant to provide delegates with a concise record of all papers and assist them follow congress presentations and discussions. The book contains 47 thematic papers, 4 keynote papers

and 15 poster presentations and can be accessed through the 1ACCA website at <http://www.africacongress.org/presentations/book-of-condensed-papers>

2.2 The Congress Programme

The Congress programme included tours, workshops and themes highlighting the newest innovations in conservation agriculture. It catered for different interest groups including smallholder, medium and large scale CA farmers. The Congress took advantage of Zambia as the host country since it has the largest number of smallholder CA farmers as well as access to advanced CA research groups and facilities and Lusaka's proximity to large scale CA farmers. The Congress Programme Book and Poster/Exhibition Guide was one of the last tasks to be accomplished to accommodate newly approved papers and last minute changes. Due to the very low numbers of papers in Sub-themes 3 and 6, they were combined into subtheme 4 and 6, respectively. *Congress Technical Documents*

A number of technical documents were prepared by the Secretariat in the endeavour to inform, promote and in seeking targeted inputs on the Congress from the general public and targeted institutions and individuals. The following are some of those produced with the targeting.

Document	Purpose	Target Group
1. 1ACCA Congress Concept Note	Define congress theme, objectives, outputs and process	General public
2. 1ACCA Information Note	Logistics	Delegates and sponsors
3. Concept Note for Farmers' Forum	The central role of farmers in the IACCA	General public
4. Book of Condensed Papers	Provide concise record of all papers	Authors and Delegates
5. Congress Programme	What, where and by who of Congress Events	All delegates
6. Sponsors guide	Present opportunities for sponsors	Exhibitors and Sponsors
7. Guidelines for Power-point and Poster Presentations	Highlights issues of interest and for time management	Poster and oral paper presenters
8. Guidelines Session Chairs & Rapporteurs	Chairing and Rapporteur guide	Session Chairs and Rapporteurs
9. Awards Committee TORs	Inform on roles and tasks	Panel of judges
10. Questions and Answer Sheets	Capture questions and responses	Rapporteurs

2.3 Congress Papers for Publication in Scientific Journals and Climate-Smart Book

Good quality papers were selected for publication in an international journal while others were selected for publication in a climate-smart book. The selection criteria included scientific soundness (content),

conformity to the standard format of scientific papers, statistical analysis and inference, elements of empirical evidence to support CA, and elements of novelty. In the case of the papers selected for the book, there was less emphasis on scientific rigour but more on content details and this targeted more the review and methodological papers.



3.0 The Congress

The Congress was officially opened by the Hon. Mr. Robert Sichinga, Minister for Trade, Commerce and Industry, and outgoing Minister for Agriculture and Livestock, and it was officially closed by Hon. Luxon Kazabu (MP) Deputy Minister for Agriculture and Livestock. Keynote presentations, Parallel thematic sessions and Side events were all undertaken with remarkable time management. The Field trip involved 6 different routes all focusing on different aspects of CA and was particularly enriching. The following are highlights of the various sessions.

3.1 Highlights of the Opening Session

During the opening session, various dignitaries and representatives of supporting and implementing organisations addressed the Congress participants. They included Rudo Makunike (NEPAD Representative), Eng. Saidi Mkomwa (ACT Executive Secretary), Manyewu Mutamba (SACAU Representative), Rune Skinneback (Charge d'Affaires EU Delegation to Zambia), Arve Ofstad (Norwegian Ambassador to Zambia), George Okech (FAO Representative in Zambia) and Dr. Mclay Kanyangarara (COMESA Representative on behalf of the Secretary General Mr. Sindiso Ngwenya).

In their brief remarks, the officiating dignitaries noted that there was a worrying trend of decline in agricultural productivity and production, especially in Sub-Saharan Africa in spite of the great potential for CA to address this challenge. It was also equally disturbing that although a total of 85% of land mass in Zambia was under agriculture, the fraction under CA was insignificant. There was therefore an urgent need to scale up adoption of CA to enhance environmental protection, food production and productivity, and minimise climate change effects, globally. This will contribute to the attainment of Millennium Development Goals (MDGs) and therefore linking agricultural production to global development agenda by reversing the current agricultural production that has remained relatively constant over the last 30 years at 1MT/ha of grain maize.

The Officials expressed their appreciation and recognition that the Congress was not about scientists but about farmers and that they (farmers) are at the centre of the work everyone else does in agriculture. Rather than speaking about farmers, the Congress would speak to and with the farmers. Emphasis was laid on the need for being farmer-smart in programming and to working with farmers in knowledge generation. It was noted that Zambia had taken a lead in CA with some 300,000 smallholder farmers currently practicing

CA, 40% being women. Because of the noted success of CA, the Norwegian Embassy in the country began supporting Conservation Farming (CF) in 1996 through the Community Marketing and Cooperation (COMACO) in Zambia. CA was also supported because it was an approach for mainly reducing CO2 emissions. Norway also established a programme to support food security.

3.1.1 Highlights of Opening Remarks by Eng. Saidi Mkomwa, ACT Executive Secretary

Eng. Mkomwa said the theme for the congress represented the overall sharing expected from the huge diversity of participants at the congress; from local and international experts, smallholders farmers, medium and large-scale farmers, research scientists, academia and development partners. He said that the Congress aimed at unblocking some of the hindrances limiting adoption of agriculture and in particular CA and find ways to have millions adopting CA in Africa. He articulated the specific objectives of the Congress and stressed that it would provide a platform for information sharing among CA stakeholders. He noted that there were CA champions who would share their information to others to avoid re-invent the wheel in adopting CA. He added that it was important to learn and share initiatives including business models and engage small holder farmers on entrepreneurial basis so that the private sector and other small holder farmers can be motivated to move beyond subsistence farming to commercial farming and contribute to economic growth. He said while looking at growing more with less, it was important to understand how to reduce cost of production through the use of CA, to enhance resilience of smallholder farmers even in situations of climate change and variability.

Issues of food needs and sovereignty and access to what farmers preferred food would be a subject discussed at the Congress. He added that the power of collaboration was especially important in understanding how to increase coverage for CA, while putting farmer at the centre of all discussions and interventions. He noted that this was a good platform to share lessons and information that would lead to the development of the Lusaka Declaration on Conservation Agriculture for stimulating increased production through CA.

He acknowledged the more than 400 registered participants that included farmers from Zambia, Mozambique, Malawi, Kenya, Tanzania, Zimbabwe, Botswana and other delegates from countries all over the world.

3.1.2 Official Opening Speech by Hon. Robert Sichinga Minister of Commerce, Trade and Industry, Zambia

The Guest of Honour, Mr. Robert Sichinga, Minister of Commerce Trade and Industry welcomed all delegates to the Congress and Zambia and thanked all sponsors of the Congress and applauded the efforts made in organising the Congress. He paid special tribute to Dutch Gibson and the Conservation Farming Unit (CFU) family for their tireless efforts in promoting conservation farming in Zambia. He also thanked the delegates representing the European Union for the support that has continued over several years.

The Guest of Honour shared an experience from Chikakanta in the Southern Province of Zambia that demonstrated the success of Conservation Farming in improving crop yields. A woman farmer from the region had increased her maize several folds compared to those of her neighbours by adopting CA. He added that a Strategic Plan designed by the Ministry of Agriculture (MoA) in Zambia had been changed into a transformation plan to upscale CA for increased production in CA. He thanked the Norwegian Government for their continued support in the CA activities in Zambia.

The Guest of Honour noted that the 1st ACCA was an inaugural meeting during which it was important to promote the tenets of the Congress theme as it was the most appropriate form for learning with more than 350 people in attendance. He also noted that the theme resonated very well with Zambia's own vision for a sustainable agriculture production, embedded in the Sixth National Development Plan (SNDP) and Agricultural Transformation Plan.

He said mechanisation and excessive tillage affected soils negatively impacts on and thanked the Organising Committee for bringing people together in learning about CA to improve crop yields. He added that the presence of all the delegates was an indication of the importance attached to improving agricultural production and productivity in response to ever increasing food needs and to adverse global climate changes. He pointed out that industrialised countries are discharging a lot of CO₂, cause pollution and Africa is also affected. He said countries responsible for high emissions should also pay more to mitigate for the effects of the pollution.. He informed participants that the 2013/2014 agricultural season was characterised by low production levels because of inadequate rainfall and therefore there is urgent need for more investment in CA which fosters efficient utilisation of available rainfall.

The Congress was also a demonstration of widespread interest in CA, which aims at achieving judicious use of agricultural resources and enhances agricultural productivity. When productivity is low,

even profitability is low, and so MDG Number 1 of Reducing Poverty cannot be achieved because people are not treating this as a business through which they can improve their incomes. He noted and appreciated the EU for supporting the Conservation Agriculture Scaling Up (CASU) Programme, as it would support the Agriculture Transformation Plan that aimed at increasing farmers' yields from 1.9 to 5 MT/ha and reduce the use of fertilizers hence reducing costs of production.

He added that the largest programme in the Ministry of Agriculture in Zambia is the Farmer Input Support Programme (FISP) that imports more than 100,000 metric tons of fertilizer to support small scale farmers. He also said that CA makes positive contributions against GHG effects, especially because of what is emitted into the atmosphere because of the fertilizer used. He noted that if current systems were continued it would not be sustainable neither profitable, and so there is need to diversify into nitrogen fixing leguminous crops for instance, as Zambia has been mono-cropping for decades.

In his conclusion, the Minister quoted John Sternberg and said "Ideas are like rabbits, you look after them, and then soon enough you have a dozen"; he said when all the ideas from the Congress are shared and multiplied, they would grow the CA concept globally. He advised the delegates not to spare any effort in making the Congress a success and very memorable. The Guest of Honour reiterated the goal of the Zambian Government to increase the number of CA adopters from 250,000 to 650,000 and that it was his desire that each and every Zambian farmer practices CA. He thanked the organisers for choosing Zambia as an inaugural country for the first ACCA, and offered to have Zambia as a hub for the ACCA on the continent or the region.

3.1.3 Vote of Thanks by Eng. Jasper Nkanya, Ministry of Agriculture, Kenya

Eng. Jasper Nkanya, Director of mechanization in the Ministry of Agriculture Kenya, gave a vote of thanks following the official opening by the Minister of Commerce Trade and Industry for Zambia, Hon. Mr. Robert Sichinga. He said farming in Kenya was not fully commercialised as a larger number of farmers were small scale farmers. There was therefore significant pressure to move and make changes in the growing of food crops. He added that there was need to borrow a leaf from Zambia on how to adopt technologies and look at the economics of it, identifying a programme that can support the smallholder farmers. He thanked the Minister for his participation in organising institutions in Zambia and all those that are taking part in the programme.

In addition he noted that farmers were leading science as they kept trying things that they think could work. Funding for agricultural research was low and it should be enhanced so that it provides appropriate technologies and recommendations.

3.2 The Farmers' Forum

Unlike scientific CA symposiums, the 1ACCA was focused on how to scale-up CA to reach and benefit not thousands but millions of smallholder farmers in Africa.. This agenda required a different approach - speak to and with the farmers, rather than speaking about farmers. Putting "farmers first" and at "the centre" of all congress discussions was meant to set the farmer agenda which was to be addressed in all Congress themes and deliberations. The farmers' forum was therefore purposefully scheduled in the initial sessions of the congress and it was moderated by professionals; Edward Chuma (ACT Board and Institute for People, Innovation and Change in Organizations (PICOTEAM)) and Dr. John K. Mutunga (Chief Executive Officer, Kenya National Farmers' Federation). Speakers at the forum were smallholder farmers from North Africa (Morocco); Eastern Africa (Kenya and Tanzania) and Southern Africa (Zambia, Zimbabwe and Mozambique). Their names are presented in Figure 2 below.

Farmers appreciated the opportunity to be heard at such high level fora. Other participants emphasised the need to be farmer-smart in programming, and the

need to work with farmers on the ground where they work and where knowledge is created. This approach was hailed as the beginning of a new generation of farmer-smart programmes.

3.3 Keynote Presentation Sessions

Six (6) papers were presented as sub-theme keynote papers covering all seven sub-themes, namely, a) Growing more with less, b) Weather-proofing agriculture, c) CA for sustained wealth creation, d) Effective and targeted biophysical and socio-economic research for enhanced CA adoption, e) Harnessing the power of collaboration, f) Increasing CA adoption through innovative technologies, and g) infrastructural and policy support. The main areas of focus of the presentations were the future of sustainable intensification, making CA evergreen (integration of agroforestry into CA systems), and up-scaling and out-scaling CA for food security and improved livelihoods. The following issues arose out of the keynote presentations.

Agricultural-industrial transition. The current situation where 80% of the rural African population is involved in agricultural production is inconsistent with the proposed agricultural-industrial transition. The fate of the surplus labour off-loaded by the transition will largely depend on the rate and nature of industrialization. Governments should embark on the establishment of diversified, labour-intensive,



Figure 1. Congress plenary session in progress

rural-based industries, while smallholder farmers gradually consider amalgamation of unproductive parcels of land into productive economical units that can exploit economies of scale and be mechanized. This will go hand in hand with the establishment of informal private sector (e.g. *Jua kali* or open air artisans of Kenya).

Motivational incentives for agricultural producers.

Agricultural producers can only get monetary incentives if the consumers are willing to pay higher prices for food commodities. This entails Government intervention in form of additional taxes but with a reasonable limit. Another feasible option is to promote climate-friendly (or climate-smart) agriculture, which is less dependent on the normal vagaries of weather and the environment (e.g. drought, flooding, soil acidity and salinity, pests and diseases). Within the context of agricultural value chain approach, production costs can be minimized, markets assured and premium prices negotiated. This would constitute a win-win situation to the producers, consumers and most, if not all, the intermediate chain actors.

Crop-livestock interaction in CA. Livestock is a vital component of the African small and medium scale farming systems. It is a source of draught power, farmyard manure, meat and milk. Livestock also transforms crop stover and other fodder tree biomass into soil nutrient-rich farmyard manure. In spite of these benefits, farmers have to strike a fair balance in CA systems, between use of crop stover as livestock feed and surface mulch for soil and water conservation. Finally, it was noted that transition from conventional, inorganic fertilizer-based cropping system to largely GMCC and N-fixing tree-based (e.g. *Faidherbia albida*) CA systems is a gradual process. Farmers require support in that time of transition to retain production levels as they transit to profitable and sustainable CA.

Pros and cons of ridging. It was noted that conventional tillage is a pre-requisite for ridging. Consequently, ridges promote water accumulation in furrows and while this could benefit the ridged crop, it could also promote runoff and soil erosion, depending on the rainfall intensity. With CA, the necessity of tillage is reduced as most crops can be grown on the flat so long as the ridges were not in place for irrigation/drainage purposes and the CA systems is complete with soil cover to facilitate biological tillage. So far, some 145,000 to 158,000 farmers had adopted minimum tillage in Zambia and this has had a positive implication on soil erosion reduction.

Conservation Agriculture information dissemination.

CA pioneering work in Africa dates back to 1956 and in Southern Africa it was widespread with farmer-to-farmer dissemination and special emphasis on zero-tillage. The approach was subsequently discouraged by generations of British Agricultural Officers in an

effort to control noxious weeds. Sixty (60) years down the line, CA is being re-discovered as a scientific breakthrough! This notwithstanding, CA adoption has been hindered by inadequate access to information. It was noted that CA is a long-term process and needs commitment and consistency. Current practitioners should play the dual role of farmer-trainers and advocacy.

Session Summary

Soil, water and nutrient management are the core elements of CA. Efforts to harness/harvest, conserve and utilize them productively deserve individual farmer and community attention as well as government policy intervention. Although less amplified, livestock is an integral component of CA and impacts directly and very significantly on soil, water and nutrient management. Finally, CA has been with us for a long time, albeit in a fragmented and less appreciated way. It is time to re-discover it, perfect it scientifically and exploit it to improve family and community livelihoods.

3.4 Sub-theme Parallel Sessions

3.4.1 Sub-theme I: Growing more with less

The main focus of the sub-theme was the future of sustainable intensification. Six papers were presented covering meta-analysis of crop yield response to CA practices, best fit residue allocation, mulching effects on weed dynamics, effects of CA-based cropping systems, *Tephrosia* (cover crop) and herbicide use, and up-scaling and out-scaling CA. A number of issues arose from the presentation and they are highlighted below.

a) Residue competition for mulch and livestock feed. It was noted that smallholder mixed farming systems rely heavily on crop stover as livestock feed; especially within the first few post-harvest months when livestock feed resources are low. Discussed suggestions included spraying stover with chemicals to keep animals off. A more practical solution is to grow supplemental fodder crops.

b) Seeds for green manure cover crops (GMCC). This can be addressed through massive awareness creation of the economic benefits of GMCC and deliberate promotion of high quality GMCC seed banks as viable smallholder income generating enterprises. This should be supported by relevant research into species identification and agro-ecological zone-specific agronomic practices so that farmers can make informed decisions. This has been achieved in some countries where local seed companies have taken up commercial seed production of some GMCC species in response to increasing demand. Preferences were expressed by participants on edible cover GMCC such as cow peas and soybeans to *Tephrosia* but there was no empirical basis for this.

c) Nitrogen immobilization in the use of mulch. The extent and duration of nitrogen immobilization is largely dependent on the C:N ratio of the residue and the degradability of the Carbon component. Research done in Zambia and Zimbabwe suggested that with the conventional stovers, this was not a major problem.

d) Effectiveness of mulch in high rainfall areas. Mulch is primarily a soil and water conservation (SWC) measure as well as a source of organic matter and its effectiveness as a SWC measure in high rainfall flat areas is less evident. The weed suppressing effect of mulch in high rainfall areas can however be significant. Water-logging can even be a problem in planting basins especially in poorly drained soils. There is need for research-based guidelines on the use of mulch under different rainfall regimes.

e) Profitability in CA systems. It was stressed that CA is not necessarily a low input system and its profitability can only be assessed after all other factors (seed, soil nutrients, post-emergence disease, pest and weed control, labour input including family labour and its opportunity cost, and other associated costs) are taken into consideration. Economic analysis should also factor in CA equipment expenses regardless of whether the equipment is a donation. CA equipment can be a fixed cost that can be incurred early in the adoption and the costs are likely to reduce as the farmer continues practicing CA. It was, for instance, reported that maize yields below 3.5 MT/ha are in most cases below the economic threshold. It is noteworthy, however, that the profitability of CA systems is more of a medium and long-term endeavour rather than short-term.

f) Control of termites in CA systems. Termites present a special problem in CA systems and deserve an integrated, research-based management (rather than control) approach.

g) Standard fertilizer rates. Strictly speaking, there can only be agro ecological zone (AEZ) - specific standard fertilizer rates based on detailed soil analysis. In as much as there are different fertilizer formulations in different countries, nutrient composition of different fertilizer formulations should be indicated at all times.

Session Summary

- Crop residue retention in CA fields in mixed crop-livestock farming systems remains a challenge. Identification of suitable CA-based GMCC and N-fixing fodder trees and their management practices not only provide an alternative, protein-rich, feed resource but also conserve soil, water and nutrients. Vigorous promotion will create seed demand which will, in turn, motivate formal and informal commercial seed production.

- The soil and water conservation benefits of surface mulch should be weighed against the N-immobilization potential of the mulch, which is a function of the C:N ratio and the nature of the Carbon component. There is need for empirical evidence for conventional mulches.
- Profitability of CA should be looked at from a value chain perspective. All the chain actors from planning to consumption, and the associated costs and benefits, should be considered. Currently, CA promotion is still very limited to land preparation and planting
- Termites present a special problem in CA systems and deserve an integrated, research-based management (rather than control) approach.

3.4.2 Sub-theme II: Weather-proofing agriculture

The focus of this sub-theme was the adaption of farming practices to address climatic variability and change. This was in appreciation of the realities of climate change and its negative implications on, and the vulnerability of the Sub-Saharan Africa smallholder farming communities. The papers focused on climate-smart technologies and practices including studying trends in crop yields under CA, the push-pull maize-herbaceous legume-based intercropping system for effective control of stalk borers in cereals, improvement of soil water availability in CA systems and greenhouse gas emissions potential in CA systems. Use of the Nitrogen-fixing *Faidherbia albida* as a source of soil organic matter and nutrients, either as an intercropped hedgerow or transferred biomass, received special attention. Main issues that arose from the presentations were:

Breaking seed dormancy in *Faidherbia albida*. Under natural pasture grazing systems, seed ingestion and passage through the gastro-intestinal tract (GIT) constitutes a form of natural scarification and enhances germination. Under nursery conditions manual scarification is done prior to planting in plastic bags. *F. albida* is sensitive to root pruning and hence the need to ensure that plants are grown on a raised platform in order to ensure minimal disturbance to the tap root system.

Soil erosion and runoff control properties of *Vertiver grass*. Participants expressed the need for research into food crops with SWC properties similar to those of *Vertiver grass*. Sorghum and pigeon peas were suggested but it was also acknowledged that they were annuals and do not have the unique benefit of *Vertiver grass* of a dense root system which firmly binds soil particles for effective soil erosion control and increased water holding capacity.

Perennial versus annual intercrops. To the extent possible, perennial intercrops are preferable and economical. Perennial intercrops, whether herbaceous (e.g. *Desmodium*) or woody (e.g. *F. albida*) serve as a protein- and mineral-rich livestock feed resource, especially during the dry season. Increased milk production has been reported.

Elements of CA in push-and-pull pest control technology. Establishment of some herbaceous GMCC such as the *Desmodium* demand a clean seedbed thus necessitating initial conventional tillage. The same, however, may be successfully established through no-till over-sowing or vegetatively. Once established, CA principles can be fully implemented. The smell expressed by the intercrop hormones is the main repellent for the stalk borer especially as they search for places to lay eggs. The system avoids the use of chemicals as much as possible and allows natural pest control processes to take place, leaving beneficial organisms (e.g. pollinators) unharmed. The current focus is on enhancing understanding of the science behind the system and improving the system based on scientific evidence.

Validity of farmer-based survey data. Participants expressed concern over statistical validity of data derived from farmers during surveys. Concerns were based on the fact that farmers may not have kept records at all, time-lag between the activity and the survey and a perception that generally farmers will tell you what they think you want to hear, among others. This underscores the need for well thought out survey instruments, administration, data interrogation and analysis.

Potential for CA in carbon sequestration. None of the presentations covered this critical attribute of CA. The potential for carbon sequestration, particularly where woody perennials such as *F. albida* are integrated in CA systems is real. There is therefore need, not only for scientific assessment but for full exploitation of this potential.

Session Summary

- The “push-pull” pest control technology in maize appears particularly compatible with CA systems. Its deliberate avoidance of chemicals and promotion of natural pest control processes is not only environmentally-friendly but also smallholder farmer-friendly. There is need for detailed studies on the scientific basis of the pest control properties of herbaceous legumes in an effort to expand the legume-cereal combinations and even non-legume and non-cereal combinations.

- Inevitably, CA studies involve extensive on-farm surveys. For the resultant data to be meaningful there is need for technical harmony in the design of survey instruments, their administration, data collection, interrogation and subsequent analysis and interpretation.
- Food crops, GMCC and N-fixing trees diversification, combinations and their potential benefits, featured prominently in many sessions. The issue of carbon sequestration, an inherent and significant property of such combinations, hardly featured in spite of its implications on climate change and variability. There is therefore need for deliberate scientific research attention.

3.4.3 Sub-theme III & IV: CA for sustained wealth creation and food sovereignty

The main thrust for this sub-theme was ways and means of unlocking barriers to entrepreneurship along the value chains. Recalling the notion that CA is not necessarily a low-cost endeavour, the sub-theme looked at innovative ways of sustainably maximizing net profits without sacrificing environmental integrity. The presentations covered exploitation of potential synergies and complementarities between CA and organic agriculture (OA), household food security and labour productivity under smallholder CA systems, CA as a commercialization tool, CA adoption and up-scaling studies, and youth engagement in CA, in recognition of their numbers and their potential. The following were issues arising from the presentations:

Youth engagement in CA. It was noted that in the Sub-Saharan Africa, youth involvement in agriculture was generally low for a variety of reasons, ranging from the complex diversity of land tenure systems that deny youth ownership and access to land resources, the relative unprofitability of agriculture (due to low or partial adoption of technical recommendations), high cost and erratic supply of farm inputs (including machinery) and produce marketing challenges. It was noted that general agricultural productivity was in highest South Africa, primarily because of advances in agricultural science, technology and mechanisation but in the rest of Africa, average age of farmers is over 40 years. There is therefore need for deliberate policy, economic and social incentives to attract and retain the youth in agriculture, and by extension CA.

Private sector involvement in CA. The concept of agricultural product value chain entails the involvement of all the actors within the chain, from the consumers to producers with adequate attention to research and regulatory institutions. If properly implemented, it can be a win-win situation for researchers, regulatory

bodies, input manufacturer and suppliers, producers, transporters, post-harvest custodians (storage), value-adders, distributors, wholesalers, retailers and consumers, among others. The concept, however, is not well understood and appreciated by the chain actors, another area of concern and potential in intervention.

Partial adoption and dis-adoption of CA. It was noted that very few farmers adopted the whole CA package (minimum tillage, maximum soil cover and diversity of rotations, especially with GMCC), with most farmers adopting and even modifying components of CA, while yet others abandoned CA after a season or two. This raises a fundamental question of who qualifies to be called a CA farmer. Components adopted and/or modified and the decision to quit or stay on may be influenced by resource endowment, size of operation, agro-climatic conditions and anticipated returns on investment (profitability). Inadequate information on the CA processes and anticipated returns on investment (short-term and long-term) as well as government or NGO-sponsored promotions could lead to mass entry and exits. Finally, while there is need to meet farmers at their point of need, farmers' adoption of CA (especially rationalization of fertilizer use and mechanization) involves a change of mind-set which can take a long time.

The concept of "Pfumvudza" utilizes the smallest possible plot that will produce enough food to feed the family for one year. Participants suggested need for research to establish its scientific basis, feasibility for up-scaling and sustainability. There was also need for crop diversification in order to ensure family nutritional security.

Session Summary

- The success of CA dissemination, adoption, up-scaling and impact will largely depend on the extent of inclusiveness of potential value chain actors and stakeholders. The value chain approach entails involvement of all actors along the value chain with particular attention to the private sector players.
- Youth involvement in agriculture is generally low due to a complex diversity of land tenure systems that deny youth ownership and access to land resources; perceived unprofitability due to high cost and erratic supply of farm inputs and produce marketing challenges. Yet the youth constitute more than 50% of the Sub-Saharan African population. There is therefore need for deliberate policy, economic and social incentives to attract and retain the youth in agriculture, and by extension CA.
- Policy makers must be convinced that food security can be achieved and that CA can

provide the vehicle to achieve it. The promotion of CA under cotton in Eastern Zambia is a good example of how the farming community, public and private sectors can team up to make a difference in community livelihoods.

3.4.4 Sub-theme V: Effective research for enhanced CA adoption

The main thrust of this sub-theme was effectiveness in CA research, inclusion of socio-economic challenges and targeting strategies for enhanced CA adoption. This was in recognition of general weakness in undertaking socio-economic analysis in CA studies and in turn weakening the integrity of CA promotional materials (literature, technical recommendations etc.). The end-result is low and/or erratic adoption of CA. Presentations covered conceptual typology of CA systems for semi-arid and sub-humid areas, increasing AEZ-based CA options for smallholder farmers and lessons from long-term CA research in Southern Africa. Main issues arising out of these presentations were:

Methodology for CA typology studies. This particular study was conducted in an iterative manner to identify the best CA options for different AEZ in West and Central Africa. Competition for biomass and crop residues between livestock, fuel and soil fertility management featured, yet again, and it was stressed that farmers have to strike a fair balance, noting that introduction of agroforestry options did address this challenge substantially. It was reported that there was need for more empirical evidence to define the typologies for CA in West and Central Africa. In Zambia, for instance, the higher the rainfall the lower the soil fertility because of challenges of leaching and soil acidification. This, however, cannot be generalized because of AEZ-specific peculiarities.

Access to credit for CA machinery and equipment. It was reported that in Zimbabwe, farmers received micro-finance credit as groups but in other countries, individual farmers can access credit, so long as they have a viable business plan and provide some collateral/security.

Crop planting pattern in CA systems. Basins serve as planting stations for both cereals (maize) and legumes while mulch is applied in the inter-row spacing. The challenge is that the basins are mostly waterlogged during the early part of the season, which often leads to poor legume establishment. There is need for further research in integration of grain legumes in CA systems.

Harmonization of CA information/messages. There is need to package CA information and knowledge in such a way that different partners (e.g. researchers, extension workers, NGOs etc.) communicate the same message

Session Summary

- Competition for biomass and crop residues between livestock, fuel and soil fertility management featured yet again. Introduction of agroforestry options can address this challenge substantially. There is, however, need for more empirical evidence to define the typologies for CA in Africa.
- In spite of its historical background, CA is a relatively new concept to many smallholder farmers across the Africa continent. Because of its crucial role in sustainable agricultural intensification, it is a fertile ground for scientific research and development, information dissemination and impact studies. There is therefore need for harmony in the packaging of CA information so that the various partners, collaborators and stakeholders communicate the same message.
- Introduction of CA in new areas should take into consideration existing practices, including the multiple roles of livestock (as a source of meat, milk, draught power and soil nutrients), land preparation and plant arrangement, as well as entry points for CA components.

3.4.5 Sub-themes VI&VII: Harnessing the power of collaboration, increasing CA adoption

The focus of the combined sub-themes was the harnessing of the power of collaboration in promoting CA adoption and up-scaling, with particular attention to networking, partnerships, communities of practice and how innovative technologies, approaches, infrastructural support and policies can drive CA adoption and up-scaling in Africa. In line with this, it was noteworthy that the Congress had two foundation sponsors, namely, NORAD and COMESA and an impressive list of prominent international partners and collaborators, among them, the European Union, NEPAD, FAO, CIMMYT, AGRA, ICARDA, CIRAD, CCARDESA, GART, All Africa (on-line media), National Farmers' Union (Zambia) and the Congress host, the Zambian Government through the Ministry of Agriculture and Livestock. This in itself was a clear indication of collaborative partnership in action. The presentations focused on up-scaling of CA technologies and innovations through a variety of communication tools including agricultural innovation platforms. A number of issues arose out of the presentations:

Effective dissemination of CA technologies, innovation and practices. There is need to promote adoption and up-scaling of a package of the three principles of CA. Farmers will adopt CA *in toto* only if it is compatible with their farming systems and makes economic sense. It is therefore imperative that biophysical and socio-economic benefits be packaged in a user-friendly way

that attracts adoption and up-scaling. The agricultural value chain approach should clearly define potential complementarities and mutual benefits among all the actors and stakeholders along the chain, with particular attention to the private sector. On the other hand, participatory research demands a thorough understanding of the target farming landscape in order to ensure demand-driven and client-oriented research.

“Dis-adoption” of CA by non-farmers. It is clear that what is termed “dis-adoption” is in most cases mistaken identity of farmers who were just starting to practice CA and had not actually adopted CA. However, concern was voiced, that hand-outs in form of free seeds and fertilizers, distributed as motivational incentives to promote CA adoption can be counter-productive when not properly targeted to the needy and the real farmers. Nearly all the farmers are rural-based but not all rural-based people are farmers. Rural dwellers who are non-farmers do easily grab handouts for reasons other than improving agricultural productivity. Clear distinction needs to be made between the role of inputs as related to the role of the 3 CA principles.

Finally, it is difficult to attribute or partition crop yields among the three CA principles or even components of a principle (e.g. ploughing, ripping and basins). Promotion of CA technology is dependent on existing farming systems. You cannot promote draft animal power systems where there is no livestock and farmers are not using animals.

Session Summary

- There is need for deliberate promotion of adoption and up-scaling of CA packages. Farmers will adopt CA *in toto* only if it is compatible with their farming systems and makes economic sense. It is therefore imperative that biophysical and socio-economic benefits be packaged in a user-friendly way that attracts adoption and up-scaling.
- Hand-outs in form of free seeds and fertilizers, distributed as motivational incentives to promote CA adoption, can sometimes be counter-productive if not properly administered. This is because non-farmers can benefit from the handouts but will abandon the exercise as soon as the hand-outs run out.

3.5 Congress Side Events

Three side events were held, namely:

- How to scale up CA to benefit millions of smallholder farmers
- Making CA EverGreen
- Prospects of smallholder conservation agriculture

The main issues that arose from the side events have been integrated in the relevant sessions in this report but the summary recommendations can be summarized as follows:

3.5.1 Side event 1: How to scale CA to benefit millions of smallholder farmers

The convener of this side event was Ms Rudo Makunike of NEPAD. The following were some of the recommendations from the side event:

- There is need to increase networking amongst all CA players: Researchers and media need to work together to ensure proper information is given to the farmers.
- There is need for inter-disciplinary and inter-institutional CA collaboration in research in order to exploit complementarities and value-addition
- There is need for participatory, demand-driven and client-oriented research. This entails detailed characterization of farming systems from a CA perspective, and joint identification, prioritization and implementation of remedial interventions.
- There is need to mainstream gender in CA rather than giving it lip-service for funding and other purposes. How, for instance, does CA impact on the work of women in terms of labour supply and demand.
- Use of local languages or vernacular in extension materials and farmer-based technical literature should be promoted as much as possible but in accordance with the government policies on such languages.
- There is need for deliberate and persistent lobbying and advocacy for CA in order to influence government policy and support. Conservation Agriculture should feature in national development blueprints such as the Vision 2030 of Zambia and Kenya and integrated in primary, secondary and post-secondary educational curriculum.
- There is need to re-think critically about mechanization in smallholder CA. This includes access to credit and subsidy facilities for appropriate and affordable machinery and equipment and their maintenance.
- Agricultural researchers and farmer groups should be adequately represented in government planning and regulatory bodies.

3.5.2 Side event 2: Making Conservation Agriculture EverGreen

The convener of this side event was Dr Dennis Garrity, UN Ambassador for the Dry lands. The objectives of this side event were:

- Share experiences in combining agroforestry with Conservation Agriculture,
- Identify opportunities for the scaling-up of conservation agriculture with trees, and
- Distil a few recommendations for the Congress.

The following recommendations were made:

- There is need to bring Agroforestry (AF) and CA together and work to integrate trees into CA systems since trees can dramatically increase soil fertility and crop production, regenerate the land, and buffer agriculture to climate change.
- There is need to better harmonize the technical messages and recommendations being promoted in CA and CA with trees. This demands a stronger cadre of trainers in CA and CA with trees (CAWT). To accomplish that, we ought to launch a Certification Program for CA trainers that would enhance the professionalism of CA training.
- Donor investors are investing in CA and AF with project time frames that are as short as one or two years. EverGreen CA needs sustained project investments that are multi-year and should be maintained over a number of years.
- Fertilizer tree technologies present an enormous opportunity for farmers to improve their biomass production in CA systems, and to increase the availability of nitrogen and other nutrients for their crops. It is proposed that national governments now seriously consider gradually redirecting a proportion of current fertilizer purchases and subsidies to investments in enabling farmers to establish fertilizer trees on their fields. This gradual shift from subsidies to sustainability with fertilizer trees could reduce national governments' trade deficits and budget deficits, and create a more internally sustainable agriculture.
- The farmer-managed natural regeneration of trees on farmlands (FMNR) has been hugely successful in the Sahel across millions of hectares, and is proving to be a successful and low-cost way for farmers to establish trees on their croplands and community forest and grazing lands in Eastern and Southern Africa. The practice was shown to be widespread now in Malawi, and should be promoted in other countries as well.

3.5.3 Prospects of smallholder conservation agriculture

This side event was deliberately included in the Congress programme to gather first-hand information and the perspectives of farmers on the topic. The side event facilitators were Emanuel Sakala (MOAL Zambia), Isaiah Nyagumbo (CIMMYT Harare), and Sepo Marongwe (MOAL Zimbabwe).

Participants were drawn from CA practitioners, primarily smallholder commercial or semi-commercial farmers, national and regional farmer organisations and CA technology and information disseminators. They were drawn from Eastern Africa (Kenya, Uganda, Tanzania and Madagascar); Southern Africa (Lesotho, Madagascar, Malawi, Mozambique, Zambia and Zimbabwe); and Western Africa (Burkina Faso, Guinea and Niger) and North Africa (Morocco).

Issues arising out of the Farmers' Side Event

Farmers acknowledged that CA is a very promising technology for increasing productivity but stressed the need for policy support, addressing of market issues and increasing access to relevant CA literature. It was also noted that the main drivers of CA adoption, among the farmers, include low productivity, recurrent drought, need for soil and water conservation in mountainous areas, and high cost of production in conventional systems. Participants reported the following challenges facing smallholder CA systems:

- Weed management due to inadequate farmer capacity in terms of strategies including integrated weed management and use of herbicides (packaging herbicides for smallholder farmers was an issue)
- Manual CA systems (basins) may cost more if you hire labour
- Management of residues in mixed crop-livestock farming systems
- Unreliable rainfall
- Cultural and social issues/mind-set (witch craft accusations, land disputes)
- Inappropriate packaging and dissemination of weather information to help the farmers
- Unavailability of draft power

The following were suggested as potential interventions:

- Increasing availability of CA extension materials especially in local languages; accompanied with their requisite training to improve their CA capacities.

- Capacitating farmers with agricultural skills and information (including crop management, weather forecasts and marketing, among others)
- Detailed studies and recommendations on the use of farmyard and livestock manures, and associated challenges in CA systems
- Introducing business principles in CA programmes
- Promoting farmer-to-farmer learning approaches
- Promotion of research on appropriate technologies for indigenous and exotic cover crops, fodder crops and nitrogen-fixing trees
- Characterization of CA adopters to facilitate up-scaling and out-scaling
- Introduction of CA entrepreneurship training in secondary and post-secondary education curriculum in order to attract and involve the youth
- Creation of an enabling policy environment for facilitating access to land by all, especially women and vulnerable groups; promotion of CA up-scaling, public-private partnerships, CA mechanization and increased donor funding
- Harmonization of CA principles and processes between and within countries (a national body should provide guidelines).
- National farmers unions should cater for the interests of both commercial and smallholder farmers and should promote mentoring of the latter.
- Deliberate priority consideration of CA farmers for input support, including access to finance for CA equipment and the use of the latter as collateral for credit
- Taking advantage of advances in ICT to promote CA through advocacy and mass media
- Farmers need to be well educated and informed on Biotechnology and its application in CA to enable them to make the right decisions when the need arises.
- There is need for the recognition of CA farmers at National and International level (National awards, CA Day, etc.)

There is need to address issues of transition from subsistence to large scale commercial. There is an absence of equipment for those farmers who are ready to grow but are not able to use large equipment due to resource or land constraints

4.0 Mid-Congress Field Visit

The objective of the mid-Congress field visit was to expose the participants to the diversity of Zambian farming systems in general, but more specifically, CA technologies and practices. This was in recognition of the fact that most CA farmers had adopted and even modified specific components (principles) of CA to suit their farm-specific circumstances. Having gone through the Congress sub-theme keynote presentations and the first session of the sub-theme based parallel presentations within the first two days; the field visit provided an opportunity for the participants to have a hands-on experience of CA principles and practices.

Congress organisers had developed an elaborate, day-long, six-route programme (refer to table 1) that took the participants to the East, West, North and South of

Lusaka, within about 100 km radius. A brief recap of the field trip the next day indicated the following issues:

Organic/CA vegetable farming. Feasibility of growing horticultural crops organically, for household food and nutritional security and cash income was amply demonstrated. Use of animal manures, composting, vermiculture for soil fertility management and integrated pest management were also demonstrated. Organic agriculture entails use of minimal or none of the synthetic fertilizers and pesticides, whereas CA condones the use of herbicides where feasible among other synthetic chemicals. This apparent conflict needs to be addressed. Integrated pest management utilizes crop diversity, push-pull, and use of botanical pesticides (e.g. *Tephrosia vogelli*) to maintain healthy plants.

Table 1. Mid-Congress Field Trip to CA sites

Route/ General area	Farms/ Farmers visited	Distance from Lusaka (km)	Site description	Conservation Agriculture technologies/ practices
Route 1- North of Lusaka	CFU Farm Smallholder farms	51-78	Research & demo site Smallholder CA/CF farmers	All CA/CF methods and practices
Route 2 – Lusaka South	Commercial CF farmer Smallholder CA/CF farmers	31-38	Commercial CF farmer Smallholder CA/CF farmers	Mechanised zero-till Direct drill Mini-till basins (Chaka hoe) Mini-till ripping Mechanised mini-till ripping
Route 3 – Lusaka south (Chikankata)	Commercial farm block Medium-scale CA/CF farmer	85-103	Commercial farm block Medium-scale CA/CF farmer	Mechanised mini-till ripping Mechanised zero-till direct drilling Oxen mini-till ripping Oxen zero-till drill
Route 4 – Lusaka North (Chibombo- Shimukuni)	Medium-scale mechanised tillage service provider Smallholder CA/CF farmers	54-94	Mechanised tillage service provider User of mechanised tillage service Smallholder user of mechanised CA services	Mechanised tillage equipment Mechanised mini-till ripping Oxen mini-till ripping Conventional plough Own oxen mini-till ripping Hired mini-till services
Route 5 – Lusaka East (Kasisi)	Kasisi Agric. Training Centre Smallholder organic CA/CF farmer	30	Organic CA/CF practice Smallholder organic CA/CF farmer	Research and demo on organic CF practice Vegetable gardening
Route 6 – Lusaka East (Chongwe)	Agro-dealer E-Voucher user, Field Coordinator site	35-57	E-voucher discounter	E-voucher dispenser for Magoye ripper and herbicides Use of e-voucher to access sprayer, Chaka hoes and herbicides

Introduction of trees into the crop landscape for soil fertility improvement. Agroforestry provides an opportunity for introducing high value trees into the crop landscape. Trees for soil fertility improvement include *Faidherbia albida*, *Gliricidia sepium* and *Sesbania sesban*. Seed availability, quality, establishment and management need special attention.

Organic versus Conventional vegetable production. Markets for organically-grown crops, especially vegetables, are emerging and consumers are willing to pay premium prices for quality produce. Concurrent emergence of farmer cooperatives will increase their bargaining power, promote exploitation of economies of scale and targeting. Gradual transition towards organic farming necessitates quality control (certification) which is expensive. To scale up commercial vegetable production, farmers were given interest free loans (of about US \$1,000 in kind of bicycles, wheelbarrows and sprayers). The challenge is sustainability of the system.

Farmers' perception of organic farming. Farmers who participated in organic farming project activities perceived it as more profitable, primarily because the produce fetches premium prices and the cost of production relatively lower since most inputs are sourced on-farm. Mulilansolo Organic Farm, is a 20.5 ha certified (as an organic) farm and registered by ECOSAT. It is more of a model farm and specializes mostly in herbal crops, training and supporting out-growers to produce quality produce that it supplies to hotels. Organic farmers are in agreement about a number of challenges:

- It is labour-intensive
- Premium prices sometimes promote overproduction in the smallholder production

sector, relative to the market absorption capacity, leading to lower prices and profits

- Special packaging and branding materials for specialized market are not available locally

Consequently, there is need to establish scientifically the potential profitability of organic farming, within a smallholder African farmer context. It was also suggested to use green or renewable energy (such as solar and biogas) instead of fossil fuel.

While farmer co-operatives indicated absence of markets, private farmers who are more organized, cannot meet the demand. There is need for capacity building for farmers.

Turning a field into an organic farm is a gradual process, primarily because of the high initial costs and low production at the beginning. Organic farmers should preferably grow high value crops that can fetch premium market prices in order to off-set the high cost. On the other hand, CA farmers should engage in high value organic production to diversify income sources.

When ripping is done after onset of rains (for ease of ripper penetration) and any time after onset of rains is considered late planting, planting labour could be a challenge, depending on the area to be planted. There was concern that repeated tractor-ripping and planting on the same rows does promote substantial soil compaction within the inter-row spaces. There may be need for alternation but this needs research attention.

Glyphosate-based herbicides constitute a major component of CA. There was concern that prolonged use of any herbicide in one field may lead to herbicide resistance or other soil-based interactions in case of pre-emergence soil-surface applied herbicides.

5.0 Exhibitions

Private sector and CA stakeholders were invited to exhibit at the First Ever Africa Congress on Conservation Agriculture for the four days of the congress. Several aspects were considered to be of value to sponsors as follows:

- Be visible to African and Global influencers, consumers and decision-makers before, during and after the event.
- An opportunity to consolidate corporate and community relationships and expose institute staff to key markets.
- Interacting with delegates face to face during the morning, afternoon tea breaks and lunchtimes plus the opening reception held in the exhibition area.
- Benefiting significantly from exposure to a keenly interested, relevant and, above all, influential audience in an educational environment away from the competition of everyday distractions.
- Some sponsorship packages include complimentary trade expo space, making your brand even more visible
- Wide-reaching visibility through the congress' promotional campaign which includes promotion in professional and trade journals and direct mail campaigns (through the African conservation Tillage network's significant database, email broadcasts and web exposure).

Key features of the congress which made it attractive for exhibitors are as follows:

- The very FIRST EVER Africa Congress on Conservation Agriculture (CA)
- The BIGGEST all-Africa CA event on the continent with an expected attendance of over 400 farmers, policy makers, researchers, investors and industry players from AFRICA and ACROSS the globe.
- A STELLAR team of top presenters, INTERACTIVE DISCUSSIONS, multimedia coverage and web-streaming to a global audience, and much MORE!
- BOLD discussions among CA stakeholders on KEY issues such the use of CA technologies, which addresses both land and water management, and productivity issues, has the potential to minimize the impact of some of the major causes of food insecurity, thus contributing to the success of food security initiatives at national, regional and continental levels.
- A FORMAT that facilitates formal and informal interactions and co-ownership of a permanent CA knowledge and information sharing platform that takes into account the needs of farmers, increased networking, partnerships and information sharing.

Advertisements were made through posters <http://www.africacongress.org/exhibition-booth> and visits. A tent was pitched by the Intercontinental Hotel Swimming Pool side and the necessary partitions and labelling were made. The following exhibitors participated:

Table 2: List of Exhibitors at the Congress

No.	Participating Institution	No.	Institution
	CRS		HAZIDA Motors
	IAPRI		Musika Development
	CCARDESA		SARO Engineering
	FAO		Total Landcare Malawi
	CFU		NWK Agric Services
	CIMMYT		NCBA CLUSA
	ACT		MB Seed Corporation

6.0 Awards and Cultural Gala

The CA Awards of Excellence program was designed to showcase the people, products, innovations, and organizations that represent excellence in the field of Conservation Agriculture and to the society itself. The gap was identified, that CA role models are in rare supply and strategically demanded to change behaviours and influence adoption of CA. Role models are individuals whose behaviour, example, or success is or can be emulated by others, especially by younger people.

The Secretariat introduced IACCA Awards to recognise CA role models, promote their deeds and reward them. Ten awards were identified for the IACCA summarised in the Awards and Criteria for Participation <http://www.africacacongress.org/media-ward> falling into the categories as shown in the table below.

The winners were selected through a pre-determined criterion by an independent International Committee of jurors, chaired by Collins Nkatiko (CEO, CFU Zambia) with Janet Achora (ACT KIM Manager) as the Secretary. Other members were: Patrice Djamen (ACT West & Central, Burkina Faso); Moncef Ben Hammouda (ESAK, Tunisia); Lewis Hove (FAO,

Southern Africa); John Mussa (NCATE, Malawi); Isaiah Nyagumbo (CIMMYT, Zimbabwe); Damas Birindwa (ZOA DRC); Enny Namalambo (MOA, Namibia); and Nadine Andrieu (CIRAD/CIRDES, Burkina Faso/ Columbia).

Hellen Masibo – Winner of upcoming CA Farmer Award – receiving her prize from CCARDESA’s Dr Simon Mwale and witnessed by Minister Hon Robert Sichinga

The prestigious awards were presented to the winners during a cultural gala night filled with African/Zambia music by the Hon. Robert Sichinga, Minister for Trade, Commerce and Industry, and outgoing Minister for Agriculture and Livestock. The awards comprised of cash money, a certificate of excellence and an engraving in the awardees name.

The Centre for Coordination of Agricultural Research and Development for Southern Africa (CCARDESA) sponsored one of the upcoming CA farmers and their awarded was handed over to Helen Masibo of Kenya by the CCARDESA representative Dr Simon Mwale.

Table 3: Categories of Awards and Winners

No	Award Description	Number	The Winners	
			Name	Country
1	The Conservation Agriculture Challenge Award	1	Harouna Sawadogo	Burkina Faso
	The Media Award - Individual			
2	Individual Journalist	1	Victor Muyakane	Kenya
3	Media House	1	National Agricultural Information Services (NAIS)	Zambia
	Upcoming CA Farmer Award			
4	Southern Africa	1	Sinoya Phiri	Zambia
5	Southern Africa		Lughana Mwaghano	Malawi
6	Eastern Africa	1	Helen Masibo	Kenya
7	West Africa	1	Yahya Kima	Burkina Faso
8	North Africa	1	Azeddine ELBrahli	Morroco
9	Conservation Agriculture Champion Award	1	Conservation Farming Unit (CFU)	Zambia



Figure 4. Hellen Masibo – Winner of upcoming CA Farmer Award – receiving her prize from CCARDESA’s Dr Simon Mwale and witnessed by Minister Hon Robert Sichinga



Figure 5. Traditional Zambian entertainment

7.0 Summary of Conclusions and Recommendations

The following is a summary of conclusions and recommendations arising from the sub-theme keynote papers and parallel presentations, mid-congress field trip and side events

1. *Congress Sub-themes Keynote Papers*

Soil, water and nutrient management are at the core of CA. Efforts to harness/harvest, conserve and utilize them productively deserve individual farmer and community attention as well as government policy intervention.

Although less amplified in CA, livestock is an integral component and impacts directly and very significantly on soil, water and nutrient management.

2. *Sub-theme 1: Growing More with Less*

Crop residue retention in CA fields in mixed crop-livestock farming systems remains a challenge. Identification of suitable CA-based GMCC and N-fixing fodder trees and their management practices not only provide an alternative, protein-rich, livestock feed resource but also conserve soil, water and nutrients. Vigorous promotion will create seed demand which will, in turn, motivate formal and informal commercial seed production and income generation.

Competition for biomass and crop residues between livestock, fuel and soil fertility management presents yet another challenge. Introduction of agroforestry options can address this challenge substantially. There is, however, need for more empirical evidence to define the typologies for CA in Africa.

The soil and water conservation benefits of surface mulch should be weighed against the N-immobilization potential of the mulch, which is a function of the C:N ratio and the nature of the C and N components. Acceleration of crop residue/mulch breakdown by termites has both positive and negative attributes. There is need for an integrated study to determine short-term and long-term costs and benefits for conventional mulches.

Profitability of CA should be looked at from a value chain perspective. All the chain actors from planning to consumption, and the associated costs and benefits, should be considered. Currently, CA promotion is still very limited to land preparation and planting

3. *Sub-theme 2: Weatherproofing Agriculture*

The “push-pull” pest control technology in maize appears particularly compatible with CA systems. Its deliberate

avoidance of chemicals and promotion of natural pest control processes is not only environmentally-friendly but also smallholder farmer-friendly. There is need for detailed studies on the scientific basis of the pest control properties of herbaceous legumes in an effort to expand the legume-cereal combinations and even non-legume and non-cereal combinations.

Carbon sequestration, an inherent and significant property of food crop-GMCC-fodder trees combinations deserve deliberate scientific research attention, primarily because of its implications on climate change and variability.

4. *Sub-theme 3&4: CA for Sustained Wealth Creation and Food Sovereignty*

In spite of its perceived benefits, CA still suffers from adoption constraints primarily due to inadequate consistent empirical evidence, unreliable seed supply, small-scale rather than landscape (community-level) operations and poor knowledge and extension support systems. There is need for detailed studies, including simulation modelling, to give indications of future production and environmental trends.

The success of CA dissemination, adoption, up-scaling and impact will largely depend on the extent of inclusiveness of potential value chain actors and stakeholders. The value chain approach entails involvement of all actors along the value chain with particular attention to the private sector players. Since the youth constitute more than 50% of the Sub-Saharan African population, there is need for deliberate policy, economic and social incentives to attract and retain the youth in agriculture, and by extension CA. For the same reason, there is also need to introduce CA entrepreneurship training in secondary and post-secondary education curriculum.

5. *Sub-theme 5: Effective Research for Enhanced CA Adoption*

In spite of its historical background, CA is a relatively new concept to many smallholder farmers across the Africa continent. Because of its crucial role in sustainable agricultural intensification, it is a fertile ground for scientific research and development. There is therefore need for harmony in experimental designs, data collection, interrogation, analysis and interpretation. There is also need for harmony in the packaging of CA information so that various partners, collaborators and stakeholders communicate the same

message.

Introduction of CA in new areas should take into consideration existing practices, including the multiple roles of livestock (as a source of meat, milk, draught power and soil nutrients), land preparation and plant arrangement, as well as entry points for CA components

6. **Sub-theme 6&7: Harnessing the Power of Collaboration and Increasing CA Adoption**

There is need for deliberate promotion of adoption and up-scaling of CA packages. Farmers will adopt CA *in toto* only if it is compatible with their farming systems and makes economic sense. It is therefore imperative that biophysical and socio-economic benefits be packaged in a user-friendly way that attracts adoption and up-scaling.

Hand-outs in form of free seeds and fertilizers, distributed as motivational incentives to promote CA adoption, can sometimes be counter-productive and should be avoided. This is because non-farmers will benefit from the handouts but will abandon the exercise as soon as the handouts run out.

7. **Farmers' Forum**

There is need for the creation of an enabling policy environment for facilitating access to land by all, especially women and vulnerable groups; promotion of CA up-scaling, public-private partnerships and CA mechanization; and farm input support, including access to credit and increased donor funding. In addition, there is need for harmonization of CA principles and processes between and within countries, with national bodies providing guidelines.

Farmers should be capacitated to take advantage of advances in Biotechnology applications and information communication technology (ICT) relevant to CA, through training, advocacy and lobbying. Conservation Agriculture should feature prominently in national development blueprints such as the Vision 2030 of Zambia and Kenya and integrated in primary, secondary and post-secondary educational curriculum.

There is need for the recognition of CA farmers at national and international levels, including national awards, CA Day, etc. There is also need to address issues of transition from subsistence to large scale commercial CA, with emphasis on the role of collective action (cooperative movement) for input supply and produce marketing, and appropriate machinery and equipment to facilitate the transition. National farmers unions (NFUs) should cater for the interests of both commercial and smallholder farmers and facilitate mentoring of the latter.

8. **Mid-Congress Field Visit**

There is need for detailed biophysical and socio-economic studies on the feasibility and compatibility (integration) of smallholder CA and organic farming (OF), with emphasis on exploitation of complementarities and the use green or renewable energy (such as solar and biogas) instead of fossil fuel.

Organic farmers should, preferably, grow high value crops that can fetch premium market prices in order to off-set the high cost. On the other hand, CA farmers should engage in high value organic production to diversify income sources.



Figure 6. Speakers at the Farmers Forum

There is concern that repeated tractor-ripping and planting on the same rows does promote substantial soil compaction within the inter-row spaces. There may be need for alternation but this needs research attention.

Glyphosate-based herbicides constitute a major component of CA. There is concern that prolonged use of any herbicide in one field may lead to herbicide resistance or other unintended soil-based interactions in case of pre-emergence soil-surface applied herbicides.

9a. Side Event 1: How to Scale CA to Benefit Millions of Smallholder farmers

There is need for participatory, inter-disciplinary and inter-institutional collaboration in CA technology development and dissemination, in order to exploit complementarities and value-addition. This entails detailed characterization of farming systems from a CA perspective, and joint identification, prioritization and implementation of remedial interventions.

There is need to mainstream socio-economic issues (e.g. gender, access to and ownership of land, use of local languages etc.) in CA rather than giving them lip-service for funding and other purposes. How, for instance, does CA impact on the work of women in terms of labour supply and demand?

9b. Side Event 2: Making CA EverGreen

There is need to bring Agroforestry (AF) and CA together and work to integrate trees into CA systems since trees can dramatically increase soil fertility and crop production, regenerate the land, and buffer agriculture to climate change.

There is need to better harmonize the technical messages and recommendations being promoted in CA

and CA with trees. This demands a stronger cadre of trainers in CA and CA with trees (CAWT). To accomplish that, we ought to launch a Certification Program for CA trainers that would enhance the professionalism of CA training.

Donor investors are investing in CA and AF with project time frames that are as short as one or two years. EverGreen CA needs sustained project investments that are multi-year and should be maintained over a number of years.

Fertilizer tree technologies present an opportunity for farmers to improve their biomass production in CA systems, and to increase the availability of nitrogen and other nutrients for their crops. It is proposed that national governments now seriously consider gradually redirecting a proportion of current fertilizer purchases and subsidies to investments in enabling farmers to establish fertilizer trees on their fields. This gradual shift from subsidies to sustainability with fertilizer trees could reduce national governments' trade deficits and budget deficits, and create a more internally sustainable agriculture.

The farmer-managed natural regeneration of trees on farmlands (FMNR) has been hugely successful in the Sahel across millions of hectares, and is proving to be a successful and low-cost way for farmers to establish trees on their croplands and community forest and grazing lands in Eastern and Southern Africa. The practice was shown to be widespread now in Malawi, and should be promoted in other countries as well.

Finally, CA has been with us for a long time, albeit in a fragmented and less appreciated way. It is time to re-discover it, perfect it scientifically and exploit it to improve family and community livelihoods.

8. 0 Declaration of the First Africa Congress on Conservation Agriculture

A Background

The African Conservation Tillage Network (ACT) in close liaison with partners convened the 1st Africa Congress on Conservation Agriculture (IACCA) in Lusaka, Zambia, from 18th to 21st March 2014. This was held under the theme “Conservation Agriculture (CA): Building entrepreneurship and resilient farming systems”. The Congress brought together more than 380 delegates from 42 African and other countries of the world to share experiences and lessons and facilitate alliances to unblock hindrances to expanded and scaled-up adoption of CA, especially among the smallholder farming systems and related industry in Africa.

The Congress was convened against the backdrop of the year 2014 being designated by African Union Heads of State and Governments as the Year for Agriculture and Food Security, and marks the 10th anniversary of Comprehensive African Agriculture Development Programme (CAADP). It also marks the adoption of a new CAADP results framework, which recognizes the role of climate-smart agriculture in addressing agriculture and climate change challenges.

This is in addition to the fact that, while worldwide hunger has decreased by 132 million people in the last 20 years, it has increased by 64 million (from 175 to 239 million) in Africa over the same period. Africa is a net importer of food, having imported, for instance, 43 million tons of food worth US\$ 50 billion in 2011. While global population is projected, by 2050 basis, to increase by 33% to 9 billion people by 2050, Africa’s population is projected to increase by 115% from 1.1 to 2.39 billion, within the same period; thus requiring a similar increase in food production. These figures point to the bitter reality that urgent efforts are needed to transform agricultural production on the continent, in line with the CAADP framework to which African governments have pledged their support.

Conservation Agriculture is defined as a management system based on three principles that should be applied in a mutually-reinforcing manner: minimum physical soil disturbance, permanent soil cover with live or dead plant material, and crop diversification in space and time. CA is now spreading at an annual rate of some 10 million hectares, and covers more than 130 million hectares globally. CA is a production system which uses appropriate management practices to minimize risks and ensure ecological sustainability and resilience to underpin economic and social sustainability.

B. Preamble

We, the CA stakeholders attending the First Africa Congress on Conservation Agriculture meeting in Lusaka, Zambia, from the 18th to 21st of March 2014:

- Acknowledging that CA is set to become a major contributor to achieving CAADP’s goal of 6% annual growth in the agricultural sector which employs 80% of Africa’s rural population;
- Noting the documented impact and feedback from practicing CA farmers across Africa and in other developing regions, and its significantly positive impact on their incomes, livelihood, well-being and on empowerment of women farmers;
- Further noting that CA is one of the best food security and profitability options for farmers, in addition to being a climate-smart and environmentally sustainable solution that gives farmers the choice to apply CA principles to a range of production systems including, horticulture, agroforestry and crop-livestock integration, amongst others;
- Recognizing that governments are making great efforts in support of Food Security and sustainable agricultural intensification in general, but that these efforts need to be stepped up to create a more conducive environment for the adoption of CA;
- Further recognizing the necessity of promoting farmer associations and platforms and strengthening their partnerships with governments;
- Realizing the need to strengthen partnerships, communication and information flow within the CA community of practice at national and regional levels;
- Considering that new knowledge and experience exchange are an important resource for uptake and spread of CA;
- Further considering that CA is a key to enhancing the capacity of all farmers to adapt to climate change effects;
- Underlining the importance of the three inter-linked principles of CA, namely, minimum soil disturbance, maintenance of soil cover and cropping system diversity;

- Highlighting the crucial need to upscale mainstreaming of education on the science and practice of CA in existing educational systems at primary, secondary and tertiary levels;
- Further realizing the importance of South-South cooperation, in the form of exchange of expertise, information and experience; and
- Also recognizing the role played by women and the youth in the accelerated up-scaling and adoption of CA; resolve as follows:

C. The Resolve

In order to achieve the CAADP goal of 6% growth of the agricultural sector, we resolve:

Policy, Political Commitment And Leadership

1. We call for commitment from all national and international stakeholders in the public, private and civil sectors to support the up-scaling of CA as a climate smart technology to reach at least 25 million farmers across Africa by 2025;
2. Governments are called upon to create a conducive environment for the adoption and development of CA by investing more in CA education and extension; integrating CA training in educational curricula, and supporting CA farmers and their organizations.
3. Governments are called upon to create enabling policy environment to allow investment financing, and technological development including private sector involvement in CA related value chains;
4. Development partners are urged to increase support to CA programmes under the CAADP Agriculture climate agenda;

Private Sector Engagement

5. Urge the Private sector to proactively support up-scaling of CA through further innovations and increased investments financing in

appropriate CA technologies and related services;

Training, Extension, Research and Innovation, and Knowledge Support

6. ACT is to establish a quality-assurance system for accredited agricultural training institutions to provide CA training certificates. Furthermore, ACT will collaborate with relevant stakeholders for the harmonization of CA training curricula;
7. Farmers who have adopted CA should be supported to be champions and educators for their counterparts. Furthermore, they should establish locally relevant collaborations, innovation platforms and associations that can engage with government and other CA actors;
8. Agricultural training institutions are requested to take up CA as an integral part of their training programmes and take part in farmer sensitization and training efforts;
9. Urge all concerned including FARA and the CGIAR to ensure research and extension on CA is farmer-focused and responsive to the needs of farming communities, and research findings should be communicated more effectively to inform decision making at different levels as well as to support knowledge management systems including extension and training;
10. ACT, in collaboration with FAO & Regional Economic Communities are called upon to support knowledge management by stakeholders, including the CA task forces.

The Participants to the 1ACCA
Lusaka, 21st March, 2014

9.0 Resources

9.1 Congress condensed papers book

Available at: <http://tinyurl.com/kgwdthj>

9.2 Programme book Available at:

<http://www.africacacongress.org/file/1acca-updated-programme-version-feb2014pdf>

9.3 Field visit site profiling. Book available at:

<http://www.africacacongress.org/field-trips>

9.5 Sponsors prospectus Available at:

<http://www.africacacongress.org/sponsorship-packages>

9.6 Submissions of awards

<http://www.africacacongress.org/awards>

9.7 PowerPoint presentations

Available at <http://www.africacacongress.org/presentations>

9.8 Congress Videos available on YouTube

https://www.youtube.com/channel/UCofLj9eI5ShyQny3xcWR4DA?feature=em-share_video_user

Category	Total	%
Smallholder Farmers	82	19.8%
Large scale CA Farmers	2	0.5%
NGOs and Extension workers	99	23.9%
Researchers and the Academia	92	22.2%
National Governments	33	8.0%
Private-Public CA Investors	11	2.7%
Farmer Organizations	3	0.7%
African CA Champions	0	0.0%
CA Equipment & inputs and Suppliers	5	1.2%
Banks	1	0.2%
Regional Bodies (+ RECs)	3	0.7%
Development partners	34	8.2%
Media	49	11.8%
TOTAL	414	100.0%

Table 4: List of Participants by category



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