



FANRPAN
Food, Agriculture and Natural Resources Policy Analysis Network



REGIONAL CONSERVATION AGRICULTURE SYMPOSIUM

Held at the Emperors Hotel, Johannesburg, South Africa

8th - 10th February, 2011



Workshop Documentation

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From the 'Institute for People, Innovation and Change in Organisations' - PICOTEAM



About this report

This report documents the Regional Conservation Agriculture Symposium, held on the 8th-10th- February, at the Emperors Hotel, Johannesburg, South Africa. The Symposium was hosted by the Conservation Agriculture Regional Working Group (CARWG), with support from the Food and Agriculture Organization of the United Nations (FAO), the Food, Agriculture and Natural Resources Policy Analysis Network (FANRPAN), African Conservation Tillage Network (ACT) and the African Union Partnership for Africa's Development agency (NEPAD). The symposium objectives were:

1. To share and document information on the social and economic impacts of Conservation Agriculture technologies in the region;
1. To share and document experiences on Conservation Agriculture and scale-up approaches and impacts;
2. To identify key areas for research and development and explore institutional and policy innovations for Conservation Agriculture scale-up.

The Symposium brought together over 130 participants from national, regional and international research and development organizations involved in conservation agriculture. There was also media representation from the SABC Radio and the Agricultural Writers Association of South Africa.

This document, which is in two parts, is meant TO BE A REFERENCE material for all participants. The first part provides details of workshop process and outputs in a non-interpreted way. Almost all results of the working groups and plenary sessions are documented, including the input presentations. The second part of this reference document will be the posters as they were displayed in the conference room. This will be sent to all participants by 31 March 2011.

Other Symposium outputs that will be shared with participants are the Symposium Synthesis Report and Symposium Technical Proceedings.

The *Symposium Synthesis Report* is currently being compiled by the Synthesis Team and a draft will be circulated for input by 31 March 2011.

The *Symposium Technical Proceedings*, which includes both full oral technical papers and poster papers, as agreed in the symposium, will be available by June 30, 2011.



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Foreword by the facilitators

Working with you in this symposium/ workshop – as one of you has called it- was a great pleasure for us. The discussion on Conservation Agriculture brought back a lot of our memories as we have had practical experience in this field dating back to the 1990s. The meeting was a bit of a stress with the many presentations, however we have managed to balance that with useful discussions.

We would like to thank all you for your active participation and engagement during the discussions. Our special thanks go to all the chairs of the sessions as well as the rapporteurs. Most importantly, we like to thank the process steering group that sat with us every evening to reflect on the progress of the day. It is through your feedback and direction that we managed to navigate to achieve the results that we have.

We believe that in order to be successful in conservation agriculture you will need to move away from the usual, and explore different ways of doing business. And that requires an entrepreneurial spirit of trying out unconventional means. And this is a big challenge for research. We wish you all the best as you will continue to explore what works better for your different contexts.

Jürgen Hagmann

Hlami Ngwenya

Institute for People, Innovation and Change in Organisations – PICOTEAM



Executive Summary

The Conservation Agriculture Regional Working Group (CARWG), with support from the Food and Agriculture Organization of the United Nations (FAO), the Food, Agriculture and Natural Resources Policy Analysis Network (FANRPAN), African Conservation Tillage Network (ACT) and the African Union Partnership for Africa's Development agency (NEPAD), hosted a successful and well attended Symposium on Conservation Agriculture (CA) in Johannesburg, South Africa on 8-10 February 2011. The symposium objectives were:

1. To share and document information on the social and economic impacts of Conservation Agriculture technologies in the region;
2. To share and document experiences on Conservation Agriculture and scale-up approaches and impacts;
3. To identify key areas for research and development and explore institutional and policy innovations for Conservation Agriculture scale-up.

The Symposium brought together over 130 participants as follows: government representatives from 12 countries (Angola, Botswana, Lesotho, Madagascar, Malawi, Mozambique, Namibia, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe), the Southern Africa Confederation of Agriculture Unions (SACAU), three national farmer organizations (CFU-Zambia, KZN No-Till Club, National Farmers Union of South Africa), eight NGOs (CA Academy/EcoPort, CARE, CHOPPA, CRS, KATC, Mennonite Central Committee, Peace Parks Foundation, RESCOPE), eight research organizations (ARC-South Africa, CIAT, CIMMYT, Food Security Research Project-Zambia, ICRAF, ICRISAT, Institute for Poverty, Land & Agrarian Studies-South Africa, Department of Research-Zimbabwe), 14 universities and agricultural colleges from nine countries (Botswana, Namibia, Netherlands, Norway, Swaziland, South Africa, USA, Zambia and Zimbabwe), USAID/OFDA, Royal Norwegian Government, GRM International, FAO, ACT, FANRPAN, COMESA and NEPAD.

Main outcomes were:

1. A critical need for action to up-scale CA in the region as CA can contribute to food security, poverty alleviation, income generation and environmental sustainability was agreed upon by the majority of the participants,
2. The up-scaling of CA should be led by farmers based on farmers' needs,
3. The holistic systems nature of CA needs broader consideration and acceptance in both the design of research activities and in development programmes that promote CA,
4. That the research that supports the promotion of CA should be participatory action research that takes a broader integrated systems approach to ensure relevancy to farmer needs,
5. That there must be an increased emphasis on capacity building through accredited CA education and training at all levels, with a particular focus on farmers, extension and other change agents necessary for effective up-scaling,
6. That public-private partnerships and efficient value chains are necessary to achieve CA up-scaling,
7. Effective coordination of CA promotion efforts at national and regional level is critical for success,
8. That CA practitioners and stakeholders must engage in coordination and information sharing platforms and networks to ensure effective support to CA up-scaling, and
9. Governments were encouraged to develop and implement policies that support the up-scaling of CA, and particularly those that are evidence-based.

Way forward

The CARWG will review its workplans, taking into consideration the outcomes of the Symposium. A regional strategy for up-scaling CA and institutional arrangements with member countries will be created to implement the recommendations from the Symposium. Advisory notes will be produced for sharing with policy makers in the region and COMESA will present outcomes of the Symposium to the COMESA Technical Committee on Environment and Agriculture. A synthesis report on key issues emerging and the way forward for up-scaling CA will be published. Furthermore, technical proceedings containing papers and posters presented at the Symposium will be published.

1 Symposium Opening Speeches

Chaired by Lewis Hove

Lewis Hove officially welcomed the participants. He then called the representatives of some organisations that play a significant role in the promotion of conservation agriculture in the region and were instrumental in making this symposium success to deliver their opening address. Their speeches are presented in this section.

1.1 Welcome remarks by the chair of CARWG

Mr Martin Ager

(The Chair of CARWG)

Honourable Mr Klaas Mampholo the Assistant Director of Land Care of the South African Department of Agriculture, Forestry and Fisheries.

Distinguished Representatives of USAID, the Norwegian Government and COMESA

Ladies and Gentlemen

It gives me great pleasure to welcome you to this Conservation Agriculture Symposium on behalf of the Conservation Agriculture Regional Working Group.

This Symposium is being organized under the auspices of the CA Regional Working Group as one of the activities from our 2011 work plan.

The Symposium will give an opportunity to a large number of specialists to share and discuss their findings on CA Technologies, Impacts, Institutional Arrangements, Policy Issues and Market Innovations. Apart from the oral and poster presentations from southern Africa, we will hear something about experiences from elsewhere in the world.

We will also use the opportunity of having so many specialists in one place to formulate a CA Research and Development Agenda for Southern Africa.

I have been asked to say a few words about the regional and national coordination of CA Stakeholders, which arose out of an expert meeting in Harare in 2007. This was to address a need for the many different players in the sector to work together for the scaling up of CA, which is seen as having significant potential to help address the food security problems of Southern Africa as well as to reverse the progressive decline in soil fertility. This will help farmers to cope with the droughts, which sometimes wreak havoc with their harvests and put them in a better position to withstand the forecast climate change scenarios for the region, which will see an increased frequency and severity of droughts.

At the national level, CA Task Forces now exist in 12 SADC countries. The Task Forces are coordinated by one of the key players in the sector either from Government or from another organization, which plays a major role in CA development. Membership is open to anyone who is interested in CA promotion and members come from different government departments, NGOs, research and training institutions, private sector equipment and input suppliers and, of course, farmers organizations. The Task Forces work to coordinate activities and define principles and policies for the rolling out of CA. If you are interested in participating in the National CA Task Force from your country, please see me afterwards and I can give you their name and their contact details.

The CA Regional working group is made up of these national coordinators and representatives of organizations with a regional mandate in relation to CA or which have active CA programmes in at least 4 countries. These include such organizations as FANRPAN and ACT together with CG Centres, some of the larger international NGOs and Regional Economic Communities. It is currently chaired by FAO. There is an Executive Committee and 6 Thematic Groups;

- Research and M & E
- Capacity building and extension
- Inputs and equipment
- Policy development and advocacy
- Resource mobilisation
- Knowledge management and publicity

The Regional Working Group coordinates the work of international organizations in the sector to provide support to the National Task Forces as well as the mobilization of resources and carrying out various studies and disseminating information to policy makers throughout the region.

The Regional Working Group has an annual meeting where the work plan is developed for the following year. Apart from this symposium, we intend this year to refine the Terms of Reference for the group and to present CA to various Regional Economic Communities and Donors. There will also be specific activities for each of the Thematic Groups. All these activities lead towards longer term 5 and 10-year targets related to the scaling up of CA.

I look forward to an interesting and informative symposium and wish you every success with your presentations and discussions.

THANK YOU

1.2 Welcome remarks by FAO

By Ms Cindy Holleman

(FAO Sub Regional Emergency Coordinator for Southern Africa)

Ladies and Gentlemen, Colleagues, Distinguished Representatives of the Department of Agriculture, Forestry and Fisheries of South Africa, Regional Intergovernmental Institutions – NEPAD, COMESA, and FANRPAN, and Distinguished delegates from Southern Africa and Abroad,

on behalf of the FAO Representative of South Africa, Madame Kurwijila, the FAO Coordinator of Southern Africa, Mr. Han, and the FAO Sub-Regional Emergency Office of Southern Africa, it is my honor to welcome you.

It gives me great pleasure to be with you today and welcome you to the first Regional Conservation Agriculture Symposium of Southern Africa. As you are all aware, this region faces many developmental challenges, including pervasive poverty, food insecurity and rampant land degradation. The causes of these challenges are varied and interlinked and the effects of climate change will worsen the situation. It is critical that, in a region where up to 80% of the population's livelihoods depend on agriculture, stakeholders put in place policies and programmes that ensure growth in the agricultural sector.

Agricultural productivity needs to be increased. Farming households should find it profitable to farm; they should be assured of harvests, a diverse diet and a decent living from working their land. Farming households cannot continue to apply practices that have long-term negative consequences to the soil, water and other aspects of the environment.

Research, extension and development professionals have been working with farmers in testing and promoting CA technologies in the region for more than 30 years. CA has been shown to increase yields, gain efficiencies in input use and maintain the long-term productivity of land and water resources. CA contributes to increased profitability and sustainability of farming enterprises through the application of minimum tillage, permanent soil cover and crop rotations. This region would benefit tremendously if CA was adopted by millions of smallholder farmers.

FAO has long promoted good farming practices across the globe. In southern Africa, FAO has taken a proactive approach to promoting Conservation Agriculture, because we see that it has great potential to help households achieve food security, poverty alleviation and environmental sustainability.

As FAO, we do recognize that the benefits of and challenges to CA adoption will vary according to the biophysical and socio-economic environments. But we also believe that if all stakeholders work together, the challenges to CA adoption can be effectively tackled. We need to demonstrate and provide evidence to farmers that CA is applicable to their situation, otherwise they will continue to use the plough to the detriment of their farms and livelihoods. It is therefore prudent that we understand the diverse needs of farmers and tailor-make our promotion efforts to address these needs.

This symposium provides an excellent opportunity for stakeholders to share their experiences and work together to identify solutions to the bottlenecks to scaling up CA in southern Africa.

I would like to commend the Conservation Agriculture Working Group (CARWG) for developing and hosting this symposium. I am pleased to see such a wide representation of organizations at this meeting and the strong interest among practitioners to participate in such a gathering. I sincerely hope that you will be able to share your experiences - positive and negative - debate the contentious issues, and at the end of the day, identify key areas of intervention with respect to CA technology, policy and

institutions. Ultimately, farmers need access to CA information and knowledge, quality inputs, appropriate tools and equipment, and produce markets.

I would like to thank The Food, Agriculture and Natural Resources Policy Network (FANRPAN), the African Conservation Tillage Network (ACT), the New Partnership for Africa's Development (NEPAD), for organizing this symposium together with FAO.

I would also like to thank the USAID Office for Foreign Disaster Assistance (USAID/OFDA), the Norwegian Government's Ministry of Foreign Affairs, and the German International Corporation (GTZ) who have provided the necessary financial resources to support this meeting.

Once again, I wish you all warm welcome and fruitful deliberations during these next three days.

THANK YOU

1.3 Remarks by USAID/ OFDA

By Mr Harlan Hale

(Principal Regional Advisor)

Why is USAID's OFDA supporting Conservation Agriculture -

- 70 % of the Region earns their Livelihood through Agriculture
- 90 % of the Farm Land in the Region is Rain Fed - Majority of Climate Models indicates a Hotter, Drier southern Africa.

In the area of Disaster Risk Reduction, Drought Mitigation is priority for Southern Africa. Conservation Agriculture makes better use of water resources and address issues of soil fertility. CA has shown to be an effective Loss Reduction Strategy when faced with Erratic Rainfall OFDA's Two-Pronged Approach

Fund FAO at the Regional Level to Promote CA among policy makers and those who influence policy, to get them thinking about it as something of interest.

Fund NGOs to teach Target Farmers about CA and promote the adoption, so that people can see the benefits for themselves and continue and expand the practice. In this way, Policy Makers can make Policy based on Evidence in the Field, evidence demonstrated by improvements in yields and reduction in losses, resulting in improvements in household food security status. Target Group addressed by USAID/OFDA - Food Insecure - Destitute - Made so by Recurrent Disasters.

Some Anecdotes of Success:

Swaziland - Woman who almost gave up on farming. Man with surplus from last year.

Zimbabwe - Combined with Sorghum for Region 4 areas. The difference between losing 50% and 100%

Zambia - where even in the most CA-friendly country, people are still learning about it. But working with some traction-based CA with Rippers.

While there have been successes, we have also heard of some failures, some concerns on methodology, and some doubts about whether CA holds the promise Proponents claim it does.

Critical Question:

From the perspective of a Foreign Assistance official, IS CA something we should be advocating and putting resources toward? Will it make demonstrable impact on reducing the risk of Food Insecurity?

Challenge to the Participants:

Help me, help the policy makers of the region, help to NGO implementers, and help the Farmers of this region - both Big and Small - determine whether the benefits of Conservation Agriculture justifies changing the way Farming is practiced in Southern Africa.

While there is a lot of research taking place on Conservation Agriculture, there are also a lot of Opinions being put forward, and some of them contradictory. My challenge to you all is to help us make sense of the subject, so that we can all make the best decisions on support to Agriculture in the face of Climactic Changes in the years and decades to come. I look forward to hearing your presentations and the discussions to follow.

Thank You

1.4 Remarks by Royal Norwegian Government

By Jan Erik Studsrød

(Counsellor/ Regional Advisor- Zambia)

Dear participants

First of all I would like to thank the organisers for allowing me to have your attention for a few minutes.

When I was a young high school student in Norway I was, let's be honest, more or less forced to read a number of novels. Most were rather boring and a waste of my time as I rather wanted to be outside playing football with my friends. . But some really made an impact on me.

One was the novel by John Steinbeck called Grapes of Wrath. Set in the farming community of Oklahoma where in the 1930'ties the fertile topsoil literally blew away. There are still pictures in my mind of houses covered with top soil blown from fields far away and clouds of dust blocking the sun and the horizon for months at time. Thousands of farmers, some that migrated from my own country Norway in search of a better life, were forced again to migrate. This time to California. In a movie some years later starring Henry Fonda the tragic events in Oklahoma and other Midwestern states were made available for a larger global audience. What caused the tragic events were the combination of a long drought spell and the intensive use of the plough. This simple tool so effective in dealing with weeds and providing a good seedbed was clearly not the appropriate tool for the mid western prairie soils or for that matter soils in other parts of the world. Recognising this, the US Army Corps Of Engineers came to assistance and to make a long story short this was the early start of modern conservation agriculture.

The concepts and adoptions have since developed and spread to other parts of the world such as Brazil which may be emerging as the most important role model for Africa. It is reported that up to 60% of the agricultural land in Brazil is under CF. In fact as I understand it conservation farming in this region was initially introduced to Zimbabwe inspired by the development in Brazil. I assume that others attending this symposium would clearly be in a much better place to give the details.

We have in recent weeks seen a number of reports that paints a rather gloomy picture of the global food supply and the ability of this fragile planet to feed its growing population. In 1960s it was around 250 million people living in this beautiful continent. Last year it passed more than one billion. Maybe there are room for many more but it is certainly a huge challenge to deal with the rapid population growth .

We are all aware of the challenges facing Africa and other parts of the world. Very often, maybe too often we hear about the negative aspects of the development of agriculture in Africa. Numerous reports and scientific papers repeatedly tell us about the low productivity, the lack of growth, the dependency on rain fed agriculture, the low use of inputs etc etc. Some, maybe too few, are also concerned with the extremely high post harvest losses, often as a result of poor access to markets, lack of infrastructure etc.

Against this backdrop, the Norwegian Embassy in Lusaka has since the establishment of the Zambia Conservation Farming Unit in 1996, known as CFU, provided financial support aimed at supporting the up scaling of conservation farming in Zambia.

During the first few years the activities of CFU were below the radar screen of both government and the majority of the players in the sector. But increasingly the many virtues of this radical shift in farming practices began to make headway in to the ministry of agriculture, the donor community and among researchers. You will of course over the next few days elaborate in detail about both virtues and challenges and as a non technical person I will leave the floor to the experts and rather spend a few minutes on what we as Norway are doing in support of conservation agriculture as a recognised strategy for increasing climate resilience and productivity of global food systems.

Many of you may be aware of the significant support provided by the Norwegian government to climate mitigation and more specifically in support of what is named REDD. Reduced emissions from deforestation and forest degradation recognise the role forest degradation and deforestation have in increasing the release of CO₂ and other Greenhouse Gases into the atmosphere. The recent climate conference in Mexico paved the way forward for the implementation of REDD. While by no means perfect it is seen as an important stepping stone in the right direction, addressing the forestry sector that contributes some 13-18% of Greenhouse Gases released into the atmosphere. On the African continent and in particular in the Eastern and Southern parts of the continent agricultural expansion tends to play a key role in deforestation and forest degradation, often compounded by the burgeoning charcoal industry. In addition to the significant support to REDD the Norwegian Government provides substantial support to clean energy and disaster risk reduction.

Coming back to Zambia, it became increasingly more evident that the Conservation Farming Unit was making significant headway in addressing a number of critical issues facing the agricultural sector. Issues like low and stagnating yields, low return on labour, unreliable performance depending upon rainfall etc etc. In 2006 it became quite clear that CFU was up to the challenge of playing a key role in transforming agriculture in Zambia.. From the original focus the addition of agro forestry to the agronomic practices saw the transformation from conservation farming to conservation agriculture. Many has visited Zambia to get a first hand look at this transformation and I am told that last year delegates from around 20 countries came to visit CFU. Maybe some sitting here today.

Realising that conservation agriculture can play an important element in how Africa can braise herself in view of climate change but also address other critical issues we have seen a growing interest for conservation agriculture in the region. The symposium this week is a clear indication of this.

In a recent Norwegian policy document on environment and development the role of conservation agriculture as an important strategy to develop climate smart agriculture is clearly recognised. Also the important role of women farmers is underlined and the Norwegian government has allocated a substantial resource envelope in support of addressing climate change and women, with a particular focus on women and agriculture. I would like to stress that Norwegian Aid is provided as Grants and not loans and that ODA exceed 1% of BNP. Far more than most countries. One example of forthcoming Norwegian support to climate mitigation and adaptation is a regional programme led by COMESA and where support to conservation agriculture has a key role.

CFU has been contracted by COMESA to look at countries where early actions can be implemented. The Norwegian Embassy in Lusaka (on behalf of the Norwegian Ministry of Foreign Affairs) will within a few weeks from now sign a contract with CFU enabling them and their partners in Uganda, Malawi and Kenya to expand Conservation Agriculture in those countries as early anchor investments being part of the regional Mitigation and Adaptation Program in the tripartite region. With support from both national governments and other cooperating partners we can spearhead the transformation of food and agricultural systems in a sustainable and climate smart manner

In Zambia we have had a number of visiting Norwegian politicians and cabinet ministers. Many have visited farmers involved in conservation agriculture and with the increased global focus on results such a visit can be rather convincing. It can be rather impressive to talk to a poor women farmer standing next to a stand of maize way above her head and especially when you compare it with the weedy fields of her neighbour where the maize is trying hard to convince the weed that it should be the superior plant.

But after being impressed with the fantastic achievements of CF/CA a natural questions to the neighbour is;

If your neighbour is achieving such fantastic results why don't you copy her?? Well I hope that this conference can help me in phrasing a sensible answer next time I take a visiting dignitary to a Conservation Agriculture Field. While some may have stated that conservation agriculture is God sent i

would like to recognize the important contribution that serious research has to offer in the emerging field of conservation agriculture and its potential role in Africa.

With these remarks I would once again thank you for the invitation and wish you all the best success with this symposium. Thank you for your kind attention

1.5 Welcoming remarks by the Government of South Africa

Mr Klaas Mampholo

(Deputy Director, Department of Agriculture, Forestry and Fisheries, South Africa)

Good morning Ladies and gentleman

Program Director, CARWG Chairperson, Dr Gaoju Han FAO Sub-regional Coordinator for Southern Africa

Ms Rosebud Kurwijila FAO South Africa, Ms Cindy Holleman FAO REOSA, Dr Mclay Kanyangara COMESA

Distinguished guests and participants, ALL PROTOCOLS OBSERVED

LADIES AND GENTLEMAN

Welcome to South Africa

I extend my warm welcome to all participants from SADC, Africa and abroad. It is indeed an honour and privilege to be given opportunity in this CA regional symposium of SADC working group. You are welcomed to the cradle of human kind of which the discovery site is just some few kilometers away from our symposium. I hope you will reconnect with your beings and be able to enjoy the hospitality of the country.

I will like to remind us that as we mark the hosting of first regional symposium in South Africa, appreciation should be given to CARWG, its leadership and secretariat for speedily advancing the course of CA and bringing the multi sectoral occasion of this magnitude. This add to impetus of devising strategies and responding to the call of the heads of state of SADC of committed to achieving a target of a GDP growth of at least 7 per cent per year and halve the proportion of the population that lives on less than US\$1 per day between 1990 and 2015. This call was the noble response by our leaders to international obligations of millennium development goals. Our leaders hope on the sector is justified and founded, because Agriculture is a major player in the SADC regional economy, contributing 35 percent to its gross domestic product. About 70 percent of the region people depend on the sector for food, income and employment. In addition, agriculture is a dominant source of exports in many countries, on average contributing about 13 percent to total export earnings and about 66 percent to the value of intra-regional trade. For these reasons, the performance of agriculture has a strong influence on the rate of economic growth, the level of employment; demand for other goods, economic stability and on food security and overall poverty eradication.

Therefore this concession by the leaders of the peoples for the peoples means that a lot is expected from any regional fora addressing agricultural productivity and sustainability. Our discussion and resolution in advancing conservation agriculture (CA) in SADC must culminate in defeating food insecurity and scourge of poverty. The approaches we share for promoting CA should be founded within the people's needs and allowing peoples to take the front stage. The threats to achieving noble call of achieving millennium development goals are exuberated by effects of climate change and rising products cost of agricultural basic commodities. The recent natural disaster and February statics about food cost is a cause for concern.

The above challenge dictates that CA promotion should be multi-pronged and integrated. Mainstreaming of CA into policy directives of agricultural inputs strategy, land reform and rural

development, mechanization, extension support and farmers lead experimentation, incentives to CA techniques and overall promotion should take the centre stage. It is quoted that, 226,581,000 hectares (25%) is arable and of which only 48,653,300 hectares is under cultivation. Distinguished delegates lets out of our discussion and country efforts ensure that of this limited size under cultivation in the region is under CA which is the only option of sustainable production. I therefore hope that benefits brought by CA will lead to equitable advances to the beneficiaries in the region. May you enjoy the presentations over the coming days and develop networks and partnership that this CA movement requires across to really make a lasting legacy.

It is a pleasure for me on behalf of the Department of Agriculture Forestry and Fisheries to declare the meeting officially open.

I thank you

1.6 Opening Speech by COMESA

Dr Mclay Kanyangarara
(Climate Change Advisor – Zambia)

Mr/Madam Chair, ladies and gentlemen, I bring you greetings from the Secretary General, Management and staff of COMESA. I have been sent on their behalf to say this to you.

We are honoured and proud to be accorded this privilege to share some thoughts with you at the start of this important meeting of the regional CA Regional Working Group (CARGW) organized and coordinated by FAO.

We congratulate, applaud and fully support the FAO for crystallizing the regional approach to CA through the now well established (CARGW) in which we are happy to be an active participant.

Why spotlight is on CA:

- No doubt CA is the buzz word in many circles and is poised for storming the stage
- In the last 10 years or so, interest in CA has literally exploded especially among the NGO sector, with Norway as lead donor along with the EU and others
- Adoption rates have gone up ambitious targets set.
- It is attracting the attention of the highest echelons in many Member States.
- In COMESA we have taken it fully on board and it is the centre piece of our flagship Climate Change Adaptation and mitigation programme

CA in the COMESA Climate Change Initiative

- The superstructure Negotiations – Technology Transfer – early flagships
- COMESA selected CA as an early flagship adaptation and mitigation intervention
- The vast majority of stakeholders focus on the adaptation component and rightly so for food security reasons.

What have we achieved so far?

- Raising awareness and profile of the African position:
 - o REDD+ Accepted
 - o Agriculture recognized as playing significant role
 - o (Global regional) Green/Adaptation Funds

- Registered Carbon Fund
- Raised profile of CA in the COMESA Climate Change Initiative, Resource Mobilisation.
- Training and CB in 12 out of the 19 COMESA Member States, i.e. Djibouti, Democratic Republic of Congo, Rwanda, Uganda, Kenya, Malawi, Zambia, Zimbabwe, Sudan, Eritrea, Ethiopia, Burundi.
- Stock Takes
- NIFS
- Tripartite initiative on Climate Change.

Need for and Role of Partnerships

- Cannot succeed against Climate Change without genuine all encompassing global partnerships down to individuals
- Significant role individually and collectively individual effort must add to the collective.
- COMESA FAO special partnership
 - Same programme, same target groups
 - Realisation that complementarity is better than competition
 - Joint activities: meetings, tours
- Technical partnerships
- Development finance partnerships
- PPP
- We are all in this together and for the long haul.

Looking ahead, what do we see?

- Gender social aspects of Climate Change. The vulnerable must become significantly less so as the adaptation and mitigation programme rolls out, it will be necessary to broaden the scope to include all aspects of successful livelihoods: forestry: AF, livestock, fisheries, cash crops, wildlife, energy, water.
- Investment into Early Warning Systems and DRR measures.
- Mainstreaming Climate Change into all aspects of development.
- The future belongs to green economies, jobs are going green so are investments, trade energy. We have to go green if we are to thrive.
- CA in high rainfall systems – Market linkages for surpluses.
- The big question is how will this transformation be financed? I leave you with one thought.

Future

- Adaptation demands a lot of resources that are beyond the capacity of poor countries to generate internally.
- Mitigation can generate resources to jumpstart adaptation actions. For example, 3 million farmers at 1 hectare each sequestering 5 tonnes C/Ha at \$10 per tonne generates \$150 million that can be used to bring on board another 1 – 2 million farmers at 50:50 PPP, creating a potential snowball effect thus contributing to sustainability.

1.7 Security Briefing

Mr Frans Kloppers

Security Assistant, UNDSS- South Africa

Mr Frans Kloppers of the UN Department of Safety and Security made a briefing to the participants about the security issues.

2 SETTING THE SCENE

2.1 Introduction of the facilitation team

After the official opening, Jürgen (the facilitator) took over to introduce the workshop process. (N.B In this document, Jürgen and the facilitator will be used interchangeably).

Jürgen indicated that he knows quite a number of participants, and he has been doing this work in the last 25 years. He worked in conservation tillage and conservation farming for a long time. For the last 15 years he has shifted much more towards facilitation, change management, organisational development. Helping institutions in their transformation; at local level, at service provider level. He does a lot of work on value chains, partnership, and innovation systems. In the last five years he has worked at the higher level with Pan African processes, such as NEPAD / CAADP and the Regional Economic Communities (RECs).

He understands the issues pretty well, right from the bottom to the highest political level. He has been working with the conservation farming community for quite a long time, from 1998 when the Conservation Tillage networked emerged. He has supported a number of meetings, including the world congress in 2005. He emphasized that while he understand the issues, he has no stake in this meeting. He does not have set beliefs where he wants to drive the meeting towards. Nor does he know of any hidden agenda that he has to endorse. His role will be to guide the process and the discussions in an inclusive and interactive manner.

Jürgen then introduced PICOTEAM. PICO standing for People Innovation and Change in Organisations, and these are at the core things of what they do. They believe in people, they do a lot of work in innovations, change and organisational development. Developing institutional arrangements and so on. PICOTEAM has branches in Southern Africa, East Africa (Kenya, Uganda) and also in Latin America, and one part in Germany. They have about 20 professionals, who operate as independent nodes under one umbrella, which is PICOTEAM LTD. (see www.picoteam.org)

He also introduced his colleague Hlami Ngwenya who would be co-facilitating the meeting, and also do the process documentation. She will be capturing the discussion of the different sessions.

Process steering group

The facilitator then introduced the process steering group (PSG), which is composed of some participants and the organisers. This group had tele conferenced prior this meeting, and had met a day before the meeting. He stressed that is the group was not representative of any positions, but a representation of the wide range of participants. The PSG is a mechanism for co-management of the workshop by the participants. This group will get feedback from the participants and will meet with the facilitator in the evening to take stock of the process.

Process steering Group

A mechanism for Co-management of the meeting by participants

Task:

To get a feedback from the participants on the workshop process and contents

To plan with the facilitators the next day in the evening

Members:

Amir Kassam, Tonie Putter, Martin Ager, Michael Jenrich, Klaas Mampholo, Collins Nkatiko, Catherine Namome, Ousmane Djibo, Enny Namalambo, Mdrina Mloza-Banda, Saidi Nkomwa, Cindy Holleman, Steve Twomlow, Lewis Hove

2.2 Introduction of the facilitation principles

After introducing the facilitation team, Jürgen introduced to the participants some facilitation principles that will be guiding their interaction during the meeting. This was meant to create an open atmosphere. The principles comprise of core value and rules for interaction at tables.

The core values:

Informality- relaxed atmosphere with discipline: He indicated that in this meeting we want to create a very relaxed atmosphere, but with discipline. Informality, means no titles such as Dr, Professors, honourable, Ambassadors etc, but rather address each other by the first names. He stressed that this will help create equality in the manner in which people interact in this meeting.

The discipline part means that participants need to take responsibility during the meeting. They need to respect time and not wait to be pushed after breaks. He also encouraged them to stand up when they feel tired, but they need to be careful not to make noise or disturb others in any way.

Inclusiveness: He indicated that some people are more articulate, while others speak less. So he will give priority to the quiet ones. The aim is to balance the dynamics and not to let it be dominated by few individuals.

Openness, Transparency and accountability: Jürgen indicated that he has been interacting with the organiser's prior this meeting. However, he has not been briefed of any hidden agenda or a need to push the process to a certain direction. He indicated that he sometimes find the Conservation Agriculture community to be very interesting; in the sense that people are not open, they are very rigid in their approach. He encouraged the participants to be open in their discussion so that they move away from their positions.

Constructive Controversy: The participants are allowed to be controversial, as this is an enormous source of creativity and innovation. We can use constructive controversy to bring out depth in our discussions. He indicated that sometimes he will be provocative, but only to challenge them to bring the real issues on the table.

No defensiveness: We all tend to believe in what we do, and often defend our positions. In this meeting, he urged the participants not to be defensive, but be open to new ideas.

No jargon: We tend to express things in the manner that everyone agrees, but at end of the day we do not understand what one is saying. So the facilitator encouraged the participants to use the language that will be understood by everyone, and to avoid jargons that do not mean anything.

Imagine you have a seven year old child in front of you, how would you articulate things that she understand that. That is the level of simplicity that is encouraged in this meeting.

No Gurus- Some people have been in the field for very long and others not so long. Let us listen to each other. Let us not assume that we know it all. Let us encourage others, because sometime people who have not been long in it have very exciting ideas.

Minimal institutional agenda- this community has always been full of institutional agendas. Let us try minimise that. There are institutional interests, but let us bring them up as transparent agenda and let us really discuss that.

Pragmatism for performance / impact- In my experience, if we really take a pragmatic approach and say what works and what does not work; what we want to achieve and how we want to achieve that, it breaks a lot of boundaries which we create and are often very rigid.

Understanding and accepting reality- we have different realities especially in conservation farming. Be clear which reality you talk about when you discuss. Try to understand it and accept it.

"Reality is stubborn, it does not go away". Unless we engage with reality and we deal with it, it will persist. Let us deal with it, and let us explore at our tables to see which reality we are talking about.

Creativity and innovation: This community has been around for a long time. I recently pulled out a 1998 documentation, and I am curious to hear what is different now, 13 years later. Are we moving or not, and why? In this meeting, we need to challenge ourselves very hard in terms of what works. We need to ask if it is really moving, or is it new? Or are we trying to do the same things again?

Creativity- thinking beyond the box: We need a lot of creativity in this process. We need to create imaginations of how things could work in a different way. Let us bring out ideas that are not conventional. Let us challenge ourselves. Even wild ideas are welcome

Honesty and political incorrectness: In our scene there are so many things that cannot be said, and we do not say what need to be said. Some of you work at the level that we code things so nicely that people do not know what it means. But we are not moving forward in this way. Let us deal with the real issues, Let us call a spade a spade and let us talk what we mean. Do not shy away, be bold and come up with the real issues in a positive way.

“The problems of the world today cannot be solved by the level of thinking that created them”

Albert Einstein.

Rules for interaction at tables were:

After outlining the facilitation principles (as shown above), Jürgen presented some rules that he would like the participants to adopt for interaction at their tables. The rules were:

- Sit at a new table with new people every half day (we want to avoid the boring neighbour syndrome) - It also helps to learn more about different perspectives and to create a different dynamics
- Think first individually, then discuss in a group- This enhances the discussions
- Control yourself, give others a chance
- No speeches, be to the point
- No computers during the sessions

After introducing all these principles, the facilitator asked the participants if there was anyone who did not subscribe to them. In general all the participants agreed to the principles.

2.3 Getting to know each other

2.3.1 Participants introduction and their expectations

In order to allow the participants to know each other beyond just names, the facilitator asked them to sit at the table with people they do not know so well. He then asked them to get to know each other as guided by the questions in the box below:.

Participants' introduction

1. Make sure you sit at a table with people whom you do not know well (none of your own organisation)
2. Find out from each other:
 - a) Who you are and where your roots are
 - b) What are you really proud of in your personal and professional life
 - c) Since when have you been active in CA and what were your major positive and negative highlights since?
 - d) What do you think are the 'not so open' agendas in this meeting
3. Agree together (5 mins, write on cards)
 - a) What should happen in this meeting is....(Max 2 cards)
 - b) What should not happen here is.....(max 1 card)

Total time 20 minutes

Expectations from the participants

As part of the participants introduction, the participants were asked to agree at their table on what they would like to see happening in this meeting, as well as what should not happen. What is reflected in the tables below is what came out of that discussion.

What should happen.... ..	
<ul style="list-style-type: none"> • Concrete action for the future, we do not want to dwell in the past 	<ul style="list-style-type: none"> • Commitment to support CA
<ul style="list-style-type: none"> • Improving farmers livelihood 	<ul style="list-style-type: none"> • More strengthening of networks in CA
<ul style="list-style-type: none"> • CA become alive to extension 	<ul style="list-style-type: none"> • Agree on what is meant by CA
<ul style="list-style-type: none"> • Come up with practical examples of promoting CA 	<ul style="list-style-type: none"> • Receptive and respectful of others views
<ul style="list-style-type: none"> • Strong voice from national level in agenda setting 	<ul style="list-style-type: none"> • Apply principles of CA in a flexible rather than rigid manner
<ul style="list-style-type: none"> • A pathway to sustainability 	<ul style="list-style-type: none"> • Create awareness among non- believers and enthusiasm and knowledge among the believers
<ul style="list-style-type: none"> • Clearly define the limitations of CA 	<ul style="list-style-type: none"> • Farmers involvement in defining the problem
<ul style="list-style-type: none"> • CA not being limited to agronomy • Emphasis on inclusiveness in CA 	<ul style="list-style-type: none"> • Making a link between researchers and on farmer development

<ul style="list-style-type: none"> • Agree on some key issues 	<ul style="list-style-type: none"> • Recognising research gaps
<ul style="list-style-type: none"> • Overview of state of science on CA in the Southern African region 	<ul style="list-style-type: none"> • We need to come up with support structures for CA
<ul style="list-style-type: none"> • Free and constructive discussions on critical issues in CA 	<ul style="list-style-type: none"> • Adequate definition of research needs and procedures
<ul style="list-style-type: none"> • We need to be clear about what works and where 	<ul style="list-style-type: none"> • Address challenges- research and development
<ul style="list-style-type: none"> • Inclusive communication 	<ul style="list-style-type: none"> • Action at provinces
<ul style="list-style-type: none"> • Recognising opportunities as well on challenges 	<ul style="list-style-type: none"> • Concrete action plans • Need a plan of action • Actions on outputs

What should not happen in this meeting is...	
<ul style="list-style-type: none"> • Wha wha wha • Not another talk shop • Do not waste time on definition 	<ul style="list-style-type: none"> • No rigidity in application of CA principles
<ul style="list-style-type: none"> • Not work in isolation 	<ul style="list-style-type: none"> • CA to be depicted as a magic wand / panacea
<ul style="list-style-type: none"> • Personal attack 	<ul style="list-style-type: none"> • This should not be the first and last symposium- the synergy must not be lost
<ul style="list-style-type: none"> • No preaching 	<ul style="list-style-type: none"> • Fighting amongst the gurus
<ul style="list-style-type: none"> • Facilitator not take over and dominate 	<ul style="list-style-type: none"> • People should not follow their own agendas sub regionally
<ul style="list-style-type: none"> • Nobody should use this meeting to legitimise their personal agendas 	<ul style="list-style-type: none"> • Controversy
<ul style="list-style-type: none"> • Do not destroy gain that has been made to date 	<ul style="list-style-type: none"> •

2.3.2 The objective of the meeting

After the participants had shared what they expected from the meeting, the facilitator then presented the objectives of the meeting as agreed with the organisers and the process steering group that met the day before. The objectives are shown in the box here.

The facilitator then asked the participants to make comments about what this meeting has been set out to achieve, and what they (the participants) expect. It was agreed that there was no

The objectives of the meeting
<ul style="list-style-type: none"> • To share the latest knowledge on CA and agric. development in the region • To take stock of the state of the art of CA research and development in the region • To identify the critical challenges in scaling up of CA and options to make a MAJOR STEP forward • To identify the future direction in CA research

discrepancies between the expectations and the objectives.

2.3.3 Tasks for Session Chair Persons and the rapporteurs

The facilitator indicated that some participants will chair different sessions. He therefore presented what the task of the session chairs and their rapporteurs would be.

Task for session chair

Task: Manage the contents and time of the presentations

1. Make sure the presenters stick to max 10 slides in 10 minutes
2. Manage presentation time strictly
3. At the end of the presentations, allow for 15 minutes questions and answers
4. Support the rapporteurs in the synthesis

Tasks for Session Rapporteurs

Task: Synthesize the outcomes of your session in terms of:

1. What transpired from this session: Where are we compared to 5 years ago:
2. Major areas of progress and success
3. Most critical bottlenecks now – any changes?
4. What are the implications for the future direction in CA development and in research?

N.B. In the next sessions, the participants made presentations of their work and experiences. It is important to note that the organizers of this meeting made an effort to collect all the power point presentations in memory sticks which, were given to all the participants. Therefore, what is captured in this process documentation are only highlights of these presentations.

3 Global and regional perspectives

Chaired by Amy Sullivan

Rapporteurs: Florence Mtambanengwe and Hebert Mwanza

In this session there were four presentations. The first two looked at the broader picture on CA. One is focusing on the global issues, and the other the issues from the region. The other two presentations looked more at the practical activities that are happening on CA issues. The papers were presented as follows:

1. Conservation agriculture: Global perspective and developments by Theodor Friedrich
2. Conservation Agriculture Research and Development in southern Africa: a Review of Achievements and Challenges in the Past 20 Years, by Lewis Hove
3. Conservation Agriculture Developments in East, Central and West Africa, by Saidi Mkomwa
4. Conservation Agriculture institutional and technological innovations in South America: their relevance to Southern Africa, by Pat Wall

All the presentations were made one after another. At the end, the presenters were asked to sit as a panel where the participants asked some questions for clarity. Once that was done, the facilitator asked all the participants to further analyse –at their tables- the presentations in term of critical issues that were emerging in relation to scaling the benefit of CA. The outcomes are presented later in this document.

In addition to this the rapporteurs for this session were also asked to make a synthesis of the session. What is captured in session are:

- The highlights of the four presentations, with more emphasis to conclusions and recommendations
- The issues emerging from the presentation- questions for clarity and
- The rapporteurs synthesis reports

3.1 Conservation Agriculture: Global Perspectives and Developments

Presented by Theodor Friedrich

In his presentation, Theodor highlighted the following:

- Some key challenges for CA globally
- Drivers for Adoption
- CA in Southern Africa
- CA and the Global Agenda

Conclusions

- Is universally applicable/location specific
- Is existing on 8% of farmland and growing
- Is successfully proven in SSA
- Is productive and sustainable (win-win)
- Is responding to actual challenges
- Is compatible with global agenda
- Requires supportive, problem solving, not comparative research
- Requires supportive policies for accelerated adoption

3.2 Conservation Agriculture Research and Development in southern Africa: a Review of Achievements and Challenges in the Past 20 Years,

Presented by Lewis Hove

Gave a snap shot of what is happening in Southern Africa. He emphasized issues around the following:

- Key features of Southern Africa
- CA Research
- CA and Soil Organic Matter and Water
- What have been happening since 1990
- CA Techniques Being Promoted in the Region
- CA Promotion in Southern Africa (large and small scale)
- Benefits and Challenges
- CA Training and CA **Coordination**
- CA Policy Research

Future Research and Development Needs

- Generate science-based evidence and use in advocacy – on-farm and complementary on-station research
- Promote a diverse range of complementary technologies, e.g. agro forestry, fodder crops, IPM, production of organic fertilizers, etc
- Strengthen and implement robust M&E systems
- Monitor farm level, landscape, catchment/basin impacts of CA adoption
- Training and capacity building - increase CA knowledge and skills among the farmers and extension. This should include agronomic practices and use of CA equipment and herbicides

- Develop and strengthen innovative extension approaches, including those led by farmers, farmer unions and private sector
- Promote farmer linkages to inputs and produce markets – seed for rotation legumes critical
- Increase farmer access to appropriate CA tools and equipment –increase labour productivity and area under CA
- Analyse and improve relevant policies
- Mainstream CA in national and regional programmes and policies – education, extension, research
- Facilitate farmer access to carbon markets

Partnerships and cooperation - farmers, private, public, civil society

3.3 Conservation Agriculture Developments in East, Central and West Africa,

Presented by Saidi Mkomwa

He started his presentation by elaborating the need for CA in the continent. He then touched the issues around:

- Who is our targeted CA beneficiary?
- ACT and SCAP in West and Central Africa
- The CA Interventions being promoted
- Complimented with Essential CA enhancers ... (which are however not CA!)
- What equipment for minimum soil disturbance? - How to Achieve Permanent Soil Cover?
- Learning Processes to introduce and adapt innovative CA technologies
- ACT - and the CA SARD Project Achievements and some lessons from CA SARD

Way forward

- A RE-DEFINITION OF CA IS REQUIRED!
 - It must be simplified for people to SEE CA. What colour is CA? Farmers, Investors, Policy makers and Development partners need to see CA.
 - CA (the concept) must be de-alienated from inputs.
 - The re-definition – should be geared primarily for the advocacy and promotional point of view.
 - Watchdog to certify when inputs are not CA?
- We must bring on-board the private sector (including investments from non-farmers) to invest in and promote CA.
- There is need to attract more investments for CA –National Governments, private sector and Development partners for the watershed benefits of CA
- Africa requires comparatively longer term, concerted efforts and investments for the promotion of CA
- Systematic documentation and wider sharing of CAWT Experiences and Learning's at all levels
- The Need to Sharpen Approaches
 - Of the 105 m ha under CA worldwide, less than 4 million ha is adoption by smallholder farmers
- Smallholder farmers in Brazil are benefiting from CA, but not as much as large-scale farmers. Their youths are migrating to cities (R Kochhann, SEMEATO, 2008).

- The world over, farming is a business, driven by profits and commercialization, or strategically subsidized. Can Africa succeed to modernize farming through aid?
 - The services of the medium scale farmers need also to be unleashed and brought on board

We need to strive for competitiveness in TRADE by full exploitation of the AID

- Commercialize smallholder farmers' production
- Target the middle class urban dweller:
 - They are a food market
 - Like the maize milling machines, they can invest and provide CA services
- Target regional rather than export markets
- Value addition of the cover crops (e.g. mucuna, lupins) through processing will bring more money and diversify cover crops' use into animal feeds
- Facilitate access by farmers to CA equipment services through hiring schemes. Win-Win!
- Develop CA equipment attachments to exploit the power for the increasing walking tractors

1.0 Conservation Agriculture institutional and technological innovations in South America: their relevance to Southern Africa,

Presented by Pat Wall

Pat 's presentation touched issues around:

- How did the Revolution Begin?
- Expansion in the Area of No-Tillage Agriculture in Brazil
- Expansion in the Area of No-Tillage Agriculture on Small Farms in Brazil
- The Road to Conservation Agriculture (CA)
- The Three Components of Conservation Agriculture
- Many lessons learned from an analysis of the patterns of adoption of "no-till" in six cases
- Changes in two basic paradigms
- Soil and Land Degradation Resulting from Tillage
- Innovation systems approach for complex processes
- Key successes with CA- lessons from South America
- Requirements to Start CA: -
 - Information
 - Preparations
 - Implementation

"There are a lot of changes necessary to adopt zero tillage (and conservation agriculture) but the biggest change is in the mind."

1.0 Issues emerging from the presentations- questions for clarity

At the end of all the presentations, the facilitators opened space for the participants to ask questions for clarity. These are some of the issues that were raised:

Question- I see quite a lot of reference to successful farmers, and knowing why they succeeded. This is where the research is concentrating. I like to know more about those who are not adopting, and why they are not adopting?

Response: My thinking is that either they have not heard, or they have heard but they have not seen. Or they have seen but have not tested. Or they tested but have not adopted. They need to be helped to go through that process of seeing, testing and adopting. We need to create awareness and support them to implement. If they have tested and have not adopted, it may be because they may not have seen the benefits and we need to better understand why.

To Pat

Question: In the presentation you said one has to control the weed. How do we control the weeds?

Response: The short answer is, with difficulty. As I have mentioned, weed control is a problem. There are different ways of doing it and in the region we have tried different ways of doing it. We tried everything from using the control package of different herbicides to just doing it via manual weed control. There is a range of problems there. The cost associated with it, the knowledge embedded in using herbicides, which is very worrying. What can happen if farmers use the wrong herbicides? So there are a lot of questions there. But it is a possibility. For example, farmers in Malawi love the herbicides because it saves them lot of money. On the manual side, obviously it is more difficult and farmers doing CA can consume more hand labour.

So we do not have the answer, but we have got a range of different things and we need to look at that. I think the key factor here is to not let the weed set, so there is a need to control the weed throughout the year.

Additional input:

To compliment, I think weed control is a problem in farming, full stop. Not only for conservation Agriculture. And from that point of view, there are problems. But there are also solutions in CA. Actually the solutions in CA are more varied that in conventional agriculture. Pat mentioned that if we do not mix the seeds with the soil, and we do not let weeds set; we already do a lot for the long term weed management. And we have successful cases of farmers doing CA weed management without chemicals. In that case, I would eve contradict Pat, it is easier for small farmers, because they do their weed controlling by hand. And if they manage the weed correctly in CA, the labour goes down. It is more the larger farmers that without chemicals, have problems. But also there it is not completely impossible. There are solutions, but it is the quality and a long-term weed management and not short-term weed control approach.

Question: My question is in two parts. You talked about the benefit that takes place in conservation agriculture and part two you talked about the need for innovation systems and the champions. How do we actually get this situation in Africa to take place? And how do we sell the long-term benefits to the private sector, where you are asking them to take the risk and make a short-term investment for a long-term gain?

Response: There are some operations of CA where the benefits are immediate. If there is soil compaction and introduce ripping. The yield increase immediately and farmers can get the benefit right away. But the second element is why the whole farmer enterprise might take time to stabilize. There are some specific operations that are an outright business venture.

For example, there is herbicides application, which is done using different ways. Even the direct seeding using animal traction; hand tools or even tractor equipments. And these are obvious entry points. We have examples now in Kenya and Tanzania where we have hired tractor owner's provider services using the ripper. And they are making money out of it. But what is even more important is that they are making money but they are also extending the technology.

Another business example is the Crop insurance organisation in Kenya. Which is also enticing smallholder farmers to guarantee a return on the input if there is crop failure. Well it is not a big business but it is a very good incentive

Another input on champions

When you find champion, you have to nurture them and we have to be on the look out for these people. And I am sure there are many in this room who have got that drive and they are going to drive the system. There is no one recipe of what sort of institution it should be for driving it.

I think public sector research and extension agents, which include the international centers have a large role in this. For the instance, if we look at the example in South Asia, it was an international center of agronomist who saw the benefit of their idea. They got it moving with farmers and then went to the private sector as said look, here is an opportunity for you to get involved and make money. And that stimulated the private sector to get involved.

To Saidi

Question: Saidi talks about carbon benefit and maybe getting carbon payment using CA. The challenge there is that you are asking farmers to make an investment, a major change in the production system for the payment that might take place in the future. The biggest challenge there is how do you monitor it, and how do we ensure that compliance takes place?

Response:

To Lewis

Question: I observe a lot of focus on practicing farmers in terms of CA in our research and everything. But there is very little if any in terms of future farmers. For example; institutionalisation of CA in tertiary institutions, as those are the future farmers.

There is also lack of CA in agricultural programmes

Response: This is a gap that I have acknowledged in my presentation, that we need to address that. Once we have national education system, be it tertiary education, secondary or primary talking about CT, teaching CA, I think we would have made a big impact as far as scaling up is concerned.

Questions: You spoke about getting rid of compaction. Sometime the roots can get through the compacted soils.

Response: It appears that there are certain plants that will break out compaction better than others. It also appears that most will break the compacted layers. The question is what do you do in the interim period before you restructure the soil. Farmers in Paraguay will tell me that you just have to bite your teeth for three years, and after that the problem will sort itself out. But in those three years, if you do not do anything about it, even if you are planting root plants that will go through and punch that compacted layer, you might have reduced the productivity.

1.0 Rapporteurs' synthesis report- global and regional perspective

Chaired; Amy Sullivan: rapporteur: Florence Mtambanengwe and Herbert Mwanza

1. Major Areas of Progress/Successes in Last 5 years

- There are increasing trends worldwide in the adoption of Conservation Agriculture (CA) because this practice is being widely accepted as answer to meeting increasing food demands, mitigating land degradation, overcoming labour shortages, and reducing production costs.
- CA initiatives in Southern Africa indicate visible levels of adoption (600,000 farmers), but marred by inconsistent policies, and missing supportive infrastructure such as markets for inputs and produce.
- CA has attracted partnering of different players, including increasing private sector participation.
- Accommodating some flexibility in the promotion of the 3 CA principles.
- Evidence of increasing yields and land productivity, attractive gross margins.
- Participation of farmers/multi-agents in developing innovative techniques, with increasing use of different learning processes such as farmer field schools, innovator farmer approaches, and other farmer-to-farmer methodologies.
- The main message coming out of this session was that tillage was incompatible with modern agriculture. CA is universally applicable and location specific. While about 117 million ha were under CA worldwide, adoption rates in Africa were still considered low, with erosion, drought and cost of production being the main drivers of adoption.
- Amongst communities, CA has been the difference between harvest and no harvest. Productivity driven by agro ecological conditions, farmer management and experience.
- Entry points to CA practices include
 - Starting with what farmers have and can afford
 - Training and capacity building of target groups. Emphasis should tilt towards the potential benefits of CA to increase land productivity without too much emphasis on yield

2. Implications for Future CA

- CA in Southern Africa demands working out mechanisms that will make it work, recognizing that its principles are universally applicable but its practices location/site-specific.
- CA still has challenging matters of effective weed control, crop rotation, soil cover, coordination and networking. Farmers must drive the CA agenda in looking for technologies to overcome their problems.
- CA must diversify range of complementary practices, and explore ways to add value to cover crops and other legumes produce as part of building effective produce markets.

- CA must generate science-based evidence to support it, and avoid prescriptive approaches but gradually build up the principles/pillars of CA. It must strengthen/support innovative extension approaches; facilitate access to CA tools/equipment, analyse/improve relevant policies. Sharpen CA approaches and encourage better documentation.
- A redefinition of CA so that farmers see benefits of CA in the field, that mitigate the high levels of land degradation and poverty, and not CA for humanitarian reasons.
- Attract more public/private sectors participation, including major development catalysts and supported by longer-term investments in by governments and their supporting partners.
- Increase access to literature on CA to farmers, extension agents, and others.
- Need for formulation of an exit strategy, which does not include inputs. Could it be that reason for practicing CA is because of the inputs package?
- Need to promote farmer linkages to input- output markets
- Need to develop packages which cater for the crop- livestock integration
- Need to sensitive farmers and practitioners on the potential role of CA as part of a strategy to reduce climate risk

1 Biophysical, environmental and socioeconomic impacts of Conservation Agriculture

Chaired by Hamisi Mzoba

Rapporteurs: Christian Thierfelder and Wells Kumwenda

In this session there were four presentations, which looked at biophysical, environmental and social-economic impacts of Conservation Agriculture. The papers were presented as follows:

1. Conservation agriculture and Soil Health by Paramu Mafongoya
1. An analysis of the socio-economic impacts of Conservation Agriculture in southern Africa by Kizito Mazvimavi
2. Conservation Agriculture and Climate Change by Steve Twomlow
3. When and where is Conservation Agriculture an appropriate option for smallholder farmers in Southern Africa by Ken Giller

All the presentations were made one after another. At the end, the presenters were asked to sit in a panel where the participants asked some questions for clarity. Once that was done, the facilitator asked all the participants to further analyse –at their tables- the presentations in term of critical issues that were emerging in relation to scaling the benefit of CA. The outcomes are later presented in this document.

In addition to this, the rapporteurs for this session were also asked to make a synthesis of the session. What is captured in session are:

- The highlights of the four presentations, with more emphasis to conclusions and recommendations
- The issues emerging from the presentation- questions for clarity and
- The rapporteurs synthesis reports

1.0 Conservation Agriculture and Soil Health,

Presented by Paramu Mafongoya

This presentation focused on issues around:

- Development of Conservation Tillage (CT) Systems in Zimbabwe
- History of CT Research Programmes
- Effect of tillage systems on soil micro-fauna density/m²
- Effects of different residue amounts under CA on termite abundance/m²
- Soil Chemical Properties

Conclusions

- Tillage systems involving shifting cultivation and use a hand hoe to open up planting stations were commonly used in Zimbabwe during the pre-colonial period
- Promotion of the ox-drawn mould board plough was good for land preparation and weed control

- More than 90% of the farmers own a plough
- Minimum tillage techniques were de-popularised and regarded as backward technologies, which could only be practiced by the poor who could not own draught animals and could not afford a plough.
- Concept of minimum tillage disappeared from the smallholder sector
- It needs to be re-introduced
- Where soil fertility and yields are declining due to soil loss and run-off
- Targeting CA should be for the following:
- Farmers who are losing draft animals due to more frequent and severe droughts
- Draught animals which are much smaller than they were a few decades ago due to inbreeding and declining grazing
- Poor animal condition at the beginning of the season resulting in the late land preparation and planting
- In situations where soil fertility and yield are declining
- Research data from different agro-ecological zones show that:
- CA technologies effectively reduce soil loss and run-off
- Improve available soil water to support crop growth under dry condition especially on medium to heavy textured soils
- This is important during drought years and mid season drought years to provide a buffer against crop failure
- Technological and socio-economic constraints to CA adoption must be addressed
- Employ participatory approaches in technology development and dissemination
- With full participation of research, extension organisations, NGOs, farmers and donors

Future Research needs

- Need for properly designed and managed CA trials which measure soil chemical, physical and biological properties both on-farm and on-station over the long term
- This will lead to science-based CA crusade
- Determine the biophysical and socio-economic domains of various CA technologies
- Test the use of herbicides for weed control in CA systems
- Monitor diseases and pests in the long-term
- Test various equipment for CA based on the mould board plough
- Conduct knowledge, attitude and perception studies (KAP) on CA with farmers
- Adoption studies, policy and institutional support for CA

1.0 An analysis of the socio-economic impacts of Conservation Agriculture in southern Africa,

Presented by Kizito Mazvimavi

In his presentation Kizito looked at:

- Introduction
- Study Methodology
- CA Initiatives in Southern Africa
- CA Adoption Trends Among Smallholder Farmers
- Total labor requirements for alternative tillage options (Maize – 1ha)
- Farm Enterprise Budget Analysis for Conservation Agriculture (CA) and Conventional Draft (CD) Tillage practices
- Socio Economic Impacts of CA Practices
- Then Why CA Adoption is Variable Across Farmers?
- Key Issues to Deal with in CA Up Scaling
- Addressing Issues of Gender in CA practices
- Targeting farmers in CA promotion
- Dealing with Crop-Livestock Interactions
- Harmonized Approaches to CA Promotion

1.0 Conservation Agriculture and Climate Change in Southern Africa: A Smallholder Perspective

Presented by Steve Twomlow

Steve presented about:

- Impacts of climatic induced risk
“Adapting and managing our agriculture to cope with climate change”
- Can we manage current risks?
- Seasonal Variations in Rainfall
- Yield Gaps
- Observed yield gap in southern Zimbabwe, Matobo, 2004 (moderate drought year)
- Additive impacts of water and fertility management to combat declining crop yields
- Conservation Agriculture
- A four degree rise ‘would scupper African Farming’
- Adapting and managing our crops to grow in a warmer world
- Socio-economic and Biophysical Factors that Influence Adoption
- Knowledge Constraints
- Socio-economic and Biophysical Descriptions A Quick Look at 15 recent papers on SLM in Africa
- Rainfall Characterized by Convective Storms

Key Challenge

Scaling up and out from the Plot to the Landscape

- Investments Needed
- Need for good rural infrastructure

Research and Development Needs to Address Increasing Climatic Risk

- Systems/landscape work
- Disaggregate packages according to status of target farmers
- Market Development
- Enabling Environments – Policy and Legislation
 - Tax incentives
 - Reduction in tariffs
- Critical Mass of practitioners
- Machinery access – modification and manufacture
- Machinery hire schemes – planters, sprayers
- Are we providing the information policy makers need?

1.0 When and where is Conservation Agriculture an appropriate option for smallholder farmers in Southern Africa,

Presented by Ken Giller

- Conservation Agriculture is promoted as a panacea
- Univocal promotion by international organizations, NGOs (and churches!) is stifling debate
E.g..” the plough is the enemy of sustainability”

He presented two main arguments:

1. Scientific evidence to support the claims made for CA is unclear and inconsistent
1. CA does not ‘fit’ within the majority of smallholder farming systems in Africa

- Principles of conservation Agriculture
- How much mulch is needed to control erosion?
- Does CA lead to increased yields?
- Does CA lead to increased soil carbon?
- Does CA save labour?
- Evidence for adoption of CA in Madagascar
- Does CA ‘fit’?
- The underlying problem - poor soil fertility
- Potential solutions - Nitrogen fixing legumes
- Green manures on smallholder farms
- Resource flow mapping of smallholdings
- The ‘niche’ for legumes

- Likelihood of adoption by farmers?
- Does CA fit?

Conclusion:

- Scientific evidence to support the claims made for CA is unclear and inconsistent
- CA does not 'fit' within the majority of smallholder farming systems in Africa
- A more subtle and differentiated understanding of the socioeconomic environment, the farming systems, and aims of smallholder farmers is required

1.0 Issues emerging from the presentations- questions for clarity

At the end of the four presentations, the participants were given a chance to ask questions for clarity. These are some of the questions that were raised.

To Ken

Questions: In your presentation you said CA does not fit in smallholder farming system. I would agree that in many cases we do not know how to do it yet. I would like you to say if you think it will fit or not. I stressed the point that we have to get it adapted. So do you believe it will fit?

Response: I guess my answer is I want farmers to have an option of trying anything. Zero tillage, different types of CA system, basin system whichever; and making their informed choices. But if I were to put my hand on my heart and say where should we start, it will be first of all start by getting things functioning in terms of input and output markets, so that the farmers can get input and they can sell their crops. That is first priority. Secondly, will be the rotations. So basically the reason why farmers do not rotate is that there is no market for legumes, so why should they? So there is a need to get that right, and once that is done, we can start thinking about herbicides and bringing in no till; or playing around with those things. For me these will not be high on my priority list.

Comment: Saying that there is no scientific evidence on the relations between tillage and soil organic matter. That is just ignoring the vast amount of scientific papers on both sides, showing the decline of soil organic matter in consequence of tillage, and showing the rebuild of organic matter. The other effects which you mentioned about supply of organic matter in the system rotation. They all have an impact on top of the tillage impact. There is also scientific evidence of all that.

Response: My point is in the sandy soil there are no structural effect, no texture, and no micro aggregation. In the clay soil, you get structural effect, micro aggregate effect, which can help to build a little bit more soil carbon. But if you compare that to the effect of the amount of carbon added, it is very minor. That is what I said in the graph, and that I will argue till the cows come home.

Questions: The basin system seems so high laboured. I wonder if we really make correct comparisons. Because if a conventional tillage based system would also be on hand, this would mean that the farmer will have to hoe the entire area. And I think doing this by hand is much more labour than hoeing the planting basin. So I think comparing animal hand traction ploughing or animal traction ripping with making the basin by hand is not a fair comparison.

Response: In terms of the basins and the labour, I think the proper comparison should be returns to labour. In terms of the grains per hour invested. If we do that calculation with the same

data, they come out much more even and it is actually still in favour of conventional agriculture. When we respond to these question we have to take into account the context and the seasonality.

To Steve

Question- You differentiated between temperature and moisture, but I would suggest that much of the temperature stress is shown through moisture stress, because you are increasing moisture stress by increasing the temperature.

Response: Yes the moisture stress will come in if the temperatures are higher, and the plants grow faster. That is a given. They also can be the other way round, depending on the rainfall season. But if the plants grow faster in this climate, we may have an opportunity for cash crops to actually increase the residue. So it is not either or, and this is difficult to say.

Questions: How much tillage do we achieve by changing from animal powered to human powered tillage? The amount of basins that we have seen constitutes tillage. Do we know how much tillage that is? And the weeding that I have seen - even in the morning presentations- constitute tillage. How much tillage is that?

Response:

Question- Given the evolution over time, of what farmers are calling their practice, and the diversity. We have the liberty as scientists to choose which one to call conventional and which one to call farmer practice. Sometime simulating, so what is convention or farmer practice that you are referring to? If I take Steve slide, yours was fertilized versus unfertilized farmers field.

Response:

Question: The issue of CA and soil health. Looking at the microform, the micro fauna. Has anybody look at the macro form- the soil biology, because that is what determines the fertility. Also to know what effect the microorganisms have on herbicides.

Response If you look at the Western literature there are studies where you see that mulching increasing fungal population and visa vice the impact on nutrient cycling. But I am not aware until the people have done adaptive research in the region. I think it is something we need to look at, because the micro fauna is very important in the whole cycle.

Question: If you look at climate change, the biggest impact that we can do in Sub Saharan Africa is soil carbon. How do we get there?

To Kizito

Question: The slide that you have shown, where cattle were getting into someone's field to feed on Stover. Something that I have observed and you tend to ignore was the condition of those cattle. They looked terrible in need of that Stover. We tend to concentrate on Mulch. In Ken's presentation, he tries to bring out other factors that are happening outside the field. But in CA we tend to concentrate on the farm, as an isolated entity. I think in this symposium we should try to incorporate the whole farming system.

Response: I am glad that pictures have an impact. The emphasis here was on the communal bylaws and the movement of animals. But we also appreciate that there is higher demand for livestock to feed during that time of the year, which we should not ignore when we are

dealing with CA issues. Basically yes, we need to talk of CA within a system of crop/livestock, rather than in isolation.

1.0 Rapporteurs' synthesis report: Biosphere, Environment socio impact of CA

This synthesis report was prepared by the

Chair – Hamisi Mzoba, Rapporteurs Christian Thierdelder and Wells Kumwenda

1. CA does not work without mulch- CA support biological activity
1. There is need for better understanding of how CA works as we promote this technology and careful targeting of farmers is important
2. CA has the potential of a variety of positive impacts, i.e. high yields, climate change mitigation, gender and HIV/ AIDS affected participation but there is need of finding out why there is so little adoption and withdrawal by some farmers
3. There is need to adapt CA to the situation of farmers in each region or locality
4. CA will reduce the risk of crop production under the threat of climate change. These are more towards temperature changes than reduction in rainfall
5. Crop yield gaps are due to better management under CA (weed control, moisture retention etc) than under normal tillage production
6. There is need to investigate the controversy whether CA improves some soil quality indicators (i.e. carbon) and if farmers can access enough residues to make the system function properly
7. Need to look into the feasibility of labour intensive system (digging basins) etc
8. Need to encourage the crop/ livestock interaction system because of the potential synergies that exist

1 Conservation Agriculture, Agroforestry and Soil Fertility Management

Chaired by Collins Nkatiko:

Rapporteurs – Mugove Walter Nyika and Donald Zulu

In this session six presentations were presented as follows:

1. The effect of Previous Crop and Differential Nitrogen Application on Soil Nitrogen Mineralization and Availability to Wheat grown under a No-till System in the Swartland sub-region of the Western Cape by Johan Labuschagne
1. Soil Fertility Status of Fields under Conservation Agriculture in Selected Smallholder Areas with Contrasting Agro-ecological Conditions in Zimbabwe by Justice Nyamangara
2. The effects of reduced tillage on soil chemical and physical characteristics, and maize yields in Malawi by Thomas Chigowo
3. Prospects for Integrating Conservation Agriculture with Fertilizer Trees in Southern Africa by Festus Akinnifesi
4. Does *Faidherbia albida* improve the Fertility of Soils in Smallholder Conservation Agriculture Systems in Southern and Eastern Zambia? by Bridget Umar
5. Conservation Agriculture and Ecosystem Services-foundation for rural household economies in Southern Africa, by Khosi Ramachela
6. Climate Change mitigation benefits of Conservation Agriculture in Southern Africa by Isaiah Nyagumbo

All the presentations were made one after another. At the end, the presenters were asked to sit in a panel where the participants asked some questions for clarity. Once that was done, the facilitator asked all the participants to further analyse –at their tables- the presentations in term of critical issues that were emerging in relation to scaling the benefit of CA. The outcomes are later presented in this document.

In addition to this, the rapporteurs for this session were also asked to make a synthesis of the session. What is captured in session are:

- the highlights of the four presentations, with more emphasis to conclusions and recommendations
- the issues emerging from the presentation- questions for clarity and
- The rapporteurs synthesis reports

1.0 The effect of Previous Crop and Differential Nitrogen Application on Soil Nitrogen Mineralization and Availability to Wheat grown under a No-till System in the Swartland sub-region of the Western Cape

Presented by Johan Labuschagne

Introduction

- Current norms mainly based on info from wheat fallow and wheat monoculture under conventional tillage practices.
- Reduced tillage increases soil fertility

- Better planters ensure optimum placement of fertiliser during the planting process
- Improved cultivars
- Does reduced tillage influence N availability and absorption by the wheat crop and if so how?
- Component study on long-term systems trial

Materials & methods

RESULTS

- N mineralisation – McWMcW System (08-10)
- N mineralisation – WWCW System
- N mineralisation – WWWW System
- N mineralisation (Fallow)
- Nitrogen recovery (kg ha⁻¹)
- Agronomic efficiency (kg grain/kg N)
- Water use efficiency (kg grain/mm rain)

Conclusions

- Higher mineral N levels in the McWMcW system first 60 days
- Increased N absorption by wheat in McWMcW system
- McWMcW and WWCW systems more efficient in converting rainfall into grain production
- N requirements of WWWW system higher
- Place of canola in systems proved by increased N absorption and biomass production

1.0 Soil Fertility Status of Fields under Conservation Agriculture in Selected Smallholder Areas with Contrasting Agro ecological Conditions in Zimbabwe,

Presented by Justice Nyamangara

In his presentation Justice gave an overview of the background, research method, key results and conclusion.

The concluding remarks are:

- Some marginal build up in SOC in CA plots of CADT after 6-9 years across NRs.
- Resource-constrained farmers - infertile soils, no resources, limited options and experience – wrong targets for CA promotion.
- Need to continually monitor CA adopters beyond 9 years, and to include richer farmers.
- Many farmers not mulching and practicing balanced rotations (i.e. low intensity adopters).

1.0 The effects of reduced tillage on soil chemical and physical characteristics, and maize yields in Malawi,

Presented by Thomas Chigowo

The objective of this study was:

- To find the best tillage practice to suit the smallholder farmers in Malawi.

Results and Discussion

- Effect of tillage system on maize grain yield

- The differences in maize grain yields between the two tillage systems over a three-year period, were not statistically significant at the 5% level of prob. except at Chitedze during the initial year of 1997/98.
- The highest yields were recorded under the RT trts and where residues were removed.
- Seasonal variation, and in particular, inter-seasonal rainfall distribution greatly influenced maize grain yields at these sites.

N.B as part of the results and discussion, he also mentioned

- Effect of the seedbed preparation method on maize grain yield
- Effect of the crop residue mgt. techniques on maize grain yield
- The Effect of tillage systems on soil chemical characteristics
- The effect of tillage systems on soil physical characteristics

Recommendations

- It is still too early to notice the effects of the residues that have been left on the surface because of the long time that OM takes to build-up hence the need to continue with the study for some more years.
- The quality of residues used (maize Stover) does not favour immediate release of nutrients. This is the reason why the removal of crop residues in the RT treatments surpassed the other treatments during the three-year study period, hence the need to intercrop with high nitrogen content leguminous plants.
- It has been observed that termite attack on crop that has residues on the surface is mild, hence the need to carry out a scientific study to validate the claim.

CONCLUSION/LESSONS LEARNT

- Maize grain yields were influenced by both tillage practices and rainfall distribution pattern at all the study sites.
- Planting on the flat is better than planting on ridges, an observation that can cut down on the labour for ridging, provided soil and water losses are arrested.
- RT practices improved grain yield, soil fertility and the water holding capacity of the soil.
- CT does not only expose the accumulated OM to greater microbial activity, but also removes the source of annual accretions of the OM cycle in the soil, and for structure-forming activities of soil fauna.

1.0 Prospects for Integrating Conservation Agriculture with Fertilizer Trees in Southern Africa,

Presented by Festus Akinnifesi

Festus presented on issues around the:

- RATIONALE FOR CAWT and the Diamond-chain pathway of Fertilizer trees development in SA
- Short-term, medium and Long-term Fertilizer tree Options for replenishing Soil Fertility
- An Early Adopter of Fertilizer Trees Systems in southern Malawi
- Factors Affecting Adoption of CA/CAWTs

SUMMARY

1. Integrating Fertilizer Trees in CA on agricultural landscapes achieves the following:

1. Minimum soil disturbance.

- The roots of tree/shrub species and the soil fauna perform some tillage function in CAWT.
- Improved soil structure and water infiltration
- Maintenance of vegetative soil cover year-round

1. Permanent or semi-permanent soil cover.

- The trees provide dry season and/soil cover year-round; add more biomass, which functions as mulch, protecting the soil and, feeding soil biota and smothering weeds.
- Bolstering nutrient supply through N-fixation and nutrient cycling;
- Enhanced suppression of insect and weeds

1. Rotation:

- Improved production of food, fodder, fuel wood and income
- Intercropping with tree legume may reduce weeds, insect pests and diseases.
- Increase savings from inputs (e.g. fertilizer and herbicides)

1. Others:

- Enhanced carbon sequestration above and below-ground
- Greater quantities of soil organic matter in the surface
- More effective conservation of above and below ground biodiversity

1.0 Does *Faidherbia albida* improve the Fertility of Soils in Smallholder Conservation Agriculture Systems in Southern and Eastern Zambia?

Presented by Bridget Bwalya Umar

The study

- Soil samples collected from 102 mature *F. albida* trees in Southern and Eastern provinces of Zambia.
- Tested for: pH, N, K, P and OC at increasing radii from the tree (under and outside canopies)
- Assessments on presence of dung & tillage under the trees.

Results

- N, OC and K levels were 42%, 31% and 25% higher under the canopies than outside.
- Under full density (100 trees/ha), these additions equivalent to 39 kg N / ha (390kg D-Compound) and 203kg K/ha (2443 kg D-Compound)
- OC was 1.58% (under) and 1.21% (outside)
- CN Ratio: 11 (under) and 14 (outside).
- No differences in P and pH.
- No effect of dung & tillage.

Implications

- Substantial improvements in N, K, and OC.
 - Adequate supply of N and K under canopy
 - OC additions from leaf and pod litter help to address challenge of crop residue removal.
- Important for resource - poor farmers
- Encourage maintenance in areas with mature stands.
- Training of CA farmers on seedling establishment/maintenance.
- Incorporate into CA package.

1.0 Conservation Agriculture and Ecosystem Services-foundation for rural household economies in southern Africa,

Presented by Khosi Ramachela

- Ecosystem services IN SADC
- Ecosystem services categories
- Overview of conservation agriculture practises

- A crop of maize grown with Conservation Agriculture in KAZA
- Conservation agriculture as a recipient of ecosystems services
 - Water balance
 - Soil protection
 - Biodiversity - BIODIVERSITY: FAUNA & FLORA
 - Mitigation of greenhouse gases emissions
- Carbon sequestration
- Conservation Agriculture As A Supporter Of Ecosystems Services
- Conservation agriculture and co2 dynamics
 - 'Reduced tillage' farming practises help to retain more carbon in soil
 - Increased crop yields lowers the need to clear forest areas for subsequent crops
- Win-win balance between CA & ESS
- Food production potential in the SADC region

1.0 Climate Change mitigation benefits of Conservation Agriculture in Southern Africa,

Presented by Isaiah Nyagumbo

- Temperatures in Africa
- Precipitation patterns have changed
- Effect of climate change on various crops in Southern Africa
- So farmers need to adapt!
- Conservation Agriculture's role in climate change mitigation?
- CA reduces run-off, increases infiltration and groundwater recharge
- Available soil moisture in the first 60cm at Monze Farmer Training Centre, Zambia, 2005/2006

The Objective

- To assess the relative yield benefits of CA under varying rainfall and weather conditions in Southern Africa (Malawi, Mozambique, Zambia and Zimbabwe)

1.0 Issues emerging from the presentations- questions for clarity

At the end of the six presentations, the participants were given a chance to ask questions for clarity. These are some questions that were raised:

Question: Soil carbon sequestration is challenging. How do you monitor this?

Response: I agree with you that soil carbon sequestration measurement could be challenging, in terms of really quantifying that over time, because the plants will keep using that as well. But we are talking about CA we are talking about beyond carbon, and you can beat trees. So combining them you will actually deal with that problem.

Questions: Were you presenting on Climate change or climate variability? And also want to know which one has got more effect.

Response: You can understand that these are measurements done over the last five years based on 295 observations, and they tend to lean towards variability. In the event where rainfall reduces

in certain places, what is the benefit we are likely to get from CA. Will CA fare better under those conditions than under rainfall conditions? This is what we seek the answer. So whether you call it climate change or climate variability, it does not matter at this stage.

Comment- Climate change and maize yield. I want you to create an imagination. Where you are sitting now is the center of the country's maize triangle. Most of the maize is produced from East to West and to South, across the area that is extremely variable. The temperatures of Johannesburg and Pretoria differ in 2 degrees, but the average temperature change from East to West you will have climate change predicted by the IPCC for the next 50 years overnight. The farmers are able to plant the maize varieties that fit to these different climate conditions easily to accommodate these conditions.

Question- I am hearing again and again people trying to compare the conventional maize system with CA trying to show the yield benefit of the CA systems. In our experience in the US we have never sold this technology as a yield increase system. We talk about CA along the low energy benefit rather than the yield benefit.

Response: We are dealing with farmers who are looking for that short-term yield benefit and we need also to show that there is yield benefit. We know that there are many other offsite benefits. But the majority of farmers do not normally think of those.

Questions: Bridget, you described the fertility benefit of these trees, what was the rainfall like when the study was conducted?

Response: The response to rainfall will be different. But there is advantage of the three as they preserve soil moisture

Additional input: when you compare areas that have more rainfall to the low rainfall areas, the effect is higher in the higher rainfall areas. This suggests that rainfall does play a role. But if you compare the different distance under the same tree, therefore rainfall does not play a role.

1.0 Rapporteurs' synthesis reports: CA Agroforestry and soil fertility management

Chair: Collin Nkatiko Rapporteurs: Donald Zulu and Walter Mugove Nyika

Theme Synthesis

- Legume rotations are critical for increasing N in the soil and increasing water use for plants.
- Soil carbon build up takes time in depleted soils (6 – 9 years).
- There is need to diversify crop production (re-enforcing the first point).
- It's more beneficial to combine CA with fertilizer trees than any of the two alone.
- N, C and K are higher under Faidherbia canopies than outside.
- At 100 trees per hectare, you get full benefits from Faidherbia.
- There is mutual benefit between CA and Ecosystem services (ES).

- CA performs better (yield benefits) under water stress.
- It's important to broaden the benefits of CA as opposed to concentrating on yields.

1 Cropping Systems and Weed Management

Chaired by Paul Mapfumo:

Rapporteurs - Johan Labuschagne and Eunice Mangosho

In this session six presentations were presented as follows:

1. The effect of Previous Crop and Differential Nitrogen Application on Soil Nitrogen Mineralization and Availability to Wheat grown under a No-till System in the Swartland sub-region of the Western Cape by Johan Labuschagne
1. Soil Fertility Status of Fields under Conservation Agriculture in Selected Smallholder Areas with Contrasting Agro-ecological Conditions in Zimbabwe by Justice Nyamangara
2. The effects of reduced tillage on soil chemical and physical characteristics, and maize yields in Malawi by Thomas Chigowo
3. Prospects for Integrating Conservation Agriculture with Fertilizer Trees in Southern Africa by Festus Akinnifesi
4. Does *Faidherbia albida* improve the Fertility of Soils in Smallholder Conservation Agriculture Systems in Southern and Eastern Zambia? By Bridget Umar
5. Conservation Agriculture and Ecosystem Services-foundation for rural household economies in Southern Africa, by Khosi Ramachela
6. Climate Change mitigation benefits of Conservation Agriculture in Southern Africa by Isaiah Nyagumbo

All the presentations were made one after another. At the end, the presenters were asked to sit in a panel where the participants asked some questions for clarity. Once that was done, the facilitator asked all the participants to further analyse –at their tables- the presentations in term of critical issues that were emerging in relation to scaling the benefit of CA. The outcomes are later presented in this document.

In addition to this, the rapporteurs for this session were also asked to make a synthesis of the session. What is captured in session are:

- the highlights of the four presentations, with more emphasis to conclusions and recommendations
- the issues emerging from the presentation- questions for clarity and
- The rapporteurs synthesis reports

1.0 Benefits and challenges of crop rotations in maize-based Conservation Agriculture Cropping Systems of Southern Africa,

Presented by Christian Thierfelder

N.B refer to the full presentation

Christian's presentation focused on the following.

- Biophysical benefits of rotations
- Economic benefits of rotations and associations
- Challenges in promotion of rotations and associations

- Priorities for future interventions

Among other things, he highlighted on some in the promotion of rotation as well as some priorities for future CA promotion.

Why are farmers not adopting rotations?

Malawi:

- Over 70% of cropped land is dedicated to maize
- Farmer own less than 1 ha land on average
- Food security considerations more important than income generation

Possible solutions:

- Maize-pigeon pea intercropping
- Maize-cowpea intercropping

Zambia:

- Farmer own more land (optimal utilization)
- Farmers experiment with some cash crops in rotations (cowpea, cotton, groundnuts) but
- Markets are often not available to sell surplus
- Unavailability of seed (GMCCs)

Possible solutions:

- Concentration and increased productivity of maize
- Rotations and GMCCs on remaining land
- Development of functional markets

Priorities for future CA promotion

Farm level:

- Encourage rotations and associations wherever possible
- Promote growing important cash crops (i.e. groundnuts, cassava, tobacco, cotton etc.) under CA
- Develop technical bulletins for various rotational crops under CA
- Identify niches for different rotational crops in the farming systems

Policy level:

- Create an enabling environment for input and out markets to facilitate selling of produce
- Promote CA not as a “maize only system” but as a whole farming system
- Support research on rotations and associations for sustainable crop production

1.0 Productivity of Maize-Legume Intercropping under No-till in central Mozambique: Challenges and Opportunities,

Presented by Leonard Rusinamhodzi

From Leonard’s presentation, what is captured here, are the objectives of the research, some results as well as conclusion. (N.B. Refer to the full presentation for the details).

Research objectives

- To evaluate the productivity of maize-grain legume intercropping as an alternative to sole cropping in mixed crop-livestock systems
- To understand the circumstances that lead to the success of maize-legume intercropping under no-till, and to identify challenges and opportunities for improved impact

Results

Intercrop productivity

- The intercrops were more productive than the sole crop, in row intercrop was more productive than the distinct row strategy

Weeding requirement-

- On average, intercropping increased weeding time by 36%.

Rainfall infiltration

- Significant improvement in infiltration with duration of intercropping

Discussion

- Maize-legume intercropping addresses the constraints on short-term productivity
- Success of maize-pigeon pea intercropping systems is underpinned by strong extension support, strong market linkages and group selling of produce.
- The improvement in infiltration with duration of intercropping shows that intercropping is can be a substitute for mulch based cropping.
- Challenges include the late maturity of pigeon pea, which coincides with free roaming livestock, but farmers have responded by targeting homesteads.
- Intercropping increased weeding time by 36% compared to sole crops

Conclusions

- Maize-legume intercropping combined with reduced tillage reduces the risk of crop failure, improves productivity per unit area and ensures food security in vulnerable production systems.
- Maize-grain legume intercropping should be promoted as an alternative soil cover strategy in the sub-humid and semi-arid regions of southern Africa.

1.0 Cereal and legume yield responses to conservation agriculture under semi-arid conditions of southern Zimbabwe,

Presented by Walter Mupangwa

What are captured in this presentation are the research questions, as well as the conclusion. Walter focused on responding to the **questions**

- What are the short-term maize yield responses to CA systems under highly variable rainfall of southern Zimbabwe?
- What is the effect of rotating maize with cowpea and sorghum on maize productivity in CA systems under semi-arid conditions?

Conclusions

- Conventional and CA systems gave similar yields when water was not limiting
- Mulching increased yields in below average rainfall seasons – multiple seasons analysis still required to assess impact of rainfall variability on systems' performance
- Mulching at 2-4 tha-1 gave highest yields – economic analysis required to identify mulch level for highest economic returns

1.0 Assessing the Feasibility of Mulching in Mixed-Crop Livestock Systems of Zimbabwe,

Presented by Kizito Mazvimavi on behalf of Putso Nyathi

What are captured here are the objectives of the research,

Objectives

- Determine the current household crop residue allocation to crop production and livestock production
- Determine household crop residues uses

- Determine alternative sources of mulch material available for farmers
- Determine CA area mulched

Conclusion and Recommendations

- Majority of farmers are not mulching their fields
 - Mulching is constrained by low biomass productivity
 - Farmers are discouraged by termites problems
 - Crop residues normally used as livestock feed
- Embark on a large scale promotion of live mulch
- Finding alternative livestock feed like lablab

1.0 Weed Growth Under Hand-Hoe Based Conservation Agriculture In Smallholder Farmers' Fields In Zimbabwe,

Presented by Justice Nyamangara

Justice presentation looked at the

- Planting Dates
- Weeding frequency
- Effect of tillage on weed growth
- Agro-ecological effects on weed growth
- Effect of agro-ecology on dry matter yield

Concluding remarks

- Fields under CA associated with higher end-of-season weed growth.
- These weeds flower and replenish the soil seed bank.
- Weed growth highest in fields under CA for more seasons compared to just reverted to CA.
- Farmers cannot weed at rec. frequencies due to labour constraints.
- There is need to explore use of herbicides to control weeds in CA systems in SH areas.

1.0 Effects of Tillage System and Weed Management on Weed Emergence and Density in Smallholder Cotton Production Systems,

Presented by Zira Mavunganidze

Objective of the study

To evaluate the effects of tillage system and different weed management options, on

- Weed density
- Weed emergence
- Weed spectrum

Some key findings

- Tillage system, weeding option and year significantly ($P < 0.05$) affected weeds diversity (DMG)
- Weed emergence was erratic with a peak in Dec and Feb
 - Weed emergence was not only affected by rainfall, other factors play a major role
 - Weed species composition
 - Comprised of more annual (88%) than perennial (12%) weed species.
 - 25 species of weeds within 14 families were identified

Conclusion

- CA resulted in an increase in weed density
- Prometryn was effective in reducing weed density and diversity.
- Glyphosate would need a broad spectrum herbicide to reduce emerging weeds.
- The area comprises of a few perennial weeds
- There is need for more research on integrated weed management in CA.

1.0 Issues emerging from the presentations- Questions for clarity

After the set of presentations were made, the participants were given a chance to ask questions for clarity. These are some of the comments and questions that were raised, including the responses from the presenters.

Questions: To Leonard: what is the extent of no till practice in Mozambique?

Response: What we have seen is that when farmers practice maize-pea intercropping, there is not need for tillage in the next season. But at the national level I cannot say how much is no till in Mozambique

Question: The presence of termites in mulch

Response: The concern from farmers is that the more you residues there more you bring in the termites. They believe that the residue should be there and not be destroyed by the termites, from the social perspective

Questions: Is it not possible that people adopt a more aggressive positive system. The farmers in the rest of the world work towards the farm system not the farm system work towards them.

Response: If you go to the system and promote a technology without knowing that farmers need to adapt. When you introduce it you do not prepare them that they need to change their lifestyle. So when it comes up, to them is a shock, and especially when they feel that they are moving from a system where they were a bit more relaxed to a system where labour is more demanding and yet the short-term benefits are not yet evident. So I think it will be important to tell the farmers about the socio-economic changes that comes with CA at the beginning.

Comment: I am wondering about the reports on the weed studies, if the cost of the herbicide is like a third to maximum 50% of the tillage. So just give people the herbicides and save a lot of money, and we can save a lot of money on studies too.

Response: I have a question with regard to the increased labour and weed benefit. There are several studies that will prove the opposite. So I wonder if these studies do anything to change the weed management approach, and I also refer to the actual practice of weeding. What I have seen is that in many cases farmers were just told, you do CA and you weed six times, but they were not told that the type of weeding in CA is completely different.

Questions: Termite studies, is there any attempt to classify termites, because they might be many but may not affect maize?

Response: No we did not classify the termites in our study

Question- Is there a possibility to introducing GMO crops to deal with the weed control?

Response:

Question- have they come across striga – how is it being managed in the CA system?

Response: We have seen striga in Malawi but they were more prominent in conventional plots than in CA plots. If you introduce a rotation that controls the striga.

Comment: If farmers are subsistence, maybe they should not worry about the markets

1.0 Rapporteurs' report on cropping system and weed management

Chair: Paul Mapfumo: Rapporteurs Eunice Mangosho and Regis Chikowo

- In the market for green manure seed is available the green manure maize rotation are viable
- Promote maize not only as a CA system- rotation have been neglected in Southern Africa with 18% of farmers practicing rotations
- Intercrops in Mozambique re more productive (as there is no fertilizer use)- land equivalent ration (LER) > than 1
- Therefore, intercropping is a possible substitute for mulch-based approach
- If rainfall is more than 800mm, there will be possibilities for water logging in the basis
- When rainfall is not limiting, there is normally no separation between CA and conventional practices under similar management. E.g. same fertilizer application, weed control, planting time etc
- More than 60% of the farmers were not mulching at all as i) mulch attracts termites
ii) Mulch material is limited
- CA was associated with higher end of season weed growth
- Off season weeding not attractive to farmers as it disrupts social system e.g. farmers was to concentrate on garners, rest etc
- The weed striga was more pronounced in conventional plots in Malawi
- There is a need for an integrated weed management system to reduce weed pressure and timeliness operations

1 Scaling Up Conservation Agriculture: approaches and impacts

Chaired by Theodor Friedrich:

Rapporteurs - Thomas Chigowo and Inácio Nhancale

1.0 Up scaling Conservation Agriculture in Southern Africa: An analysis of driving and hindering factors from Malawi, Zambia and Zimbabwe,

Presented by Isaiah Nyagumbo

The objective of the study

To analyse factors driving and hindering the uptake of CA in Southern Africa based on experiences from Malawi, Zambia and Zimbabwe

Emerging Key drivers for CA up-scaling

- Improved yields
- Reduced labour requirements through herbicide and mechanized equipment use (Malawi, Zambia)
- Residues also contributed to reduced weeding (Malawi, Zimbabwe)
- Adoption of CA as government policy e.g. Zambia
- Absence of livestock (e.g. in most of Malawi's systems) ensured provision of soil cover
- The use of various CA options e.g. in Zambia
- Consistent donor funding ensures continuity (Zambia)
- Provision of loans to farmers (Malawi)

Emerging key hindering factors

- Competition of livestock for residues
- Weed control (especially manual systems)
- Inaccessibility of inputs (seed, fertilizer and chemicals)
- Free input provision as opposed to loan systems
- Poor access to markets for crops e.g. legumes limits rotations practised.
- Lack of appropriate equipment
- Poor policy incentives

Outlook

- A wide range of up-scaling factors have been identified in the study but need to be explored further to establish their relative importance to up-scaling.
- Multipronged approaches addressing identified factors are required to upscale CA in the various farming systems of Southern Africa
- Important scaling up lessons can be drawn from experiences of Malawi, Zambia and Zimbabwe as the region draws towards a regional CA scaling up strategy

1.0 Scaling up Conservation Agriculture: Experiences from Zambia,

Presented by Sina Luchen

*Background to Conservation Agriculture CA Scaling up
CA Scaling up
Some CA operational districts*

Scaling up approach

- The Farmer to farmer extension model which focuses on the Lead farmer, has been adopted and adapted by major on-going CA scaling up initiatives in the country.
- Focus of the interventions has been on training of extension staff and lead farmers, coupled with voucher based input support through local agro-dealers for demonstrations.
- CA scaling has been given impetus by the involvement of MACO's extension network implementation.

Lessons learnt

- Approach aids lesson harvesting, building of synergies, and sharing of learning experiences and avoiding duplication of efforts among the major CA stakeholders.
 - Evolution of some knowledge sharing platforms.
 - Adherence to CA practices has been observed to double yields and considerably increases returns.
 - Major challenges to CA scaling up include low awareness of the technology and its benefits, conflicting demands for crop residues, increased weed pressure and poor market access for rotation crops.
- "We together should aspire for greater heights, appreciating each other's efforts even when individual capacities are profoundly different."*

1.0 Qualitative Assessment of Conservation Agriculture in the Angonia Highlands of Mozambique –Perspectives from Smallholder Farmers,

Presented by Philip Grabowski

What are the constraints to spontaneous adoption?

Method

Two forms of manual CA

Results

- CA addresses a priority need – increased maize production
- Little sign of adoption beyond plots where inputs provided by NGOs
- Constraints - nutrient availability, labor requirements and profitability

CA requires fertility supplements

- Conventional tillage preferred where fertilizer is unavailable
- Several farmers dis-adopted when IRM stopped giving out fertilizer
- Compost is not as effective and is too labor-intensive for use at large scale
- Most farmers buy fertilizer for use on potatoes

Labor changes with CA

- CA moves less soil but does it save labor?
- Less time on physically demanding tasks but no statistical difference in hours/Ha
- Basins - land preparation takes longer
- Weed pressure is greater requiring either more labor or herbicide use

Profitability of CA maize

- Fertilizer and herbicide use only profitable when subsidized or when high yields are sold at a high maize price
- Basins and compost not profitable at large scale because of high labor requirements

Implications for smallholder CA

- CA is limited to small "insurance" plots where constraints are lowest and the opportunity cost of labor is lower
- There is a need to work with farmers on their non-CA plots as well to reduce erosion and increase production utilizing their given amounts of labor and capital.

1.0 Conservation Agriculture “a winners’ choice” – Catholic Relief Services’ experiences of a holistic approach in scaling up conservation agriculture rural Zimbabwe,

Presented by Urayayi Mutsindikwa

Background to and focus of the study

Geographical coverage

CA Holistic Model Introduced in 2004/05 by CRS

Methodology

Key Findings & Messages

Implications & Conclusions

- If adopted holistically CA has the potential to improve HH food security
- Approach resulted in strong collaboration with Gvt extension staff – no conflicting message dissemination
- LF model, farmer-to-farmer extension works; ideal for rapid adoption of research findings & new technologies (e.g. mechanised CA)
- Still some ‘grey’ areas; scope for both applied & farmer on-farm participatory research (e.g. around labour, markets, mechanization etc)

1.0 Scaling Up Conservation Agriculture Among Vulnerable Small-scale Farmers In Malawi,

Presented by Wells Kumwenda

Objectives

- Promote CA in order to improve food security and rebuild farmers livelihoods damaged by a prolonged drought of 2004/5 seasons.

Scaling Up Challenges

- Commanding approach
- Inadequate knowledge of frontline staff
- Limited availability and high cost of inputs
- Crop rotations not seriously followed
- Lack of equipment for ripping and planting
- Poor livestock management – in some areas
- Delayed clearing by new technology clearing committee – scientific body
- Need for ready markets for the increased produce from beneficiaries.
- Inadequate ground cover [15%].

Lessons learnt

- It is more efficient to work with groups than individual beneficiaries.
- The minimum size of the fields should be 0.4ha to enable farmer to produce for food and sale.
- Village group revolving fund very useful in getting farmer commitment and hedging them against donor absence
- Need to link beneficiaries to input suppliers so they can purchase directly.
- Beneficiaries with livestock use manure from their animals and cut down fertilizer requirement.
- Ca requires little labour- vulnerable groups can adopt it.
- Ca eliminates the need for child labour

Conclusions

- Need to adopt ca to increase crop yields
- Need to increase knowledge of frontline staff.
- Need to promote ca as a system including livestock, agro forestry and rotations.
- Need to document advantages of ca over a long period and share information [donors, policy makers and farmers].

1.0 Conservation Agriculture: Rejuvenating Farming Practices Basket For Resource-disadvantaged Farmers Of Zambia,

Presented by Herbert Mwanza

Study Objective

- To assess the uptake of CA practices among resource- disadvantaged farmers as a way of improving productivity and mitigating land degradation.

Results

Improved Farm Practice

- Use of oxen for farm operations was common
- Among the communities in the study area:
- Farmers used the Magoye ripper to:
 - Shatter the plough pan (common problem), and
 - Prepare land for planting, while the less advantaged dug PPBs.
- CA allowed spreading of field activities/ practices over time, with most land preparation-taking place in the dry season long before onset of rains.

Increased Benefits from CA

- Yields varied from place to place for a myriad of reasons, but on average CA gave better yields compared to conventional practices, of as much as 70% increase.
- Average sizes of land tilled per HH were higher under conventional farming systems than those under CA (ripping and PPBs), but 'for food security' at HH level; a consistent 0.25 ha was tilled under PPBs.

Conclusion

- Availability of better knowledge and skills in CA practices through targeted training, follow-ups and monitoring offers opportunities to enhance adoption of CA among small-scale farmers.
- A regular household approach supported by a farmer-based performance assessment system encourages beneficiaries to move from one level to the next with increasing confidence.
- Building of good CA farm records among farmers, disseminators and promoters is desirable to support various decision-making processes including up scaling and the economics of CA.
- Promotion of farmer-to-farmer approaches is encouraged, including establishing small trial plots at household level where it becomes possible to record, track and share lessons in CA practices.

1.0 Issues emerging from the presentations- questions for clarity

At the end of the series of presentation in this session, the participants were given a chance to ask questions for clarity. These are some of the issues that were raised:

Comments: I get nervous when people start to harvest grass in order to mulch their plots. What are the livestock going to eat? That will start to create social conflict where you can no longer promote CA. Please take care of that.

Response: From what is happening on the ground, we discovered that a larger percent of the farmers who are implementing mulching, 39 % are using crop residue, 15 % are using leaf litter and the others are harvesting grass. They tend to harvest this grass not from the common land, but from their own plots. We also do not believe it is the best way to go.

Comment: I think we need to analyse more in-depth the benefit of CA. When the community see you as an outsider, they have a tendency of being polite and tell you what they think you want to hear.

Response: I personally used to be a critic of CA, but like the Biblical Paul I had to convert to become a disciple of CA after seeing the benefits. So I think most farmers have appreciated the benefit of CA.

Question: With the information given about Malawi, I was rather surprised of the dismissal of the job planter and the animal drawn planters, which seemed to be not working correctly. I wonder what kind of training was given to the people who were going to operate these machines in the field. Because you then said the frontline extension officers need more knowledge, so I wonder where that knowledge is coming from if perhaps does not even exist.

Response: The knowledge of the frontline staff is still a problem; we need to give them more information. I know that right now they have information, but it is not perfect enough for them to promote CA. But that one comes through the government channels, NGOs and so on.

Response: Please get me right, what I am saying is that the equipment that we are having now require perfection. What I want is actually to perfect these things. We should remember that in some countries where we are distributing these things, farmers are planting and blade seed are not graded. There are different sides, and that presents a problem with job planters. But those are required if you want to scale up CA. As for the animal drawn planters, yes, but there is also another problem. As the economic crisis comes to the region, some of the factories are closing down, and we used to have factories in each country. But now we can only find the factories in Zambia, which presents a problem for the farmers to access the equipment.

Additional input: In terms of the non existing knowledge base, I tend to differ little bit. I believe the knowledge base is there and it is actually growing.

Questions: To Wells: Malawi had a lot of different subsidies for fertilizers. I do not know what is happen now, could you elaborate how that has linkages to the promotion of CA?

Response: Some of that also go to CA. It is not only the projects that are promoting CA in Malawi, there are also religious organisations and NGOs and also some organisations such as CYMMT and FAO. So, the benefits are combined from all these people, that is why we have an over production of maize in Malawi.

Additional input: If CA requires these fertility supplements, this means CA is an intensification process right? People will only be able to intensify large scale if they have an incentive to do that. When the markets are right and they can sell enough, and the inputs are cheaper. The one farmers in the community where I did my research, was able to adapt his own without an NGO support. He received no fertilizer subsidy. So I think if we are repackaging CA, we should be thinking about it, and not forgetting other parts of the plot, which is not under CA.

Question: The lead farmer concept: are we stroking our own egos by working with these lead farmers who are doing exactly what we need? In the process, we drive them so far from the

community where it becomes useless. Are we stroking our own egos or are they actually effective?

Response: What we understand from the lead farmer approach is that it is a way to scale up the technology more efficiently at the cheaper rate. In many of our countries, extension services are now very weak, and so getting farmers involved in extension delivery are useful.

Additional input: In Zambia we have more than one type of lead farmers. There are lead farmers that are actually elected by a local based group to represent them and to put forward their interest, and to get feedback from whichever authorities that are above them. But they are given facilitation skills and some technical skills to deal with certain things. These type of lead farmers are not paid anything by some institutions, but the farmers themselves in appreciation do give some incentives.

Questions: I noticed with the first three presentations, there were consistent donor funding, supply of fertilizers by NGOs, and then the introduction of CA to disaster management. So in terms of up scaling, do we not need maybe to repackage or reposition CA for it is apparent proposed benefits?

Response: In Zimbabwe we are trying to promote CA as a technology not as an input support programme.

Additional input: What we see in Zambia is that the consistent support from the Norwegians for CA seems to help to ensure that there is continuity. I think maybe different models should be adopted for different situations. I think when CA starts taking off, it will probably be after an investment of 3 to 4 years, but until then there is a need for support.

Another input: With the farmers that we are working with in Zambia, there were no hand out that were given. The farmers chose to participate on their own using their own resources.

Another input: We have to take note that these economies have donor support inherent in them, so it is not only the support for CA. It will be unfair to say donor funding should not support CA.

1.0 Rapporteurs' report: CA and its impact on Rural Livelihoods

Chair: Theodor: rapporteurs: Thomas Chigowo and Inacio Nhancale

Six papers were presented and discussed. All papers focused on experiences gathered in up-scaling CA practices. The following were some of the approaches discussed:

- Lead farmer approach
- Group approach
- CA stakeholder synergy approach
- Training frontline staff who will in turn train the community

The following are some of the ideas that need to be looked into so as to promote the up scaling of CA:

- There is need to promote CA as a system encompassing livestock, agro forestry and rotation.
- There is need to perfect CA equipment like the jab planters for use by farmers or eventually improve seed quality
- Frontline staff need to have adequate knowledge about CA
- Concerted efforts are required by all stakeholders to upscale CA: government, NGOs, research organizations, extension, church organizations etc.

- There is need to delink inorganic fertilizers from CA from a conceptual point of view.
- Use of cover crops should be emphasized as these may also be used as food to the community and may not be eaten by livestock.
- Farmers should be made to understand that even though donor support is limited to a CA plot, this is only meant to be a start for expansion.
- On farm demonstrations on CA have to be intensified from which farmers will be able to learn and adopt.
- There should be a common understanding among researchers, farmers and extension workers.
- CA support (incentives) to farmers shouldn't go beyond 3 years for fear of encouraging dependency syndrome. This is not the case for technical support.
- Free inputs must at all cost be avoided in order to empower farmers to own the CA practices.

1 Scaling Up Conservation Agriculture: socioeconomic impacts

Chaired by Enny Namalambo

Rapporteurs - Bridget Umar and Jens Anderson

In this session there were 6 presentations. The package of the full presentations was given to the participants. What is captured here are the highlights in terms of the objectives, some lesson learnt as well as the recommendations.

1. The Implementation of Conservation Agriculture in the Limpopo Province of South Africa: Approach and Technologies by *Hendrik Smith*
1. Prospects for Adoption of the Conservation Agriculture System by Semi-commercial Grain Farmers in South Africa by Alphonse du Toit
2. Productivity Impact of Conservation Farming on Smallholder Cotton Farmers in Zambia by Stephen Kabwe
3. Assessment of Labour Requirements in Conservation Agriculture in Zimbabwe by Patience Tshuma
4. Comparative analysis of conservation and conventional agriculture in Swaziland by Phinda Dlamini
5. Efficiency of Conservation Agriculture in South Africa: the case of No-Till Farming in KwaZulu-Natal by Thulasizwe Mkhabela

1.0 The Implementation of Conservation Agriculture in the Limpopo Province of South Africa: Approach and Technologies

Presented by Hendrik Smith

In his presentation, Hendrik highlighted the following:

- Theoretical Framework From Paradigms to Practice
- Action Research Process
- Conservation Agriculture: Field crops & vegetables
- Experiential learning
- Social learning
- Summary: Action research process

Conclusions and Recommendations

- Has achieved critical milestones in the first season, of which awareness, training, farmer-led experimentation and the introduction of equipment to a core group of beneficiaries are the most important.
- A high level of awareness and interest, and a reasonable level of knowledge and skills (short-term outcomes) on CA have been generated.
- Stakeholder platforms & networks have been formed which elevated the innovation capacity of communities
- The facilitation of a well-designed action research (and learning) process' has been instrumental.
- Constructing an enabling environment (and culture) in support of the farmers' self-empowerment process.

1.0 Prospects for Adoption of the Conservation Agriculture System by Semi-commercial Grain Farmers in South Africa

Presented by Alphonse du Toit

Goal of the project:

- To revitalise cropping systems through CA
- Appropriate technology development

Purpose of the investigation

- Opportunity for semi-commercial farmers to express themselves in terms of their own
 - Understanding
 - Opinions
 - Perceptions of CA

Outcomes

Advantages:

- **Farmers able to identify advantages**
- Chemical weed control emphasised
- The value of grain legumes acknowledged

Constraints identified:

- Farmers revealed their concerns about the shortcomings and their doubts about the potential of CA
- Poor access to equipment
- High cost of fencing
- Start up capital and the high cost of mechanization

An alternative option

- Farmers to convert their existing planters
- Managing a soil cover in the form of a mulch
- The risk of a decline in crop yields
 - Farmers cannot afford the risk of reduced crop yields

Recommendations

- Local on-farm demonstration trials a prerequisite
- Much more effort to involve the farmers
- Assist farmers to convert their existing planters
- Expose farmers to CA implements on the market
- A purposeful training programme – chemical weed control
- Create links to the industry and government support

Conclusions

- CA should be explored in a context based approach
- Appropriate technology the key to a significant change towards CA.
- Adoption to be slow – unless a strong attempt is made to support farmers

1.0 Productivity Impact of Conservation Farming on Smallholder Cotton Farmers in Zambia

Presented by Stephen Kabwe

- Motivation for the study
- Methods
- Results
- Conclusions

Objective

- To Evaluate impact of CF on asset-poor cotton farmers in Zambia
 - With and without oxen
 - With and without cash
 - With and without herbicides

Conclusions

- Hand hoe CF increases
 - Income by over 140%
 - Area cultivable by 50% (from 1.0 to 1.5 ha)
- Herbicides + CF increase
 - Income by over 300% (from \$203 to \$866)
 - Area cultivable by over 100% (from 1.1 to 2.7 ha)
- Herbicides
 - Single application most profitable
 - Cotton company financing lowers farmers' cash costs by two-thirds (129 to 69 US\$)
- Nonfarm labour opportunities govern dry season labour and hence agricultural technology choices
- Cotton and CF
 - Disciplined farmers
 - Cash poor, have incentives to trade management for purchased inputs
- Therefore CF can be a vehicle for incrementally raising productivity and income among resource-poor farm households in Africa

1.0 Assessment of Labour Requirements in Conservation Agriculture in Zimbabwe,

Presented by Patience Tshuma

Objectives of the study

- To compare the labour required per hectare of CA and Conventional Tillage (CT) plots by smallholder farmers.
- To determine which of these two technologies has higher labour returns
- To determine which components of CA are labour intensive
- To compare the time allocated towards CA operations by men and women

Conclusion & Recommendations

- NGO targeting of vulnerable households impact negatively on labor availability for CA practices
 - Need to explore mechanization options and use of herbicides (Might not be for most vulnerable)
- Some CA components (e.g. Winter weeding) and equipment (e.g. Chaka hoe) not appropriate for women farmers

- Need to Empower women to make a choice on farming practices
- Comparisons on labor demand tend to focus on the actual time invested in production
 - Need to assess the returns to labor invested

1.0 Comparative analysis of conservation and conventional agriculture in Swaziland,

Presented by Phinda Dlamini

The objectives were to:

- Compare conventional and conservation agricultural systems in terms of farming costs and yield.
- Evaluate the potential of conservation agriculture in improving food security.

Results and Discussion

- The first objective was achieved through comparatively analysing the two farming systems'
 - Land preparation costs,
 - Fertilizer costs along with the quantity required per hectare,
 - Weeding costs along with the labour hours a person spends in the field per hectare,
 - And average production per hectare of maize.
- The second objective was achieved through focusing at the maize yields between the farming systems
- Land preparation costs
 - Land preparation under CA is cheaper than under conventional agriculture.
- Weeding costs
 - CA seemed to have higher weeding costs than conventional agriculture in the graph, however the t-test shows that there is no significant difference, this can be attributed to that after a few years weeds prevalence drop in a CA field (ISTRO, 1997)
- Average maize production
- The two farming systems seemed not to be significantly different from each other in terms of yield and even the figure below do show that there are no much differences also the t-test below echoes that.

Conclusion and Recommendations

- Conclusion
 - From the results and farmer's comments it can be concluded that CA is better than conventional agriculture in terms of farming costs and yield since it had low farming costs and higher yield. This system has a potential to improve food security in the country since it also involves crop diversification, which then makes sure a farmer reduces the chance of loss due to a misfortune of one crop.
- Recommendations
 - It can be recommended that the farmers should adopt CA since it can improve food security while at the same time saving farming costs and conserving the soil

1.0 Efficiency of Conservation Agriculture in South Africa: the case of No-Till Farming in KwaZulu-Natal

Presented by Thulasizwe Mkhabela

Conclusions

- No-till efficiency is site-specific
- Soil type plays an important role
 - Sources of efficiency:
 - Reduced operations – machinery costs
 - Reduced labour requirements
 - Reduced costs (sometimes compensates for reduced yields)
 - Caveat:
 - Environmental issues need to be looked at

1.0 Issues emerging from the presentations: questions for clarity

At the end of all the presentations in this session, the participants were given a chance to ask questions for clarity. These are some of the things they raised.

To Phinda Dlamini

Question: I think some of the statements you have made about CA are very strong. You conclude that CA is better than conventional agriculture in addressing food security because it promotes diversification. Does it mean that the farmers in Swaziland came to know about diversification with the introduction of CA?

Response: I think the practice of CA is better because it comes as a package with the three principles. The farmers are not just doing what they like as it is with conventional agriculture.

Question: What is the type of land preparation?

Response: But as this was just a survey, I did not consider much this aspect.

To Hendrik

Question: You have shown us your innovation system approach and I am sure it is effective. Did you test this approach with counterfactual villages as well to see the effect? Have you thought of doing innovation networks or you are just doing that particular extension methodology?

Response: We did not have the capacity to test the approach in other villages. But we have tried it out over a decade in a mode of testing and doing action research and improving it over time. Where we are now, we think it is the best approach.

To Alpheus

Comment: You say your farmers are farming about 10 ha. Where I have done research farmers farming less than 100 ha said it was not necessary to have a tractor. I am amazed that your farmers have tractors.

Response: Yes the scale makes a difference in the form of mechanisation used. These farmers are business oriented and they also provide tractor services to the communities

To Patience

Question: How big were the basins?

Response: 15 x 15 x 15

Question: Why do you think the Chaka hoe is not spreading widely in Zimbabwe? The one that the farmers use in Zambia was actually manufactured in Zimbabwe

Response: Well, I did not even know that it was produced in Zimbabwe. I think we have to consider the fact that smallholder farmers are quiet rational people. They are obviously going to choose something that works for them. Chaka hoe is associated with higher labour requirement in its use. I assume that people would rather use the normal hoe, which does not require much labour input.

1.0 Rapporteurs' report: Scaling up CA – socio economic impacts

Chair – Enny Namalambo, Rapporteurs - Bridget Umar and Jens Andersson

Labour, mechanization and weeds

- Labour needs in CA are contentious; as the specific CA technology differs as well as the 'conventional practice' it is compared with.
- Labour productivity comparisons are problematic for the reasons above and the input support given for CA plots.
- Mechanization seems to be the only way forward to upscale the areas farmers can manage. This has implications for the targeting of CA technologies. Basin-based CA is essentially a food security enhancing practice for resource poor vulnerable households. The more endowed farmers (with ADP) are candidates for mechanized forms of CA.
- Weed pressure does not seem to be decreasing in CA. Use of herbicides should be explored further in terms of costs, types, and availability and packaging.

Scaling up

- For the scaling up of CA, there appears to be a tension in the strategies to be used. On the hand there are pleas for a move away from linear top-down prescriptions and teaching of the three CA principles as non-negotiable. On the other hand there are calls for more stringent teaching of the principles, training of extension frontline staff.
- There are contradictory views on input supported CA promotion. Some think CA should be promoted on its own merits, whereas others argue for a continued provision of inputs in order for farmers to learn and evaluate, and scale up.
- Preferences for extension and scaling up strategies are not specific to CA, but depend largely on people's experiences and preferences for T&V, lead farmer, Farmer-First, or innovation platform approaches, etc.
- There is a general opinion that there should be more involvement/investment in linking farmers to mechanization equipment producers and private sector services.

1 Conservation Agriculture Training An Education

Chaired by Gilbert Gaboutloeloe

Rapporteurs – Mphatso Gama and Gloria Musowa

In this session there were 6 presentations. The package of the full presentations was given to the participants. What is captured here are the highlights in terms of the objectives, some lesson learnt as well as the recommendations.

The papers were presented as follows:

1. Conservation Agriculture Training: Experiences from the CFU in Zambia by Collins Nkatiko
1. Lessons Learned: Preparing and Deploying Extension Materials to Mainstream CA Practice by Tonie Putter on behalf of Dirk Lange
2. An evaluation of Conservation Agriculture Training in southern Africa by Lewis Howe on behalf of James Breen
3. Integrated Land Use Design – A Mechanism To Entrench Conservation Agriculture In Small Scale Farming Communities Through Schools In Partnerships With Civil Society And Governmental Agencies In Southern Africa by Mugove Nyika
4. Mainstreaming Conservation in Agricultural Colleges in Zimbabwe: Successes, Challenges and the Future by Labyrinth Sibanda
5. Framing CA Education & Training in the Context of UNESCO Guidelines, Official Qualification Frameworks by Tonie Putter

3.4 Conservation Agriculture Training: Experiences from the CFU in Zambia

Presented by Collins Nkatiko

Collins' presentation was on the following:

- CAP Areas – 4 Administrative Regions
- Key Features of CFU Training Programmes
- CAP I -Regional Management Structure x 4
- 'Lead Farmer' Extension and Training Structure by CAP Region (Total 4 Regions – 164,000 beneficiaries)
- Lead Farmer Remuneration: Electronic Voucher System
- TYPES OF CF & CA PROMOTED IN ZAMBIA

Challenges

Own training

- Socio-cultural complications in Group farmer selection-relatives ,churches.
- Poor selection of lead farmers makes others shun trainings
- Training session disruption by festivities, camp meetings
- Farmer frustrations arising from delayed input distribution systems

Outside training

- No control of activities that follow after training: Unable to check progress of farmers.
- Institutional Ethics Transferred to farmers (Concern and ox CA,)
- Timing of trainings usually wrong
- Trained staff do not believe in CA and end up discouraging farmers and reference materials remain in offices
- Technology distortion leads to failure and discourages adoption
- Sometimes language barriers impedes farmer assessment

Way forward

- CFU contracts for training other agencies will include a clause for CFU to follow up the beneficiary farmers.
- CFU will cut out 'middlemen' and train farmers directly
- Relatively advanced farmers and MT providers will be trained by CFU staff/consultants.

1.0 Lessons Learned: Preparing and Deploying Extension Materials to Mainstream CA Practice

Presented by Tonie Putter on behalf of Dirk Lange

In his presentation Tonie explained their experience in the participatory poster development process on CA, with the local extension officers and the farmers. He highlighted the following:

The evolution of the poster

The poster development journey

- The benefit of CA with very simple English
- Translated version into the local language
- It is a participatory process that is flexible

How the poster looks like

- Poster as webpage
- Picture from database

People say they would like to cooperate, but they do not

1.0 An evaluation of Conservation Agriculture Training in southern Africa,

Presented by Lewis Hove on behalf of James Breen

This paper is based on:

- An evaluation of the regional project Up-Scaling Conservation Agriculture for Improved Food Security Using the CAADP Framework (UP) CA in Lesotho, Mozambique, Swaziland and Zimbabwe
- Author's experience in CA training in southern Africa since 2002.

Findings

- A number of institutions involved in CA training at national and regional level (FAO, ACT, CGIAR institutions, International and National NGOs, Ecoport, ARC in South Africa)
- Training materials available at national and regional level (manuals, books, pamphlets, flyers)
- Serious lack of confident and competent CA trainers in the region
- Some trainers are OVER-CONFIDENT of the efficacy of CA, not admitting the existence of problems, but these problems do exist and should be recognized and solved – on the farms concerned.
- Many senior staff of ministries of agriculture, mechanization services and livestock services are still openly sceptical of CA and this affects commitment of extension
- CA is still not on the curriculum of most education institutions (schools, colleges, universities) despite strong evidence of the good results being achieved by CA.
- This needs to be changed.

Implications of Findings

- Many more, well trained, confident and competent CA trainers needed and they should have a proper career structure.
- This will require long-term funding from both governments and donors.
- Ministries of Agriculture and Education need to include CA in curricula at schools, teacher training colleges and agriculture colleges
- Farmer training through farmer groups has been successful in several countries and should be promoted
 - Farmer Field Schools
 - Lead farmer
- Successful CA farmers should be identified and given incentives to demonstrate how, through the year, they implement CA on their own farms, with costs and returns made available to trainee farmers.
- Demonstration plots, training materials, M&E need improvement
- More and well-managed paired demonstration of CA v Conventional agriculture are needed which farmers can visit throughout the year to learn what they should be doing at that time.
- Facilitate private sector participation in CA training, especially on CA equipment and its use. CA cannot succeed without the active support of the private sector. The CA projects in Zambia have successfully co-opted the private sector through voucher schemes.
- More training on integrated weed management - chemical and mechanical weed control
 - the effects of liming on soil fertility needed.

1.0 Integrated Land Use Design – A Mechanism To Entrench Conservation Agriculture In Small Scale Farming Communities Through Schools In Partnerships With Civil Society And Governmental Agencies In Southern Africa

Presented by Mugove Nyika

The presentation by Mugove focused on the following

- Key problem
- Location of project
- Intervention methods

Results/Impact

- School and community linkages are strengthened
- Rain water is harvested, infiltration is increased, while surface run off and soil erosion is controlled
- Organic production of fruits, vegetables, tubers, spices and herbs is scaled up
- Access to shade, windbreaks, medicines, cool micro-climates, firewood, seeds and seedlings is increased
- Biodiversity of both plants and animals is increased
- Teaching and learning using locally available resources (TALULAR) is enhanced

Lessons Learned

- Wide genuine participation of stakeholders is difficult but is possible and productive
- The interest of the school head is critical for successful implementation
- Schools have much more potential than is normally assumed

- Whole school design dramatically increases production
- Personal benefits to participants are highly motivational
- Start small

Recommendations and conclusion

- NGOs and CBOs should use schools in the areas where they are working as an additional avenue to send messages on conservation to the target communities
- Training in Permaculture increases the capacity of NGOs and CBOs to tackle effectively issues of food and nutrition security, food sovereignty, livelihoods and climate change
- ILUD is a low input approach that can be replicated easily and increases chances of continued adoption at the end of the projects

1.0 Mainstreaming Conservation in Agricultural Colleges in Zimbabwe: Successes, Challenges and the Future

Presented by Labyrinth Sibanda

- Agricultural Colleges in Zimbabwe
- Agricultural Education and Training (AET) System
- Syllabus Reviews (to incorporate CA)
- The training module

Challenges in Implementing CA Training

- Staff development and exposure
- Equipment to widen CA options
- Standardized demo plot designs
- Complementary and practical rotations.
- Integrating livestock in CA
- Transforming commercial college farms to practice CA

The Future

- Setting out demo plots that save training and research
- Transforming college farms to be models for CA
- Monitoring the implementation CA training in colleges and its impact.

1.0 Framing CA Education & Training in the Context of UNESCO Guidelines, Official Qualification Frameworks

Presented by Tonie Putter

SADC regional Qualification framework- initial reflections on possibilities

The intension of the paper

- To carry forward the SADC Protocol on Education and Training, 1997
- 20 years to harmonize qualifications
- To plan a journey into poorly mapped terrain
- To explore the fundamental concepts and practice involved

- To grasp the seriousness of consequences and the responsibilities in setting up a common qualifications framework

The presentation touched issues on:

- View of technical committee on certification and accreditation
- Resolutions of the technical committee on certification and accreditation
- Transnational qualification framework for the Virtual University for small states of the commonwealth- a concept document
- Architecture of the TQF

1.0 Issues emerging from the presentations- questions for clarity

At the end of the 6 presentations, the presenters were asked to sit in a panel, and the participants raised questions for clarity. Some questions were directed to specific presenters, but some questions were general. What is presented here is the question as raised by the participants as well as the responses from the presenters.

Question: Where are the kids playing their soccer, if the entire ground is covered by plants?

Response: These schools do not just do anything without planning. Actually the planning process is two third thinking and one third action- They plan, they lay out the access routes, and where the sports field. In this case the sports field is surrounded by the shade of trees. Which is beneficial, as the sun does not burn the kids when they are watching soccer.

Question: Is the ripping done, and why once a year?

Response: The first is to break the soil, and the following two are for opening the way.

Question: The farmers that are trained, where do they get the initial input to start CA?

Response: they use the input they use in conventional agriculture and they convert that to CA

To Sibanda

Comment: Compliment for leading the way to integrate CA- how did you become aware for you to start that?

Response: CA was an area that is topical; the students raised a lot of questions about CA

- There was also a lot of training of trainers
- In order to bridge the gap between the need and the students
- Sometimes we are approached by NGOs to provide training on CA, for us to remain relevant we have to know how to do it

To Lewis

Question: What incentive to put to encourage farmer groups to come together to discuss CA without the extension support

Response: You build on what the farmers already have. And along the way, they see the benefit

- There is need for facilitation at the beginning, mainly from extension. If farmers get something useful from the meetings they get the motivation to come back again.

- The driving force is what they gain which is useful in helping solve their problems

Question: What do you do when you go to a ministry where the staff does not believe in CA- where do you start?

Response: There will be a need to raise awareness with, well targeted messages. You can force people to adopt, the when they become more aware of the benefits they will embrace it.

Question: At the university – do you see CA as a separate subject or can it be mainstreamed in existing course?

Response: I think to give the prominence it deserves, it might need to be taught as a separate subject.

Question: Did you try something else- in mainstreaming CA in the existing curriculum?

Response: The idea is to have an open source system, which will be owned by the people who input into it

Adding accreditation – that will be the transnational qualification authority for the SADC region

1.0 Rapporteurs' report: Scaling up – CA education and training

Chair: Gilbert Gaboutloeloe: Rapporteurs: Mphatso Gama and Gloria Musowa

- Governments in the region should endorse CA policy and get involvement in the actual training of farmers -Zambia
- Up scaling of CA farmers to 51000 On 12750 ha. Conservation Agriculture targeted at 125000 on 64860 ha by 2015.
- Well-based poster can be standardized for conservation Agriculture (CA) training in the region.
- Need for more funding for future training of trainers in the region.
- Private sector to participate in promotion of CA
- CA to be incorporated in informal school curriculum, Zimbabwe to be used as a starting point
- College farms to be used as models for CA
- Demo plot set up on CA to accommodate research and training
- Integrated land use design model to be used for promotion of CA in schools.
- Creation of virtual university academy model for dissemination and sharing information on CA.

1 Institutional Arrangement Policy and Market Innovations for Conservation Agriculture in Southern Africa

Chaired by Peter Lenhardt

Rapporteurs: Bruce Sosola and Medrina Mloza-Banda

In this session there were 5 presentations. The package of the full presentations was given to the participants. What is captured here are the highlights in terms of the objectives, some lesson learnt as well as the recommendations.

The papers were presented as follows:

1. Africa- wide Conservation Agriculture expansion: Institutions and Policies by Ousmane Djibo
1. Conservation Agriculture expansion in southern Africa: An analysis of the policy environment by Catherine Namome
2. Conservation Agriculture in Zimbabwe: Roles and Responsibilities for Stakeholders in the past, present and the future by Lungowe Marongwe
3. The Establishment of the National Conservation Agriculture Task Force (NCATF) and Provincial Conservation Agriculture Task Forces in South Africa by Henry Ndlovu
4. Creation of a South African National Federation of Conservation Agriculture – A Necessity for the Up-scaling of CA by Peter Hittersay

1.0 Africa-wide Conservation Agriculture expansion: Institutions and Policies

Presented by Rudo on behalf of Ousmane Djibo

Rudo of NEPAD made a presentation about what NEPAD is, especially in reference to the Comprehensive African Agricultural Development Program (CAADP). In her presentation she put emphasis of the CAADP implementation framework at national level, and the role of different actors in the process.

1.0 Conservation Agriculture expansion in southern Africa: An analysis of the policy environment

Presented by Catherine Namome

What is FANRPAN?

- Call by Ministers in 1994
- Created in 1997, and registered in 2002
- Focus:
 - Improving policy research, analysis and formulation on key SADC priority themes
 - Developing human and institutional capacity for coordinated policy dialogue among all stakeholders
 - Improving policy decision making by enhancing the generation, exchange and use of policy-related information
- Stakeholder categories:
 - Farmers, Government, Researchers, Private sector

- Members/National nodes in 13 southern African countries:
Angola, Botswana, Lesotho, Namibia, Madagascar, Malawi, Mauritius, Mozambique, Namibia, South Africa, Swaziland, Zambia, Zimbabwe.

The presentation also highlighted issue around:

- Overall challenges of agricultural policy development in southern Africa
- Challenges in up-scaling CA policies
- A New Institutional Arrangement for scaling up CA policies
 - Matrix of the current policy environment
 - A Node model – how does it work?
 - How to inform policy processes?

1.0 Conservation Agriculture in Zimbabwe: Roles and Responsibilities for Stakeholders in the past, present and the future

Presented by Lungowe Marongwe

The presentation looked at the following:

- Trends in CA Development in Zimbabwe

Major Findings and Key Lessons

- Interaction of key stakeholders at implementation level
 - CA programmes designed by NGOs and implemented as such (CA fields viewed as belonging to implementing NGOs)
 - Lack of ownership by farmers has reduced innovations as farmers feel they have to strictly comply or risk losing input support
 - Limited involvement at the decision-making levels within government institutions
 - CA activities viewed as “projects “ outside routine government programmes
 - Conflicting approaches by government and NGO field officers: lead farmer/master farmer
- Role of government in coordination and regulation
 - Absence of regulatory guidelines has resulted in inappropriate approaches being used (targeting of vulnerable) and conflicting and wrong information getting to the farmer and unsustainable approaches have been used
- Involvement of government research institutes- Absence of funding for research
- Limited Involvement by private sector
 - Focus on manual systems and low value crops over the past years has limited involvement of the private sector

Conclusion and Way Forward

- Harmonization of CA implementation: Government needs to play a more effective coordinating role
- Need for implementation guidelines and their effective monitoring
- International Institutions should continue to mobilize resources
- Availing of all CA options for all farming sectors and empower farmers with information to make choices. Targeting more resource-endowed farmers will separate CA technologies from inputs

- Use of existing government policy documents as entry points (national policy document, regional policy document –NEPAD CAADP Pillar 1 and 2, COMESA, International policies)

1.0 The Establishment of the National Conservation Agriculture Task Force (NCATF) and Provincial Conservation Agriculture Task Forces in South Africa

Presented by Masingita Chauke

Henry made his presentation along the following points:

- Introduction
- Milestone, challenges and current status
- LandCare Policy
- Green Economy Policy
- Expanded Public Works Programme (EPWP)

Conclusion

- SA is engaged in reducing the 70% level of land degradation to 55% and CA is seen as the solution to achieve this ministerial target while simultaneously creating green jobs.
- The country is devoted to CA and will ensure that various policies on mechanization, land reform and food security are in conformity to the principles of CA and encourage our fellow countries to do so.
- A GE is a knowledge economy because it requires ecological literacy of a kind and at levels that go well beyond the needs for conventional numeracy and literacy.
- Green practice will need and simultaneously generate green knowledge of which CA knowledge is a key element. Thus, NCATF's activities will support and nurture the emergence of a coherent Conservation Agriculture Knowledge Ecosystem (CAKE) that will drive and inform the rural green economy.

1.0 Creation of a South African National Federation of Conservation Agriculture – A Necessity for the Up-scaling of CA

Presented by Peter Hittersay

Peter's presentation touched the following issues:

- The challenges around slow adoption of CA in South Africa
- Informal CA groups
- Early no-till development
- No-till club of Kwazulu Natal (KZN)
- Summary of status of CA in South Africa
- European Conservation Agricultural Federation (ECAAF)
- CA alliance of Australia and New Zealand
- SA federation of CA
- Conclusion

1.0 Issues emerging from the presentations- Questions for clarity

At the end of these presentations, the participants were given a chance to ask questions for clarity with the presenters providing answers. These are the things that we raised:

Comment: There is a need for one CA club for farmers

Response: There is a club in KwaZulu-Natal. What I am proposing here is not replace them, but to form a national federation of conservation agriculture in South Africa, of which the club itself could either reconstitute itself and take over, or otherwise become a member of that federation. There is no other organ in South Africa

Additional input: We as government support that, but we might need to reconcile. What we are doing now is that as a government we have established a national CA task force. The objective is to work together with both emerging and commercial farmers to address the issues of CA. We want to establish the provincial structures of CA, and that can involve the local farmers with their local decision on CA.

Another input: What we saw in the Western Cape is that there is a definite need for a club or an organisation that is run at high speed.

Another input: I think the federation should be farmer owned, non- governmental and it will collaborate with the government.

To Catherine

Question: You said research need institutional arrangement. I wonder if you can clarify what it means, and you are using the word institution or organisation.

Response: In this instance, the institutions we are using are not the rules of the game as per the definition of what an institution is. But we are talking about the organisations in the form of nodes, to be the voice in expanding CA.

To Henry

Question: We are all aware that agriculture is at the crossroad. There is a big collaborative center about technology in Agriculture that was initiated in South Africa in 2002. The policy document was a result of that, and all the SADC countries have signed it except South Africa. This makes me wonder about South African policy consistency.

Response: I must clarify that I am not aware of that 2002 policy that is why we have established this in 2009. We came u with the terms of reference. But other than that, what we did was to embed CA in the land care policy. We did participate in the Harare meeting in 2002. However, with regard to the policy you are referring to, I will still have to check with my supervisors as well as the national chairperson of CA

Question: The government is slow and the farmers are quick. How are we going to mix this together?

Response: One of the issues is that we should never treat CA as a different entity. You must integrate it with other natural resource management programmes in the country. The reason why CA was quickly adopted in the whole South Africa after just one conference, it is because we integrated it within our land care program, which was already in operation for the last 14 years. What we need to do is to make sure that CA is integrated with the national resource management programmes of the province. In such a way, we will have the institutional arrangements. We can have CA stand-alone, but that will take time. We want to fast track the adoption and hope to have impact in the next five years. Watch South Africa then.

Question: There is someone from SACAU, what is the stance of the farmers union on CA and how do they view the things that were suggested in this meeting?

Response: SACAU stands for Southern African Confederation of farmers Union. We have as members the national farmers' unions in the SADC countries. From our recent consultation we had with our members, it is very clear that CA is an issue for us too. In fact it is one of the top issues that we want to work more on in the future. We would like to participate in the promotion of CA in the region, and also in the policy.

One of the expectations is to work more closely with the research institutions

Comment: I think the panel should consider that as farmers we are farmers. Every time that is spent on CA is at our cost. And if we do not have compensation for it, we are not going to do it. Not because we are not passionate about, but economically we are not going to afford it. We need to put together some system that will create incentives for us to participate.

1.0 Rapporteurs' report: Institutional arrangement, policy and markets innovation for CA in Southern Africa

Chair – Peter Lenhardt, Rapporteurs: Bruce Sosola and Medrina Mloza-Banda

Key issues

Expanding CA- advocate policy in CA

Challenges

- Dominance of government in policy process
 - Development of policy is appropriate when all stakeholders come on board
 - Bu there is a limited stakeholders
- There is a gap between policy and science- the problems in policy development
- Missing of farmers' voice
- CA technology cut across most of the sectors
- Conflicting information
- Model node- appreciate history and networks of change

To take CA to policy

- Stakeholder dialogue
- Research on institution arrangement
- Policies should be science based in order to succeed

Roles of stakeholders

- Limited interaction of key stakeholders at implementation level, decision making level in government institution
- Absence of funding for research (government research institutions)
- Harmonize CA implementation- government need to take the role

1 Conservation Agriculture and Market Linkages

Chaired by: Brian Sims

Rapporteurs: Kizito Mazvimavi and Stephen Kabwe

1.0 A Value Chain Approach to Conservation Agriculture,

Presented by Leslie Johnston

Aim of our study, supported by HGBF

Key question: How to ensure that conservation agriculture approaches with smallholder farmers are sustainable and impactful, well beyond the direct intervention of the program implementer”

Deliverables:

1. Assessment of lessons learned, with a particular focus on Zambia, Malawi, Honduras, Nicaragua, and Guatemala
1. Identification and prioritization of 1-2 value chains with significant smallholder production potential per target country which are complementary to a CA approach
2. Analysis to determine what activities along each value chain need to be put in place to link CA smallholder farmers to the market
3. Detailed assessment (and business case) for private sector-driven solutions to the challenges of having reasonably priced and appropriate CA implements.
4. Design of up to four pilot programs across these five target countries for implementing a market-driven, CA approach, with, if appropriate, a more detailed program design of at least two of these potential pilots.

Focus countries

- Zambia, Malawi, Honduras, Guatemala and Nicaragua

The value chain approach

- Overall challenges along the value chain
- Six elements of a systemic CA approach

1.0 Private-Public Partnerships in the Promotion of Conservation agriculture,

Presented by Michael Jenrich

In his presentation, Michael highlighted the following

Where are we?

- Subsistence based farming, low productivity, most land used for food crops
- Government/donor programs focus on seasonal inputs, without much impact on incomes and livelihoods
 - Short term
 - Without agronomy component
 - Persistent poor practices
 - Missing of cash crops and market support
 - Lack of capacity support

He further talked about the following:

- Problems facing the smallholder farming sector

- What should/could be done
- Limiting factors
- What CA can offer?
- The approach of this case
- What is done in this case?
- Complementing
- Crops and impact

Lessons

- Small holders can and will commercialize if supported appropriately
- Small holders can generate sufficient income from their farms
- Private sector can utilize the vast potential of small holder agriculture
- Farmers, private sector and economy benefit

1.0 Availing appropriate tools and equipment for conservation agriculture farmers

Presented by Clopas Rukuni

Background

- Chronic labour shortage in the smallholder farming sector has resulted in Low uptake of CA and Limited expansion of area under CA
- Work rates and labour requirements (see the table in the presentation)

Intervention

- To improve supply, distribution and access to CA tools and equipments

Methodology

Short-term strategy (Promotion phase)

Long-term strategy (expansion phase)

Conclusion

- FURTHER WORK TO DETERMINE PERFORMAMNCE OF EQUIPMENT UNDER DIFFERENT OWNERSHIP MODELLS IS REQUIRED
- STOCKTAKING OF REGIONAL CAPACITY MANUFACTURE EQUIPMENT IS REQUIRED
- INCENTIVES FOR LOCAL PRODUCTION

1.0 Issues emerging from the presentations: questions for clarity

After the three presentations were made, the participants were given a chance to ask questions for clarity. These are some of the issues that were raised:

Comment from Miti from COMESA:

You talked about Africa Wide. In the region we have a program for up-scaling CA. We have on- going processes in the member states that facilitate the development of markets and design some frameworks.

I believe that development of market is key in up-scaling CA. In the COMESA region, we have just set up an initiative that is promoting integration of smallholder with large-scale farmers in the regional markets. And also we are working with governments in addressing some of

the issues regarding intra-regional trade. The biggest challenge we are facing is that of maize trade.

To Leslie

Comments: there was a comment about the integration of Private sector. How it is done?

Response: Integration of private sector is very close to my heart, because this is the approach that my organisation takes. We found out that private sector is not only critical, but also necessary for sustainable interventions that move beyond interaction of government and NGOs. Regarding the integrating maize in the value chain; what we have observed in the 5 countries where we worked, the issue is not so much on how to do it. The biggest challenge is how to mitigate the political interference. On one hand you have the benefit from political interference through the provision of fertilizer subsidies. For example, in Malawi maize yield increase with 20 % in 5 years. This is largely due to that intervention. But on the other hand you have price distortion that makes it difficult for farmers to realize fully the extent of the surplus they have. The question is how to mitigate?

Question: Very interesting presentations this morning. My question is what is so special with CA? What is so peculiar with your story? For me it is absolutely important to get the value chain right. Why do we exclude other forms of agriculture?

Response: We have very little experience on CA and value chain approach But we have seen that what CA can do is to help the most vulnerable farmers be better able to migrate to being more food secure and more able to be better players in the value chain.

Additional input: CA is much more efficient for smallholder farmers. The cost in the future is smaller than in conventional farming.

To Clopus

Question: You gave us a very good structure of ownership models. My question is, do you have any practical example, which can give us in insight on where it has been implemented where private sectors played a facilitation role?

Response: When we look at the basin technology, which basically uses hoes. We are dealing with simple traditional hoe or a chaka hoe as tools to dig basins. In Zimbabwe at the moment, the chaka hoe is not being used, it is largely popular across the Zambezi, in Zambia. All farmers practicing basins today in Zimbabwe, are using the traditional hoe. There is very little maintenance required, and people just need a small capital to acquire it. And people can make the handle of their own choice in terms of length.

The jab planters are fairly sophisticated and the majority of them are being imported from Brazil and a little bit from China. And because of their complexity, they need special skills to use them. Very few farmers own those as individuals. What is happening is that the organisations that are promoting CA distribute these to farmers for use. The responsibility of maintenance is for the organisation.

The other model I spoke about of the direct seeder is a bit complex, and it is facilitated by the organisations promoting CA. We have local companies who have taken on board and they are also manufacturing. In terms of ownership, it is the organisations that to the large extent own the tool. They are responsible for maintenance, repair and also the promotion in terms of training because these tools are fairly complicated.

I do not have statistics of how many of these tools we have in the country, but I can confirm that we have them in clusters or in groups, in villages and are roughly within a radius of two

kilometres.. The success of these tools largely relies on the organisation that is promoting them.

Comments: There is a neglect of tools for weeding. I wonder if the institute for agricultural engineering has looked at tools like the Chaka hoe, which is well known in the United States. This is a tool that cut the weed under the surface and it makes weeding so fast.

Response: The issues of shallow weeding. Yes something has been done before, but people felt it was not in line with the principles of CA. We had equipment from America tested, and again for some unexplained reasons, local industries did not take that technology up for mass production. It boils down to the issue of investment. Who is going to invest, given the fact that we are dealing with resource poor farmers

1.0 Rapporteurs report: Conservation Agriculture and Market linkages

Chaired by: Brian Sims Rapporteurs: Kizito Mazvimavi and Stephen Kabwe

Synthesis of the key issues coming from the presentations

Conservation Farming (CA) cannot be looked only at production level, but it has to go beyond that level if scaling up the use of CA has to be sustainable. Farmers have to make income and invest on CA activities. One major success in that regard is the realization of these points and now stakeholders are discussing on how well, farmers could be linked up to the input and output markets. And the governments are also trying to harmonize agricultural policies to support CA utilization by smallholders. However, despite these successes, there is need to:

- Continue enhancing the linkage of conservation farming farmers to large and robust markets
- Improved weak organizational structures of smallholder, improved the poor infrastructure (e.g. roads) to ensure quick access to the markets.
- Encourage private sector participation through reducing the huge investment requirement which hamper private sector and smallholder partnership
- To stop considering conservation agriculture as a single model for all smallholders but a set of practices which need to be adapted locally to allow resource conservation in many areas
- To consider the social profile of CA farmers in terms of ability to purchase the inputs e.g. (draft power and other inputs)
- To enhance post harvest management in the value chain analysis of CA
- To involve commercial manufacturers of farm implements in the development of the CA agenda since the farm implement are part and parcel of CA

The implication of this realization is that it will result in increased CA development and up scaling in the use of CA in Southern Africa. This will enable farmers to improve their yields and income at farm level.

1 Some Critical challenges for CA promotion

3.5 Identification of critical challenges

After every round of presentations, the facilitator asked the participants to discuss at their tables and analyse the issues that were emerging as guided by the task in the box below.

Analysis of presentations

Looking at the presentations and your own experiences around these issues,

what are the critical challenges / what needs to change if we want to make a leap in scaling up the benefits of CA?

2 cards /issues max per table

The outcome of the table discussions were written on cards and presented in plenary. As the issues were presented, Jürgen clustered them according to similarities. This was an accumulative process in the sense that all the issues that emerged in all the sessions were consolidate. Eleven (11) big clusters emerged, and they were given the following headings.

1. How to reduce dependency of CA on donor support (stigma)
1. How to manage weed control and labour shortage
2. How to make policies conducive for large-scale CA
3. How to match the CA principles with local adaptation of practice
4. How to enhance access to input and output markets and financial services
5. What are the benefits and drivers for CA promotion
6. How to justify CA as a way to Carbon sequestration
7. How to design and implement research relevant to CA in practice
8. How to integrate CA into Education at different levels
9. How to integrate CA in the broader systems
10. How to scale up CA from pilot to large scale

What is presented below is the consolidation of the critical challenges including all the issues that were written on cards

How to reduce dependency of CA on donor support (stigma)

- Connotation/ link food assistance/ humanitarian initiatives (e.g. CA not business as usual) also short term nature of assistance
- CA linked to free inputs for farmers to benefits- is it sustainable?
- Promote loans versus grants
- No free input beyond 2-3 years of starting/ initiating a CA promotion program- loan alternative
- Uptake after donor support? – We need data in the future

- Even if donor support is limited to a small plot for CA- the farmers should understand that this is only the start for further expansion
- Sustainability versus donor support
- Challenges to CA adoption- cultural- success frowned upon
- Incentives system is wrong. CA should be promoted on its own merits
- Incentives based assistance
- Need to disconnect CA promotion from input support (it hampers farmer evaluation)
- Continuity of CA after ceasing of donor funding
- No exit strategy put in place in the absence of donor support
- Free inputs can remove risk of vulnerable farmers

How to manage weed control and labour shortage

- Weed control
- Focus on weed management strategy
- Research labour saving CA- especially weeding and importance of timing in achieving that
- Lack of adequate mulch to reduce weed emergence growth
- Timely weeding (other household have post harvest)
- Use of herbicides for weed control
- Challenge is effective weed control
- Lack of skills, knowledge and equipment for herbicide use
- Understanding the peak labour demand in relation to field activities (timing)
- Extension gap on herbicide use, benefit well documented in research
 - Mechanisation technology i.e. labour saving land care, cost saving, risk, maintenance
- We need new mechanical tools to reduce weeding time
- Mechanisation step- the plough open planting line
- Need to hear more about striga weed in CA considering rotations are not yet being practice effectively
- Need more emphasis on reducing weed pressures- cover crops rotation integrated into system
- Integrated weed management system needed
- Initiate local community based solution to protect CA field / plots
- Preservation of a mulch in Africa major problem where there is communal grazing
- Why weeding is a problem in Southern Africa

How to make policies conducive for large-scale CA

- Need for governments to increase funding for CA
- Policy support by governments
 - Small scale farmers
 - Rechanneling resources from conventional to CA

- Other catalysts
- Medium/ long term investment
- Need for government policies to support CA adoption
- Insufficient investment up front in developing the tailored solutions for farmers (take time, effort...)
- Long term and consistent support of CA – stop distribution of free inputs
- Lobbying- branding- marketing
- Government policies must support smallholders with infrastructure finance, extension
- Policies / legislation for better functioning input and output markets
- Enabling policy or public and private sector support for CA to farmers for inputs, equipments etc. Capacity and knowledge
- Lack of policy framework on CA
- Government accountability to
 - Knowledge dissemination among farmers i.e. economic analysis for all classes of farmers
- Government to take over long term funding to promote CA
- Policies for more investment in agriculture

How to match the CA principles with local adaptation of practice

- Local adaptation of CA technologies must include consideration of the methods already being used- why would a farmer want to dig holes when they have access to a livestock drawn plough
- Not adopting CA practices to local context (e.g. using residues where lots of livestock)- need to understand farmers' problem and developing solutions
- Attaining all principles in problematic and not realistic in some contexts- deal with the reality of context specific benefits
- Are the 3 principles a straight jacket?
- When do we say we are practicing CA- 3, 2 or 1 principle (s)
- CA system and principles work as a whole- integration of the 3 principles
- Scale up CA practices with 3 principles
- How do we make CA locally adapted and maintaining the principles
- Problem faces by smallholders greater than what CA can solve
- Need for more practical rotations! Most CA farmers do not use
- Why recommend PITS- labour cost? What not the CA cafeteria?

How to enhance access to input and output markets and financial services

- Access to equipment (and most imported) and need for supporting infrastructure to support (e.g. repair) and stigma of simple tools being seen as primitive
- Need to rebuild agro-dealer networks

- Strengthen input/ outputs markets
- Access to improved seeds (including GMO, which has regulatory repercussions)
- Access to equipment and machinery
- Credit and cash flow constraints need to be overcome
- Financial institutions awarding loans use credit approach criteria that are anti- CA- they need education
- Fix up input/ output markets
- Micro financing by farmers themselves- bank accounts, rules, endowment funds etc
- Dependency syndrome- options for loans? - Small farmers do not pay back

What are the benefits and drivers for CA promotion?

- Benefits have to do with profit not just yield
- When there is less rainfall CA is more superior than conventional tillage and reduce risk and food insecurity
- Smallholder farming must be profitable for investment in CA
- If farmers do not adopt a technology it demonstrates the potential benefit is irrelevant
- Net margin maximise return on the long term
- CA promote food security and cash income but this to be looked along the whole value chain analysis- production- transport- market
- Are we lost in the branding issue?
- Is current CA branding a Logjam?
- The problem of food security might be outside the realm of development and technology use
- Please note DFN of CA 5 out of 8
- Farmers evidence of CA benefits
- Smallholder farmers in southern Africa need yield increase immediately- ok with basins
- Lack of real evidence of yield increase (claims versus reality)- this is exacerbated by small plots of farmers
- Research should consider other benefits of CA rather than yield
- What benefit the farmers in the long term?
- Mismatch on benefit of CA we are largely medium-to-long term against what farmers want (short-term benefit effect)
- To eliminate/ reduce conflict
- Conduct a comprehensive review of CA research in the region
- Unsustainable methods are not an option if we want to improve productivity
- Currently CA is an option
- CA cannot make a 40% difference on yield. Spend money on real issues
- Promoters trying to sell short term benefits (largely fertilizer effect)

How to justify CA as a way to Carbon sequestration

- Difficult to measure Carbon sequestration in the short term (< 5years)
- More studies are required on carbon sequestration below and above ground for CC mitigation
- No robust mechanism for proper M & E (miscounting, duplication, multiple attribution etc)
- Too many speculative arguments on climate change mitigation. Presenters to separate mitigation and adaptation options- where does CA fit?
- Does CA low yield variability against climate change?
- More research has to be done on climate change on CA
- Which crops to grow sequentially in the field to absorb CO₂
- More work on crops adapted to drier areas in light of climate change

How to design and implement research relevant to CA in practice

- Research agenda to be determined by all stakeholders i.e. farmers, researchers, extensions etc
- From socio-economic environment to plot- level
- Don't criticise, but find out why
- Better understanding of conditions under which CT works- technology change, socio-economic and macro- economic issues
- Farmers involvement in research needs
- Research should not design trials to prove pre-conceived ideas
- There is a need for more research in CA since reports from research re contradicting e.g. number of years when benefits of CA can be realised
- Researchers must understand CA and practical farm work to make research relevant
- Research reported out of context: poorest farmers (defined the system)
- To see CA system as socially constructed
 - Test construct it as a team of scientist
- Research by farmers and on-farm deserve more recognition and support
- Need for qualitative research in CA

How to integrate CA into Education at different levels

- Research measures the present education shapes the future of CA lies in education
- Introduce CA into the curriculum of universities / colleges
- CA can be slotted into all the normal agronomy etc courses if it is recognized as a policy
- We support the open knowledge network system

- Coordinating CA body- education, communication, international and national links
- CARWG should be mandated to explore ways in which CA should be mainstreamed into formal education at national level
- You cannot cite Wikipedia as no peer review process
- Is SADC ready to implement policies –education
- Open knowledge bases are the future but need a lot of change in thinking
- Integration and harmonisation agricultural syllabus for consistence for the region
- CA to be offered as a subject up to BSC level
- Pursue all suggestions of the previous session- CA education and training
- Undo previous approach- education training
- Incorporate CA in education from primary level up (wit trained teachers)
- God quality training is important
- Collaboration and cooperation between CA invested parties to spread standards message and curriculum
- What about UNISA?
- Feasibility of using the internet to connecting issues mainstream CA education- countries recognising other countries qualification
- Serious school intervention
- CA should be integrated into other subjects (agronomy)
- CA training should be a component emphasized in broader sustainable agriculture programs
- Focus on curriculum

How to integrate CA in the broader systems

- Need to differentiate poor management practices with CA
- Crop-livestock interaction
- Need for adaptive research for biomass
- Need to cover all links of the value chain of CA (sustainable) system
- CA should be a science based as a whole system- How- integration of research, extension and social (research-farmer- extension)
- CA should be a holistic farming system approach
- Agro forestry to foster crop cover and animal feed
- Residue/ livestock modelling should be given emphasis
- Address the present challenge of farmers (i.e. market access constraints real more than climate change)
- Investing in participatory learning innovation system linking farmers extension, research and education
- Integration of CA with other farming systems (e.g. livestock)
- Get notable/ respected people to speak on benefit of CA

- How do we integrate CA into a watershed! - Extension needs landscape approaches
- CA can embrace other technologies like organic
- No scientific data on the trade offs of alternative input access and use with and without CA
- How to integrate CA with other root crops such as cassava, ground nuts etc)
- Going beyond productivity
 - Address crop/ livestock diversity
 - Innovation systems to benefit farmers
- Promote CA with the growing of more trees along the field boundaries- agro forestry windbreaks
- Rehabilitation of degraded lands before introducing CA
- Integrating trees in CA
- Financial viability of Faiderbia establishment - donor intervention?
- Challenge around long term frame when using alternative ways (i.e. trees) to increase fertility
- Extremely degraded lands require rehabilitation before meaningful results
- Timeline of operation
- Linking CA with organic fertilizers should be avoided (from conceptional point of view)
- Emphasize the use of cover crops in CA
- CA should embrace other practices
- CA provides a better use of inputs
- CA should be holistic beyond the crop
- Promote cheaper options for profitable cropping

How to scale up CA from pilot to large scale

<ul style="list-style-type: none"> • Lead farmers (champion) • Create CA hot spot or movers • Getting useful information to farmers • Let the farmers decide for themselves • Farmers organisations (small and large) around CA • Flexibility / in-rigidity is a big issue in up-scaling • Clarify scale issue- food security versus commercialisation • CA to be practical by levelling the playing field (resource- social- market) • Promote commercial services providers- 	<ul style="list-style-type: none"> • Challenge with information management • Empower farmers to take management decision by training in production economics, farming record keeping, book keeping, accounting etc • For scaling up we need groups of farmers (innovation networks) • Most farmers do not use the farm equipments correctly • Need to do training to ensure that equipments are used correctly • Need to know farmers' need and constraints and make technologies to solve them • Awareness on the benefits of CA to the farmers- Need to do more, not only once
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<p>local level e.g. herbicides sprayers</p> <ul style="list-style-type: none"> • Need a system wide comprehensive approach to commercializing CA among practitioners • Ask the farmers what they need to improve their lifestyle • Possibly increase income for household, enough knowledge and sustainability • Contact other groups who are practicing successfully on small areas, producing ample tonnage Amish • Investing in participatory learning innovation system lining farmers-extension - research and education • Need to put farmers at the center of deciding what works and what not, and how • Connecting scientific results with farmers decision- takes too long • Need to identify innovative and influential farmers who can champion scaling out • Better techniques of approaching farmers and changing their mind set on CA • Need to be convinced about the benefit of CA • Need to demonstrate evidence through farmers • Not involving farmers from inception to ensure scale up • Targeting of farmers can lead the up scale • Farmer to farmer extension • Serious extension interventions • Level of operations • Credibility (all of it relates back to extension) • No free input farming is a business even at small scale • Differentiate subsistence farming from small scale: the latter can be commercial • Smallholders do not have all the time in 	<ul style="list-style-type: none"> • Technical training to extension staff on CA equipment (especially animal drawn) • Focus on farmer based innovation and quality not rapid widespread • CA to be a practice for all interested farmers versus targeted to resource poor and the vulnerable • Scaling up requires innovation platforms • Establish a common understanding between research- farmers- extension about what factors makes a difference • Top down linear approaches not appropriate, instead farmer centred approaches are critical • Labour- mechanisation- what is available- can it be modified or supplied- can government intervention subsidise or loans • The language used still reflect a quite top down attitude- having solutions to be adopted • Inadequate knowledge of CA by the frontline staff • Conduct training to frontline staff on CA • Entry strategy should go with inputs to promote CA • Uptake is a process not a once event • Support Tonie's internet site for centralisation information so that farmers / interested parties can make informed and knowledgeable decision • Got to be a norm, to be monitored, so that the same information is given to people not differing advice that leads t mistrust and confusion of CA practice • How long do farmers need training and support? • Expansion and intensification of training of trainers to promote CA (Extensionist lead farmers) • More awareness campaigns on CA to all key stakeholders • Access to sufficient resources to cover higher cash cost / training (and how to incentivise private sector to invest • Viable CA investment linked to private sector • Create linkages between industry and government support (tools, implements, machinery, output) • Mindset of stakeholder (conventional)
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the world	
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1.0 Dealing With The Critical Issues Identified

After the critical challenges were identified, presented and clustered as shown in the previous session; the participants were engaged in a very intensive group work to work further on the identified issues. The participants were divided into seven groups, and each group was allocated one or two issues to work on. These were the issues that were discussed:

1. How to scale up CA from pilot to large scale
1. How to integrate CA into Education at different levels
2. How to enhance access to input and output markets and financial services
3. How to manage weed control and labour shortage
4. How to integrate CA in the broader systems
5. How to match the CA principles with local adaptation of practice
6. How to reduce dependency of CA on donor support (stigma)
7. How to make policies conducive for large-scale CA
8. What are the benefits and drivers for CA promotion
9. How to justify CA as a way to Carbon sequestration
10. How to design and implement research relevant to CA in practice

These discussions were guided by the task in the box below:

DEALING WITH THE CRITICAL ISSUES IDENTIFIED

Please try to understand and differentiate the contexts (large scale-smallholder etc where necessary!!!! Be pragmatic!

Please work on the cluster of issues you choose:

1. What are the real underlying strategic issues in this cluster for the way forward for scaling up of CA benefits?
1. What are the major areas of progress in this area / cluster? – what is new / different from 5 years ago? (in terms of thinking, practice, lessons, changes in the external environment?)
2. Where are we bogged down – what are the real bottlenecks in these underlying issues which we have not been able to solve so far?
3. Where do you want to go?- what exactly do you want to achieve in this area in the next 5 years?
4. What are promising strategies to deal with these underlying issues? (Draw from lessons, but also think of very unconventional / out of the CA domain experiences)
5. What are the three main actions to focus on for the way forward in the next 2-3 years? (prioritise)
6. What are the main knowledge gaps in this cluster - where you need expertise within and outside the CA community to help you 'break through' (also look at dissimilar experiences, completely different 'out of the box' ideas....)

BE SPECIFIC AND CONCRETE as much as possible!

Please choose a **facilitator** and visualize the discussions on flipcharts

Please nominate a **rapporteur** who writes a **2-3 page summary report** for the documentation.

Please present the outcomes of your group in the plenary in max 7 minutes (main points only)

After this intensive group discussions, the different groups presented -through their representatives- the outcomes of their group. These outcomes are captured in this next session.

1.0.0 How to scale up CA from pilots to large scale

What are the real underlying strategic issues?

- Innovators / hubs / hotspots /champions
- Integrated holistic strategy
- Include commercial & small scale
- Strategic & spatial land use planning
- Knowledge & information shortage
- Capacity on all levels
- Training education extension facilitation
- Networking / associations / farmer driven
- Awareness on all levels
- Co-ordination / communication
- Availability / Access to inputs & equipment

Major area of progress

- Regional and National CA networks & Co-ordination
- Governments are starting to buy in
- CoP updates on e-mail
- Knowledge base and experience improving
- Improved access to information
- Adoption among farmers
- Improved availability of equipment (small & large scale, but area specific)

Where are we bogged down?

- No holistic, Integrated implementation strategy
- Opportunistic adoption – lack of ownership amongst the farmers – donor syndrome
- Knowledge & soft skills inadequate - change agents & farmers
- Improper extension and learning methodology
 - Disintegrated
 - Top-down approaches
 - Linear vs integrated dissemination approaches
 - Driven by short term, project focused, time frames
- Equipment
- Lack of political buy-in

Where do you want to go?

- Integrated strategy in place in all countries in the region, at all levels
- Implementation of these strategies
- Supporting policies

What are promising strategies to deal with the underlying Issues?

- Knowledge & information sharing systems
- Innovator / stakeholder networks
- Awareness campaign
- Training & Education
- Co-ordination (driver) at all levels (Regional, National, Provincial, district)

What are the four main actions to focus on the way forward?

- FAO to create, fund & staff a dedicated CA office in the region within 12 months
- Create and co-ordinate national and sub-national CA for a / networks with delegated mandate to promote scale-up of CA
- Capacity building with awareness & lobbying campaign
- Information / knowledge sharing among stakeholders

What are the main knowledge gaps in this cluster?

- Result of a lack of standard CA curricula for different levels of qualifications.
- CA principles, practices, benefits and impacts
- Use of no-till equipment plus collective management
- CA (as a total package) by the policy makers
- Business development skills
- Financing
- Appropriate / non-linear extension methodologies integrating R&D
- Lack of ecosystem approach
- List of data base of CA stakeholders in region / country

1.0.0 How to integrate CA into Education at different levels

1. The Group recognizes the existence and value of both formal and informal education in CA. Informal education could benefit from accreditation. Formal education could benefit from adding CA perspectives and materials. Existing manuals could be used in the development of both formal and informal courses. However when this is done, systematically many more manuals and handbooks will be needed.
2. The creation of formal qualification frameworks and accreditation Schemes in the region provide major new opportunities for mainstreaming CA education.

3. The formal qualification frameworks do not have provision for CA. CA community is unaware of how best to establish relationships with the formal education sector. Consequently awareness building is required in both communities.
4. CA community should structure its information in standard curriculum format so that:
 - a) Informal training can be accredited
 - b) Formal accreditation qualification training in CA can become part of official qualification recognition framework
- 5 a) Review of existing courses, curricular and course materials to identify opportunities in order to design new CA qualifications and to add CA to existing qualifications.
- 5 b) Donors and Decision makers should recognize the opportunities inherent in establishing accredited qualification in CA.

- 6 a) Form working group to design a strategy to take the matter forward.
- 6 b) Existing materials should be enhanced in terms of both content and potential for accreditation.

7. To improve the immediate impact on CA-education and training, existing sources of information and education resources such as CA. ECOPORT. ORG deserve to be harnessed.

1.0.0 How to enhance access to input and output

Underlying strategic issues

- Chicken and egg issue
- Accessibility and packaging of inputs
- Finance availability

Areas of progress in the past 5 years

- Local manufacture*
- Placing of batch orders*
- Batch imports*
- Private sector participation
- Formation of farmer groups

* Facilitated by private sector and organization initiatives

Real bottlenecks

- Some equipment are non-existent
- Markets not visible
- Access to credit
- Risk aversion by the private sector
- There is no connection between the supplier and the consumer.
- Retailers are not interested or informed

- Unavailability of some inputs e.g. cowpeas seeds

Target for 5 years from now

- Viable, vibrant commercial market for inputs
- Developmental agents to ensure all farmers have access to input markets.
- Established credit facilities including , which should include animal power

Promising strategies

- Farmer group formation
- Training of local private sector CA providers
- Viable credit service to farmers
- Promoting micro-contractors (e.g. machinery hire services)

Three main actions in order of importance for the next 2-3 years

- Gather information about demand and supply
- Create access to and availability of inputs
- Form CA clubs

Main knowledge gaps in to achieve breakthrough

- Knowledge of demand timing
- Types of inputs (including implements) wanted
- Proper use
- Appropriateness
- sharing among farmers of applied knowledge

1.0.0 How to manage weed control and labour shortages

Underlying strategic issues

- Achieving effective weed control with less labour.
- Awareness of options, e.g. integrated weed management
- Recognise that weed control in CA requires different approach than CA
- Lack of integrated weed management approach few options available

Progress in the past 5 years

- Development of animal powered implements
- Improved awareness and availability of herbicides and equipment
- Improved participation of private sector in herbicides and implement markets

Real bottlenecks

- Poor weed control
- The high labour requirement and poor weed management options
- Costs of labour and herbicides

Target for 5 years from now

- Adoption of mechanization and animal power
- Increased use of available weed control alternatives
- Promotion of awareness of risks/ proper training of users
- Increased use of cover crops

Promising strategies

- Judicious start with herbicides followed by other strategies (knife rollers, mulch, cover crops, intercropping).
- Farmer-friendly packaging
- Contract spraying by competent providers
- Mechanized CA seeding

Three main actions in order of importance for the next 2-3 years

- Mechanised weed management options
- Introduce more weed management options
- Training (of farmers, extension, hire service providers)

Main knowledge gaps in to achieve breakthrough

- Weed management options applicable to small farmers
- Proper use of herbicide use
- Advantages of mechanisation alternatives

1.0.0 How to integrate CA into the broader systems?

3.5.1 How to match the CA principles with local adaptation of practices

N.B. these two issues were dealt with simultaneously.

What are the real key strategic issues?

Understanding the broader context will help identification of needs and the role that CA can play.

- Need for a farmer-centred approach

Huge diversity in farming systems in Africa – between countries, between regions within countries...

- Need to educate donors as to the complexities

What are the weaknesses in current production systems – approach should focus on removing the negative components?

1. Tillage
 1. Monoculture (leading to build-up of pests and weeds)
 2. Removal of organic matter

Need for (re)-design of new farming systems.

- Need community action: new arrangements for grazing and cattle management.
- Need much better understanding of what drives farmers' choices and management.

- Current markets and incentives not conducive to diversification and investment (Need a value-chain approach)
- Livestock – crop interactions:
 - Competition for Stover
 - Address fodder production
 - Set aside land permanently for fodder strips, fodder banks
 - Yields need to increase to address fodder needs
 - Livestock kept as insurance and for cultural value
- CA systems have to be economically viable (i.e. save on costs)
- Increasing total farm productivity

Legumes

- Improved varieties – seed availability

What progress has been made in the past five years?

- Now established that CA not a recipe
- Advances in CA equipment
 - Brazilian equipment imported and modified
 - Not producing locally as steel not available
- More farmers are experimenting with CA
- Much richer understanding of farms and farming systems – farm scale and village analyses rather than focus on single components or crops
- Identifying niches for technologies

Where are we bogged down?

- Is there too rigid an interpretation?
- Different interpretations of CA so we need a definition as point of reference
- Need appropriate approaches for the dry lands (keeping residues, livestock management)
- CA being (mis)-used as a marketing gimmick
- Farmers not “owning” the CA plots – so CA not moving outside the plots
- It’s all about KNOWLEDGE! Within context – need principles (move less soil) not recipes
- Weak extension systems – need to move to facilitation of farmer-to-farmer exchange

Where do you want to go in five years? Strategies/Actions

- Need thriving markets for legumes – context specific
 - Seed of good varieties available/targeted
 - Engage with private sector linking along the value chain
 - Processing/adding value (also for cereals) differentiated
- Retrain extension to enable farmer learning – (not us telling them what to do!)
 - To facilitate farmer-to-farmer learning

- Knowledge broker role
- Iterative adaption to constant change (training for transformation)
- Problem-solving
- Participatory learning
- Include livestock in the whole concept of CA
 - Community involvement in adapting /changing grazing patterns
 - Intensify livestock use – milk, meat fattening schemes etc
 - Integrate with traction for rippers etc
 - New tools for plough frames
- Better integrated ways to control weeds
 - Biological (cover, intercrops, heavy grazing etc)
 - Mechanical (Hula hoe, animal drawn)
 - Chemical (problem of herbicide resistance)
- Private sector involved in equipment development
 - Credit for purchasing
 - Competition from Brazil/China?
 - Need adapted implements and parts manufactured
 - Local parts made and assembled
 - Public/private partnerships

Knowledge gap

- How to get training at scale?
- Dibble sticks or basins?
 - Infiltration vs. evaporation
- Better targeting to and within systems at all levels – searching for niches

NEED MORE “SEARCHERS” AND FEWER “PLANNERS”

I\√.\ (Easterly not Sachs)

1 Next steps

In this session the facilitation took the participants through a process where some concrete next steps were discussed. He asked what would be the next steps following this meeting.

What	When	Who
Workshop documentation	20/02	Jürgen
Synthesis group- synthesis report	28/02	Lewis
Adapted work plan of thematic groups		CARWG
Technical proceedings	End of June	
Advisory notes for governments and RECs		CARWG and FANRPAN
Present messages to ministerial meeting of COMESA		COMESA Miti
Synthesized the African agenda to be presented in the 5 th congress		
The papers will be put in the Ecoport website and FAO website		

1 WORKSHOP CLOSING STATEMENTS

The workshop closure was done in two parts. First the facilitator asked the participants to evaluate the meeting. Second, there were a number of closing statements.

1.0 Some closing statements

On behalf of the facilitators

On behalf of the facilitators, *Jürgen* said: I have enjoyed this meeting. It was a bit of a stress because of the many presentations. Normally I prefer to have a lot of interaction where we go deeper, but I think we have managed pretty well. I would really like to thank the speakers, the chairs and the rapporteurs for the great job, because time management was very good. It could have gone out of hand completely, so thank you very much for really sticking to your time. Despite the dense agenda, we managed to bring out good issues.

Tomorrow the synthesis group will pull the things together while they are still fresh, and I hope that we will have a productive meeting using all the material that Hlami has captured, and we can use that directly. And we will come up with some orientating document which shows a bit the discussion where is going.

I also want to thank Hlami for working very hard, and I wish you all the best.

On behalf of the South African Government

Klaas spoke on behalf of the South African government. He said: I want to first applaud the facilitator. I think we need to give him a very big handclap. When we met with him on Monday, I had my own views, because I never thought we could have such a highly participative meeting. When I said we need interaction among participants, he said we do not have enough time, and I was worried. He is very much strict on time but he managed within the constraint of time to get us talking to one another. I think there is no one here who can tell me that he or she never talked to anyone or engage in the process within these three days. So I think that is a big plus for his team.

I want to acknowledge the contribution of other institutions like FAO, FARNPAN and others I think they have been working hard. But mostly to us, it has been a very useful process. I know staying for the whole day is not that easy, but because we wanted to achieve something, we withstood that pressure and I think something better will come out from this symposium.

But what came out clearly is that the regional working group and the national task force need to pull up their socks, because nothing will be achieved without hard work. Structures need to work, and implement decisions that came out of this meeting. We need to strengthen these structures. It was quite clear from the working group that we need to have strong coordination.

The issue of policies at national levels would not happen on its own. The task force should ensure that an enabling environment is created for us to move forward through farmers and even the politicians. We need farmers to push us so that we are accountable to the people we are serving.

With these few words, I will say, let us take the opportunity of the CAADP round tables and the investment framework so that CA is highly embedded in those high-level documentation and policy directives of the region. So that we do not remain on the sideline. We need to claim the space by forming partnerships and interacting with those high level actors.

I would like to thank everyone who made this symposium a success. I think we had a symposium and a workshop at the same time, and it was an achievement for CAWG.

On behalf of the country, we are very glad that you are here. You have spent your money, and that has saved a lot of jobs in the tourist industry. We would like to host. If you want another meeting next year, we will be happy to host. As a country we want to create 5 million jobs, and of you are here you are helping us to do so.

Thank you.

On behalf of CARWG

Martin – On behalf of CARWG- thanked the participants for their amazing participation. He further said: the last three days have been hard, and I was especially impressed that day two in the afternoon we were still here, we were not shopping. And at 9 o'clock in the night of day two, again a significant number of people were here in the room, working, discussing and talking things serious and being interested in CA. I have heard all the good ideas that came out from this group, and I have heard all the concerns were raised. I have heard what Klaas said that we have regional group and the national groups; we have to pull our socks up. We will try to do that.

It is a multi-stakeholder enterprise that promote CA, and we are the stakeholders. So go out and promote it.

Thank you and travel safely

On behalf of FARNPAN

Lindiwe- it has been a pleasure working, learning and networking with all of you. What I heard was, we need government to do this, we need private sector to be here and we need farmers to do that. But when we go away what are you going to do? As a networker, I think there is a lot that each one of you can do. Go home with that memory stick and share the content with your own network. People are hungry for knowledge out there, they are hungry for evidence, but we are the gatekeepers. So we can be the conduits for scaling up. So let us not look at other people, let us look at how many people have I educated with the wealth of information that I have learnt here.

For my network, we have learnt, we now know you all and you are all becoming members of the FARNPAN network. We are going to put you in our database, and whatever knowledge we get we are going to share with you.

Thank, safe travel and I am sure we are going to have another symposium via the newt.

On behalf of FAO

Cindy said: on behalf of FAO I just want to say a few things. First of all to reiterate what my colleagues have already said in their closing remarks. I also want to say, I am very impressed by the level of participation and engagement in the last two days. If you look back on the first day; we said we wanted to share information, we wanted to debate issues; we succeeded on this front. Given our tight schedule, the level of energy was amazing. Some of you were still here discussing up to 11 o'clock last night. Wherever I went there were heated discussions. We are thankful that we were able to do this amongst our colleagues. I think we have achieved what we set out to do.

I also want to acknowledge the presenters in preparing, and also reducing the time. You were under a lot of pressure, and again thanks for your cooperation in reducing the schedule. A special word of thanks to the people that prepared the posters. A lot of work went into these posters, and it is excellent information and analysis. We did not have adequate time to look at all these, we will make sure not to forget these and we are going to look for opportunities to see how we can share this information.

In terms of the technical review team that was engaged in reviewing the abstracts, of which there were more than 80 of them, as the symposium was oversubscribed. This took the review team a lot of time to go through each one of them. So I say thank you to the review team.

Also to Jurgen and Hlami, I think at the very beginning we were all apprehensive we all wanted a good facilitation. We were not an easy group, but I think Jurgen and his colleague has done a excellent job. Trying to balance all the presentations, the information and also creating space for discussion.

We should also acknowledge the process team, they had teleconference before, and every evening they met to make sure that we stay on track. Thank you for your contributions and for taking that extra time.

Another word of thanks goes to the synthesis team (8 people) , which will be pulling this together. I want to acknowledge that you will be putting more time.

For all of you, please when we send you the proceedings, take your time to read it because we want your input. We want to get it right, and it to be owned by all of us. And this is to thank you and a warning to you that you will get it and we would need your input. So we thank you in advance.

To the chairpersons and rapporteurs, and timekeepers, we could not have done it without you. And I think it added to the programme. It was amazing that we kept very good time. I know Jürgen was panicking and we all were. It was very tight and actually unrealistic schedule. But everybody came through and engaged. It is really commendable to all of you.

Not last, I would like to thank the Norwegian government for the funding that made it possible, and also OFDA and the German International Cooperation. We would not be here if that support was not there. I would also like to thank our co-organisers, FARNPAN, ACT, and NEPAD. It is important that we have this kind of partnership and cooperation at the regional level.

We have prepared a press release, and we did take radio interviews and TV interviews, and there is a press release that will be coming out. I think that is an important thing that we need to keep in mind. We need to create public awareness and try to use these events to raise awareness about Conservation Agriculture. So we will continue to do that and support it.

Last and not least, there are two ladies that have done a lot on logistics; that is Carla and Gladiola. They have been working very hard with the help of others. I would also like to thank Naume who has been handling the documentation, information and communication aspects of the symposium.

I also want to say a special thanks to Lewis. He has put many hours and sleepless nights in terms of preparation and organising this symposium.

To CARWG. The idea of this conference and sharing came from CARWG. We are trying to support them to come up with this event. I think it is a good form that we will continue to support. And when I say CARWG, I do not mean the regional, because CARWG is made of national task force people. So it is comprehensive representing all the national task forces. Actually they wanted to have one day meeting with the group of people afterwards, and we found that there was such a high subscribed of this even, so we did not have time for that meeting. But we will continue to support CARWG, and find ways of calling all the national task forces together, and see how we can take forward this important agenda that came out from this meeting.

Thanks to all for all your contributions. You have given us an orientation on where we are going with Conservation Agriculture. Have a safe trip, and I hope to see you all again

Thank you

1 Annex

3.6 Annex 1: Open space discussion on Use of animals in CA

Compiled by Peta

USE OF ANIMALS IN CA

- It appears that those who have suitable animals are *expected* not to use them, and to make planting basins instead. Mazvimavi, in his presentation, quoted a farmer: “I cannot be seen to be digging basins when I have cattle.” Adoption of CA is thus discouraged.
- Where African farmers *can* keep livestock, they need them for **food security**, although animals have many social roles as well. In some areas, such as those infested by tsetse fly, cattle may not be possible, but other animals are, including donkeys.
- Donkeys are even more efficient work animals than cattle are, because they –
 - incur lower lower costs, while being just as fast and strong;
 - have lower environmental impacts;
 - have many other uses, e.g. transport, especially without wheels, stock protection, etc.Yet, even where people use cattle for planting, they tend to ignore the donkeys they may already have.
- Upgrading from basins *is* expensive, if it means buying an implement *and* buying oxen. An intermediate step can be the cheaper one of using donkeys. (Donkey = $\sim 1/10$ price of an ox; $\sim 1/4$ price of a planter.)
- Another upscaling strategy would be a *two-row* animal-drawn planter, to reduce labour time and thus costs.
- At the other end of the scale, tractors are used. In the time it takes animals to do 25 ha with a two-row planter, a single axle tractor (i.e. the small one) can do 40 ha.
- Small, multi-purpose tractors are very versatile, but they are –
 - an economic proposition only for ≥ 20 ha;
 - physically demanding for field operations, even when they can be ridden;
 - very dangerous without proper training.
- Larger tractors are said not to be viable for farms ≤ 100 ha. They are labour-saving and prestigious, but repairs are expensive and slow and difficult in remote areas. So:
 - timing is a problem due to breakdowns (field work puts tractors under maximum stress, so breakdowns most frequent at crucial times);
 - cost $> \text{ZAR}900/\text{ha}$, and rising, even when used in CA.
- Livestock discouraged in CA on grounds that they remove too much ground cover, particularly the mulch, in CA fields. This seems to apply mostly to cattle, and is deemed to be difficult to prevent because –
 - fencing is too expensive;
 - it is often required by reciprocity arrangements;
 - the social domination of owners cannot be resisted.

But there are other options:

- intercropping with fodder plants;

- planting of 'living fences' around fields, which can also be fodder plants such as leucaena;
- creation of distant pastures (where land available; zero-grazing *not* recommended in the interests of animal welfare);
- supervision of animals, preferably on a community basis.
- Education at the school level may be the key to solving many of the problems of CA in general. It can address:
 - community solutions;
 - problems arising out of envy;
 - animal welfare;
 - the most beneficial management of animals;
 - an economic assessment of technologies.

Although not necessarily specifically targeting CA, in this way many curricula can assist in CA adoption

1.0 Annex 2: Open space discussion on weed control and chemicals in agriculture

Compiled by Peta

WEED CONTROL AND CHEMICALS IN AGRICULTURE

- The use of chemicals is the result of looking at symptoms rather than causes.
- Opting for a 'quick fix' only leads to further problems. Opting for one quick fix leads to another and thus a lifetime of firefighting.
- Scientists don not necessarily have a benign agenda: too often they are following the agenda of sponsors so as to arrive at particular results.
- Weed control can be accomplished naturally. Examples of crop plants which are also effective in weed control are:
 - Comfrey (has many uses and a market value);
 - Pumpkins (providing ground cover);
 - Pawpaws.

Other plants without a commercial value can be fodder for animals.

- Also, there are animals – down to the very small – that will target particular plants regarded as weeds.
- Effective use of animals can be found in the use of –
 - 'CHICKEN TRACTOR': a moveable poultry cage moved onto harvested areas to eliminate weeds, insect pests and fertilize the soil. Properly designed ones including easy-access laying boxes and sleeping perches.
 - 'PIG TRACTOR': essentially a system of small camps in rotation for pigs to fertilize and dig soils to ready them for planting.
- Nature's processes must be looked at and understood. Then they can be used, as in permaculture. 'Nature abhors a vacuum', so weed control consists of not allowing open spaces, and creating diversity. Diversity results in –
 - the effective control of pests and diseases;
 - the production of multiple crops;
 - more varied and thus more healthy diets.

- All this also requires education and changing mindsets, so best addressed at the school level.
- Diversification can also be encouraged by the existence of appropriate markets

1.0 Annex 3: List of participants

Regional Conservation Agriculture Symposium, Johannesburg, 8-10 February 2011 List of Participants

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