African Conservation Tillage Network

Final Report

CONSERVATION AGRICULTURE AND SORGHUM TRANSPLANTING TRAINING OF TRAINERS' WORKSHOP

VENUE: MAAN SOOR HOTEL, HARGEISA, SOMALILAND

2ND TO 7TH SEPTEMBER, 2012

BY

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African Conservation Tillage Network (ACT)

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ABBREVIATION

ACT African Conservation Tillage Network

AF Agroforestry

CA Conservation Agriculture

FAO Food and Agricultural Organization of United Nations

FFS Farmer Field School

GAP Good Agricultural Practices

IPM Integrated Pest Management

EXECUTIVE SUMMARY

The world population is forecasted to reach 9.2 billion by 2050 with the largest increase expected in developing countries. In order to meet the food needs for this population, production will have to increase by around 70% globally and 100% in the developing world. In order to achieve this increase in output and ensure sustainability, an unprecedented intensification and transformation of agricultural production is required which must also take into account challenges posed by pervasive poverty, higher energy and food prices, climate change, land and environmental degradation as well as increase water scarcity[1]. As a panacea to this multi-scale menace, Conservation Agriculture (CA) is progressively viewed as a promising alternative for coping with the need to increase food production on the basis of more sustainable and environmentally friendly farming practices.

Factually, CA specifically offers a window of opportunity to convert the degraded soils into productive soils and thereby improves crop yields, lower production costs and reduces land degradation. It embraces three principles of minimum soil disturbance, permanent soil cover and crop rotation/association. While some of the aspects of the principles are not new, it is the simultaneous application of all three principles that makes CA be viewed as a new farming technique. In spite of its successes in other continents including North and South America, its adoption in Africa where it is even needed more remains at all-time low. It is based on this reality that most governments, agencies and organizations have prioritized the adaptation and adoption of CA as one of the "Climate Smart" technologies.

It is based on this that FAO Somalia, having recognized and appreciated the potential of CA technology, engaged African Conservation Tillage Network (ACT) to conduct a First training of trainers course on CA for 18 extension staff from various organizations and ministry of Agriculture earmarked to coordinate and implement adaptive research trials on sorghum transplanting and conservation agriculture technologies. The training took place at Mansoor Hotel in Hargeisa from 2nd to 7th of September 2012. The participants included representatives from SWISSO KALMO, SOADO, COOPI, BVO, GOLLIS University, MADO, ADO and Ministry of

[1] ***Friedrich, T. and Kassam, A.H. (2009).*** *Adoption of Conservation Agriculture technologies: constraints and opportunities. Invited paper, 4th World Congress on Conservation Agriculture, 4–7 February, New Delhi: ICAR.*

Agriculture Somaliland. ACT was also expected to capture the training on video and still photos and present a video footing in addition to the training report

The African Conservation Tillage Network (ACT) is a not-for-profit Pan-Africa non-governmental organization with the mandate to promote Conservation Agriculture in Africa by enhancing access to CA knowledge, information, research, training, advocacy, lobbying and strengthening collaboration and partnerships.

The training went on as planned with participants reporting on time to the venue. The first part of the training involved introduction to the Adaptive Research experiences, Sorghum transplanting, Integrated Pest Management (IPM) and safe use of chemical pesticides on the first day. This was followed by field visits to Aburin research station for field practical on the second day.

The second part of the training dealing with Conservation Agriculture (CA) started on the third day and proceeded to the last day of the training. Mode of training employed ranged from plenary presentations and discussions, group discussions and field based practical demonstrations and tests.

The training went on as expected with every actor participating actively and collectively. There were no incidences that deterred the proceedings. Innovativeness and enthusiasm demonstrated during the training was really impressive. Notably, innovative modification of the Jab planter to accommodate planting of smaller seeds (sorghum, millet, etc) was witnessed and participants appreciated the input of Dr. Dario, (FAO) to this achievement.

At the end of the training participants were tested and the results were encouraging clearly depicting that all was well with training and its objectives were achieved. The average performance after the assessment was 79.6%. Besides, participants were able to evaluate the course by filling in the course evaluation forms rating various training components and on analysis gave an impressive rating of 4.33 out of 5. The participants were finally asked to take on the adaptive research immediately, develop the implementation strategies and responses to the research timings appropriately.

1.0 INTRODUCTION

1.1 Training objectives

- To enhance understanding of the principles of Conservation Agriculture (CA) as the new way of farming.
- To provide practical knowledge and skills in the application of CA practices for different socio-economic and agro-ecological environments to enable participants to respond competently to farmers' needs.
- To provide the participants with approaches and methodologies necessary to enhance documentation and wide scale adoption of profitable CA.
- To strengthen competency of the participants to facilitate learning of CA by CA support staff.

At the end of the training, participants were expected to have basic understanding of CA and to give input to the development of individual organization action plans aimed at facilitating effective implementation of the FAO designed adaptive research trials geared towards introducing CA technology and other climate change adaptive technology in the region of their operations and the country.

At the end of the course the participants were expected to be able:

- To explain and demonstrate the concept and principles of CA and applications of the same
- To guide farmers and other stake holders innovatively in analysing and determining solutions to problems in sustainable use of soil and water in farming
- To plan and lead farmer-based trials and demonstrations for development/adaptation of CA technologies in their regions of operation.
- To develop learning and facilitation materials as well as work plans for implementing the designed adaptive research experimental trials and identified field activities
- To be provided with relevant CA materials and Monitoring and Evaluation Tools

1.2 Participant's expectations

At the beginning of the training, participants expressed their expectations on the CA training as summarized below;

- Establish solid foundations of GAP/sorghum transplanting and IPM
- Have fruitful discussions and achieve a common plan on how to create capacity building on the subjects among the FFS
- Identify all together the most appropriate way to use/implement these techniques during the adaptive research experiences.
- learn the new techniques and methods especially CA and be able to establish how they can be implemented in Somalia
- Assess applicability of the new technology (CA) in their specific localities
- Increase knowledge on Conservation agriculture and general agriculture
- Learn modalities of transferring the knowledge and information gained to the farmers for better farming practices.
- Establish the effects of sustainable agriculture on the use of pesticides and chemical crops diseases control.
- Understand how CA works in improving soil and water conservation and how to apply the technologies in arid and semi-arid areas
- Understand how the technology reduce cost of production and establish whether the technology ensures better use of natural resources for farmers
- Distinguish between conventional agriculture and Conservation Agriculture
- Have competence and ability to disseminate the CA knowledge to farmers in order to foster the uptake of the technologies

1.3 Topics covered during the training

The first part of the training covered*; Introduction to the Adaptive Research experiences, Sorghum Transplanting, Integrated Pest Management (IPM) and safe use of pesticides*. These were done in the first day through plenary presentations and discussions, while field practicals on these subjects were accomplished the second day through demonstrations at Aburin research station.

The second part of the training concentrated on Conservation agriculture technology which involved various topics namely: *Conservation agriculture (CA) Vs Conventional farming; Concepts and principles of CA; Soil Health; CA equipment and CA equipment manufacturing and service provision; CA techniques in manual, animal traction and tractor based systems; Weeds, pests and diseases management and control in CA systems; Extension approaches in CA; Social economic aspects of CA; CA and climate change and CA and agroforestry; Monitoring and evaluation of CA programmes, data collection and information management; On farm training/ Field practical and finally action planning (planning for trials implementation.* The topics were covered through power point presentations, plenary and group discussions. There was also practicals on the operation and utility of CA equipment specifically weed wiper, jab planters and shallow weeders. A demonstration on the effects of CA (soil cover) on soil erosion was simulated and the results discussed.

Indeed, more emphasis is needed on CA equipment utility as well as attention to CA technology adoption to avoid impartial application of single principle which may end up not bringing expected results of the technology as proven when full system is adopted, this can be captured in any subsequent training intended to beef up the same or in different new dimension.

2.0 TRAINING PROCESS AND METHODOLOGY

The methodology of course delivery was mainly through power point presentations punctuated with plenary and group discussions and demonstration of CA implements made available by ACT. The resource persons delivering the various course packages had a wealth of practical/field experience which they freely shared with the participants. Hand outs were given in the consolidated form of the publication "*Conservation Agriculture: A manual for Farmers and Extension Officers"*, while all presentations and training materials were burnt to DVDs and distributed to participants.

PLATE 1: Illustration of various modes used during the training (courtesy of ACT Network)

3.0 SUMMARY OF TOPICS COVERED

3.1 PROCEEDINGS FOR DAY ONE

3.1.1 Introductory Remarks

The training sessions for day one were conducted by the FAO staff. The ACT team arrived on the evening of day one hence did not capture the proceedings. Dr Laura Cortada will report on this.

3.2 PROCEEDINGS FOR DAY TWO

Day two activities involved field day for sorghum transplanting in Aburin Research station and homemade pesticides demonstration. The day started with setting off from the Hotel to the research station where participants were taken through the process of sorghum transplanting techniques, they were exposed and had the chance to carry out by themselves nursery establishment, planting nurseries, nursery husbandry, reproductive field preparations, spacing in the field, removing and transporting the seedlings to the field, planting or transplanting in the reproductive field and husbandry of sorghum fields. Participants were also tasked to apply the knowledge gained on principles of integrated pests' management by identifying the status of pests' invasion on sorghum nurseries in the research station and attempt to establish whether it has reached economic thresholds and propose which appropriate measures could be taken.

PLATE 2: Sorghum transplanting practical session at Aburin Research station, activities like nursery bed preparation and management, reproductive field preparation and transplanting were demonstrated (Photo by ACT)

The second session of the day's activities was an overall recap of what was covered both in the first day and in the field through groups and plenary discussions, followed by the demonstration on the methodology of preparing homemade pesticides from the Neem plant seeds and procedural safety of handling pesticides and other chemicals with emphasis on the observation of safety measures to avoid health risks.

3.3 PROCEEDINGS FOR DAY THREE

3.3.1 Introductory Remarks

An introductory brief was facilitated by Mr. Peter Kuria, who welcomed the participants to the second part of the training on Conservation Agriculture. He requested the participants to do self-introduction stating their name, organization and expectations about this part of the training.

He then introduced the Course objectives, outputs and content and requested the participants to actively participate and interact adequately. He also hinted that CA is about innovativeness which participants must be prepared to demonstrate in any level of CA implementation. Peter ended his remarks by inviting Simon to take on the first topic to introduce CA technology.

3.3.2 What is and Why Conservation Agriculture?

This was facilitated by Dr. Simon Lugandu. It centred on the background, history and rationale of Conservation Agriculture. The emphasis was on understanding the accrual benefits derived from adoption and practice of CA to the farmer and the soil. Indeed several devastating ills of poor tillage systems were highlighted to underline the inevitable need for changing our farming systems and bring forth the damage caused to the environment due to application of conventional tillage practices. Besides, challenges in the adoption of conservation Agriculture was mentioned in a manner that chocked the minds of the participants in order to think of appropriate remedy to these predicaments of poor adoption and promotion of the system.

3.3.3 Conservation Agriculture: Concepts and Principles

This topic was facilitated by Dr. Simon Lugandu. Here the difference between conventional farming practices and CA was highlighted with emphasis on the predicaments of the former (CF) to the soil and environment. Participants were taken through benefits of CA relative to traditional tillage system. The concept of CA and the principles that underline it were discussed.

The presenter emphasised the three CA principles and stressed the relevance of each and how it related to the others. The tri-principles discussed were; minimum soil disturbance, permanent soil cover and crop rotation and associations. Various connotations of CA were highlighted to broaden the understanding of the participants and establish at what level of such semantics can be used to refer to CA. Current challenges experienced with the

implementation of the technology were shared with the participants, but they were urged to innovatively think about how to overcome the challenges as they start the trials.

3.3.4 Soil health and fertility

The session was presented by Mr. Peter Kuria. It touched on importance of understanding soil health and fertility, basic soil science, Soil degradation, healthy soil, soil fertility, soil cover, effects of CA on soil health, fertility and soil organic carbon. The session was concluded by stressing the significance of applying the three CA principles simultaneously and gradually to enhance soil health and fertility (soil quality). The practical demonstrations on the effects of CA-soil cover concept on water infiltration and soil erosion were accomplished later; this was meant to bring out clear understanding to the participants of the training

Plate 3: Presentation by Peter on Soil Health and Fertility (Photo by ACT).

3.3.5 Introduction to adaptive research experiences

This session was facilitated by Dr Dario Cipolla and Dr. Laura Cortada. They highlighted on Operational trials; the adaptive research activities, the implementation teams and targets; germination tests; the hypotheses and experimental objectives. The participants were also briefed on the experimental layouts, variables to be analyzed, data collection and recording and the calendar of activities.

3.4 PROCEEDINGS FOR DAY FOUR

3.4.1 Conservation Agriculture Tools and Equipment

This topic was facilitated by Mr. Peter Kuria. The presentation begun with revisiting conventional tillage equipment utilized at different level of crop production, their effects on production agents and effects of this system mechanization. Besides, it focused on the various CA equipments used for different operations in CA. He touched on the tools for land preparation, planting, weed management and other operations. He also elaborated on the hand/manual, animal drawn and tractor drawn equipment used in CA system. The topic was later concluded by practical on the use, handling and calibration of the manual CA tools in the practical session.

Plate 4: Peter displays the Jab planter to the participants during the session (photo by ACT).

3.4.2 Weed Management and control in Conservation Agriculture systems

This session was facilitated by Dr. Simon Lugandu. Under this topic several issues pertaining weed control and management. Definition and characteristics of weeds, importance of weed control and traditional methods employed were discussed. It also touched on approaches to weed control, integrated weed control methods in CA system and how CA reduces invasion of weeds in the crop land. Several equipment used at different scales for weed control under CA systems were touched including their operation and importance.

Plate 5: Dr. Simon presents the topic on weed management in CA (photo by ACT).

In this session, there was great concern on issues of herbicide usage to control weeds since they are chemicals and may be environmentally unfriendly, from FAO team. Besides, most of the evidence - photographs shown during presentation on use and operation herbicides application equipment had the people involved neglecting safety measures articulated in handling chemicals. The scenario reveals the importance required in articulating safety procedures when using herbicides as a means to manage weeds.

3.4.3 Field practical; CA techniques in Manual systems

This session was facilitated by Mr. Mutai Weldone. It focused on the practical use and operation of the manual tools availed by ACT, these included Jab planters (both metallic and wooden type), Micro wiper (weed wiper) and shallow weeders (Weed scrappers). Participants were taken through assembling, calibration and operation of the jab planters, operation of weed wiper and scrapers.

PLATE 6: Mr. Mohammed, trainee operates the Jab planter (photo by ACT)

There was a lot of excitement and anxiety to have a feel of the tools, hence everyone was given a chance to try the tools and familiarize themselves more.

During this session also, effects of soil cover on the water infiltration and control of soil erosion was practically

PLATE 7: Demonstrating the effects of Cover on the water infiltration, Water percolates deeper in cover soils (photo by ACT)

demonstrated. Soil trays and simulated rain drops on mulched soil and bare soils were used; this was majorly to show the effects of residence time due to soil cover. The practical was conducted by Mr. Peter Kuria.

3.5 PROCEEDINGS FOR DAY FIVE

3.5.1 Extension Approaches for Conservation Agriculture

This session was facilitated by Mr. Peter Kuria. It started with the plenary discussions on extension approaches participants were aware of and their effectiveness, several approaches were raised that included; FFS, contact farmers, study circles, Common interest groups, Training & visits and contract farming. Later each of the approaches was handled differently through plenary presentations.

FFS methodology was discussed, with focus on its core principles which included; FFS facilitation principle (not teaching), Hands-on learning (field is the class room), learning focuses on principles not the technology, season-long comparative experimentation, agro-eco system analysis (AESA) and team building or group dynamics. Major steps in FFS implementations and participatory M& E in FFS were also discussed.

PLATE 8: Mr. Peter Kuria facilitating the topic extension approaches. It also shows some of the participants' plenary suggestion on the topic (Photo by ACT)

Study circles as one of the extension approach was touched with emphasis on the understanding of the study circles, implementation steps and advantages of the method. It also captured the role of the facilitator in the study circle approach.

Contract farming was discussed, basically the approach implementation, definition and advantages to both the farmer and the buyer (contract parties).

3.5.2 Socio economic aspects of Conservation Agriculture

Under this section, facilitated by Dr. Simon Lugandu, issues on the profitability of CA in terms of increased productivity and improved food security was touched. The economic aspects of CA in regard to income generation and reduction in production costs were presented. The importance of doing the analysis to establish the influence of CA on the socio economic issues

was touched with focus on basic tools and concepts, features of partial budget, estimating gross benefits and estimating costs.

Indicative issues that promoted adoption of CA by small holder farmers, fundamentals of adoption, key determinants of CA adoption, peculiarity of CA, levels (category) of adoption, CA adoption and impact pathway and finally facilitating CA adoption were of main focus.

PLATE 9: Dr. Lugandu takes the trainees through socio-economic aspects of Conservation Agriculture and Climate change issues (Photo by ACT)

3.5.3 Conservation Agriculture and Climate change

This section also facilitated by Dr. Simon Lugandu, started off looking into the climate change phenomenon, the understanding of climate change, its effects on the natural resources of the world and ultimately food production and environmental services. These basically were meant to bring participants into the perspective.

This presentation also focused on the strategy adaptation to climate change and identified conservation agriculture as one of the appropriate adaptation measures that create resilience to this phenomenon in the agricultural sector. Participants were taken through all these primarily to boost their understanding on the subject matter. The section also highlighted how CA works in contributing to carbon sequestration and maintenance of nature.

3.5.4 Conservation Agriculture and Agroforestry

This section was a short preview of importance of integrating Agroforestry and conservation Agriculture. It was handled by Dr. Simon who took up the subject and focused on the understanding of agroforestry, the importance of some trees to improving soil fertility through nutrients fixation and biomass contribution, approach of integrating AF and CA and how this combination influence fodder production and fuel.

3.5.5 Monitoring and evaluation of Conservation Agriculture programmes

This topic was facilitated by Dr. Simon Lugandu. It focused on the understanding of participatory monitoring and evaluation and the rationale behind this technique. It also touches on the elements of managing the impact of the technology, Participatory M & E

matrix, characteristics or indicators to evaluate the performance of CA, methodology of doing monitoring and evaluation at farmer level and satisfaction assessment.

3.5.6 Action Planning

This illustration was facilitated by Dr. Simon Lugandu through plenary presentation and discussion. This session was meant to illustrate how to develop and decide on the way forward in implementing the dissemination of the knowledge acquired and setting up adaptive research trials. It concentrated on guidelines on how to devise an action plan to implement the trials and generally promotion of the technology illustrating step by step methodology towards developing action plan sheet and implementing strategy.

After this presentation, there was a recap session, plenary discussion facilitated by Dr. Dario (FAO), which focused on the adaptive research implementation guidelines and procedures. Participants were tasked to explain their understanding at every step of the research design and attributes involved. This was meant to remind the participants on the research trial designs, number of farmers required, number of Jibals per experiment, number of plants in each Jibal (area of 625m^2), timings of the research and number of nurseries required per Jibal among other research components.

3.6 PROCEEDINGS FOR DAY SIX

3.6.1 Way forward

This session was the last part of the programme. It was facilitated by Dr. Simon Lugandu and the FAO team, who requested the participants to team up according to their organizations, discuss as a group and develop action plan for the research activities they will implement in the new program. This was followed by plenary presentations by group representatives of their outputs. Each group was able to present how they will implement the first adaptive research activity step by step from mobilizing the farmers to setting up demonstrations and subsequent activities as they were designed.

Plate 10: Participants assemble the jab planters in readiness for the tasks ahead (photo by ACT)

Ultimately, Participants were requested to go and develop concrete action plans at the organizational level and share

them with FAO before they begin implementing the adaptive research trials.

3.6.2 Tests and quality assessments

As proof to ascertain the impact and gauge the understanding of the training, facilitators adopted the tests evaluation method. Participants were examined on various aspects covered during the training. There was quick marking of the tests and results realized. The tests results were impressive and clearly depicted that the training was well understood by the participants since the average percentage score was 79.6

Course evaluation forms to check the quality of the training was also issued to the participants to rate the training on various issues, this was then summarized and overly the rating was 4.33 which is substantial recommendable (Annex 1).

Comments from the participants about the training are summarized below;

- The training was appropriate and went on marvellously, facilitators conducted the training effectively.
- To beef up the knowledge acquired through the training, the participants felt that it is paramount to have training and substantial follow ups.
- Many participants appreciated the two organizations (FAO & ACTN) for their support and promised to disseminate the same information through the adaptive research experimental trials and beyond.

3.6.3 Closure and Diplomas' ceremony

The training was graced by FAO Somaliland representative Mr. Jama, who applauded the organizers of the event, the facilitators and the participants for their fruitful and active participation in the training. He encouraged the participants to deliver the message to their jurisdictions and implement the adaptive research well. He recognized the role played by ACT and FAO team in the training. Finally he presented the course certificates, CA manuals, T-shirts, conference bags and presentations DVDs to the participants ceremoniously. Participants were really impressed with this issuance of the diplomas and expressed their appreciation to the two organizations.

3.7 CONCLUSION

- The training went on as planned and all the planned topics and activities were achieved and adequately covered.
- The target number of participants made to the training with quorum being 100%.
- Participants were very enthusiastic about the subject and noted that more sensitization and follow-up trainings and support needs to be done to ensure successful implementation of the developed adaptive research trials.

❖ **Emerging issues**

Certain critical issues that arose during the training which needs further attention are summarised below;

- Chemicals applications (Herbicides) – This was felt to be injurious to the soil and is a new experience for the area and hence should be tackled with care. All the same the participants were reminded that chemical weed control was only one of the weed control methods and can be used only when none of the other methods can work. At the same time the application of herbicides should be done using the right protective clothing and only after understanding the mode of action of the herbicide.
- Conservation agriculture – livestock integration – this was felt to be a major issue as most farmers were pastoralists. One proposition was to use the non-edible cover crops especially to remain covering the soil off season.
- Policies and institutional arrangements need to be streamlined to ensure that the technology can be smoothly adopted and all extension agents well sensitized.
- Weeds management – e.g. vegetative - it was felt that vegetative weeds are relatively difficult to control and more information need to be provided to address the vegetative propagating weeds.
- Birds especially on sorghum are a menace and participants felt that more solutions need to be sought.

ANNEX 1: COURSE EVALUATION RESULTS

Participants	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	AVERAGE[1]	
A.- Course logistics																				%
Transport from your district/institution to the training venues	4	1	5	5	5	5	5	1	4	1	5	2	two rates	4	5	4	5	1	3.65	73
Accommodation arrangements	4	4	5	5	4	5	2	5	3	5	3	NR	two rates	3	NR	NR	4	NR	4.00	80
Entertainment during the training period	1	4	2	4	3	2	4	5	2	5	2	5	4	2	5	5	2	2	3.28	65.6
TOTAL AVERAGE																			**3.64**	**72.8**
B.- Course facilities																				
Training venue	5	5	4	5	4	5	5	5	NR	5	3	5	5	NR	5	NR	5	5	4.73	94.6
Food services during the training (meals and snacks)	3	4	2	5	3	5	5	5	5	5	3	5	NR	4	5	4	5	3	4.18	83.6
TOTAL AVERAGE																			**4.45**	**89**
C.- Course content on Conservation Agriulture																				
Did the course content cover your expectations?	4	4	5	4	5	3	5	5	4	5	4	NR	NR	4	5	4	3	4	4.25	85
Rate the presentation methodology	5	4	3	4	4	NR	2	5	NR	5	4	5	NR	3	5	NR	5	5	4.21	84.2
Quality of session facilitators	4	NR	5	4	4	3	4	5	NR	5	4	5	NR	4	5	4	4	5	4.33	86.6
Facilitators	4	2	5	4	5	5	5	5	NR	5	4	NR	5	4	5	NR	5	5	4.53	90.6
Books and materials	4	1	5	4	4	5	5	5	3	5	3	5	5	3	5	4	5	5	4.22	84.4
Technical content	4	4	5	5	4	5	5	5	4	5	3	4	NR	3	5	3	5	5	4.35	87
Where your questions answered satisfactorily?	4	4	5	5	5	5	5	5	5	5	4	3	3	4	5	5	5	5	4.56	91.2
TOTAL AVERAGE																			**4.35**	**87**
D.- Course content on sorghum transplanting																				
Did the course content cover your expectations?	NR	NR	5	5	4	5	5	5	5	5	4	4	5	5	5	4	5	5	4.75	95
Rate the presentation methodology	NR	5	4	4	4	5	4	5	3	5	4	5	NR	4	5	4	5	5	4.44	88.8
Quality of session facilitators	NR	5	4	4	4	5	3	5	4	5	4	4	NR	4	5	5	4	5	4.38	87.6

Facilitators	NR	NR	5	4	4	5	5	5	3	5	4	5	NR	4	5	NR	4	5	4.50	90
Books and materials	NR	two rates	4	5	5	5	5	5	NR	5	4	4	NR	3	5	4	3	5	4.43	88.6
Technical content	NR	NR	5	5	5	5	4	5	4	5	3	NR	NR	3	5	4	4	5	4.43	88.6
Where your questions answered satisfactorily?	NR	NR	5	4	5	5	5	5	5	5	4	5	5	4	5	NR	5	5	4.80	96
TOTAL AVERAGE																			**4.49**	**89.8**
E.- Course content on Integrated Pest Management																				
Did the course content cover your expectations?	NR	NR	5	5	4	5	5	5	5	5	4	4	NR	3	5	5	5	4	4.60	92
Rate the presentation methodology	NR	5	5	4	4	4	4	5	4	5	4	3	NR	3	5	5	5	5	4.38	87.6
Quality of session facilitators	NR	NR	5	5	4	5	5	5	5	5	4	4	NR	3	5	4	5	5	4.60	92
Facilitators	NR	NR	5	5	5	5	5	5	5	5	4	4	5	3	5	5	5	5	4.75	95
Books and materials	NR	1	4	5	4	5	5	5	4	5	4	5	5	3	5	5	5	5	4.41	88.2
Technical content	NR	5	5	5	4	5	4	5	5	5	4	4	NR	3	5	NR	4	5	4.53	90.6
Where your questions answered satisfactorily?	NR	NR	5	4	5	5	5	5	5	5	4	2	NR	3	5	4	5	5	4.47	89.4
TOTAL AVERAGE																			**4.53**	**90.6**
Observations of this training																				
Timeliness & overall logistics of course sessions	NR	5	4	4	4	5	4	5	5	NR	4	3	NR	4	NR	5	4	3		
Logistics to field day	NR	5	2	4	4	5	5	5	5	NR	3	4	NR	5	3	4	5	4		
Logistics of practical	NR	5	2	4	4	5	4	5	5	NR	2	3	NR	4	3	4	5	3		
TOTAL AVERAGE																			**4.51**	**90.2**
TOTAL AVERAGE FOR THE TRAINING																			**4.33**	**86.6**

Rates from 1 to 5 where 1 is the lowest and 5 is the highest score

NR: NOT RATED

Two rated: two different rates where indicated for the same question

[1] The average rate has been calculated only considering the number of those answers where numeric values were given and those with NR or Two rates were not considered

ANNEX 2: LIST OF PARTICIPANTS

S/No.	NAME	M/F	DISTRICT	ORGANIZATION	POSITION	TEL	EMAIL
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ANNEX 3: WORKSHOP PROGRAMME

1st Training on conservation agriculture and sorghum transplanting (2nd – 7th September 2012- Hargeisa)

Date - Time	08:00-08:30	08:30-10:30	10:30-10:45	10:45-12:00 (12:00-12:20 prayer) 12:20-13:00	12.45-14:00	14:00-15:30	15:30-17:00
DAY 1 2/9/12	Participants Registration	**Setting the scene** Introductions; logistics; participants' expectations; course objectives and workshop processes including committees Official opening: 9:00 am **Part I: Pest & disease management (IIPM) and control in CA systems** *Plenary presentations and group discussions* (Dr. Laura Cortada)	Tea Break	**Part II: Pest & disease management (IIPM) and control in CA systems** *Plenary presentations and group discussions* (Dr. Laura Cortada)	**Protective measures for handling and storage of pesticides** **Use of protective equipment** *Plenary presentations and group discussions* (Dr. Laura Cortada)	**LUNCH BREAK**	**Sorghum transplanting** *Plenary presentations and group discussions* (Dr. Osman Gedow Amir)
DAY 2 3/9/12	Committee reports	*Field based Practical Exercises*: **Field day on Sorghum transplanting & IPM control** **(Osman & Laura)** **THIS SESSION MAY BE HELD IN COORDINATION WITH THE FFS in Aburin Research Station**					

	08:00-08:30	08:30-10:30	10:30-10:45	10:45-13:00 (12:00-12:20 prayer)	13:00-14:00	14:00-15:30	15:30-15:45	15:45-17:30
DAY 3 4/9/12	Committee reports	**Setting the scene** Introductions; participants' expectations; course objectives **(Peter)** **What is CA and why CA?** Background, historical perspectives, rationale, benefits, challenges *Plenary presentations & discussions* **(Dr Simon)**	**B**	**CA Concepts and principles** **I: Soil cover** **II: Minimum Soil Disturbance** **III: Crop rotations and Associations** ***Plenary presentations and discussions*** **(Dr Simon)**	**L**	**Soil Health** • Soil characteristics & properties • Erosion and water infiltration *Plenary presentations and discussions* (Peter)	**B**	**Part I:** Introduction to adaptive research experiences *(FAO team)*
Day 4 5/9/12	Committee reports	**Conservation Agriculture Equipment** **CA techniques in manual systems (ACTN)** • laying, digging basins • jab planting • dibbling; manual weed control ***Plenary presentations, discussions*** **(Peter)**	**R**	**CA in animal traction & Tractor based Systems** • harnessing animals for ripping and direct seeding • tractor rippers & direct seeders • Tractor sprayers *Video and discussions* **(Peter)**	**U**	**Weed management and control in CA systems** *timeliness; manual and chemical options; strategic control* *Video and discussions* **(Dr Simon)**	**R**	**Practical Demonstration of: erosion processes, infiltration,** Run-off trays **(Peter)** **CA techniques in manual systems** • jab planting *Field based Practical Exercises* (Weldone)
Day 5 6/9/12	Committee reports	**Extension Approaches for CA** Farmer field schools; Study circle; Contract farming **(Peter)**	**E**	**Social economic aspects of CA** Group work and presentations **CA and Climate Change** **CA and Agro forestry** *Plenary, discussions, exercises* **(Dr Simon)**	**N**	**Monitoring and Evaluation of CA programmes** **Data collection and Information management** **(Peter)**	**E**	**Action planning** Feasible CA options; Plans for implementation **(Dr Simon)** Methodology and action plan of the OTs **(FAO team)** *Exercises visualized on flip charts*
DAY6 7/9/12	Committee reports	Group discussion & presentations of **Individual Action plans** **Identified critical issues in CA** **Way forward** **(Dr Simon and FAO team)**	**K**	**Course evaluation** **(Peter)** **Closure & Diplomas' Ceremony** **(FAO/ACT)**	**C H**		**K**	

ANNEX 4: PHOTO STORY

Photo story on the Conservation Agriculture and sorghum transplanting training at Hargeisa, Somaliland

PLATE 11: Field day on Sorghum transplanting & IPM control at Aburin research station

PLATE 12: Field based Practical Exercises: Practical Demonstration of CA techniques in manual systems; jab planter and weed control as well as practical demonstration of erosion processes, infiltration and run off.

PLATE 13: Group discussions and group presentations during the training proceedings

PLATE 14 Plenary presentations on CA courses at the training facilitated by the ACT Network Conservation Agriculture Experts

PLATE 15: Closing remarks from Mr. Jama, FAO representative and issuances of Diplomas and sampled participants interview