CCAP Community Technology Assessment Dodoma, December 2015

Mahama and Nzali (top). Manchali A & B (bottom)

Introduction

Tanzania Organic Agriculture Movement carried out a two day community technology assessment in December 2015 to explore the takeup, effectiveness, gender benefit, and affordability of the technologies introduced in the three CCAPA project villages in Chamwino District, Dodoma. The two workshops involved project beneficiaries from the three initial villages and control groups of non-project farmers. The assessment also compared project impact in terms of crop yields between project farmers and the control groups. Altogether 103 farmers participated in the workshops.

Mahama & Nzali, 11 Dec 2015

Total Participants 48 (30 female / 18 male).

Project participants (26)

Non project participants (22)

Manchali A and B, 12 Dec 2015

Total Participants 55 (30 female / 25 male).

Project participants (35)

Non project participants (20)

Technology Take Up

Farmers were first asked to name the technologies introduced by the project. A list of around ten technologies were named.

Then farmers were asked to indicate their take up of the various technologies, disaggregating data by gender using different colour pens (red for males and blue for females). Also disaggregated by project participants and non project (control groups) participants.

Day 1: Mahama & Nzali

Technology English	**Technology Kiswahili**	**Takeup by project participants**	**Takeup by project participants**	**Takeup by project participants**	**Takeup by project non participants**	**Takeup by project non participants**	**Takeup by project non participants**
		Female (17)	Male (9)	Total (26)	Female (13)	Male (9)	Total (22)
Ox tillage	Plau ya ngombe	17 (100%)	9 (100%)	26 (100%)	5 (38%)	7 (78%)	12 (56%)
Planting in rows/spacing	Kupanda kwa Mstali	13 (76%)	9 (100%)	22 (85%)	9 (69%)	6 (67%)	15 (68%)
Tree planting	Miti	13 (76%)	9 (100%)	22 (85%)	5 (38%)	2 (28%)	7 (32%)
Improved seeds	Mbegu bora	13 (76%)	5 (56%)	18 (69%)	8 (62%)	4 (44%)	12 (56%)
Farmyard manure	Samadi	11 (65%)	7 (78%)	18 (69%)	3 (23%)	3 (33%)	6 (28%)
Thinning	Kupunguzia	12 (71%)	5 (56%)	17 (65%)	4 (31%)	3 (33%)	7 (32%)
In situ	Kinga Maji	11 (65%)	3 (33%)	14 (54%)	5 (38%)	5 (56%)	10 (45%)

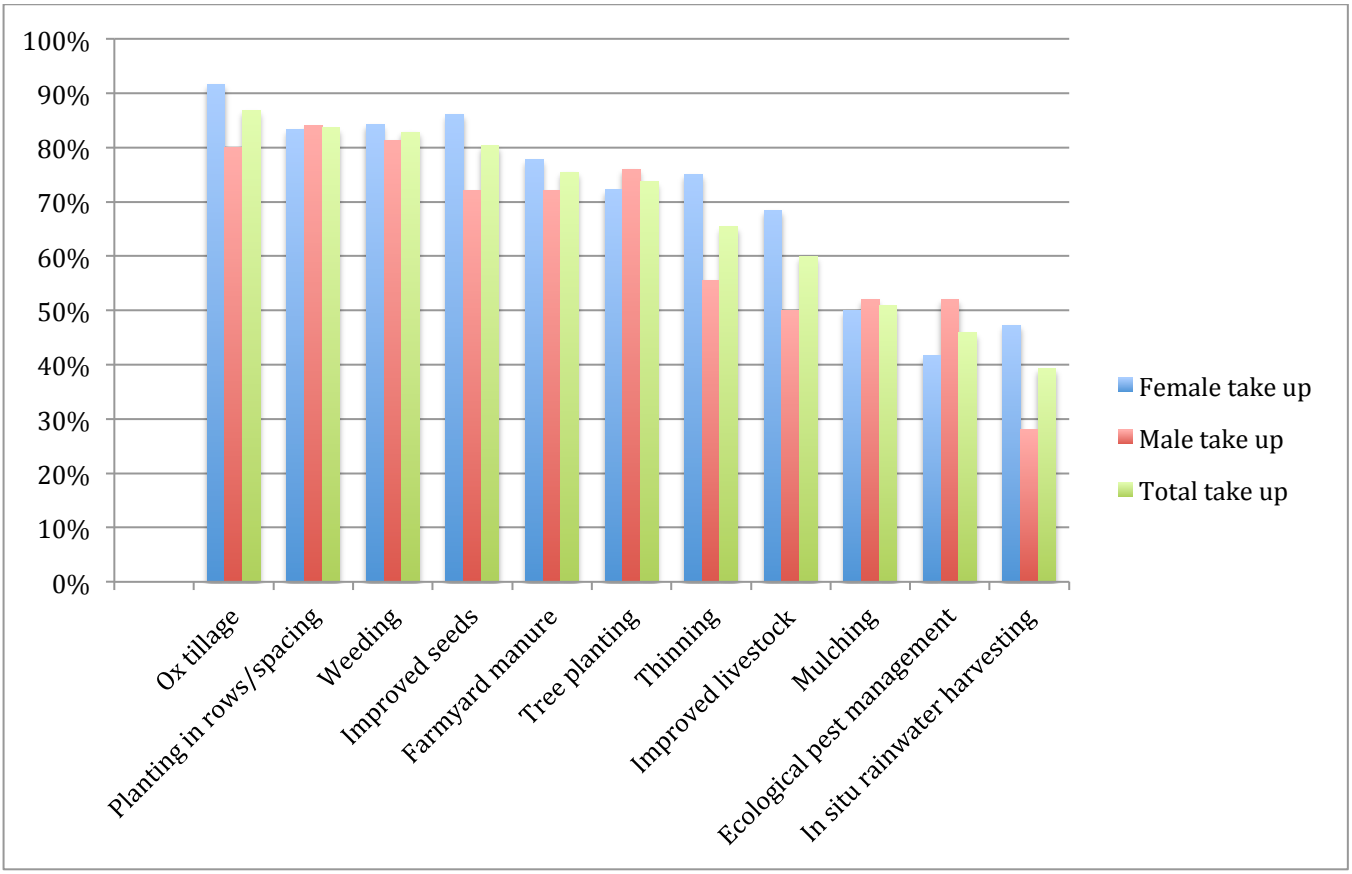
rainwater harvesting							
Ecological pest management	Dawa ya Asili	1 (6%)	4 (44%)	5 (19%)	1 (8%)	3 (33%)	4 (18%)
Mulching	Matandazo	1 (6%)	4 (44%)	5 (19%)	0 (0%)	5 (56%)	5 (23%)

Day 2: Manchali A&B

Technology English	**Technology Kiswahili**	**Takeup by project participants**	**Takeup by project participants**	**Takeup by project participants**	**Takeup by project non participants**	**Takeup by project non participants**	**Takeup by project non participants**
		Female (19)	Male (16)	Total (35)	Female (11)	Male (9)	Total (20)
Improved seeds	Mbegu bora	18 (94%)	13 (81%)	31 (89%)	10 (91%)	9 (100%)	19 (95%)
Weeding	Kupalilia Mapema	16 (84%)	13 (81%)	29 (83%)	9 (82%)	9 (100%)	18 (90%)
Planting in rows/spacing	Kupanda kwa Mstali	17 (89%)	12 (75%)	29 (83%)	6 (55%)	2 (22%)	8 (40%)
Farmyard manure	Samadi	17 (89%)	11 (69%)	28 (80%)	6 (55%)	8 (89%)	14 (70%)
Ox tillage	Plau ya ngombe	16 (84%)	11 (69%)	27 (77%)	9 (82%)	9 (100%)	18 (90%)
Mulching	Matandazo	17 (89%)	9 (56%)	26 (74%)	3 (27%)	7 (78%)	10 (50%)
Tree planting	Miti	13 (68%)	10 (62%)	23 (66%)	4 (36%)	4 (44%)	8 (40%)

Ecological pest management	Dawa ya Asili	14 (74%)	9 (56%)	23 (66%)	5 (45%)	0 (0%)	5 (25%)
Improved livestock	Ufugaji Bora	13 (68%)	8 (50%)	21 (60%)	2 (18%)	0 (0%)	2 (10%)
In-situ rainwater harvesting	Kinga Maji	6 (32%)	4 (25%)	10 (29%)	1 (9%)	1 (11%)	2 (10%)

Technology Take Up across all three project villages (Mahama, Nzali, Manchali A)



Take-up Conclusions

Take-up of the ten technologies introduced has been very high, with over 80% take-up of the top four techniques, over 70% of another two, and around 40-60% take-up of the more labour intensive actions.

Effectiveness

Participants were asked to write down on a Post It note their No 1 most effective technology

DAY 1: Mahama / Nzali

Most effective technology		Score	Rank
Improved seeds	Mbegu Bora	24	1
Ox tillage	Plau ya ngombe	15	2
Planting in rows/spacing	Kupanda kwa mstali	8	3
Farmyard manure	Samadi	4	4
In situ rainwater harvesting	Kinga maji	2	5
Thinning	Kupunguzia	1	6

Day 2: Manchali A&B

Most effective technology		Score	Rank
Improved seeds	Mbegu Bora	22	1
Planting in rows/spacing	Kupanda kwa mstali	9	2
Weeding	Kupalilia mapema	8	3
Ox tillage	Plau ya ngombe	5	4=
Farmyard manure	Samadi	5	4=
In-situ rainwater harvesting	Kinga maji	3	6
Planting trees	Kupanda miti	1	7
Improved livestock	Ufugaji bora	1	8

Overall results

Rank	Most effective technology	Score
1	Improved seeds	46
2	Ox tillage	20
3	Planting in rows/spacing	17
4	Farmyard manure	9
5	Weeding	8

Gender benefit

Female participants (only) were asked to identify the technologies of most benefit to women, and asked why.

Day 1: Mahama / Nzali

Technologies of most benefit to women	**(Sw)**	**Why**
Improved seeds	Mbegu bora	More food, more oil, cash for school
Ox plough	Plau ya ngombe	Saves time, conserves moisture, faster growing, easier weeding

Day 2: Manchali A&B

Technologies of most benefit to women	**(Sw)**	**Why**
Improved seeds	Mbegu bora	Early maturing, higher yields, more food for the children
Improved livestock	Ufugaji bora (kuku)	Increased income from selling eggs, to meet household needs
Ox plough	Plau ya ngombe	Prepares large area in short time, frees up time to do other productive activities

Affordability

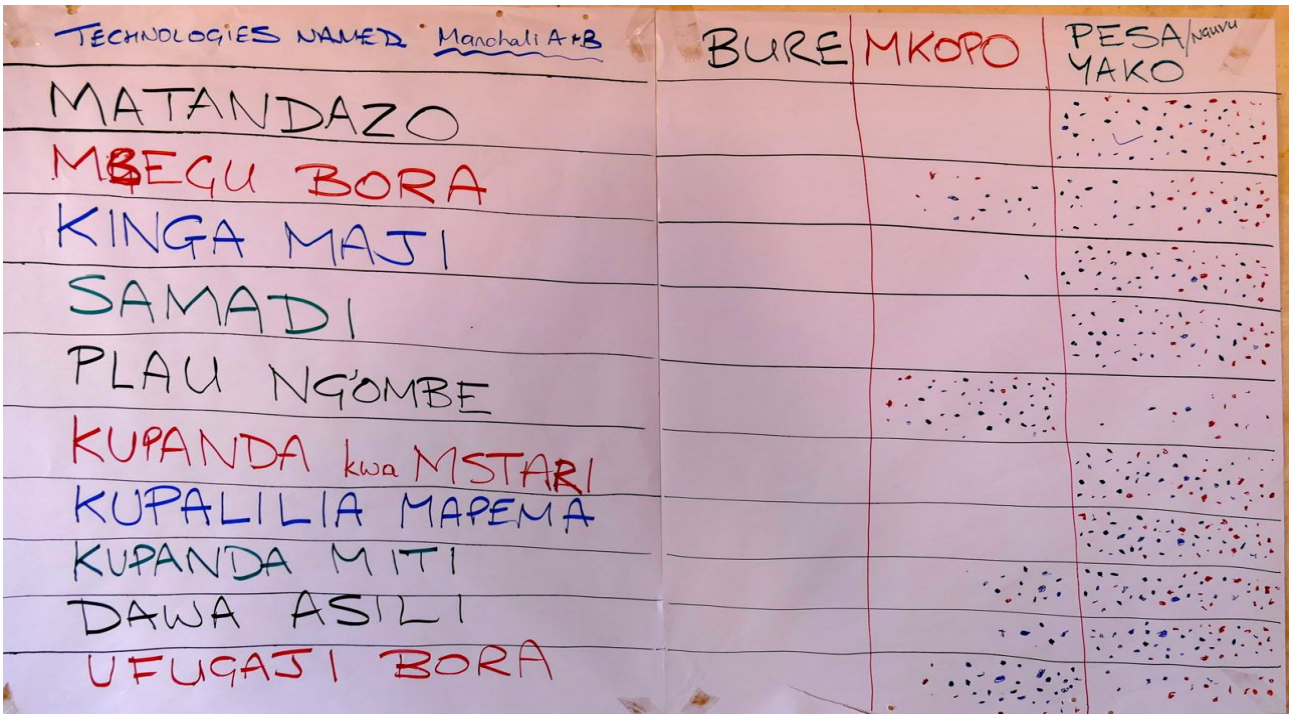
Participants were asked to indicate their ability (by drawing a dot with a marker pen – red male, blue female) to take up the various technologies, under different financial conditions:

1. Yes – but only if the technology was free
2. Yes – but I would need a loan
3. Yes – with my own money or labour

Day 1: Mahama & Nzali

Technology (En)	Technology (Sw)	Free	Loan	Own money/labour
Planting in rows/spacing	Kupanda kwa mstali	3	1	35
In situ rainwater harvesting	Kinga Maji	3	0	35
Farmyard manure	Samadi	5	0	34
Thinning	Kupunguzia	5	0	31
Improved seeds	Mbegu bora	2	25	11
Trees	Miti	11	3	24
Ox tillage	Plau ya ngombe	1	25	13
Mulching	Matandazo	1	2	35
Traditional pest management	Dawa ya Asili	1	1	33

Day 2: Manchali A&B



Technology (En)	Technology (Sw)	Only if free	Only with a loan	With own money or labour
Mulching	Matandazo	0	0	50
Improved seeds	Mbegu bora	0	16	40
In situ rainwater harvesting	Kinga Maji	0	1	50
Farmyard manure	Samadi	0	0	50
Ox tillage	Plau ya ngombe	0	40	13
Planting in rows/spacing	Kupanda kwa mstali	0	0	50
Weeding	Kupalila mapema	0	0	50
Tree planting	Miti	0	13	40
Ecological pest management	Dawa ya Asili	0	6	40
Improved livestock	Ufugaji bora	0	35	16

Affordability Conclusions

Most of the technologies introduced are affordable to most of the farmers, without need of loans or grants. However a few technologies are judged by farmers to be beyond their current means, requiring them to seek loans, particularly ox tillage implements, and to a lesser extent improved seeds – both of which are clearly recognised by farmers to be of high benefit.

It was also noted that women felt more need to take loans, while men were more inclined to take up the technologies using their own resources, perhaps reflecting women's lower access to financial resources.

Crop Yields

Day 1: Mahama & Nzali

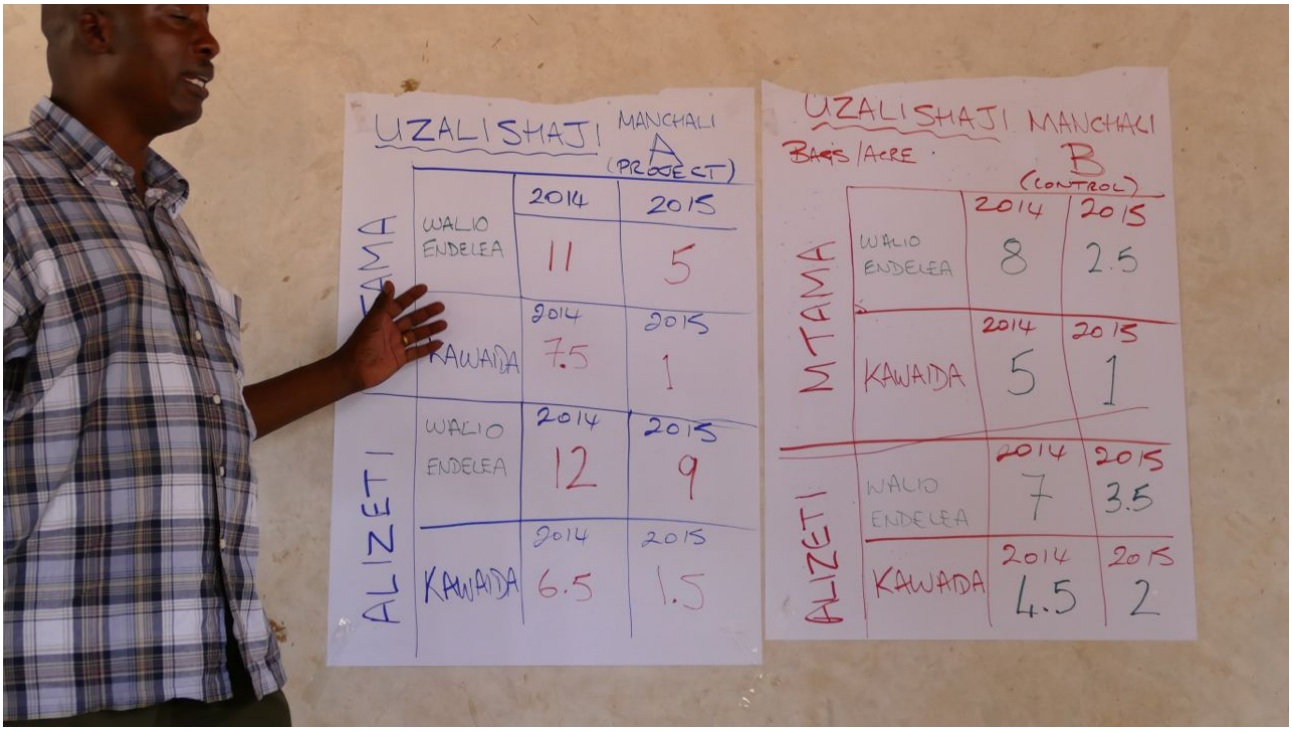
Yields were compared (participants vs non participants) for the 2014-15 season (extreme drought conditions).

Bags per acre	**Sorghum (bags/acre)**		**Sunflower (bags/acre)**	
	Lowest yield	Highest	Lowest yield	Highest yield
Progressive farmers (project participants)	6	10	8	16
Average farmers (project participants)	3	6	4	8
Average farmers (non project participants)	0	3	2	3

Note: farmers tend to overestimate the size of their land by up to 25%, so these yield figures are probably underestimates.

The above figures demonstrate that even in this very dry drought year, project participants performed much better than their non-participant neighbours.

Day 2: Manchali A&B



This group explored the yields of sorghum and sunflower over two years – a 'normal' rain year (2013/14) and a 'drought year'(2014/15), comparing crop yields by project participants (Manchali A) and a control group (Manchali B). The workshop disaggregated 'progressive' farmers and 'average' farmers in both project participant and non project participant groups.

YIELD (Bags per acre)		Manchali A (Project beneficiaries)		Manchali B (Control group)	
CROP	***Type of farmer***	***2013/14 normal year***	***2014/5 drought year***	***2013/14 normal year***	***2014/5 drought year***
Sorghum	Progressive	11	5	8	2.5
	'Average'	7.5	1	5	1
Sunflower	Progressive	12	9	7	3.5
	'Average'	6.5	1.5	4.5	2

The findings show that:

1. In a normal rain year all project participants (both progressive and 'average') achieved higher yields ranging from 37.5% to 70% increase upon the control group.
2. In a drought year only the progressive farmers (higher technology uptake) achieved higher yields ranging from 100% to 157% increase over the control group.
3. In a drought year the 'average' (lower technology uptake) farmers achieved no better yields than the control group.
4. In a drought year the progressive farmers (with high technology uptake) achieved much greater yields (5 to 6 times as much) than the 'average' (relatively low technology uptake) farmers within the project.

Yield conclusions

All farmers adopting project practices gain significant yield improvements in normal years.

'Average' farmers (relatively low uptake of improved technologies) who adopt the practices of the progressive farmers (high uptake of improved technologies) will gain a significant increase in yields and a massive leap in climate resilience.

Best Seeds

Participants were asked which were the most effective / useful improved seeds / crops

Day 1: Mahama & Nzali

Most effective improved seed	Score	Rank
Mtama / Sorghum	40	1
Alizeti / Sunflower	27	2
Kunde / Cow pea	22	3

Sustainability Way Forward

Farmers were asked to consider what they could do to ensure the sustainability of the benefits now that the project is coming to an end.

They agreed the following actions and commitments:

1. Continuing to learn using farmers field schools, farmers family learning and farmer- to -farmers approaches
2. Conducting regular groups meetings for sharing and discussing relevant issues, meeting at least twice/month
3. Communicating agricultural production issues to District Council (extension department) for seeking appropriate support.
4. Requesting in writing Chamwino District Council to facilitate them to produce quality seeds (quality declared seed grades)
5. To start/improve non-farm economic activities, specifically improved local chicken and pigs rearing

Overall Conclusions:

Take-up of the ten technologies introduced has been very high, with over 80% take-up of the top four techniques, over 70% of another two, and around 40-60% take-up of the more labour intensive actions.

Most of the technologies introduced are affordable to most of the farmers, without need of loans or grants. However a few technologies are judged by farmers to be beyond their current means, requiring them to seek loans, particularly ox tillage implements, and to a lesser extent improved seeds – both of which are clearly recognised by farmers to be of high benefit.

The most effective technologies judged by farmers are as follows:

1 Improved seeds
2 Ox tillage
3 Planting in rows/spacing
4 Farmyard manure
5 Weeding

Women particularly found improved seeds and ox-tillage beneficial, as they provided food for the family, and saved labour and time for other productive activities. Ox tillage was also found to facilitate planting in rows and easy weeding.

Yield increased and climate resilience improved. It is clear that uptake of even one or two technologies brings a significant yield benefit in 'normal' local conditions, but is not sufficient to protect farmers against severe drought (as occurred in the 2014/15 growing season. However, we see that take up of several technologies provides further yield increases, but more significantly this provides major increases in climate resilience (measured by yield) during extreme drought conditions.

Recommendations

- Improved seeds, ox tillage and Good Agriculture Practices are the package that needs to be rolled out across the region. Benefits accrue to both women and men.
- Famers' access to improved seeds needs to be improved, e.g. by promotion of QDS production.
- Farmers should be supported with access to loan finance to buy (or hire) ox tillage equipment.
- All farmers should adopt these key project practices to gain significant yield improvements in normal years.
- 'Average' farmers (relatively low uptake of improved technologies) should adopt the practices of the progressive farmers (high uptake of improved technologies) to gain a significant increase in yields and a massive leap in climate resilience.
- Small livestock improvements should be included as a useful C3S agriculture technology.