Presentation to the National Climate Change Committee Stakeholder Meeting

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Promoting collaborative, pro-poor agricultural innovation

2003-2018






Our Mission

- To design and implement innovative projects and programmes which promote collaborative, ***pro-poor agricultural innovation,*** working in partnership with other organizations and communities.
- To work at the cutting edge of development methodology and process integrating ***learning (training), research and implementation*** into new models and processes emphasizing synergy and integration.

CSA PRINCIPLES

- Minimize external inputs
- Maximise internal diversity
- Focus on soil health and natural soil building techniques
- Take care of the environment
- Use available water as efficiently as possible.
- Work together, learn together and plan together
- Local solutions and economies
- Farmer driven development
- Getting our hands dirty

Community based CCA

- Conservation Agriculture 2013-2018- Maize Trust;
  - KZN, EC -550 farmer led CA trials
- Smallholder CSA Decision support 2017-2020 – WRC;
  - 15 Village based sites across KZN, Limpopo, EC (200 participants)
  - (S&WC, agroecology- gardening, CA-field cropping, livestock and natural resource management)
- Community CCA 2017-2019 – USAID(AWARD);
  - 7 Villages in Lower Olifants' Basin (150 participants)

Optimising the Conservation Agriculture system for non- commercial and semi-commercial smallholders 2013-2019

Smallholder farmer innovation programme

GRAIN SA
GRAAN SA

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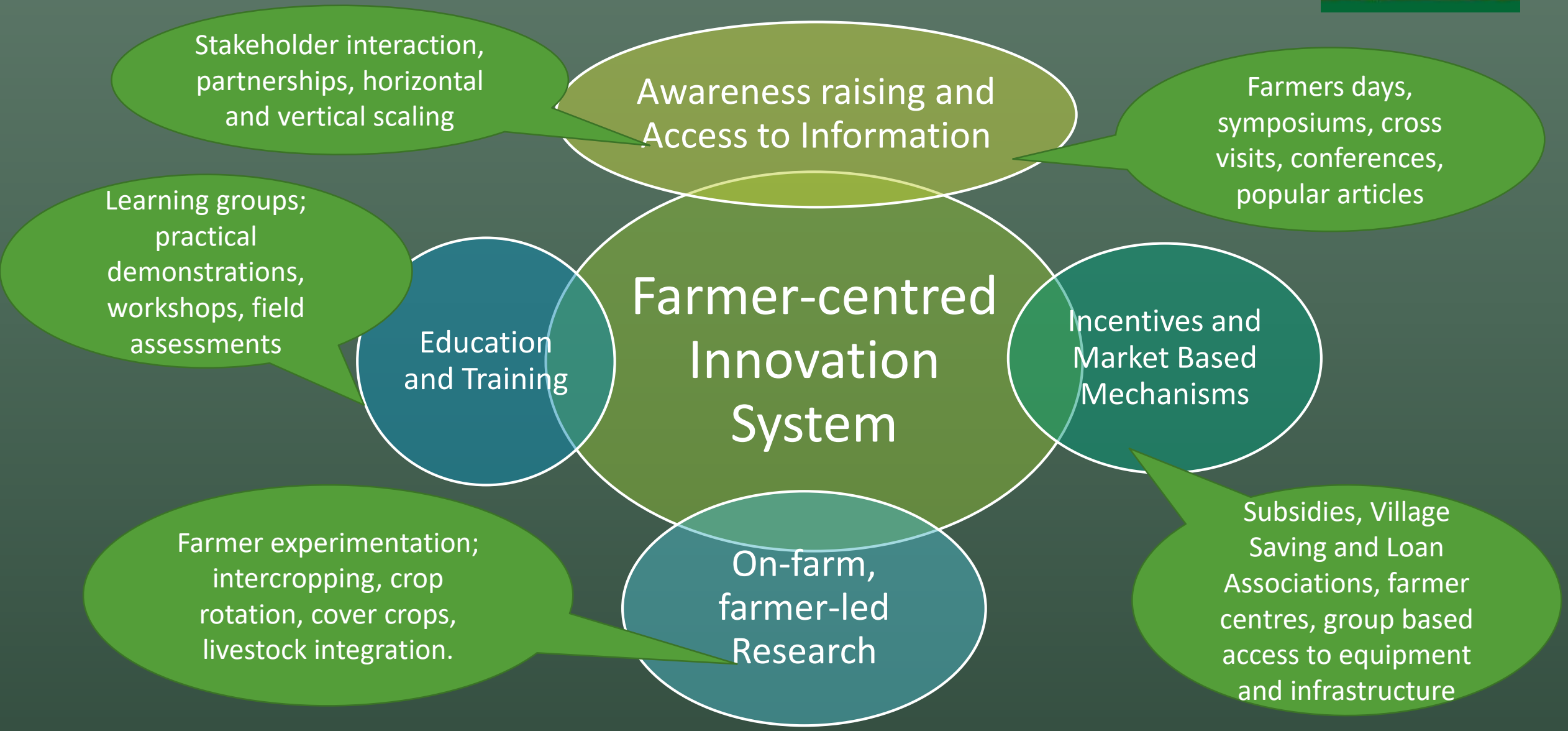
The Maize Trust

Regenerative Agriculture

- Optimising CA systems for smallholders including intercropping (maize- legumes), crop rotation, summer and winter cover crops, minimal input and organic options
- Integration of whole value chain – bulk buying and VSLAs, local facilitators, farmer centres, storage and processing options, marketing
- Farmer level experimentation – 550 farmers across 33 villages, 8 areas in KZN (Midlands and Southern KZN) and EC. 50 farmers in 4 villages - Limpopo

CA-Farmer Innovation Programme
Key objectives and activities



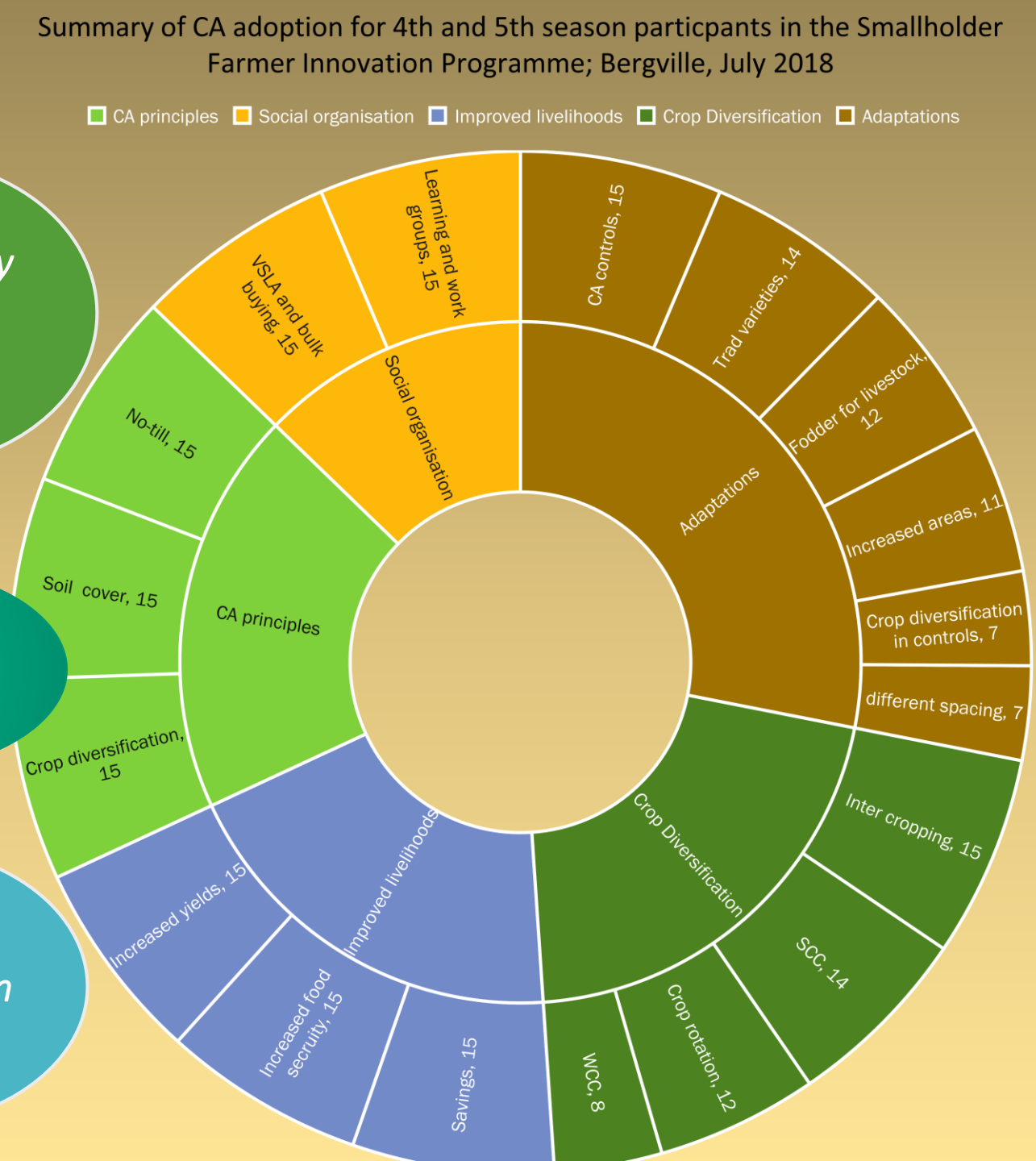
Trends for 4th and 5th year participants

- All these participants are:
  - ➢ Implementing all three principles of CA,
  - ➢ Involved in intercropping
  - ➢ Improving yields
  - ➢ Including CA into their overall farming practices.
  - ➢ Saving money and increasing food security considerably
  - ➢ Involved in local VSLAs (Village savings and loan associations)
  - ➢ Using traditional seed varieties alongside the more modern OPVs, hybrids and GM varieties promoted.

Sustainability has been achieved

73% have increased their field sizes

2-3,5t/ha Carbon sequestered in CA plots (2016-2017)



Environmental and Livelihoods indicators

- Decreased run-off- increased water infiltration
- Increased water holding capacity
- Increased organic matter (Organic C and Organic N)

- Increased crop diversity
- Increased soil fertility
- Decreased need for external inputs

- Increased production
- Increased incomes

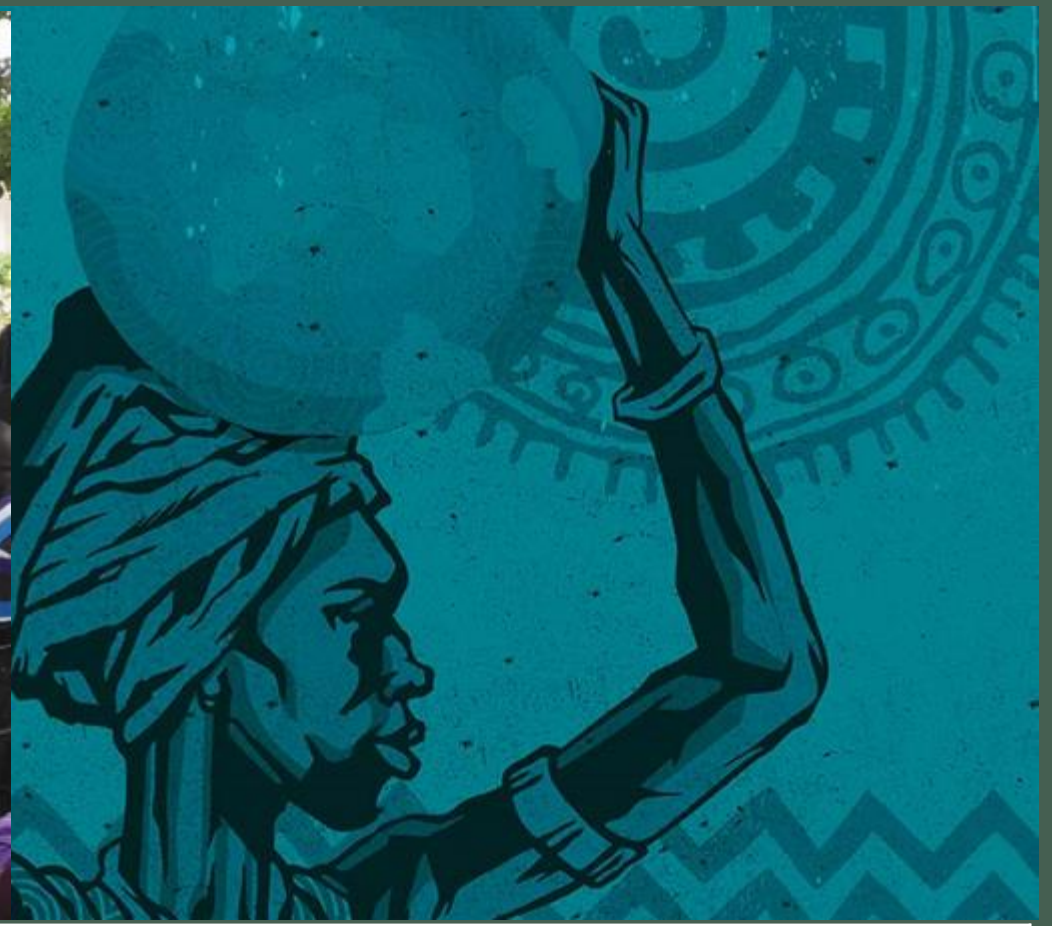
- Increase social agency
- Increased savings

Bergville: Case study

Mphumelele Hlongwane- Ezibomvini

- 4-5 years: Reduced need for herbicide - no spraying on trial plots this season
- Increased organic matter, reduced fertilizer requirements - No basal fertilizer applied- only top dressing
- Reduced runoff
- Increased yields and diversity

t/ha	2016	2017
Maize (Control)-CA	7,8	9,7
Maize Trial CA - combined	6,93	8,3
Beans	0,25	1,81
Sunflower	0,3	0,8



RESILM-O: Resilience in the Limpopo Basin Program– Olifants'

Lower Olifants' catchment

Agricultural Support Initiative (AgriSI);2017-2019

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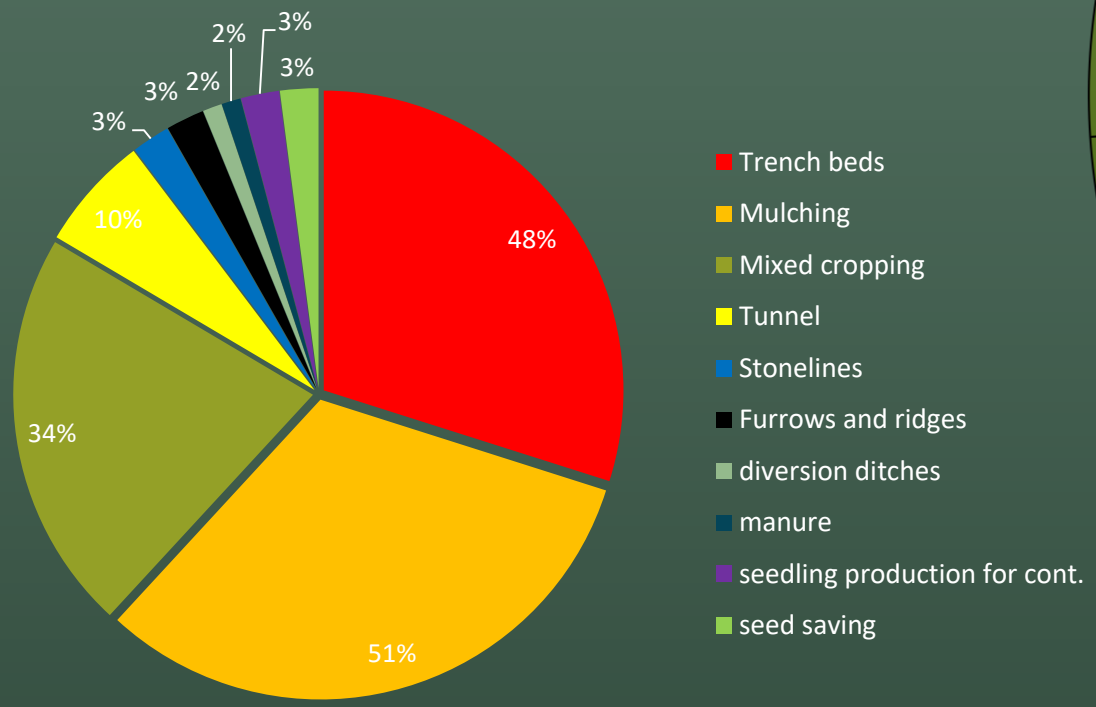
award

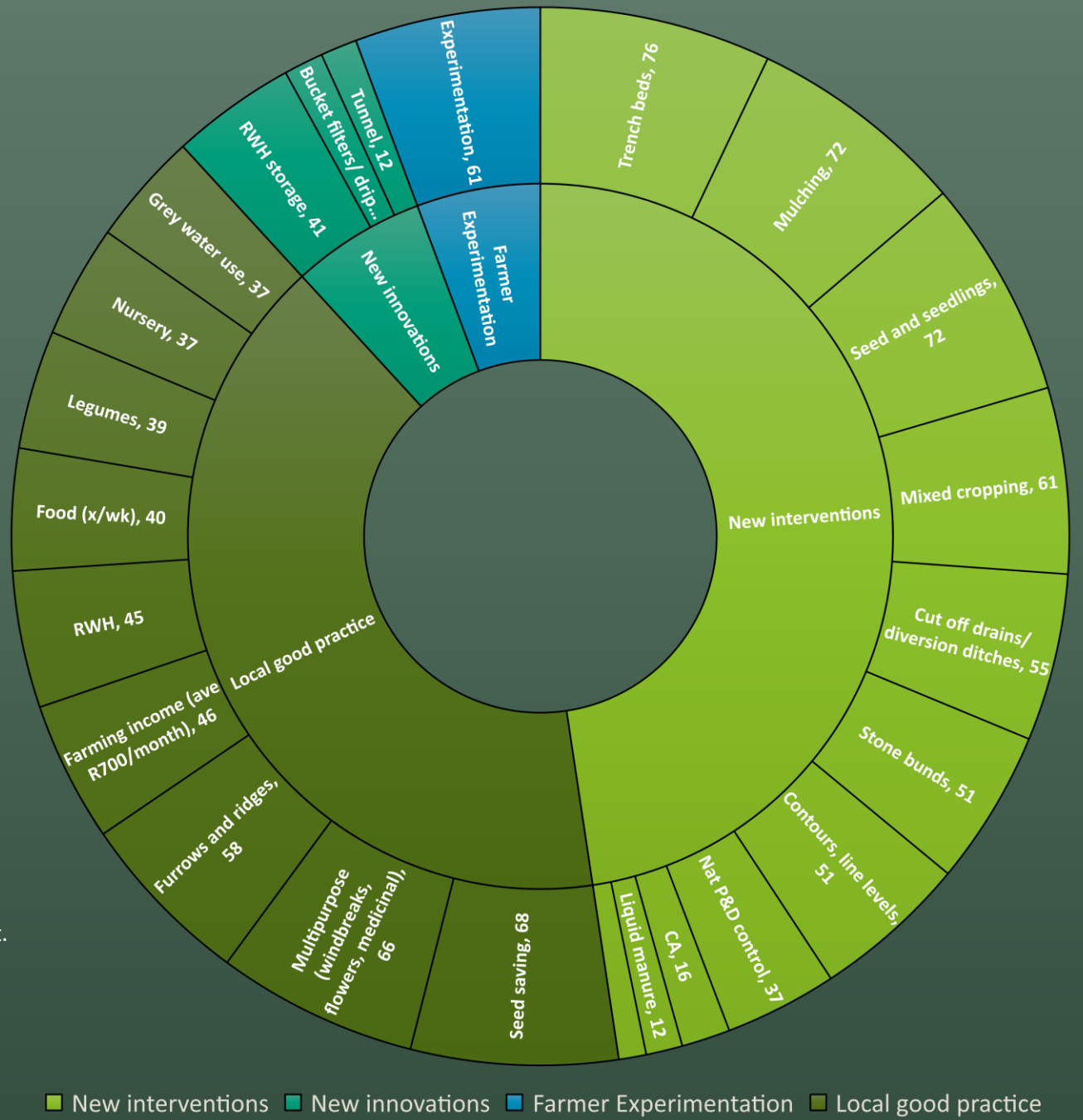
Community level CCA_ CSA

7 Villages/ learning groups – Mametje
150 participants
9 Local facilitators

Individual experiementation (N=61)



Overall implementation of practices; April-Nov 2017 N=100










Production in tunnels

How productive is each practice?

- Water productivity – how much crop is produced for the amount of water used?
  - Trench in tunnel 10x more than furrows and ridges and 5 x more than trench outside tunnel
  - Must have mulch and do deep watering. If not then result is similar to furrows and ridges…
- Cost- benefit (R35/210l)
  - Profit of R31/m of trench bed (in tunnel)
  - ~R620/tunnel fully planted ($15m^2$), for a season
  - If water is free then~ R900

	Farmers' method (Water applied)		
Name of famer	water use (m^3)	Total weight (kg)	WP (kg/m^3)
Christina Thobejane (Tunnel; trench beds, with mulch)	1,10	48,9	56,7
Christina Thobejane (Furrows and ridges with mulch)	3,91	24,5	5
Christina trench outside	2,93	14,7	11,3
Nora Mahlako (Tunnel; trench beds without mulch)	9,47	19,6	5

	Water	Cost (R/m^2)	Yield	Sales (Rands/ m^2)	Profit (R/m^2)
Trench inside tunnel	1100	R18,70	6 bundles/m^2	R60	R41,30
Trench outside tunnel	2926	R48,80	4,2 bundles/m^2	R42	-R6,80
Furrows and ridges	3913	R130,40	2,4 bundles/m^2	R24	-R106,40

Collaborative knowledge creation and mediation strategies for the dissemination of Water and Soil Conservation practices and Climate Smart Agriculture in smallholder farming systems. 2017-2020

CSA – decision support system for smallholders

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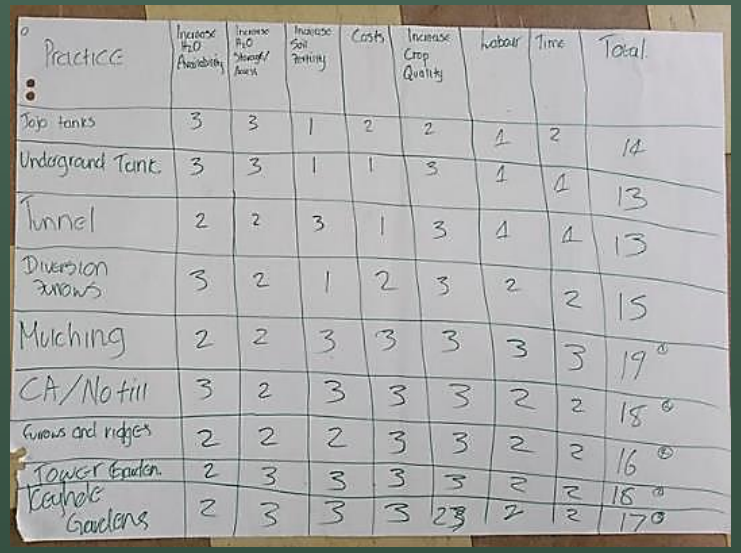
WATER RESEARCH COMMISSION

Climate Smart Farming

- CC ADAPTATION; CC impacts, strategies, adaptive measures and practices
- FIVEF FINGERS; Water, soil, cropping, livestock and natural resources
- FARMER INNOVATION SYSTEMS; experimentation, impact
- FACILITATION AND LEARNING; processes and manuals
- COMMUNITIES OF PRACTICE; learning groups, forums, networks….
- DECISION SUPPORT PROCESS; Model internet based and facilitated process



Practice	Increase H_2O Availability	Increase H_2O Storage/ Access	Increase Soil Fertility	Costs	Increase Crop Quality	Labour	Time	Total
Jojo tanks	3	3	1	2	2	1	2	14
Underground Tank	3	3	1	1	3	1	1	13
Tunnel	2	2	3	1	3	1	1	13
Diversion furrows	3	2	1	2	3	2	2	15
Mulching	2	2	3	3	3	3	3	19
CA/No till	3	2	3	3	3	2	2	18
Furrows and ridges	2	2	2	3	3	2	2	16
Tower Garden	2	3	3	3	3	2	2	18
Keyhole Gardens	2	3	3	3	23	2	2	170

DSS PROCESS FLOW

PHYSICAL ENVIRONMENT

FARMING SYSTEM

FARMER SOCIO-ECONOMIC BACKGROUND

RESOURCES TO MANAGE

SUGGESTED PRACTICES

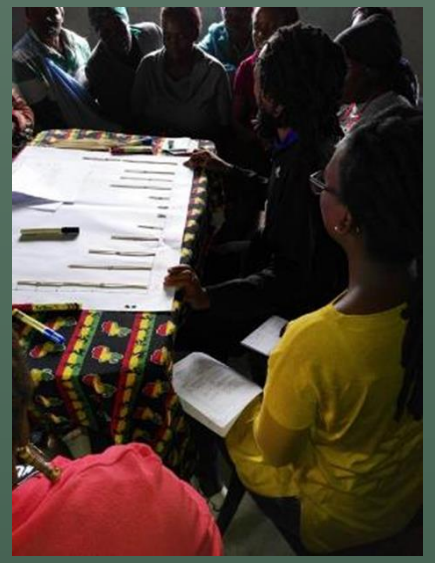
CONSTRAINED BY FARMER TYPOLOGY AND ENVIRONMENT

FACILITATOR BASED PRIORITIES

FARMER BASED PRIORITIES

RANKED PRACTICES BASED ON FACILITATOR

RANKED PRACTICES BASED ON FARMER



Individual interviews; CCA Baseline – Indicators for vulnerability

Average monthly income per household	
Male headed (39%)	R7 071
Female and male headed (33%)	R 2 068
Female headed (28%)	R 940

OUTCOMES

- Average age 49 years most with high school level education
- Higher dependency ratio than national ave
- Ave household income- R3 992/ month
- Access to services- 89% electricity, water ~50% only
- Access to fencing and agricultural tools – 89%
- 80% belong to social organisations such as learning groups VSLAs, gardening groups and co-ops
- 67% of participants have household gardens only and 55% of participants also have access to large fields (0,1-.2ha). 61% of participants keep livestock Only 16% own cattle
- 16% of households have direct access to traction (animal and mechanical)

This sub-group of rural dwellers are more organised and committed and better resourced for production and adaptation than the average rural person

Household gardens are most common (67%), followed by dryland cropping (38%), and cattle ownership (16%)

Farmer Typology

TYPOLOGY A: (2,5million); Female, farm for food only, very low incomes – mostly unemployed, access to small plots, no hh level access to water, lower education levels and no access to formal markets
Belong to VSLAs, engage in other livelihood activities

TYPOLOGY B: (250 000) Male and female, farm for food and sell surplus, slightly higher incomes, some access to hh level water, somewhat higher education levels and no access to formal markets
Belong to VSLAs

TYPOLOGY C: (10 000) Male, farm mainly for income, much higher incomes from employment in hh, good access to water, higher education levels and access to formal markets.
Belong to cooperatives or farm individually

What we have

- An appropriate methodology and process_ Innovation Systems
  - For horizontal and vertical scaling
  - For farmer level learning and implementation of CSA
  - For providing social platforms for financial management
  - For providing appropriate support for all types of smallholders
  - For monitoring (technical and social) and evaluation including
    - Scientific benchmarks for visual indicator

Communities of practices for stakeholder involvement; sharing information, joint operational activities

Microfinance options for smallholder contributions and independence

Relationships with Agribusiness for appropriate technical support; infrastructure and equipment

What we need - Smart Subsidies

- Based on implementation of CSA practices
- A set of criteria per activity type; 3-5 main criteria
- Individual or group, yearly subsidies experimentation in CSA,
- Average 30% of cost value
- ~R3 500/ participant/year depending on scores
- Administered by non profit organisations and institutions

Based broadly on provision of ecosystem services, not only carbon sequestration

Paid for through carbon tax, user pays, flagship and pilot programmes from Government Departments, Agribusiness

Gardening	Field cropping	Livestock	Other
Improved organic matter (Mulching, compost, manure…)	**Minimal disturbance** (percentage soil disturbance)	**Fodder production** (types of crop, types of livestock)	**Social organisation** (learning groups, coops,..)
Improved water use efficiency (greywater management, irrigation scheduling, infiltration run-off)	**Soil cover** (percentage soil cover)	**System integration** (Use of manure, multifunctional plants, …)	**Collaborative actions** (Work groups, local marketing, ..)
Diversification (no and type of different crops)	**Crop diversification** (no and types of crops)	**Grazing management**	**Local savings and loans** (stokvels, VSLAs,…)
Food security (no of crops no of times/week)	**Improved soil health** (carbon sequestration, % Organic carbon, soil aggregates, …)	**Water use**	
Income potential (percentage of hh income)	**Food security, income** (no of months food provisioning, scale of income)		

Incentive based options for CA

MEASURABLE CHANGES

PRACTICES:

- -Reduced tillage (linked to time.. 1yr,2yrs, 3yrs etc),
- -Increased soil cover (5-10%, 10-15%, 15-25%)
- Increased diversity (1crop, 2 crops, 3 crops, >3 crops -intercropping or crop rotation),
- Improved social organisation (learning groups y/n, collective work groups y/n, , Cooperative y/n)
- Increased access to finances (savings groups y/n, savings and loans for inputs y/n)

Use opportunity costs to determine level of payment,

LEADING TO:

- Increased production/yield (compared to controls)
- Improved livelihoods (increased food supply y/n, increased income y/n)
- Increased carbon (tricky to prove; tests variable depending on weather, timing, depth of tests- …)
- Reduced erosion/run-off/increased infiltration (Quite a mission to test but benchmarks possible)
- Improved soil structure (also not easy to measure or show – but definitely positive over time)
- Improved soil health (overall showing positive trends but a lot of variability between years)……

Funding period; long term funding instruments – avoid R&D and pilot project design