Water management in homestead farming systems

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August 2011

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Background

WRC Solicited project (2003)

- Duration: 2006-2009
- Team:
  - Chris Stimie: Project leader
  - Erna Kruger: Researcher, Principle author
  - Marna de Lange: Researcher, co-author
  - Charles Crosby: Project Advisor
  - Marius Botha: Layout and artwork

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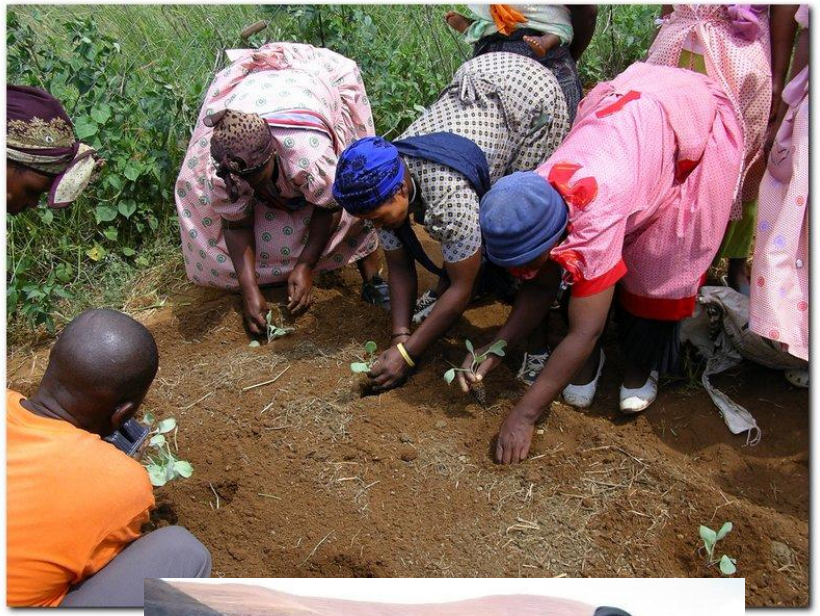
Overall Aim

To improve food security through homestead gardening, by developing and evaluating the appropriateness and acceptability of training material for water use management, training the trainers and training of household members in selected areas.

- Indigenous practices and water related best practises;
- Developmental constraints and opportunities;
- Economic incentives - youth.
- Training needs, developing and testing materials and refining these.
- Impact assessment on food security

Points of departure



- **Household Focus:** Learning at household level, farmer learning groups, experimentation
- **Intensive production:** Low external input, organic, holistic farming systems – efficient and low cost
- **Appropriate learning processes:** Experiential learning, start from existing knowledge base, scaffolding of information and skills, motivation (nutrition, mind mobilisation)
- **Use existing information and good practice:** Lirapa (Lesotho), MmaTshepo Khumbane (garden layout for water management) and others

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Learning process

Day workshops at a homestead level

- Joint analysis of the farming process
- New topics included through discussion and on request
- Practical implementation and demonstrations
- Learning group members conduct experiments at their own homesteads
- Once a season, the groups get together to celebrate the progress of their members, report on their experiments and plan for the coming season.

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Workshop outlines

- 1: **Nutrition** – Reflection, Garden drawing; food groups; “what we eat”; nutritional gaps
- 2: **Experimentation and Trench Beds** – Importance of observation and recording; Trench bed demo; seedbed
- 3: **Garden Layout** –Rain Water Harvesting; wind and frost protection; soils; mulching
- 4: **Brews and Liquid Manure** – Pest and disease control; soil fertility
- 5: **Fruit Trees and Crop Rotation**– Fruit production; companion planting; crop rotation
- 6: **Food and Seeds**– Food processing; seed saving; celebration
- 7: **Tank Safety and Maintenance** – Water management user education; RWH review, irrigation





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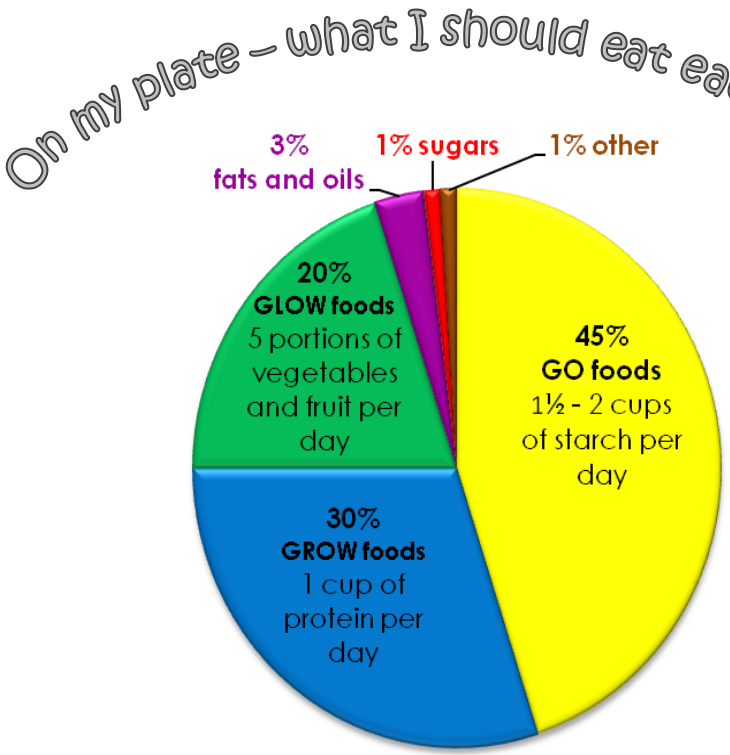
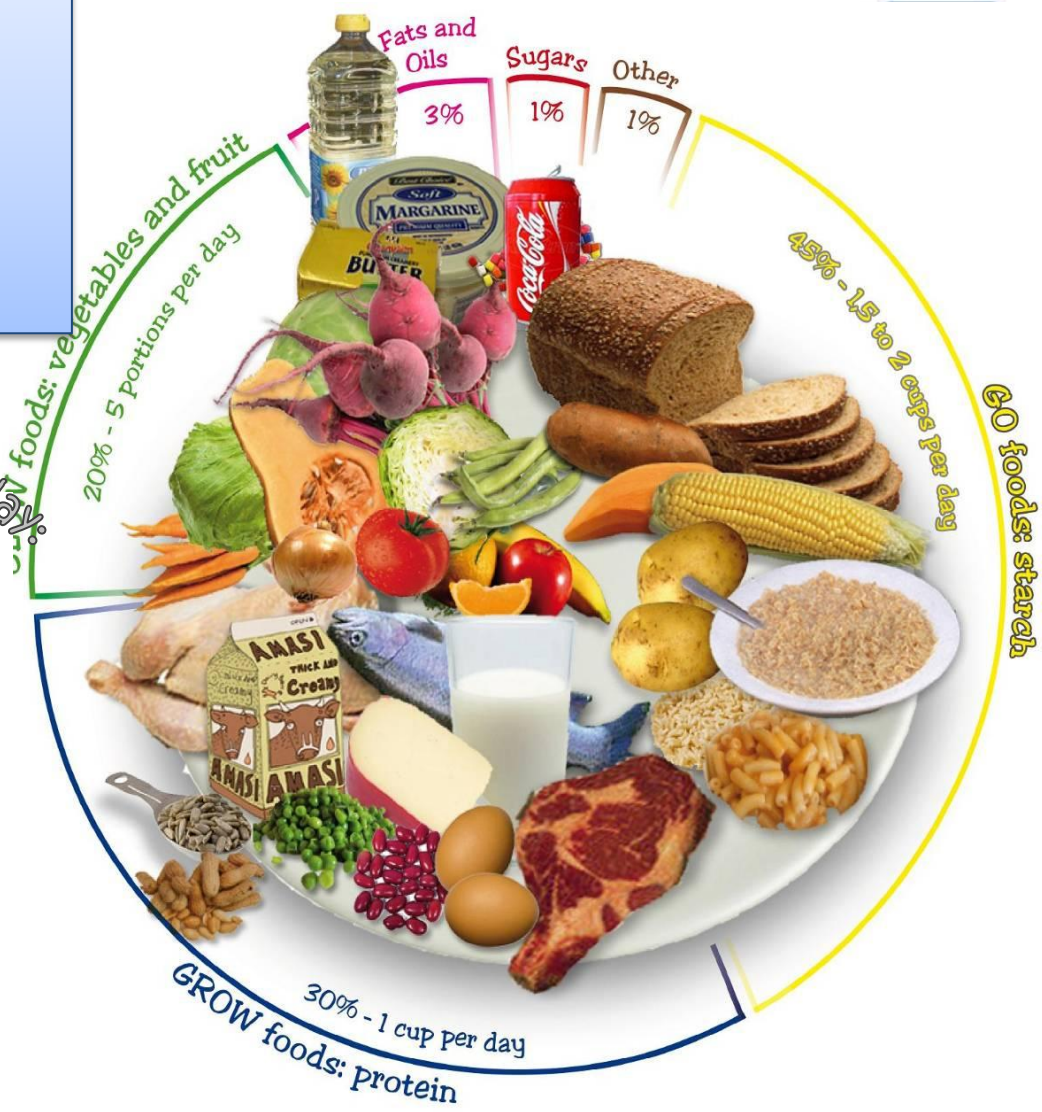
Facilitating changes in food behaviour:

- Go, grow glow foods
- Traditional foods
- Nutrition gap analysis
- List of crops to diversify





Highlights: Nutrition cont.

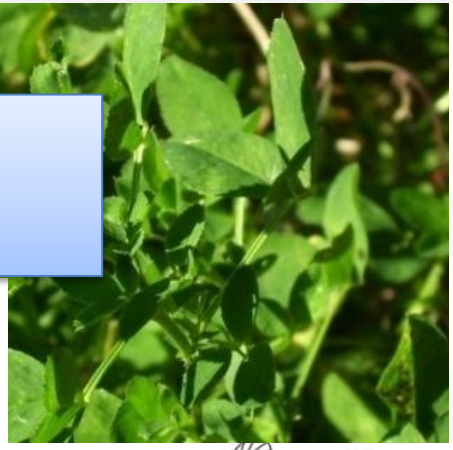
List of crops to be grown for a balanced diet (and especially for children <5years).

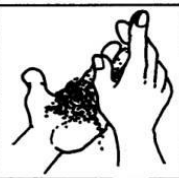
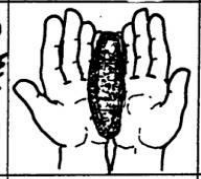
-Amadumbe (taro)
-Indlubu (jugo beans)
-Peanuts (amatongomane)
-Sweet potatoes
- Carrots, beetroot, spinach
- Lettuce, tomatoes
- Garlic, onions
- Eggs
- Meat; beef and chicken
- Fruit: Apples, oranges, lemons, pears, grapes, plums, peaches.

Carrots; planted in a trench bed (for deep fertile soil), sowed evenly using sand and ash and lines covered with compost.

Soil fertility

- **Understanding soils:** Type, texture,
- **Soil fertility**



WHAT SOIL LOOKS LIKE	WHAT SOIL FEELS LIKE	WHEN ROLLED INTO A SAUSAGE		THE SOIL IS
VERY SANDY	VERY ROUGH	CANNOT BE ROLLED INTO A SAUSAGE		VERY SANDY 0-5% clay
QUITE SANDY	ROUGH	CAN BE ROLLED INTO A SAUSAGE BUT IT CANNOT BEND		SANDY 5-10% clay
HALF SANDY & HALF SMOOTH	ROUGH	SAUSAGE CAN BEND A LITTLE		SANDY LOAM 10-15% clay
MOSTLY SMOOTH	A LITTLE SANDY, QUITE SMOOTH BUT NOT STICKY	SAUSAGE CAN BEND ABOUT HALF WAY AROUND		LOAM OR SILT LOAM 15-35% clay
MOSTLY SMOOTH	A LITTLE SAND QUITE SMOOTH AND STICKY	SAUSAGE CAN BE BENT MORE THAN HALFWAY ROUND		CLAY LOAM OR SANDY CLAY 35-55% clay
SMOOTH	SMOOTH AND STICKY	SAUSAGE CAN BEND INTO A RING		CLAY More than 55%

Clockwise; soil types and exercise, water holding demonstration, natural methods for increasing fertility

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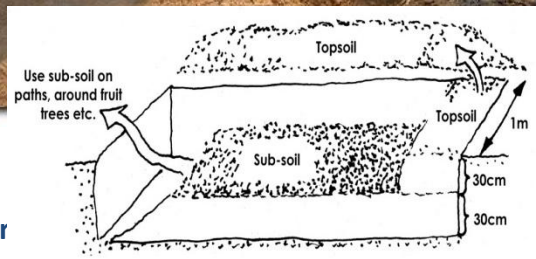
Highlights:

Soil and water management

- **Soil building techniques**
  - Mulching, liquid manure, (compost)
- **Bed design**
  - Dedicated beds, using manure
  - Trench beds

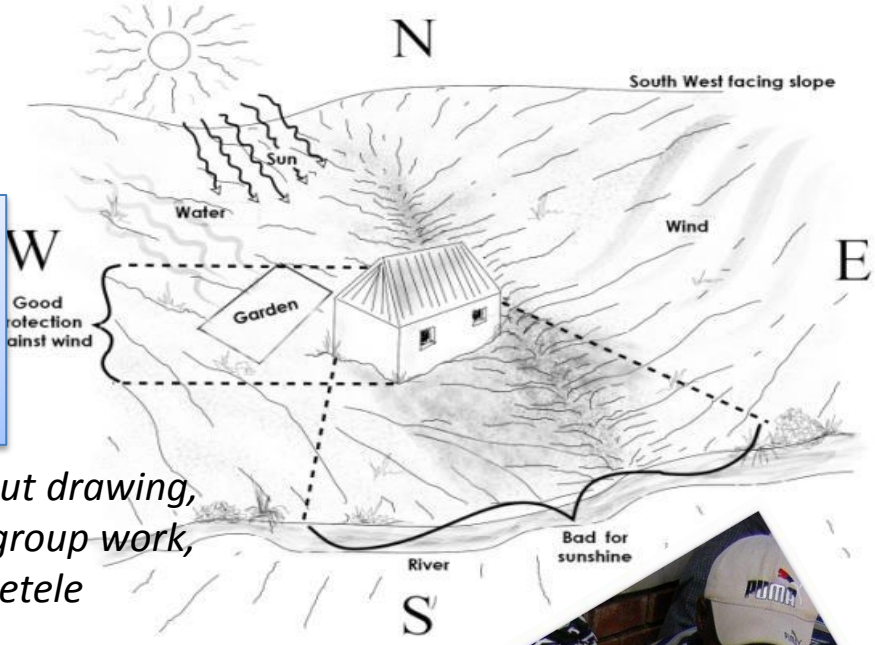


Highlights:

Garden layout

Principles of garden layout and design
(water, topography, aspect, wind...)

Rainwater: catchments, drainage, run-off and run-on



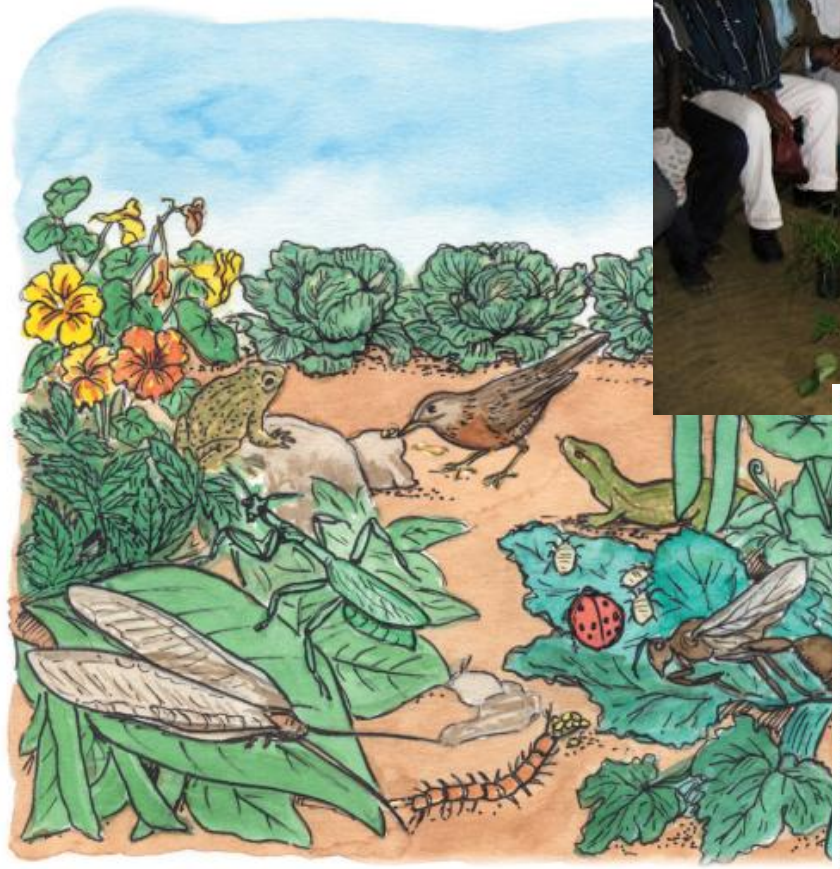
Clockwise: Layout drawing, run-on ditches group work, example in Moretele

Highlights:

Diversification

- **Diversity management plans**
- Crop mixes and food preservation
- **Natural pest and disease control**
- Pest predators and strong smelling plants
- Pest control remedies

Clockwise; companion planting exercise, drying frame, dried pumpkin, garden friends, making chilli garlic spray.



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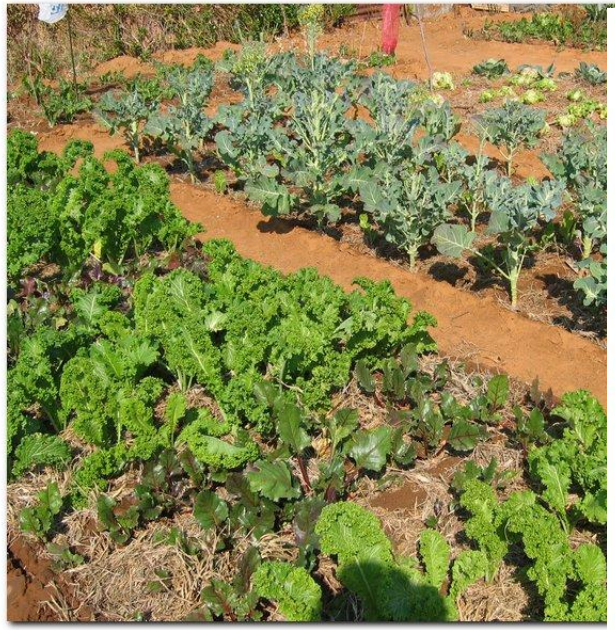
Crop diversification



Clockwise; beetroot and mustard spinach, turnips, windbreaks and mulching, kale, broccoli

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- Seed saving
- Fruit production

Highlights:

Seed and Fruit

Clockwise: storage, seed swap, mustard seeding,

Clockwise: grafted trees, fruit fly trap, pruning (Qwa-qwa, Moretele)

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- **Starting to sell;** Start with where you are and what you have, supply and demands, niche marketing
- **Potential financial benefits;** Continuity, think ideas not problems, the 7 C's - clarity, competition, courage, co-operation, calculation, care, control
- **Marketing ideas & appropriateness**

Highlights:

Income generation

NAME and area	Size of plot (m^2)	Crops grown	Marketing	Average monthly income
Phuthaditjaba, Free State				
Mrs and Mr Gumbi	1800	Variety: carrots, beetroot, spinach, mustard, rape, onions, cabbage, tomatoes, potatoes, green beans, turnips, peas...	Locals	R400
Mr and Mrs Ntai	1000	Spinach, pumpkin, peas, lettuce, potatoes, mustard spinach, rape, turnips, carrots, beetroot, maize	Vendors and locals	R1180
Mr Sibeko	500	Spinach, rape, mustard, green and flat beans, pumpkin, potatoes, onions	Locals and PicknPay	R418
Mr and Mrs Mohale	3000	Beetroot, cabbage, lettuce, green beans, maize, pumpkin, tomato, spinach, rape, mustard spinach	Sells in town, with own transport	R2200
Potshini, KZN				
Ms P Mavundla	36	Cabbages, tomatoes, potatoes, beetroot, spinach	Locals	R125
Mr V Zondo	400	Tomatoes, carrots, chillies, beetroot, cabbage, spinach, onions, sweet potatoes, turnips, peas	Locals	R400
Ms B Hlongwane	100	Cabbage, spinach, onions, chillies	Locals	R150
Ms Z Mduba	180	Chillies, tomatoes, cabbage, spinach, potatoes, Kenyan spinach	Locals	R250

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- Tank maintenance
- Irrigation

Highlights:

Tank maintenance

Clockwise: Roof tanks, checking gutters, inside the underground tanks two arrangements for underground tanks, the hand pump (impulse)

A

- Monthly garden monitoring by Local facilitators
- Nutrition monitoring for volunteer vulnerable families

Highlights:
Garden Monitoring

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Table: Comparison of uptake of innovations introduced through gardening learning process in two different communities

INNOVATIONS	% uptake for Potshini (52)	% uptake for Moretele (43)
Trench beds	48%	93%
Liquid manure	16.4%	56%
Experiments	13.5%	39.5%
Mulching	21%	74.5%
Pest control brews	4%	65%
Run-on ditches	10%	35%
New crops tried (mixed cropping)	33%	58%
Windbreaks	4%	53.5%
Selling vegetables	23%	39.5%

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Impact of gardening

- Savings of R1,000 (22%) and more (21%) have been made
- Only learning group members have been selling vegetables. 63% (n=27).
- They have sold mainly cabbage, spinach and tomatoes (also green pepper, beetroot, carrots)
- Incomes of between R100-R300/season were realized
- 63% of members reported an increased ability to purchase things and save money (7%) *from Mudhara et al, 2008*

Impact on Nutrition

- 87.5% (n=27) of households reported better nutritional status in the household; variety, balanced diet, fresh food, don't get sick often, use less fat.
- Around 15% (n=19) are including nutritional aspects in their gardening; such as diversifying plantings of greens and inclusion of more legumes for protein.

–Nelisiwe's garden in Jan 2007

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Social Impact

- 92.5% of members felt that the project influenced how farmer groups operate;
  - Major changes were instilling of confidence, self-reliance, motivation and independence (54%)
  - Willingness and opportunities to share knowledge and skills (33.3%)
  - Provision of infrastructure and training (7.4%)

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Nutrition monitoring

Note: The dietary diversity of these families is very low. The addition of greens from a vegetable garden makes a significant difference

Table: Comparison of uptake of innovations introduced through gardening learning process in two different communities

Family 1; garden not productive yet	**Family 2; garden**	**Family 3: garden**	**Family 4; garden**
Tea for breakfast only	Mostly tea only for breakfast	Mostly tea only for breakfast	Mostly tea only for breakfast
Porridge 12x/7days	Mabele 15x 7 days	Porridge 16x/7days	Mabele 14x/7days
Maas 5x/7days	Milk 1x 7days	Maas 1x/7days	Maas 5x/7days
Potatoes 2x/7days	Bread 2x/7days	Soup 2x/7days	Rice 1x/7days
Soup 2x/7days	**Greens 9x/7days**	**Greens 3x/7 days**	Chicken 2x/7days
Meat 1 week /month for 3x/7 days)			**Greens 5x/7days**

Processes for Facilitators

What does a facilitator need to know and be able to do:

An intensive 3 day training and exposure visit

Taking part in an existing intensive food production training course; assisting with logistics and facilitation

A process of mentoring and follow-up which includes a planning and monitoring process of household visits

CINDI; 10 facilitators; Nov 2006- March 2007

World Vision; 20 facilitators – Sept 2007-May 2008

WRC; 3 facilitators;

Facilitators learn the basics of what they will teach, practically. Here they are doing a bottle test for soil types

The formal training courses

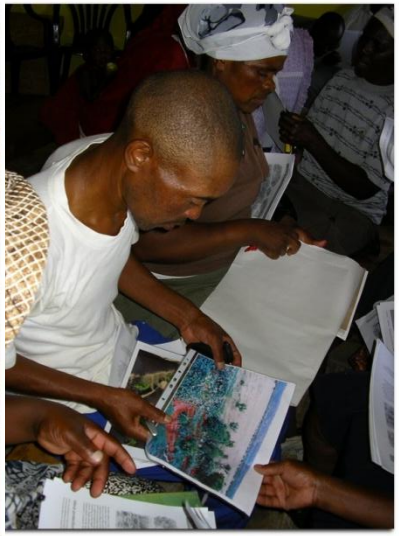
- UNISA: Piloting (NQF 5) Short learning Programme in Food Security (9 months)
- A module (or a number of modules) within an existing course design;
  - UNISA Higher Certificate in Food and Nutrition Security (NQF6)/ diploma – degree
- An elective within an existing higher education process;
  - UKZN Certificate in Education(Participatory Development) (NQF5)

Thabani Madondo in facilitation mode; Left; talking to the local high school and right dealing with the intricacies of group process facilitation

Application of the resource material

Food Security and Development Programmes

- *DWA homestead rainwater* harvesting subsidy, pilot programme (2009)
- Social responsibility programmes through mining sector and the CWP (Teba development) (2010-
- *KZNDAE&RD* – Food security programme (2009-2012)
- Limpopo Dept of Agric: Waterberg District; training of extension officers.



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Thank You

To the WRC, the communities that have participated and supported us and all the academic and institutional input, conversations and advice...