Module 1: Overview

Introduction to the Rainwater Harvesting and Conservation (RWH & C) Practices; Understanding different farming contexts; Using the Navigation Tool; Activity Systems and Learning Networks

Module 1, the first of three, focuses on the RWH&C practices, and how these practices are appropriate in different farming contexts. There are activities to help find more information on the practices by direct links to the website and using the Navigation Tool. The module closes with discussions on farming as an Activity System, and the value of Learning Networks. The module consists of this Overview, the Core Text and presentations, the WRC Resources relevant to this module, and the Assignment.

If you wish for certification in Stream 1 (at NQF level 6) you will be required to complete a written analysis of your existing curricula in relation to RWH&C and identify the information sources used to support the curricula. For Stream 2 (NQF level 5), if you do have involvement in RWH&C you will provide an analysis of the practices you are involved in, the partners you are working with, and the information sources you are using to support this work. If you are not currently involved in RWH&C you will conduct a survey among your local farmers to see what if any RWH&C practices they are using, where they learned about these, and whether they would be interested in sharing their knowledge on them.

Module 1: Core Text

1. The reasons behind 'Amanzi for Food'

There is increasing interest, in South Africa and globally, in the concept of food security and its importance for all human development. A reliable supply of good quality water is essential to growing food. South Africa is a waterscarce and water stressed country (DWA[F], 2000), with all of the available water resources already being allocated for different uses. This situation is likely to become even more serious as climate change and variability lead to reduced rainfall and increased temperatures, especially in the central and western areas of the country.

The main aim behind Amanzi for Food is to support everyone in the agricultural sector – including small-scale farmers and homestead food producers, extension workers, lecturers/trainers/teachers in agricultural

traininginstitutions (universities, colleges, high schools), etc. – to learn together about and implement different ways of harvesting, storing, and using rainwater according to their needs and contexts, to improve food production. This online course will draw mostly on two sets of key materials developed by the Water Research Commission (WRC):

1. Water Harvesting and Conservation (Denison et al.,2011) – **WH&C**
2. Agricultural Water Use in Homestead Gardening Systems (Stimie et al., 2010) – **AWHGS**

In addition, the course will introduce other WRC materials with connections to rainwater harvesting and conservation (RWH&C). Presentation 1.1 provides short summaries of all the key WRC materials – click on the box, below.

PRESENTATION 1.1: WRC MATERIALS – SUMMARIES

2.Rainwater Harvesting & Conservation practices in farming processes and systems

This Amanzi for Food Training of Trainers course is designed to strengthen your work in implementing and supporting RWH&C practices, or techniques, across a wide range of farming processes and systems. RWH&C is not an isolated activity, and should be seen as part of a range of activities that contribute to the production of food through a wide variety of different farming processes and systems carried out at different scales. These processes, systems and scales are shaped by market (and society) needs and demands, and by farmers' own ideas and aspirations, their capabilities, and their access to resources such as land, finance, labour and equipment. You need to understand the different farming systems that are being followed in your area, so that you can identify which practices might be most appropriate in your farming community.

Additional Information 1

Farming Processes and Systems

A farming process is the whole story from planning and acquiring all the necessary inputs for production to harvesting, consumption and selling the product to the consumer.

A farming system is the particular kind of farming for production of livestock, or crops, or vegetables or fruit. For example, livestock can be raised as 'free-range' in open fields, grazing on the grass and other vegetation, or 'housed' in special buildings and fed food concentrates. Vegetables can be grown in the open ground, or in plastic tunnels, or under shade-cloth.

Reflection Question 1

Ask yourself, or discuss with fellow farmers or colleagues: What different farming systems are found in this area, and who is involved in these (home/ homestead food garden producers, field crop small-scale and emerging farmers, commercial farmers):
-For livestock (including small livestock e.g. poultry)?
-For field crops?
-For vegetables?
-For fruit?
Record your answers in a table for future reference. This will be helpful when you work on your assignments.

2.1 The RWH&C Practices

RWH&C practices are the starting point for sharing information on RWH&C, as these practices need to be implemented in order to improve food security. It is important to establish which practices might be most appropriate for different farmers in your area, and which ones you might focus on in your work (as lecturers, extension officer, NGO/CBO trainers or farmers). You can decide on which might be appropriate given the different farming systems, the contexts, and the climate, soils and topography (shape of the land) of the area.

The course will help you find detailed information on all these practices from a variety of sources, including the WRC materials and the Amanzi for Food website. At different stages in the course text hyperlinks will be provided to take you to other resources where you will find further information on the topic being discussed.(You have already seen and maybe used one of these hyperlinks, taking you to Presentation 1.1.)

Amanzi for Food groups the practices described in the key materials into 4 categories:

1. General Activities (Skills) Applicable to and Underpinning Many of the Key Practices:

- Constructing and using ‘A-frame’
- Constructing and using a ‘line-level’
- Identifying soil types
- Calculating slope
- Establishing precipitation (rainfall) amounts
- Calculating storage requirements
- Calculating irrigation (watering) requirements

2. Collecting, Reducing Loss and Holding Rainwater (in the ground):

- Saaidamme
- Dome Water Harvesting
- Ploegvore
- Roofwater Harvesting
- Greywater Harvesting
- Fertility Pits
- Terraces
- Stone Bunds
- Swales
- Tied Ridges
- Gelesha / Infiltration
- Diversion Furrows
- Trench Beds
- Mulching
- Cover Crops
- No/Low Till
- Mechanised Basin

3. Storing Rainwater:

- Dams
- Homestead ponds
- Underground tanks
- Roof Tanks

4. Using Water: Simple Irrigation Practices:

- Drip/trickle Irrigation
- Buried pipes
- Spaghetti lines
- Sponge lines and string lines

Activity 1.1
Following hyperlinks to find more information

Each of the practices listed here (except for cover crops, no/low till, and mechanized basin) is hyperlinked to an information pack on the website. Then left clicking on the name of the practice on the website will take you to more information on the practice in different downloadable resources. These resources can include: info cards and handouts, with a few posters, and even some videos on a few practices. Try the hyperlinks on a few practices that look interesting, and see what you can find out about them.

3. Farming scales, farmers' aspirations and other factors

The choice of which RWH&C practice might be most appropriate will also depend to a large degree on the scale of any farming operation and on the farmers' aspirations. The scales and farmers'/homestead garden food producers'aspirations are often linked and are also often limited by other factors, especially access to critical resources such as land and finance.

Additional Information 2
Aspiration

Aspiration – ambition, desire (Oxford English Dictionary)
Here we can take it to mean the reason a person farms, the place farming has in their life, and how they wish to farm in the future.

3.1 Three scale bands

There is considerable discussion concerning how to define farming scales, and Amanzi for Food has decided to workwith three scale bands:
Umzi (garden/homestead/school) – Fundamentally subsistence level or school learning This is thesmallest scale band, and includes homestead gardens, shared community gardens and school gardens, with thefocus very much on production for own use. Areas involved are rarely more than 1ha.
Field (Small arable) – Small-scale commercial production. This mid-scale band encompasses larger sharedcommunity/co-operative gardens and dedicated arable plots, with the emphasis on production for incomegeneration, with some for own use, sharing and Generally areas of 1–2ha.

Farm (Large arable and livestock) – Full commercial production, and differing levels of (small and large) livestock Essentially focused on production for income generation. Generally areas of more than 2ha.

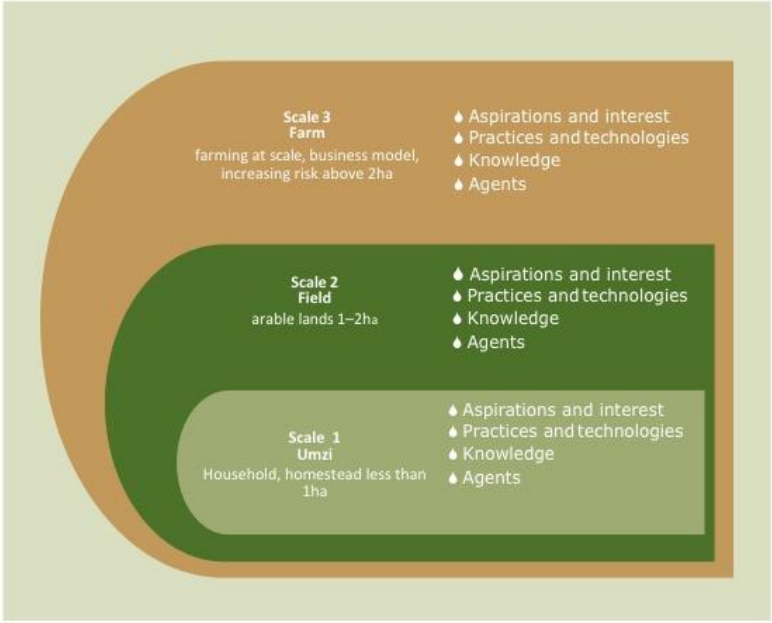
Additional Information 3
Scale 'bands'

The **scale 'bands'** indicate that there are a range of farm sizes and practices within each scale. There is inevitably some overlap between the bands. All farming activities fit within one or other of these scale bands.

Presentation 1.2 provides short case studies to illustrate each of the farming scales – click on the box below.

PRESENTATION 1.2: CASE STUDY EXAMPLES

Figure 1: The 3 Scale Bands



This approach identifies some clear connections between factors. By using these scales you can identify:

- Aspirations and interest – often with strong links to the scales,
- Appropriate practices and technologies;
- Required knowledge and skills; and
- Partners/agents (who needs to be involved, who can assist and support?).

3.2 Further contextual factors

In addition to scale, aspiration and/or style of farming, the identification of practices will need to take account of:

- Crop types – What types of crop do people want to grow? Which crops are suitable for different uses (subsistence use or commercial [market] use)?
- Ecotype – What are the geophysical, biological and climatic features of the areas under cultivation?
- Availability of financial and other resources

Other important factors to consider when deciding on appropriate practices are:

- The level of technology involved
- The levels of skill and knowledge required
- The financial cost

- The level of maintenance required

4. Selection of practices and selection of supporting information

4.1 The 'Navigation Tool'

The 'Navigation Tool' (which you can access by clicking on the heading) focusses on all these practices, and is designed for the purpose of helping in the process of 'navigating' into the key WRC materials and findinginformation relating to any of the practices you may be interested in. The information can come inany of three forms:

- as handouts (H)
- as case studies or stories (CS)
- as information in the text (T)

The Tool is arranged around four (4) different kinds of Activity or Practice associated with RWH&C:

- *General Activities (Skills) Applicable to and Underpinning Many of the Key Practices*
- *Collecting, Reducing Loss and Holding Rainwater*
- *Storing Rainwater*
- *Using Rainwater for Irrigating Crops*

The Tool also identifies the different levels of technology, skills and understanding, financing, and maintenance associated with each practice and defines the different levels as follows:

Low: Technologies – basic gardening equipment; Skills and understandings – as required for basic gardening; Cost R0 – R1000; Maintenance – none or one or two days a year, simple repairs	Technologies – simple testing or measuring kits, tanks, pipes; Skills and understandings – as required for small-scale business; Cost R1000 – R10,000; Maintenance – regular but infrequent checking/repair, 7 – 10 days/year, technical repairs.	specialised equipment (tractors, mechanical pumps, laboratories etc.); Skills and understandings – as required for professional specialists; Cost >R10, 000; Maintenance – essential regular and frequent checking and repair, up to 50 days/year, complex technical repairs
Medium:	**High:** Technologies –	

Presentation 1.3 provides guidance on using the Navigation Tool to find out more information on the RWH&C practices, and is linked to Activity 1.2 – click on the box below.

PRESENTATION 1.3: USING THE NAVIGATION TOOL TO FIND INFORMATION

Activity 1.2
Using the Navigation Tool to find more information on your selected practices.

Select a small number (4-6) practices which you believe might be useful in your farming context. Select at least 1 from each category. Guided by the Presentations find these practices in the navigation tool. First check that they are appropriate for the scale of farming and other factors (columns 2 and 4). If they are, look in column 5 where there is guidance on exactly where in which materials more information can be found.

4.2 Underpinning knowledge and skills'

This supporting information should include what is known as:

- 'Underpinning knowledge' – what we need to know in order to be able to do something
- 'Underpinning skills' – what abilities we need to have in order to do something.

Your next step is to identify the essential underpinning knowledge and underpinning skills needed for you to understand and implement the practices.

Activity 1.3

Identifying the Underpinning Knowledge and Skills needed for your selected practices

For each of the practices you have selected, and learned about in Activity 1.2, list the knowledge and skills which would be needed to implement them effectively. Once you have made the lists, see if you can find information on these, either through the Navigation Tool, or through going directly to the different WRC materials. Some of the information you found in Activity 1.2 may already include some of the knowledge and skills needed for the practices.

5. Small-scale farming as an activity system

Farmers do not act alone in their farming activities. They work with other people in different ways, with each having their own roles and responsibilities. Farmers also draw on information from different sources and use a variety of tools to help achieve what they want with their land. They are therefore involved in what is known as an Activity System.
Presentation 1.4 explains farming as an Activity System and provides an example of how to describe a farming enterprise as an Activity System – click on the box below.

PRESENTATION 1.4: UNDERSTANDING OUR FARMING AS AN ACTIVITY SYSTEM

5.1 Working and learning together across agricultural activity systems: The value of learning networks

In the areas in which the Amanzi for Food project has been working, it has been seen that one of the most effective ways in which farming activities (and activity systems) can be strengthened is through the development of learning networks. These bring together all the roleplayers, from farmers and farmer associations, extension services, education and training institutions, NGOs, and others to share their ideas and experiences, and support each other in their work.

Network members maintain almost constant communication via WhatsApp groups, where they can share their ideas and inform others of developments in their farming practices, notify each other of training opportunities or interesting articles they have come across in the media, or plan for meetings or other activities.

Members come together whenever they can to discuss issues of shared interest, or to support each other through lending their labour (for *ilimas*) and/or equipment to help develop new practices. In the case of the people involved with the Amanzi for Food project, it is often to implement new RWH&C practices. One key focus for these learning networks has been to support members in establishing Productive Demonstration Sites (more on these in Module 2), where they can share active RWH&C practices with other farmers and neighbours beyond the network.
Figure 2 shows how different members in the learning networks are connected around their shared interest in sustainable water use.

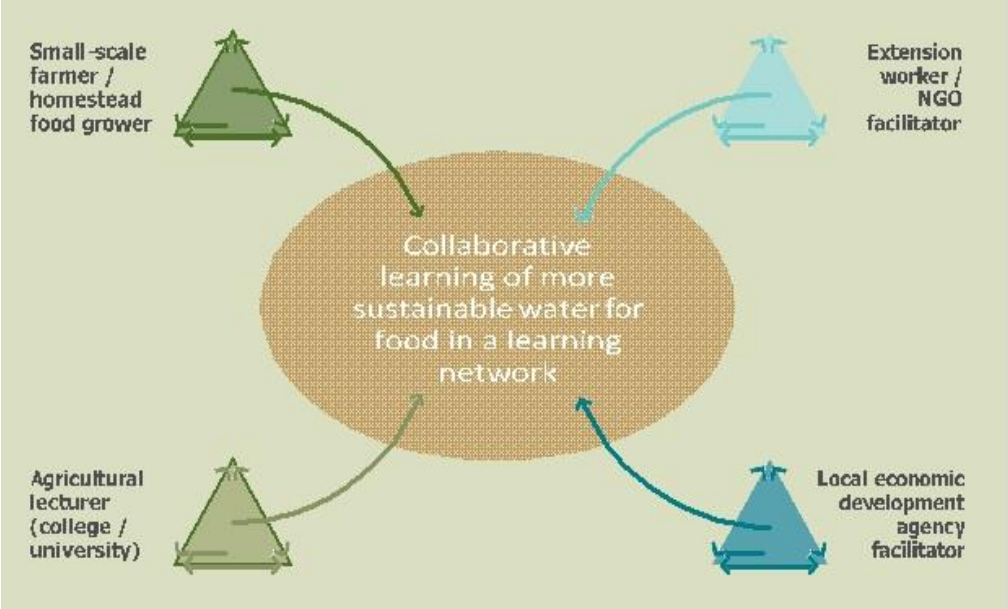


Figure 2: Collaborative Learning Model

6. Module 1 Assignments

As mentioned in the introduction to the course, certification, for those who wish to pursue this, is available at both NQF Level 6 (Stream 1 – primarily for professionals involved in the formal education and training sector – lecturers, teachers, senior extension officers/agricultural advisors), and NQF level 5 (Stream 2 – primarily for those involved in the informal training sector – NGO personnel, junior extension officers/agricultural advisors, farmers). It is entirely up to you at which level you wish to work, and this may depend on your specific work context or interests. It will be worth looking at all versions of the assignment before deciding on which one to go for. However, once you have decided on which Stream you wish to follow, you will need to stay with that Stream for all assignments.

To view and /or download the assingment click on the Next button, below.