Executive Summary

Introduction

The Umhlaba Consulting Group developed the comprehensive water harvesting and conservation learning materials package over the period November 2007 to March 2011.

The learning materials were developed within a 'training of trainers' framework targeting three user groups:
- learners at training organisations (this includes agricultural extension officers and rural development fieldworkers who will later work with gardeners and farmers),
- facilitators at training organisations who will be responsible for teaching the WH&C training course, and
- resource-poor gardeners and farmers who are the end users of the WH&C techniques.

It is important to note that the Comprehensive Learning Package that was developed under this project does not cover the crop production and agronomic elements that are essential for successful gardening and farming. The first part of the package is focussed specifically on the technical aspects of improving water availability in homesteads, gardens and fields, using water harvesting and conservation techniques. The second part of the learning package aims to equip fieldworks and extension officers with the facilitation skills needed to transfer the knowledge of these WH&C techniques to, and between, home-gardeners and farmers.

The materials therefore have useful application:

- EITHER with gardeners and farmers who already have crop production knowledge in which case the WH&C techniques will then help them increase their agricultural water quantity and security leading to improved production with reduced risks,
- OR where a parallel training programme is implemented with gardeners and farmers that is specifically focussed on food and crop production techniques.

Structure of the Learning Package

The package comprises three main parts:
1 A Technical Module covering water, soils and WH&C methods
2 A Facilitation Module covering facilitation techniques within a Participatory Innovation Development approach
3 A set of Farmers Handouts with illustrated steps on how to implement the methods.

Each of the technical and facilitation modules comprised two volumes. There is a detailed, annotated and illustrated manual for learners, and a Facilitation and Assessment Guide for course facilitators. These are set at the level of NQF 5 on the (new) 10 tier scale. The set of farmers handouts are designed for people with low literacy and are illustrated 'how-to' instructions for the water harvesting and conservation methods.

Stakeholder Consultation

It was a contract requirement that the materials be developed in close consultation with key stakeholders to ensure relevance of materials to likely organisations of learning, and to end-user needs. The project team consulted widely over the duration of the assignment and found that while there was consensus on the need and usefulness of the water harvesting and conservation learning materials package, there were widely divergent opinions in regard to accreditation pathways for the materials. Consultation included: AgriSETA, the Agricultural Colleges and some Higher Education Organisations (University of KwaZulu-Natal, University of Pretoria, University of Free Sate, Fort Hare University).

The outcomes from the consultation process were:
- There is marked positive interest in water harvesting and conservation and enthusiasm to have this new material embedded in existing and new courses.
- The Agricultural Colleges in particular expressed specific and immediate need, such that some are planning to use the draft materials in their 2011 curricula.
- Relevance of the materials (set at NQF 5) seems to be primarily at FET level and not HET level (NQF 6 and above).
- Colleges stated a need for assistance in restructuring curricula, both for existing courses, and establishing a new short course / skills programme (at 25 to 30 credits) using the entire set of development materials.
- A motivation for a training course for those lecturers/facilitators who would be responsible for facilitating WH&C courses was made as most lecturers did not have experience with WH&C and the experiential learning processes on which the facilitation course is structured.

Accreditation

The state of flux of the national accreditation framework, particularly the establishment of the Quality Council for Trade and Occupations (QCTO) over 2008-2010, and the termination of registration of new Unit Standards (2011) as reported by AgriSETA, presented an ongoing challenge to the accreditation framework for the materials. Given the uncertainty and the absence of consensus between key stakeholders, the learning materials were developed to allow future accreditation along Unit Standards lines, and within the QCTO framework.

The two courses comprise a total of 30 credits, which ties in well with the Quality Council for Trade and Occupations occupationally directed Short Courses (minimum 25 credits, with 30 credits being acceptable). The two WH&C facilitation and technical courses were written as an integrated package and are ideally run as a single course, which fits in well with the short course structure. The consultation with the Agricultural Colleges showed clearly that this arrangement would be most suitable to them.

The facilitation manual was also developed in alignment with the following Unit Standards:
- Qualification ID 59409: National Certificate in Agricultural Extension, NQF Level 5
- US 252476 (10 credits) Develop and implement an extension programme plan
- US 252474 (5 credits) Implement strategies for behaviour change.

The technical manual was developed in the absence of usable Unit Standards at a suitable NQF level (4, 5 or 6 on the newer 10 tier structure). There are only two possible Unit Standards relating to water harvesting, which are both at NQF 2. The Technical Guide has been prepared based on literature review, consultations and team assessment of what is needed to teach the key elements of water harvesting and conservation.

Future tasks which follow the completion of this assignment, in regard to accreditation are to identify the appropriate qualification and specialisation within the QCTO, and should these not exist at present, pursue the QCTO specialisation registration process. The specialisation would be achieved by successfully completion the WH&C short course set out in the comprehensive learning materials.

Development Process and Sources of Information

It was the intention from the onset of the project that no primary research and development of water harvesting and conservation methods would be undertaken, but that the learning package would be compiled from existing information. The materials were therefore developed from existing publications and other information in the public domain. The range of methods encountered and found to be applicable to South Africa are documented in Chapter 1 of the Technical Manual in a table of techniques and names. There was a set of primary references that were used to guide the selection of methods to be included, and on what nomenclature would be used. These are included in the References section of this Main Report. All sources of information both published

documents and from websites, have been carefully and accurately referenced at the end of each chapter in the manuals. Where information has been replicated without change in the guides, specific permission was requested and received in writing from the original authors or from the originators of video clips, and these written permissions are maintained in the project archive of the Umhlaba Consulting Group.

Piloting of the Learning Materials

The piloting of the materials was conducted over six months at the Centre for Adult Education at the University of KwaZulu-Natal. The piloting process was designed to maximise feedback by setting up a review process with feedback from:
- learners/ students
- facilitator/ trainer
- the project team
- UKZN (external examination of the learning programme).

The piloting was largely financed by project funds, in the form of payment of fees for 14 learners, payment of the facilitator's fees and financial support to fieldwork and practicals that were undertaken. Detailed weekly assessments from the facilitator provided a substantiated basis on which to finalise the guides. Feedback from the WRC Reference Group and internal team review completed the piloting and revision process.

Capacity Building

The nature of the assignment was that it was primarily a materials development exercise, requiring higher level professional input. There was little conventional research activity. However, capacity building was embraced as follows:
- 68 students from Walter Sisulu University Fine Art Department were financially supported (fieldwork exposure and competition funding) and directly involved in illustration of the guides.
- 14 learners at the UKZN Centre for Adult Education completed the full WH&C course (Technical and Facilitation components) during the pilot and graduated from the Centre with a Certificate in Development Facilitation.

Future Research

Preparation for knowledge dissemination: The purpose of the assignment was to create materials to further water harvesting and conservation education and practice. Three future activities, while not strictly 'research' can actively market and promote uptake in line with the primary objective of the assignment:
- Identify the appropriate qualification and specialisation within the QCTO, and should these not exist at present, pursue the QCTO specialisation registration process.
- Develop and roll-out to all of the likely learning organisations, a 3 day training of trainers course to prepare facilitators to present the course to learners.
- Explore and provide alternate motivations in relation the Department of Agriculture policy that Extension Officers may only study courses equal or higher than their existing qualifications as this will limit these people gaining the value of the WH&C course.

A South African WH&C Nomenclature: There are major inconsistencies in the terminology around water-harvesting and conservation in South Africa, also reflected in Water Research Commission publications. This results in confusion and misunderstanding. Colloquial terms such as 'run-on' water harvesting and 'in-field' water harvesting, have different meanings in the international domain and are not consistently used locally. It is warranted to develop South African terminology and align this, where practical with international norms, like the United Nations Food and Agriculture Organisation classification system described by Denison and Wotshela (2008).

Socio-economic assessments of WH&C: There are many documented methods of WH&C, with 13 of these included in the technical manual. To date, there is only one socio-economic assessment of one method that has been conducted in South Africa

(i.e. ‘infield water harvesting’). While this work shows positive returns and presents a strong motivation for implementation of that method, the results do not necessarily extend to other WH&C methods or initiatives. Decision-makers and funders are often reticent to fund ‘new’ technologies and thorough quantitative and qualitative socioeconomic assessments on a wider range of methods will provide stronger motivation.
Technical video on WH&C. A previous WRC assignment produced a 20 minute DVD which gave an overview of WH&C in South Africa. This low-budget documentary with a broad scope did not focus on technical details of the different methods. A technical DVD which provides specific how-to-do-it information on a range of methods would be a valuable asset to facilitators who will run the course at learning organisations. Such media would also be valuable to fieldworkers who will work with gardeners and farmers at village level.

Conclusion

The comprehensive learning materials package that has been developed meets an articulated need in the agricultural water sector. It has been structured to comply with both the Unit Standard and the Quality Council for Trade and Occupations accreditation frameworks. The draft materials were successfully piloted in a formal learning environment and were reviewed by seven agricultural colleges. The materials were found to be interesting, relevant and useful and there is significant interest to embed the materials into existing and new courses with immediate effect. The challenges that face a rollout are linked mainly to finalising the accreditation and materials registration process, to assisting learning organisations to modify their curricula and finally to establish a training course for facilitators at the organisations so that they can effectively implement the course.