



Assessment of the Liana Adult Education Package for Drylands of East Africa

**Pilot Training Amongst Form 3 Students
in Mwanga District, Tanzania**

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Contents

Acknowledgements	iii
1. Introduction	1
2. Account of Pilot Training	2
Practical Arrangements and Suitability of Schools	3
Attendance and Punctuality	3
English Language	3
Comprehension	4
Participation: Engaging Participants	4
Participation: Gender	6
Additional Practical Activities	6
Additional Participation Exercises	7
3. Assessment of Session Plans	7
3.1 Degradation	7
3.2 What causes land degradation?	8
3.3 Enclosures to protect and conserve	9
3.4 Agroforestry, an introduction	10
3.5 Conservation agriculture, an introduction; Conservation agriculture, an introduction cont.	10
3.6 What is an illness and where does it come from?	11
3.7 How to avoid many sicknesses	11
3.8 Latrines	12
3.9 How to examine a sick person	12
3.10 Some very common sicknesses and sicknesses that are often confused	13
3.11 Water Harvesting Session 1	13
3.12 Water Harvesting Session 2	14
3.13 Food and Nutrients	15
3.14 Preventing and Recovering from Disease with Nutrition	16
3.15 Nutrition for Mothers and Babies	16
4. Review of Additions and Facilitation	16
Community Health Survey	17
Rain-gauge construction and use of Rainfall Data	17
Enclosures: Practical Activities	18
Negating the 'Teacher-pupil' dynamic	18
Community Organising	19
Repeatability	19
5. Summary and Recommendations	19
Participants' Feedback	20
Key Recommendations for Extension	20
6. Conclusion	20
7. Bibliography of Additional Resources and Materials	21
Appendix I: Outlines of Proposed Introductory and Concluding Sessions	22
Appendix II: Sample Session Outlines for Additional Practical Activities	22
Appendix III: Rainfall Data: Mwanga District	24

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1. Introduction

The pilot study of the *Liana Adult Education Package for Dryland East Africa* was conducted with form three students at two secondary schools in Mwanga District – Jipe Secondary and Kwangu Secondary – between 20/04/12 and 16/06/12. Two sessions of 1 ½ hours took place weekly with each group - a total of sixteen sessions. In introductory sessions, both groups were given a choice of topics from the package to study; grouped thematically as:

- *Health, Medical and Hygiene*
- *Nutrition*
- *Environmental Care and Dryland Agriculture*
- *Water Harvesting*

Participants were invited to design the schedule of the course, and were informed of the content of sessions. They were invited to select two themes to focus upon but welcomed to cover any topic. Given the limited duration of pilot training, not all material could be covered (*Environmental Care and Dryland Agriculture* amounts to nineteen sessions in full). However, given the overlap between *Health, Medical and Hygiene* and *Nutrition*; and between *Environmental Care and Dryland Agriculture* and *Water Harvesting* – participants were able to design the schedule of the pilot training so as to prioritise particular elements whilst covering the four themes with sufficient breadth.

Participants at Kwangu Secondary opted to cover *Nutrition; Health, Medical and Hygiene* and *Environmental Care and Dryland Agriculture* – prioritising *Nutrition* rather than subsuming it within *Health, Medical and Hygiene*. Participants at Jipe Secondary opted to study methods of *Water Harvesting* (the first two sessions of the course), and to broadly cover *Environmental Care and Dryland Agriculture* and *Health, Medical and Hygiene*.

Section two of this report is a general account of the delivery of the pilot training and of practical issues which affected its success. It outlines additional activities and exercises which were included.

Section three reviews the session plans used by each group during pilot training in detail and discusses changes and additions made. No revisions to the learning material were made prior to sessions – only *ad hoc* changes to the material arising necessarily or circumstantially during sessions are described. Additional practical sessions were incorporated during the pilot, however, and these are outlined in section three. Additions and revisions were made according to the following criteria:

- The operating principles and purpose of Liana, particularly;
 - the ownership of development processes by local communities (in this case by participants)
 - the commitment to joint responsibility
- The three key goals of the *Adult Education Package*
 - to help people analyse their current development constraints and raise awareness of available current solutions that have been proved to work elsewhere
 - to encourage people to start looking at their surroundings with new ideas of how they could

shape them or cope with them

- to hopefully lay a solid foundation on which practical projects can later build in a truly participatory way enabling beneficiaries, through their prior knowledge and understanding, to contribute to and thus feel involved in and invested in

Further, in committing to these criteria it was judged necessary that, where possible, any revisions or additions to the package met the following conditions:

- Additional or revised activities must be repeatable with few or no externally supplied resources (to maximise the potential of the commitment to community ownership of development processes and to encourage participants to share knowledge beyond the course) -towards the end of the course it became clear that this commitment should not have be followed strictly, as section Four discusses
- Any revisions to teaching material must be sourced from readily and freely available resources

Section three forms the bulk of this report and, with section two, is intended to be duly thorough as a review of the teaching material. It is important to note that these sections are intended to be sufficient as a report independently of subsequent sections, which are comparatively brief, and offered as additional and hopefully useful resources for any extension of the *Adult Education Package*.

Section four is a more reflexive account of the additions made to the package and the effectiveness of facilitation. Its purpose is to give a more holistic image of the strengths of the session plans by discussing responses to issues which arose contingently or circumstantially during the pilot training. It is included with the intention of highlighting potential pitfalls which *do not* reflect faults in the session plans, but the correcting of which might enhance the value of the package to participants. For example, one significant issue which arose recurrently was the perception of a 'teacher-pupil' dynamic, particularly in early sessions. As this dynamic ran contrary to the three key goals of the package (by encouraging the mere memorisation of material, rather than its extension into the everyday lives of participants¹), steps were taken to counter its effect. These are expanded upon in Section Four, as their incorporation into the course was not the direct result of any issue with the teaching material.

A summary discussion of strengths and potential issues follows, including recommendations for any potential extension of the package; before a conclusion and bibliography of additional resources used. As practical activities were added to the package, sample session outlines showing these in tandem with original session plans are included as appendices.

2. Account of Pilot Training

A significant early challenge, and one which set the tone of the pilot training in general, was that of establishing the method of delivering a unique educational package in a school environment without the conventions of that environment limiting the participatory, comparatively informal and active design of the sessions. Whilst useful resources were sourced to deal with this issue, including literature in a Tanzanian context (see Bibliography of Additional Resources and Materials); it remained necessary to creatively adjust

¹ The disconnect between intellectual knowledge or familiarity with course material and its application beyond the classroom was ever-present in the course. In this report, 'intellectual knowledge' refers to capability with the material in theoretical or abstract terms, to distinguish from capability in acting upon, extending and applying that knowledge.

both the schedule (as section four discusses in detail) and the classroom conventions and environment at both schools, but particularly at Kwangu Secondary. The challenge of striking a balance between facilitating participatory activities and delivering intellectual knowledge defined the duration of the pilot training. It is in that context that the practical elements of the course are reviewed below.

Practical Arrangements and Suitability of Schools

Both schools were welcoming, and provided appropriately equipped classrooms and sufficient basic resources (clean blackboards, chalk, sufficient desks and chairs). Beyond the classroom, one significant advantage was Kwangu Secondary's 'school farm' area – a large stretch of grassland behind the main school building. The school had access to the area and staff and participants expressed excitement at the potential of the space but had no plans for its development. This presented an opportunity to conduct *Environmental Care and Dryland Agriculture* sessions in a very appropriate environment and in a suitably direct and practical style. A similar, but much smaller space was consequently designated for the same purpose at Jipe Secondary. In retrospect, the availability of both spaces was key to the delivery of *Environmental Care and Dryland Agriculture* sessions. It is worth noting that the availability of the 'school farm' at Kwangu Secondary was not discussed until the end of the third week of the course. Whilst this was early enough to utilise the space, the potential in the 'school farm' led to substantial changes in the schedule and content of the course (see section four) and as such a thorough initial appraisal of the school and its surroundings would have allowed for a more appropriate schedule design (appendix I proposes an outline of an introductory, participatory 'appraisal' of the learning environment).

Jipe Secondary - as a boarding school occupying a larger area – was better equipped with physical study aids to enhance interaction and participation. Participants were consistently able to use (and on occasion, break) everyday objects and tools with no objection from staff. This was significant when practical activities were added to sessions, as it allowed the commitment to local repeatability to be upheld.

With a higher degree of formality, and fewer resources at Kwangu Secondary, access to study aids was harder. Participants and staff were generally less willing for activities to take place beyond the classroom. Staff occasionally permitted participants to source objects from the surrounding village.

Attendance and Punctuality

With the exception of one week in which sessions at Kwangu Secondary were cancelled due to very low attendance (9/30 present) with no explanation, attendance was high at all sessions (above 25/30 in both groups). Classes did not consistently begin on time in either school, it was repeatedly necessary to wait for participants for up to twenty minutes, as they arrived from other activities. Sessions began over thirty minutes late on three occasions. Extra time was used after late-running sessions, but as sessions at Kwangu Secondary were held in late afternoons, it was not possible to continue beyond 6pm (an additional forty five minutes) to allow time for participants to travel home in daylight.

English Language

Conducting sessions in English was adequate. Initially participants in both groups seemed to be struggling to understand the sessions' content and delivery, but in the third week a significant improvement was noted in both groups. This improvement was accompanied by an overall sense of confidence and ease

in the groups (particularly Jipe Secondary), and was as such held to be superficial – the initial sense of a significant language barrier being more likely a sign of a lack of confidence. It was not necessary to adjust or 'dilute' any material as a result of language difficulties, but many terms required thorough explanations and definitions. Teachers were always available for Swahili and Kipare translations. Creative responses to language difficulties were judged to have the following advantages:

- Enhancing participation
 - In *Environmental Care and Dryland Agriculture* sessions, participants were encouraged to list the qualities and uses of plant species they could not name in English, often leading to discussions amongst the group as to the environmental advantages and disadvantages of species, and to highly participatory 'guessing games' to identify the species.
 - Where sessions touched on causes and cycles of diseases, unknown diseases could be identified by encouraging participants to draw cycles together on a blackboard, the entire group could be involved in the task of identifying the disease.
- Disrupting the 'teacher-pupil' dynamic by creating the opportunity for participants to educate the facilitator either:
 - in local language – taking a break from the session plan to compare relevant terms in English and Swahili
 - In local knowledge – for example, in session two of *Health, Medical and Hygiene*, participants at Kwangu Secondary encouraged the facilitator to eat very bitter leaves of neem (*Azadirachta indica*) whilst explaining their anti-malarial properties.

. A Swahili speaking facilitator may have been more able to intuitively create a relaxed atmosphere and to help conversation to flow; but on balance sessions conducted in English were by necessity dynamic, creative and participatory. Additional exposure to English is of course beneficial for participants broader educational needs.

Comprehension

There were very few issues with comprehension of material on an abstract or intellectual level. All participants were consistently able to discuss the material in the abstract, once language difficulties were overcome. This suggests that were the *Adult Education Package* repeated with young participants, no substantial revisions to the intellectual content of the material would be necessary, and that textbooks and other resources have been well sourced.

Participation: Engaging Participants

Facilitating the engagement of participants with sessions and course material was by far the greatest and most preoccupying challenge, and played out in two dimensions:

- Creating and sustaining interest in the material intellectually through adequately explaining its relevance in terms of livelihoods and development constraints; and through keeping non-practical, classroom-based activities dynamic and participatory
- Facilitating the motivation to implement and act upon knowledge gained in immediate and everyday

ways

The first of these dimensions was limited in both schools by the presence of teachers in sessions. At Kwangu Secondary, a staff member insisted on being present for the first four weeks of sessions. A marked difference in the level of participant's ease, confidence and engagement was noted in subsequent sessions. Whilst that staff member contributed helpfully and encouragingly to discussions and provided Swahili translations, their presence ultimately made participants less at ease, and ran counter to attempts to forego classroom conventions and formalities. At Jipe Secondary, a teacher was present for the first three weeks of sessions. Their rapport with participants and the school's comparatively relaxed atmosphere meant that their presence was less noticeably disruptive; but equally did little to enhance participant's engagement with the course. Further, whilst not overtly running counter to Liana's operating principles of community ownership of development processes and joint responsibility, contributions from school staff occasionally created the sense that such responsibilities are involuntary – which does not help to encourage participants and is perhaps not a message Liana would endorse.

It was always possible to work with staff at both schools with no ill-feeling; but were the *Adult Education Package* extended in similar environments, working without such authority figures present would be strongly advised.

Explaining the relevance of material to development constraints was made difficult at first through a lack of a thorough, local and personal understanding of those constraints. As participants came to discuss them openly once a rapport was established this was much easier, and some content was reviewed appropriately. Otherwise, local points of reference were used where possible. Appendix I outlines a proposed introductory session which collaboratively appraises and explores local development constraints.

Maintaining participation in classroom activities was a constant but not problematic issue. The dynamics of the two groups varied, and as such it was often necessary to engender engagement at Jipe Secondary through physical games or friendly conversation, and at Kwangu through asking for written rather than spoken answers to initiate discussions.

The second dimension was the more significant. With the package's key goal of “[encouraging] people to start looking at their surroundings with new ideas of how they could shape them or cope with them” in mind, it became clear that for many themes covered there was a disconnect between abstract knowledge and practical action. This remained an issue throughout. To give one example of many; participants at Kwangu Secondary were particularly familiar with the content of the *Health, Medical and Hygiene* sessions – such that explaining the importance of basic hygiene in preventing disease seemed uncomfortable and patronising. However, some hygienic practises and easily implementable provisions at the school fell below the high standard of which participants had demonstrated an awareness, leading to the participatory design and undertaking of a basic 'community health survey' as the first of some additional practical activities to emphasise the significance of community, participation and organising/cooperation to development. These elements formed the basis of all additional practical activities (the rationale of which is discussed below, and outlined in full in section four).

Participation: Gender

In the group at Jipe Secondary there was a stark gender difference in levels of engagement with the course material. The dynamic of the sessions was naturally dominated by an enthusiastic group of male participants – this was counteracted in part by assigning female participants leadership roles in group activities, and trying as much as possible to prioritise their contributions to discussions. This gender difference was not noted to have varied according to subject matter. In contrast, the group at Kwangu Secondary was divided according to quite predictable gender differences; male participants dominated discussions of *Environmental Care and Dryland Agriculture* and female participants led sessions on *Health, Medical and Hygiene*. It is conjectural, but tempting to suggest that this divide did not originate in the session material, but in the more formal and conventional educational atmosphere at Kwangu Secondary – the persistence of classroom conventions in the more theoretical sessions of *Health, Medical and Hygiene* may have favoured female participants. Those conventions did not apply in practical *Environmental Care and Dryland Agriculture* sessions which largely took place outside the classroom. Likewise, as some *Health, Medical and Hygiene* sessions are similar to a syllabus already in use at Kwangu Secondary, the female participants' higher academic ability may simply have been made more apparent by the material.

Additional Practical Activities

Additional, complementary practical activities were added to the syllabus in response to the perception of the disconnect between intellectual knowledge and its implementation in the everyday lives of participants. In line with the package's second key goal, which encourages participants to engage with their development constraints, it seemed helpful to incorporate activities which emphasised the value of community organising and teamwork. Whilst such activities fall short of motivating participants to organise independently, they are held to be beneficial in exposing participants to the possibilities of effective organising, and as repeatable frameworks for future action. Perhaps going some way towards spanning the divide between participants' intellectual and applied knowledge, additional practical activities were designed to complement participants at Kwangu Secondary's intellectual engagement with *Health, Medical and Hygiene* sessions, and participants at Jipe Secondary's particular interest in environmental issues. Activities were tried with both groups however.

Additional practical activities were:

- a basic 'community health survey', designed and implemented by participants
- the establishing of enclosed spaces for soil regeneration and participant-led conservation agriculture 'experimentation'
- the building of very basic rain-gauges and use of rainfall data for Mwanga District

Sustained engagement with these activities allowed a continuous theme of the value of community health and nutrition and their relationship with agriculture and joint responsibility to flow throughout the latter half of the course. This made the package's key goal of encouraging new ideas for engaging with development constraints easier to articulate. Further, these activities - being participatory by nature - lessened the 'teacher-pupil' dynamic of sessions as the enclosed space was used in tandem with the classroom.

Additional Participation Exercises

In addition to practical activities, more theoretical discussions of community organising and team-building methods were added to sessions. These were intended to complement intellectual material, as well as attempts to link knowledge to action that are included in the session outlines. Additional resources used - many of which were sourced from textbooks already included in the package - are referenced in this report's bibliography.

3. Assessment of Session Plans

Table 1 gives an overview of sessions selected by participants in chronological order. The subsection of this report in which each session plan is reviewed is indicated (for convenient reference, reviews follow the order in which session plans appear in the course outlines – circumstances required that the outlines could not strictly be followed chronologically).

Table 1. Sessions piloted.

School	Date	Session 1	Review #	Session 2	Review #
Kwangu	21/04/12	<i>Introduction and schedule design</i>			
Jipe	22/04/12	<i>Introduction and schedule design</i>			
Kwangu	27/04/12	<i>Environment 1</i>	3.1	<i>Health 1</i>	3.6
Jipe	28/04/12	<i>Environment 1</i>	3.1	<i>Water Harvesting 1</i>	3.11
Kwangu	04/05/12	<i>Environment 2</i>		<i>Health 2</i>	3.7
Jipe	05/05/12	<i>Environment 2</i>	3.2	<i>Health 1+2</i>	3.6/7
Kwangu	11/05/12	<i>Health 2/Nutrition Practical Session</i>	3.7	<i>Health 2/Nutrition Practical Session</i>	3.7
Jipe	12/05/12	<i>Health 3</i>	3.8	<i>Environment 3</i>	3.3
Kwangu	18/05/12	<i>Cancelled due to low attendance</i>			
Jipe	19/05/12	<i>Environment 3 cont.</i>	3.3	<i>Health 4</i>	3.9
Kwangu	25/05/12	<i>Environment 3</i>	3.3	<i>Health 3</i>	3.8
Jipe	26/05/12	<i>Environment 3 Practical Session</i>	3.3	<i>Environment 3 Practical Session</i>	3.3
Kwangu	01/06/12	<i>Environment 4</i>	3.4	<i>Health 4</i>	3.9
Jipe	02/06/12	<i>Environment 4</i>	3.4	<i>Water Harvesting 1 + 2</i>	3.11/3.12
Kwangu	08/06/12	<i>Nutrition 1</i>	3.13	<i>Nutrition 2</i>	3.14
Jipe	09/06/12	<i>Environment 5</i>	3.5	<i>Health 4 + 5</i>	3.9/3.10
Kwangu	15/06/12	<i>Nutrition 5</i>	3.15		

3.1 Degradation

In both groups, participants demonstrated a thorough, but possibly superficial knowledge of the causes of environmental degradation and its social impact. This knowledge was clearly drawn from school syllabi. At Kwangu Secondary, 'reafforestation' was repeatedly mentioned in discussions of the condition of the local environment, but participants were unable to expand on the meaning and practicality of the term, or even to give a basic definition. Similarly at Jipe Secondary, several participants mentioned 'the eruption of disease' as an outcome of degradation experienced locally – reference to such an indirect effect of degradation suggesting that this is a standard, intellectual answer and not one which indicates thorough and personal understanding. Both examples demonstrate the importance of avoiding classroom conventions in this session. School staff at Kwangu Secondary did not allow the session to be a field trip as the session plan suggests, citing limited time and no 'suitable environment' nearby. This meant that an informal and participatory learning style could not be introduced at this crucial, early stage. The session was held entirely

within the classroom, making the immediate, physical and personal effects of local degradation much harder to discuss.

At Jipe Secondary, the session was held outdoors, within the school grounds. This allowed the session to be much more 'hands-on'. It was necessary at times to return to the classroom for participants to write lists of the effects of degradation they had described, and to take notes and summarise the session.

The age and circumstances of participants made it impossible for them to describe even short-term changes in the local environment. Teachers at both schools claimed not to have been serving long enough to offer a description, but a teacher at Jipe Secondary offered a speculative description of how the area may have looked ten years ago; which, despite its potential inaccuracy, provoked a discussion which dominated the session.

Participants in both groups were unable to describe preventions which had been attempted locally, and the discussion turned to potential preventions and solutions, thus pre-empting the content of subsequent sessions. In repeating the course, it would be advised to merge sessions 1 and 2 of *Environmental Care and Dryland Agriculture* if possible, to limit the frustration of the two week interval between sessions 1 and 3, and to capitalise on the enthusiasm of participants (session 3 at Jipe Secondary began by reappraising the local environment, it would have been beneficial for this to have simply been a continuation of the previous week's session).

As a session which sets the tone and style of subsequent sessions, this session was not successful at Kwangu Secondary. Particularly with younger participants, it seems necessary to base this session outdoors. In addition, discussing the benefits of appraising and assessing the condition of land in the abstract may be useful as an introduction to the session – asking questions such as 'How do we begin to take control of the state of our environment?' and 'How should we measure environmental degradation?' helped to provoke discussions in which the value of observing the condition of land might be articulated explicitly.

3.2 What causes land degradation?

It is not necessarily an issue that this session covered very similar ground to the previous – session plans rightly describe the issue as complex and important, and requiring two sessions to discuss fully. In this session it became clear that there was a significant overlap between the content of both sessions, and the different angles of each (how degradation happens in the first, and why it happens in the second) were not sufficiently distinct to warrant their separation. Discussions in the first session had naturally turned to causes of degradation, and were allowed to flow in the interests of participation. This meant that this session was slower in style, as it covered familiar material.

The drawing of cycles of effect for causes of degradation was very successful with both groups, and was a technique with which they were evidently familiar. The blackboard proved more useful for this, as participants could more directly edit and correct one another's contributions. At Jipe Secondary, participants were encouraged to use props (soil, water, sticks and leaves to represent trees etc) to construct representations of cycles. This allowed the exercise to take place outside of the classroom.

3.3 Enclosures to protect and conserve

This session was a significant turning-point for both groups. Both groups identified local spaces which could be enclosed, and were keen to design and build enclosures. The identification of suitable spaces for establishing enclosures in both schools proved beneficial in allowing for additional practical activities and creating an alternative space in which the conventions of the classroom could be foregone. They also allowed participants to engage with the subject matter of *Environmental Care and Dryland Agriculture* in a direct and physical way. Subsequent sessions were facilitated in and around the enclosed spaces, as they provided a constant and immediate reference point for environmental issues and a relaxed space which participants had designed and built themselves.

At Jipe Secondary the session ran over three weeks. Initially, the session was cut short by the over-running of the previous session. The following week it was completed and participants chose to subsequently hold a practical session in which grass seeds and manure were collected from the local area and preparation of the enclosure began. The group at Kwangu Secondary had no practical session, but did begin to prepare the enclosed space outside of sessions.

Both groups were unfamiliar with the concept of enclosures, and the value and purpose of enclosing a space was difficult to communicate initially. Although participants at Jipe Secondary all engaged with the pamphlet *Enclosures to Protect and Conserve*, they recognised few of the grasses to which it refers and did not engage with the quite immediate possibility and simplicity of acting upon knowledge gained in the session. It was necessary to emphasise the value of sowing a variety of grasses, to counter the inference that only the grasses listed in the pamphlet are sufficient for land regeneration. Conducting the majority of the session within the space to be enclosed eased these communication difficulties, as participants could more easily visualise the finished enclosure. The enclosure at Jipe Secondary was designed in the space itself, with participants arranging themselves to mark boundaries and locate trees. It was only in summarising the value of enclosures (by revising the cycles of degradation's causes and effects) that it became necessary to return to the classroom.

An additional and unexpected element to the success of these sessions was the degree to which participants engaged with the idea of regenerated enclosures as controlled spaces in which they could later experiment with agriculture. The concept of enclosures made it easy to articulate the ideals of community ownership of development processes and joint responsibility. In extending the *Adult Education Programme*, it would be advised that these ideals frame the session. Telling participants that 'this is your space', in which development processes begin, proved a quite effective catalyst for activity.

Finally, it is worth noting that despite their enthusiasm, participants at Jipe Secondary initially misunderstood the theoretical content of the session; later choosing to slash and remove the pre-existing grass in their enclosed space and to plant various grasses in nine-seeded holes within the enclosure. The cause of this error is unknown, as participants demonstrated an intellectual and practical ease with the material by the end of the session. The content of the session was revised later, and whilst the health of the enclosure may have suffered, the participant's keenness to experiment and motivation is clearly more significant in terms of the package's key goals.

3.4 Agroforestry, an introduction

Whilst the discussion outlined in the teacher's manual for this topic was useful, both groups found agroforestry hard to grasp in the abstract. This is the one instance in *Environmental Care and Dryland Agriculture* in which revising session material would be advised. At Kwangu Secondary, some participants formed the impression that agroforestry is the intensive farming of trees, and participants in both groups struggled to see the distinction between agroforestry and tree-planting. As participants at Kwangu Secondary had engaged so effectively with conceptual cycles of causation in previous sessions, the idea of a crude 'symbiosis' between animals and trees was outlined as a cycle to explain the concept of silvipasture (and the effects of animals and trees upon land quality). Asking 'what do the animals do for the trees, and what do the trees do for the animals?' helped frame discussion around that symbiosis, and provided a conceptual foundation for outlining the principles of agroforestry. In repeating this session; beginning by drawing *fig.1* on page 16 of *Agroforestry in Dryland Africa* together with participants and introducing a discussion of the fundamental relationship between animals, trees and land quality would be advised. This would clarify the meaning and purpose of the topic.

Sessions with both groups were held in the classroom initially, before moving to the enclosed spaces. Attempting to introduce a practical or immediate element to discussions in the enclosed space at Jipe Secondary led to the repeating of the value of tree-planting from the previous session, and a failure to grasp the distinction between this and agroforestry. Speculatively, it may be easier to draw this distinction by discussing agroforestry practices in large-scale agriculture (whereas tree-planting is something anybody can and should do), before outlining progressively smaller-scale practices, to the level of the home-garden.

3.5 Conservation agriculture, an introduction; Conservation agriculture, an introduction cont.

These sessions were held consecutively in the final week at Jipe Secondary. They formed a very effective review of the *Environmental Care and Dryland Agriculture* course, as their broad subject matter touched upon many discussions from previous weeks. This was an opportunity to clarify and expand upon material from the entire course, and the session overran as a result.

As soil fertility is a recurrent issue in previous sessions, participants were well aware of its importance and the causes and effects of degradation. Articulating the three principles of conservation agriculture took some time; participants were invited to give examples and make comparisons to conventional agriculture for each, to ensure the principles were holistically understood.

The tables discussed in session plans proved useful. In addition, a table of 'A Year in Conservation Agriculture', showing each stage in the annual life of a farm, was filled in on the blackboard gradually throughout the first session. The group exercise in the second session worked well. In addition, cycles of causation were drawn collaboratively, showing the effects of conventional and conservation agriculture comparatively. Following this, conversation flowed naturally to the challenges of conservation agriculture. The final half hour of this session was a discussion of those challenges together with a review of the entire course.

These sessions are very effective as a conclusion and review of *Environmental Care and Dryland Agriculture*, and revisiting them at the end of the course would be advised. Additional time could be used to

tie in themes of joint responsibility for both environments and development processes (and the relationship between both), and ideas of community ownership. Alternatively, reviewing the topic of conservation agriculture at the end of the course could provide a bridge to a concluding session which reappraised the local environment and the community's role in its development (see appendix i).

3.6 What is an illness and where does it come from?

There was a clear distinction in the level of intellectual knowledge of this topic between the group at Kwangu Secondary, where the material seemed to strongly resemble a syllabus with which participants were familiar, and the group at Jipe Secondary for whom the content (including names of illnesses) was unfamiliar.

At Kwangu Secondary, participants were familiar and competent with the concept of cycles of disease, and drew these together in groups. Participants were similarly familiar with the classification of diseases. *Protozoa* had to be defined, this was done collaboratively with a staff member, drawing upon cognate Swahili terms of reference. These were also drawn on the blackboard. Viruses and bacteria were also drawn, but this led to unnecessary confusion as to their scale and perhaps should not be repeated. This aside, participants at Kwangu Secondary had such a sufficient intellectual knowledge of this topic that attempting to 'teach' it felt uncomfortable. Observation of the school environment and its facilities indicated a clear disconnect between this knowledge and its application however. It seemed helpful to frame discussions of the latter half of the session in the physical and direct terms of the local environment, asking broad questions such as 'how do you see where diseases are spread?' for example. Participation and enthusiasm were low at Kwangu Secondary, probably because the information was familiar and apparently abstract. As such the session became little more than an introduction to subsequent *Health, Medical and Hygiene* sessions, with the promise that due attention would be paid to practical and social effects of illness in subsequent sessions.

As participants were so familiar with the material, this session was ineffective and potentially unnecessary, doing little to tackle the *Adult Education Package's* purpose of instigating action. Because it was abstract and familiar, it created a conventional classroom atmosphere which had to be countered in subsequent sessions. At Jipe Secondary, however, intellectual knowledge of the topic was comparatively lacking and participants were comfortable and engaged. Framing the session as an assessment of local health (asking which diseases are particularly prevalent locally, what particular local factors are their cause) may be a solution to this potential issue; allowing new knowledge to be transferred when necessary, and linking the material to the practical realm otherwise. This would reframe the session as a 'development exercise' rather than a 'lesson'.

3.7 How to avoid many sicknesses

At Kwangu Secondary, this session was held in the week following *What is an illness and where does it come from?*, whereas at Jipe Secondary the sessions were held consecutively on the same day.

In both groups it was possible to cover the material in one session, explicitly making the link between avoiding individual diseases (as in *Where there is no doctor*) and general approaches to health (as in *Community health worker's manual*) in the middle of the session. The session plan is well designed, discussing cycles of disease at first before moving on to ideas of community health moves the session from

the abstract to the practical. The first practical exercise was effective, groups at Kwangu Secondary disagreed as to which household rules were most significant for health, provoking a debate that continued outside the classroom following the session. The exercise was also scaled up to the community level, with participants asked to list responsibilities (as distinct from rules) for community health and hygiene. They were then invited to design and implement a basic 'community health survey' to put this knowledge into practice (see section four). Participants engaged with the design of the survey, which was useful as an exercise in itself. Some participants at Kwangu Secondary carried out the survey. At Jipe Secondary the group chose not to, on the basis of the school's distance from the nearest village.

The session was useful in both groups in making the link between abstract knowledge and practical action. The lists of household rules created in the practical exercise became repeated points of reference in subsequent *Health, Medical and Hygiene* sessions.

3.8 Latrines

This session was comparatively problematic. Participants in both groups were able to independently describe the importance of latrines for health, and latrines were factored into cycles of disease from previous sessions to cement this knowledge. However, pre-existing knowledge of practical elements of the material was lacking, this made the session intensive and less engaging. At Kwangu Secondary, the final exercise had to be completed in the following session as outlining and explaining each type of latrine took an entire session. Participants at Kwangu Secondary were particularly interested in the practical issue of determining a safe distance of latrines from water-sources in various scenarios, but otherwise the session remained abstract and confusing and some participants perhaps struggled to see its relevance to development constraints.

The session plan is useful in recommending a focus on detail as bringing the material into the practical realm; but there is perhaps too much information to cover in a single session here, and maintaining interest in the details of each design is challenging. *Management of Solid and Liquid Wastes* is a useful and readable resource. The challenge of sharing its information effectively and efficiently may perhaps be met by making this session an appraisal. The disadvantages and possible negative health effects of existing latrines in schools and/or homes could be discussed, before the most appropriate alternatives are identified and planned using *Management of Solid and Liquid Wastes*. In this session as often similarly elsewhere, discussing the relative affordability of various latrine designs immediately made their possibility seem remote and subsequently abstract and uninteresting (it also significantly disrupted the flow of discussion). Asking 'what resources are available and where?' is a simple alternative that implies the immediate possibility of action.

3.9 How to examine a sick person

Of the *Health, Medical and Hygiene* sessions, this was by far the most successful. It very smoothly ties intellectual or theoretical knowledge of health and its visible, bodily signs. Contrary to the session plan's advice, cycles of diseases were not reviewed with the group at Kwangu Secondary. This had been done several times previously, and their knowledge was thorough. Instead, visual flow diagrams linking causes to symptoms of specific diseases were drawn collaboratively on the blackboard. The introductory exercise

outlined in the session plan was useful at Jipe Secondary however, as it established a good point of departure for discussing the process of examining a sick person. The session plan is perhaps lacking in not allowing the *purpose* of each step of diagnosis to be fully explored. Thus both groups were given the task of linking symptoms to causes using the diagrams from the previous exercise. This is time consuming, but makes it easier to link specific symptoms to specific illnesses where necessary. Thus it was easier to make the knowledge transferred more immediate and relevant to development constraints. These were presented as simple methods of confirming locally prevalent illnesses, rather than merely ways of examining somebody who is unwell.

More immediate practical knowledge was gained for both groups in this session than any other from *Health, Medical and Hygiene*. No props were taken to sessions in line with the commitment to repeatability outlined in the introduction to this report. This may have been an error and cause for an exception, as participants were already familiar with the method of detecting a fever without a thermometer; it would have been beneficial to have practically demonstrated the use of a thermometer and the precision it allows rather than outlining this in the abstract. Participants were all unaware of the method of taking a pulse – this in particular allowed for a highly participatory practical exercise at Kwangu Secondary, with the entire group joined in a circle taking one another's pulses.

The session was concluded by returning to the list of questions to ask in diagnosis as outlined on page 28 of *Where there is no Doctor*. It was useful to summarise by inviting participants to collaboratively identify the purpose of each question by referring to the cycles and diagrams of the introductory exercise, in so doing touching upon each stage of illness (from root cause through infection, diagnosis and treatment).

Overall, this session was very successful. If time was available for *Health, Medical and Hygiene* sessions to run their course, it would no doubt prove a very useful point of reference in the middle of the course. It would perhaps also provide a means of framing a concluding summary of the course's theme, as it so succinctly links theoretical and practical knowledge.

3.10 Some very common sicknesses and sicknesses that are often confused

This session was covered only briefly in some spare time following the conclusion of sessions at Jipe Secondary – mostly with the intention of allowing time to review health topics which had perhaps been overshadowed by the group's enthusiasm for *Environmental Care and Dryland Agriculture*. Time was insufficient for the practical exercises outlined in the session plan, and no false beliefs were revealed in discussing how to deal with symptoms. Some gaps in knowledge were clear however, and the exercise of assigning groups a disease for which to list symptoms and responses was useful: filling the knowledge gaps became a competition between groups.

It was difficult to draw the distinction between the content of this session and the previous, but this almost certainly was circumstantial, owing to limited time and the fact that the two sessions were conducted in quick succession.

3.11 Water Harvesting Session 1

This session was piloted with the group at Jipe Secondary, who expressed a particular enthusiasm for its subject matter. The session was problematic, and it is hard to distinguish errors in the design of the

session from environmental circumstances at Jipe. Whilst it was intended to be the first session of the course, it was abandoned shortly after beginning and postponed until rainfall data for Mwanga district was available. It was eventually held with *Water Harvesting Session 2* towards the end of the course. The session was initially abandoned as participants stated that no water harvesting method was appropriate or relevant to their constraints – they claimed there was a severe shortage of rainfall at Jipe, and that there were no riverbeds suitable for water harvesting nearby. Participants expressed no interest in water harvesting methods in the abstract, even when expressed as possible future options, and when it was clarified that no materials for harvesting water would be provided, the decision was reached to postpone the session. It was supposed that obtaining rainfall data for Mwanga district would allow a comparison between appropriate water harvesting methods of other villages to be made, and potential water harvesting options for Jipe to be explored as viable possibilities. Once data was obtained, it was necessary to incorporate a practical session in which a rudimentary rain-gauge was built collaboratively, as no data for Jipe was available. This done, the session ran relatively smoothly.

Participants chose to move the session during the introductory discussion, pointing out the water sources at the school (two small water tanks fed from roofs)². Participants were only able to describe advantages of these sources when prompted, and discussion did not progress beyond the disadvantage of the method's dependence on sufficient rainfall. Water harvesting methods were outlined in the classroom and designs were drawn on the blackboard. Ensuring that the methods were fully understood took considerable time. The session plan may be slightly sparse in this respect – additional activities expanding upon the advantages, context and detail of each design may be useful in future. Given the complexity and unfamiliarity of rock outcrop harvesting and harvesting from dry riverbeds, participants were given twenty minutes to study the manuals for these methods in two groups and to ask questions. Opinion in the group was divided as to which method would be most appropriate at Jipe Secondary. Many participants expressed the opinion that none of the methods outlined were appropriate, as rainfall at Jipe is perceived to be exceptionally low. They pre-empted the content of subsequent session plans by stating that exploring methods of conserving water and more efficiently managing its use would be more relevant. This is an outcome that should be encouraged, as it keeps the atmosphere of the session positive and productive; participants expressed no desire to explore water harvesting methods hypothetically. Other participants simply described water harvesting methods already in use at Jipe Secondary as the most appropriate.

It was very difficult to maintain enthusiasm amongst participants in this session. Its success seems limited by the local possibility of the water harvesting methods (including materials and expenses). One possible response to this may be to state in the opening discussion that effective water conservation and management are equally as valuable as water harvesting, and that these will subsequently be explored. This might allow the anticipation of locally-implementable solutions, and thus enthusiasm, to remain throughout the session.

3.12 Water Harvesting Session 2

In light of the lack of enthusiasm or perception of the local possibility of water harvesting methods in the previous session, this session was briefer than planned (40 minutes in total) and framed around

² It was later found that some additional water used at Jipe Secondary is sourced from rock outcrops

discussions of methods already in use at Jipe Secondary. Discussing harvesting from roofs in detail rekindled enthusiasm within the group to an extent. The session naturally moved beyond the classroom, to discuss and study existing water tanks and gutters at Jipe Secondary. This made outlining the different options within harvesting from roofs much more engaging for participants. Likewise, discussing the possibility of repeating or experimenting with designs was particularly engaging as existing tanks and gutters, with their disadvantages very visible, were an immediate point of reference.

Asking 'who could make these?' inadvertently introduced an enjoyable competitive element to the session, but little more. Participants likewise struggled to engage with discussions of the value of community/teamwork for these projects. These discussions were eventually moved back into the classroom, with participants asked to plan a community project, including assigning roles, on the blackboard. More than likely, participants did not engage with this discussion because their age and circumstances (as school boarders) prevented them from acting upon knowledge gained in this session, not because of a fault with the session outline. The challenge in repeating this session under similar circumstances would thus be to provoke that engagement. As competitive elements emerged within this session, a solution might be to split the group into teams, awarding 'contracts' to the most viable project designs. This would also holistically link the community organising element of this session to the practical.

There was a notable gender difference in levels of engagement with the material in this session – efforts should be made to positively encourage the contribution of female participants to discussions; if necessary by highlighting the importance of those elements of water harvesting projects beyond conventional male roles.

3.13 Food and Nutrients

This was a very successful session. Held only with participants at Kwangu Secondary, it provided a refreshing link between their proficiency with intellectual knowledge of health issues and practical implementation of that knowledge. There were no issues with the sensitivity of the topic – it was apparently sufficiently to maintain that ideals and targets, rather than immediately implementable actions, were being discussed. This was one occasion when Kwangu Secondary's classroom conventions may have been beneficial, as discussions were by default kept abstract.

Participants were aware of food categories and their uses, but there was some confusion as to the contents of categories. The first exercise of the session plan was very useful in this regard, and was revisited to assess and review new knowledge at the end of the session. Participants corrected errors in this exercise as a group, which became an enjoyable and participatory (if potentially insensitive) competitive process.

Participants were comfortably able to distinguish between an adult's nutritional needs and those of children, the additional needs of pregnant women and babies were also discussed. The only necessary deviation from the session plan occurred at this stage, when it became necessary to distinguish fibre and water from nutrient categories, highlighting their importance and recommended daily intake.

The task of creating meal menus was slow when attempted as a group, participants were thus divided into teams to design a day's worth of healthy meals (three balanced meals). The three colour system was very well understood, and was useful in completing and justifying answers in the exercise. Each team was asked to explain how the meal they designed was nutritionally balanced, allowing acquired knowledge

to be confirmed.

3.14 Preventing and Recovering from Disease with Nutrition

The purpose of this session was harder to articulate. It seemed necessary that the key point that nutrition is very significant as a foundation for the alleviation of development constraints (and thus should be prioritised) was repeated and returned to throughout. The cycle described in the lesson plan was useful, but took the majority of the session to explain and to explore in its complexity. Confusion seemingly arose through the incorporation of both social and physical elements in the cycle. Each stage was explained and discussed in detail. In retrospect, it may be simpler and more effective to create separate cycles for social and physical elements before combining them once holistic understanding seems assured. Participants could first draw cycles of the effects of malnutrition upon physical capability, before cycles showing the relationship between available money and nutrition. Outlining cycles of cause and effect proved a simple way of sharing knowledge throughout the course, but this task may have been overly complex.

The final discussion was held as a group, and was very useful in summarising this session and its links to the previous.

3.15 Nutrition for Mothers and Babies

This session was the final session at Kwangu Secondary. What was most striking was that the group knew the relevant information in its entirety, and no corrections were made. Likewise, potentially harmful false beliefs were discussed and participants were able to describe why they are false and what dangers they pose without prompting. The sensitive discussions with female participants described in the session outline were held whilst male participants were given an additional collaborative task facilitated by a staff member. This meant that all participants could remain in the same room, limiting disruption to the flow of the session and maintaining a relaxed environment. As a potentially repeatable addition, these 'teams' of female and male participants were maintained later, and a quiz held at the end of the session. The results of the quiz were fixed to give the lasting key message that when it comes to infant nutrition, 'women know best'. The session finished early, as no revisions or corrections needed to be made. A thorough discussion of locally common cravings during pregnancies arose following the session. This was encouraged as a useful way of locally contextualising the nutritional needs of pregnant women, and may be worth repeating.

4. Review of Additions and Facilitation

Additional activities were included in response to the perception of a disconnect between evident intellectual capability with the course material and the immediate, independent implementation of knowledge gained. The session plans were generally very capable in delivering intellectual knowledge, and the inclusion of these activities should not be considered a reflection on the session plans' effectiveness. It is more productive to identify weaknesses in the session's delivery and facilitation and in the circumstances of participants as causes. Further, it is important to note that the perceived failure to inspire direct action played out in the very short-term (the duration of the pilot training), and that longer term observation might more conclusively establish the necessity of additional activities in achieving the package's goals. The strengths and weaknesses of additional activities are thus reviewed here as example responses, should similar

circumstances arise and facilitators wish to act upon them. Revised, sample session outlines are included as appendix ii of this report.

Community Health Survey

This was included to complement *Health, Medical and Hygiene* sessions, in line with the package's goal of encouraging people to “start looking at their surroundings with new ideas of how they could shape them or cope with them”. Its rationale was to provide an experience, however basic, of easy and repeatable ways to “start looking”. The exercise was moderately successful with the group at Kwangu Secondary, where some participants chose to implement the survey. At Jipe Secondary participants were disinterested, claiming that the relative isolation of the school made the task too difficult.

The importance of, and mutual responsibility for assessing the health of developing communities was outlined following a discussion of the social and economic effects of good and bad health. Participants were invited to select significant criteria for assessing health, drawing upon material covered in the sessions, before appropriate and sensitive questions to ask were identified with some prompting. Participants at Kwangu asked three households each:

- How old are you?
- How old is the oldest person in your village?
- How many in your family?
- What illnesses have affected your family in the last year?
- Draw the latrine you use

Around half of the group at Kwangu Secondary produced results. The results of three participants who had evidently falsified the survey were discounted. The results of course fell short of an accurate or holistic impression of the health of the community, but helped to demonstrate the utility of quantifying even a basic impression.

It is worth noting that whilst participants engaged with the classroom-based task of designing the survey, its implementation was less popular. Participants were reluctant to implement the survey in their spare time. The activity cannot thus be called a success in facilitation – participants were not motivated to act independently. Better facilitation might at least make it a useful exercise in highlighting the utility of basic research design. Appendix ii outlines a session plan for the exercise with that in mind.

Rain-gauge construction and use of Rainfall Data

This activity was very successful; particularly at Jipe Secondary where the lack of an authoritative account of local rainfall shortage had postponed *Water Harvesting* sessions. Available rainfall data for Mwanga district was written on the blackboard and explained, and its value as a development resource was emphasised. Participants copied the data into exercise books. Very basic rain-gauges (a small bucket at Kwangu Secondary, and a modified washing powder container at Jipe Secondary) were made with materials from the schools, and placed on suitable roofs. This process was of course enjoyable and participatory. Facilitating a sense of ceremony was helpful in emphasising the key point that the combination of rainfall data and basic rain-gauge allowed a very approximate sense of the schools' relative rainfall to be gained,

and that this in turn would allow participants, even in the medium term (after one or two months data collection), to compare and contrast data and actively implement very localised approaches to agriculture on the basis of what succeeds or fails elsewhere in Mwanga district.

The key message of the importance of active experimentation was well received with both groups, and the sense of excitement and empowerment, particularly at Jipe Secondary, was perceived to be genuine³.

Enclosures: Practical Activities

This activity was designed with two purposes in mind:

- Encouraging the practical uptake of intellectual knowledge gained in *Enclosures to Protect and Conserve*, by implying that the activity was compulsory if necessary
- Creating a controlled environment to experiment with local approaches to agriculture, in combination with the continuation of rainfall monitoring from the previous activity

The key components of an effective enclosure were revised, with a focus upon the goal of regenerating and controlling soil fertility. Suitable spaces to enclose were then selected collaboratively before teams were formed to collect varied grasses and good quality manure from the local area. Participants were left to prepare the enclosures in their spare time. The group at Jipe Secondary made some practical errors in preparing their enclosure, but this seemingly did not affect their understanding of the key message of experimentation and taking control of the environment. As such, their enthusiasm and direct action were encouraged. Preparing the enclosed space in the middle of the course allowed subsequent sessions to be held in the area around the enclosed space, using the space as a continuous and immediate point of reference and often foregoing classroom conventions.

Following the two environmental practical sessions, it was necessary to emphasise the long-term nature of rainfall data and its application to experimentation in the controlled environment of the regenerated enclosed spaces. Participants understood that results would not be visible in the short-term, and that as little disruption to the enclosed spaces were necessary for their regeneration and preparation for experimenting. This naturally created a sense of anti-climax in both groups, which was actively countered by using potential future activities and uses for the spaces as points of reference in subsequent sessions.

Negating the 'Teacher-pupil' dynamic

Some quite direct approaches to engendering a sense of equality and facilitating participation were necessary. It seemed essential from the offset that avoiding the conventions of the classroom would be necessary if sessions were to inspire action. It was of course frequently necessary to deliver correct answers and authoritative advice in a more formal style, but the following general rules were necessary elsewhere:

- the exclusive use of first names, particularly in addressing the facilitator
- the facilitator's participation in practical activities
- creating opportunities for participants to educate the facilitator in local practices where possible

³ At time of writing, Jipe Secondary have reported no days of rain, one month since the activity. They are nonetheless continuing to record data.

- careful attention to body language and the physical conventions of the room, including facilitating sessions from a space in the middle of the group

These were naturally not always effective, but it would be recommended that these and other approaches to engendering a sense of equality were prioritised in extending the package. Fundamentally, the task of a teacher is to impart information which can be examined and assessed; whereas the scope of the facilitator of this package is perhaps broader and deeper – to share knowledge which encourages participants to act and think in new ways. In retrospect, whilst strong efforts were made to counter the 'teacher-pupil' dynamic, more could have been done to make sessions more personal. Sensitively keeping abreast of participants' personal circumstances where possible, and making session content relevant to those circumstances could be a powerful tool for beginning to engender equality.

Community Organising

Some additional content on the value of community organising was delivered, outside of session schedules. It was drawn mostly from materials already found in session plans (see bibliography) and delivered as discussions, with key points summarised. Participants at Kwangu Secondary expressed a strong interest in the principles of organising, but the attention paid to this topic may have been superfluous. In extending the package, it may well be sufficient to emphasise the value of effectively building and managing teams. The bibliography of this report offers some potentially useful material for this.

Repeatability

Practical activities and additional content in the pilot training were conducted with the intention of being as repeatable as possible with little or no external resources, so encouraging participants to share knowledge gained beyond the sessions. As much as possible, the blackboard and flipcharts were used with this in mind, rather than producing hand-outs. This also created more naturally participatory and collaborative sessions. However, participants from both groups requested photocopies from key textbooks towards the end of the course, and these were provided. In *How to Examine a Sick Person*, props were intentionally not taken to the sessions. Whilst this had the aim of encouraging participants to source resources locally, so that they could repeat the exercise elsewhere; an effect was that the accurate use of a thermometer could not be demonstrated practically (participants nonetheless demonstrated a good knowledge of healthy body temperatures and how to use a thermometer). This was regrettable, and arose through committing inflexibly to a general rule of ensuring repeatability. To maintain the quality of sessions, it would be advised to bear repeatability in mind as an ideal, and to act accordingly, rather than to rigidly follow a general rule.

5. Summary and Recommendations

It is very encouraging that there were no significant issues with the intellectual content of the course. Amongst young people, the material was comprehensible and it was possible to maintain engagement with it, through creative facilitation where necessary. Course material is generally well selected and resources naturally engender comprehension. Material for *Health, Medical and Hygiene* sessions particularly required little explanation, and discussions flowed naturally (in the case of the group at Kwangu Secondary, the

material was overly familiar). Sessions were generally well designed so as to run on schedule, and to make the facilitation of active participation possible without significant deviations from the session plans. Participants generally engaged with sessions intellectually, when facilitation was adequate – from this it can reasonably be inferred that the material bears sufficient relevance to their development constraints. Engagement is clearly key, however, and as such the success of the package depends upon recognising and articulating its relevance to local and personal development constraints.

Most challenges were circumstantial, and did not reflect faults in the session plans.

Participants' Feedback

Two female participants from Kwangu Secondary were invited to offer feedback and recommendations for future extension of the package amongst young people⁴. Their responses were certainly offered through politeness or a sense of obligation, but the following recommendations may nonetheless be of interest:

- covering methods of community education
- more physical resources in sessions
- sessions on access to media, networks/organisations and wider resources

The final two recommendations could certainly be implemented within the current scope of the package, with adequate facilitation.

Beyond minor revisions outlined in reviews of session plans, the following are more holistic recommendations for the course.

Key Recommendations for Extension

- the inclusion of introductory and concluding sessions, in which local development constraints are collaboratively explored and appraised, thus clarifying the purpose and setting the tone of subsequent sessions
- using one or more ongoing practical activities (in this case, rainfall monitoring and enclosure preparation) to make thematic continuities in the course explicit
- making continuities in intellectual content of the course explicit, through providing an overview document for each participant, mapping the key themes of the course
- holding sessions outside/away from classrooms or environments with similar conventions, where possible

6. Conclusion

Two of the key goals of the *Adult Education Package* were reflected upon recurrently during pilot training:

- to help people analyse their current development constraints and raise awareness of available current solutions that have been proved to work elsewhere

⁴ They were invited only to discuss the delivery of the package, and crucially not the relevance of its content to their development constraints, which is beyond the remit of this report.

- to encourage people to start looking at their surroundings with new ideas of how they could shape them or cope with them

The balance of intellectual and practical knowledge thus emerged as a defining issue, and effective facilitation of the package certainly could engender a complementary relationship between the two. The question that remains however, is how the success of the package in delivering those aims is measured. If success requires that participants are independently analysing and acting upon development constraints, a stronger focus upon practical activities may be necessary. If success amounts to the thorough understanding of development constraints intellectually, this may not be so. The scope of the *Adult Education Package* is sufficiently broad, and its sessions well designed, that prioritising the practical or the intellectual within sessions is possible. Repetition and extension of the package will perhaps lead the package's design in one direction or the other.

Finally, it is worth reporting that the intellectual capability of this pilot training's young participants was consistently underestimated in the first half of the course. The package will perhaps work most effectively, and most compatibly with Liana's operating principles, when it supports, and crucially recognises and acknowledges the innate capabilities of its participants.

7. Bibliography of Additional Resources and Materials

Rain-gauge Construction

At time of writing, no authoritative resource on rain-gauge construction, particularly in an East African context could be sourced (some of the best were found by searching <http://www.youtube.com>).

There are several easy to follow plans at <http://www.ehow.com>

Community Organising and Participation

GTZ Sustainet (2006) – *Sustainable Agriculture: A Pathway out of poverty for East Africa's rural poor. Examples from Kenya and Tanzania*
Eschborn: Deutsche Gesellschaft für Technische Zusammenarbeit, chapter 5

International Institute of Rural Reconstruction (2005) - *Conservation Agriculture: A manual for farmers and extension workers in Africa*
Nairobi: International Institute of Rural reconstruction, chapter 13

International Institute of Rural Reconstruction (2002) – *Managing Dryland Resources*
Nairobi: International Institute of Rural reconstruction, chapter 6

For a thorough and readable guide to some basics of community organising approaches and understanding organisations in theory: <http://www.barefootguide.org>

A good and freely available overview of themes and approaches to participation: FAO Regional Office for Asia and the Pacific (2012) – *A Handbook for Trainers on Participatory Local Development* available online from the *corporate document repository* at <http://www.fao.org>

Appendix I: Outlines of Proposed Introductory and Concluding Sessions

Introduction

The purpose of this session is to contextualise and set the tone of the course. Begin by outlining the key goals of the package and explaining their utility in tackling development constraints. Discuss with participants the importance of observing and analysing their development constraints. The key theme is empowerment: Ensure there is an adequate understanding that observing the local environment is an initial step towards ownership of its development process.

If possible, have participants guide you around the local area, noting development needs in terms of the themes covered by the course (remember that many will not be visible, but use the environment as a prompt) and the ways in which they are linked: How does agriculture affect nutrition? How does sanitation affect health? Etc. If a tour of the environment is not possible, participatory mapping can be a good exercise. Have participants collaboratively draw a map of the area on a blackboard or flipchart, marking development needs and connecting them visually. Information collected in these exercises should allow the facilitator to locally contextualise information in subsequent sessions, and set the participatory and collaborative tone for participants. As such, there is little harm in prompting or guiding the discussion of development needs. What is important is creating points of reference for later sessions.

Next, introduce the content of the sessions and facilitate the design of the schedule of the course according to the needs and challenges revealed in the exercise.

Conclusion

This bulk of this session should be a review of the course, focusing not on details of knowledge gained but on its thematic continuity. Repeat the tour from the introductory session, asking participants what actions they might take and what changes they could practically make to their environment and behaviour. Perhaps end with a final discussion of empowerment and community ownership of development processes. Do participants feel capable of enacting the practical knowledge gained? What steps could they take to begin to put ideas into practice? Rhetorically, how do you measure if a community owns development processes?

Appendix II: Sample Session Outlines for Additional Practical Activities

Community Health Survey

Begin by revising the fundamentals of community health, and its key signs. As a bridge to the design of the survey, ask how you measure the health of a community, and discuss responses.

Have participants choose key community health criteria. Some from Kwangu Secondary were:

- Prevalence of diseases
- Life expectancy
- Family size
- Latrine quality and sanitation

Next, collaboratively design questions which will succinctly (and tactfully) begin to give an image, however basic, of the reality of the criteria. Designing these questions with sufficient tact may need extra input from the facilitator. Given that results will not give an accurate image of community health, it may be helpful to design questions with broad geographical scope (How old is the oldest person in the area? How big is the

biggest family you know?). With relevant permission and means, participants could conduct the survey with 3-4 households, perhaps family members or friends would be most appropriate. If undertaking the survey is impossible, its design may still prove a valuable theoretical exercise.

Building a Rain-gauge and using rainfall data

First, list the area's rainfall data and ensure that some participants have made copies (alternatively provide photocopies). Ensure that the group understands what it represents.

Explain that a rain-gauge will allow the group to establish their area's place amongst the rainfall data, and that this in turn will allow them, eventually, to compare approaches to agriculture regionally (what grows well, where? What adaptations are made where?).

Next, discuss the ideal specification of a home-made rain-gauge (see bibliography), before explaining the utility of even the most rudimentary container. Even the most approximate image of rainfall levels is far better than none, and the key point to emphasise is that in constructing the rain-gauge, participants are beginning to take control of a development process. One or more volunteers can source suitable materials at this stage, whilst others find a suitable location. Once the rain-gauge is installed, assign responsibilities to one or more volunteers for:

- collecting, emptying and measuring rainfall
- recording data
- comparing data regularly to the wider region

The practical element of the session should be highly participant-led, and enjoyable. A sense of ceremony is perhaps appropriate to emphasise that this can be the beginning of a process of engagement with development.

Enclosures: Practical Session

This session is simply to complement *Enclosures to Protect and Conserve*, and may only be worthwhile if an appropriate space is available. Following the session, collaboratively choose an area to enclose, discussing the pros and cons of larger and smaller spaces, as well as the necessary components of the enclosure. Participants can establish its boundaries by arranging themselves in larger or smaller squares until an appropriate size is reached.

Split participants into two teams, one to source a variety of grasses from as far afield as possible, the other to carry out other preparations (perhaps sourcing manure, beginning to prepare the boundaries of the space). It may be appropriate to frame subsequent *Environmental Care and Dryland Agriculture* sessions around the enclosed space – if so, emphasise that 'the enclosure is the classroom' – and will become a new space for experimentation.

Appendix III: Rainfall Data: Mwanga District

NYUMBA YA MUNGU DAM STATION (LOWLAND ZONE)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Annual Total
1977	34.9	62.4	38.8	90.5	5.0	11.3	0.0	8.1	17.2	87.4	35.9	64.6	456.1
1978	124.2	51.1	177.3	113.9	21.9	10.6	0.0	0.5	0.0	27.0	117.0	150.8	794.3
1979	79.1	73.8	53.3	176.7	112.8	28.4	8.3	0.0	0.8	1.5	18.0	31.6	584.3
1980	63.5	15.5	64.2	77.3	6.4	0.0	0.0	23.4	0.0	77.7	17.3	21.8	367.1
1981	5.0	0.4	104.5	82.9	42.0	0.0	47.0	5.0	3.5	40.9	37.8	34.1	403.1
1982	0.0	12.9	7.3	76.4	102.0	11.2	0.0	2.7	12.3	145.8	137.5	90.8	598.9
1983	7.1	28.3	59.3	10.8	13.5	7.5	7.1	0.0	0.0	1.9	9.0	53.6	198.1
1984	29.8	0.3	25.0	101.9	10.0	9.6	1.0	0.0	0.0	5.5	76.8	72.2	332.1
1985	13.0	91.4	29.9	39.2	84.0	0.0	0.0	0.0	0.1	37.4	59.3	13.1	367.4
1986	108.5	1.0	41.4	31.7	66.8	20.7	1.0	3.3	0.2	64.2	36.5	35.0	410.3
1987	43.7	1.3	12.8	66.0	81.8	0.0	0.3	13.8	0.0	0.0	2.3	9.9	231.9
1988	42.8	27.5	133.5	76.6	5.8	3.6	0.0	5.2	16.8	23.0	50.4	23.7	408.9
1989	61.2	26.4	50.9	164.2	11.5	0.0	0.0	22.0	0.7	43.1	23.2	55.2	458.4
1990	54.7	24.9	188.5	59.0	9.1	0.0	3.1	0.0	0.0	12.0	39.3	19.4	410.0
1991	7.7	2.5	35.3	29.9	56.2	0.0	1.0	2.8	0.0	0.4	24.1	26.9	186.8
1992	0.0	18.9	33.3	36.3	47.5	3.5	0.0	0.3	0.0	5.8	20.4	80.0	246.1
1993	143.5	67.0	47.3	25.6	31.0	0.0	0.0	0.0	0.0	17.3	7.2	0.0	338.9
1994	8.8	22.5	66.7	115.1	63.9	0.0	0.0	0.0	0.3	19.8	12.0	92.3	401.4
1995	17.0	23.0	147.7	68.1	31.0	0.0	9.5	0.0	0.0	24.8	6.4	1.0	328.5
1996	61.8	63.5	53.7	68.1	40.0	0.0	0.0	0.0	0.0	72.4	0.0	0.0	359.5
1997	10.0	0.0	0.0	0.0	30.3	26.2	0.0	0.0	0.0	58.4	106.1	107.8	338.8
1998	198.4	127.8	32.1	18.0	0.0	114.3	0.0	141.5	0.0	0.0	0.0	0.0	632.1
1999	0.0	0.0	24.8	33.8	0.0	0.0	0.0	0.0	10.0	0.0	0.0	15.7	84.3
2000	0.0	18.0	8.0	8.0	0.0	0.0	0.0	0.0	29.2	0.0	0.0	0.0	63.2
2001	35.0	0.0	10.0	30.8	0.0	0.0	0.0	0.0	0.0	12.0	0.0	32.0	119.8
2002	0.0	28.0	10.0	18.0	0.0	0.0	0.0	0.0	28.0	57.0	26.0	23.0	190.0
2003	13.0	17.0	54.0	40.0	16.0	0.0	0.0	0.0	0.0	0.0	30.0	0.0	170.0
2004	50.0	15.0	19.0	0.0	0.0	0.0	0.0	0.0	5.0	10.0	27.0	40.0	166.0
2005	4.0	0.0	25.0	61.0	34.0	0.0	0.0	6.0	0.0	23.4	14.3	0.0	167.7
2006	7.4	6.6	119.6	110.6	10.1	2.8	6.0	0.0	30.7	38.4	80.7	137.8	550.7
2007	0.5	43.5	41.5	65.2	16.6	10.0	3.8	26.0	0.0	22.9	18.5	43.1	291.6
2008	6.5	36.6	218.7	43.1	4.6	0.5	0.0	0.0	17.3	4.9	36.9	0.0	369.1
2009	23.9	2.6	1.3	19.2	29.7	9.8	0.0	0.2	0.0	23.8	33.6	34.3	178.4
2010	64.6	15.9	44.6	210.8	21.6	0.7	0.0	0.0	1.3	0.4	40.2	13.0	413.1
Average	38.8	27.2	58.2	65.7	29.6	8.0	2.8	7.7	5.1	28.2	33.6	38.9	341.7

SOURCE: PANGANI RIVER BASIN AUTHORITY

SHIGATINI PRIMARY SCHOOL STATION (MIDLAND ZONE)

No. OF DAYS	1996		1997		2006		2007		2008		2009		2010		2011	
	AMOUNT (mm)	No. OF DAYS	AMOUNT (mm)	No. OF DAYS	AMOUNT (mm)	No. OF DAYS	AMOUNT	No. OF DA	AMOUNT	No. OF DA	AMOUNT	No. OF DA	AMOUNT	No. OF DA	AMOUNT	No. OF DA
1	5.5	1					70.4	3			34	4	123.5	8	29.8	3
4	65.7	4					212.68	8					13	2		
8	133.6	8					339.4	9					193	6		
10	53.1	8					543.64	20			185.5	7	277	6		
11	128.7	10					386.48	10			80.5	8	106	10		
0	0	0					53.5	6			59.6	8				
0	0	0					26.4	3			4.5	1				
0	0	0					75.9	2			5	4				
0	32.4	5					120.7	2			2.2	1				
0	0	0					5.4	1			77.8	7				
11	82.5	9					327.5	7	157.5	5	446	11				
0	0	0					191.6	6	121.3	4	257.8	15	153.1	5		
45	501.5	45					2353.6	77								

SOURCE: SHIGATINI PRIMARY SCHOOL MET STATION

MALIASILI RAINFALL STATION (LOWLAND ZONE)

YEAR	1986		1987		1988		1989		1990		1991		1992	
	AMOUNT (mm)	No. OF DAYS	AMOUNT (mm)	No. OF DAYS	AMOUNT (mm)	No. OF DAYS	AMOUNT (mm)	No. OF DAYS	AMOUNT (mm)	No. OF DAYS	AMOUNT (mm)	No. OF DAYS	AMOUNT (mm)	No. OF DAYS
JANUARY	0		22.5		12.5		59.3		47.6		61.4		0	
FEBRUARY	0		3		12.1		12.8		32.1		3.9		186.4	
MARCH	18.3		27.7		290.6		43.4		167.8		50.6		102	
APRIL	92.1		172.5		241.3		208.3		219		92.4		57.09	
MAY	138.7		75.5		15		37.8		15		100.3		146	
JUNE	0		0		0		0		0		0		0	
JULY	0		0		0		0		0		14.4		0	
AUGUST	12		40.9		16.3		0		0		0		0	
SEPTEMBER	0		0		28.1		0		0		0		0	
OCTOBER	30.3		4.6		0		21.2		33.4		53.2		27.5	
NOVEMBER	119.4		115.3		221.2		141.3		141.1		48.4		237.8	
DECEMBER	51.7		46.9		165.4		194.3		96.6		191.6		321.5	
TOTAL	462.5		508.9		1002.5		718.4		752.6		616.2		1078.29	

2001		2003		2004		2005		2006	
AMOUNT (mm)	No. OF DAYS	AMOUNT (mm)	No. OF DAYS	AMOUNT (mm)	No. OF DAYS	AMOUNT (mm)	No. OF DAYS	AMOUNT (mm)	No. OF DAYS
118	4	19	3	91	9	24	2	32.5	4
9.1	1	23	5	58	7	13	3	40	4
42	3	44	3	60.5	7	55.3	11	139.5	15
181	13	87	7	136	9	76.5	14	364	21
21	2	80	15	2	1	54	7	70.5	11
10	1	10	2	16.5	4	8	4	8	2
0	0	0	0	1	1	2	2	4	1
0	0	9	3	0.5	1	30	3	6	2
0	0	0	0	0	0	3	1	12	2
0	0	10	1	68	8	9.5	4	69	8
189	7	64	8	85	8	134.5	12	135	14
20	2	87	6	109	10	33	5	252.9	15
590.1	33	433	53	627.5	65	442.8	68	1133.4	99

2007		2008		2009		2010		2011	
AMOUNT (mm)	No. OF DAYS	AMOUNT (mm)	No. OF DAYS	AMOUNT (mm)	No. OF DAYS	AMOUNT (mm)	No. OF DAYS	AMOUNT (mm)	No. OF DAYS
31.8	5	11	4	26	3	64	5		
30	5	86.4	7	20	1	14	1		
74	17	372	16	89	4	100	7		
54	8	55	8	43	6	163	17		
87	9	30	5	18	3	50	12		
13.5	2	0	0	27	5	5	1		
2	1	0	0	0	0	0	0		
22	6	0	0	2	1	0	0		
0	0	0	0	0	0	3	1		
8.5	2	12.6	3	72	10	0	0		
103.5	8	244	15	256	9	61.5	8		
224	13	22	3	251	10	44.2	6		
650.3	76	833	61	804	52	504.7	58		

SOURCE: MALIASILI MET STATION

Kisangara Sisal Estate

YEAR	2007		2008		2009		2010	
	AMOUNT (mm)	No. OF DAYS	AMOUNT (mm)	No. OF DAYS	AMOUNT (mm)	No. OF DAYS	AMOUNT (mm)	No. OF DAYS
JANUARY	60.9	7	0	0	42.9	4	66.1	5
FEBRUARY	54.2	6	66.9	7	49.2	2	9	1
MARCH	60.3	14	120.3	12	45.7	8	181.3	9
APRIL	76	8	52.6	11	65.5	7	137.1	14
MAY	35.4	7	13.5	4	19	4	42.5	7
JUNE	2.2	1	5	2	7.9	2	5.3	2
JULY	0	0	0	0	5.7	1	0	0
AUGUST	8.2	1	0	0	0	0	0	0
SEPTEMBER	0	0	9.5	2	0	0	0	0
OCTOBER	12	2	28	2	70.2	9	1.5	1
NOVEMBER	72	6	135.25	10	229.9	8	108.15	9
DECEMBER	128.3	10	46.5	3	154.6	11	107	8
TOTAL	509.5	62	477.55	53	690.6	56	657.95	56

Source: Kisangara Sisal Estate MET Station

MWANGA DISTRICT COUNCIL STATION (PLAINLAND ZONE)