Everything You Ever Wanted to Know about Sweetpotato

Reaching Agents of Change ToT training manual

VOLUME 7

Topic 13: Using the 'Everything you Ever Wanted to Know about Sweetpotato' ToT course
Topic 14: Reflections

RAC Reaching Agents of Change Support Vitamin A Sweetpotato

CENTRO INTERNACIONAL DE LA PAPA CIP A member of the CGIAR Consortium

UNIVERSITY of GREENWICH
Natural Resources Institute

Helen Keller INTERNATIONAL

Orange-Fleshed SWEETPOTATO Rich in Energy & Natural Vitamin A

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Reaching Agents of Change ToT Training Manual

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Foreword

During the past decade, interest in sweetpotato in Sub-Saharan Africa (SSA) has been expanding, the number of projects utilizing sweetpotato increasing, and the demand for training development practitioners and farmers subsequently rising as well. Sweetpotato scientists at the International Potato Center and national research centres often receive these requests and frequently hold 1-3 day training sessions, drawing on whatever training materials they have or can quickly pull together. The inadequacy of this approach has been quite apparent, but resources to address the problem were not available until now.

The funding of the Reaching Agents of Change (RAC) project in 2011 has changed the situation. Jointly implemented by the International Potato Center (CIP) and Helen Keller International (HKI), RAC seeks to empower advocates for orange-fleshed sweetpotato (OFSP) to successfully raise awareness about OFSP and mobilize resources for OFSP projects. RAC also seeks to build the capacity of public sector extension and non-governmental organizational personnel to effectively implement those projects funded to promote the dissemination and appropriate use of vitamin A rich, orange-fleshed sweetpotato. The goal is to see *sustained* capacity for training senior extension personnel about the latest developments in sweetpotato production and utilization in each of the major sub-regions of SSA: Eastern and Central Africa, Southern Africa, and West Africa. Hence, CIP has identified a local institution to work with in Mozambique, Tanzania, and Nigeria to host an annual course entitled: *Everything You Ever Wanted to Know about Sweetpotato.* During the first cycle of this course, CIP scientists worked closely with national scientists in implementing the course. During the second cycle, the national scientists will lead the training activities and course management with backstopping from CIP personnel. During the third cycle, national scientists will organise and conduct the course with just financial support from the project. In subsequent years, we hope that the course will have become fully self-sufficient on a cost recovery basis.

In developing the course content, a long-time collaborator of CIP, Dr. Tanya Stathers of the Natural Resources Institute (NRI), University of Greenwich, has led the review of existing training material, added in new knowledge from sweetpotato scientists and practitioners, and designed the course with a heavy emphasis on learning-by-doing. Dr. Stathers previously collaborated with CIP, Ugandan sweetpotato scientists from the National Agriculture Research Organization (NARO), and FAO Global IPM Facility in Kenya on a field project which developed a comprehensive Sweetpotato IPPM Farmers Field School manual for Sub-Saharan Africa in 2005. In developing the course, Dr. Stathers has consulted CIP personnel (Robert Mwanga, Ted Carey, Jan Low, Maria Andrade, Margaret McEwan, Jude Njoku, Sam Namanda, Sammy Agili, Jonathan Mkumbira, Joyce Malinga, Godfrey Mulongo) and HKI nutritionists (Margaret Benjamin, Heather Katcher, Jessica Blankenship) and an HKI gender specialist (Sonii David) as well as her fellow NRI colleagues (Richard Gibson, Aurelie Bechoff, Keith Tomlins). She adapted training material from the DONATA project, the Reaching End Users project and many others. After running the course and using the manual in 2012, a review was held and the manual and course were subsequently updated to meet facilitators and participants demands, and a standard set of accompanying Power Point presentations were created. Dr. Stathers has done a tremendous job and we deeply appreciate her commitment to producing this high quality manual.

The level of this course is aimed at senior extension personnel or leaders of farmer organizations who will in turn train others. We envision the course to be improved on an annual basis as new knowledge comes in and based on feedback received from the course participants. In this way, we expect the vibrant and knowledgeable sweetpotato community of practice to continue to grow in the coming years. The *Everything You Ever Wanted to Know about Sweetpotato* course will help us to achieve the major objectives of the Sweetpotato Profit and Health Initiative (SPHI). Launched in October 2009, the SPHI seeks to improve the lives of 10 million sub-Saharan African families in 16 countries by 2020 through the diversified use of improved sweetpotato varieties.

Jan W. Low, Leader of the Sweetpotato for Profit and Health Initiative, International Potato Center
June 2013

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This team has brought together and shared their many years of experience of working with sweetpotato systems and farmer learning processes across Sub-Saharan Africa to compile this *Everything You Ever Wanted to Know about Sweetpotato* resource. None of this experience would have been gained without the partnership of many sweetpotato farmers and other stakeholders (extensionists, national researchers, traders, transporters, NGO staff, nutritionists, media and donors) across the region. We thank you, and hope that this resource can in return offer you support in your sweetpotato activities.

The photographs used throughout this manual come from a wide range of places and we thank Margaret McEwan, Jan Low, Richard Gibson, Erna Abidin, Aurelie Bechoff, Keith Tomlins, Sam Namanda, J. O'Sullivan, Gabriela Burgos, Tanya Stathers, Olasanmi Bunmi, Benson Ijeoma, Grant Lee Neurenberg, Sammy Agili, the late Constance Owori, Ted Carey, Robert Mwanga, Ana Panta, Kirimi Sindi, Frank Ojwang, CIP digital archive, G. Holmes, B. Edmunds, and Nicole Smit for kindly sharing them. Most of the cartoons used in this manual were drawn by Movin Were.

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Acronyms and abbreviations

ACIAR	Australian Centre for International Agricultural Research
AIs	Adequate Intakes
ARMTI	Agricultural and Rural Management Training Institute
ASCII	American Standard Code for Information Interchange
AVRDC	The World Vegetable Centre
BMGF	Bill and Melinda Gates Foundation
CBO	Community Based Organisation
CGIAR	Consultative Group on International Agricultural Research
CIAT	International Centre for Tropical Agriculture
CIP	International Potato Center
DAP	Days After Planting
DFE	Dietary Folate Equivalents
DONATA	Dissemination of New Agricultural Technologies in Africa
DVM	Decentralised Vine Multipliers
EMU	Eduardo Mondlane University
dwb	Dry weight basis
FAEF	Faculty of Agronomy and Forestry Engineering
FAO	Food and Agriculture Organisation of the United Nations
FC	Food Consumption
FW	Fresh Weight
GI	Glycemic Index
HH	Household
HIV/AIDS	Human Immunodeficiency Virus / Acquired Immunodeficiency Syndrome
HKI	Helen Keller International
IBPGR	Bioversity International
IFPRI	International Food Policy Research Institute
IIAM	Institute of Agricultural Research Mozambique
IIED	International Institute for Environment and Development
IIRR	International Institute of Rural Reconstruction
IITA	International Institute of Tropical Agriculture
IMMPACT	International Micronutrient Malnutrition Prevention and Control Program
IPGRI	International Plant Genetic Resources Institute
IPM	Integrated Pest Management
IPPM	Integrated Pest&Production Management
IRETA	Institute for Research Extension and Training in Agriculture
K	Potassium
LGA	Local Government Areas
LGB	Larger Grain Borer
LZARDI	Lake Zone Agricultural Research and Development Institute (Tanzania)
M&E	Monitoring and Evaluation
MAP	Months After Planting
m.a.s.l.	metres above sea level
MM	Mass Multiplication
MRC	Medical Research Council, South Africa
MSC	Most Significant Change
N	Nitrogen
NARO	National Agricultural Research Organisation
NAS	National Academy of Sciences
NBS	National Bureau of Statistics
NGO	Non Government Organisations
NHV	Negative Horizontal Ventilation
NPC	National Population Commission
NPCK	National Potato Council of Kenya
NPK	Nitrogen, Phosphorus, and Potassium
NRI	Natural Resources Institute
OFSP	Orange-fleshed sweetpotato
P	Phosphorous
PMCA	Participatory Market Chain Approach
PMS	Primary Multiplication Site
PPP	Public Private Partnership
PVC	Polyvinyl chloride
QDPM	Quality Declared Planting Material
QDS	Quality Declared Seed
RAC	Reaching Agents of Change
RAE	Retinol Activity Equivalents
RCT	Randomised Control Trial
RDA	Recommended Daily Allowances
RE	Retinol Equivalents
REU	Reaching End Users
RH	Relative Humidity
SASHA	Sweetpotato Action for Security and Health in Africa
SDC	Swiss Agency for Development and Cooperation
SMS	Secondary Multiplication Site
SP	Sweetpotato
SPCSV	Sweetpotato chlorotic stunt virus
SPFMV	Sweet potato feathery mottle virus

SPHI Sweetpotato for Profit and Health Initiative
SPKP Sweetpotato Knowledge Portal
SPVD Sweetpotato Virus Disease
SSA Sub-Saharan Africa
SUA Sokoine University of Agriculture
TFNC Tanzania Food and Nutrition Centre
ToT Training of Trainers
TMS Tertiary Multiplication Site
Tshs. Tanzanian Shillings
TSNI Towards Sustainable Nutrition Improvement
UN HABITAT United Nations Human settlement Programme
UNESCO United Nations Educational, Scientific and Cultural Organization
UNICEF United Nations Children's Fund
UNU United Nations University
USA United States of America
USAID United States Agency for International Development
USD United States Dollar
USDA United States Department of Agriculture
Ushs. Ugandan Shillings
USIM United States Institute of Medicine
VAD Vitamin A Deficiency
WAP Weeks After Planting
WFP World Food Program
WHO World Health Organisation
WTP Willingness To Pay

Contents

How to use this manual

This manual contains '*Everything you ever wanted to know about sweetpotato*'. We hope that it will be useful for those involved in training extensionists and NGO staff at different levels, and that they in turn will train farmers in practical ways that help them to build their problem solving and decision-making skills so they can continue to learn, question, test and address different opportunities and challenges relevant to their livelihoods.

The manual consists of fourteen topics which, after the initial two topics on training and the origin and importance of sweetpotato, follow the sweetpotato crop cycle. Each topic discusses the key need to know aspects highlighting the relevant gender issues and then presents suggestions for how this topic might be incorporated in a 10 day ToT course, with step by step guidelines for several hands-on learning-by-doing activities. The last two topics focus on the ToT training course programme and preparations. The fourteen topics are:

Topic 1: Helping Adults to Learn discusses the characteristics of good facilitators, and provides suggestions to help improve one's facilitation skills. It covers how to plan a training course from the needs assessment, through the development of learning outcomes, awareness raising, participant selection, development of the programme, use of discovery-based/ experiential learning approaches, follow-up and long-term monitoring and scaling up and out. The learning-by-doing activities involve the participants practicing their facilitation skills while delivering different sweetpotato topics and understanding the importance of evaluating their training.

Topic 2: Origin and Importance of Sweetpotato describes the historical origins and spread of sweetpotato and presents an overview of the current uses of and production figures for sweetpotato across the world.

Topic 3: Sweetpotato Varietal Selection and Characteristics. Sweetpotato roots range in colour from purple to orange to yellow or white. A wide diversity of leaf shapes, root sizes and shapes, tastes, textures, maturity periods and flesh colours also exist. Farmers use such characteristics to select which varieties to grow. A method for comparing the different characteristics of different varieties on-farm is described.

Topic 4: Orange-fleshed Sweetpotato and Nutrition. An overview of food groups and good nutrition is given, followed by discussion of the consequences of poor nutrition including vitamin A deficiency and the use of conventional breeding to biofortify crops. The benefits of eating orange-fleshed sweetpotato are discussed along with the complexities of trying to create demand for foods that help address frequently unrecognised nutritional problems such as vitamin A deficiency.

Topic 5: Sweetpotato Seed Systems are reviewed including the different seed multiplication levels, the roles of the different stakeholders within the system. The factors influencing decisions on whether to use a single shot or an ongoing planting material dissemination approach, and the level of subsidisation required are discussed. Examples are given for planning different types of planting material multiplication and dissemination strategies. Methods for selecting clean planting materials and then conserving and multiplying them are presented.

Topic 6: Sweetpotato Production and Management covers the importance of advanced planning to ensure sufficient planting materials are available at the start of the rains, land preparation, planting methods, intercropping, nutrients needs, the main growth stages and their associated management tasks.

Topic 7: Sweetpotato Pest and Disease Management explains how recognising the lifecycles of the damaging insect pests and diseases such as the sweetpotato weevil (*Cylas* spp.) and viruses can help farmers learn how to manage them more successfully. The signs and management strategies for mole rats and erinose are also discussed.

Topic 8: Harvesting and Postharvest Management. The physical damage caused during harvest and transport can reduce the shelf-life and value of sweetpotato roots. Over-drying and prolonged storage can reduce the beta-carotene content of dried orange-fleshed sweetpotato products. Good postharvest handling and storage practices for dried products are discussed, and methods for curing and storing fresh roots to increase their quality, value and availability are presented.

Topic 9: Processing and Utilisation. Many delicious, nutritious and potentially profitable food products can be prepared from orange-fleshed sweetpotato. The use of sweetpotato as animal feed is also discussed.

Topic 10: Marketing and Entrepreneurship. The concepts of marketing, market orientation, entrepreneurship, and the 5 pillars of marketing (product, price, price, promotion and people) are discussed in relation to fresh sweetpotato roots and sweetpotato products.

Topic 11: Gender and Diversity Aspects. The importance of recognising gender and diversity issues in agriculture and sweetpotato systems is discussed. Situations where sweetpotato is grown as a female crop, and others where it is grown as a male crop, or grown by both men and women are presented along with the different constraints, needs and priorities of female and male farmers. Best practice suggestions are made for how gender can be incorporated into sweetpotato programmes.

Topic 12: Monitoring of OFSP Dissemination and Uptake. An explanation of the reasons for monitoring and the differences between monitoring and evaluation is provided. This is followed by a range of tools which can be used for monitoring the dissemination, performance and use of sweetpotato planting materials. In order to understand the long-term impacts and reach of sweetpotato training it is important that records are kept on who has been trained. These records can be used for follow up activities.

Topic 13: Using the 'Everything you Ever Wanted to Know about Sweetpotato' ToT course. Detailed programs for a 10 day and a 5 day learning-by-doing ToT course are presented. They describe: the topics to be covered each day; the intended learning outcomes; the sequential activities and their timing; and the materials and advanced preparations required. These programs are not intended to be prescriptive and we hope that facilitators will creatively adjust them to their participants needs.

Topic 14: Reflections. We hope that after field testing this manual trainers and participants will reflect on it and share their ideas for how it could be improved. Please send any suggestions you have to Jan Low j.low@cgiar.org and where possible we will incorporate them into new editions.

TOPIC 13: USING THE EVERYTHING YOU EVER WANTED TO KNOW ABOUT SWEETPOTATO ToT COURSE

IN

Everything you ever wanted to know about sweetpotato

Contents

Topic 13: Using the '*Everything you ever wanted to know about Sweetpotato*' ToT course and manual

13.1 Overview of the 10 day '*Everything you ever wanted to know about Sweetpotato*' ToT course

These learning by doing activities have been designed to provide hands-on discovery learning opportunities for the participants of the 10 day '*Everything you ever wanted to know about sweetpotato*' ToT course. We hope by learning about sweetpotato in a hands-on way, as trainers you will then train others using a practical learning-by-doing approach.

The full 10 day suggested ToT course programme is described here (Table 13.1), and the 5 day suggested ToT course programme is described in section 13.2. This programme aims to help facilitators in their planning, but is not intended to be prescriptive. *Please use your creativity to adapt it to your participants needs.*

Overall learning outcomes of the '*Everything you ever wanted to know about sweetpotat*o' course: By applying the principles and strategies offered during this 10 day course, participants will:

- Understand the key aspects of sweetpotato production, utilisation and marketing in SSA
- Be able to demonstrate key skills such as selection and preservation of clean sweetpotato planting materials, sweetpotato crop and pest and disease management, and preparation of different recipes made from sweetpotato
- Know about the importance of vitamin A in the human diet and ways that OFSP and other foods can be used to avoid vitamin A deficiency
- Understand how gender roles affect sweetpotato production, utilisation and marketing in Sub-Saharan Africa
- Feel confident in delivering a training course on sweetpotato to field level public extensionists and NGO staff using a practical discovery-based learning approach

Target participants: District level government extensionists, NGO staff, national agricultural researchers, nutrition/health extensionists. These participants then have the responsibility of training other field level private and public extension staff who would then train farmers.

The **programme** below describes the topics, intended learning outcomes and activities suggested for each day of the 10 day ToT course. Step by step details of each of the learning by doing activities can be found in the earlier chapters for example Activity 1.3.1 will be found in Section 1.3 of this manual. The step by step details for each learning-by-doing activity outline the intended learning outcomes, the expected duration of the activity (and each step of it), the advanced preparations required, the materials required, and step by step suggestions for the facilitator while supporting the activity.

The **advanced preparations** required are detailed in the final column of the programme. They cover the need to have arranged field and market visits well in advance of the course, particularly if the fields have to be planted especially for the course. The sweetpotato hands-on field activities form a major part of the learning environment for both the 10 and 5 day ToT courses. These sweetpotato learning fields need to: be nearby; with a range of sweetpotato varieties planted within them; have sweetpotato plants which will have mature vines and storage roots during the course period; preferably have some virus infected and weevil infested plants; be owned by farmers who are happy for the participants to cut off a few vines while learning to select clean planting materials, and dig up a few plants in order to find out how the roots look and grow and to learn about harvesting, and who will of course be compensated for their roots and vines. Ideally there should be nearby farmers' fields, and a nearby plot in which the participants can practice setting up rapid multiplication beds, and fresh root stores etc. A suggested timeframe for the preparatory activities is given in Table 13.2.

Table 13.1 Programme for the 10 day ToT '*Everything you ever wanted to know about sweetpotato*' course

Day	Topics	Intended Learning Outcomes	Activities	Materials and advanced preparations
1	Introductions Participants expectations, agreement on learning outcomes Overview of importance of and uses of sweetpotato How gender and diversity is relevant for sweetpotato activities	*Participants will:* - Understand the course programme and how it aims to prepare them for training others on sweetpotato - Know about trends and challenges in sweetpotato production and use - Understand how gender issues are relevant throughout the sweetpotato value chain - Be able to prepare two sweetpotato dishes	- *Introduction*s: group activity [30mins] - *Expectations*: Sharing and grouping of participants' expectations (individual stickers) and levelling of these with the trainers' expectations and then fine tuning the existing learning outcomes as necessary. [45 mins]; - *Entry test*: Test on sweetpotato knowledge at start of course [30 mins] (*Appendix 1.2*) - *Programme*: Overview of the training programme for this TOT course. [10 mins] - *History and knowledge of sweetpotato:* Small group work on participants' knowledge about sweetpotato history, cultural importance, production and utilisation trends, and the main problems faced by sweetpotato farmers [30 mins group work, followed by 5min presentation of key issues per group] - *Cooking with OFSP*: Groups prepare an OFSP dish (sweetpotato porridge or sweetpotato mandazi) see 9.4 for detailed recipes and ingredients. [1.5 hrs] - *Presentation 2.* Origin and Importance of sweetpotato (Topic 2), followed by group discussion. [45 mins] - *Presentation 11.* Gender and diversity and how it is relevant for sweetpotato activities (Topic 11), followed by group discussion. [45 mins]	- Flip charts, marker pens, masking tape, stickers/post-its - Photocopies of the sweetpotato knowledge test (Appendix 1.2) - Overview of the training programme (Day and Topics) - Ingredients and cooking utensils and equipment and cooking fuel for groups to prepare OFSP porridge and mandazi (using recipes given in 9.4.1 and 9.4.2) *OFSP porridge*: Ingredients for 4 person multiply as required: 1 heaped tablespoon sweetpotato flour; 4 heaped tablespoons millet, sorghum, cassava or maize flour; 1 heaped tablespoon soya flour; 1 small lemon; 2 tablespoons sugar; 6 cups water; cups; saucepan; cooker; matches; wooden spoon; tablespoon *OFSP mandazi*: Ingredients for 10 people multiply as required: ½ cup sweetpotato mash (*pre-prepared*) or sweetpotato flour (30%); 2 cups wheat flour (70%); 2 tablespoons sugar; pinch of salt; 2 cups cooking oil; 1 tablespoon baking powder; adequate lukewarm water; mixing bowl; sieve; rolling pin; frying pan; cooker; serving dish - *Presentation 2.* Origin and Importance of SP - *Presentation 11.* Gender and diversity and how it is relevant for sweetpotato activities

Day	Topics	Intended Learning Outcomes	Activities	Materials and advanced preparations
2	Different varieties of sweetpotato and their characteristics	*Participants will:* - Understand key differences between sweetpotato varieties - Know about the key characteristics of at least 3 sweetpotato varieties suitable for their area/ region - Be able to help farmers identify the key characteristics they are looking for in a sweetpotato variety - Understand that varietal preference differs between people - Be introduced to why care during harvesting is important for sweetpotato - Know how to conduct a variety ranking test (using red, yellow and green cards) - Be experienced in conducting a taste test (using red, yellow, and green cards)	- *Activity 3.5.1: Spot the difference*. Field activity to: identify characteristics of different sweetpotato varieties in a nearby field; to discuss with the farmer why s/he grows each of them; and to then use the roots from these different varieties to conduct a taste evaluation (*see 3.5.1*). [2hr 45mins] - *Activity 3.5.2: Selecting sweetpotato varieties.* Group discussion on key factors differentiating sweetpotato varieties and which are important for which reasons. Participants then create promotion posters/ training materials for the main sweetpotato varieties grown or suited to their location (*see 3.5.2*). [70mins] - *Presentation 3*. Covering the natural diversity of sweetpotato; defining characteristics of different sweetpotato varieties; and methods for on-farm testing of different sweetpotato varieties and discussion. [45 mins]	- *Activity 3.5.1*: Nearby field with several varieties of sweetpotato growing in it and which the participants can harvest some roots from, flip chart, marker pens, sheets of A4 plain white paper, pencils, erasers, participants notebooks, sufficient copies of the handout on sweetpotato descriptors (Appendix 3.1) and on estimating the beta-carotene content through flesh colour of orange fleshed sweetpotato varieties (Appendix 3.2), sufficient copies of the form for participatory storage root taste evaluation (Forms 5B and 5B2 Appendix 3.5b), cooking stoves and fuel, pans, water, matches, knives. - *Activity 3.5.2*: Flip charts (at least 1 page per participant); coloured pencils including plenty of green, brown, orange and yellow ones; CIP orange-fleshed sweetpotato catalogue. - *Presentation 3* on sweetpotato diversity, varietal characteristics and methods for on-farm testing of different sweetpotato varieties <u>*Advanced preparations*</u>: *For Activity 3.5.1:* Identify a nearby field with several varieties of sweetpotato in it, and meet the farmer and see if they are agreeable to: their field being visited by the participants; themselves being interviewed by the participants; and some (try and minimize the number) of the plants being dug up to see the root characteristics and to remove some roots for tasting, possibly 1-2 plants per variety. The farmer will need to be compensated for the roots that are harvested and removed.

Day	Topics	Intended Learning Outcomes	Activities	Materials and advanced preparations
3	Nutrition and OFSP	*Participants will:* - Understand what a balanced diet is and why it is important - Know how OFSP can contribute to reducing Vitamin A deficiency - Be able to select appropriate local ingredients to prepare child-friendly, and nutritious OFSP meals - Understand the importance of the gender aspects of household nutrition	- *Brainstorming*: What is a balanced diet? - *Presentation 4a* and *Activity 4.8.1: How well balanced are our diets?* What is good nutrition*? (see 4.8.1).* [10 & 40 mins] - *Presentation 4b* and *Activity 4.8.2: Dining from a vitamin A rich menu*: Vitamin A, why OFSP helps combat VAD & who is at risk from VAD (see 4.8.2). [10 & 20mins] - *Activity 4.8.3: Virtual porridge making (see 4.8.3) {Note: actual porridge making occurs on Day1; other OFSP recipes are made on Day 9}.* [1 hour] - *Activity 4.8.4: Raising awareness and creating demand for OFSP (see 4.8.4).* [55 mins] - *Group discussion*: Strengths and weaknesses of approaches and tools. Are we integrating gender well? [30 mins]	- Flip charts, marker pens, masking tape, stickers/post-its - *Activity 4.8.1*: Presentation 4a, flip chart, pens and masking tape - *Activity 4.8.2: Presentation 4b,* A4 sheets of paper and pens, real examples of vitamin A rich local foods such as pumpkins, pawpaw, OFSP, local and exotic green leafy vegetables etc. if available - *Activity 4.8.3*: 4 sets of the virtual porridge cards with photos and descriptions of different ingredients that could be used to make a nutritious child's porridge (Handout 4.8.3a) - *Activity 4.8.4:* Topic 4 of the manual
Day	**Topics**	**Intended Learning Outcomes**	**Activities**	**Materials and advanced preparations**
4	Selecting, preserving and multiplying sweetpotato planting materials	*Participants will:* - Be able to identify, select and conserve clean sweetpotato planting materials - Know about the principles of positive and negative selection and preservation of sweetpotato planting materials - Understand how to calculate vine	- *Activity 5.10.1: Vines for planting: clean and multiplied.* Field activity to identify clean planting materials, take vine cuttings, cut them into planting materials, learn how to plant them in a rapid multiplication bed, discuss how to care for them, when and how to plant them out, calculate vine multiplication rates. [2.5 hours] - *Presentation 5a.* To cover sweetpotato planting materials, traditional practices for vine conservation, water management of vines (drip irrigation), Triple S system, and	- *Activity 5.10.1*: Nearby planted sweetpotato field with some virus infected plants. Half completed nursery bed. 5 cutting knives. 2 watering cans with water in. 2 hand hoes. A nearby rapid multiplication plot which had been planted 8 weeks prior to the course with two varieties with different multiplication rates. Flip chart. Pens - *Presentation 5a* on planting materials - *Activity 5.10.2:* About 200 sweetpotato roots – some damaged and a range of sizes. 6 plastic basins. Newspaper. 5 buckets. 5 brooms. Set up one Triple S system about 3

		multiplication rates and how varieties rates' differ	net tunnels. [20 mins] - *Discussion.* Existing SP seed systems. [20 mins] - *Activity 5.10.2: The Triple S system.* Practicing the triple S method, from the root selection stage, to loading and placement in cool dry area. [1.5 hours] - *Additional activities:* If there is time, construct a net tunnel (see Appendix 5.2) or practice hardening off tissue culture plantlets (see Appendix 5.1).	months in advance of the ToT course so that the students can see the sprouting roots <u>*Advanced preparations*</u>: • *For Activity 5.10.1* Make arrangements with the owner of the field for the participants to visit, select and take vine cuttings. It should be a field with virus and weevil problems, so the participants can practice negative selection (i.e. roguing diseased material and discarding unhealthy material and only selecting planting materials which look healthy, and disease and pest free) • Set up a rapid multiplication plot 8 weeks prior to the course planted with cuttings of two varieties with very different multiplication rates, e.g. 1sqm (50 cuttings) of Variety A, 1 sqm (50 cuttings) of Variety B • Set up half a rapid multiplication bed at the field, so the participants can complete it and then practice planting out the cuttings they have taken, shading, and watering it • *For Activity 5.10.2* Set up a Triple S system a few months in advance of the ToT course, so that the students can uncover the roots and find them sprouting, and can then use them to practice planting them out • If you plan to include practical on construction of a net tunnel or hardening off of tissue cultured plantlets advance preparations will be required – see Appendices 5.1 and 5.2.

Day	Topics	Intended Learning Outcomes	Activities	Materials and advanced preparations
5	Sweetpotato pests and diseases and their management	*Participants will:* - Be able to find field examples of the key pests and diseases of sweetpotato and explain and show the damage each can cause - Know a range of practical techniques for managing these key pests and diseases	- *Activity 7.9.1: Field hunting for sweetpotato pests and diseases and learning how to manage them.* Collection of infested roots, damaged and diseased leaves, some observation of insect activity in the sweetpotato field, group discussion and brainstorming on where these pests and diseases come from and how they spread (including whitefly if possible). Include practice and discussion of hilling up and rouging of SPVD affected plants (*see 7.9.1*). [85 mins] - *Presentation 7a*. Lifecycles of key sweetpotato pests and diseases. [30 mins] - *Activity 7.9.2: Hidden damage.* Dissection of infested roots to try and identify different lifecycle stages of *Cylas* weevils, and to calculate what percentage of the root is physically lost due to weevil damage. [*Note: facilitator should prepare some weevil infested roots in advance*] *(see 7.9.2).* [1 hr] - *Presentation 7b.* Sweetpotato pest and disease management practices (including mole rats) followed by discussion. [45 mins] - *Activity 7.9.3: Training others on key sweetpotato pests and diseases.* Development of training presentations and activities on a range of key sweetpotato pests and diseases *(see 7.9.3).* [1 hr 45 mins]	- *Activity 7.9.1*: Ideally a nearby young crop with SPVD in it, a field which previously had sweetpotato in it and a mature or old sweetpotato crop which participants can explore and find diseases and pest damaged sweetpotato plants in; 20 digging sticks; 8 buckets for transporting the infested roots; 8 sacks; 20 transparent collecting pots or jars with lids with a few small holes made in them; 20 magnifying lenses; participants should carry their notebooks and pencils; flip chart and stand; marker pens; masking tape. - *Presentation 7a* on lifecycles and key sweetpotato pests and diseases - *Activity 7.9.2:* About 50 weevil infested sweetpotato roots; 20 wooden boards; 20 sharp knives; 20 magnifying lenses; 40 dishes or plastic bags; 1 set of scales for weighing the damaged and undamaged portions of the sweetpotato roots; participant's notebooks and pencils - *Presentation 7b* on sweetpotato pest and disease management practices - *Activity 7.*9.3: The root and vine and insect materials they collected during the field hunt that morning; flip charts; 40 marker pens; masking tape; magnifying lenses; 3 packs of stickers/ post-it; participants' notes books and pens <u>*Advanced preparations*</u>: *For Activity 7.9.1:* Identify several nearby fields (one field with a young crop with SPVD in it, a

				field which previously had sweetpotato in it and a mature or old sweetpotato crop) which participants can explore and find diseases and pest damaged sweetpotato plants in *For Activity 7.9.2*: Collect some weevil infested sweetpotato roots a couple of weeks before the training course. The participants may find some during their field hunt but, in case they do not, the facilitator should be sure they have some for the participants to dissect to see the eggs, larvae, pupae and feeding tunnels. This may require artificially investing roots in the laboratory if field invested examples are not easily available at the time of the course.
Day	**Topics**	**Intended Learning Outcomes**	**Activities**	**Materials and advanced preparations**
6	Sweetpotato production and crop management	*Participants will:* - Be able to help farmers set up a field experiment to compare different sweetpotato varieties or different sweetpotato management practices - Understand the different stages of the sweetpotato crop cycle and the management implications of each stage	- *Activity 6.9.1: Comparing sweetpotato varieties and management practices.* Setting up a sweetpotato field experiment (see details in 6.9.1). [3 hours] - *Activity 6.9.2: Advanced planning.* Development of their sweetpotato agricultural calendar and identification of the associated advanced planning and crop management activities and discussion of the gender roles associated with these activities and what changes are occurring (see 6.9.2). [75 mins] - *Presentation 6.* The sweetpotato crop cycle (including post-harvest stages), participants then draw the crop cycle in their note books, and after a discussion add in the details of what has to be paid attention to during each stage.[45 mins]	- *Activity 6.9.1*: Flip charts, pens, rope, measuring tape, spades, labels, sticks, nearby field in which they can set up the experiment, topics 3,6 and 7 of this manual, pages 20-22 in the handout booklet 'What is damaging my sweetpotato?' - *Activity 6.9.2*: Flip charts, marker pens, pencils, masking tape - *Presentation 6* on sweetpotato development stages and associated management tasks. *Advanced preparations*: *For Activity 6.9.1*: Identify an empty nearby field area of about 30m * 30m, which participants can use for practise in designing and setting up a field experiment

Day	Topics	Intended Learning Outcomes	Activities	Materials and advanced preparations
7	Planning a planting material dissemination program	*Participants will:* - Understand all of the key steps, and bottlenecks that may emerge in planning a mass multiplication or DVM approach dissemination exercise - Practice designing a dissemination program for their area to reach 5000 households - Understand why it is important to monitor and evaluate projects - Practice monitoring the dissemination of planting materials	- *Presentation 5b.* Key principles of sweetpotato planting material multiplication and dissemination. [30 mins] - *Activity 5.10.3: Planning your multiplication and dissemination strategy.* Practical. [3 hrs] - *Group discussion*: comparing the strategies for different scenarios. [20 mins] - *Activity 5.10.4: Working with DVMs.* Practical exercise. [2.5 hrs] - *Presentation 5c.* Costing out the dissemination exercise. [10 mins] - *Presentation 12.* Introducing M&E. [20 mins] - *Activity 12.7.1: Where did it go?* Practice in monitoring planting material dissemination. [30 mins] - *Homework problem:* to figure out costs of dissemination strategy	- *Presentation 5b* on key principles - *Activity 5.10.3*: flip chart and markers; 35 copies of blank template of sweetpotato activity calendar (Handout 5.10.3a); 35 copies of the blank worksheet for calculating your sweetpotato multiplication strategy (Handout 5.10.3b); 35 copies of template of sweetpotato dissemination plan (Handout 5.10.3c) - *Activity 5.10.4*: A nearby sweetpotato demo plot with two distinct varieties separated, labelled and containing clean planting material and a second plot with a mixture of clean/ virus infected planting material and mixtures of varieties is required for training; flip charts; marker pens; masking tape, copies of handouts 5.10.4a and 5.10.3b - *Presentation 5c* on costing out of multiplication and dissemination - *Presentation 12.* Introducing M&E - *Activity 12.7.1:* 200 completed planting material vouchers which have the information required for Table 12.5.2 on them; 40 photocopies of form 12.5.2, pens *Advanced preparations*: *For Activity 5.10.4* Locate or plant two nearby sweetpotato plots with two varieties planted separately in each. Rogue one to remove any diseased material, leave the other plot in the hope that virus infection and symptoms occur *For Activity 12.7.1* Collect or complete 200 completed planting material vouchers

Day	Topics	Intended Learning Outcomes	Activities	Materials and advanced preparations
8	Harvesting, post-harvest management, and processing	*Participants will:* - Know about the main aspects of sweetpotato harvesting, post-harvest management and processing. - Understand how the processing and storage of OFSP affects it beta-carotene content - Understand the importance of involving different groups in processing training and awareness	- *Activity 8.9.1: Increasing profits through storing fresh sweetpotato roots.* Field exercise to harvest roots, separate out damaged roots; set up a protected fresh root pit store (NB grass, bamboo pool and wood for cover need to be arranged in advance and hole dug in advance) *(see 8.9.1). [2 hrs]* - *Activity 8.9.2: Effect of sun-drying and storage on beta-carotene content of OFSP.* Participants observe the differences between samples of OFSP chips which have been sun-dried for 7, 5, or 2 days. Beta-carotene content estimates are provided to illustrate how the beta-carotene content declines over time during storage. *(see 8.9.2) [30 mins]* - *Presentation 8.* Piecemeal harvesting, chip drying and curing for improved shelf-life; including gender aspects. Post-harvest management of fresh roots and dried chips; storage containers, protection from pests and monitoring over time. Discuss who in the household is responsible for storage, and how to ensure information reaches them? [45 mins] - *Activity 9.8.1: Substituting sweetpotato flour for wheat flour in a chapati recipe AND Activity 9.8.2: Making sweetpotato juice AND Activity 9.8.3: Making sweetpotato fiossis.* Split the group into halves and in small groups have them	- *Activity 8.9.1:* nearby sweetpotato field which is ready for harvest and where the participants can dig up 10 plants per group to work out the yield; scales; sacks; calculator; pen and paper; spades; hoes; dry grass; bamboo poles; harvesting sticks; branches, thatching grass and string - *Activity 8*.9.2: ~50 orange-fleshed sweetpotato roots, chipping machine, raised drying rack, at least 3 sample bags, labels, marker pens, data set showing how beta-carotene content decreases with prolonged sun-drying, sufficient photocopies of the data set showing how beta-carotene content decreases with prolonged storage (Handout 8.9.2a) - *Presentation 8* on harvesting, drying, curing and postharvest gender aspects - *Activity 9.8.1*: Per small group: sauce pan; charcoal or gas stove; frying pan; cutting board; 1 litre luke warm boiled water; rolling pin; grater; fruit squeezer; food containers; bowls; plates; knives; 2 kg wheat flour; ½ kg OFSP; ½ kg boiled OFSP; ½ kg; ½ kg OFSP flour; 1 cup of vegetable oil; some salt; flip chart; marker pens; masking tape - *Activity 9.8.2*: 4 cups of sugar; 8 medium sized boiled peeled sweetpotato roots; 3 teaspoons of citric acid OR juice from 5 fruits; 5 litres of cooled boiled water; flavouring add tamarind, passion, pineapple or orange juice; sieve; pans; fruit squeezer; wooden spoon; jug; 5 * 1

			follow either activity 9.8.1 or (9.8.2 & 9.8.3). *[2 hrs 30 mins]* - *Presentation 9.* Processing and discussion on who to target for processing training, such as people who are already micro-food processors and might incorporate OFSP, discussion regards the importance of involving men even though women do the food preparation usually, but men are still influential in deciding what foods to plant or purchase. [45 mins]	litre clean empty bottles; fridge to chill the juice in - *Activity 9*.8.3: 300g (2-2 ½ cups) wheat flour; 50g margarine; 200g (1 – 1 ½ cups) sweetpotato puree; 65g ($^1/_4$ cup) sugar; 2 eggs; oil for frying; 2 teaspoons baking powder; mixing bowl, wooden spoon, sauce pan, sieve, frying pan, dish - *Presentation 9* on processing, and who to involve in processing training, and gender aspects <u>*Advanced preparations*</u>: • *For Activity 8.9.1*. Identify or plant a nearby sweetpotato plot that the trainees can harvest in order to calculate yield • *For Activity 8.9.2*. On Day 1 of the 10 day ToT course, prepare a small quantity of OFSP chips and place on a raised rack to sun-dry (this will become the 'sun-drying for 7 days sample'), on day 3 chip some more OFSP and place on the same rack but do not mix with the first sample. Make sure the samples are clearly labelled and protected. On day 6, chip some more OFSP and place it on the same raised rack to sun-dry, ensure it is clearly labelled and not mixed with the earlier samples. On Day 9 collect the three samples (keep them separate) and take them to the training room • *For Activity 9.8.1.* Obtain sufficient OFSP for each small group to have ½ kg of it. If time will be short pre-boil the OFSP for the boiled& mashed recipe so that the

				participants just mash them and then incorporate them into the recipe • *For Activity 9.8.2 and 9.8.3.* Organise cooking ingredients, equipment and facilities. Obtain sufficient OFSP. If you will be short of time pre-boil the OFSP so that the participants just mash it and then incorporate it in the recipe
Day	**Topics**	**Intended Learning Outcomes**	**Activities**	**Materials and advanced preparations**
9	Marketing and entrepreneurship	*Participants will:* - Be familiar with the concepts of marketing and market orientation - Understand the 5 pillars of marketing - Understand the opportunities and challenges in sweetpotato fresh root and processed product marketing - Explore gender issues along the value chain - Be aware of how to select an appropriate processed product - Know how to calculate marketing margins for fresh root trading - Know how to calculate marketing margins of processed products from flour or puree	- *Activity 10.10.1: Market trip*. Research visit to a market with half the group working on fresh root marketing margins and issues and the other half on processed products, find out about characteristics and constraints of each including any gender issues. Back at training centre groups summarise findings into a presentation followed by discussion (see 10.10.1). [4.5hrs] - *Presentation 10a*. Marketing and entrepreneurship and relevant gender aspects. Group marketing. [20 mins] - *Activity 10.10.2: Calculating you profit margins.* Using a farmer case study, participants will work out the profit margins at each stage of the value chain (see 10.10.2). [45 mins] - *Activity 10.10.3: The 5 Pillars of Marketing.* Role play to get participants to explore marketing issues (see 10.10.3). [55 mins] - *Presentation 10b*. The 5 pillars of marketing, and how to select your product. [20 mins]	- *Activity 10.10.1*: nearby market, transport, 5 measuring cups, 5 plastic containers (~2kg root capacity), notebooks and pens, flip charts and markers - *Presentation 10a* on Marketing and entrepreneurship and relevant gender aspects - *Activity 10.10.2*: Sufficient photocopies of the Case Study on Esther (Box 10.3) - *Activity 10.10.3*: 20 orange-fleshed sweetpotato roots, stickers/ post-its, marker pens, flip charts, masking tape - *Presentation 10b* on the 5 pillars of marketing and how to select your product *<u>Advanced preparations</u>*: • *For Activity 10.10.1* organise transport, facilitator should make a pre-visit to the market to find out where the sweetpotato root traders are and whether any sweetpotato processed products are being traded, and if not to look at which processed products the participants could study

Day	Topics	Intended Learning Outcomes	Activities	Materials and advanced preparations
10	Planning to train others on '*Everything you ever wanted to know about sweetpotato*'	*Participants will:* - Understand and have developed the draft learning outcomes and approaches, training materials and draft logistics plans (timing, venue & field sites, participants) of the sweetpotato training courses they will be delivering - Be able to deliver a 5 day training course on '*Everything you ever wanted to know about sweetpotato*'	- *Activity 1.4.1: Practising being learning-by-doing facilitators.* Practice in facilitating a key sweetpotato topic, and group work on the principles of giving and receiving constructive feedback (see *Activity 1.4.1*). [2hr 30 mins] - *Presentation 1*. Helping adults to learn and familiarisation with the suggested 5 day ToT program (see Topic 13). Discussion of it, and draft logistics planning for their delivery of it (see Appendix 1.3). [1hr] - *Activity 1.4.2: Ideas for additional sweetpotato learning-by-doing activities.* (*see Activity 1.4.2*). [1hr 20 mins] - *Activity 1.4.3: Evaluating a training course.* Course evaluation (*see Activity 1.4.3) (option to repeat sweetpotato knowledge test as exit test (Appendix 1.2)). [1hr]* - Presentation of certificates. [1hr]	- *Activity 1.4.1*: Cards of the key topics from the 5 day ToT course, participants need their '*Everything you ever wanted to know about sweetpotato*' manual, note books and pens; stickers/ post-its, flip charts, masking tape, marker pens, all equipment that has been used during the training program including ~100 sweetpotato roots some OFSP. - *Presentation 1*. Helping adults to learn and the programme for the 5 day TOT program (see Topic 13) - *Activity 1.4.2*: Participants will need their manual, note books and pens; stickers/ post-its, flip charts, masking tape, marker pens, all the equipment that has been used during the training program including ~100 sweetpotato roots some of which should be orange-fleshed - *Activity 1.4.3*: Enough photocopies of the course evaluation form 12.5.5c for each participant, pens, sufficient copies of the sweetpotato knowledge test (Appendix 1.2) if you plan to do an exit test - Completed certificates, soft drinks

Table 13.2 Advanced preparations required for the 10 day ToT course

***Advanced preparations*:**	**Suggested time frame for advanced preparations before the ToT course**						
	6 months before	5 months before	4 months before	3 months before	2 months before	1 month before	1 week before
Selection of and contact with facilitators							
Advertising ToT course							
Planning the field preparations required (see list below)							
Activity 3.5.1: Spot the difference. Identify or plant a nearby field (near to the training centre with several sweetpotato varieties in it, some roots and leaves of which can be harvested by participants during the course. Meet the farmer to discuss and plan.		Plant or plan		Monitor		Monitor	Monitor
Activity 5.10.1: Vines for planting: clean and multiplied. Identify a nearby field which is likely to have virus and weevil problems at the time of the ToT course, and where participants can take vine cuttings.				Identify		Monitor	Monitor
Activity 5.10.1: Set up a nearby rapid multiplication plot planted with cuttings of two varieties with very different multiplication rates, e.g. 1sqm (50 cuttings) of Variety A, 1 sqm (50 cuttings) of Variety B. Participants will harvest the cuttings.				Identify location	Set-up	Monitor	Monitor
Activity 5.10.1: Prepare half a rapid multiplication bed at the field, so the participants can complete it and then practice planting out the cuttings they have taken, shading, and watering it.							Set-up
Activity 5.10.2: The Triple S system. Set up a Triple S system, so that during the course the students can uncover the roots and find them sprouting and can then use them to practice planting them out.					Set up	Monitor	Monitor
Activity 5.10.4: Working with DVMs. Locate or plant two nearby sweetpotato plots with two varieties planted separately in each. Rogue one to remove any diseased material, leave the other plot in the hope that virus infection and symptoms occur.		Plant or plan		Rogue 1 plot		Monitor	Monitor
Additional activities: If you plan to construct a net tunnel (Appendix 5.2) or practice hardening off tissue cultured plantlets (Appendix 5.1) you will need to make the appropriate advanced preparations (materials, space etc.).						Plan & set up	Monitor
Activity 6.9.1: Comparing sweetpotato varieties and management practices. Identify an empty field area (~30mx30m) where participants can practice designing and setting up a field trial.						Identify	Monitor

***Advanced preparations*:**	**Suggested time frame for advanced preparations before the ToT course**						
	6 months before	5 months before	4 months before	3 months before	2 months before	1 month before	1 week before
Activity 7.9.1: Field hunting for sweetpotato pests and diseases and learning how to manage them. Identify three nearby sweetpotato fields, i) a young crop with SPVD in it, ii) a field which previously had sweetpotato in it, iii) a mature or old sweetpotato crop. Which participants can explore and compare for pests and diseases.		Plant or plan		Monitor		Monitor	Monitor
Activity 7.9.2: Hidden damage. Collect ~30 weevil infested roots and keep them carefully so that participants can dissect them during the ToT.						Collect roots	Monitor
Activity 8.9.1: Increasing profits through storing fresh sweetpotato roots. Identify or plant a nearby sweetpotato plot that the trainees can harvest in order to calculate yield.		Plant or plan		Monitor		Monitor	Monitor
Activity 8.9.2: Effect of sun-drying and storage on beta-carotene content of OFSP. Prepare the OFSP roots and chips for sun-drying for different durations as described in Activity 8.9.2.							Prepare OFSP chips
Activity 10.10.1: Market trip. Make a pre-visit to nearby markets with the checklist, to decide which market enables better learning by participants regards factors affecting both fresh root and processed product marketing. Organise transport for ToT market trip.						Pre-visit & book transport	
Immediate response by organisers to interested course participants, and include a short needs assessment style survey.							
Facilitator familiarisation with training manual, suggested approach, activities and presentations and course programme and dates (could combine with a pre-training course).							
Reminder to all the facilitators about the ToT programme and the dates they will be required on.							
Finalise list of course participants, and send them details of the course programme, venue and directions.							
Send facilitators summary list of the course participants and their backgrounds and perceived needs							
Preparation of all learning-by-doing activity materials, equipment and ingredients for ToT course (see final column of Table 13.1 for details).							
Contact with all the facilitators reminding them about the ToT programme and dates they will be required.							
Preparation of all stationery, p/copying, name badges, accommodation and meal arrangements, certificates.							

13.2 Overview of the 5 day '*Everything you ever wanted to know about Sweetpotato*' ToT course

It is anticipated that that the district level extension and NGO staff who have participated in the 10 day ToT course, will then themselves train field level staff in their organisations using a 5 day ToT course, and these field level staff will then train farmers using a 5 day ToT course. We have therefore developed a suggested outline for a 5 day ToT course which includes lots of opportunities for hands-on learning. The programme for this course is shown below. Facilitators may decide to run it on 5 consecutive days or to cut it into separate training events to fit with the crop cycle. If you have more than 5 days available we strongly suggest you add in the Market Visit (Activity 10.10.1) and spend more time on helping the participants practice their own delivery of the training topics. We hope these materials are supportive and welcome your feedback on them – please see Topic 14 for reflections.

Table 13.3 Programme for the 5 day ToT '*Everything you ever wanted to know about sweetpotato*' course

Day	Topics	Intended Learning Outcomes	Activities	Materials and advanced preparations
1	Introductions Participants expectations, agreement on learning outcomes Overview of importance of and uses of sweetpotato	*Participants will:* - Understand the course programme and how it aims to prepare them for training others on sweetpotato - Know about trends and challenges in sweetpotato production and use - Be able to prepare a sweetpotato dish - Understand how OFSP can be substituted for other products in common recipes - Understand how gender issues are relevant throughout the sweetpotato value chain	- *Introductions:* group activity. [15mins] - *Expectations*: Sharing and grouping of participants' expectations (individual stickers) and levelling of these with the trainers' expectations and then fine tuning the existing learning outcomes as necessary. [30 mins]; - *Entry test:* Test on sweetpotato knowledge at start of course. [30 mins] (*Appendix 1.2*) - *Programme*: Overview of this TOT course. [10 mins] - *History and knowledge of sweetpotato*: Small group work on participants' knowledge about sweetpotato history, cultural importance, production and utilisation trends, and the main problems faced by sweetpotato farmers. [20 mins group work, followed by 5min presentation of key issues per group] - *Cooking with OFSP*: Participants to make a chapati using different recipes	- Flip charts, marker pens, masking tape, stickers/post-its - Photocopies of the sweetpotato knowledge test (Appendix 1.2) - Overview of the training programme (Day and Topics) - *Activity 9.8.1*: Per small group: sauce pan; charcoal or gas stove; frying pan; cutting board; 1 litre luke warm boiled water; rolling pin; grater; fruit squeezer; food containers; bowls; plates; knives; 2 kg wheat flour; ½ kg OFSP; ½ kg boiled OFSP; ½ kg; ½ kg OFSP flour; 1 cup of vegetable oil; some salt; flip chart; marker pens; masking tape - *Activity 9*.8.2: 4 cups of sugar; 8 medium sized boiled peeled sweetpotato roots; 3 teaspoons of citric acid OR juice from 5 fruits; 5 litres of cooled boiled water; flavouring add tamarind, passion, pineapple or orange juice; sieve; pans; fruit squeezer;

			which substitute sweetpotato for some of the wheat flour *(see Activity 9.8.1) OR* they can make sweetpotato juice (*see Activity 9.8.2*) OR sweetpotato porridge (see 9.4.1) (try and ensure a range of products are made). [2hr 5mins] - *Presentation 2*. Origin and Importance of sweetpotato (Topic 2), followed by group discussion. [45 mins] - *Presentation 11.* Gender and diversity and how it is relevant for sweetpotato activities (Topic 11) followed by group discussion. [45 mins]	wooden spoon; jug; 5 * 1 litre clean empty bottles; fridge to chill juice in. - Ingredients and cooking utensils and equipment and cooking fuel for groups to prepare OFSP porridge (see 9.4.1) - *Presentation 2*. Origin and Importance - *Presentation 11*. Gender and diversity and how it is relevant for sweetpotato activities *Advanced preparations*: Obtain sufficient OFSP for each small group to have ½ kg of it. If you will be short of time the OFSP for the boiled& mashed recipe could be pre-boiled so the participants just mash them and incorporate them into the recipe.
Day	**Topics**	**Intended Learning Outcomes**	**Activities**	**Materials and advanced preparations**
2	Nutrition and OFSP	*Participants will:* - Understand what a balanced diet is and why it is important - Know how OFSP can contribute to reducing Vitamin A deficiency - Be able to select appropriate local ingredients to prepare a child-friendly and nutritious OFSP meal - Understand the importance of the gender aspects of household nutrition	- *Brainstorm*: What is a balanced diet? - *Presentation 4a* & *Activity 4.8.1: How well balanced are our diets?*: What is good nutrition*?(see 4.8.1)* [10 & 40 m] - *Presentation 4b* and *Activity 4.8.2: Dining from a vitamin A rich menu*. Vitamin A, why OFSP helps combat VAD & who is at risk from VAD (see 4.8.2.). [10 & 20mins] - *Activity 4.8.4: Virtual porridge making (see Activity 4.8.4). [1 hr]* - *Group discussion*: Awareness raising and demand creation for OFSP *(see Activity 4.8.4).* [55 mins] - *Group discussion*: Strengths and weaknesses of approaches. Are we integrating gender well? [30 mins]	- Flip charts, marker pens, masking tape, stickers/post-its - *Activity 4.8.1*:Presentation 4a, flip chart, pens and masking tape - *Activity 4.8.2: Presentation 4b,* A4 sheets of paper and pens, real examples of vitamin A rich local foods such as pumpkins, pawpaw, OFSP, local and exotic green leafy vegetables etc. if available - *Activity 4.8.3*: 4 sets of the virtual porridge cards with photos and descriptions of different ingredients that could be used to make a nutritious child's porridge (Handout 4.8.3.a) - *Activity 4.8.4:* Topic 4 of the manual

Day	Topics	Intended Learning Outcomes	Activities	Materials and advanced preparations
3	Different varieties of sweetpotato and their characteristics Selecting, preserving and multiplying SP planting materials	*Participants will:* - Be able to identify, select and conserve clean sweetpotato planting materials - Know about the principles of positive and negative selection and preservation of sweetpotato planting materials - Understand key differences between sweetpotato varieties - Know about the key characteristics of at least 3 sweetpotato varieties suitable for their area/ region - Be able to help farmers identify the key characteristics they are looking for in a sweetpotato variety - Understand that varietal preference differs between people - Be introduced to why care during harvesting is important for sweetpotato - Be experienced in conducting a taste test (using red, yellow, and green cards)	- *Activity 5.10.1: Vines for planting: clean and multiplied.* Field activity to identify clean planting materials, take vine cuttings, learn how to plant them in a rapid multiplication bed, discuss how to care for them, calculate vine multiplication rates (see 5.10.1). [1.5 hrs] - *Activity 3.5.1: Spot the difference*. Field activity to: identify characteristics of different sweetpotato varieties in a nearby field; to discuss with the farmer why s/he grows each of them; and to conduct a taste evaluation with the roots (*see 3.5.1*). [2hr 45mins] - *Activity 3.5.2: Selecting sweetpotato varieties.* Group discussion on key factors differentiating sweetpotato varieties. Participants then create training materials for the main sweetpotato varieties grown or suited to their location (*see 3.5.2*). [70mins] - *Presentation 3*. The natural diversity of sweetpotato; defining characteristics of different sweetpotato varieties. [20 mins] - *Presentations 5a and 5b*. Planting material selection, conservation and multiplication. [20 mins] - *Activity 5.10.2: The Triple S system.* Practicing the triple S method, from the root selection stage, to loading and placement in cool dry area. [1.5 hours]	- *Activity 5.10.1*: Nearby planted sweetpotato field with some virus infected plants. Half completed nursery bed. 5 cutting knives. 2 watering cans with water in. 2 hand hoes. A nearby rapid multiplication plot which had been planted 8 weeks prior to the course with two varieties with different multiplication rates. Flip chart. Pens - *Activity 3.5.1*: Nearby field with several varieties of sweetpotato growing in it and which the participants can harvest some roots from, flip chart, marker pens, sheets of A4 plain white paper, pencils, erasers, participants notebooks, sufficient copies of the handout on sweetpotato descriptors (Appendix 3.1) and on estimating the beta-carotene content through flesh colour of orange fleshed sweetpotato varieties (Appendix 3.2), sufficient copies of the form for participatory storage root taste evaluation (Forms 5B and 5B2 Appendix 3.5b), cooking stoves and fuel, pans, water, matches, knives - *Activity 3.5.2*: Flip charts (at least 1 page per participant); coloured pencils including plenty of green, brown, orange and yellow ones; CIP orange-fleshed sweetpotato catalogue

			Materials and advanced preparations for <u>day 3</u> c*ontinued:* - *Presentation 3* on sweetpotato diversity, varietal characteristics - *Presentations 5a and 5b*: Planting material selection, conservation and multiplication - *Activity 5.10.2:* About 200 sweetpotato roots – some damaged and a range of sizes. 6 plastic basins. Newspaper. 5 buckets. 5 brooms. Set up one Triple S system about 3 months in advance of the ToT course so that the students can see the sprouting roots. *<u>Advanced preparations</u>*: - *For Activity 3.5.1*: Identify nearby field with several varieties of sweetpotato growing in it, and some virus and weevil infested plants, and meet the farmer and see if they are agreeable to their field being visited by the participants, themselves being interviewed by the participants, and some (try and minimize the number) of the vines being cut and plants being dug up to see the root characteristics and to remove some roots for tasting, possibly 1-2 plants per variety. The farmer will need to be compensated for the roots that are harvested and removed. - *For Activity 5.10.1* Make arrangements with the owner of the field for the participants to visit, select and take vine cuttings. It should be a field with virus and weevil problems, so the participants can practice negative selection (i.e. roguing diseased material and discarding unhealthy material and only selecting planting materials which look healthy, and disease and pest free). Set up a rapid multiplication plot 8 weeks prior to the course planted with cuttings of two varieties with very different multiplication rates, e.g. 1sqm (50 cuttings) of Variety A, 1 sqm (50 cuttings) of Variety B. Set up half a rapid multiplication bed at the field, so the participants can complete it and then practice planting out the cuttings they have taken, shading, and watering it. - *For Activity 5.10.2* Set up a Triple S system a few months in advance of the ToT course, so that the students can uncover the roots and find them sprouting, and can then use them to practice planting them out.

Day	Topics	Intended Learning Outcomes	Activities	Materials and advanced preparations
4	Sweetpotato production and crop management Sweetpotato pests and diseases and their management	*Participants will:* - Understand the different stages of the sweetpotato crop cycle and the management implications of each stage - Be able to find field examples of the key pests and diseases of sweetpotato and explain and show the damage each can cause - Know a range of practical techniques for managing these key pests and diseases - Be able to help farmers set up a field experiment to compare different sweetpotato varieties or different sweetpotato management practices	- *Activity 7.9.1: Field hunting for sweetpotato pests and diseases and learning how to manage them.* Collection of infested roots, damaged and diseased leaves, some observation of insect activity in the sweetpotato field, group discussion and brainstorming on where these pests and diseases come from and how they spread (including whitefly if possible). Include practice and discussion of hilling up and rouging of SPVD affected plants (*see 7.9.1*). [75 mins plus travel] - *Activity 6.9.1: Comparing sweetpotato varieties and management practices:* Setting up a sweetpotato field experiment (see details in 6.9.1). [3 hours] - *Presentation 6.* The sweetpotato crop cycle (including post-harvest stages), participants then draw the crop cycle in their note books, and after a discussion add in the details of what has to be paid attention to during each stage. [30 mins] - *Presentations 7a and 7b*. Lifecycles and management of sweetpotato pests and diseases. [45 mins]	- *Activity 7.9.1*: Ideally a nearby young crop with SPVD in it, a field which previously had sweetpotato in it and a mature or old sweetpotato crop which participants can explore and find diseases and pest damaged sweetpotato plants in; 20 digging sticks; 8 buckets for transporting the infested roots; 8 sacks; 20 transparent collecting pots or jars with lids with a few small holes made in them; 20 magnifying lenses; participants should carry their notebooks and pencils; flip chart and stand; marker pens; masking tape - *Activity 6.9.1*: Flip charts, pens, rope, measuring tape, spades, labels, sticks, nearby field in which they can set up the experiment, topics 3,6 and 7 of this manual, pages 20-22 in the handout booklet 'What is damaging my sweetpotato?' - *Presentation 6* on sweetpotato development stages and associated management tasks - *Presentations 7a and 7b* on lifecycles and management of sweetpotato pests and diseases

Day	Topics	Intended Learning Outcomes	Activities	Materials and advanced preparations
5	Harvesting, storing, processing and marketing OFSP Planning to train others on '*Everything you ever wanted to know about sweetpotato*'	*Participants will:* - Know about the main aspects of sweetpotato harvesting, processing and post-harvest management. - Understand how the processing and storage of OFSP affects it beta-carotene content - Be familiar with the concepts of marketing and market orientation - Understand the opportunities and challenges in sweetpotato fresh root and processed product marketing - Have begun to think about and practice delivering the 5 day training course on '*Everything you ever wanted to know about sweetpotato*'	- *Activity 8.9.1: Increasing profits through storing fresh sweetpotato roots.* Field exercise to harvest roots, separate out damaged roots; set up a protected fresh root pit store (NB grass, bamboo pool and wood for cover need to be arranged in advance and hole dug in advance) *(see 8.9.1). [2hrs]* - *Activity 8.9.2: Effect of sun-drying and storage on beta-carotene content of OFSP.* Participants observe the differences between samples of OFSP chips which have been sun-dried for 7, 5, or 2 days. Beta-carotene content estimates are provided to illustrate how the beta-carotene content declines over time during storage *(see 8.9.2).* [30 mins] - *Presentation 8.* Piecemeal harvesting, chip drying & curing for improved shelf-life; post-harvest management of fresh roots and dried chips; storage containers, protection from pests and monitoring over time. Discuss who in the household is responsible for storage, and how to ensure information reaches them? [45 mins] - *Group discussion:* on who to target for processing training, such as people who are already micro-food processors and might incorporate OFSP,	- *Activity 8.9.1:* nearby sweetpotato field which is ready for harvest and where the participants can dig up 10 plants per group to work out the yield; scales; sacks; calculator; pen and paper; spades; hoes; dry grass; bamboo poles; harvesting sticks; branches, thatching grass and string - *Activity 8*.9.2: ~50 orange-fleshed sweetpotato roots, chipping machine, raised drying rack, at least 3 sample bags, labels, marker pens, data set showing how beta-carotene content decreases with prolonged sun-drying, sufficient photocopies of the data set showing how beta-carotene content decreases with prolonged storage (Handout 8.9.2a) - *Presentation 8* on harvesting, drying, curing, storing and postharvest gender aspects - Presentation 10a and b on Marketing concepts - *Activity 1.4.1*: Cards with the key topics of the 5 day ToT course written on them, participants need their '*Everything you ever wanted to know about sweetpotato*' manual, note books and pens; stickers/ post-its, flip charts, masking tape, marker pens, all equipment that has been used during the training program including ~100

			discussion regards the importance of involving men even though women do the food preparation usually, but men are still influential in deciding what foods to plant or purchase. [10 mins] - *Brainstorming*: on opportunities and challenges in fresh root marketing. [10 mins] - *Presentations 10 a and b*. Marketing concepts, trader training & gender considerations. [20 mins] - *Activity 1.4.1: Practising being learning-by-doing facilitators.* Practice in facilitating a key sweetpotato topic, and group work on the principles of giving and receiving constructive feedback (see *Activity 1.4.1*). [2hr 30 mins] - *Activity 1.4.3: Evaluating a training course.* Course evaluation (*see Activity 1.4.3) (option to repeat sweetpotato knowledge test as exit test (Appendix 1.2)). [1hr]* - Presentation of certificates.	sweetpotato roots some OFSP. - Activity 1.4.3: Enough photocopies of the course evaluation form 12.5.5c for each participant, pens, sufficient copies of the sweetpotato knowledge test (Appendix 1.2) if you plan to do an exit test - Completed certificates, soft drinks <u>*Advanced preparations*</u>: • *For Activity 8.9.2*. Three days prior to the ToT course prepare a small quantity of OFSP chips and place them out on a raised rack to sun-dry (this will become the 'sun-drying for 7 days sample'), 1 day prior to the ToT course, chip some more OFSP and place it on same raised rack but do not mix it with the first sample. Make sure the samples are clearly labelled and protected. On day 3 of the 5 day ToT course, chip some more OFSP and place it on the same rack. Use the samples on Day 5 of the ToT

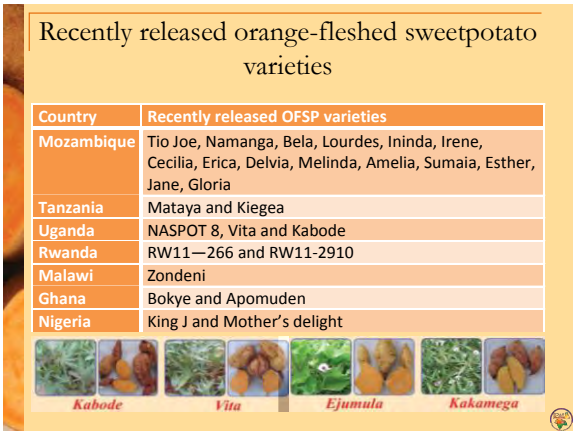
13.3 Presentations accompanying the '*Everything you ever wanted to know about Sweetpotato*' ToT course

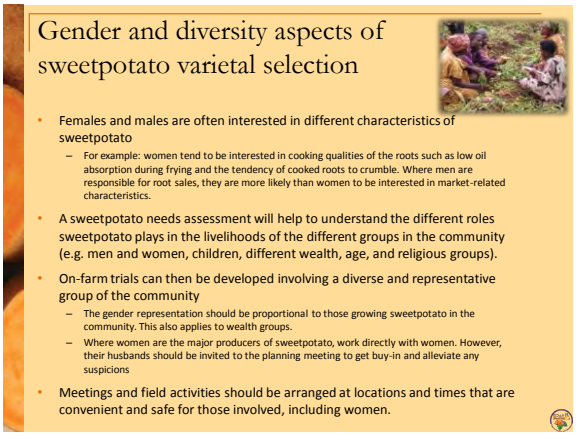
A complete set of Powerpoint presentations have been created along with this manual. It is hoped these presentations will be used as suggested in the 10 and 5 day ToT programmes shown in sections 13.1 and 13.2.

This ToT course has been designed so that learning is mainly by-doing, and facilitators should take care to maximize the hands-on learning activities and use the presentations only for support, to summarise the topics, to provide photographs of particular pests and diseases or crop stages and activities if they are not found in the field during the course, and to help focus the group on issues for further discussion.

There is a Powerpoint presentation for each topic of the manual, and for some of the larger topics such as Seed systems the presentation has been cut into several sections. Facilitators may wish to customise these presentations to make them more specific to their local context.

Figure 13.1 Example from the accompanying Powerpoint presentation slides for Topic 3 of the '*Everything you ever wanted to know about sweetpotato*' ToT course





13.4 Memory aid cards for the '*Everything you ever wanted to know about Sweetpotato*' ToT course

Additionally a set of 'memory aid cards' have been prepared as support materials to accompany the '*Everything you ever wanted to know about sweetpotato*' manual and training course.

They are a set of cards which sequentially cover different sweetpotato topics. Each card has a photo or diagram on the front and key points related to the topic on the back. It is hoped that trainers will use this set of cards as a useful notebook/ instant presentation tool at points during their training activities. The picture can be shown to the farmers/ trainees while the trainer uses the notes on the back to make sure they cover the key issues in their training. However, it should be noted that this set of cards have been prepared as memory aids and they should never replace practical learning-by-doing activities and discussions with farmers.

Figure 13.2 Example of front and back sides of memory aid card number 5.3

Front of memory aid card number 5.3

Dry season preservation of root planting materials (Triple S system)

- The Triple S system is a way of preserving sweetpotato planting materials during the dry season
- Select small/ medium sized **undamaged** roots from the roots you have harvested from healthy plants
- Place the roots carefully in a basin and make alternating layers of cool sand and roots, ending with sand on top
- Place the container somewhere dry, cool and safe away from chickens and children
- 6-8 weeks before the on -set of the rains, uncover the now sprouting roots and plant them in a nursery bed at a spacing of 50*50cm and a depth of 5cm under the soil
- Water them every 3 -4 days and within a few weeks 40 roots can produce 1,500 cuttings in time for the start of the rains.

Sweetpotato seed systems - 5.3

Back of memory aid card number 5.3

TOPIC 14: REFLECTIONS

ON

EVERYTHING YOU EVER WANTED TO KNOW ABOUT SWEETPOTATO

Reflection is a crucial part of any learning process. We hope that after field testing this training course and manual, participants will reflect on their experiences of it and share their ideas for how it could be improved. It can often be helpful to 'sleep on' an experience in order to help put it into context. You may therefore want to leave your reflection process about each topic until the day after it has occurred to make it more meaningful.

Two forms are provided which participants may wish to use to capture their reflections. An overall summary sheet (Table 14.1) which participants can complete after every day to reflect on how their experience of the training course itself or the background information in the training manual could be improved. If participants wish to use a full page for reflections on each topic, Table 14.2 provides a possible template that can be photocopied for this, it is important that the topic number and title is entered at the top of each page. These forms are available electronically via the Sweetpotato Knowledge Portal http://sweetpotatoknowledge.org/projects-initiatives/reaching-agents-of-change-rac/rac-tot-course-forms/Table%2014.1%20and%2014.2_Reflections%20on%20RAC%20ToT%20course.docx/view .

It should be noted that there is also a formal course evaluation form (Form 12.5.5c) included in Topic 12 of the manual, also available on the Sweetpotato Knowledge Portal.

Some training groups may prefer to create a small feedback committee who can collect the views of the participants and then summarise them and enter them onto Table 14.1 or 14.2, as opposed to each individual completing the form.

Other groups might prefer to use role play to summarise each morning what they learnt the day before, and areas they are still confused about.

Alternatively the facilitator might like to ask participants to think of three things they have learnt today and three things they did not completely understand today, and then go round the room asking each person to mention one of each. This process will work best where there is good rapport between the facilitator and participants, and where the facilitator has shown that they are open to suggestions for improvement.

We thank you in advance for sending any suggestions you have on how to improve the course and manual by email to Jan Low (contact details as shown below). Where possible we will incorporate them.

To: J.LOW@CGIAR.ORG

Subject Heading: Reflections on 'Everything you ever wanted to know about sweetpotato' ToT Course and Manual.

Table 14.1 Overall summary sheets for reflections on the training course and manual

Reflections on the 'Everything you ever wanted to know about sweetpotato' manual and ToT course					
Name:		**Sex:**		**Country and Year:**	
What did you enjoy most about this Topic?	**What needs to be improved, and in what ways in the Course?**	**What is missing from the Course?**	**What needs to be improved, and in what ways in the Manual?**	**What is missing from the Manual?**	**Any other comments?**
Topic 1: Helping Adults to Learn					
Topic 2: Origin and Importance of Sweetpotato					
Topic 3: Sweetpotato Varietal Selection and Characteristics					
Topic 4: Orange-fleshed Sweetpotato and Nutrition					
Topic 5: Sweetpotato Seed Systems					
Topic 6: Sweetpotato Production and Management					

What did you enjoy most about this Topic?	What needs to be improved, and in what ways in the Course?	What is missing from the Course?	What needs to be improved, and in what ways in the Manual?	What is missing from the Manual?	Any other comments?
Topic 7: Sweetpotato Pest and Disease Management					
Topic 8: Harvesting and Postharvest Management					
Topic 9: Processing and Utilisation					
Topic 10: Marketing and Entrepreneurship					
Topic 11: Gender and Diversity Aspects					
Topic 12: Monitoring of OFSP Dissemination and Uptake					
Topic 13: Using the 'Everything you Ever Wanted to Know about Sweetpotato' ToT course					

Table 14.2 Per topic reflections on the *'Everything you ever wanted to know about sweetpotato'* training course and manual

Per topic reflections on the 'Everything you ever wanted to know about sweetpotato' manual and ToT course		
Name:	**Sex:**	**Country and Year:**
Topic title and number:		
What did you enjoy most about this Topic?		
For this Topic what needs to be improved, and in what ways in the <u>Course</u>?		
For this Topic what is missing from the <u>Course</u>?		
For this Topic what needs to be improved, and in what ways in the <u>Manual</u>?		
For this Topic What is missing from the <u>Manual</u>?		
Any other comments?		

APPENDICES

IN

EVERYTHING YOU EVER WANTED TO KNOW ABOUT SWEETPOTATO

Contents

Appendices

Appendix 1. Energisers, group dynamics exercises and training action plan

Appendix 1.1a. Energisers

Energisers are typically short physical exercises to reinvigorate a tired group of participants. Below are a few examples. The participants may know some good ones they would like to share with the group.

Mirror Image

Participants sort themselves into pairs. Each pair decides which one of them will be the 'mirror'. This person then copies (mirrors) the actions of their partner. After some time, ask the pair to swap roles so that the other person can be the 'mirror'.

What has changed?

Participants break into pairs. Partners observe one another and try to memorise the appearance of each other. Then one turns their back while the other makes three changes to his/her appearance; for example, putting their watch on the other wrist, removing their glasses, and rolling up their sleeves. The other player then turns around and has to try to spot the three changes.
The players then switch roles.

Appendix 1.1b. Group dynamics exercises

To help groups of people interact and work together as an effective team, games or exercises can be used to improve group dynamics and highlight important issues.

Leading the blind:

Objectives: To have the participants experience how it feels to be blind, or to lack knowledge of some aspects of what is happening. To raise awareness about the feelings and needs of people who may need assistance. To enhance understanding about the requirements for being a good facilitator.

Materials: Cloths to tie across the eyes, preferably dark coloured so light doesn't pass through.

Duration: 15 minutes

Steps:

a) Ask the participants to get themselves into pairs, and then to tie the cloth around the eyes of one person in each pair, so that they cannot see anything.

b) The person who is not blindfolded then leads the blindfolded person around for ~5 mins (you could choose a route with obstacles, and you could get them to switch e.g. the other person puts on the blindfold after 3 minutes)

Discussion: How did the blind people feel when they could not see? How did you feel about the person who was leading you around? Did you trust him/her? Why or why not? Did you feel that your guide cared for you or that she made a fool of you? Why?
How did the 'guides' feel leading a blind person? What special efforts did they make to lead their partner? Did they search for easy or difficult things for their partner to experience? Did they give him/her their full attention? Did you supervise him/her tightly or let him/her act freely? Did you explain each situation beforehand?
From the answers given during the discussion, some general conclusions can be drawn regarding leadership and facilitation, e.g.:
A good facilitator:

- Does not force others to follow his/ her own plans
- Gives sensible and timely explanations. Does not threaten others, but does not hide constraints either
- Acts in accordance with the capabilities and emotions of the groups s/he is facilitating
- Delegates those tasks and responsibilities that can be accomplished by other members of the group

Know yourself:

Objective: To demonstrate how poorly we observe the details of things we often see
Duration: 10 minutes
Steps:

a) Ask the participants to get into pairs.
b) Ask one members of each pair to close his or her eyes. The person with their eyes closed must then tell the other person in as much detail as possible what s/he him/herself is wearing (colours, pictures or writing on T-shirts, dresses, kangas etc., holes, watches, jewellery etc). The person who has their eyes open may probe for details. When they finish the observer gives a score between 0-10, then together they evaluate the exercise, what was lacking, why was it difficult etc?
c) Then the roles are exchanged and the previous observer closes his/her eyes and tells his/her partner in detail what s/he has in her/his pockets or handbag (without feeling or touching). The observer may probe for details. When finished, s/he has to show the content of her/his pockets to check whether the description was correct. The observer gives a score between 0-10, and together they evaluate the exercise.

Discussion: As a whole group, what did the participants learn from this exercise? To what extent could we give details of our own clothes/ pocket contents? Why aren't we more observant? How can we increase our own observation skills?

There are several online resources for exercises for group dynamics and energisers. The following website is one of them:
http://www.community4me.com/Resources.html

Appendix 1.2. Basic written test to assess current state of sweetpotato knowledge

Full Name:	
Male or Female:	
Training course location:	
Date:	
1. What colour can the flesh of sweetpotato roots be?	
2. What is a balanced diet?	
3. Which part of the vine should you use as planting material?	
4. What are the signs of virus infection in sweetpotato plants?	
5. What should you do if your sweetpotato plant shows signs of being infected with a virus?	
6. Have you seen this insect before, what is its name and what does it do to sweetpotato?	
7. Are there any insects commonly found in the sweetpotato field which are beneficial to farmers. If yes, which ones?	
8. What causes this to happen to sweetpotato roots?	
9. What problems can someone who is deficient in vitamin A have?	
10. What are the main problems related to transport of sweetpotato?	
11. What are the 5 pillars of marketing?	
12. Name four key actors/ stakeholder types in the sweetpotato market value chain?	
13. What other recipes can you make from sweetpotato?	
14. What part of the sweetpotato plant can be fed to livestock?	
15. Why is it important to involve both men and women in sweetpotato training?	

Appendix 1.3. Training action plan

RAC Training of Trainers (TOT) Course –

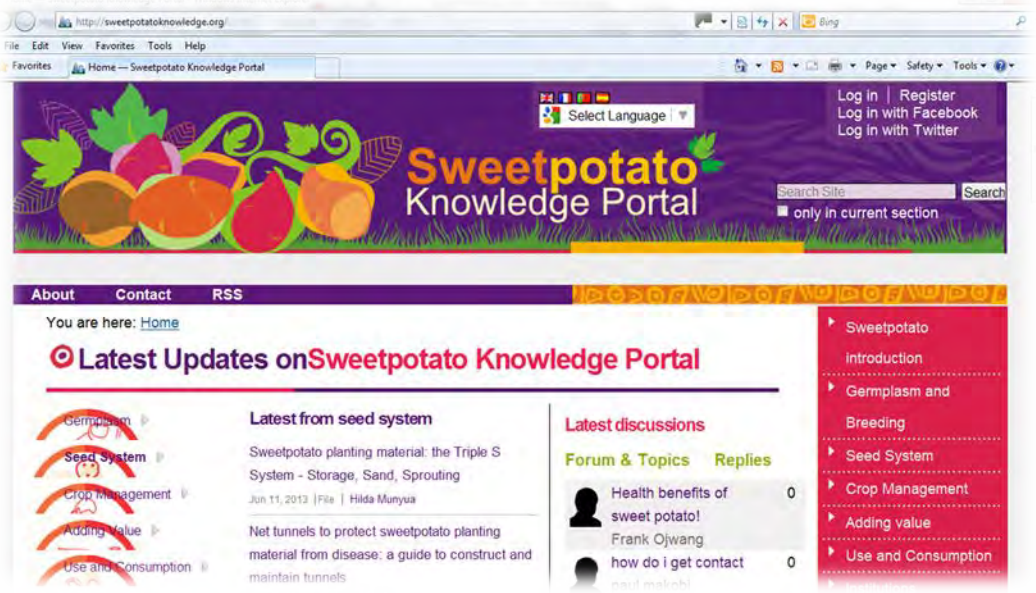
"Everything you ever wanted to know about sweetpotato"

Training Action Plan

The purpose of the action plan is to help participants of the 10-day TOT Course on "*Everything you ever wanted to know about sweetpotato*" to apply the new knowledge and skills acquired. The action plan is to be developed over the second week of training to allow for comments and input from peers and training facilitators. A copy of the final action plan is to be submitted to the facilitator on the last day of training.

Name:	Organization:	Date: .....
What were your reasons for taking this course?		
What is your plan for training others in '*Everything you ever wanted to know about sweetpotato*' upon completion of this course?		
What is the likely title of the course you plan to deliver related to '*Everything you ever wanted to know about sweetpotato*'?		
What are the tentative dates for the training course?	Start: ..... (dd/mm/yy)	End: .....
Who is the target audience for the course (state category/ies of persons to be trained)?		
What are the challenges / barriers that you propose to address / reduce by implementing the course?		
What are the expected outcomes?		
How many people do you propose to train		
Who will comprise your training support team?		
Estimated budget?	Tentative source of funding?	
Signature of participant: ..... Email address of participant: ..... Mobile number of participant:		Signature of training facilitator: .....

Appendix 2. How to use the sweetpotato knowledge portal online resource



The Sweetpotato Knowledge Portal (SPKP) is a collaborative online platform that provides an arena where sweetpotato actors meet virtually, share and exchange information and knowledge. The goal of the SPKP is to improve access to technical, scientific, local and development knowledge on sweetpotato in order to improve the nutrition and food security of the people of Africa. The SPKP is supported by the International Potato Center (CIP), through the Sweetpotato Action for Security and Health in Africa (SASHA), with funding from the Bill and Melinda Gates Foundation. Membership (by registration) to the Portal is open to all sweetpotato stakeholders and members can upload new knowledge and information resources they possess. The SPKP was initially developed to help sweetpotato scientists but membership is now open to all stakeholders. Members are encouraged to upload their outputs on the portal because publishing content on the portal increases the impact of the work. The policy of the SPKP recognizes authors but encourages information and knowledge to be considered as public goods. Training facilitators are encouraged to become members and collaborate with other experts. Click here to register as a member or paste the following URL into your browser http://www.sweetpotatoknowledge.org/register

Members have permission to:

- To add, edit and publish sweetpotato-related content on the portal.
- Create a project 'private section' where only you and the people you designate can see the content (useful for content such as calendars, budgets, reports).
- Establish contact with other members, collaborators or partners.
- Join discussion forums.
- Access content that is published on the portal.

Non-members can only:

- Search for information that is published on the portal.
- Leave comments for the author(s) or the discussion forum.

Sweetpotato Knowledge Portal Demonstration

Click the white arrow on the SPKP Homepage for a brief demo of the portal

Appendix 3. Sweetpotato descriptor charts, beta-carotene colour chart and on-farm trial forms

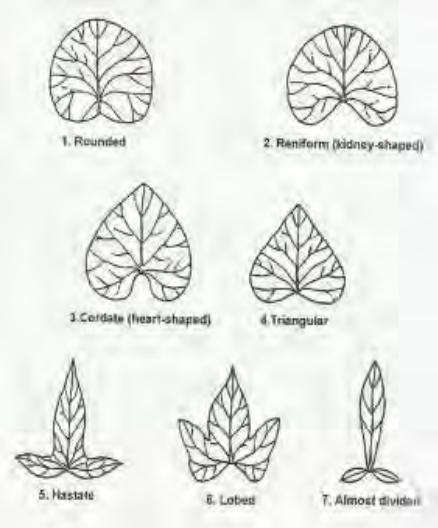
Appendix 3.1. Descriptors for sweetpotato

Source: CIP, AVDRC, IBPGR, 1991

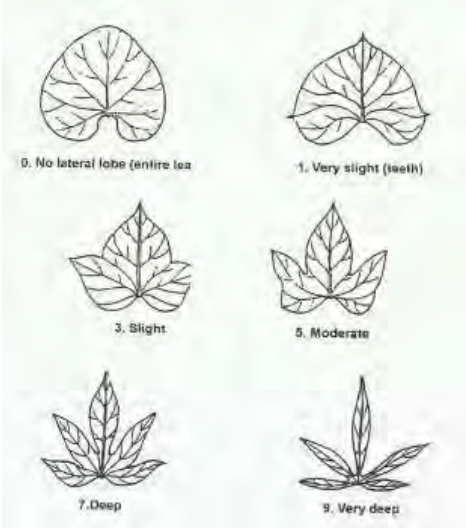
Plant type: 1. Erect = less than 75 cm high, 2. Semi-erect = 75-150 cm, 3. Spreading = 151-250 cm in length, 4. Extremely spreading = more than 250 cm

Predominant vine colour: 1. Green, 3. Green with a few purple spots, 4. Green with many purple spots, 5. Green with many dark purple spots, 6. Mostly purple, 7. Mostly dark purple, 8. Totally purple, 9. Totally dark purple

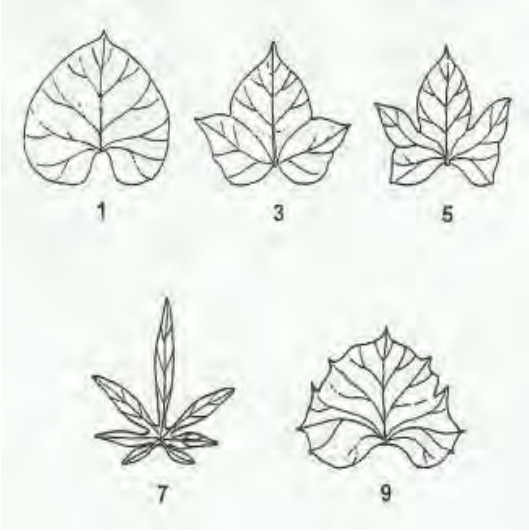
Secondary vine colour: 0. Absent, 1. Green base, 2. Green tip, 3. Green nodes, 4. Purple base, 5. Purple tip, 6. Purple nodes



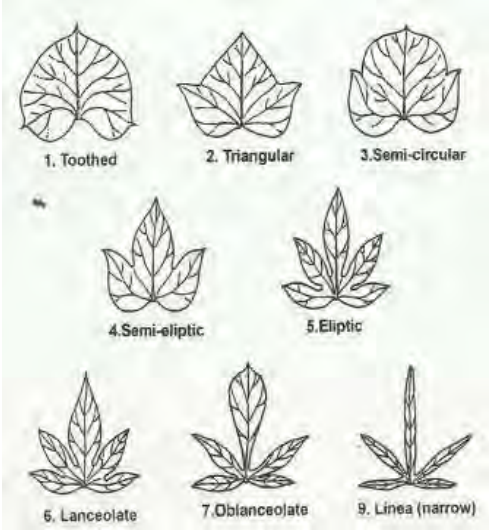
General outline of the leaf



Leaf lobe type



Leaf lobe number



Shape of central leaf lobe

Abaxial leaf vein pigmentation: 1. Yellow, 2. Green, 3. Purple spot on base of mid-rib, 4. Purple spots on several veins, 5. Main rib partially purple, 6. Main rib mostly or totally purple, 7. All veins partially puple, 8. All veins mostly or totally purple, 9. Lower surface and veins totally purple.

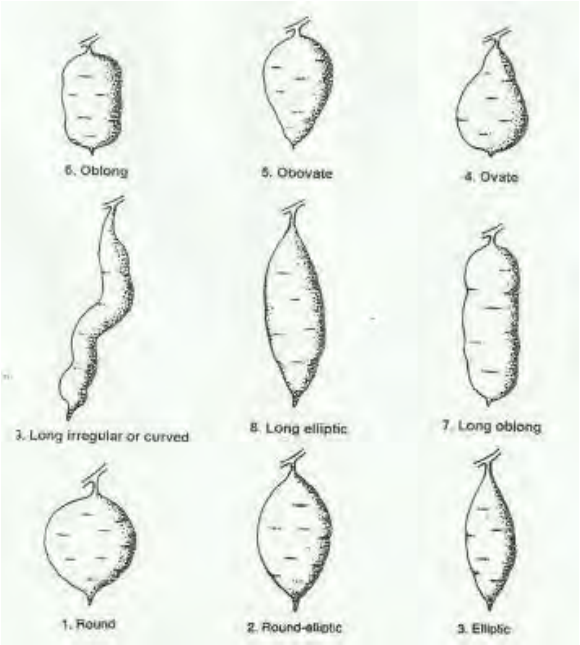
Mature leaf colour: 1. Yellow-green, 2. Green, 3. Green with purple edge, 4. Greyish-green (due to heavy pubescence), 5. Green with purple veins on upper surface, 6. Slight purple, 7. Mostly purple, 8. Green upper, purple lower, 9. Upper and lower surfaces purple

Immature leaf colour: 1. Yellow-green, 2. Green, 3. Green with purple edge, 4. Greyish-green (due to heavy pubescence), 5. Green with purple veins on upper surface, 6. Slight purple, 7. Mostly purple, 8. Green upper, purple lower, 9. Upper and lower surfaces purple

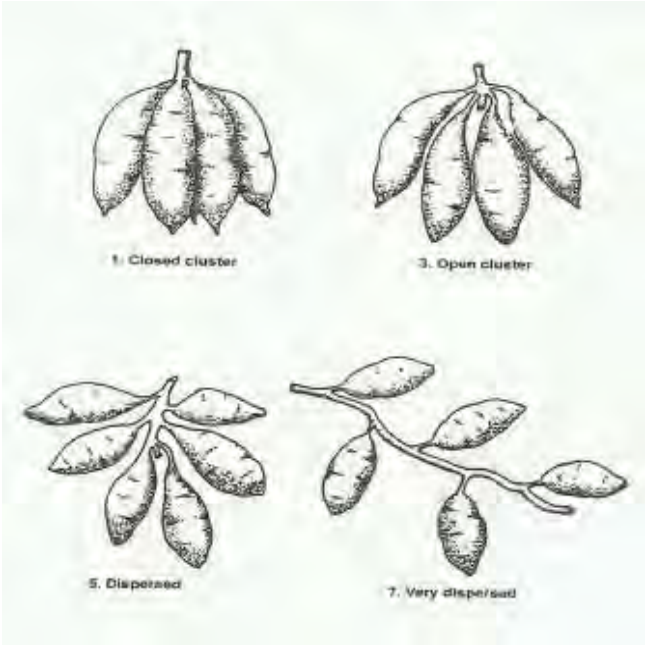
Skin colour: 1.White, 2.Cream, 3. Yellow, 4. Orange, 5.Brownish-orange, 6. Pink, 7.Red, 8. Purple-red, 9. Dark-purple

Intensity of skin colour: 1. Pale, 2. Intermediate, 3. Dark

Flesh colour: 1. White, 2. Cream, 3. Dark-cream, 4. Pale-yellow, 5. Dark-yellow, 6. Pale-orange, 7. Intermediate-orange, 8. Dark-orange, 9. Strongly pigmented with anthocyanin



Storage root shape



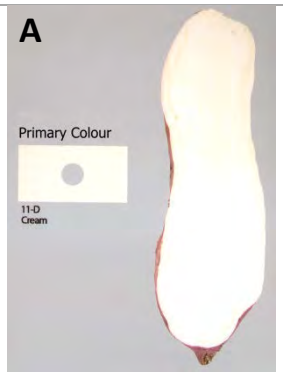
Storage root formation

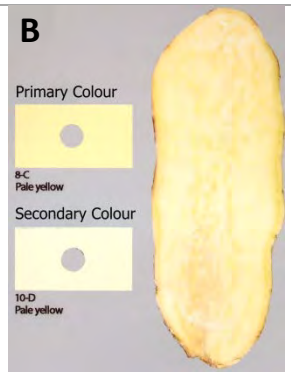
Appendix 3.2. The β-carotene sweetpotato colour chart

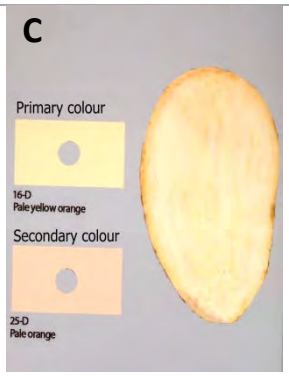
For estimating the β-carotene content of slices of freshly harvested sweetpotato

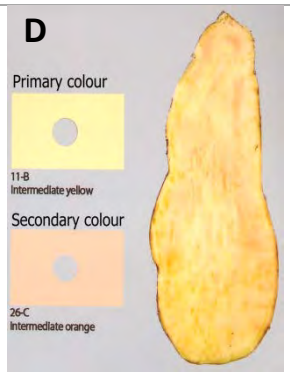
Instructions: 1. Cut a longitudinal slice off your freshly harvested sweetpotato root; 2. Hold the root up to the colour chart and see which picture its colour is closest to; 3. Read off the approximate B-carotene and Vitamin A concentrations.

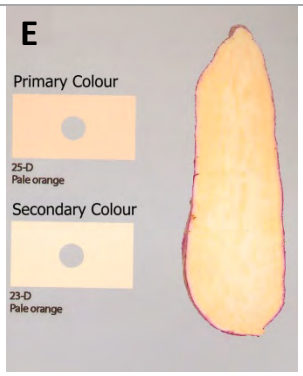
N.B. This tool is for use with orange-fleshed sweetpotato, as in yellow fleshed varieties the β-carotene content can be very variable.

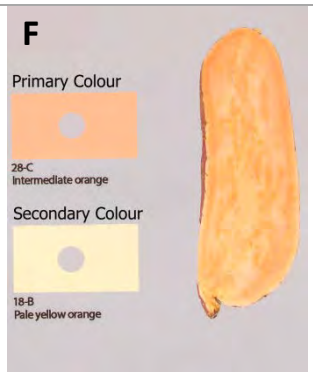
<table>
<tr>
<td> 

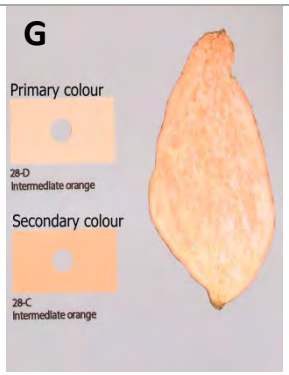
β-carotene: 0.03 mg/100g, FW
Vit A: 2.5 µg RE/100g, FW</td>
<td> 

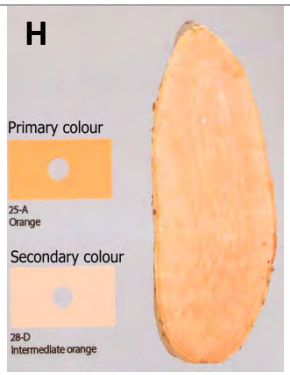
β-carotene: 0 mg/100g, FW
Vit A: 0.0 µg RE/100g, FW</td>
<td> 

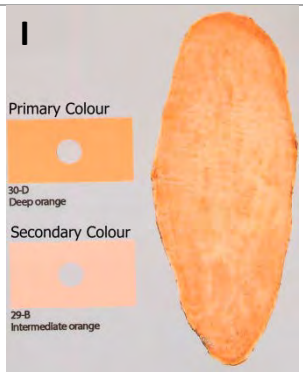
β-carotene: 0.15 mg/100g, FW
Vit A: 12.5 µg RE/100g, FW</td>
<td> 

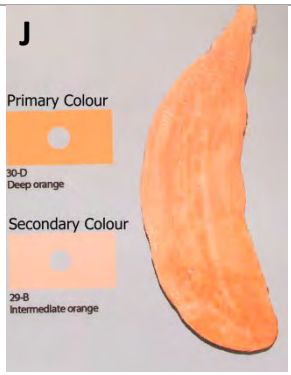
β-carotene: 1.32 mg/100g, FW
Vit A: 110.0 µg RE/100g, FW</td>
</tr>
<tr>
<td> 

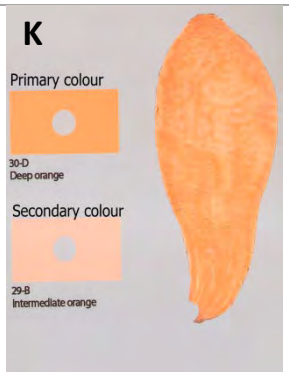
β-carotene: 1.65 mg/100g, FW
Vit A: 137.5 µg RE/100g, FW</td>
<td> 

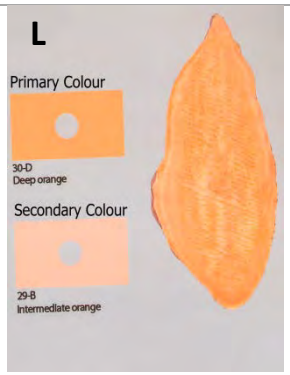
β-carotene: 3.96 mg/100g, FW
Vit A: 330.0 µg RE/100g, FW</td>
<td> 

β-carotene: 4.92 mg/100g, FW
Vit A: 410.0 µg RE/100g, FW</td>
<td> 

β-carotene: 6.12 mg/100g, FW
Vit A: 510.0 µg RE/100g, FW</td>
</tr>
<tr>
<td> 

β-carotene: 7.76 mg/100g, FW
Vit A: 646.7 µg RE/100g, FW</td>
<td> 

β-carotene: 10.5 mg/100g, FW
Vit A: 875.0 µg RE/100g, FW</td>
<td> 

β-carotene: 12.39mg/100g, FW
Vit A: 1032.5 µg RE/100g, FW</td>
<td> 

β-carotene: 14.37mg/100g, FW
Vit A: 1197.5 µg RE/100g, FW</td>
</tr>
</table>

Key: FW = Fresh Weight; Vit A = Vitamin A; RE = Retinal Equivalent

Source: Adapted from Burgos et al., (2001) "A colour chart to screen for high beta-carotene content in OFSP breeding"

Appendix 3.3. Sheet for collecting key morphological descriptors for identifying sweetpotato varieties

(see Appendix sheets 3.1 and 3.2 for details)

Variety name	Plant type	Predominant vine colour	Secondary vine colour	General outline of leaf	Leaf lobe type	Leaf lobe number	Shape of central leaf lobe	Leaf vein pigmentation	Mature leaf colour	Immature leaf colour	Skin colour and intensity	Flesh colour	Estimated β-carotene content	Storage root shape	Storage root formation

Appendix 3.4. Sample farmer contract for on-farm trial

Contract between the farmer named _____ and the researcher named _____ and the representative from the local partner organization _____.

We the undersigned:

1. Understand that the 3 middle rows of each plot will be reserved for harvesting together with the researchers/local partners, and that they will not be harvested before the agreed-on main harvest time. One row will be reserved for in-ground storage. One row will be for farmer's use to harvest as desired.

2. The farmer agrees to the following management practices:

a. To take good care of the trial plots, weeding and performing other management following the instructions agreed upon with the researcher including:

Preparing the field with 30 cm between plants on ridges, ridges should be 40 cms high.

1st weeding after 3 weeks.

2nd weeding as needed, hilling up as demonstrated by the researcher.

b. To protect the field from animal attack through careful site selection or fencing (with bushes or other materials).

c. To be available to attend field training on sweetpotato management

3. Understand that other farmers and members of the community will be invited for field days or at other times to observe the fields

4. Researchers will make several visits to take measurements during the growing season

5. The plot owner will own all of the roots from the harvest, except those needed for the cooking trials and the storage trials (approximately 20 roots).

6. Any other agreed upon point.

Signed and dated:

_____	_____
Farmer(s)	Date
_____	_____
Researcher(s)	Date
_____	_____
Local partner(s)	Date

Appendix 3.5a. Forms for pre-harvest and harvest evaluation of on-farm trials by research, extension or NGO workers

FORM 4B. SWEETPOTATO PRE-HARVEST COUNTRY (C): ____

SITE (L) ____ Trial Type (T) ____ Year:(Y) ____ Season(S) ____ Page: ____

PLOT NO.	REPLI-CATION NO.	GENOTYPE NAME (USE NUMBER IF NO NAME EXISTS)	SIMPLE CODE	1-Check clone 2- New Clone	3-4 WEEKS AP # VINES PLANTED	# PLANTS ESTA-BLISHED	VIRUS SYMPTOMS 6-8 WKS AFTER PLANTING 1- No symptoms to 9- Very Severe	VIRUS SYMPTOMS 1 MONTH BEFORE HARVEST 1- No symptoms to 9- Very Severe	ALTERNARIA 6-8 WKS AFTER PLANTING 1- No symptoms to 9- Very Severe	ALTERNARIA 1 MONTH BEFORE HARVEST 1- No symptoms to 9- Very Severe	VIGOR 1 MONTH BEFORE HARVEST 1- None to 9- Strong
PN	R	G	SC	CL	NOPS	NOPE	VIR1	VIR2	ALT1	ALT2	V V

AP= AFTER PLANTING.

CODING SCHEMES:

VIRUS SYMPTOMS

1- No virus symptoms
2- Unclear virus symptoms
3- Clear virus symptoms < 5% of plants per plot
4- Clear virus symptoms at 6-15% of plants per plot
5- Clear virus symptoms at 16-33% of plants per plot
6- Clear virus symptoms at 33-66% of plants per plot
7- Clear virus symptoms at 67-99% of plants per plot
8 = Clear virus symptoms at all plants per plot (not stunted)
9 = Severe virus symptoms in all plants per plot (stunted)

ALTERNARIA SYMPTOMS

1- No symptoms
2- Unclear symptoms
3- Clear virus symptoms at one plant per plot
4- Clear symptoms at 6-15% of plants per plot
5- Clear symptoms at 16-33% of plants per plot
6- Clear symptoms at 33-66% of plants per plot
7- Clear symptoms at 67-99% of plants per plot
8 = Clear symptoms at all plants per plot (not fully
9 = Severe virus symptoms in all plants per plot (fu

VINE VIGOR

1- Nearly no vines exist
2- Weak vines, thin stems, very long internode distances
3- Weak to medium strong vines, medium thick stems & long internode distances
4- Medium strong vines, medium thick stems, and medium internode distances
5- Medium strong vines, thick vines, & long internode distances
6- Medium strong vines, thick stems, and medium internode distances
7- Strong vines, thick stems, short internode distances, and medium long vines
8- Strong vines, thick stems, short internode distances, and long vines
9- Very strong vine strength, thick stems, short internode distances and very long vines

FORM 4C. SWEETPOTATO HARVEST COUNTRY (C): SITE (L) Trial Type (T) Year:(Y) Season(S) Page:

Code: 1- Preliminary (PT) 2- Advanced or Uniform (AT) 3- On-farm (OFT)

						# ROOTS		**WEIGHT OF ROOTS (KGS)**		**VINE WEIGHT**	SKIN	**FLESH**	SIZE	FORM	WEEVIL	ROOT DEFECT
	REPLI-			#	#	*>100 gms*	*<= 100 gms*			AT HARVEST	COLOR	**COLOR**	1- Excellent		1- No damage	C- Cracks
PLOT	CATION	GENOTYPE	SIMPLE	PLANTS	PLANTS	*undamaged*	*or damaged*					*4 roots, 1 rep*	3- Good		3- Minor	V- Veins
NO.	NO.	NAME	CODE	HAR-	WITH	MARKETABLE	NON-	MARKETABLE	NON-	KGS	*see*	*Page # from*	5- Average		5- Mod (10-30%)	G-Grooves or
		(USE NUMBER IF NO NAME EXISTS)		VESTED	ROOTS		MARKETABLE		MARKETABLE		*codes*	*color chart*	7- Fair		7- Heavy (30-60%)	constrictions
													9- Terrible		9- Severe (>60%)	P-Pencil roots
PN	R	G	SC	NOPH	NOPR	NOCR	NONC	CRW	NCRW	VW	SCOL	FCOL	RS	RF	WED1	DAMR

SKIN COLOR: 1- White 2- Cream 3- Yelllow 4- Orange 5- Brownish Orange 6- Pink 7- Red 8- Purple Red 9- Dark Purple

FLESH COLOR: *IF COLOR CHARTS ARE UNAVAILABL* 1- White 2- Cream 3- Dark cream 4- Pale yellow 5- Dark yellow 6- Pale orange 7- Intermediate orange 8- Dark orange 9- Stongly pigmented with anthocyanins (purple)

FORM 5A. SWEETPOTATO FARMER PARTICIPATORY FIELD EVALUATION

SITE: ____________________ Year: ____ Season: ____ PAGE ____

TOTAL NUMBER OF FARMERS ____ TOTAL NUMBER OF FEMALE FARMERS ____ TOTAL NUMBER OFMALE FARMERS ____

		PRODUCTION OF PLANTING MATERIAL			ASSESSMENT OF SPVD RESISTANCE			ASSESSMENT OF WEEVIL RESISTANCE			ASSESSMENT OF YIELDING ABILITY			ASSESSMENT OF ROOT SKIN COLOUR			ASSESSMENT OF ROOT FLESH COLOUR			OVERALL ACCEPTABILITY		
GENOTYPE	GENDER	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#
CODE		RED	YELLOW	GREEN	RED	YELLOW	GREEN	RED	YELLOW	GREEN	RED	YELLOW	GREEN	RED	YELLOW	GREEN	RED	YELLOW	GREEN	RED	YELLOW	GREEN
	1 - MALE																					
	2 - FEMALE																					
	1 - MALE																					
	2 - FEMALE																					
	1 - MALE																					
	2 - FEMALE																					
	1 - MALE																					
	2 - FEMALE																					
	1 - MALE																					
	2 - FEMALE																					
	1 - MALE																					
	2 - FEMALE																					
	1 - MALE																					
	2 - FEMALE																					

Colour code: red – (red = not acceptable; yellow = moderately acceptable; and green = very acceptable)

Form 5A1. Group ranking of varieties for the overall field performance using pair wise comparison

	Variety					
Variety	A	B	C	D	E	F
A	X					
B		X				
C			X			
D				X		
E					X	
F						X
Total frequency per variety						
Rank						

Reasons for the high ranked varieties:

_____

_____

_____

_____

Reasons for the least ranked varieties:

_____

_____

_____

_____

Appendix 3.5b. Forms for farmer participatory storage root taste evaluation

FORM 5B. SWEETPOTATO FARMER PARTICIPATORY TASTE TEST EVALUATION

SITE: ____ Year: ____ Season: ____ PAGE ____

TOTAL NUMBER OF FARMERS ____ TOTAL NUMBER OF FEMALE FARMERS ____ TOTAL NUMBER OFMALE FARMERS: ____

		ASSESSMENT OF APPEARANCE			ASSESSMENT OF TASTE			ASSESSMENT OF STARCHINESS			ASSESSMENT OF FIBROUSNESS			OVERALL ACCEPTABILITY		
GENOTYPE CODE	GENDER	# RED	# YELLOW	# GREEN	# RED	# YELLOW	# GREEN	# RED	# YELLOW	# GREEN	# RED	# YELLOW	# GREEN	# RED	# YELLOW	# GREEN
	1 - MALE															
	2 - FEMALE															
	1 - MALE															
	2 - FEMALE															
	1 - MALE															
	2 - FEMALE															
	1 - MALE															
	2 - FEMALE															
	1 - MALE															
	2 - FEMALE															
	1 - MALE															
	2 - FEMALE															

Form 5B2. Group ranking of varieties for the overall consumer acceptability of storage root taste using pair wise comparison

	Variety				
Variety	A	B	C	D	E
A	X				
B		X			
C			X		
D				X	
E					X
Total frequency per variety					
Rank					

Reasons for high ranked varieties:

_____

_____

_____

_____

Reasons for least ranked varieties:

_____

_____

_____

_____

Appendix 3.5c. Forms for farmer participatory evaluation of leaf culinary quality

FORM 5C. SWEETPOTATO FARMER PARTICIPATORY LEAF EVALUATION

SITE: ______ Year: ______ Season: ______ PAGE ______

TOTAL NUMBER OF FARMERS ______ TOTAL NUMBER OF FEMALE FARMERS ______ TOTAL NUMBER OFMALE FARMERS: ______

		PREHARVEST ASSESSMENT OF APPEARANCE			ASSESSMENT OF COOKED APPEARANCE			ASSESSMENT OF COOKED TASTE			ASSESSMENT OF COOKED TENDERNESS			OVERALL ACCEPTABILITY		
GENOTYPE CODE	GENDER	# RED	# YELLOW	# GREEN	# RED	# YELLOW	# GREEN	# RED	# YELLOW	# GREEN	# RED	# YELLOW	# GREEN	# RED	# YELLOW	# GREEN
	1 - MALE															
	2 - FEMALE															
	1 - MALE															
	2 - FEMALE															
	1 - MALE															
	2 - FEMALE															
	1 - MALE															
	2 - FEMALE															
	1 - MALE															
	2 - FEMALE															
	1 - MALE															
	2 - FEMALE															

Form 5C1. Group ranking of varieties for the overall culinary quality/acceptability of sweetpotato greens using pair wise comparison

	Variety				
Variety	A	B	C	D	E
A	X				
B		X			
C			X		
D				X	
E					X
Total frequency per variety					
Rank					

Reasons for high ranked varieties:

_____

_____

_____

_____

Reasons for least ranked varieties:

_____

_____

_____

_____

Appendix 5. Caring for tissue cultured plantlets and constructing a net tunnel

Appendix 5.1. How to transport, receive, harden-off, transplant and manage tissue cultured plantlets

Packing and transporting: Prior to transporting tissue cultured plantlets, the jars or pots of plantlets should be transferred to a slightly cooler room with ambient light, for two days. The jars should then be very carefully packed into big, strong cardboard boxes and labelled clearly with the word 'FRAGILE' and an arrow ↑ and the words 'THIS WAY UP' to clearly show which way up the boxes must be kept. If the plantlets are to be taken across a national border, the appropriate customs forms (e.g. plant import permit, phytosanitary certificate, phytosanitary statement, Standard Material Transfer Agreement (SMTA) and consignment description) need to be obtained and completed in advance to reduce delays and possible loss of materials. All accompanying documents should clearly indicate the registration number of the vehicle carrying the consignment, the number of packages, number of plantlet containers and total number of plantlets per variety in each package and date of dispatch. The documents should be photocopied for presentation during customs clearances.

The vehicle transporting the plantlets must be in good mechanical order, and all windows should be closed during the journey to reduce the entry of dust and air-borne pathogens. Driving speed should be kept between 60-80 km/ hour, emergency funds should be carried in case of a break down and the journey should be made during the day to make it easier to access any mechanical or logistical requirements. If possible a technician should accompany the consignment in case of any problems and the recipients contact details should be kept easily available during the journey.

Receiving: A week prior to receiving the plantlets, the recipient should disinfect the screened reception room to reduce the possibility of contamination. The screened reception room needs to have shelves in it to place the containers on and should be around 24-29°C, with evenly distributed light to enable the uniform growth of the plantlets. The purpose of the screened reception room is to provide a clean space for the plantlets to undergo their final hardening-off and recover after their long journey inside the dark boxes. On arrival, the jars should be carefully taken out of the cardboard packing boxes and surface sterilised using an alcohol mist spray. The person unloading the boxes should disinfect their hands and wear gloves to unpack the jars, and place them in an upright position on the shelves in the screened reception room.

Hardening-off: If the plantlets appear stressed the jars or pots should be kept closed under high temperatures to maintain the relative humidity high for at least 3 – 7 days before opening. If the plantlets are not stressed, the containers should be kept closed for at least a day; and then using sterile gloved hands the lids can be loosened partially to a quarter open from day 2-4, and then fully opened and transferred to the final hardening shade on the 5th day. This partial opening of the containers gradually lowers the relative humidity, which stimulates growth of the wax layer (protective) coating on the leaves, minimises water loss from the plantlets and maintains sterile conditions.

The final hardening-off process involves transferring the plantlets from the culture medium into sterile compost soil in 10cm high polybag containers and exposing them to ambient conditions. This is the most delicate stage of the hardening-off as it exposes the plants to dehydration, nutrient loss and root or stem damage. The final hardening-off shelter needs to ensure that: the light is

adequately moderated (by having a roof made of palm or bamboo leaves to allow light to diffuse through); care is taken to prevent rain-damage or heavy winds blowing into the hardening shelter;

pest-free conditions are maintained especially with regards to cutworms, and plant diseases; compost, soil and potted polythene tubes are well prepared and treated; careful transfer of the plantlets to the soil in the tubes is done; high relative humidity is maintained in the growth tunnels by using a clean polythene roof cover over each hardening tunnel.

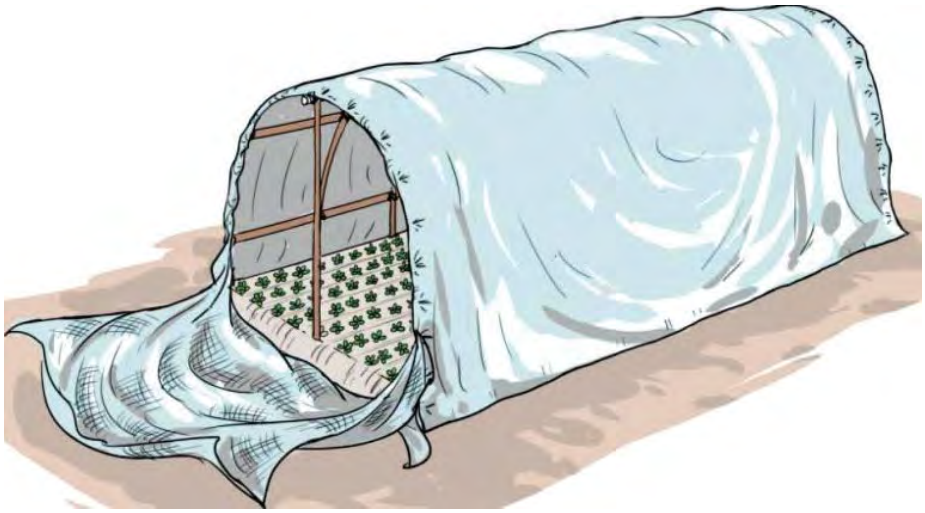
The compost soil can be a mixture of 1 part forest soil: 5 parts sandy soil sterilised by heating it to kill off all microorganisms, however it must be cool before use. Sterile hands and gloves need to be used to transplant the plantlets into the polytubes. The agar is gently washed off the roots by gently immersing them repeatedly in clean water until all the agar is completely removed, the roots are then dipped in a solution of fungicide (benlate) dissolved using sterilised water for 3 – 5 minutes before planting each of them in a pre-made hole in the soil of a polytube, ensuring that at least 2 nodes are below the soil surface, and that the soil is gently pressed around the root base of the plantlet. It is best to avoid wetting the rest of the plantlet. The polytubes are then placed into a wooden plank made frame, and a mist spray of water is administered prior to covering the frame with a clean polythene sheet to help the humidity build up. The polythene's tightness and the moisture of the beds are checked daily. From the third to the 8th day the tunnel is gradually opened more and more, and mist watering continued.

Foliar fertilizers should be applied when the plants are well established to stimulate faster growth. Dursban insecticide (or chlorpyrifos) 10g/litre is applied to control cutworms, aphids, and other pests that might invade the plants. Watering depends on the prevailing weather conditions. If it rains there may be no need of watering. The plants are kept in this final hardening-off house for one month.

Transplanting: When the plants are evidently growing vigorously, and have attained at least 4 – 6 new leaves, and do not show any signs of disease, pest or nutrient deficiency they can be transferred to open multiplication beds in the field. The field should be located at least 100m away from any other sweetpotato crop, and should have well drained soil, be free of difficult weeds such as couch grass and be near a reliable source of irrigation. A pre-planting artificial compound fertilizer (NPK 25:5:5) at the rate of 100 gm per m2 can be incorporated into the soil to stimulate vigour especially in sites with marginal soil fertility. The use of organic compost should be minimised at this point due to the risk of it being a source of disease infections. Five rows per bed should be planted at a spacing of 20cm between lines and 10cm within the row or a total of 300 plants per bed. When transplanting large numbers of plantlets, ensure that adequate labour is available to complete the activity as quickly as possible and thus avoid exposing the young plants to possible infection. In case of dry spells, watering should be done either early in the morning or late evening. Any diseased sweetpotato plants should be rogued out as soon as they are seen.

For a more detailed guide on hardening-off tissue cultured sweetpotato plantlets see Namanda *et al*., 2013

Appendix 5.2. Net tunnel method for keeping foundation seed material clean



Planting material multipliers, who produce and distribute or sell planting materials have to ensure that their planting materials are not infected by viruses or infested by insect pests, otherwise they could act as a source of infection for the farmers who buy and plant the materials.

In order to keep the planting materials clean and uninfected, and to accelerate multiplication rates, a net tunnel can be used. This is similar to a greenhouse structure but covered in a fine net instead of plastic. This net tunnel prevents aphids and whiteflies that spread sweetpotato viruses from accessing the covered sweetpotato materials and therefore protects them from being infected with sweetpotato viruses. Research stations often use large expensive screen houses, but smaller net tunnels can be constructed which are more suited to the needs of community-level multipliers.

Instructions for constructing a simple net tunnel which can be used to keep planting materials clean are given in Box A5 below (full details can be obtained from Schulte-Gelderman *et al*., 2012).

In Kenya in 2011, it cost ~USD$120 to construct and maintain one tunnel, resulting root yields of varieties from planting materials produced protected inside the tunnels were much higher than those obtained from planting materials of the same varieties produced outside the tunnels.

Depending on the growing conditions harvesting can be done 80-100 days after planting, or last cutting. Care must be taken not to damage the netting when opening the tunnel. Apical (top) portions of vines at least 3 nodes long should be cut, while leaving some nodes on the remaining stems so they can grow again. If NPK fertiliser is available, after each harvest of vine cuttings 1 teacup (~200g) of NPK (17:17:17) per tunnel can be applied to the soil, along a furrow between the lines of plants. The furrow should then be covered over with soil.

After harvesting, spray the tunnel with an insecticide (against aphids and white-flies) before covering again. The synthetic pyrethroid Duduthrin (1.75EC) can be applied at a rate of 10g/ 20l of water using a back pack or hand sprayer.

Box A5. Constructing a Net Tunnel for Protecting Planting Materials from Disease

Height: 1.2 to 1.6m
Length: up to 3m
Width: 1.8m wide at each side

Materials required:

Netting materials:For one tunnel = 4m x 3.20m for the top and long sides; 2m x 1.7m for the front end; 2m x 1.7m for the back end; OR you can make 20 tunnels from one 4m x 100m roll of OPTINET 50 Mesh size netting.

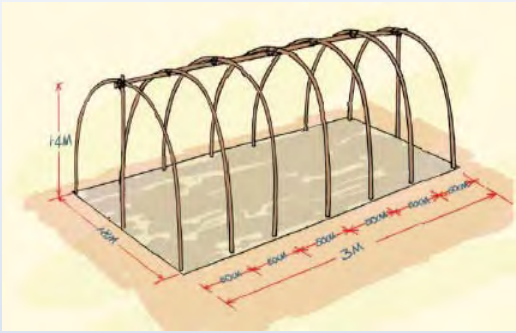
Wooden poles for frame: 30 flexible wooden sticks, each 3.6m long and 4cm in diameter

Binding wire: 5m length, or sisal twine can be used but will need to be replaced every time you harvest the vines.

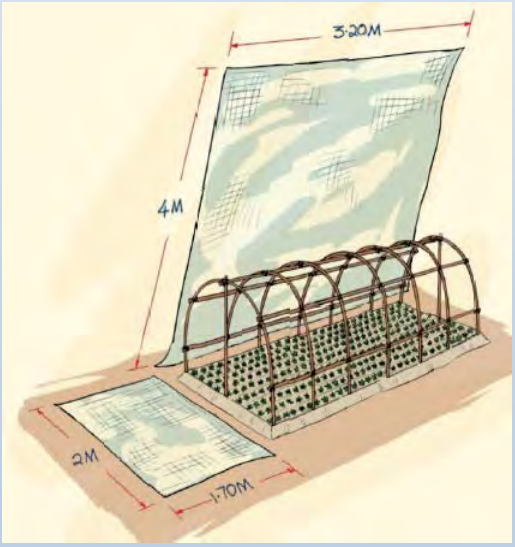
Site selection: The site must have fertile, easy-to-work, well-drained soils and be near a perennial source of water. If soils are poor, mix in 1 wheelbarrow of manure per sq m. Avoid old sweetpotato fields as they will be sources of diseases and pests, weed the area around the tunnel.

Steps:

1. Mark two parallel lines 3m long with a distance of 1.8m between them on the site.
2. Bend the flexible wooden sticks into an arch shape, and push them into the ground (on the marked parallel lines) to a depth of about 20cm. Distance between the sticks = 50 cm.
3. Place one wooden stick (1.7m long) at each end (front and back) and push into ground, place one 3m long stick along the top. Fix them with an iron wire or sisal twine to the arched sticks to increase stability.



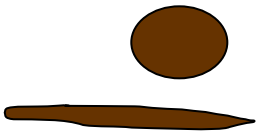
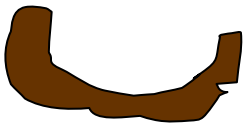
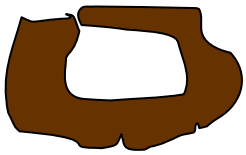
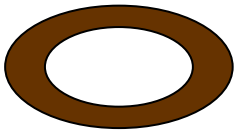
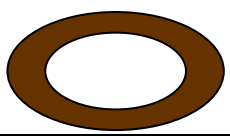
4. Place 4 additional 3m long sticks along the sides (2 on each side), and fix them with wire or sisal.
5. Plant the virus-free 3 node long cuttings, make sure 2 nodes are under the soil. Plant spacing should be 10cm x 15cm (total of 360 plants per tunnel) if you plan to cut vines every 80 days, or 10cm x 20cm (total of 270 plants/ tunnel) if you plan to cut vines less frequently. Add label with variety and date.
6. Put the netting on top of the tunnel frame and fix it to the structure with iron wire. Give allowances of an extra 20cm at each side. Also, give 20 cm allowances at front and back.
7. Carefully fix the net pieces at the front and back to the net piece over the top of the frame, and to the frame itself. On each side where the net tunnel touches the earth, place a pole along the length of the respective side and cover it with a depth of 20cms of soil to make the tunnels storm-proof.



8. Watering is done through the net twice per day (early morning and late afternoon) with a watering can from the top of the net, unless it is raining. The nets are only removed during vine harvesting. Before replacing the net, the crop is sprayed with an insecticide to kill any aphids or whiteflies that might have landed on the remaining leaves.

Appendix 6. Determining your soil type

Table 6A.1 Common soil types and features, and field tests to determine the soil type.

Soil type	Characteristics	Field test	Method for improvement
Sand	Will not aggregate, or will slightly aggregate. Will form a relatively stable ball if rolled carefully. Cannot be rolled into a sausage. Less than 10% clay.		Add organic matter (crop residues / compost / manure) and fertiliser regularly. Use green manure.
Sandy-loam	Forms a stable ball without difficulty. Will form a thick sausage if rolled carefully. The sausage will break if slight pressure is applied. Contains 15% to 20% clay.		Add organic matter and fertiliser. Use green manure.
Sandy-clay-loam	Can be rolled into a stable sausage. When bent into a U-form, it cracks in the centre. About 20% to 35% clay.		Organic matter is less important. Soil analysis will show which fertiliser programme is needed.
Clay-loam	Forms a stable sausage. Can form a stable U-form with careful handling. Contains 27% to 40% clay.		Organic matter is less important. Soil analysis will show which fertiliser programme is needed.
Sandy-clay	General characteristics of clay. Sausage tends to crack when formed into a circle. A definite grittiness when firmly pressed or rubbed between thumb and forefinger. Contains 35% to 55% clay.		Add organic matter.
Clay	Sausage forms a stable circle without cracking. Absence of grittiness. Plastic consistency. Good water-holding capacity. Some of the clay soils are very hard when dry and are difficult to roll (e.g. black turf). Contains more than 55% clay.		Add organic matter, such as compost and gypsum.
Silt	Poor structure, good fertility. Smooth and silky and slightly sticky. Generally behaves like clay. More than 80% clay.		Add loose organic matter. Use green manure.

Source: Faber et al., 2010

Appendix 11. Gender situation analysis checklists

Appendix 11a. Gender situation analysis checklist for group interviews

Organize a meeting with a mixed group of sweetpotato farmers

- Materials needed: flip chart paper, stand and markers

Purpose of exercise: Explain to the group that we are interested in understanding how men and women are involved in sweetpotato production, how their farming practices may be similar or different, whether the problems they face in growing sweetpotato are similar or different. The purpose is to see how we can help both men and women to produce more sweetpotato and benefit from the crop for food or income or both

Record the following information:

Location

i. Date
ii. Name of village, district, province etc.
iii. Criteria for selection
iv. Major ethnic group found in the area
v. Predominant religion
vi. Other observations (e.g. OFSP on-farm trials conducted nearby)

Group

vii. Number of farmers present, women/men
viii. Which officials or outsiders were present
ix. Location of discussions
x. Observations about bias in the selection of the farmers (e.g. mainly wealthy, commercial farmers, religious groups represented etc.)

General/plenary session

1. What are the main food and cash crops grown in this area? Is any crop grown mainly for sale? How is the crop grown by husbands and wives: family farm; separate plots belonging to husband and wife; plot belonging to husband only; plot belonging to wife? Who provides labour?

Crop	Crops grown mainly for sale	Who owns farm	Who provides labour
		Men ☐ Women ☐ Both together ☐	Land preparation Ridging Planting Weeding Harvesting Transporting Selling Men, women, male children, female children, male hired labour, female hired labour

2. What is the main staple food(s) in the area?

Sweetpotato

3. How do you cook/eat sweetpotato in this area? How do you process sweetpotato? What do you do with sweetpotato leaves?
4. About what proportion of households grow sweetpotato in this LGA (use the idea of 10 stones to get percent)?
5. Of the sweetpotato farmers in this area (those who manage their own farms), how many are men and how many are women (NOTE: include both farmers who grow for subsistence and market: use the idea of 10 stones to get percent)

   Men:

   Women:

   Total=10

6. How do husbands and wives grow sweetpotato in this area?
   a. Separately, husband has his farm and the wife has her farm
   b. Wife only has an sweetpotato farm
   c. Husband only has a sweetpotato farm
   d. Sweetpotato grown on family farm

7. Has there been a change in the number of farmers growing sweetpotato: 10 years ago (2002)? 20 years ago (1992)?

If the number has changed, how has it changed and why? Which gender has changed in terms of numbers growing SP-men or women or both?

8. Do most farmers have one sweetpotato plot or several plots?
9. Is there a difference in the size of sweetpotato farms now and 10 years ago? How and why?
10. Do any farmers in the area rent land for planting sweetpotato? Why do they rent land? Who rents land: men or women?
11. How do farmers plant sweetpotato in this area: mound, ridges, flat ground?
12. How many times a year do people plant sweetpotato?

Appendix 11b. Checklist for groups of female or male farm managers (where men and women have separate sweetpotato farms)

Women's group

1. Is it difficult for women to get land for planting SP? For other crops?
2. How many SP farms do most women in this area have? Get average area planted by women to SP if possible (use local measurement, convert to acres/ha)?
3. Do women grow SP with other crops? What are the intercrops?
4. If you look at the SP farm managed by a man, generally would it look different from that of a woman? How and why are they different?
5. Rank most important crops that provide women with money (explain reason for ranking in terms of amount of income, timing of income etc.)
6. SP cropping calendar by month and gender (for farms managed by women) (FIRST CHECK TO MAKE SURE FARMERS AGREE WITH THE LIST OF ALL THE TASKS BELOW)

Task	Month												Who is involved?	Other activities/ crops competing for women's labour at this time
	J	F	M	A	M	Jn	Jy	Ag	S	O	N	D	Men, Women, Male children, female children, Hired male labour, hired female labour	
Land preparation														
Land clearing														
Making mounds/ ridges														
Obtaining vines														
Transporting vines														
Planting														
Weeding														
Applying fertilizer														
Harvesting														
Transport to market														
Selling														
Processing														

7. Where do most women farmers sell SP (traders who come to village, local market, nearby market)? (rank by proportion of women) If in nearby market, who transports the SP and by what means?
8. Who mainly sells SP in the local markets in this area: men, women, both?

SP varieties and preferred characteristics

For the facilitator:

Examples of SP characteristics:

Taste (roots, leaves)

Dry matter content (firm /watery)

Cooking time

Flesh colour

- Root yield and size
- Time to produce (maturity period)
- Vine yield
- Harvesting (piecemeal, all at the same time)
- Storability
- Resistance to pests/disease
- Ability to withstand drought
- Marketability
- Input level /production costs
- Labour requirements

V1. What SP varieties do farmers in this village/area grow? Get a description of the following for each variety:

- Flesh colour
- Production objective (food, feed, market?)
- What is good about each variety? What is bad about this variety?
- How variety is used (e.g. boiling, frying, flour etc.)
-

V2. Rank varieties in terms of preference and explain reasons for rank (IF FARMER IDENTIFY MORE THAN 4 VARIETIES, ASK THEM TO SELECT 4 FOR RANKING)

	Variety A	Variety B	Variety C	
Flesh colour				
Production objective				
Likes about variety				
Dislikes with variety				
Main use				
Rank in terms of overall preference				

V3. How many SP varieties do most women farmers grow on average? Do they plant different varieties on the same plot/mound/ridge? If so why?

V4. Are there some varieties of SP that farmers no longer grow? Name of lost varieties? Why don't people grow them anymore?

V5. Have you ever seen/grown an orange-fleshed SP?

V6. If OFSP is being grown, who grows it: men , women or both? (IF ONE GROUP IS EXCLUDED OR NOT WELL REPRESENTED, FIND OUT WHY)

V7. What do farmers do with the OFSP roots: eat, sell, both, process?

What sources do women farmers rely on for technical information about agriculture?

Seed systems

For the facilitator:

Major sources of SP vines:

- Own farm
- Gift from other farmers in same village
- Gift from other farmers in other villages
- Buy from farmers in same village
- Buy from farmers in other villages
- From extension/research (government)
- From NGOs, projects
-

On-farm vine production approaches:

Leaving some roots in the field to sprout at the start of the rains

Planting some vines near the house or a water source

Leaving a section of the farm unharvested

S1. Where do women SP farmers get vines to plant in most years? Which source is most important (in terms of frequency used), least important? Rank in terms of importance

S2. Is there ever a situation where many or most farmers have no SP planting material? What causes this situation? Where do farmers get vines from when this happens?

S3. There are many practices that farmers use to get vines from their own farms. What are the practices used in this area?

S4. How do farmers get SP vines from other farmers: buying, gifts, borrowing?

S5. How much do vines cost in this area? (NOTE THE QUANTITIES INVOLVED)?

S6. If you get vines from other farmers (gift, brought), are they usually women, men or both? If only from one sex, why?

S7. Are there some farmers in this area who are known to have good quality SP vines or grow vines to provide to others? Are they men/women? How many of these farmers do you know?

Production constraints

PC1. What is the major problem that women SP farmers face in growing the crop? Rank by importance

Decision making

DM1. Who decides what to do with the SP harvested from a farm managed by a married woman?

DM2. Where married women sell SP that they grow on their own farms, who decides on how they spend the money?

DM3. In most cases, what proportion of SP grown by married women is used for food and for sale?

DM4. In most cases, what proportion of SP grown by a married man is used for food and for sale? (IF THE PROPORTIONS ARE SIGNIFICANTLY DIFFERENT BETWEEN MEN AND WOMEN, ASK WHY)

Household food consumption

FC1. In some places, people believe that ONLY/MAINLY women should be responsible to make sure their households eat well. What do people in this area believe? What role do men play in deciding what food households eats?

FC2. Generally, in this area, who in the home is responsible for providing food either by growing it on or buying it?

Foods	Husband provides from farm	Husband buys	Wife provides from farm	Wife buys (with own money)	Both provide from farm	Both buy with own money
Main staple (cassava, maize, rice etc.)						
Animal protein (meat, fish)						
Cooking oil						

FC3. In this area, who decides every day what to cook every day in most homes?

FC4. Do men play in deciding how young children are fed? What role do they play?

FC5. Who else besides the parents provides advice on how to feed and what to feed young children eat (health centre, grandmother etc.)?

FC6. Do mothers in this area feed SP to young children? At what age do children start eating SP? In what form do young children (up to 5) eat SP

Sweetpotato processing

1. How many people in this group process SP for home use or for sale?

2. What processed products do women in this area make from SP (SEPARATE BY PRODUCTS FOR HOME USE (e.g. flour) AND PRODUCTS FOR SALE E.G. “sparri”—roasted granules, SP mandazi, SP juice, SP chapatti, SP puff-puff, SP cakes, chips, etc.)

3. Do men process SP? What products do they produce?

4. Where do women in this area sell SP products (from house, roadside, market etc.)? Who sells processed SP (women, men, children)?

5. Who buys SP processed products (all types of people, school children, labourers etc.)?

6. Are there some women who process SP but don’t grow the crop? Where do they get the roots from? Do any women get roots from their husbands? How do they get the roots from their husbands (buy, exchange etc.)

[NOTE: the checklist can be altered for use with men]

Appendix 12. Sweetpotato baseline data collection form

BASELINE SURVEY MODULE COVER PAGE

A00 WET AREA ☐ DRY ☐

A. HOUSEHOLD IDENTIFICATION AND STATEMENT OF AGREEMENT

A01 Region _____

A02 DISTRICT _____

A03 WARD _____

A04 VILLAGE _____

A05 HOUSEHOLD (HH) NUMBER (hhid) _____

A06 NAME OF THE HEAD OF THE HH _____

A07 STATUS OF HEAD OF THE HH

1- MAN
2- WOMAN HH WITH THE SUPPORT OF A NON-RESIDENT MAN
3- WOMAN HH WITH RESIDENT MAN
3- WOMAN WITHOUT THE SUPPORT OF A MAN

A08 GLCI member Yes ☐ No ☐ SILC member Yes ☐ No ☐

LISTING INFORMATION

A08B1 NUMBER OF RESIDENT PEOPLE ☐☐ (Living in the hh for 3 of the last 12 months)

A08B2 ACCESS TO A LOW ZONE? 0- NO 1- YES ☐

A08B3 MEMBER OF A FARMER GROUP? 0- NO 1- YES ☐

A09 SIGNED THE AGREEMENT STATEMENT 0- NO 1- YES ☐

A10 *OR VERBALLY AGREED TO PARTICIPATE?* 0- NO 1- YES ☐

A11A *If the person has refused to participate, then register the reason and close the interview:* _____

_____

A11B INTERVIEWEE'S NAME #1 _____

A11C INTERVIEWEE'S NAME #2 _____

A12 ENUMERATOR'S NAME _____

A13 GPS COORDINATES Correction factor ☐☐

A14	(S)			(E)			
A15	Longitude Degrees ☐☐	Minutes ☐☐☐	Decimal in Minutes ☐☐☐	Latitude Degrees ☐☐	Minutes ☐☐☐	Decimal in Minutes ☐☐☐	Elevation (Metres) ☐☐☐☐

QUALITY CONTROL

A16 DATE OF THE 1ST INTERVIEW DAY ☐☐ / MONTH ☐☐ / YEAR ☐☐

A17 TIME OF THE INTERVIEW START: ☐☐ : ☐☐

A18 END: ☐☐ : ☐☐

A19 NAME OF THE SUPERVISOR _____ ☐☐

A20 CALL-BACK 0- NO 1- YES ☐

DESCRIBE THE PROBLEMS ENCOUNTERED:

A21 DATE FOR THE SECOND INTERVIEW DAY ☐☐ / MONTH ☐☐ / YEAR ☐☐

A21D LAST APPROVAL _____

A22 DATE FOR THE FIRST DATA ENTRY DAY ☐☐ / MONTH ☐☐ / YEAR ☐☐

A23 NAME OF 1ST DIGITIZER _____ ☐☐

A24 DATE FOR THE SECOND DATA ENTRY DAY ☐☐ / MONTH ☐☐ / YEAR ☐☐

A25 NAME OF 2ND DIGITIZER _____ ☐☐

B. HOUSEHOLD MEMBERS WITH AN AGE ABOVE 60 MONTHS

REG | DIST | WARD | VILL | HHID

Pg 2

We would like to ask you questions about each member of your household. We will start with those members over five years.
List the names of everyone considered to be a member of this household since the beginning of January of 2009.

D3 codes:
01- head; 02- Spouse; 03- son/daughter; 04- grandchild; 05- Step child; 06- Parent; 07- brother/sister; 09- nephew/niece; 10- Brother/sister in-law; 11- parent in law; 12- Son/Daughter in law; 13- Worker; 14- Other relative; 15- Other family; 16- No relation

No.	Name	Sex (1-M 0-F)	Relationship with the the head of the HH (see codes)	Year born	How many months in the last 12 months has this person been living at home	is … currently enrolled in formal schooling (1- No 2- Yes)	highest level of education	Marital Status (1- Single 2- Married 3- Marital Union 4- Polygamous 5- Divorced or Separated 6- Widowed)	*is … involved in growing* sweet-potatoes currently (0- No 1- Yes)	Is agriculture his/her principle or secondary activitiy (0- Not applicable 1- Principal 2- Secondary)	Since the Beginning of 2009, has this person: Sold agricultural or livestock products? (0- No 1- Yes)	Undertaken salaried employment? (0- No 1- Yes)	Done casual labour? (0- No 1- Yes)	Been involved in informal business (0- No 1- Yes)	Been involved in some other form of self-employment (e.g. fishing, wood cutting, masonry)? (0- No 1- Yes)
MEM	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12	D13	D14	D15

Education levels (D6)

0=pre school; 0= No formal education
1= std 1; 2= std 2; 3= std 3; 4= sts 4; 5= std 5; 6= std 6; 7= std 7; 8= form 1; 9= form 2; 10= form 3; 11= form 4; 12= form 5; 13= form 6; 14= college 1; 15= college 2; 16= college 3; 17= college 4; 18=graduate; 15= diploma year 1; 16= diploma year 2; 15= Certificate year 1; 16= Certificate year 2

DEMOGRAPHIC OF MEMBERS OF HOUSEHOLD WHO ARE LESS OR EQUAL TO 60 MONTHS OF AGE (5 YEARS) REG ☐ DIST ☐☐ WARD ☐☐ VILL ☐☐☐ HHID ☐☐☐

No.	Name	Sex 1-M 0- F	Date of Birth 88- Does not know DAY MONTH YEAR	AGE (in months)	Has a health card ? 0- No 1- Yes	*If Yes:* How many registered visits?	Child's mother: Name	mem no. *(see Section B)* 99-non resident 88- Deceased	*If caregiver is not the mother:* mem no of the child's main caregiver	Child's father: name	mem no. *(see Section B)* 99- non resident 88- Deceased	*If father is not resindent:* mem no of main male caregiver
mem	C1 C2	C3	C4 C5 C6	C7	C8	C9	C10	C11	C12	C13	C14	

HOUSEHOLD LEVEL DIETARY DIVERSITY AND YOUNG CHILD DIET DIVERSITY

N00 Is there a child 6-23 months of age in the household ? 0- No 1-Yes ☐

N01 *If there is a child 6-23 months of age in the household, record his/her name here as the reference* ***(If there is more than one child 6-23 months, randomly select the child)***

Name: _____ MEM ☐☐

Yesterday, did your household consume at least a tablespoon (15 gm minimum) per person of any of the following kinds of food?

Follow-up question for each item if there is a reference child: Did *(name of reference child) consume this type of food*

		Household 0-No 1-Yes		Reference Child 0-No 1-Yes	
N02	Any starchy staple, like maize, cassava, cooking banana, sweetpotato				
N03	Any starchy staples that are biofortified (OFSP, orange maize, iron rich beans)				
N04	Any legumes or nuts, like beans, groundnuts, seeds, soybean				
N05	Any dairy products like milk, youghurt or cheese				
N06	Any organ meat like liver or heart				
N07	Any eggs				
N08	Any other kind of fish, meat or poultry, like beef, chicken, or pork				
N09	Any dark green leafy vegetables				
N10	Any vegetables that are orange inside, like pumpkin or carrot				
N11	Any fruits that are orange inside, like mango or papaya				
N12	Any other kind of fruits or vegetables				
N13	Any source of fat, like cooking oil, coconut milk, or butter				

Farmer's membership to farmers associations/ other groups

Group10.sav (key variables: hhid, group)

G 01 What savings, credit, women, or farmer association do members of this houshold actively particippate in?

Member ID number	Name of the assoociation or group	Association or Group function	How often does the group meet?	Role in the group	Services received in the last 2 years
(mem)	G02	G03	G04	G05	G06
	1				
	2				
	3				
	4				
	5				
	6				

CODES

Group functions		Frequecies	Role in group	Services Received
1 Tree planting	9 Soil and water conservation	1 Daily	1= Ordinary	1= Inputs
2 Water harvesting	10 Aquaculture	2 Twice weekly	Member	2= Financial
3 Irrigation	11 Bee keeping	3 Weekly	2= Official	3= Seed
4 Financial	12 Value addition	4 Once after 2 weeks		4= Training
5 Funeral/welfare	13 Training	5. Monthly		5= None
6 Produce marketing	15 Livestock production	6 Annually		
7 Crop production	14 Other specify	7 Rarely		
8 Input acquisition		8 3 times a week		
		9 Other specify		

G07 Have you ever obtained a new variety of any crop through any or your groups? …….. 0= No 1= Yes ……. ☐

G08 Is the woman of the household an active member or leader of a religious organization? …….. 0= No 1= Yes ……. ☐

G09 Is the man of the household an active member or leader of a religious organization? …….. 0= No 1= Yes ……. ☐

(For the next two questions please put a 1 if they would give or receive and 0 otherwise)

G10 Which of the following would you give your village membes in times of a major hunger?

1 Seed	2 Grain	3 Other food items	4 Cloths	5 Cash	6 Nothing	7 Other, specify_____

G11 Which of the following would you receive from your village members in times of a major hunger?

1 Seed	2 Grain	3 Other food items	4 Cloths	5 Cash	6 Nothing	7 Other, specify_____

Agricultural land (agland10.sav)

Land holdings in 2008/2009 cropping year (acres) key variables: country, hhid, plot

(Please put a 1 in the right unit of measure)

L01 How much land did you own in the 2008/2009 cropping seasons? m^2 ☐ acres ☐ Ha ☐

L02 How much land did you use in the 2008/2009 cropping seasons? m^2 ☐ acres ☐ Ha ☐

L03 How many separate plots did you have on your farm in 2008/2009 cropping season? …… ☐

L04 How many of those plots have fertile soils? …… ☐

L05 In how many plots does the woman of the hh has control on what is grown in the plot? …… ☐

L06 If the answer to L05 is 0 then does the woman have any access to any other plot of land elsewhere?

1- Yes 0- No …… ☐

P01 In 2008/2009 crops seasons, how many fields were cultivated by this HH? Uplands Lowlands

P02 Please estimate the total area of the land in the uplands and lowlands Uplands Lowlands Units

Unit codes: 1- M^2 2- Acres 3- Hactares

P03 In 2008/2009 crops seasons did you contract full time or part time workers to help with your agricultural/livestock activities?

0- No 1- Temporary workers 2- Full-time workers 3- Both .....

Which of the following crops where produced or sold by your HH during the 2008/2009 seasons?

Food crop?	Did your HH PRODUCE this crop in 2009? 0- No 1- Yes	Did your HH SELL this crop 0- No 1- Yes	Which is the most important crop for the HH Rank all in order (1 =highest) 88= N/A
	P04	P05	P06	P07
01- Maize			
2- Rice			
3- Sorghum			
4- Cassava			
5- Sweet potato			
6- Beans			
7- Groundnuts			
8- Bananas			

P08 Which of the crop was the most productive during the 2008/2009 season ?
(Use the codes found in the table on the left) .....
If the most productive was Not cassava or sweet potato, then fill the following:
(In this section please fill one of them either with the hust or without husk)
P9 Quantity WITH HUSK P10 WITHOUT HUSK or in GRAIN
P11 Unit of measure P12 Unit of measure .....
(Units of measure codes are below)

P13 Which of the crops was the second most productive during the year 2008/2009 ?
(Use the codes found in the table on the left) .....
If the second most productive was Not cassava or sweet potato, then fill the following:
P14 Quantity WITH HUSK P15 WITHOUT HUSK or in GRAIN
P16 Unit of measure ..... P17 Unit of measure .....

P18 Which of the crops was the third most productive during the year 2008/2009 ?
(Use the codes found in the table on the left) .....
If the third most productive was Not cassava or sweet potato, then fill the following:
P19 Quantity WITH HUSK P20 WITHOUT HUSK or in GRAIN
P21 Unit of measure P22 Unit of measure .....

OTHER CROPS other crops	Did your HH PRODUCE this crop in 2008/2009? 0- No 1- Yes	Did your HH SELL this crop in2008/2009? 0- No 1- Yes	How many are still productive? *(only for crops 18 and 19)*
	P23	P24	P25	P26
11-Tobacco			
12- Paprika			
13- Chillies			
14- Pineapple			
15- Sunflower			
16- Sesame			
17- Sugar cane			
18- Cashew nut			
19- Coconut			

UNIT OF MEASURE

01- KG	02- UNIT
3- 100 KG BAG (EQUIVALENT IN MAIZE)	10- 25L CAN
4- 90 KG BAG (EQUIVALENT IN MAIZE)	11- 20L CAN
5- 70 KGS BAG (EQUIVALENT IN MAIZE)	12- 10L CAN
6- 60 KG BAG (EQUIVALENT IN MAIZE)	13- 5L CAN
7- 50 KG BAG (EQUIVALENT IN MAIZE)	14- 1L CAN
8- 25 KG BAG (EQUIVALENT IN MAIZE)	15- TONS
	16- OX CART
	9- 10 KG BAG (EQUIVALENT IN MAIZE)

S01 Did this household **sell any crop produce** from the **main and short season in** 2008/2009 growing season? 0. No 1. Yes ……..

(If No please skip to the next section)

S02 Please ask the farmer these questions and fill the table. (Each different sale should be put on its own row and sweetpotato and cassava sales on this table)

Crop sold	Crop code	Year sold 2008=1 2009=2	Month 1=Jan 2=Feb … 12=Dec	Amount sold		Average price received		Where did you sell the crop produce? *(Use codes below)*	Who bought the crop produce? *(Use codes below)*	What is the main reason you sold your crop this month *(Use codes below)*	Who took the money from sales 0= woman 1= man 2= Both
				Quantity	Unit	Total sales (Tshs)	Unit price (Tshs)				
S03	S04	S05	S06	S07	S08	S09	S10	S11	S12	S13	S14

UNIT OF MEASURE

01- KG 02- UNIT 06- 60 KG BAG 10- 25L CAN 15- TONS

3- 100 KG BAG 7- 50 KG BAG 11- 20L CAN 16- OX CART

4- 90 KG BAG 8- 25 KG BAG 12- 10L CAN

05- 70 KGS BAG 09- 10 KG BAG 13- 5L CAN

14- 1L CAN

Reasons for sale

1- Good price 5= Buy other household items (eg. Soap)

2- Buy food items 6= To avoid pest attack

3- School fees 7= Difficult to store

4- Medical fees 8= Build house 9= Other (specify)

Where the crop was sold code:

1- Farm gate

2- Local market

3- Big towm market

Buyer type codes

1= Farmer 5= Consumer at a local market

2= Local trader

3= Institution 6= Other _____

4= NGO

Road access questions

R01 What type or road provides the main access to this village?

1- Foot paths 2- Secondary earth road 3- Primary earth or murram road 4- Tarmac road 5- Water transport ……

R02 How far is it to the **nearest outlet/market to buy or sell** crops or animal products? …… Km Minutes (Please ask the respondentfor both Km and Minutes)

R03 How far is it to the **nearest outlet/market to buy** seed or fertilizer? …… Km Minutes

R04 What is the **main transport mode** to the nearest market?

1- Walking 2- Bicycle 3- Motorbike 4- Bus/small van 5- Car/truck 6- Other (specify) _____

SWEETPOTATO AND CASSAVA PRODUCTION REG DIST WARD VILL HHID

SP01 Do you grow sweet potatoes? …… 0. No 1. yes ……

SP02 What is the main reason for growing sweet potato? …… 1- For food 2- For sale 3- The only food that can torrelate drought 4-For food and for sa……

SP03 If yes, have you grown Orange Fleshed Sweetpotatoes *(Show SP photos)* …… 0. No 1. yes ……

SP04 Have you ever had any training of sweetpotato production and management? …… 0. No 1. Yes ……

SP05 Do you grow cassava? …… 0. No 1. Yes ……

SP06 If yes, was your cassava attacked by disease that rots the roots (brown streak)? …… 0. No 1. Yes ……

SP07 If yes, what was the degree of severity? …… 1. Low 2. Medium 3. High ……

Now we will ask you question about SP and cassava you have grown in the past

SP08	SP09	SP10	SP11												SP12		SP13		SP14		SP15		SP16		SP17	SP18	
Crop name	Crop code	Who decides how much to grow of this crop? Husband --1 Wife --2 Both --3 Other --4 N/A … 9	During the past 12 months, please tell us in which months your hh harvested large quantities of the crop or which months your household harvest minor quantities for consumption or for sale Codes 1- No harvest 2- Months of minor harvest 2- Months of major harvest												During the major harvest months of.. (list months) how much did you harvest per day?, per week?, or per month?		Each time you harvest, how much did you harvest? *(Units codes are below)*		During the minor harvest months of.. (list the months) how much did you harvest per day?, per week?, or per month?		Each time you harvest, how much did you harvest? *(Units codes are below)*		What is the total area of (Crop) you cultivated in this period?		Do you chip and dry this crop?	If yes for how long can you store the crop	
				Oct	Nov	Dec	Jan	Feb	Mar	April	May	June	July	Aug	Sep		Times	Unit	Qty	Units	Times	Unit	Qty	Units	Qty	Units		Time	Units
																		1- day 2- Week 3- Month 4- Units				1- day 2- Week 3- Month 4- Units				1- M^2 2- Acre 3- Hectare	0- No 1- Yes		1- Days 2- Weeks 3- Months 4- Years
OFSP																											
Other SP																											
Cassava																											

Sweetpotato and cassava sales *(Please start by asking about the sweetpotato sales)*

SP19		SP20	SP21	SP22		SP23		SP24	SP25	SP26	SP27
Crop name	Crop code	Who decides how much/ when to sell the crop Husband --1 Wife --2 Both --3 Other --4	Which months did you sell this crop? Month of sale 1= Jan 2= Feb …… 12= Dec	Amount sold Qty	Units	Money received per sale Total sale amount (Tshs)	Unit price (Tshs)	Where did you sell the crop produce? (see codes below)	Who bought the crop produce (see codes below)	What is the main reason	Who sold the crop? 1- Woman 2- Man

UNIT OF MEASURE

01- KG 02- UNIT 10- 25L CAN
3- 100 KG BAG (EQUIVALENT IN MAIZE) 11- 20L CAN
4- 90 KG BAG (EQUIVALENT IN MAIZE) 12- 10L CAN
5- 70 KGS BAG (EQUIVALENT IN MAIZE) 13- 5L CAN
6- 60 KG BAG (EQUIVALENT IN MAIZE) 14- 1L CAN
7- 50 KG BAG (EQUIVALENT IN MAIZE) 15- TONS
8- 25 KG BAG (EQUIVALENT IN MAIZE) 16- OX- CART
9- 10 KG BAG (EQUIVALENT IN MAIZE)

Where the crop was sold code:	Buyer type codes	
1- Farm gate	1= Farmer	5- Local consumer in the market
2- Local market	2= Local trader	6= Other _____
3- Big towm market	3= Institution	
	4= NGO	

Reason for sale:

1= Good price 2= To buy food 3= For school fees 4= Medical fees 5= Buy other hh goods (eg. soap) 6= To avoid pest attack 7= Difficult to store 8= Other (specify)_____

Labor

(Labor01.sav key variables: hhid laborcode)

L01 Do you ever use hired or have salaried labor?

0- No 1- Yes, both 2= Only salaried labor 3- Only hired labor ……

(If the respodent has never used hire or salaried labor skip to the next section)

L02 What is the daily wage rate for general farm labor for men and women in this area?

Men day rate (Tshs)	Women day rate (Tshs)

(This is a daily wage rate not piece work rate however you can convert the piecework rate to a daily rate)

	MEN	WOMEN
L03 Typical no. of hours		

(Please ask when men/women go to the farm and leave the farm to know the total number or hours they work per day)

L04 Rank the following different labor types as used on your crop farming enterprises according to the degress of usage

1- Hired casual labor	2- Salaried	3- Family labor by men	4- Family labor by women	5- Group labor

Codes: 1= very important 2- important 3- Somewhat important 4- Least important

L05 Is labor readily available for hiring when you need it? 1- Yes 0- No ……

L06 Do you hire labor for sweetpotato production activities 1- Yes 0- No ……

L07 If yes, which ones? (Please put a 1 if is is Yes and 0 otherwise)

6-Land preparations	1- Planting	2- Weeding	3- Harvesting	4- Processing	5- Marketing

L08 If No, why? _____

Credit

C01 Have you ever applied for credit …… 1- Yes 0- No ……

C02 If yes, have ever received credit? …… 1- Yes 0- No ……

C03 If yes, what was the source of the credit?

1- Friend 2- Relative 3- Saving and credit group 4- Microfinance organization 5- Commercial bank 9- N/A

6- Othere (specify) _____ ……

L09 For the following sweetpotato activities tell me who is most responsible

L09	1- Women 2- Women & all children 3- Men 4- Men with all children 5-Women and men equally 6- Women, men and Children 7- Women with girls 8- Women with boys 9- Men with girls 10- men with boys 11- Children 12- Girls 13- Boys
Ploughing the plot	
Ridging the plot	
Preparing the bed	
Cutting the vines	
Carrying the vines to the plot	
Planting the vines	
Weeding for the SP	
Harvesting	
Bagging	
Transport to the market	
Selling in the market	
Deciding how the funds will be spent	

Attitude, Perception, Practice and Knowledge

AP 01 Name of the respondent _____ mem [ ][ ][ ]

(Enumerator ask the respodent to rate the statement below, let them rank them according to the in the five ranks below)

Codes: 1= Strongly agree 2= Agree 3= Do not know or do not have an opinion 4= disagree 5= Strongly disagree

Attitude and Perception

AP 02 Sweetpotato leaves are good for human beings to consume …… [ ]

AP 03 Sweetpotato is a food for women and children only …… [ ]

AP 04 Sweetpotatoes that are orange inside are healthier than ones that are white inside (Please show the SP roots) ……. [ ]

AP 05 Sweetpotato is the most reliable food crop for our family during times of food shortage …… [ ]

AP 06 Even when we have lots of maize/cassava/rice *(or use major food crop in area)* to eat, we still like to have sweetpotato in our diet …… [ ]

AP 07 You can't grow sweetpotatoes and be considered a man …… [ ]

AP 08 You can't eat too much sweetpotato because you will get stomach problems …… [ ]

Practice

AP 09 If an important person comes to your house, do you serve them a meal with sweetpotatoes?
1. Yes always 2. Yes, sometimes 3. Rarely 4. No …… [ ]

AP 10 If you got richer, would you eat more or less sweetpotato? 1= Less 2- More …… [ ]

(Please write the number on the box in the box provided)

AP 11 How many days in a week does your household consume sweetpotato when they are in production? …… [ ]

AP 12 Does your household eat something when you start your day or before mid-morning 1= Yes 0= No …….. [ ]

AP 13 If yes, what do you eat? _____

Knowledge

AP 14 What is healthier to eat in the morning bread or sweetpotato? 0= Bread 1= Sweetpotato …….. [ ]

(Enumerator; conduct this interview with the person who is most knowledgeable about sweetpotato vine transfer in the last 12 months.
Record the earliest transaction first, then more recent transactions)

We would like to ask you question about local transaction of vines to and from your farm

SD01 Respondent _____ ..... mem

SD02 Where do you normally obtain sweetpotato vines from?
1- Own farm 2- Male neighbor 3- Female neighbor 4- Relatives 5- Farmer group 6- Research institution 7- Vine multipliers far away 8- NGO
9- Other (specify)_____ .....

SD03 Are the vines readily available when needed? .....1- Yes 0- No ....

SD04 Are you satisfied with the quality of vines usually available at planting time?
1- Satisfied 2- Somewhat satisfied 3- Not satisfied .....

SD05 If you want a new variety where do you go to get it?
1- Local nearby farmers 2- Farmers far away 3- Specialized multipliers 4- Extension agents 5- Research stations 6- Markets 7- Other (specify)_____ ....

SD06 Do you know of a specialized multiplier (that is, someone who has been trained in SP vine multiplication for quality)? ..... 1- Yes 0- No ....

SD07 In the last 12 months, did you have anyone in your household get any SP vines from elsewhere apart from your farm? ..... 1- Yes 0- No ....

SD08 In the last 12 months, did you or anyone in your household sell or give SP vines to another person? ..... 1- Yes 0- No .....

(If No in the last two question please skip the table to the next section)

SD09 If anyone in your household gave out or sold any SP vines please fill the table below

No.	Recipient	Gender of giver	Is the giver a specialized vine multiplier?	Is the receiver a farmer group member?	Is Receiver a relative	You gave the sweetpotato vines before the rains started or 2-3 weeks into the rainy season or well after most of the rains have fallen	Total amount of SP vines exchanged		Did you sell the SP vines?	What is the total value of the SP?		If you sold Who received the money?
										Value	Money	
							Qty	unit code	1- Yes 0- No		1- Tshs 2- RwFr 3- Kshs 88 -N/A	1- Woman 2- Man 88 - N/A
	1- Woman 2- Man 3- NGO	1- Woman 2- Man	1- Yes 0- No	1- Yes 0- No	1- Yes 0- No	1- Before 2- During 3- After 4- All						
SD11	SD12	SD13	SD14	SD15	SD16	SD17	SD18	SD19	SD20	SD21	SD22	SD23

Unit code: 1- Kg 2- Number in 30 cm long equivalent 3- Small bundle 4- Medium bundle 5- Big bundle 6- 90 kg sack 7- 50 Kg sack 8- Other (Specify)_____

SD24 If anyone in your household received any sweetpotato vines from elsewhere apart from your own farm, please fill in the table below

No.	Who gave the vines to your hh Member?	Gender of receiver	Is the giver a specialized vine multiplier?	Is anyone in this HH a member of a farmer group?	Did you receive the vines from a relative?	You received the sweetpotato vines before the rains started or 2-3 weeks into the rainy season or well after most of the rains have fallen	Total amount of SP vines given		Did you buy the SP vines?	What is the total value of the SP vines received?		Who bought or borrowed the vines?
							Qty	unit code	1- Yes 0- No	Value	Money	1- Woman 2- Man
	1- Woman 2- Man 3- NGO	1- Woman 2- Man	1- Yes 0- No	1- Yes 0- No	1- Yes 0- No	1- Before 2- During 3- After 4- All					1- Tshs 2- RwFr 3- Kshs 88 - N/A	88 - N/A
SD25	SD26	SD27	SD28	SD29	SD30	SD31	SD32	SD33	SD34	SD35	SD36	SD37

Unit code: 1- Kg 2- Number in 30 cm long equivalent 3- Small bundle 4- Medium bundle 5- Big bundle 6- 90 kg sack 7- 50 Kg sack 8- Other (Specify)_____

(Please ask the person most knowledgeable to the SP production)

K01 Who is the most knowledgeable person about Sweetpotato? _____ ..... mem

K02 Who answered the questions? _____ ..... mem

K03 Please tell me what causes the holes in these sweetpotatoes (Show the picture of weevil infested root)

1- Insect kind not specified 2- Sweetpotato weevil 3- Lack of rain 4- Infection/rot 5- Animal/pest

6- Do not know 7- Other (specify) _____ .....

K04 Have your sweetpotatoes ever suffered from the problem in the picture? 0-No 1- Yes 8- Not applicable .....

K05 If yes, is the problem a major or an ocassional problem? 0- Minor 1-Major 88- Not applicable .....

K06 If yes, does this problem force you to harvest your SP field earlier than you would like? 0- No 1- Yes 88- Not applicable .....

K07 What methods have you used to try and control or avoid this problem?

(Please put a 1 if mentioned and 0 if not)

1- Disinfect vines	2- Hilling up	3- Selection of clean planting material	4- Weeding	5- Use rotation	6- Harvest early	7- Other (specify)

K08 If you see a tired looking plant in the field, do you remove it or do you you leave it to get what you can?

1- Remove 2- Leave it .....

K09 Have you ever stopped growing a variety in your field or got new materials of the same variety bacause it had become too tired?

1- Yes 0- No .....

K10 Do you think this plant is healthy or sick? (Show healthy plant)

1- Healthy 2- Sick 3- Do not know .....

K11 Do you think this plant is healthy or sick? (Show medium virus plant)

1- Healthy 2- Sick 3- Do not know .....

K12 If the respondent says that the plant is sick, what is it suffering from?

1- Virus 2- Disease (general) 3- Drought 4- Insect damage 5- Other (specify) _____ .....

K13 How many times do you grow sweetpotato in the same plot before you plant another crop or fallow?

(Please put number of the space provided but if do not rotate put a 99 on the box) .....

K14 Which part of the SP vine is best to use for planting?

1- Top 2- Middle 3- Bottom 4- Top and middle 5- All parts .....

K15 Why did you indicate that part being better?

1- Better output 2- Less diseases 3- Easier to cut 4- More vigorous growth after planting .....

K16 Do you grow sweetpotates on (Please put a 1 if mentioned and 0 if not)

1- Raised beds	2- Flat beds	3- Ridges	4- Mounds	5- Field without raising the soil

K17 Do you grow sweetpotato on its own or mixed with other crops?

1- Pure stand 2- Mixed crop 3- Both .....

K18 If you intercrop which crop(s) you mix with? Crop 1 _____ Crop 2 _____

Crop 3 _____ Crop 4 _____

K19 Do you grow all varieties of sweetpotato mixed together or do you separate them in different plots?

1- Mix varieties 0- Separate varieties .....

K20 Do you normally plant more than one cutting in one hole?

1- Yes 0- No .....

K21 Do you use manure, or fertilizer, or both to produce sweetpotato roots?

0- Neither 1- Manure only 2- Fertilizer only 3- Both fertilizer and manure .....

K22 Do you use any manure, or fertilizer, or both to increase the number of vines you produce for planting materials?

0- Neither 1- Manure only 2- Fertilizer only 3- Both fertilizer and manure .....

K23 How many varieties of sweetpotatoes have you tried growing in the past 5 years? .....

(Please record a number of the variety in the box)

K24 Do you plant sweetpotato within one week of the start of the rains?

1- Yes 0- No

K25 If not, why not? _____

_____

K26 Do you plant sweetpotato several times during one season?

1- Yes 0- No

K27 If Yes, Why? (Please put a 1 if mentioned and a 0 if not mentioned)

1- Lack of planting material	2- Cannot depend on rain	3- Spread out production	4- Lack of labor
5- Differencet varieties have different maturing period	6- To conserve planting materials	7- Other (specify)	

K28 Do you conserve SP vines during the long dry period?

1- Yes 0- No

K29 If yes, what do you do to conserve the SP vines?

(Please put a 1 if mentioned and 0 if not mentioned)

1- Plant vines in fenced lowlands area or swamp
2- Plant vines in lowland/swamp area not fenced
3- Keep vines in a small plot near the house and water them
4- Keep the vines under the shade of other crops and water them
5- Keep vines under shade of other crops and do not water
6- Do not harvest part of the existing field
7- Plant near a bathroom
8- Burried roots
9- Other (specify)_____

K30 If No, how do you get your SP vine material after a long dry period?

(Please put a 1 if mentioned and 0 if not mentioned)

1- Buy vines .....
2- Borrow from neghbors
2- Ask relatives for vines .....
4- Left over roots re-sprouts in the field

K31 Have you ever stored sweetpotato root whole and fresh after harvest? 1- Yes 0- No

K32 If Yes, how did you store them? ***(Please put a 1 when mentioned and zero if not mentioned)***

1- Pile in a house	2- In a sack	3- In a pit	4- Wooden crates linned and covered by wood shavings	5-Other Specify

K33 If Yes, what is the maximum period of time you have stored the fresh roots?

Length of period stored Days Weeks Months

K34 Do you ever dry sweetpotatoes for storage?

1- Yes 0- No

K35 If yes, which method do you use 1- Chipped and dried 2- Boiled, chipped and dried 3- Other specify_____

K36 If yes, how long did you store dry sweetpotato?

Length of period stored Days Weeks Months

K37 Have you stopped growing any varieties in the past 5 years?

1- Yes 0- No .....

K38 If yes, how many? .....

K39 If yes, name one variety you discontinued? _____

K40 If yes, what was the reason you discontinued the variety?_____

_____

K41 I am going to read for you a list of traits about sweetpotato. Please tell me whether the characteristics is not important to you at all,or somewhat important.
or important, or essential when you decide what kinds of SP to grow in your farm.

Desirable attribute	Relative importance 1- Likes the trait 2- Dislikes the trait 3- Not important
1- Early maturing, that is the variety has some roots in less than 4 months	
2- Cooks quickly	
3- Resists diseases	
4- Easy to store in the ground	
5- High yielding	
6- Roots tastes good	
7- Leaves tastes good	
8- Easy to establish when there is little rain	
9- Once it is growing it is easy to keep if the rains stop in the in the middle of the rain season	
10- Easy to conserve vines during the long dry period	
11- Red skin	
12- White skin	
13- White flesh	
14- Yellow flesh	
15- Orange flesh	
16- Vines spread out when they grow	
17- Gives lots of roots and lots of vines at the same time	
18- Very little sugary	
19- Very sugary	
20- Not watery	

K42 What are the two top sweetpotato varieties you grow?

1- Variety 1 _____ 2- Variety 2 _____

K43 Do you grow these varieties?

(Record 1 if the answer is yes, and 0 otherwise)

1- Jewel		6- Beritha	
2- Nasport		7- SP2001/261	
3- Ukerewe		8- SP2001/264	
4- Polista		9- Kabode	
5- Ejumla			

K44 Do you give SP leaves and vines to your livestock? ..... 1- Yes 0- No

K45 Do you sell sweetpotato leaves? ..... 1- Yes 0- No

K46 Do you ever dry SP leaves for later consumption? ..... 1- Yes 0- No

K47 Have you ever heard of sweetpotato sillage
(SP leaves and vines cut and fermented to be used later by animals)? 1- Yes 0- No

E. WOMEN´S KNOWLEDGE ABOUT VITAMIN A

REG: ☐ DIST: ☐ WARD ☐☐ VILL: ☐☐☐ HHID: ☐☐☐

E00 **Is the lady available for the interview?** 0- No 1- Yes ☐

E01 NAME OF INTERVIEWEE: _____ mem ☐☐

E02 Have you heard of Vitamin A? …… 0- No 1- Yes ☐

If E02=0, skip to F01.

E04 Why is Vitamin A important for us? _____

_____

_____

E04A Does the answer mention that it protects the body? 0- No 1- Yes 99- Don´t know ☐

E04B Does the answer mention that it protects the eyes? 0- No 1- Yes 99- Don´t know ☐

E04C Does the answer mention any other correct fact? 0- No 1- Yes 99- Don´t know ☐

E06 Give 3 examples of foods rich in Vitamin A: (1) _____ ☐☐☐ (2) ☐☐☐ (3) ☐☐☐

E07 Where did you learn the names of Vitamin A rich foods? ☐☐

(Please use multiple boxes if more than one source is mentioned ☐☐

but to a maximum of 3 sources) ☐☐

01- Radio, programme in local language 02- Radio, programme in Kiswahili 03- Health Unit 04-Health Extensionist/Volunteer
05- Local Leader 06- Religious Leader 07- Friend 08- Relative 09- Sign in the market/elsewhere
10- School 11- Other, specify

F. NUTRITIONAL KNOWLEDGE, DIETARY HABITS AND PRACTICES, AND RADIO USE: WOMEN

1. Dietary Habits and Practices Now we are going to ask you some questions regarding your opinions about diet (Please use 99= Do not know 88=N/A)

F01 Thinking back to when a baby is born, is it bad or good to give the baby the first breastmilk (colostrum)? …… 0- Bad 1- Good 99- Do not know ☐

F02 At what age should a baby be given water for the first time? …… ☐☐

F02u *Did she answer in days, weeks or months?* …… 1-Days 2-Weeks 3-Months …… ☐

F03 At what age should a baby be given other foods such as porridge for the first time? …… ☐☐

F03u *Did she answer in days, weeks or months?* …… 1-Days 2-Weeks 3-Months …… ☐

F04 At what age should a baby be given sweetpotato for the first time? …… ☐☐

F04u *Did she answer in days, weeks or months?* …… 1-Days 2-Weeks 3-Months …… ☐

F05 Under normal circumstances, how long should a mother breastfeed her child? …… ☐☐

F05u *Did she answer in days, weeks, months, or years?* …… 1-Days 2-Weeks 3-Months 4-Years ☐

F06 How many times during the day should a baby, that is old enough to crawl but not yet walking, be fed porridge or other foods? …… 99- Do not know …… ☐☐

F07 How many times during the day should a child of one to two years be fed? …… 99- Do not know …… ☐☐

F08 Where did you learn about child feeding? From which persons or other sources do you get advice or information concerning how best to feed your chilld?

Enumerator: Do NOT read the list! Code each cell "1" if mentioned and "0" if not mentioned

a-Health Cent r ☐ b-Extension Agent ☐ c-Mosque/Church ☐ d-Husband ☐ e-Mother ☐ f-Mother-in-law ☐ g-Other relative ☐ h-Other Female ☐ i-Other Male ☐

j-Radio ☐ k-School ☐ l-Traditional Healer ☐ m-Trained health volunteer/promoter ☐

Now, I am going to ask you a few questions about whether and how you listen to the radio

F09 Last month, how many times did you listen to the radio? 1-Every day 2- 3 to 4 times per week 3- 1-2 times per week 4-Irregularly 5- Did not listen 8-Do not know …… ☐

F10 What is the station you listen to most often? 1- National radio 2-Regional radio 3-Community level radio 8- Do not know 9- Not applicable, do not listen …… ☐

F11 What is the name of the stations you usually listen to? Station 1 _____ Station 2 Station 3

F12 At what time of day do you usually listen to the radio?

1-First thing in the morning	2- Later in the morning	3-Afternoon	4-Evening	5-After dinner	6- Varies, no specific time	99- Do not know

J. FREQUENCY OF CONSUMPTION OF VITAMIN A RICH FOODS

REFERENCE CHILD UNDER 60 MONTHS OF AGE

J00 Is there a child under 60 months? 0- No 1- Yes

(If there is more than one child under 60 months, randomly select the child

J01 Name: _____ mem

J02 Are you breast feeding the child? …….. 0- No 1- Yes .....

J03 *If Not:* At what age did the child stop breast feeding?

[88- don´t know] ……

Units Months---1 Years---2

J04 How many times yesterday did the child receive food? ……

J05 *If the child is NOT breastfeeding:* How many times yesterday did the child receive milk from a cow, goat, or from a package? ……

Frequency of Consumption

During the past 7 days, how many days did the selected child eat *(name of the food)* ?

Meaning, how many days, starting with the last day *(specify the day)* , did the child eat *(food)* ?

Explain to the mother that you want the number of DAYS, not the number of times. For example, if she gave the child maize and porridge twice on Wednesday it only counts as 1 day.

Num.	NAME OF THE FOOD	NUMBER OF DAYS THE FOOD WAS CONSUMED OVER THE PAST 7 DAYS
J06		J07
1	Cassava or maize or rice - fresh or flour	
2	Whole chillies	
3	Dark green leaves (of all kinds)	
4	Cows milk/goats milk/powdered/condensed milk	
5	Carrots	
6	Ripe mango	
7	Pumpkin	
8	Pigeon pea leaves	
9	Ripe papaya	
10	Stiff porridge of sorghum/millet/maize	
11	Rice	
12	Pumpkin or cucumber seeds	
13	White flesh sweet potato	
14	Eggs with yolk	

Num.	NAME OF THE FOOD	NUMBER OF DAYS THE FOOD WAS CONSUMED OVER THE PAST 7 DAYS
J06		J07
15	Small fish FRESH (with intact liver)	
16	Small fish DRIED (with intact liver)	
17	Groundnut or cashew nut	
18	Orange-flesh sweet potato (OFSP)	
19	Chicken	
20	Pumpkin leaves	
21	Liver - from any animal	
22	Sweet potato leaves	
23	Meat from cow/pig/sheep/rabbit/rat	
24	Butter	
25	Beans (all kinds)	
26	Wheat/biscuits/cookies	
27	Cod liver oil	
28	Food fried in oil or with oil	
29	Cassava leaves	
30	Vitamin A fortified margarine or oil	
31	Prawn/crab	
32	Coconut milk	
33	Yellow-flesh sweet potato	
34	Cerelac (fortified packaged cereal)	

If you did not give either orange-flesh or yellow-flesh sweet potato:

Why did the child not eat orange-flesh or yellow-flesh sweet potato in the last 7 days?

J08 1- OFSP & YFSP not available 2- They do not like them 3- Other specify _____

J09 *If the child consumed OFSP* , on a typical day, how much OFSP would the child eat?

Number of roots: Size of roots: 1-Very Small 2-Small 3-Medium 4- Large

J10 Was orange-flesh sweet potato available from your fields or from the market in the month of:

(0- No 1- Yes 88- N/A, not yet the end of the month)

MARCH	APRIL	MAY	JUNE	JULY	AUG

IF YES : In the month of XX how often did the reference child eat OFSP (as root or porridge)?

J10A FREQUENCY

J10B PERIOD 1- Per day 2- Per week 3- Per month 4- Total

MAN´S KNOWLEDGE ABOUT VITAMIN A

REG ☐ DIST: ☐ WARD ☐☐ VILL ☐☐☐ HHID ☐☐☐ Pg 17

E00 **Is the man available for the interview?** 0- No 1- Yes

E01 NAME OF INTERVIEWEE: _____ mem ☐☐

E02 Have you heard of Vitamin A? …… 0- No 1- Yes ☐

If E02=0, skip to F01.

E04 Why is Vitamin A important for us? _____

_____

_____

E04A Does the answer mention that it protects the body? 0- No 1- Yes 8- Don´t know ☐

E04B Does the answer mention that it protects the eyes? 0- No 1- Yes 8- Don´t know ☐

E04C Does the answer mention any other correct fact? 0- No 1- Yes 8- Don´t know ☐

E06 Give 3 examples of foods rich in Vitamin A: (1) _____ ☐☐☐ (2) ☐☐☐ (3) _____ ☐☐☐

E07 Where did you learn the names of Vitamin A rich foods? ☐☐

(Please use multiple boxes if more than one source is mentioned but to a maximum of 3 sources)

01- Radio, programme in local language 02- Radio, programme in English 03- Health Unit 04-Health Extensionist/Volunteer
05- Local Leader 06- Religious Leader 07- Friend 08- Relative 09- Sign in the market/elsewhere
10- School 11- Other, specify

F. NUTRITIONAL KNOWLEDGE, DIETARY HABITS AND PRACTICES, AND RADIO USE: MEN

1. Dietary Habits and Practices Now we are going to ask you some questions regarding your opinions about diet

F01 Thinking back to when a baby is born, is it bad or good to give the baby the first breastmilk (colostrum)? …… 0- Bad 1- Good 8- Do not know ☐

F02 At what age should a baby be given water for the first time? …… ☐☐

F02u *Did she answer in days, weeks or months?* …… 1-Days 2-Weeks 3-Months …… ☐

F03 At what age should a baby be given other foods such as porridge for the first time? …… ☐☐

F03u *Did she answer in days, weeks or months?* …… 1-Days 2-Weeks 3-Months …… ☐

F04 At what age should a baby be given sweetpotato for the first time? …… ☐☐

F04u *Did she answer in days, weeks or months?* …… 1-Days 2-Weeks 3-Months …… ☐

F05 Under normal circumstances, how long should a mother breastfeed her child? …… ☐☐

F05u *Did she answer in days, weeks, months, or years?* …… 1-Days 2-Weeks 3-Months 4-Years ☐

F06 How many times during the day should a baby, that is old enough to crawl but not yet walking, be fed porridge or other foods? …… 88- Do not know …… ☐☐

F07 How many times during the day should a child of one to two years be fed? …… 88- Do not know …… ☐☐

F08 Are you ever involved in the feeding of your young children, either by preparing or giving them food or by advising on what to prepare or buying them foods or snacks?

Enumerator: <u>Do NOT read the list!</u> Code each cell "1" if mentioned and "0" if not mentioned

a- Buy food ☐ b-Advise mother or other person on what to prepare ☐ c-Prepare food for the child ☐ d-Give food to the child ☐ e-Give snacks to the child ☐

F09 Last month, how many times did you listen to the radio? 1-Every day 2- 3 to 4 times per week 3- 1-2 times per week 4-Irregularly 5- Did not listen 8-Do not know …… ☐

F10 What is the station you listen to most often? 1- National radio 2-Regional radio 3-Community level radio 8- Do not know 9- Not applicable, do not listen …… ☐

F11 What is the name of the stationS you usually listen to? Station 1 _____ Station 2 Station 3

F12 At what time of day do you usually listen to the radio?

1-First thing in the morning	2-Later in the morning	3-Afternoon	4-Evening	5-After dinner	6-Varies, no specific time	9-Not applicable

FS01 What months of the year do you consume sweetpotato in your meals at least twice a week?

(enumerator, please record a 1 on the month mentioned and a 0 if a month is not mentioned)

January	February	March	April	May	June	July	August	September	October	November	December

FS02 In the last 12 months, which months did you have less than two meals a day from your own resources (purchases and production)?

(enumerator, please record a 1 on the month mentioned and a 0 if a month is not mentioned)

January	February	March	April	May	June	July	August	September	October	November	December

FS03 In the last 12 months, how many months did the household receive relief food or food from an external source?

(enumerator, please record a 1 on the month mentioned and a 0 if a month is not mentioned)

January	February	March	April	May	June	July	August	September	October	November	December

FS04 In the last 3 years, has there been a particularly difficult situation in order to have food you were forced to sell assets to buy food? 1- Yes 0- No ..... ☐

FS05 If FS04 is Yes, what kind of property was sold?

(enumerator please record a 1 on a box under each item mentioned and 0 otherwise)

1-Farm implements	2- Household goods	3- Livestock (big animals)	4- Land	5-Trees	6-Food	7- Others (specify)

FS06 Think of the last time you had a prolonged period of food scarcity, what did you or any member of the HH do to deal with the problem?

(enumerator please record a 1 on a box under each item mentioned and 0 otherwise)

1- Food relief	2- Rely on relative/friends	3- Skip some meals in a day	4- Skip a meal	5- Take smaller meals	6- Eat meals that are less prefered food	
7- Consume wild food	8- Consume immature crops	9- Consume taboo or toxic foods	10-Consume seed stocks	11- Send HH members to eat elsewhere	12- Beg or engage in degrading jobs	
13- Withdraw children from school to work	14- Allow children to eat more than adults	15- Abandon children, eldery, or sickly	16- Purchase food on credit	17- Migration out of the area	18- Sell assets	19- Other (specify) _____

FS07 Do you own a valley bottom? 1- Yes 0- No ..... ☐

FS08 If No, do you have an access to a valley bottom? 1- Yes 0- No ..... ☐

FS09 What crops do you normally store longer than a month?

1- Crop1		2- Crop2		3- Crop3		4- Crop4	

FS10 If yes, where do you store them? _____

(shock10.sav key variable hhid, shockcode) REG DIST WARD VILL HHID

Shocks (Recall period: In the last 3 years)

Enumerator please tell the respodent this statement:

(Households sometimes experience unexpected events that hurt them economically and can affect their normal livelihood)

S01 We want to ask you a series of questions about the negative unexpected events you may have faced over the last three years 2007, 2008, and 2009.

Please ask these questions about shocks and record the answers in the table provided

Negative shock (unexpected events)	Did the HH experience this shock in the last 3 years? 1- Yes 0- No	What year (2007, 2008, 2009) was this shock the worst? 2007=0, 2008=1, 2009=2 (write the appropriate code)
1- Major loss of crops due to drought, or due to too much rain or flood		
2- Major loss of crops due to other reasons (pests, diseases etc)		
3- Cannot market crops produced for the market		
4- Loss of livestock due to drought/death/theft		
5- Loss of productive assets or loss of access to assets (due to theft, fire, erosion, storms, etc)		
6- Death of household member or other important member of the household		
7- Death of extended family members		
8- Loss of income due to illness or injury or loss of a job of a household member		
9- Dispute with community members over land, assets, or income opportunity		
10- Access to government program was stopped or other programs from any sources that provided assistance		

L LIVESTOCK AND FISHERY

LS01

Animal	How many do you have?	Did you sell in the year 2009? 0- No 1- Yes N/A	Who owns 0= woman 1= Man 2= Both
O01	O02	O03	O04
Cattle …….			
Goats …….			
Sheep …….			
Pigs …….			
Chickens …….			
Rabbits …….			
Ducks ……..			
Geese/turkeys			
Donkey			

F Fish sales

LS02 Did any woman in HH raise and sell fresh fish?
0- No 1- Yes …… ☐

LS03 Did any man in the HH raise and sell fresh fish
0- No 1- Yes …… ☐

LS04 Did any woman in the HH catch and sell fresh fish?
0-No 1- Yes …… ☐

LS05 Did any man in the HH catch and sell fresh fish?
0- No 1- Yes …… ☐

I. ORDERING THE ECONOMIC ACTIVITIES BY THOSE GENERATING THE MOST CASH INCOME FOR THE HH.

We would like to ask you some questions about those economic activities generating some cash income

Start by putting zeros on those activities that were not practiced by the HH. Then ask about the most important activity, then the second and so on.

Activity number	Economic activities	*Fill with a ZERO if the HH did not get any cash income with the activity* You have already mentioned that you got some cash income from the following activities: …… Among these: Which one generated the highest cash income? *Fill with 1* Which one generated the second highest cash income? *Fill with 2* *… continue until the least practiced economic activity*
P01	P02	P03
1	Sale of the agriculture products ……	☐
2	Horticultural crops and fruit sales ……	☐
3	Sale of products like milk, eggs ……	☐
4	Animal sales ……	☐
5	Fish sales ……	☐
6	Salaried work ……	☐
7	Self-employed activity outside of agriculture like trading, sale of charcoal etc ……	☐
8	Received remittances or pensions ……	☐
9	Casual labor ……	☐

A1 At present, how much/many of the following does this household own that are usable/repairable?

(Instructions: For value per unit, ask how much they would pay for the asset if they have to buy it in its current state)

(If any item is not mentioned please put N/A)

Asset	Qty	Value per unit (Tshs)	If value per unit is unknown ask for total value	Owner 1- Woman 2- Man 3- Both 3-Son 4- Daughter	Asset	Qty	Value per unit (Tshs)	If value per unit is unknown ask for total value	Owner 1- Woman 2- Man 3- Both 4- Son 5- Daughter
ITEM	QTY	VALUE	TOTALVAL	OWNER	ITEM	QTY	VALUE	TOTALVAL	OWNER
1- Storage facility for crop					18- Saw				
2- Water tank					19- Spray pump (back pack)				
3- Radio/ cassette player					20- Motorized water pump				
4- TV					21- Mechanical water pump				
5- Telephone/Mobile					22- Drip irrigation equip.				
6- Solar panels					23- Other irrigation equip.				
7- Gas cooker					24- Cart				
8- Bicycle					25- Plough				
9- Wheelbarrow					26- Harrow, tiller, ridger, weeder				
10- Milking equipment					27- Motor cycle				
11- Chaff cutter					28- Car/truck				
12- Sewing/knitting machine					29- Tractor				
13- Borehole or well					30- Generator				
14- Posho mill					31- Watering can				
15- Sheller					32- Axes				
16- Other agro-processing equip.					33- Watch				
17- Weighing machine					34- Farm equipments				

REG ☐ DIST ☐☐ WARD ☐☐ VILL ☐☐☐ HHID ☐☐☐

(Observe or ask about the following)

Main housing

A2 What is the roofing material of the households' main house?

1- Grass 2- Iron sheet 3- Tiles 4- Other (specify) _____ ..... ☐

A3 What is the wall material of the main house?

1- Mud 2- Bricks/Stones 3- Iron sheets 4- Wood 5- Plastered 6- Other (specify) _____ ..... ☐

A4 What is the floor material of the main house?

1- Earth 2- Cement 3- Wood 4- Tiles 5- Other (specify) _____ ..... ☐

A5 Who owns the house?

1- Man of the house 2- Woman of the house 3- Jointly owned 4- Other HH member 5- Owned by non- resident relative 6- Rented 7- Other _____ ..... ☐

A6 Does the household have their own toilet?

1- Yes 0- No ..... ☐

A7 What type of a toilet is it?

1- Pit latrine 2- Flush toilet 3- Compost or Eco-toilet 4- Outdoor unwalled 5- Other (specify)_____ ..... ☐

A8 What is the main source of your water during the wet season?

1- Pond 2- Dam/sand dam 3- Lake 4- Stream/river 5- Unprotected spring 6- Protected spring 7- Well 8- Borehole 9- Water tank ..... ☐

10- Roof catchment 11- Piped water into the compound 12- Piped water outside the compound 13- Water hawker-cart

14- Bodaboda 15- Other (specify) _____

A9 What is the distance (in Km and minutes) to main source of water for domestic use during wet seasons? 1- Distance in minutes ☐ 2- Distance in Km ☐

A10 What is the main source of water during the dry season?

1- Pond 2- Dam/sand dam 3- Lake 4- Stream/river 5- Unprotected spring 6- Protected spring 7- Well 8- Borehole 9- Water tank ..... ☐

10- Roof catchment 11- Piped water into the compound 12- Piped water outside the compound 13- Water hawker-cart

14- Bodaboda 15- Other (specify) _____

A11 What is the distance (in Km and minutes) to main source of water for domestic use during dry seasons? 1- Distance in minutes ☐ 2- Distance in Km ☐

A12 What is the main cooking fuel in this household?

1- Firewood 2- Charcoal 3- Paraffin 4- Solar power 5- Biogas 6- LPG Gas 7- Electricity 8- Animal dung 9- Other (specify) _____ ..... ☐

A13 What is your Main type of lighting in the main house?

1-Tin lamp 2- Lantern 3- Pressure lamp 4- Wood fuel 5- Solar power 6- Electricity 7- Rechargeable lamps 8- Other (specify) _____ ..... ☐

A14 *Enumerator please look at the main house and give your assessment of the quality of the house*

1- Excellent 2- Good 3- Fair 4- Poor 5- Very poor ..... ☐

INTERVIEW END TIME END ☐☐:☐☐