IPM CRSP Trip Report

Country(s) Visited: Uganda

Dates of Travel: June 7-July 9, 2010

Travelers Names and Affiliations: Daniel B. Taylor, Department of Agricultural and Applied Economics (0401), Virginia Tech, Blacksburg, VA 24061, USA taylord@vt.edu

Purpose of Trip: To conduct economic analyses of IPM CRSP activities, and discuss continuing research activities and future plans for the IPM CRSP in East Africa.

Sites Visited: (*locations within countries: institutions, cities, villages, or regions*)

- Makerere University, Kampala, Uganda
- Bugusege Coffee Research Station, and two farms in the vicinity, Sironko Sub-district, Uganda

Description of Activities/Observations:

Monday-Tuesday, June 7-8: In transit – arrived in Kampala, Uganda at 10:30 PM.

Wednesday, June 9: It was a national holiday. I reactivated my mobile phone. Then I contacted Jackline Bonabana-Wabbi (Agricultural Economist, Makerere University) who was in Kigali, Rwanda; Sam Kyamanywa (Dean Faculty of Agriculture, Makerere University), who was in Korea; and Beatrice Nginah (IPM CRSP Administrative Assistant, Makerere University), who was on holiday by phone and email to inform them of my arrival and begin to organize activities for the rest of my time in East Africa.

Thursday, June 10: I went to Makerere University with Jackline Bonabana-Wabbi to make workspace arrangements in the Faculty of Agriculture building for my stay with Beatrice Nginah. I paid a courtesy visit to Archileo Kaaya, who is now Deputy-Dean of the Faculty of Agriculture at Makerere University and who worked on past IPM research in his capacity as a Food Scientist researching aflatoxins, mycotoxins, and pesticide residues on various crops of interest to the IPM CRSP. I also met with William Ekere (Agricultural Economist, Makerere University) who worked on economic analyses in the early phases of the IPM CRSP. Power and thus internet went out at the University at 9:00 AM. Work is being done on a power substation near the university, and power has been out most of the week. Effectively working at the university while work continues on the substation will be problematic. I began to work on a review of curriculum for two courses for a regional/multi-institutional masters program in Agricultural Economics at the request of Bernard Bashaasha (Agricultural Economist, Makerere University). The graduates of this program will have the skills to make a substantial contribution to IPM CRSP activities as well as other facets of the regional economy. When the battery on my

laptop ran low, I returned to my hotel to complete the review (Annex A), where I learned that the hotel's internet was also down.

Friday, June 11: There is no power and the internet is still down at the university, so I worked at my hotel. I worked on this trip report and some travel paperwork for Virginia Tech. I had hoped to work on some internet resources for the project, but with the internet still down; I worked on a Hatch Project review for Dr. Bradford Mills. In the evening, I had dinner with Theresa Gregory of the NGO: Global Vision Alliance, Inc. and to discuss their interests in value added processing.

Saturday-Sunday, June 12-13: I worked on a baseline survey with Jackline Bonabana-Wabbi, and added resources to a Scholar site that I have developed for the project.

Monday, June 14: I worked at university – power went out at about 11:00. Many of the faculty are tied up all day in a meeting with the central administration of Makerere University. I discussed IPM CRSP research with Rosemary Emegu Isoto, who earned her M.Sc. in Agricultural and Environmental Economics. She will work on impact assessment for the IPM CRSP for at least part of her Ph.D. research. Her Ph.D. coursework will begin at Ohio State University in the fall of 2010. I met with Richard Edema (Plant Pathologist, Makerere University) and discussed his progress on funding graduate students. I also met with Sam Kyamanywa and Jackline Bonabana-Wabbi to discuss current and future IPM CRSP research.

Tuesday, June 15: I discussed IPM CRSP research and planning activities with Jeninah Karungi, (Entomologist, Makerere University), Archileo Kaaya, Valentine Kasenge (Agricultural Economist, Makerere University). I also discussed various academic issues with Bernard Bashaasha (Agricultural Economist, Makerere University) and Richard Edema.

Wednesday, June 16: I discussed research approaches to the economic analysis and impact assessment of hot pepper (Scotch Bonnet) production with Jeninah Karungi, Jackline Bonabana-Wabbi, and Dave Kraybill (Agricultural Economist, Ohio State University, via Email). My main concern with Dave's proposed approach to impact assessment is the limited number of producers in Kasese and Mipigi given the approach that Dave Kraybill wants to use for the analysis. That is, and econometric analysis with this low number of observations would probably not be viable. However there are other approaches that could be employed in an economic analysis. For example, economic surplus analysis could be conducted, with all the surplus changes impacting farmers since this is an export crop. Jeninah reports that AVRDC hot pepper germplasm is now being screened in Uganda.

Thursday, June 17: I discussed hot pepper impact assessment issues with George Norton (Agricultural Economist, Virginia Tech, via Email). I added more resources to the project's scholar site, and showed Geoffrey Tusiime (Plant Pathologist, Makerere University) how scholar works. I discussed (via email) with Nancy (Muthoka) Laibuni (Agricultural Economist, Kenya Institute for Public Policy Research and Analysis – former IPM CSRP collaborator a KARI) the possibility of revising a report on and economic surplus impact analysis for tomato production in Kenya for publication.

Friday, June 18: I met with Archileo Kaaya and Maria Elisa Christie (Program Director, Women in International Development, Virginia Tech) to discuss gender activities. I worked with Jackie Bonabana-Wabbi on planning for the IPM CRSP workshop in Mbale next week.

Saturday, June 19: I prepared a presentation on an overview of the economic surplus approach to impact assessment for presentation at the workshop in Mbale (Annex B).

Sunday, June 20: In transit from Kampala to Mbale, Uganda for the IPM CRSP workshop.

Monday, June 21: I attended IPM CRSP workshop in Mbale. The list of participants is located in Annex C. Most of the day was devoted to the summary of IPM CRSP research activities and plans for the future in Kenya, Tanzania, and Uganda. Sam Kyamanywa (Makerere University, Uganda) and Mark Erbaugh (Ohio State University) presided over the meeting. Pictures of most of the other attendees follow.

From left to right are Mtui Hosea (Sokiene University of Agriculture, Tanzania); and Monicah Waiganjo, Ruth Amata, and Gitonga Justa (all of Kenya Agricultural Research Institute at Thika).

From left to right are Jackline Bonabana-Wabbi (Makerere University), Patrick Kucel (National Agricultural Research Organization, Uganda); and Geoffrey Tusiime, Mildred Ochwo-Ssemakula, and Robinah Ssonko (all of Makerere University) – missing in this picture is: Rosemary Emegu Isoto of Makerere University.

Finally from left to right: Rwakaikara Silver (Makerere University), Maria Elisa Christie (Virginia Tech); and Jeninah Karungi and Didas Asiimwe (both of Makerere University) – missing in this picture is: Dan Taylor (Virginia Tech, taking photographs).

In the late afternoon we went on a field trip organized by Patrick Kucel to look at the IPM CRSP coffee trials that were on station last year, and now have been moved on-farm. To the right, in a farmer's field, Patrick explains the treatments: insecticide banding, brushing (smoothing) the bark on lower stem of the trees, wrapping the lower stem with banana leaves – all to control the coffee stem borer, which essentially kills the trees (stems). In addition to the direct stem borer controls, fertilization with commercial fertilizer, cow dung, and intercropping with beans are also being examined as a way to add nutrients to the soils. A group of farmers gathered at the next farm we went to.

The group consisted of 14 women and 5 men. After introductions we talked about coffee production for a while. In spite of the rich looking volcanic soil, the farmers say that the nutrients in the soil are much depleted. However, when asked to rank their major problems, they listed poor quality seedlings as the major problem followed by coffee rust (which can be controlled by spraying copper) and stem borer. We also discussed gender differentiate responsibilities in coffee production. The men sell the beans and retain control of the income from the sales. Men and women both harvest the cherries (ripe coffee ready for processing). Women process the cherries to extract the beans. Women are primarily responsible for weeding but some of the men stated that they help with weeding. Men prune the trees and cut back suckers. Men now plant the trees, but it appears that this has been occurring since the price of the beans has been high – when the price was low the women apparently did the planting.

Tuesday, June 22: I attended IPM CRSP workshop in Mbale, and presented overview of economic surplus approach to impact assessment. Most of the morning was devoted to a gender workshop presented by Maria Elisa Christie. Minutes from the regional workshop are contained in Annex D. In the late afternoon a technical committee meeting for the East Africa IPM CRSP was held. Minutes from the technical committee meeting are in Annex E.

Wednesday, June 23: In transit from Mbale to Kampala, Uganda from the IPM CRSP workshop. In the late afternoon Mark Erbaugh, Dave Kraybill (via Skype), Bernard Bashaasha, and Rosemary Isoto and I discussed Rosemary's program of study at Ohio State University, and her IPM CRSP research relating to Hot Peppers in Kasese.

Thursday, June 24: I worked on this report, helped Rosemary Isoto apply of her visa, and discussed Rosemary's research, her graduate program at Ohio State University, and a Hot Pepper baseline survey with Dave Kraybill (via Skype), Mark Erbaugh, and Rosemary. We started with a draft of a Hot Pepper baseline that we used in Mpigi a number of years ago (Annex F).

Friday, June 25: I worked with Rosemary Isoto on revisions to the hot pepper survey. Power is out at the university and I returned to the hotel in the afternoon, in part to get away from the exhaust fumes from the generator outside my office window that is bring used to provide power to the bio-tech lab located next to my office, and my laptop battery was running low.

Monday, June 28: I met with Margaret Mangheni (Extension Education, Makerere University, Gender Specialist) to talk about her role in the Hot Pepper baseline survey. She agreed to review the questionnaire with Maria Elisa Christie tomorrow and add gender specific components as appropriate. Margaret also indicated that she would like to participate in the data collection. I worked with Rosemary Isoto on revisions to the Hot Pepper questionnaire and sent it out to review to Mark Erbaugh, Maria Elisa Christie, Margaret Mangheni, David Kraybill, Jackline Bonabana-Wabbi, and Geoffrey Tusiime (who will be establishing the Hot Pepper Trials in Kasese). I worked on organizing the trip to collect Hot Pepper baseline data in Kasese.

Tuesday, June 29: I met with Maria Elisa Christie before she left Uganda to discuss her suggestions modifications to the hot pepper survey. I also collected electronic copies of the presentations from the IPM CRSP gender workshop in Kampala and the Regional workshop in Mbale workshop and added them to the project's scholar site.

Wednesday, June 30: I met with Margaret Mangheni to drop off some material that Maria Elisa Christie left with me to give her. Margaret said she would have her suggested revision to the questionnaire to me by this evening. I met with Geoffrey Tusiime to discuss the questionnaire and he said that he thought it was fine. I had asked him to review it from a technical perspective to make sure that we were using the correct phrasing in the questions. While he said that the biological questions that we were asking would gather the information he needed about hot pepper production, I asked him to think about it for a while, and let us know if there is anything he would like us to add. I helped Rosemary Isoto with some software, economic theory and econometric issues relating to a model that she is working on from her M.Sc. thesis. I also added more materials and users to the scholar site. I helped to transmit receipts for Beatrice Nginah to the IPM CRSP management entity for reimbursement.

Thursday, July 1: I worked with Beatrice Nginah to facilitate her interaction with the IPM CRSP management entity. I gave her a tutorial on Scholar, to facilitate document transmission. I determined that Beatrice does not have all the software on her computer that she needs to make file transfer more manageable. Beatrice is working on obtaining the necessary software to make file transfer easier. Her computer seems to be in good enough shape to handle the transmission. I met with Margaret Mangheni again, and she promised to get the gender comments on the hot pepper survey to me soon.

Friday, July 2: I worked with Rosemary Isoto to revise the hot pepper survey, based on my best recollection of a discussion I had with Maria Elisa Christine just before she left for the airport about her and Margaret Mangheni's proposed revisions to the survey.

Margaret Mangheni, Rosemary Isoto and Jackline Bonabana-Wabbi

Monday, July 5 – Wednesday July 7: I worked with Margaret Mangheni, Rosemary Isoto and Jackline Bonabana-Wabbi on revisions to the hot pepper survey (Annex G). We also worked on the logistics for the field work. The plan now is for the survey team to head to Kasese on Sunday. I also updated the project's scholar site with information on EUREGAP regulations. The EUREGAP (Euro-Retailer Produce working group for Good Agricultural Practices) regulations are the standards the producers try meet in order to have their produce considered for export to the EU. These standards are important to the hot pepper producers as all of their production is exported to Europe. I also continued to help Rosemary with the econometric analysis that she is conducting to revise a paper for journal resubmission from her M.Sc. thesis.

July 8-9: In transit – arrived Blacksburg, Virginia at 8:00 PM.

Training Activities Conducted: None

Program type (workshop, seminar, field day, short course, etc.)	Date	Audience	Number of Participants		Training Provider (US university, host country institution, etc.)	Training Objective
			Men	Women		

Suggestions, Recommendations, and/or Follow-up Items: The Kenyan and Tanzanian teams both need to add an agricultural economist to their teams. Tanzania has tended to use graduate students as their agricultural economist team member. My observation is that this has not worked well due to a lack of continuity and perhaps due to a lack of focus on the part of the student. I recommend that an agricultural economics faculty member from Sokiene University of Agriculture be added to the team.

List of Contacts Made:

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Ms. Rosemary Emegu Isoto	M.Sc. in Agricultural and Applied Economics, Makerere University as part of the Collaborative M.Sc. Program in Agricultural and Applied Economics for Eastern, Central and Southern Africa – Lecturer, Makerere University	Faculty of Agriculture Department of Agricultural Economics and Agribusiness P.O. Box 7062 Kampala, Uganda 256782088165 rosem@agric.mak.ac.ug
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Dr. Geoffrey Tusiime	Lecturer, Plant Pathology, Makerere University	Faculty of Agriculture Department of Crop Science P.O. Box 7062 Kampala, Uganda 256 772 674 873 gtusiime@agric.mak.ac.ug
Dr. Mark Erbaugh	Interim Director International Programs in Agriculture, Rural Sociologist, Ohio State University	113 Agriculture Administration Building 2120 Fyffe Road Columbus, Ohio 43210-1099 614- 292-7252 erbaugh.1@osu.edu
Dr. Maria Elisa Christie	Program Director, Women in International Development, Virginia Tech	Office of International Research, Education and Development 526 Prices Fork Road Blacksburg, VA 24060 540-231-4297 mechristie@vt.edu
Basil Mugonola	Lecturer, Agricultural Economist, Gulu University	P.O. Box 166, Gulu, Uganda 256772459745 basil.mugonola@gmail.com
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Mr. Mtui Hosea	Sokiene University of Agriculture	Department of Crop Science and Production P.O. Box 3005 Morogoro, Tanzania mtuihosea@yahoo.com
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Dr. David Kraybill	Agricultural Economist, Ohio State University	340 Agricultural Administration Building 2120 Fyffe Road Columbus, Ohio 43210 614-292-0078 kraybill.1@osu.edu
Dr. Michael Otim	Lecturer, Entomology -- Makerere University	Faculty of Agriculture Department of Crop Science P.O. Box 7062 Kampala, Uganda 256772897040 Otim_michael@agric.mak.ac.ug
Dr. George Norton	Professor, Agricultural and Applied Economics, Virginia Tech	Department of Agricultural and Applied Economics (0401) Blacksburg, VA 24061 540- 231-7731 gnorton@vt.edu

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Dr. Ruth Amata	Plant Pathology, KARI Horticultural Research Institute	P.O. Box 220-01000 Thika, Kenya amata.ruth@yahoo.com
Ms. Gitonga Justa	Rural Sociology, KARI Horticultural Research Institute	P.O. Box 220-01000 Thika, Kenya **Error! Hyperlink reference not valid.**

Annex A
Review of Curriculum

Daniel B. Taylor's Review of CMAAE Microeconomics (CAC 501) and Production Economics (CAC 505) Proposed Courses

We suggest that the review proceeds along the following 9 elements in our TOR namely, These are by and large our investigation questions/issues.

1. Objectives/aims of the courses:

The objectives of both courses seem reasonable.

2. Prerequisites for taking the course,

The perquisites for both courses seem appropriate.

3. Course outline/Thematic plan

It seem reasonable – although it is not the way we put course proposals together in the US – and if your three hours of independent study time to one class hour is your standard ratio, then that is fine – you should note that in the U.S. in courses like this, I might expect (including time spent on homeworks) independent study time to (in reality) be more like 5 to 6 hours (or more) per in class contact hour.

4. Detailed description for each of the topics,

I have included a number of suggestions for both courses using "Track Changes" in the document itself.

5. Recommended credit hours,

It seems appropriate to have 6 credit hours (three for each course) for a maters level microeconomics sequence.

6. Mode of delivery,

Forty five contact hours for each course with a mixture of lectures, seminars and hands on activities is an appropriate teaching method for these courses. However, in the US, similar courses would have 45 contact hours devoted to lectures, with the hands on experiences coming when the students working on homeworks and the seminar hours would largely be comprised of students visiting with professors and teaching assistants during office hours. In addition to

homeworks and office hours, I know of courses that also have three or so hours of (attendance optional) homework assignment working sessions, usually run by a teaching assistant. This is a lot of material to cover and it will be a challenge to successfully cover the material with 30 lecture hours per course.

7. Assessment criteria,

Grading homework assignments, examinations and term projects/papers are appropriate evaluation criteria for the courses.

8. Assessment method; and

As you will note from my comments using "Track Changes" in the document itself I suggested adding term projects as an option to just term papers as an assessment criteria in CAEC 505.

I do take some issue with using continuous assessment tests (CATs). CATs are useful for "forcing" students to keep up with the material and are commonly used in lower level undergraduate courses, in part to teach the students how to keep up with the material in their classes. However in upper level undergraduate courses and graduate courses, I tend to favor fewer, more comprehensive examinations. At the level of maturity these students are at, they should be able to learn well in such a system without constantly being prodded by CATs. If they cannot, then they probably should not be in the program.

9. Course materials.

I have made some suggestions relating to the textbooks for both courses and software for CAEC 505 using "Track Changes" in the document itself.

CURRICULUM

FOR THE

COLLABORATIVE MASTERS PROGRAM IN AGRICULTURAL AND APPLIED ECONOMICS IN EASTERN, CENTRAL & SOUTHERN AFRICA

An Initiative by the

AGRICULTURAL ECONOMICS EDUCATION BOARD (AEEB)

December 2004, 2nd Draft

Collaborative MSc Program in Agricultural and Applied Economics

COURSE CURRICULUM

BACKGROUND

1 Program Objectives and Focus

The Collaborative MSc Program in Agricultural and Applied Economics aims to equip professionals with knowledge and skills essential for transforming the currently underdeveloped agro-food sectors and rural economies of Eastern, Central and Southern Africa to perform well in an environmentally sustainable fashion. Its underlying premise is that such highly trained local professionals must address the challenges posed by far reaching changes in global and local economies, technology, and marketing by adapting their advanced knowledge and methods to the particular institutional, political and economic circumstances of the region. Sixteen heads of departments of agricultural economics in the Eastern and Southern Africa region, which formed the Agricultural Economics Education Board (AEEB), spearheaded the program[1]. The program will offer students the opportunity to undertake specialised study in one of the following fields:

- Agriculture and Rural Development
- Agricultural Policy and Trade
- Agribusiness Management
- Environment and Natural Resource Management

These fields were identified at the stakeholders meeting as meriting priority attention in the region

2 Program Structure

The program of study comprises five semesters over 20 to 24 months. Applications will be entertained from graduates in any field and professionals in mid-career, provided they satisfy prerequisites considered necessary to succeed in a rigorous program of study and research. Any missing prerequisites will be acquired prior to entry through courses offered separately or jointly by the collaborating departments and other reputable institutions within and outside the region.

The first two semesters of 15 weeks each will focus on core subject material in macroeconomics, production and household economics, econometrics, mathematics, research methodology and issues in agricultural and applied economics.

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[1]The departments are: Botswana (Botswana College of Agriculture, *University of Botswana*); Ethiopia (*Alemaya University*); Kenya (*Egerton University, Jomo Kenyatta University of Agriculture and Technology, Moi University, University of Nairobi*); Malawi (*University of Malawi)*; Mozambique (*Eduardo Mondlane University*), Rwanda (*Universite nationale)*, South Africa (*University of Pretoria, Stellenbosch University)*; Swaziland (*University of Swaziland)*; Tanzania (*Sokoine University*); Uganda (*Makerere University)*, Zambia (*University of Zambia),* Zimbabwe (*University of Zimbabwe)*

The third semester, to be held in a shared facility[2] in the region, will offer the student an expanded selection of elective subjects from which two courses will be taken along with a foundation course in his/her preferred field of specialised study. The selection will be guided by the student's interest and guidance from the supervisor. All students will also pursue a novel course in institutional and behavioural economics so that they can better adapt more conventional analysis to the political and economic realities of the region. Qualified subject specialists from within and outside the region will teach courses.

Comment [D1]: How about a course in sustainability/sustainable development, given the statement relating to sustainability in "program objectives and focus?"

Over the fourth and fifth semesters, the student will complete a thesis mentored by subject specialists from his/her home university and where desirable, other collaborating universities within the region. Successful candidates will be awarded the MSc degree by their home university.

3. Program Content and Quality Control

An Agricultural Economics Education Board (AEEB), currently comprising representatives of the 16 collaborating departments, will approve program content. A Program Executive Committee will guide the AEEB. Ongoing consultations with regional and national bodies, with employers in the public sector, government, not-for-profit sector, and international donor community will also facilitate the development and institutionalisation of a relevant curriculum. The AEEB will set out the criteria and procedures for accrediting collaborating departments to offer the program and conduct various evaluations to ensure continued quality and relevance.

4. Program Implementation

Up to four departments are expected to receive accreditation by September 2005, the date planned for the first intake of students. Based on current projections, up to six others may be accredited by the end of the first five-year phase.

5. Gender Sensitivity and Balance

A major aim of the Program is to attract female students, including professionals in mid-career as well as those with a first degree in other disciplines. Aside from facilitating their entry through expanded access to prerequisite courses, the Program will use other modalities, including scholarships and sponsorships, to advance female participation, not only in graduate study, but also in professions and pursuits contributing to agricultural and rural development. The male students will, however, not be discriminated against.

6. Further Information

A detailed description of the program, covering its rationale, formulation, activities, costing, financing and governance is contained in the AEEB document entitled *Collaborative MSc Program in Agricultural and Applied Economics: An Initiative for Eastern, Central and Southern Africa.* The product of an intensive 12 month planning exercise, the document can be downloaded from the program's website (http://www.agriculturaleconomics.net/), or obtained from the Planning Coordinator, Professor Willis Oluoch-Kosura (wokosura@idrc.or.ke).

[2] Under consideration as the venue is the University of Pretoria.

Further queries concerning the program can also be addressed to Dr. Bernard Bashaasha, Chair, AEEB (aspsmuk@infocom.co.ug) and Dr. Thomson Kalinda, Vice Chair, AEEB (tkalinda@agric.unza.zm).

CAEC 501: Microeconomics

Classification: Core **Number of Credits:** 3 **Semester:** 1

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1. Course Objectives

This course provides a theoretical foundation in Economics and its application for almost all other courses in the program. Specifically, the course is intended to enable students to:

- Acquire and use the language and logic of microeconomic theories of the consumer and the firm;
- Apply microeconomic theories to problems of agriculture, rural development, and the environment; and
- Acquire knowledge of the practical uses of Microeconomics in research and management.

2. Expected Learning Outcomes

By the end of the course, students should be able to:

- Apply the Lagrangian technique of constrained optimisation;
- Derive and apply individual demand functions;
- Derive market demand functions;
- Derive elasticities and apply them;
- Explain Pareto optimum conditions;
- Show the gains from exchange using the Edgeworth Box;
- Understand the fundamental theorems of welfare economics and application;
- Analyse the behaviour of the firms

Comment [D2]: Given the "environmentally sustainable fashion" statement in the "Program Objectives and Focus" section, shouldn't something relating to understanding the concept/issues of sustainability and/or applying it be in the expected learning outcomes?

Deleted: the

3. Prerequisites

Students enrolled for this course are expected to have acquired competence in undergraduate Microeconomics and Mathematics. In Microeconomics, mastery up to the intermediate undergraduate level is expected. In Mathematics, students are expected to have a working knowledge of Algebra, Analytic Geometry, and Differential Calculus.

4. Thematic Plan

Topics	Contact Hours				Independent Study	Total hrs
	Lectu	Sem	Application	Subtot		
1. Review the concepts of consumer behaviour	2	1		3	9	12
2. Utility maximization	2		1	3	9	12
3. Individual consumer and market demand	3		1	4	12	16
4. Elasticity of demand functions	2		1	3	9	12
5. Income and Substitution effects	2	1	1	4	12	16
6. Theory of revealed preference	3		1	4	12	16
7. Theory of the firm	2		1	3	9	12
8. The problem of choice in situations involving risk	3	1	1	5	15	20
9. Multiperiod consumption	3		1	4	12	16
10. Consumption efficiency and gains from exchange	3		1	4	12	16
11. Market Analysis	3		1	4	12	16
12. Limits of the Market (Externalities and Public Goods)	2	1	1	4	12	16
Total	30	4	11	45	135	180

5. Course Description

Topic 1: Review of Concepts of Consumer Behaviour

- Consumer preference
  - The concept of utility
    - Cardinal versus ordinal utility
    - Mathematical form of the utility function
  - The difference between goods and bads
  - Indifference curves and their use in depicting
    - Marginal rate of substitution
    - Intransitivity of preferences
    - Convexity of preferences
  - The feasible set and the budget constraint
  - Homotheticity of preferences
- Four stylised types of utility functions

Comment [D3]: Not clear/reword

    - Perfect substitutes
    - Perfect complements
    - Cobb-Douglas
    - Constant elasticity of substitution (CES)
- The concept of the individual demand function
- Engel function (demand as a function of income only)
    - Normal and inferior goods
    - Income-consumption curve
    - Engel's Law
- Ordinary demand function
    - Derivation of ordinary demand function from indifference curves
    - Change in Quantity demanded versus change in demand
    - Factors affecting change in demand
- Elasticity of Demand: price, income
- Price elasticity of demand

Deleted: Demand elasticity

Comment [D4]: How is this different from the preceding topic? Maybe you mean price flexibilities? But I don't think that you have introduced inverse demand functions yet.

Topic 2: Utility Maximization

- Comparative statistics
- Assumptions underlying the model of consumer optimisation
- Utility maximization subject to the budget constraint
- The Langrangian technique for constrained optimisation
    - Mathematical procedure
    - Economic interpretation of the Lagrangian multiplier
- Formal statement of the consumer's problem
    - First order condition for utility maximization
    - Second order condition for utility maximization (graphical exposition only)

Topic 3: Individual Consumer and Market Demand

- Cross-price demand function (demand as a function of price of another good)
    - Gross complements
    - Gross substitutes
- Homogeneity property of demand functions
- Derivation of demand functions
    - From Cobb-Douglas utility function
    - From CES utility function
- The indirect utility function
- Market demand functions
    - Constructing market demand functions from individual demand functions
    - Factors affecting shifts in market demand

Topic 4: Elasticity of Demand Functions

- Cross-price elasticity of demand

- Elasticities for various types of demand functions
    - Linear demand functions
    - Constant elasticity demand functions
- The relationship between price elasticity and total revenue for linear demand functions
- Elasticity of substitution in consumption

Topic 5: Income and Substitution Effects

- Changes in the price of a normal good
    - For a price increase
    - For a price decrease
- Changes in the price of an inferior good
    - For inferior good
    - For Giffen good
- Compensated demand functions
    - Derivation of compensated demand function
    - Comparison of uncompensated and compensated demand functions
    - Dual approach to the consumer's problem contrasted with the primal approach
    - The expenditure function
        - Calculating the change in real income following a change in price
        - The concept of compensation and the optimal subsidy
- The Slutsky equation
    - Mathematical derivation
    - Illustrated for normal and inferior goods
- Estimating compensated demand in elasticity form
- Consumer surplus
    - Using compensated demand function to calculate consumer surplus
    - The relationship between compensation and consumer surplus
    - Comparison of consumer surplus estimated using uncompensated and compensated demand functions

Topic 6: Theory of Revealed Preference and applications

- Weak Axiom of revealed preference
- Strong Axiom
- The substitution effect
- Comparative statitics
- Continuity of demand function
- Aggregate consumer demand
- Inverse demand functions
- Elasticity of substitution in production
- Theory of the firm and applications to agriculture

Comment [D5]: Shouldn't this sub-topic and the next one appear under Topic 7: "Theory of the Firm?"

Topic 7: Theory of the Firm

- Production Functions
- Profit Maximization

- Cost and Profit Functions
- Cost Minimization
- Relating Demand Functions to Profit Functions

Topic 8: The Problem of Choice in Situations Involving Risk

- The Axioms
- Expected utility
- Attitudes towards risk
- Risk and insurance

Topic 9: Multiperiod Consumption

- Multiperiod utility functions
- The budget constraint
- The consumption plan
- Substitution and income effects

Topic 10: Consumption Efficiency and Gains from Exchange

- Partial versus general equilibrium analysis
- Edgeworth Box for an economy with consumption only
    - Assumptions
    - Initial endowments
    - Gains from exchange
    - Pareto optimality and Pareto superiority
    - General competitive equilibrium
- First and second fundamental theorems of welfare economics for an economy with consumption only
- Social welfare functions: income distribution and equity
- The theory of the second best

Topic 11: Market Analysis (Short and Long Run)

- Perfect competition
- Demand functions
- Supply functions
- Commodity and factor market equilibria
- Futures market dynamic equilibria
- Theory of contestable markets
- Monopoly
- Duopoly
- Oligopoly
- Monopsony

Comment [D6]: How applicable is this sub-topic in the African context?

6. Mode of Delivery

The course materials will be delivered through lectures, reading and homework assignments. There will be 3 contact hours per week and 9 hrs of independent study per week for the 15-week semester.

7. Assessment Methods

The following assessment methods will be used:

- Assignments & Continuous Assessment Tests (CATs) 20%
- Project/term paper 30%
- Final examination 50%

The assignments will consist of theoretical and applied microeconomic problems to be solved by the students. The CATs will be based on the lectures, readings, and homework assignments. The final examination will test knowledge gained throughout the course.

8. Course Materials

Recommended Textbooks

- Henderson, J.M., and R.E. Quandt. 1980. *Microeconomic Theory: A Mathematical Approach*, 3rd Edition. London: McGraw Hill.
- Nicholson, Walter. 2002. *Microeconomic Theory: Basic Principles and Extensions,* 8th Edition. London: South-Western (Thomas Learning).

Further Readings

- Baumol, William J. 1999. *Economic Theory and Operations Analysis*, 4th Edition. New Delhi: Prentice-Hall of India.
- Binger, Brian, and Elizabeth Hoffman. 1998. *Microeconomics with Calculus*, 2nd Edition. Reading, Massachusetts: Addison-Wesley.
- Chiang, Alpha C. 1985. *Fundamental Methods of Mathematical Economics*. London: McGraw Hill.
- Dowling, Edward T. 2001. *Schaum's Outline: Introduction to Mathematical Economics*. 3rd Edition. New York: McGraw-Hill.
- Harkwick, P., B. Khan, and J. Langmead. 1996. *An Introduction to Modern Economics*, 4th Edition. New York: Addison Wesley Longman Publishing.
- Lipsey, R. G., and K. A. Christal. 1999. *Principles of Economics*, 9th Edition. Oxford University Press.
- Salvatore, Dominick. 1992. *Schaum's Outline of Theory and Problems of Microeconomic Theory*. 3rd Edition. New York: McGraw-Hill.
- Silberberg, E. & W. Suer, 2001. *The Structure of Economics: a Mathematical Analysis* 3rd edition, McGraw Hill Book co.
- Varian, Hal, R. *Micro-economic analysis and deduction.* W.W Norton & Co. New York
- Wetzstein, Michael. 2004. *Microeconomic Theory: Concepts and Connections with Economic Applications*. South-Western College Publishers.

Comment [D7]: While this is THE classic text, I would recommend moving it to further readings, and moving Binger and Hoffman from the further readings to a recommended text book. Binger and Hoffman provides a lot more details relating to the math than does Henderson and Quandt (and also more details than Nicholson).

Comment [D8]: There is a 9th edition, and now maybe even a 10th edition.

Comment [D9]: You will need to check, but it is possible that there is a 3rd edition.

Comment [D10]: There is now a newer edition and the authors are Chiang and Wainwright .

CAEC 505: Production Economics

Classification: Core **Number of Credits**: 3 **Semester**: 2

1. Course Objectives

Specific goals of the course are for students:

- To learn theories and methods of Production Economics;
- To apply the theory and methods of Production Economics to problems of agriculture, rural development, and the environment; and
- To study and understand examples of the practical use of Production Economics in research and management.

2. Expected Learning Outcomes

Students in this course are expected to have knowledge and skills in the following topics and acquire the following competencies:

- Differentiate between technological, allocative and economic efficiency and applications;
- Understand and apply production and cost functions and implications for profit maximisation in the short and long run;
- Analyse market structure and implications for profit maximisation;
- Apply production theory to practical problems such as agricultural supply response; and
- Understand and apply the household production model.

3. Prerequisites

Students enrolled for this course are expected to have completed MSc courses in Microeconomics and Mathematical Economics and to have fulfilled all prerequisites for those courses. The students will have to be concurrently enrolled in Econometrics.

4. Thematic Plan

Topics	Contact hours				Independent study	Total hours
	Lect	Sem	Prac	Sub-tot		
Review / overview of Theory of the Firm	2		1	3	9	12
Technology, Production sets and input requirement sets	3	2	4	9	27	36
Cost, Profit, and Supply Functions of the Firm	2	1	2	5	15	20
Cost Minimization and Profit Maximization in the Two-Input Case	2		1	3	9	12
Returns to Size and Returns to Scale	1		1	2	6	8
Technical Efficiency and Technology Adoption	1	1	1	3	9	12
Using the Profit Function to Estimate Supply and Factor Demand	2		3	5	15	20
Linear Programming (LP) and the Theory of Production	3		1	4	12	16
Risk and Uncertainty in Production	2	2	1	5	15	20
Household Production Model of Smallholder Agriculture	2	2	2	6	18	24
Total	30	7	8	45	135	180

5. Course Description

Topic 1: Review/Overview

- Review of production theory
- Assumptions in production economics
  - Price-taking (pure competition)
  - Price-setting (imperfect competition)
- Review of the production function
  - Mathematical form of the production function
  - Illustrations of agricultural production functions
  - Short-run versus long-run analysis
  - Total, average, and marginal physical products
  - Elasticity of production
- Model of profit maximization

- Total value product and total factor cost
- Value of the marginal product and marginal factor cost
- Necessary and sufficient conditions for profit maximization
- Calculating optimal input use
- Three stages of the neoclassical production function

- Review of technical, allocative, and economic efficiency
- Review of mathematical concepts for optimisation
  - First-order conditions
  - Second-order conditions using matrix algebra
  - Applying first and second order conditions to determine profit maximization with two inputs

Comment [D11]: "Review" from where – that is I do not see this topic in CAEC 501

Comment [D12]: Unconstrained and/or constrained, or is constrained only in Topic 4?

Topic 2: Representing Technology in One and Two-Input Case

- Production response surfaces
- Isoquants
  - Marginal rate of substitution in production
  - Ridge lines
  - Relationship between marginal rate of substitution and marginal product
  - Using partial and total derivatives to derive the marginal rate of substitution
  - Comparative statics
  - Elasticity of Substitution

Deleted: statitics

Comment [D13]: Or, well this topic should be covered somewhere.

Applications (from topic 6)

Comment [D14]: I am not clear why this is here or how it relates to topic 6 in this course description. Yes, this is an important thing to do – maybe it should really be topic 3, and the rest of the topics should be renumbered?

- Cobb-Douglas function
  - Properties of the function
  - The dual cost function
  - Constrained output or revenue maximization
- Cobb-Douglas function with variable input elasticities
- Constant Elasticity of Substitution (CES) function
  - Properties
  - Comparison with Cobb-Douglas function
  - Kuhn-Tucker conditions
- Crop and livestock response functions (
- Choice of variables and functional form
- Homework: estimation of Cobb-Douglas production function using data from Weir.

Comment [D15]: B

Comment [D16]: Because – why should this level of detail be here when it does not appear elsewhere in the sub-topics of the course description?

Deleted: Frank, Beattie, and Embleton)

Comment [D17]: Is this, and the homework listed under topic 7, the only two homeworks in the class. I think not, and I also think that this level of detail should not be shown here since it does not appear under the other topics. Shouldn't each topic have a homework?

Topic 3: Cost, Profit, and Supply Functions of the Firm

- Implicit (financial) versus economic (opportunity) costs
- The cost function
  - Variable, fixed, and total costs
  - Average and marginal costs in the short- and long-run
  - Relationship between average and marginal costs
- The profit function
- Duality
  - Relationship between cost and profit functions
  - The cost function as the inverse of the production function

- The supply function of the firm

Topic 4: Cost Minimization and Profit Maximization in the Two-Input Case: The isocost line

- Isoclines and the expansion path
- Unconstrained profit maximization
- Constrained revenue maximization using the Lagrangian technique
  - The Lagrangian function
  - The Lagrangian multiplier
  - First- and second-order conditions
  - Interpretation of the Lagrangian multiplier
- Comparative statitics

Topic 5: Returns to Size and Returns to Scale

- Economies of size
- Economies of scale
- Homogeneous production functions
- Euler's Theorem
- The relationship between returns to scale and production elasticities.

Deleted: and distribution

Topic 6: Technical Efficiency and Technology Adoption

- Total factor productivity as a measure of technological change
- The effect of farm-level management on productivity
- Measuring the rate of technological adoption
- Evaluating productivity gains from agricultural research
- Frontier production function concepts

Topic 7: Using the Profit Function to Estimate Supply and Factor Demand

- Profit functions and derived systems of output supply and factor demand
- Cost functions and associated systems of factor demands
- Issues in estimation of profit and cost functions
- Short-run versus long-run supply response
- Aggregate supply response
- Homework: price incentives and public goods

Comment [D18]: Again, why show a homework here?

Topic 8: Linear Programming (LP) and the Theory of Production

- Assumptions
- Fixed-proportion production functions
- Graphical solution of a linear programming problem
- The simplex method
- Introduction to computer application in LP using GAMS or any other appropriate software

Comment [D19]: Why not use solver, since it is something that comes with Excel. However, be advised that for any large/complicated models, GAMS is preferred to Solver – but as you probably know, GAMS is EXPENSIVE!

Comment [D20]: Since you just showed them LP, why not show them some linear risk modelling – MOTAD and Target-MOTAD, and use them to derive E-V frontiers. You could also introduce them to the linear version of chance constrained programming.

Topic 9: Risk and Uncertainty in Production

- Farmer attitudes toward risk and uncertainty
- Terminology: actions, states of nature, probability, consequences
- Risk preference and utility
- Marginal analysis under risk and uncertainty
- Strategies for dealing with risk
    - Diversification
    - Multi-cropping
    - Low-risk crops
    - Government programs
    - Contracting
    - Insurance

Topic 10: Household Production Model of Smallholder Agriculture

- Producer, consumer, and worker decisions in a household framework
- Specification of the household model
- Separable household model with perfect markets
- Household model with market failures
- When and how to use a household model

6. Mode of Delivery

The course material will be delivered through lectures, reading assignments, and homework assignments. The course will comprise of 3 Credit hours. There will be 3 contact hours per week and 3 hours of independent study for each contact hour of a lecture.

7. Assessment Methods

The following assessment methods will be used:

- Assignments & Continuous Assessment Tests (CATs) 20%
- Project/Term paper 30%
- Final examination 50%

Comment [D21]: For example they could estimate some function(s) or construct a LP model.

The assignments will consist of theoretical and applied problems of production economics to be solved by the student. The CATs will be based on the lectures, readings, and homework assignments. The final examination will test knowledge gained throughout the course.

8. Course Materials

Recommended Textbooks

- Beattie, B.R. & C. Robert Taylor, 1993. *The Economics of Production.* Krieger Publishing Co. Malabar, Florida
- Binger, Brian R., and Elizabeth Hoffman. 1998. *Microeconomics with Calculus.* 2nd Edition. Reading, Massachusetts: Addison-Wesley.

- Debertin, David L. 2004. *Agricultural Production Economics*. 3rd Edition. Privately published (similar to the 1st edition of Debertin published in 1986 by Macmillan).
- Edriss, A. K. 2003. *The Dynamics of Groundnut Production, Efficiency, Profitability and Adoption of Technology in Sub-Saharan Africa*. International Publishers and Printer, Las Vegas and University of Malawi.
- Henderson & Quandt, 1980. *Micro Economic theory: A mathematical approach*. 3rd edition. EC handbook series.
- Sadoulet, Elisabeth, and Alain de Janvry. 1995. *Quantitative Development Policy Analysis*. Baltimore: The Johns Hopkins University Press.
- Varian, R. H. 1984. *Microeconomics Analysis*. 2nd edition, W. W. Norton & co. New York

Comment [D22]: I would put in further readings

Comment [D23]: I would put in further readings

Further Readings

Comment [D24]: I would include Nicholson in further readings.

- Ali, Mubarak, and Derek Byerlee. 1991. "Economic Efficiency of Small Farmers in a Changing World: A Survey of Recent Evidence." *Journal of International Development*, 3, 1-27.
- Alston, J.M., G.W. Norton, and P.G. Pardey. 1995. *Science under Scarcity: Principles and Practice of Agricultural Research Evaluation*. Chap 3. Ithaca, New York: Cornell University Press, 1995.
- Beattie, Bruce R. 1993. *The Economics of Production*. Melbourne, Florida: Krieger Publishing Co.
- Beneke, P.R., and R. Winterboer. 1973. *Linear Programming: Applications to Agriculture*. Ames: Iowa State University Press.
- Block, Steven A. 1994. "A New View of Agricultural Productivity in Sub-Saharan Africa." *American Journal of Agricultural Economics*, Vol. 76, pp. 619-624.
- Chambers, Robert G. 1988. *Applied Production Analysis: A Dual Approach*. London: Cambridge University Press.
- Cornia, Giovanni Andrea. 1985. "Farm Size, Land Yields, and the Agricultural Production Function: An Analysis of Fifteen Developing Countries." *World Development*, Vol. 13, No. 4, pp. 513-534.
- Dalton, T.J. W.A Masters and K.A. Foster, "Production costs and input substitution in Zimbabwe's smallholder agriculture," Agricultural Economics, Vol 17,Isues 2-3, December 1997, Pages 201-209.
- Dawson, P.J., and J. Lingard. 1991. "Approaches to Measuring Technical Efficiency on Philippine Rice Farms." *Journal of International Development*, Vol. 3, No. 3, pp. 211-228.
- Doll, John P., and Frank Orazem. 1992. *Production Economics: Theory with Applications*. Melbourne, Florida: Krieger Publishing Co.
- Feder, Gershon, Richard E. Just, and David Zilberman. 1985. "Adoption of Agricultural Innovations in Developing Countries: A Survey." *Economic Development and Cultural Change*, Vol. 33, pp. 255-298.
- Frank, Michael D., Bruce R. Beattie, and Mary E. Embleton. 1990. "A Comparison of Alternative Crop Response Models." *American Journal of Agricultural Economics*, Vol. 72, pp. 597-603.
- Griffin, Ronald C., John M. Montgomery, and M. Edward Rister. 1987. "Selecting Functional Form in Production Function Analysis." *Western Journal of Agricultural Economics*, Vol. 12, pp. 216-227.

- Hattink, Wolter, Nico Heerink, and Geert Thijssen. 1998. "Supply Response of Cocoa in Ghana: A Farm-Level Profit Function Analysis." *Journal of African Economies*, Vol. 7, No. 3, pp. 424-444.
- Hazell, P.B. and R.D. Norton. 1986. *Mathematical Programming for Economic Analysis in Agriculture*. New York: Macmillan Publishing Co. (Out of print but available free of charge on-line at www.ifpri.org).
- Heady, E. O. and J.L. Dillon. 1961. *Agricultural Production Functions*. Ames: Iowa State University Press.
- Henderson, J.M., and R.E. Quandt. 1980. *Microeconomic Theory: A Mathematical Approach*. 3rd Edition. London: MacGraw-Hill Book Company.
- Intrilligator, Michael D. 1978. "Applications to Firms: Production and Cost Functions." Chapter 8 in *Econometric Models, Techniques, and Applications*. Englewood Cliffs, New Jersey: Prentice-Hall.
- Jayne, T.S., Yougesh Khatri, Colin Thirtle, and Thomas Reardon. 1994. "Determinants of Productivity Change Using a Profit Function: Smallholder Agriculture in Zimbabwe." *American Journal of Agricultural Economics*, Vol. 76, pp. 613-618.
- Junankar, P.N. 1989. "The Response of Peasant Farmers to Price Incentives: The Use and Misuse of Profit Functions." *The Journal of Development Studies*, Vol. 25, No. 2, pp. 169-182.
- Koutsoyiannis, A. 1979. *Microeconomics*. 2nd Edition. London: Macmillan Press Ltd.
- Lau, Lawrence J. 1986. "Functional Forms in Econometric Model Building." In Z. Griliches and M.D. Intrilligator, eds., *Handbook of Econometrics*, Vol. III. Amsterdam: Elsevier.
- Nkonya, Ephraim, Ted Schroeder, and David Norman. 1997. "Factors Affecting Adoption of Improved Seed and Fertilizer in Northern Tanzania." *Journal of Agricultural Economics*, Vo. 48, No. 1, pp. 1-13.
- Odulaja, Adedapo, and Fassil G. Kiros. 1996. "Modelling Agricultural Production of Small-Scale Farmers in Sub-Saharan Africa: A Case Study in Western Kenya." *Agricultural Economics*, Vol. 14, pp. 85-91.
- Sevilla-Siero. 1991. "On the Use and Misuse of Profit Functions for Measuring the Price Responsiveness of Peasant Farmers: A Comment." *The Journal of Development Studies*, Vol. 27, No. 4, pp. 123-136.
- Weir, Sharada. 1999. "The Effects of Education on Farmer Productivity in Rural Ethiopia." Working Paper, WPS99-7, Centre for the Study of African Economies, University of Oxford, Oxford, UK. << www.csae.ox.ac.uk\workingpapers\pdfs\9907text.pdf>>

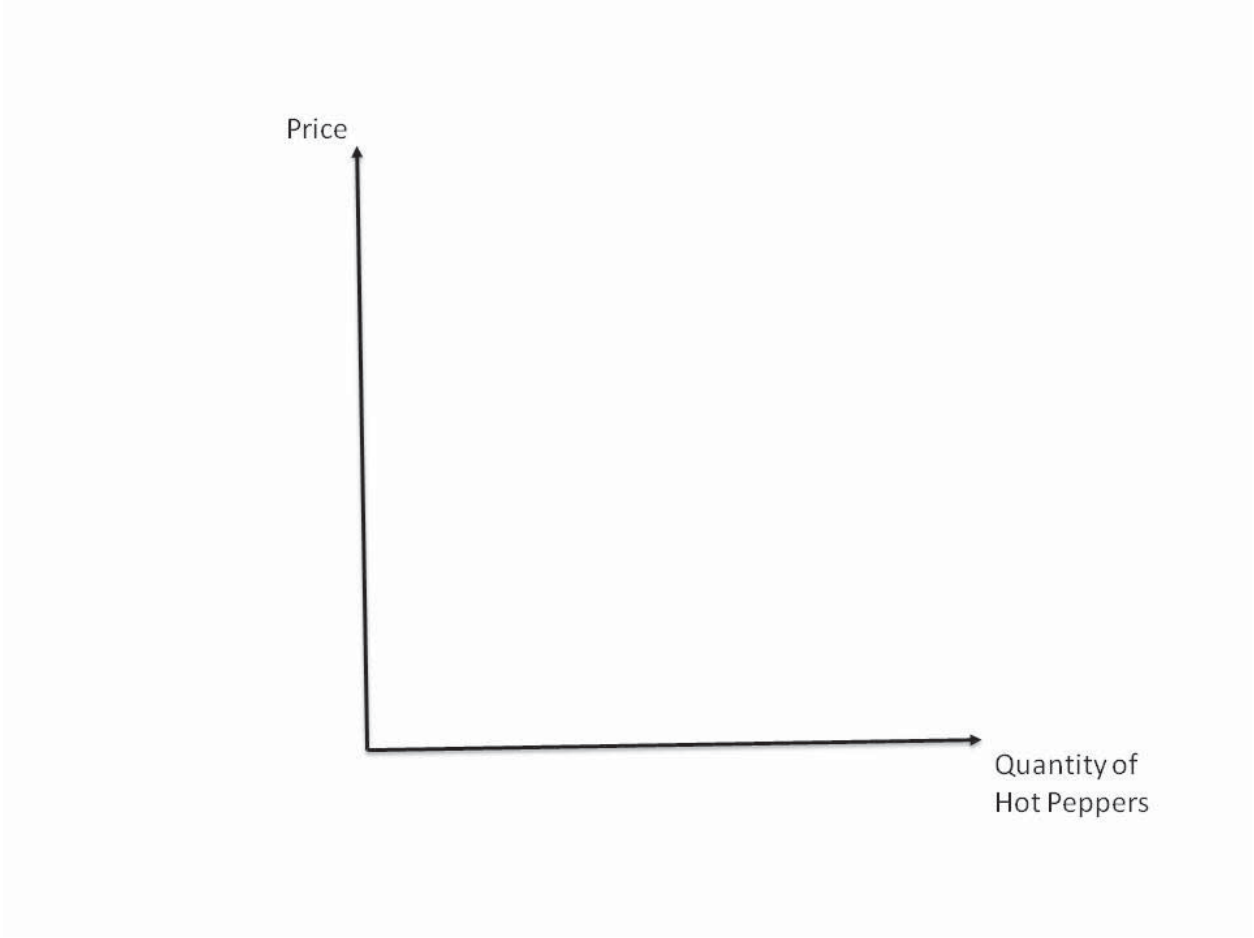
Annex B
PowerPoint Presentation for the Mbale IPM CRSP Workshop
22/06/10

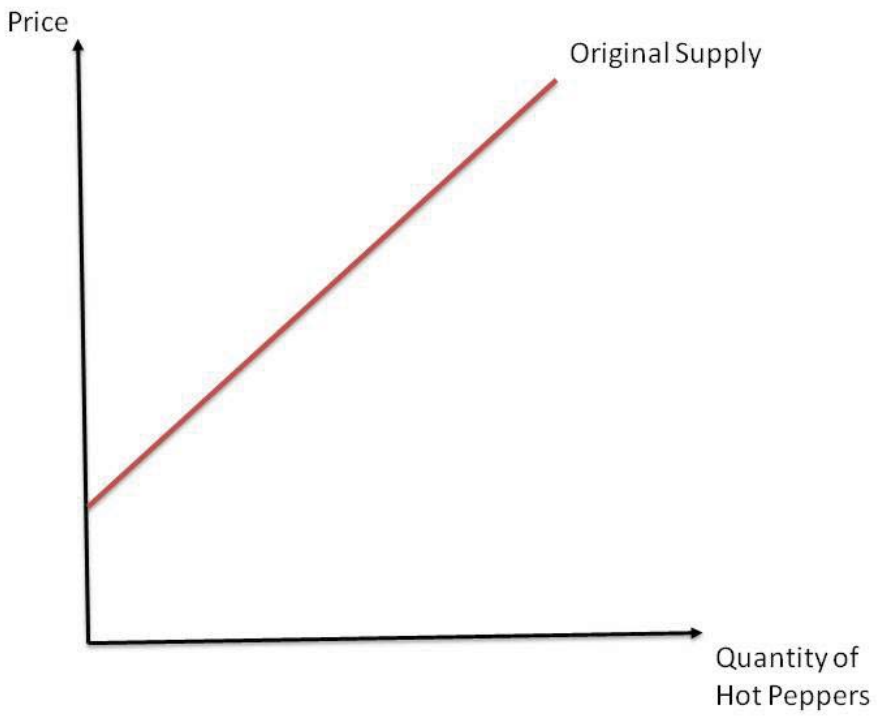
Impact Assessment Overview: Example of Changes in Producer Surplus Only Hot Peppers in Uganda

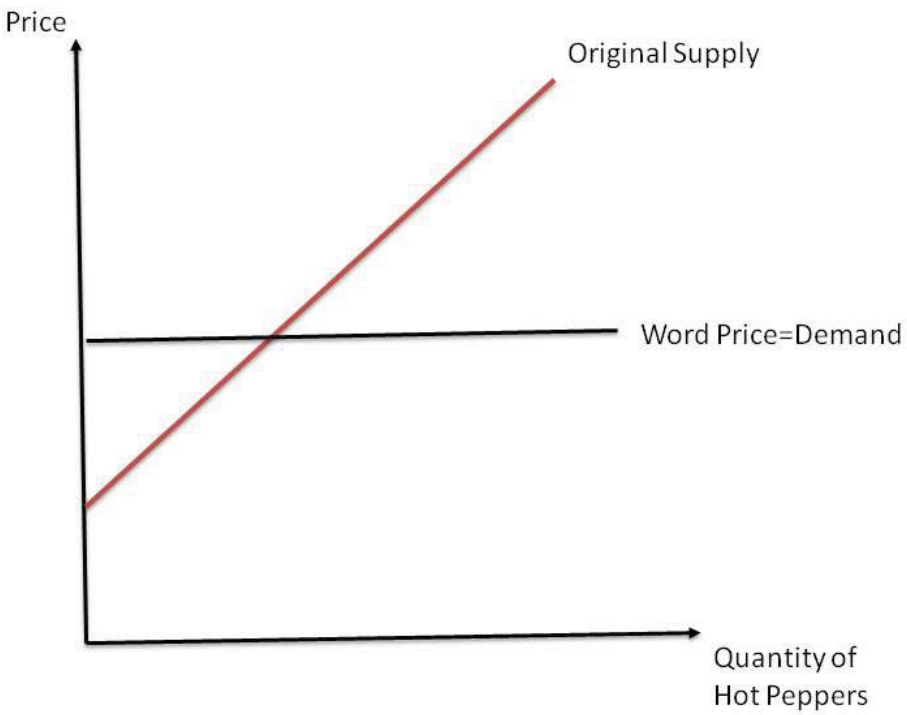
Daniel B. Taylor
Department of Agricultural and Applied Economics
Virginia Tech
IPM CRSP Workshop
Mbale,Uganda
22/06/10

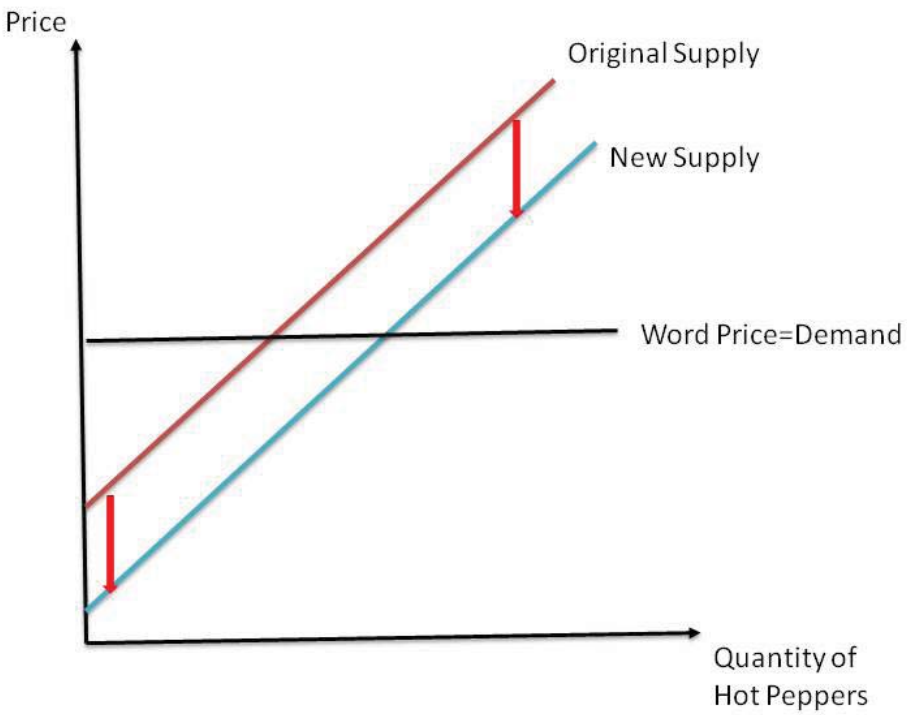
Regional Impact Assessment Workshop Next Year

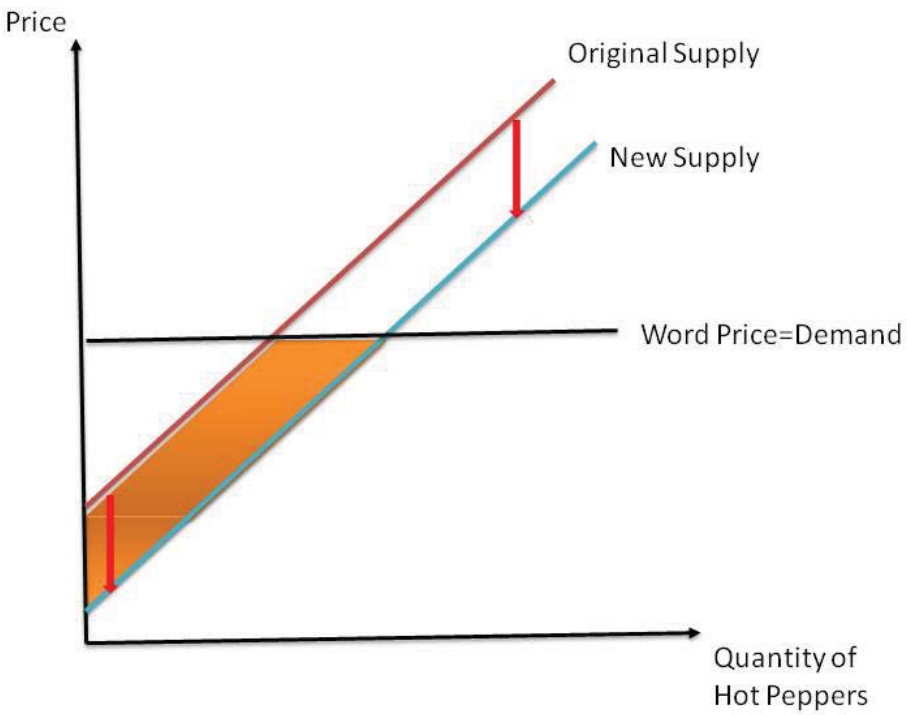
- George Norton – heading the impact assessment global theme
- Will give the workshop next year – need to schedule soon
- Key participants are those practitioners who will be conducing analyses
- Framework being suggested for all IPM CRSP technology packages
- I have been asked to give you an overview

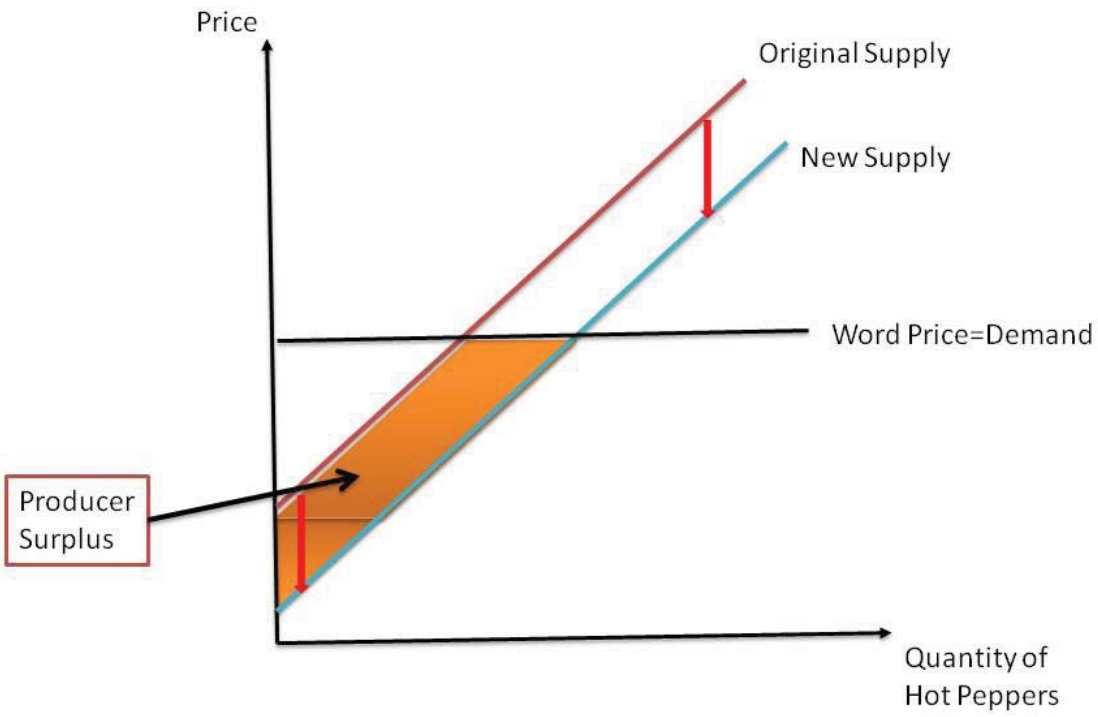

Price
Quantity of
Hot Peppers


Price
Original Supply
Quantity of
Hot Peppers


Price
Original Supply
Word Price=Demand
Quantity of
Hot Peppers


Price
Original Supply
New Supply
Word Price=Demand
Quantity of
Hot Peppers


Price
Original Supply
New Supply
Word Price=Demand
Quantity of
Hot Peppers

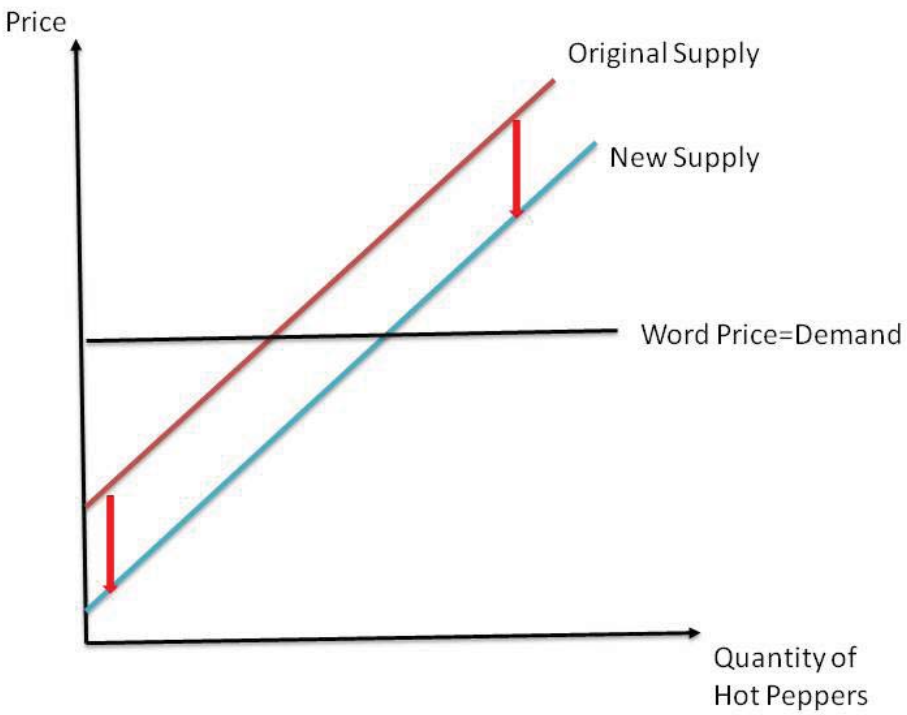

Price
Original Supply
New Supply
Word Price=Demand
Producer Surplus
Quantity of Hot Peppers

Calculate Changes in Surplus

- What causes the supply curve to shift?
- Bottom line is that it is changes in per unit cost of production
- This example looked at a decrease in per unit cost of production (cost per box of hot peppers)
- Per unit cost decrease may be due to:
  - Increase in output with same costs
  - Decrease in costs with same output
  - Some combination of cost and output changes

So Your Projects Need to Collect Production Costs to Estimate Supply Changes

- Role of the economist on your team
- Most important are changes in costs due to changes from current farmer practices
- A little more complicated – thus the need for a workshop next year:
  - Research costs over time
  - Rate of adoption over time
  - Rate of technological decay over time
  - Supply and demand curves
- Goal of Impact Assessment Global Theme is to streamline this process


Price
Original Supply
New Supply
Word Price=Demand
Quantity of
Hot Peppers

Data Collection Example from George Norton: Common Costs

IPM-CRSP
Enterprise (crop) Budget for year _____

Farmer's Name: _____ **Location:** _____ **District:** _____
Experiment: _____
Crop: _____ **Year:** _____ **Season:** _____
Plot Area: _____ **Date of Sowing:** _____ **Date of 1st Harvest:** _____

Table 1. Breakdown of *common costs* into constituents elements

Cost Items	Quantity/ha	Unit Cost (Tk)	Cost (Tk/ha)
1. Land Preparation			
Draft Power			
Power Tiller			
Labour			
2. Seeding			
Seedling			
Labour			
3. Irrigation			
Cost for water			
Labour			
4. Manures			
Cowdung			
Labour			
5. Fertilizer			
Urea			
Product 1			
Product 2			
Labour			
6. Pesticides			
Product			
Labour			
7. Weeding			
Labour			
8. Harvesting			
Labour			
		Total fixed cost =	

Data Collection Example from George Norton: Treatment Costs

Table 2. Breakdown of *variable costs* into constituents elements

Cost Items	Quantity/ha	Unit Cost (Tk)	Cost (Tk/ha)
T_1 –			
Cowdung			
Fertilizers			
Insecticides			
Labour			
T_2 –			
Cowdung			
Fertilizers			
Insecticides			
Labour			
T_3 –			
Cowdung			
Fertilizers			
Insecticides			
Labour			
T_4 –			
Cowdung			
Fertilizers			
Insecticides			
Labour			
T_5 –	-	-	-
Cowdung	-	-	-
Fertilizers			
Insecticides			
Labour			
T_6 –	-	-	-
Cowdung	-	-	-
Fertilizers			
Insecticides			
Labour			

Table 3. Income from different treatments

Treatment	Plot Size (sq.m.)	Yield (ton/ha)	Price (Tk/kg)	Total Income (Tk/ha)
T_1				
T_2				
T_3				
T_4				
T_5				
T_6				

Questions?

Annex C
List of Mbale Workshop Participants

Phase Four IPM CRSP Regional Program 2009-2014

First Partners Planning & Review Meeting
Mbale, Uganda, June 20-23, 2010

Attendance List (Day 1)

	Name	Address	Tel no.	Email	Signature
1	Mtui H.D	3005, Morogoro-TZ	+255 767135560	mtuihosea@yahoo.com	
2	Jeninah Karungi	7062-MUK	+256 712 804179	jkarungi@agric.mak.ac.ug	
3	Ruth Amata	14733, 00800-NBO	+254 733420330, +254 727624471	Amata_ruth@yahoo.com	
4	Mildred Ssemakula	7062-MUK	+256 751592061	mknossemakula@agric.mak.ac.ug	
5	Jackline Bonabana	7062-MUK	+256 774899799	jbonabana@agric.mka.c.ug	
6	G. Tusiime	7062-MUK	+256 772674873	gtusiime@agric.mak.ac.ug	
7	Mary Rwakaikara	7062-MUK	+256 777238128	marysilv@agric.mak.ac.ug	
8	Dan Taylor	Virginia Tech	+15402315032	taylord@vt.edu	
9	Maria Elisa Christie	Virginia Tech		mechristie@vt.edu	
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Phase Four IPM CRSP Regional Program 2009-2014
First Partners Planning & Review Meeting
Mbale, Uganda, June 20-23, 2010

Attendance List (Day 2)

	Name	Address	Tel no.	Email	Signature
1	Mtui H.D	3005, Morogoro-TZ	+255 767135560	mtuihosea@yahoo.com	
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Annex D – Minutes from the Regional Planning Workshop in Mbale

Minutes/report of the IPM CSRP regional planning meeting held at the Mbale Resort Hotel June 20-23 2010

Participants

Prof. S. Kyamanywa	Regional Coordinator, Makerere University
Dr. M. Erbaugh	Site Chair, Ohio State University
Prof. Dan Taylor	Virginia Tech
Dr. Maria Elisa Christie	Virginia Tech
Dr Monicah Waiganjo	Country Coordinator Kenya (KARI)
Dr Ruth Amata	KARI
Mr. Hosea Mtui	Sokoine University of Agric. TZ
Dr. Robina Namirembe Ssonko	Mak
Dr Mary Silver Rwakikara	Mak.
Dr. Geoffrey Tusiime	Mak
Dr. Mildred Ochwo-Ssemakula	Mak
Dr. J. Bonabana-Wabbi	Mak
Dr. J. Karungi	Country Coordinator Uganda, Mak.
Mr. Patrick Kucel	NARO
Ms. Rosemary Emegu	Mak.
Mr. Didas Asiimwe	Mak.

Day 1 June 21, 2010

Session I

Meeting called to order 8.55am

An opening prayer was given by Dr. Monica Waiganjo

Opening Remarks from the Session Chair, Prof. Kyamanywa

- The Regional Coordinator informed members that this was a technical committee meeting to assess progress on Year I activities and develop Year II work plans which are needed by July 15; in addition an annual report was also due by October 15.
- He also reiterated his happiness and pride in the regional collaboration especially during the Technical Committees.

Remarks from the Site Chair, Dr. Erbaugh

- Dr Erbaugh started by pointing out the fact that Phase IV of IPM CRSP is in its initial year and like any project start-up there are some issues that need to be sorted out. So Year 1 was more like a transition year.
- He said that the purpose of meetings was to:
  - build on the regional model of collaborative IPM research
  - think about monitoring/performance indicators
  - integrate Impact Assessment and Gender Knowledge global themes
  - Assess progress on Year I activities
  - Develop work plans for Year II
- He indicated that there were similarities between IPM CRSP Phase IV and the previous phases citing that the countries are the same, the crops are the same with a few exceptions, the focus remains on developing IPM systems for marketed, higher value horticultural crops and looking for alternatives to chemical pesticides, there is still a need to work with Global themes, and the partners are basically the same.
- The differences between Phase IV and the previous phases are that onions have been taken on as a new crop; there is greater emphasis on on-farm technologies/training/transfer, on assessing impacts, and working with the Global themes and the peculiarities of how they are funded.
- Dr Erbaugh presented the three objectives of the Regional IPM CRSP program: i) to continue building a regional model of collaborative IPM research, ii) implement participatory ecologically based IPM, and iii) institute innovative technology transfer approaches.
- He informed the meeting about the progress for Year 1 that included: a kick off meeting in December 2009 in Uganda; establishment of a Web Portal – Scholar – a data storage system that is managed by Prof. Taylor. (Side comment: Participants were encouraged to provide documents to Prof. Taylor to be included on the Portal; pursuing the implementation of the Year 1 work plans; progress in integration of global themes; planning and implementation of training programs including a two-day grafting and high tunnel workshop in KARI Thika (with 44 attendees: 26 men-18 women); 3 papers having been accepted in Journals and a notice in the USAID fact sheet (2/10/2009) - about tomato increasing incomes in Uganda; and the PhD student Miriam Otipa being at Ohio State University for 9 months.
- He stated what needs to be worked on and implemented –Year II work plans; activity assessment forms; performance monitoring and indicators forms and activity reporting form; and integrating global themes into all work plans. Templates for these forms are in the provided documents. If there are students on the project, training plans should be included in activity plans.

Matters arising from the remarks

Qn: The money for the global themes come from the Regional programme, what funds will be contributed by the global themes themselves?

Answer - The only funds contributed are for training one graduate student and for travel for some limited travel by Global Theme PI's.

Qn: What is "innovative technology transfer"?

Answer – this includes such strategies as working with women groups; working with groups that are demanding particular interventions (e.g. the Namulonge organic farmers group, linking tomato farmers to markets etc)

Qn: Is it possible to link the IPM CRSP Portal to the Makerere Website?
Answer – this can be done. So far, there are big gaps in receiving documents to put on the portal. Meeting reports, documentaries (video clips) should all be put on the portal.

Qn: For the no cost extension – how will it be reported?
Answer – should be include in the progress report of 01 Oct 2009 – 30 Sept 2010.

Session II

Discussions on presentations of overviews of Country Programmes

Kenya: Presented by Dr. Waiganjo
Issue - Lack of regional integration with the IPDL global theme coordinator- The country Coordinator for Kenya where the IPDL is housed told the meeting that Dr Kinyua had received first instalment of funds allocated and a work plan was expected.
Qn: Uganda had a list of IPDL activities - Who will be funding these activities?
Answer: Some of the Uganda IPDN activities are funded under the AFSI project and some additional regional activities through the IPDL Global Theme.

Tanzania: presented by Mr Mtui
Issue – Has a socio-economic scientist been contacted to work on impact assessment?
Answer: It was agreed that Prof. Kyamanywa takes up the issue with the Tanzania Coordinator, Prof. Maerere who was not present to comment.
Issue – Integration of IA and GK during the survey - they were also advised to use the already developed instrument of Tomato as a template for the survey on onions. The meeting agreed that the proposed activities for coffee and onions look very good if followed through upon.

Uganda: presented by Dr Karungi
Members made the following comments:

- List of visitors should go back to October 2009 and include Prof. Richard Pratt's and DR. Kraybill's visit
- Rosemary Emegu should be added on the graduate students' list.
- Ronald Ndawula should be included on the list of undergraduate students attached on the project Field
- The just concluded Gender Workshop should also be included
- Uganda should be cautious about involvement with CABI – ensure that a memorandum of understanding is in place before progressing with them.
- On the issue of the Twig borer, there was concern that we have always worked with Arabica coffee yet the pest is a problem of Robusta! The Uganda team defended the decision as the pest was seen as an emerging threat where there would be great impact. Was there anybody else putting in money in managing the twig borer as we are already too stretched budget-wise? – The Uganda Coffee Development Authority was putting in a little bit of money.

Discussions on presentations on progress status of specific crop activities

Tomato: Kenya

Members from Uganda wanted information on the dimensions of the tunnel screen house that is being promoted for tomato production. How big is the tunnel in area and cost?
The tunnel is 8m x15m and cost around 15,000KSh

Passion fruit: Kenya
Qn: What will constitute an IPM package?
Evaluating the passion fruit lines on-farm; also the bio-control for the disease.

Meeting AGREED that an instrument to capture Farmers evaluations should be developed and circulated to members for comments

Qn: Can Uganda access the tolerant passion fruit lines and the Trichoderma?
Possible as long as the permits are in place.

For Trichoderma – Uganda has to lodge a request to the commissioner Plant Protection Agency for research to bring in the bio-control. Another option would be for Uganda to bio-prospect i.e., screen their own. With proper training, farmers can make their own Trichoderma, e.g. in Indonesia where women are multiplying Tricoderma for sell. Moreover, Kasese farmers have already asked for it.

Tomato: Uganda
Qn: Will the system of testing for biovars enough to allow for variety release?
Prof. Rubaihayo the main Supervisor had indicated that this could work.
Meeting AGREED that this is something that needs to be checked and acted upon.
Targeted multi-location trials could be the way to go in case of variation in the trial with biovars.

Qn: What about plans for transferring the developed IPM packages?
Will include this activity in the work plan for year II

A challenge was extended to the tomato team to publish data on the IPM package so that there is evidence that what is being promoted is not only hear-say.
The meeting AGREED that publishing the paper should be included in the Year II work plan.

Qn: Reduce spray for control of the Bollworm – what's new?
Focus here is on natural enemies

Hot pepper: Uganda
The meeting ADVISED that the baseline in Kasese should be done very soon taking into account Dr Kraybill's issues with the methodology; and that Kasese would be a good place to introduce high tunnels.

Passion fruit: Uganda
Did the desertion by the MSc students delay the commencement of the research? *– yes,- Issues with the new student have been discussed and the student has been counselled thoroughly so no more problems expected*

Qn: Any complementarity between Kenya and Uganda in passion fruit research?
Can try out the Trichoderma and passion lines on the Uganda side too.

Coffee: Uganda

Qn: Why aren't we looking at the impact of our IPM packages on diseases too?
It is not easy but we need to see how to best to target both processes.

Meeting AGREED that the Posters on Coffee be given Erbaugh to publish.

Session III

Field Excursion to Bugusege Mt. Elgon region to visit on-farm trials and interact with coffee farmers.

Visited two on-farm sites where IPM packages for coffee are being demonstrated after which there was a session with farmers (List of farmers below)

Joyce Wanyala (F)
Mr. Wanzala (M)
Harriet Kadoli (F)
Florence Madoli (F)
Makwasi Nathan (M)
Peninah Kimone (F)
Bart Napaki (M)
David Kimuga (M)
Margaret Kidudu(F)
Maama Jaja (F)
Lydia Mugoya (F)
Anna Kidula (F)
Daisy Namukasa (F)
Beatrice Nanduli (F)

Discussion
Prof. Kyamanywa started off the discussion by telling the farmers that the main aim of our coming to work with the farmers in the Mt Elgon region was to promote coffee growing esp. fighting pests and diseases of coffee so that we are able to chase poverty from homes through increased income from coffee. He opened up the discussion by allowing the visiting scientists to ask the farmers a few questions.

Question to farmers
What's the biggest problem on coffee?
- *Insect pests esp. stem borers that drill around the stem producing dust; also black scales*

- *Poor quality seedlings*
- *Soil nutrient depletion*

What are the roles of men and women in coffee production?
- *Weeding – predominantly by women*
- *Harvesting – men and women*
- *Pruning – predominantly men*
- *Sales – men*
- *Post harvest handling – predominantly by women*

Are there any changes that have occurred in recent years in the roles of men and women?
- *Yes, men are putting in more effort*

If coffee sales are good – do women benefit?
- *Yes – school fees for children*

Where do you sell coffee to?
- *To Cooperative Societies*

Do extension workers speak to both women and men?
- *Yes in groups*

The discussion was closed by Dr Erbaugh who thanked the farmers for their time, their welcome and discussion. He indicated that he will be back to see progress in improving coffee production.

Day two 22 June 2010

Discussion on Global themes

IPDN activities in Uganda (mainly funded under the AFSI project) – by Dr Ochwo

The team was thanked because of what they are doing in setting up a diagnostic centre. The team was ADVISED to market the diagnostic centre in Uganda as part of Year II activities.

Qn: How do we get the global themes to be regional themes?
It is not an easy thing to do but we have to address it.
Good that the IPDN in Uganda is helping us know the viruses of tomato. Kenya should also go along those lines. The meeting AGREED that IPDL regional work plan be developed and that Global theme coordinators should always attend the Regional technical committees.

Qn: Will the MSc student be able to achieve the objective of documenting all the tomato viruses?
Yes, as the methods he is using will do the job and he will have the facilities at OSU.

Impact Assessment Global theme – by Prof. Taylor and Dr Bonabana

Members were happy to note that the IA plan was sorting out the activities by crop and by country.

Qn: How do we work with global themes when we have more than one crop and three countries? Can Dr Norton bring in more money?
The meeting AGREED that Global themes should set priorities to ensure that the meagre resources are used to address the priorities as set by the Regional programme.

Qn: When do we look for the costs associated with our interventions? AGREED that a form be designed for the researchers to fill whenever they needed.

Qn: What is the way forward for Mubuku-Kasese?
What is needed now is a baseline study after which Tusiime has the go ahead to effect his trials

Gender Knowledge global theme
This theme was presented as a workshop by Dr Maria Elisa Christie who had requested it. The workshop included interactive sessions as well as presentations.

Discussion
The meeting appreciated the workshop; it was now clear what was required of members in terms of incorporating gender issues.

The meeting AGREED that Dr Mangheni (not present because of illness), the GK coordinator, compiles a four dimensions gender Assessment for IPM CRSP activities.

Qn: Wouldn't it be good that gender issues are developed at technology development stage?
Start where you are and use strategies to include women

The meeting ADVISED that because of meagre funds the IA and GK global themes should merge some of their activities to optimally utilise the funds

Annex E – Minuets from the Technical Committee Meeting in Mbale

Minutes of the regional technical committee planning meeting held on June 22, 2010 at Mbale Resort Hotel, Uganda

Members Present:

Prof. S. Kyamanywa
Dr. M. Erbaugh
Prof. D. Taylor
Dr. M. Waiganjo
Mr. H. Mtui
Dr. R. Amata
Dr. Maria Elisa Christie
Dr. J. Karungi

Absent with apology
Prof. A. Maerere and Dr. Mangeni (due to illness)

Agenda
Review of previous meeting minutes
Work plans and budgets for year II
Annual report for year I and no-cost extension
The Tanzania dilemma
Global themes integration

Minute 1. Matters arising from previous meetings
The minutes were reviewed and the following corrections and updates noted:

- Dr Maerere was absent with apology
- Dr. Peter Sseruwagi has been selected to do the coordination of the global theme on Plant Viruses and the PI is Prof. Sue Tolin, and the contact person is suppose to be Dr Diome.
- Setting Priorities for IA and GK global themes - changed priority from passion fruit to hot pepper but if resources allow, the passion fruit can be done; for Kenya – Baseline to be done on Onion; and passion fruit if funds allow; baseline on Tomato be done in TZ with Mwanjombe. There is data but the data was not fitted on the model. Efforts should be made to find out if Mwanjombe did any analysis. Dr Bonabana should design forms that will help in cost benefit analyses for individual technologies. Kenya was commended for always complying with this.
- Final Budgets - Uganda and Kenya did the budgeting as requested transparently. TZ yet to confirm on this process.
- Students at OSU - Rosemary Emegu – for Uganda (Socioeconomics); Menza proposed for Kenya and TZ gets an MSc slot
- Calendar of events - Meeting of TC was changed from Tanzania to Uganda; the IPDL/Plant Viruses workshop to be held in Year II; annual report meeting – there will be regional meeting if funds allow otherwise each country will hold its own.

Minute 2. Work plans for year II and budgets

- It was PASSED that work plans (including for Global themes) for year II be submitted to the Regional Coordinator by July 15 and to the Site Chair by 21. They have to be in Font 12 Times New Roman.
- The Chair will communicate budget limits to Country Coordinators
- Countries with students should provide information on training plans (see template) as a separate entity.

Minute 3. Annual reports

- A template has been provided for reporting regional programmes and another for global themes (GT). Ms. Ngina was INSTRUCTED to circulate the template to country coordinators and GT coordinators.
- Country coordinators will compile the reports and forward them to the Site Chair by Oct 01, so the Regional office should be have them by Sept. 15. Reminders should be sent out in the first week of August.
- Decision to convene a report writing meeting will depend on availability of funds, the status will be communicated by July 15. If money is available dates and venue will be communicated then.
- Members argued to encourage their teams to use the portal (documentaries, brochures etc).

Minute 4. Tanzania dilemma

The meeting NOTED that the following:

- There were several changes in the contact person for the Socio-econ work
- A need for multi disciplinarity in the TZ team
- TZ was not represented in the Gender Workshop

The meeting AGREED that the Regional Coordinator should communicate with the country coordinator regarding the above concerns and copy the communications to the Site Chair. The Site chair and the Regional Coordinator were ADVISED to visit the site.

Minute 5. Global Themes integration

The meeting PASSED that:

- Coordinators of GT become members of the TC
- Budgets for GTs for the region be prioritised for the region

On the issue of Coordination of the Virus global theme – it was Noted that:

- Dr. Sseruwagi has agreed to lead
- He needs to read the proposal and develop a work plan
- Liaise with the IPDL global theme to integrate some activities
- Site chair should bring PI for the Viruses global theme to visit the site.

AOB

The meeting PASSED that whenever funds ate disbursed, an ARF (activity reporting form) be issues as well to be filled and returned accordingly for each activity.

Annex F
Mpigi Hot Pepper Survey

BIOLOGICAL AND PRODUCTION BASELINE SURVEY OF PEPPER (SCOTCH BONNET) PRODUCTION IN MPIGI DISTRICT

Enumerator: Introduce yourself and explain the purpose of this survey, which is to collect information on the prevalence of insect pests and diseases affecting pepper, current pest and disease control measures, enterprise characteristics, operational constraints, and the current application level of the code of conduct. Please explain that the information solicited is for research purposes only.

1. Basic data

Date form filled (dd/mm/yyyy) ☐☐ ☐☐ ☐☐☐☐

Name of enumerator …….

District …….
County …….
Sub-county……..
Parish ……..
Village/LCI ……..

2. Respondent's personal data:

a) Respondent's name ……..
b) Sex of respondent: 1. Male……...
2. Female ……..

c) Are you the head of household? Yes___ No___
d) If no, relationship to head of household?
Wife ___oldest son___ Other (specify)_____

e) Number of persons in household (including respondent)?_____

f) Age of respondent _____

g) Respondent's occupation:

What does the respondent consider to be his/her main occupation? *(Tick one)*	1. Farmer 2. Farm labor service 3. Non-farm casual service 4. Private service 5. Business 6. Government service	7. Artisan 8. Student 9. Housewife 10. Unemployed 11. Other (*specify*)

h) How many years of formal education have you completed? …….

i) Highest level of education of respondent:

___ None ___Technical
___ Primary ___ College/University
___Secondary ___ Other
___High School

3. Land details

a) Total land owned ……acres

b) Land rented from others……...acres

c) Total farm area ……acres
(Food crops and agro-forestry)

d) Total land area under pepper production (2003A) …… acres.
(2003B) …… acres.

e) Is the land under pepper production:
Owned: _____acres
Rented: _____acres

f) If the land is rented, what is the cost per growing season?_____Ugsh/acre

4. Labor

a) How many laborers do you employ to assist in the following farming activities (related to pepper production) and how much do you pay them?

Activity	**No. of people X no. of days**	**Cost/day/person or Cost/acre**
Nursery bed preparation & sowing		
Land preparation		
Transplanting/direct seeding		
Mulching		
Weeding		
Spraying		
Watering		
Harvesting		

5. Inputs used

a) Do you use any of these farm inputs with peppers, and if so, what is their source and unit cost?

Input	**Yes, No**	**Source**	**Quantity/season**	**Unit cost**
Seed				
Fertilizers (inorganic)				
Compost				
Farm manure				

b) Do you own a backpack sprayer? Yes___ No ___

c) Do you transplant seedlings or direct seed? _____

d) Do you irrigate your pepper?
Yes …….
No ……..

e) If yes, what is the source of the water used? ……
(Source: borehole, well, river/stream, pond, lake, collect rainwater, etc.)

f) How do you apply the water (application method)? ……

g) How far is the water source from where the peppers are grown?_____

6. Output

a) Scotch Bennet output for the 2003A and 2003B growing seasons:

	2003 A	2003 B
Date planted in field		
Date harvested		
Kgs harvested		
Kgs sold		
Price per Kgs		

b) Where do you sell your peppers?_____

c) Have you ever had your peppers rejected for sale? Yes____ No____

d) If yes, what reasons were given for rejection?_____

7. Management experience

a) How many years have you been actively involved in farming? …….

b) How many years have you been growing pepper? …….

c) Do you keep records of your farming activities?
Yes …….
No ……..

d) What has been your main source of advice on pepper growing and management?
1. ……..
2. ……..
3. ……..

e) How many times in the past year have you participated in a meeting or demonstration on how to grow/manage peppers?_____

f) Do you label your packaging with the farm's location information to ensure traceability?
Yes ……..
No ……

8. Knowledge of Insect Pests and Diseases:

a) Mention the names of the four (4) most important insect pests, diseases, and weeds that damage your pepper (*ask if there is a local name for the each of the pests mentioned*)

Insect pests	
1.	
2.	
3.	
4.	
Diseases	
1.	
2.	
3.	
4.	
Weeds	
1.	
2.	
3.	
4.	

b) Of those mentioned, rank the three most important:

Problem	**Rank**

9. Pest Control practices

a) Do you use any of these types of pesticides to control pests of pepper? If yes, name them:

Type of pesticide	**Name of pesticide**	**Number of times applied/season**	**Quantity purchased each season**
Insecticides			
Fungicides			
Herbicides			

b) If you use any of the above pesticide types, do you record the:

	Yes	No
Application location		
Date of application		
Pesticide product trade name		
Operator name		

c) When do you decide to spray the pesticide?

1. Follow a calendar program (please describe) _____

2. After scouting and have observed the pest on the farm _____

e) From your experience, are there any negative/harmful effects of using pesticides?
Yes……. No …….

f) If yes, list the negative effects:

1. ……
2. .....
3. ……
4. ……
5. ……

10. Knowledge of pesticide handling and storage

Activity	SA	A	D	SD
Do you read labels on the pesticide container before using?				
Do you wear protective clothing and other accessories like nasal mask, eye goggles, and boots when applying the pesticides?				
Do you mix pesticides with your hands?				
Do you observe the pre-harvest waiting periods after applying the pesticides?				
After spraying, do you wait 12 hours before entering the field?				
Do you store pesticides out of reach of children?				
Do you store pesticides in a secure, sound and well ventilated location				
Do you make a cocktail before applying the pesticides? (*i.e., mix more than one chemical and apply them at once?)*				

(SA = Strongly agree, A = Agree, D = Disagree, SD = Strongly disagree)

b) Do you know of any beneficial insects? Yes……. No …….

c) If yes, name them:
i) _____
ii) _____
iii)_____
iv)_____

d) Do you find that pesticide application is affecting the health of:

	SA	A	D	SD
Persons regularly applying pesticides				
Persons working in fields sprayed with pesticides				
Persons harvesting the produce				

e) From your experience, are you aware of other methods for controlling insect pests diseases and/or weeds besides pesticides?
Yes…….. No ……

f) If yes, describe these practices:
i) _____

ii) _____

iii) _____

iv) _____

11. Farm workers' welfare

	SA	A	D	SD
Are you and your workers aware of farm accidents and emergency procedures?				
Do you have a first aid box with the necessary medications and equipment on your farm?				
During harvesting, do you provide gloves to the workers of they use their bare hands?				
Do you and your workers receive regular training on good agricultural pepper production techniques?				

a) What technical information do you think you need for improving your pepper production and/or marketing?

b) Have you ever received any training on any of the following topics related to pepper production:

	Yes	No	No. of times/past yr.
Integrated Pest Management			
Pesticide Usage			
Pesticide Safety			
Insect Identification			
Disease Identification			
Quality aspects of peppers			

Thank you for your time !

Annex G
Kasese Hot Pepper Questionnaire for Pretesting

SOCIO ECONOMIC, BIOLOGICAL AND PRODUCTION BASELINE SURVEY OF PEPPER (SCOTCH BONNET) IN KASESE DISTRICT

Enumerator: Introduce yourself and explain the purpose of this survey, which is to collect baseline information on the socio economic characteristics, production, and prevalence of insect pests and diseases affecting pepper, current pest and disease control measures, enterprise characteristics, operational constraints, and the current application level of the code of practices. Please explain that the information solicited is for research purposes only.

Name of enumerator …….
Questionnaire number……..

1. Basic respondent data

Date form filled (dd/mm/yyyy) ☐☐ ☐☐ ☐☐☐☐

County …….
Sub-county……..
Parish ……..
Village/LCI/Cell ……..

2. Respondent's personal data:

a) Respondent's name (optional)……..
b) Sex of respondent: 1. Male……...
2. Female ……..

c) Are you the head of household? 1. Yes___ 2. No___
d) If no, relationship to head of household?
1. Wife ___2. Husband _____ 3. Oldest son___ 4. Oldest daughter___
5. Other (specify)_____

e) Respondent's occupation:

What does the respondent consider to be his/her main occupation? *(Tick one)*	1. Farmer 2. Farm labor service 3. Non-farm casual service 4. Private service 5. Business 6. Government service	7. Artisan 8. Student 9. Housewife 10. Unemployed 11. Other (*specify*)_____

f) How many years of formal education have you completed? …….

g) Can you read and understand English? 1.Yes_____2. No_____

h) Number of years of schooling by members of the household, list respondent first

Name of household member	gender	Age	Number of years of schooling

3. Land details

a) Total land owned ……acres

b) Land rented from others……...acres

c) Total farm area ……acres
(Food crops and agro-forestry)

d) Do you currently grow pepper? 1. Yes ____ 2. No_____ **if Yes, go to 3. F anf if no go to 3.e)**

e) When was the last time you grew pepper
1. Before 2004___ 2. 2004____ 3. 2005___ 4. 2006 ___ 5. 2007____ 6. 2008_____7. 2009____

f) Total land area under pepper production the last season or at that time …… acres.

g) How much of the pepper land is / was:
Owned: _____acres
Rented: _____acres

h) If the land is/was rented for pepper production what is/was the rental cost per growing season?_____Ugsh/acre

i) List the 3 most important crops grown on your farm.

j) What is the position of hot pepper in the ranking?

k) Does the husband and wife have separate gardens? 1. Yes_____2. No_____
(skip table) If yes, specify which crops are owned by the husband/wife; main purpose of production; Indicate acreage of the key crops last season.

Crop grown by:	Rank	Main purpose 1. Food 2. Cash	Acreage (in acres)
Husband:			
1.			
2.			
3.			
Wife:			
1.			
2.			
3.			

m) In this household, hot pepper is considered to be?
1. The husband's crop_____
2. The wife's crop_____
3. Others (specify)_____

n) Did the farmer plant on a flat land or ridges in the last season? 1. Yes_____ 2. No_____
o) Does the farmer have access to credit? 1. Yes_____2. No_____
p) If yes, what are the sources of credit
1. Bank_____
2. MFI_____
3. Relatives and friends_____
4. Farmers organization _____
5. Others (specify) _____

4. Labor

a) What type of labor do you use in hot pepper production?
1. Hired only ____
2. Family labor only _____
3. Both hired and family labor _____

b) How many laborers do/ did you use to assist in the following farming activities last season(related to pepper production) and how much do/did you pay them?

Activity	**Total number of hired labour used**	**Number of days**	**Cost (units specify)**	**Gender of person who did most of the work, M=men, W= women, C= Children**
Bush clearing				
1st tillage				
2nd tillage				

Nursery bed preparation				
sowing				
Land preparation				
Transplanting/direct seeding				
Mulching				
Weeding				
Spraying				
Irrigating				
Harvesting				
Selling/Marketing				

c) Which family members are most involved in the following hot pepper production activities?

Activity	**Total number of family labour used**	**Number of days**	**Gender of person who did most of the work, M=men, W= women, C= Children**
Bush clearing			
1st tillage			
2nd tillage			
Nursery bed preparation			
Sowing on the nursery bed			
Transplanting/direct seeding			
Mulching			
Weeding			
Spraying			
Irrigating			
Harvesting			
Selling/Marketing			

d) Who within the household makes decisions regarding each of these for pepper production?

Decision	**Mainly husband/(Man)**	**Mainly Wife/ (Woman)**	**Both**
1. Acreage to be planted			
2. Labour inputs			
3. Purchase of inputs			
4. When to harvest			
5. Use of revenue from pepper production			

5. Inputs used

a) Other than pesticides. Do/Did you use any of these farm inputs with peppers, and if so, what is/was their source and unit cost?

Input	**1. Yes 2. No**	**Source: 1. Own seed 2. Market 3. Farmers association 4. Others(specify) _____**	**Quantity: kilos**	**Unit cost/ kg**
Seed				
Seedling				
Fertilizers (inorganic)				
Compost				
Farm manure				
Pesticides				
Other (specify)				
Other (specify)				

b) Do/Did you use a backpack sprayer? 1. Yes___ 2. No ___If yes, tick whichever is applicable below
Do/ Did you own it _____
Do you borrow it _____
Do/Did you rent it _____ If yes, how much was the cost for renting _____

c) If you purchased your application as a package, how much did it cost per application and how many times?
How much_____
How many times_____

d) Do/Did you irrigate your pepper?
1. Yes …….
2. No ……..
e) If yes, how often do you irrigate it?
_____Per week
_____Per month

f) How long do you irrigate?
_____hrs per week
_____hrs per month

g) List any irrigation constraints that you face? (Rank them in order of importance)
1…….
2…….
3…….
4…….

6. Output

a) Scotch Bonnet output for the most recent season or by the time you abandoned growing it.

Number of boxes	**Most recent season**	**When pepper was last grown**
Total boxes harvested and weight of each box		
Total boxes sold		
Average Price per box		

b) Where/who do you usually sell your pepper to?_____

c) What is the distance to the regular point of sale? _____ Km/miles (Specify)

d) What means of transport do you mainly use to take hot pepper to the point of sale?_____

e) How much time does it take to move produce from the farm to the point of sale?_____

f) Have/Had you ever had your peppers rejected for sale? 1. Yes____2. No____

g) If yes, what reasons were given for rejection?
1…….
2…….
3…….
4……
h) Have your peppers been EUROGAP certified? 1. Yes_____ 2. No_____

i) How much does /did it cost you to be certified under EUROGAP……..UShs

If No, why not?……

j) List and rank any marketing constraints you face in order of importance
1…….
2…….
3…….
4…….
5…….

7. Management experience

a) How many years have you been actively involved in farming? ……(yrs)

b) How many years have/ had you been growing pepper? …….(yrs)

c) Record keeping

Do/Did you keep records of your	**Yes**	**No**

i) Production		
ii) Sales		
iii) Spraying		

d) What are/were your most important sources of advice on pepper growing and management? Rank them in order of importance.

Sources	Rank
1. _____	
2. _____	
3. _____	
4._____	

e) How many times in the past year have you participated in a meeting or demonstration on how to grow/manage peppers?_____

8. Knowledge of Insect Pests and Diseases:

a) Mention the names of the four (4) most important insect pests, diseases, and weeds that damage/d your pepper (*ask if there is a local name for the each of the pests mentioned*)

	Insect pests
1.	
2.	
3.	
4.	
	Diseases
1.	
2.	
3.	
4.	
	Weeds
1.	
2.	
3.	
4.	

b) Of those mentioned above, rank the three most important:

Problem	**Rank**

9. Pest Control practices

a) Do/Did you use any chemicals to control pests (weeds, insects, diseases) of pepper? 1. Yes__ 2. No__If yes, name them:

Name of pesticide	Name of pest to be controlled	Number of times applied last season	Quantity purchased last season (Specify unit)	Cost per unit

b) If you use/d any of the above pesticide types, do/did you record the:

	Yes	No
Application location		
Date of application		
Pesticide product trade name		
Operator name		

c) When (how) do you decide to spray the pesticide?

_____

_____

d) From your experience, are there any negative/harmful effects of using pesticides?
1. Yes……. 2. No ……

e) If yes, list the negative effects:
6. ……
7. .....
8. ……
9. ……
10. ……

10. Knowledge of pesticide handling and storage

Activity	SA	A	D	SD
You always read labels on the pesticide container before using				
You always wear protective clothing and other accessories like nasal mask, eye goggles, and boots when applying the pesticides				
You never mix pesticides with your hands				
You always observe the pre-harvest waiting periods after applying the pesticides				
After spraying, you always wait 12 hours before entering the field				
You always store pesticides out of reach of children				
You always store pesticides in a secure, sound and well ventilated location				

(SA = Strongly agree, A = Agree, D = Disagree, SD = Strongly disagree)

b) Where do you store pesticides and other agro chemicals (Tick all that apply)?
1. Kitchen _____
2. Food store _____
3. Bedrooms _____
4. Other (specify)_____ this question can be answered by observation since the interview will be conduced on the farm.

c) What do you do with the used pesticide containers (Tick all that apply)?
1. Keep them in the store _____
2. Reuse them _____
3. Throw them to the bush _____
4. Burn them _____

d) Do you know of any beneficial insects? 1. Yes……. 2. No …….

e) If yes, name them:
i) _____
ii) _____
iii)_____
iv)_____

f) State whether you strongly agree, agree, disagree or strongly disagree to the following statements.

You find that pesticide application is affecting the health of:	**SA**	**A**	**D**	**SD**
Persons regularly applying pesticides				
Persons working in fields sprayed with pesticides				
Persons harvesting the produce				
Children in your household				
Pregnant women in the household				

(SA = Strongly agree, A = Agree, D = Disagree, SD = Strongly disagree)

g) From your experience, are you aware of other methods for controlling insect pests diseases and/or weeds besides chemicals?
1. Yes…….. 2. No ……

h) If yes, describe these practices:
i) _____

iii) _____

iii) _____

iv) _____

11. Farm workers' welfare

	SA	**A**	**D**	**SD**

In case of accidental pesticide exposure, you know emergency treatment procedures				
In case of accidental pesticide exposure, your workers know emergency treatment procedures				
You have a first aid box with the necessary medications and equipment on your farm				
During pepper harvesting, you provide gloves to the workers				
You and your workers receive regular training on good agricultural pepper production techniques				

(SA = Strongly agree, A = Agree, D = Disagree, SD = Strongly disagree)

b) What technical information do you think you need for improving your pepper production and/or marketing? _____

_____

c) Have you ever received any training on any of the following topics related to pepper production:

	Yes	No	No. of times/past yr.
Integrated Pest Management			
Pesticide Usage			
Pesticide Safety			
Insect Identification			
Disease Identification			
Quality aspects of peppers			

12. Reasons for stopping to grow pepper

a) What were the major reasons for stopping to grow pepper (rank them)

Reasons	Rank
1……..	
2……..	
3……..	
4……..	
5……..	
6……..	

b) Assuming those problems are solved do you see yourself starting to grow peppers again? 1. Yes _____2. No_____if yes,

c) What would have to happen for you to start growing peppers again?

1. When you hear that those problems are solved _____
2. After you see from other farmers that those solutions work _____
3. Others

13. Income data

a) On what items do you spend the money earned from hot pepper?

Category	Tick all that apply	Rank (1=most important)
1. Children's scholastic expenses,		

2. Medical		
3. Food,		
4. Leisure		
5. I don't know how the money earned is spent.		

b) What are your main sources of income and how much on average do you get from it

Source of income	**Amount of income obtained per year**
1. Farming	
2. Non-farm casual service	
3. Private service	
4. Business	
5. Government service	
6. Other_____	

Thank you for your time !