Enhancing the Contribution of Tropical Root Crops to Development in African, Caribbean and Pacific States

A Training Programme for Early Career Tropical Root Crop Scientists in Proposal Writing, Research Methods and Intellectual Property Rights

MANUAL

2012
EU-ACP PROJECT STEERING COMMITTEE

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FORWARD

This manual forms part of the EU-ACP Project training programme which highlights the need for early career scientists\(^1\) in the Africa, Caribbean and the Pacific (ACP) region to increase their access to research funding to improve the effectiveness of TRC research and development. The aim of this project is to increase the:

1. Research capacity and enhance the potential of young career TRC scientists in ACP states;
2. Ability of TRC scientists to seek funding for research from international donors and national funding sources;
3. Levels of success of TRC scientists to attract regular donor funding due to their ability to write more attractive research proposals that place TRC as a priority to international donors;
4. Understanding of appropriate research methods that could be applied to derive useful knowledge and feed into proposals;
5. Writing ability and capacity to publish research findings in internationally-recognised journals;
6. Understanding of the link between TRC and the wider global issues of poverty alleviation, food security, human nutrition, improving farm incomes, enterprise development and links with climate change;
7. Levels of networking with eminent and world recognized TRC scientists and institutions to increase the impact and sustainability of useful findings for the benefit of TRC globally;
8. Levels of interaction with key rural and agricultural policymakers thereby improving the possibility of having high-level policy dialogues that could lead to significant actions to promote the merits of TRC.

\(^1\) A researcher who is new to the subject of root and tuber crops. We have not precisely defined the level of education but first degree level is appropriate. The inclusion of scientists with a diploma or those with a PhD is also useful.
In undertaking TRC research there is need for increased:

- Awareness of the importance of TRC in national food policy and global food supply;
- Research and development support by key donors, international agricultural research centres and national agricultural research centres;
- Research proposals with greater focus on defining research needs, the approach and method and the outcomes, particularly development impact;
- Peer reviews and greater refereeing of project proposals by eminent scientists;
- Mentoring of early career scientists within research and teaching institutions and a significant increase in networking globally;
- Dissemination of research findings through publication of useful results in refereed journals, electronic media and other outlets;
- Links with farmers, traders and processors for defining output-oriented research topics and with extension services and NGOs for dissemination of useful results to farmers and processors;
- Holding of targeted regional meetings and training programmes to promote knowledge, skills, capacity building, and creation of networks to improve impact and sustainability.

_Tropical root crops (TRC) tend to be under-researched. Furthermore, less money is generally allocated to TRC research compared to grain and legume crops. This project attempts to address these issues._
ACKNOWLEDGMENTS

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The Project Management Committee (PMC) members are acknowledged for putting together training programme as well as delivering the training nine times to early career scientists in several ACP states. We are also grateful to guest speakers and experts who further enriched the training courses with their master class presentations. We gratefully acknowledge the support of Associate Professor Mohammed Umar of the University of the South Pacific and Professor Abdul Halim of the University of Technology in Papua New Guinea who have supported the PMC in organising the courses in the Pacific region and have taken on roles as ISTRC Councillors for the Pacific.

CITATION

This is a working document, produced by the researchers working on this project. It is provided as ‘free access’. You are welcome to use the training material in whole or in part. In doing so please acknowledge the EU and the authors, as follows: ISTRC (2012) A Training Programme for Early Career Tropical Root Crop Scientists in Proposal Writing, Research Methods and Intellectual Property Rights: Training Manual. Natural Resources Institute, Chatham UK.

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Leadership and Aims of the EU-ACP Project

The Natural Resources Institute of the University of Greenwich, UK, in partnership with the Caribbean Agricultural and Development Institute (CARDI); the University of Agriculture, Abeokuta (UNAAB), Nigeria; the African Innovations Institute (AFRII), Uganda; the National Institute for Scientific and Industrial Research (NISIR), Zambia and the International Society of Tropical Root Crops (ISTRC) has been awarded funding from the European Union to implement a Science and Technology project for Enhancing the Contribution of Tropical Root Crops to Development in African, Caribbean and Pacific states.

The Project’s aim is to enhance the effectiveness of early career scientists working on tropical root crops (TRC) in African, Caribbean and Pacific (ACP) countries through training, master classes and mentoring. Eight training programmes will be run during the course of the project. The project commenced in November 2009 and will run until December 2012.

Training Objectives

The objectives of the training programme are to assist early career scientists working in tropical root and tuber crops to:
• Improve their ability and their capacity to win research funds from a number of key donors and research funding agencies;
• Improve their research capability so that the research results have greater credibility and have better chance of being accepted by peers;
• Improve the knowledge and understanding of intellectual property rights as they may apply to TRC;
• Improve the global view of the merits of TRC as important staple foods in meeting a large share world food needs
• ISTRC partnership strengthened for community of practice.

Style and Content of the Training Programme

The training programme comprises three key areas, divided into modules:
  Module 1: Writing research proposals (1.5 days)
  Module 2: Research methods (2 days)
  Module 3: Intellectual property rights (0.5 days).

In addition, there is a field information gathering exercise (0.5 days) and 3 master classes. The programme timetable is given on page 9 and 10.

The training is undertaken over five consecutive days by members of the project team. The training modules provide key ideas, examples, tips and lessons learnt from experienced scientists. These are not meant to be comprehensive nor replace academic courses on research proposal design, research methods and intellectual property. The modules are meant to provide practical advice, with the emphasis on what works, what doesn't work and why, to aid in developing research proposals and exploiting research results.

Each module includes a mix of lectures and interactive individual and group assignments. Each topic is introduced with a short PowerPoint presentation.
Each chapter in this manual relates to a presentation and gives full details of all aspects covered. Throughout the programme, examples are used to highlight key points, based on the personal experience of the presenters and related to tropical root and tuber research. The assignments are designed to address the main learning objectives as well as create an interactive atmosphere so that participants can discuss key issues and concerns. Active participation is encouraged. We hope this will be an opportunity for participants to learn techniques and ideas that are new, and to benefit from each other’s experience, particularly of problems encountered in research and solutions found.

Where appropriate, case studies are used to amplify particular points made in the text and lecture. The fieldwork exercise exposes participants to particular research issues and to enable them to ascertain key issues affecting the roots and tuber sector in Africa, the Caribbean and the Pacific as appropriate.

A list of references and further reading is also provided so that the participants can undertake follow-up study.

To support the three training modules on the above subjects, three master classes by distinguished researchers and post-training mentoring are included. Each programme participant will be linked to an in-country mentor with whom they will be invited to contact via email for post-training follow-up.

In-country peer research networks are also envisaged to provide peer support to members as they work on real issues from their place of work and in integrating theory and practice. This provides a way of helping programme participants to link what they have learned to how they will apply the material in practice. These networks will work within one country or region but as the project progresses it is anticipated that networks in one participating country will be linked to those in
another so that international networks will develop. Increasingly, international research calls require a consortium of research organisations, both from within a region or internationally. The development of ACP peer research networks will assist early career researchers to develop and strengthen these relationships. The development of the project website and an ISTRC Facebook page is further designed to encourage this interaction (see chapter 10 for details).

At the start of the training programme, each participant is requested to complete a **pre-workshop questionnaire**, which will help provide an indication of the participant’s knowledge and experience. This will guide the teaching presentations and formation of peer research groups. An **evaluation questionnaire** is handed out for completion at the end of the training programme to provide quantitative and qualitative feedback which is used in upgrading future courses. A professional development contract, a contract that a participant makes with him/herself, is given in appendix 5.

**Programme Learning Outcomes**

Learning outcomes convey to the participant what is expected of them and what they will be able to apply from following the programme. On completion you [the participant] will be able to:

- Initiate and plan research proposals for a variety of funding schemes;
- Demonstrate awareness of key requirements for submitting a successful proposal;
- Apply appropriate data collection and analytical measures for interpreting the results from research;
- Evaluate opportunities for exploiting research results;
- Operate as an effective member of a research network.
Introduction to the Trainers

**Francis Ouruma Alacho** (Agronomist). Country Manager with the Africa Innovations Institute (AFRII) for the Cassava: Adding Value for Africa project in Uganda funded by the Bill and Melinda Gates Foundation. 18 years’ experience working with agricultural research mainly in roots and tuber crops, maize, rice and groundnuts. In addition, he has over ten years with agricultural advisory services. Francis is working with the Government of Uganda and NGO Africare in seed production and distribution systems for a range of commodities to farmers.

**Professor Satish Chandra.** (Visiting Professor of Tropical Agriculture, NRI, University of Greenwich, UK). Over 40 years’ experience in tropical root crops with a focus on farming systems, agronomy, agricultural economics and evaluation of projects and programmes. Satish is the Councillor for the South Pacific of the International Society for Tropical Root Crops (ISTRC). He is a former director of agricultural research in Fiji. Most recently, he was an evaluation specialist in the Australian Aid Programme.

**Claire Coote** (Agricultural Economist). 35 years’ experience, in agricultural marketing and in natural resources research, consultancy and training. Recent work includes agricultural innovation systems work in Botswana and Mali, market development for vitamin-A-rich sweet potato varieties in Uganda and Mozambique and value chain, local sourcing and IP value capture work in Zambia, Tanzania, Kenya. Leader for MA programme on Rural Development Dynamics. Experience as an EU evaluator for framework proposals.

**Chitaku G. Mucheleng’anga.** (Research Coordinator - Water and Environment NISIR, Zambia). Over 28 years’ experience in teaching, project management, research coordination and consultancy. He has obtained technical development
support from the International Atomic Energy Agency (IAEA) for research and infrastructure development projects and is a recent past National Liaison Officer for IAEA Development Assistance to Zambia. He has won funding from the Water Research Fund for Southern Africa for water quality assessment in an unplanned settlement. He has received IPR training from the WIPO Academy.

**Dr Gregory Robin** (Agronomist). Over 25 years’ experience in research and development, currently responsible for root crops’ research with the Caribbean Agricultural Research and Development Institute (CARDI). He has made inputs into research won by CARDI with USAID funded small farming systems project, agricultural research and extension project, DFID and EU. He is the ISTRC Caribbean Councillor.

**Professor Lateef Oladimeji Sanni** (Food technologist). Over 20 years’ experience in research and consultancy. Expertise in postharvest issues of tropical root crops and specialist in process and product development; drying technologies, quality assurance and product optimisation. Grantee of the International Foundation of Science and World Bank Facility for Academic Staff in Nigeria. Author of over 90 international peer-reviewed papers. Editorial Board member of the International Journal of Food Science and Technology and Visiting Professor at NRI, University of Greenwich, UK.

**Professor Keith Tomlins** (Food technologist). Over 25 years’ experience in international project management, research and consultancy. Has won research with DFID, EU (FP7 and ACP S&T) and Gates. Expertise in post-harvest aspects of agricultural commodities: cassava, sweet potato, tea, coffee, cocoa and rice. Specialist in sensory evaluation and consumer acceptability. Experience in Africa, Asia, Europe and North America during more than 100 short- and long-term assignments. Author of 90 international peer-reviewed papers and other publications.
CHAPTER ONE: INTRODUCTION

1.1 Outline of the Module
This module is divided into three chapters:
   - Introduction to the module
   - Proposal writing: why training is importance; definitions and components
   - Elements of proposal writing: concept notes, logframes and organisation

Note: During this module we will be referring to the requirements of the EU-ACP Cooperation Programme in Science and Technology II [http://www.acp-st.eu](http://www.acp-st.eu).
The deadline for submission of proposals is 7th February 2013.

1.2 Purpose and Aims
Writing a good research proposal takes skill and requires practice. The purpose of this module is to show participants what is required to develop a successful research proposal.

1.3 Module Learning Outcomes
On completion of this module you will be aware of what needs to be addressed in writing a proposal that will meet the requirements of a funding organisation.
1.4 Importance of Tropical Root and Tuber Crops (TRC)

TRC are major staple foods and raw materials in the developing and developed world. They are important for:

- Food security at the household, village, regional and national level
- Nutrition and providing carbohydrates in the diet
- Income generation, through trading and processing and enterprise development
- Exchange/gifts for meeting traditional obligations within communities
- Generating export earnings and reducing basic food imports
- Development impact at village and regional level
- Countering the effects of climate change.
2.1 Why training is important
2.2 Proposal writing tips
2.3 Conceptualisation of research ideas and understanding the requirements

2.1 Why Training on Research Project Proposal Writing is Important

2.1.1 Poor Quality of Proposals and Limited Success in Attracting Research Funding
The limited success rate of TRC scientists in ACP countries in obtaining funding for research from international donors is recognised. However, national and regional research organisations are increasingly reliant on competitive research grants for funding; often from external sources. Many organisations and researchers are competing for grant funding. It is vital that research bids are coherent, well presented and address real issues.

There is often a limited understanding and application of appropriate research methods that could be applied to derive useful knowledge. Scientists need to be more aware of the importance of a multidisciplinary approach and of consulting stakeholders. Weaknesses include:

- A lack of focus on TRC crops and
- Limited success of TRC scientists to write “catchy” and innovative research proposals that place TRC as a priority to international donors.
There is a need to improve understanding of the link between TRC and the wider global issues of poverty alleviation, food security, human nutrition, improving farm incomes, enterprise development, energy needs and links with climate change.

It is also important to improve writing ability to increase a scientist's capacity to publish their research findings. Publishing further enhances the likelihood of obtaining funding.

We would like to encourage greater networking with key experts and world-recognised TRC scientists and institutions, thereby increasing likely impact and sustainability of useful findings for the benefit of TRC globally. Furthermore, mentoring of young staff by senior scientists is often overlooked; can be problematic and is not sufficiently stressed.

We would also like to encourage increased interaction with key rural and agricultural policymakers, thereby enhancing the possibility of having high-level policy dialogues that could lead to significant actions to promote the merits of TRC.

For all these reasons it is important to understand what is needed to change this situation, ideally by taking part in this training programme. It is hoped that the training material will be used by participants as an aide memoir and as resource for training that they provide.
2.2 Proposal Writing Tips
Proposal writing is an activity undertaken to gain funding for research; usually using a layout and format stipulated by the provider of the funds. Generally this is a competitive process.

2.2.1 Always Read and Follow the Guidelines
The proposal is a communication medium between you and the funding institution – it needs to clearly articulate why your proposal should be funded over and above those of others. Remember there will always be more proposals than the available grant funds – so you need to think competitively and produce a proposal worthy of consideration. You need to capture the attention of the referees/evaluators. Each donor has its own requirements as to how a proposal for grant funding should be written. It is very important that the guidelines are followed diligently.

Proposals often get rejected because they have not addressed all the requirements in the guidelines. Probably more than 50% of the rejections are due to this single factor alone.

2.2.2 Understand terminology and concepts used
Funders tend to have specific concepts and use specific terminology in their calls. Make sure you are familiar with what they mean. A glossary of commonly-used terms is given in Appendix 1.

2.2.3 Need to Consider
i. Relevance i.e. ensure consistency with the mandate and development objectives of the funding body, the research institution; proposed partners; the country and region. Be consistent with the particular needs and constraints of the target beneficiaries, ensure synergy with other initiatives
and avoid duplication.

In assessing a proposal’s relevance it is useful to consider the following questions:

1. To what extent are the objectives of the project relevant now or will continue to be relevant in the future?

2. To what extent were the objectives of a completed project relevant?

ii. **Impact** measures the extent to which a project achieves its objectives. Research can have impact though various ways, such as:

- Building national capability through advancing knowledge
- Supporting university teaching
- Producing a direct financial return to institution performing the research and
- Increasing productivity, employment, competitiveness & business formation
- Research can also contribute to national wellbeing through its social impacts and by improving environmental management and sustainability
- Intangible benefits of research include reputation and attractiveness of a research organisation as a place to learn, work and invest\(^2\).

Sometimes there can be **unintended positive or negative impacts** which should also be assessed. Useful questions in reviewing impact are:

1. What is likely to happen as result of the project intervention?

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2. What real difference is the project intervention likely make to the target beneficiaries?
3. How many people are likely to be affected?
4. How they are likely to be affected?

iii. **Effectiveness** i.e. measures the extent to which a project attains its purpose and achieves its objective. Consider whether this can be expected to happen on the basis of the outputs to be achieved. Useful questions to ask on effectiveness:

1. To what extent are the objectives likely to be achieved in the life of the project?
2. What are the major factors that will influence the achievement or non-achievement of the objectives?

iv. **Efficiency** measures outputs, both qualitative and quantitative, in relation to inputs (labour, equipment, supplies and funds). Efficiency can be thought of as the amount of output obtained per unit of input. It requires comparing alternative approaches to achieving the same outputs, to see whether the most efficient process has been used. Questions to consider in efficiency include:

1. Is the project likely to be cost-efficient?
2. Are outcomes likely to be achieved in timely manner?
3. Are outcomes achievable at a fair cost?
4. Is the project to be implemented in most efficient way compared to alternatives?

v. **Sustainability** is the continuation of benefits after a research project has been completed and the continuation of research activities to generate
long-term development benefits for the target beneficiaries many years into the future after project completion. Useful questions to consider:

1. To what extent will the improvements to peoples’ lives or benefits to the environment continue being generated after the project is finished?
2. What are the main factors that will influence the achievement of sustainability?

vi. **Value for money** is using resources effectively, economically, without waste and with due regard for total costs and benefits. Understanding the contribution to outcomes project is trying to achieve. It can be useful to estimate whether costs per person are acceptable (total costs/estimated number of beneficiaries). NB this is not relevant for all types of research.

vii. **Value chain approaches** addresses current focus or priority areas e.g.

- Multi-disciplinary or inter-disciplinary
- Market-oriented extension
- Market-oriented research
- Farming systems approach
- Market access for smallholder producers
- Production-consumption participatory research
- Innovation platforms
- Food safety and primary health assurance
- Reduction in carbon production and water consumption.

Questions to consider include:

1. What are end-market opportunities & constraints that enhance competitiveness of the product?
2. What linkages are required with producers, input suppliers, financial institutions, business skills development services to achieve the objectives?
3. Does national policy & regulatory environment favor attainment of the project outcomes?
4. What arrangements are there for shared learning & attitude change?
5. Will benefits for target beneficiaries & key stakeholders that will create incentives/disincentives for performance?

2.3 Conceptualisation of research ideas

2.3.1 The concept note
Before beginning to write a research proposal it is worthwhile to develop a concept note as outlined in section 2.2.2. The concept note is a summary (2-3 pages maximum) of the key issues to be addressed in the full proposal and how you intend to address them. A concept note is a communication tool – it allows you to: (a) put your ideas on paper, (b) enable you to discuss your ideas with your proposed research team and your wider group of colleagues, and (c) enable you to get key decisions from research directors in your institution and the funding agency.

A good way of discussing your concept note is to give it as an in-house seminar. You will generally get useful and perceptive feedback from your colleagues which will enable you to write a much stronger research proposal. Note that your colleagues are your sounding board i.e. like referees. The second key point about using concept note is that it is always a good idea to confront and address any likely difficulties in the proposed research proposal at the concept stage than later – it will save you time and money in the long-term.
2.3.2 **Content and purpose of a concept note**

Generally concept notes perform two jobs that correspond to two levels of communication:

1. **Accessible level**
   a. Rapid access to data
   b. Get across key messages
   c. Ensure key messages are retained
   d. Convenience for the reviewer.

2. **Due diligence**

   The reviewer will need to see details of:
   a. Scientific/technical credibility of your ideas
   b. Partner competence
   c. Project plans (budget and plan)
   d. Validation of the project need:
      - State of the art review - your ideas in context
      - Market/real world need - explain the need.

Table 2.1 below is an example of concept note outline and instructions used by CARDI. However funding agencies may provide specific guidelines and structure for concept notes. Different organisations (e.g. the EU, FAO, IICA, CTA, USAID, UNDP, AU etc.) have different formats.
<table>
<thead>
<tr>
<th><strong>Table 2.1 Concept Note Content</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Title</strong></td>
</tr>
<tr>
<td><strong>Background</strong></td>
</tr>
<tr>
<td><strong>Problem statement</strong></td>
</tr>
<tr>
<td><strong>Goal</strong></td>
</tr>
</tbody>
</table>
| **Objectives** | Specific statements in concise measurable terms which:  
  - Directly contribute towards the attainment of the stated goal.  
  - Ideally, focuses on two objectives.  
If “Goal” is best described as the “destination upon completion”, “Objectives” provides the direction one should undertake in seeking the fulfilment of the stated goal. |
| **Expected results** | Statements that describe the consequence(s) resulting from the attainment of the outputs usually by a specified time period. Statements of project deliverables which:  
  - Directly relate to the attainment of the stated objectives.  
  - Track the progress made in the attainment of the overall goal. |
| **Innovation** | What makes your concept different from that of other or previous projects? |
| **Activities** | A list of undertakings/steps to be implemented to achieve the expected results. If “Goal” is the destination and “Objectives” is the direction, then “Activities” is the vehicle that will get you there. |
| **Organisation & management** | The overall structure and design of the project and how it is to be undertaken via a systematic approach. The identification, utilisation and distribution of resources such as collaborators, partners, land, finance, etc.  
  A responsibility manual matrix may be useful. |
<p>| <strong>Duration</strong> | A single statement expressing the life period of the proposed project from the expected start date to the expected end date. |
| <strong>Project location</strong> | A statement denoting the place(s) where the proposed project activities will be undertaken. |
| <strong>Benefits and Beneficiaries</strong> | This expresses the positive gains primarily for the intended beneficiary(ies), which include those afflicted by the problem the proposed project seeks to address and/or those who stand to gain from the opportunity the proposed project seeks to capitalize on. |</p>
<table>
<thead>
<tr>
<th><strong>Other related projects</strong></th>
<th>A listing of previous work done which are related to the proposed project you wish to undertake which can be used for comparison and/or reference.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Budget</strong></td>
<td>An estimate of income/funding and expenditure for a set period that is available for a specific activity/purpose at a specific time. It should include the contribution of donors, collaborators and/or beneficiaries in cash and/or kind.</td>
</tr>
</tbody>
</table>

### 2.3.3 Understanding key requirements

1. Understand the call
   - a. Fit your ideas to their call
   - b. Understand the political dimension

2. Cutting edge ideas/concepts
   - a. Understand the state-of-the-art
   - b. Understand how your ideas fit with respect to the state-of-the-art
   - c. Clearly identify what’s new

3. Present a credible team, and partnership if required
   - a. Quality scientists or potentially good scientists
   - b. Quality processors/industrial engagement
   - c. Collaboration

4. Well written proposal shows:
   - a. Clarity, good presentation
   - b. Detail
   - c. Confidence
   - d. Treat all sections with same priority
Group Exercise: Preparation of a Concept Note

In your allocated group discuss a suitable research problem to develop into a concept note and start preparing the concept note. This should be based on:

- Your own experiences/work area
- A tropical root crop
- Call requirements e.g.
  EU-ACP Science and Technology II themes:
    - Agriculture and food security

You need to consider/include:

- Market requirements
- Value addition/processing
- Proposed target group(s)
- Partnerships/collaborators

  Cross-cutting issues:
  - Good governance and human rights
  - Gender equality and diversity
  - Environmental sustainability
  - Climate change.

2.3.4 Outline preparation plan

Stage 1 - Consensus between partners

a. Identify the call
b. Develop a project concept
c. Write your concept down in a consensus document
d. Share and discuss with likely partners to hone the idea.
Stage 2 - Proposal production

a. Start as early as possible
b. Assess the writing task – the project leader must be the lead writer
c. Divide the task up if necessary - skills to suit the sections
d. Work with clearly marked document versions
e. Facilitate and manage partner/team interactions
f. Set targets and manage risk
g. Use tools (spreadsheets, templates) to assist the task.

Checks

a. Critical to test your ideas
b. This must be done early
c. Is it a consensus document?

2.3.5 Concept summary
What is the backdrop to the call and where does your idea fit?
What are the backgrounds of the reviewers/peer groups?

2.3.6 Outlining key objectives
These need to be:

a. Quantifiable
b. Verifiable
c. Achievable

What are the key project objectives?

If you receive funding what will you specifically do?
Your objective(s) should span and define the scope of the project
2.3.7 Outlining detailed plans and costs

Plans must be clear and logical and meet the expectations of the reviewer.

Other components:
- Gantt chart - time interdependence
- Pert chart - task interdependence
- Written explanation - logic behind the plan

Cost Categories

Direct costs include:
- Salary costs of technical staff
- Travel costs of staff
- Costs for sub-contracting e.g. non-core tasks
- Other specific costs - e.g. meetings, workshops, publications
- Purchase cost of new equipment
- Depreciation of new equipment

Sub-contracting

Services and travel to be 100% reimbursed by project

Specialized professionals for non-core tasks

Contract award procedure – need for transparency and value for money

Other specific costs (e.g. audit reports, financial guarantees, etc.).
THE FOLLOWING ARE SOME OF THE KEY HEADINGS AND ISSUES YOU WILL GENERALLY BE REQUIRED TO ADDRESS WITHIN THE APPLICATION FORM/IN WRITING A PROJECT PROPOSAL. EACH HEADING IS DISCUSSED IN DETAIL.

3.1 Rationale

3.1.1 What is the rationale for the proposed project?

- **Why** is it important to the scientific world?
- **What** is expected to be achieved by the proposed research?
- **How** it will be achieved?
- **Where** will it be undertaken?
– **When** will it be achieved?
– **Are there** any Millennium Development Goal (MDG)**superscript 3** implications that will enhance the depth or reach of your proposal?

All these are critical questions that need to be considered in determining the rationale.

**3.1.2 Why will the results be of benefit?**

Who/what will it benefit?
How will it benefit them?
When will it benefit and for how long?

**3.1.3 What are the views of eminent peers/scientists in your institution?**

Do they think the rationale is sensible, logical and likely to lead to useful results?
Are they prepared to endorse the proposal?

**3.1.4 What type of research you do wish to undertake?**

National or international
Single-sector or multi-sector

Note that potential funding donors/grantees may require written support from referees in their consideration of your proposal so seek their endorsement early in proposal preparation.

**3.2 Review of Information**

**3.2.1 Undertake an extensive review of literature**

Look at both national and international sources.
Concentrate on key approaches/methods adopted and the results found.

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3 www.un.org/millenniumgoals
Don’t give too much detail in the review – instead refer the reader to the key references.

### 3.2.2 It is possible that similar (or same) research topic has already been undertaken elsewhere
If so why is your proposal better or still worthwhile to be undertaken? Don’t copy or do the same research unless you are convinced that the earlier research was wrong in some aspect or the approach and results should be tested in a new area.

### 3.2.3 Seek published and unpublished research information from eminent peers/scientists in your institution and from key global institutions
Use email networking but be very specific in your queries. Try to cultivate the interest of the person from whom you are seeking information.

### 3.2.4 Focus review on the area of concern or where the research is directed
Join networks (to include organisations, institutions, etc.) that have the same interest in the subject area, discipline and thematic area in which you are interested in and where the bulk of your research activities are concentrated.

### 3.3 Research Objective

#### 3.3.1 Write the objective of the research proposal clearly and concisely in one sentence if possible
Begin with e.g. “To assess the effect of etc.…”

#### 3.3.2 Four good examples of objectives:
- To assess the yield potential of 10 cultivars of cassava (*Manihot esculenta*) in Zambia
• To investigate the productivity of the main tropical root crops in the smallholder farming systems of the Pacific Islands
• To investigate the operating efficiencies of common cassava processing techniques
• To assess the eating quality of the 5 most popular varieties of sweet potato (*Ipomea batatas*) in Malawi.

### 3.3.3 One bad example of an objective

‘Apply multivariate linear regression analysis to various stochastic random variables on 5 stratified groups of high, middle and low income tropical root crops farmers in the ecologically and culturally diverse wet, intermediate and dry zones, and look at what are the factors and see how they are responsible for the variation in farm incomes in Fiji.’

This objective is too long and complicated. Ensure the objective is clear and easily understood by others. Avoid using words you don’t understand. **Keep it as simple and short as possible (KISS).**

### 3.3.4 Does the objective statement say what you mean?

Is it communicable to others i.e. would other scientists understand what you are trying say that you will do? The idea may not be coming across clearly. You may need to rephrase.

### 3.3.5 Is it outcome focused?

Is it based on an identified need or a gap in our knowledge?

Is there any reference to the research need in the literature you have reviewed?
3.3.6 Think of the likely level of impact of the findings and on whom
This could be at high level, medium level, low level on particular groups of stakeholders, such as farmers, extension workers, laboratory technicians, consumers, marketers, regional development bodies, etc.

3.3.7 Clearly outline the approach to be undertaken in the proposed research
This includes the sequencing of work to be carried out to reach your goal. You also need to indicate who is responsible for which tasks.

3.3.8 Outline any proposed nature and type of collaboration with other scientists and institutions
Are they willing to commit funds and other resources?
Do you have their written support?
Are they likely to remain in their current positions until the end of the project?
What contingency plans do you have if they do not?
It is best to collaborate with institutions who have experience that your organisation does not have.

3.3.9 Are there wider issues that need to be addressed by you or your institution?
Are there any intellectual property rights that may result from the research? What might be the multiplier effects of the findings? How sustainable will be the results? What is the likely short, medium and long-term impact on people’s lives? Will anybody lose out as a result?
3.4 Methods

3.4.1 Clearly outline, step by step, the methods to be adopted in implementing the proposed project
Each step must be very clear and assessable so that independent reviewers can follow what is being proposed and can identify any potential problems with the method. Pre-test your methodology to ensure workability. There needs to be a demonstrated veracity in the method to be adopted. If the funding body indicates how they will review proposals, check that your proposal addresses each factor.

3.4.2 If the method is a standard method, reference it
Validate methods if no standards are available (see case study 5 Module 2).

3.4.3 Use the logframe to identify each key activity to be undertaken
Each activity should have a unique activity number within the proposed project. Each activity should be able to be monitored during project implementation and also able to be evaluated after completion.

3.4.4 Outline each activity by year and allocate key responsibilities to individuals undertaking the research
Always think through the process to identify all critical events that may affect the proposed project. If they were to happen will project implementation jeopardised?

3.4.5 What degree of control do you have on the identified critical events?
How do you plan to manage them if they occur?

3.5 Materials

3.5.1 Outline clearly the materials required to undertake the proposed research
e.g. research land, facilities, equipment, laboratory materials, etc.

3.5.2 Identify what are locally available to you and what you have to outsource
For the outsourced materials/facilities, find out where they are available and make necessary contacts with suppliers
Would they all be available prior to the project starting?

3.5.3 Identify any critical and necessary internal and external skills to support the proposed project
These include data gathering skills, sampling skills, laboratory analysis, computing skills or statistical analysis skills that may be required to analyse the data.

3.6 Funding

3.6.1 Outline all costs clearly by key items and by years
Include plant materials, laboratory materials, computing costs, etc. for each year of the research.

Budget line items would be: (a) Personnel cost, such as support and professional services, casual labour, materials, supplies and services, and (b) Motor vehicle costs, local travel, foreign travel, training and workshops, field station expenses, communication products, printing expenses, other expenses, etc.

3.6.2 Include salary/wage costs as it is important to present all costs of the proposed project to potential funders
It assists research administrators assess the total cost of a proposed project against potential benefits. Overheads may be claimed in some cases.
3.6.3 Baseline line studies are important to be able to assess the impact of a project
Baseline studies of yield of existing varieties of cassava should be undertaken (as a baseline) prior to the introduction of new higher yielding varieties.

3.6.4 Where possible include imputed indirect costs for office and laboratory space provided by host institution
Donors/grantees often require this to be costed in project proposals because they wish to know what contribution the partner institution is willing to make to the project.

3.6.5 Maybe only 1 in 4 proposals will get funded so don’t get dispirited if you fail a few times
The key to winning is to write good proposals and be persistent. Learn from the feedback provided by the funder.

3.7 Implementing the Research
3.7.1 Outline who would do what?
Identify the team members.
Outline the key time inputs of all team members and state the start and end date of each person’s inputs.
There may be outside collaborators (i.e. from outside your institution) who need to be identified and brought into the team.
You may need to write short and specific (half to one page maximum) terms of reference for each key member of the team, outlining their key roles in the project.
Identify and set aside time slots (weekly, monthly, etc.) when you can all meet in a designated room or field area or by Skype to discuss project progress and resolve problems.

Adapt to change. Projects (especially those of long duration) sometimes have to change because of circumstances beyond the control of the team.

3.7.2 Define the formal relationship between the team members

Be very clear on who would be ultimately responsible for the research outputs e.g. who would be the team leader and who would be the key author in any subsequent publications.

3.8 In Summary

1. Identify your concept
2. Identify what costs can be funded
3. Develop your concept to:
   - Suit the fund
   - Embrace collaboration
4. Think of maximising impact and knowledge application
5. Seek the views of others, such as eminent peers.

How do we find concepts to take forward?

- **Option 1- persistence**
  1. Slow
  2. Spotting opportunities
  3. Reconfigure ideas to fit

  Technology push

- **Option 2- pro-active**
  1. Network/speak to others
  2. Flush out ideas
  3. Exploit funds as they appear
  4. Less technology specific

  Technology pull
How do we understand the requirement?

1. Interpretation of the text and data
2. Understand the socio-political dimension
3. Take account of prior funded ideas
4. Consider your competition
5. International perspective

Analyse data very carefully. Ask peers and senior scientists or your institution’s biometrician to assist you, if necessary before you start fieldwork.

Once research is complete write up the findings from what happened to what was found. Be very careful in interpreting data and in drawing conclusions. A common mistake is to claim more than what the data shows (unsubstantiated claim) or to make claims that go beyond what you set out to do (false claim). The scientific community is a vigilant lot – false claims can affect careers and bring disrepute to the research group. It is always better to err on the side of caution. Use ‘qualifying’ words, if required, to temper the claim e.g. “It is possible that ...” etc. Be careful in interpreting “one-off” results. Seek to explain possible causes of bias. Remember that only few research results are ever ground breaking. Most research results are addition to existing knowledge.

3.9 Publications

3.9.1 Always write short, sharp articles using minimum number of words
Follow the guidelines for authors carefully and look at recently published papers. Peers and reviewers don’t have time to read long-winded articles – it often has a negative effect. Most peer-reviewed journal articles are no more than 5 to 7 pages. They should follow the format requested by the editor.
3.10.2 Capture the imagination of the reader
Say your main conclusion in the first sentence of the Abstract.
What you want the reader to do is to read on.

3.9.3 Always select your publication medium carefully
What you want is the maximum impact for the scarce dollars spent on the project. You have an obligation to the funding institution to do that. Sometimes it may be possible to publish the results of a project in several mediums so as to reach a wider audience e.g. a scientific paper, an extension guide; item for a newsletter and a newspaper article.

3.10 Evaluation, Feedback and Lessons Learnt

3.10.1 Always undertake an evaluation of the project after it is finished
Evaluate from the preparation stage to publication, so that you can learn from what happened and how to improve future project design and implementation.
M&E (Monitoring and Evaluation) are standard requirement for most projects.
Larger projects may be subject to ex-post evaluation i.e. after completion evaluation by independent external reviewers. These are often used by international development funding bodies to assess the degree of success in funding various types of projects and programmes in various sectors and regions of their interest.
On-going evaluation should be undertaken during the critical stages of the project or annually.

3.10.2 Always give feedback
Provide feedback to your colleagues, eminent peers/scientists, institution administrators, farmers, extension workers and others who helped you. They
may be interested to know what results were obtained during the project.

3.10.3 Always aim to create a partnership
Try to create a partnership and a sense of ownership and mutual respect amongst all who play a part in the project, no matter how small or large their contribution.

3.10.4 Donors/grantees should be provided with reports on outcomes of projects
Reports to donors/grantees normally need to be signed-off by appropriate leaders in the institutions which undertook the research
Donors/grantees need to know that their funds were spent appropriately and efficiently as they are accountable to their governments and boards for the project expenditure.

3.10.5 Lessons learnt from the outcomes of project are important and should be used in improving the design and implementation of future projects
Positive lessons are very useful for reinforcement of human behaviour i.e. what to continue to do successfully in future projects.
Negative lessons are also useful i.e. what not to do in future projects.
Generic lessons are always handy to share with young scientists as they start their careers.
Bad project designs lead to bad projects or the quality of outputs is only as good as the quality of inputs.
3.11 Logframes

3.11.1 Use the logframe approach to clarify your thinking

The logframe is a powerful tool in:

(a) Logically relating inputs to outputs to purpose to goal
(b) Identifying verifiable indicators
(c) Identifying means of verification
(d) Identifying key assumptions and risks
(e) In setting the framework to enable proper monitoring and evaluation (M&E) to be undertaken during project implementation or after completion.

3.11.2 Preparation of Logframes for the Project Proposals

The logframe assignment is considered sufficiently large and complex to be undertaken as a separate assignment to the proposal writing assignment, but needs to be considered as an integral part of the whole research project proposal training. The logframe assignment is to help participants learn about:

a. The structure of the logframe
b. The relationship between input-output-purpose-goal relationship
c. How the verifiable indicators and the means of verification are identified and selected
d. How the assumptions and risks are identified and considered
e. How M&E can be linked to the structure of the logframe and made independently verifiable.
### Table 3.1 Structure of a logical framework

<table>
<thead>
<tr>
<th></th>
<th>Intervention logic/narrative</th>
<th>Objectively verifiable indicators of achievement</th>
<th>Sources &amp; means of verification</th>
<th>Assumptions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Goal</strong></td>
<td>What is the overall goal to which the research will contribute?</td>
<td>What are the key indicators related to overall objectives?</td>
<td>What are the sources of information for these indicators?</td>
<td>Which factors &amp; conditions outside the researcher’s responsibility are necessary to achieve the objective?</td>
</tr>
<tr>
<td><strong>Objectives</strong></td>
<td>What specific objective is the research intended to achieve to contribute to the overall objective?</td>
<td>Which indicators clearly show that the objective of the research has been achieved?</td>
<td>What are the sources of information for these indicators?</td>
<td></td>
</tr>
<tr>
<td><strong>Expected results</strong></td>
<td>What are the expected outputs or results?</td>
<td>What are the indicators to measure whether &amp; to what extent the research achieves the expected results?</td>
<td>What are the sources of information for these indicators?</td>
<td>What external conditions must be met to obtain the expected results on schedule?</td>
</tr>
<tr>
<td><strong>Activities</strong></td>
<td>What are the key activities to be carried out &amp; in what sequence in order to produce the expected results?</td>
<td><strong>Means</strong>: what is required to implement these activities</td>
<td>What are the sources of information about research progress?</td>
<td>What preconditions are required before the research starts?</td>
</tr>
</tbody>
</table>
### Table 3.2 Example of a Non-EU Logframe of Research Project

<table>
<thead>
<tr>
<th>Narrative Summary</th>
<th>Objectively Verifiable Indicators</th>
<th>Means of Verification</th>
<th>Risks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Goal</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crop post harvest innovation systems respond more effectively to the needs of the poor.</td>
<td>A range of institutional arrangements that effectively and sustainably improve access to post-harvest knowledge and/or stimulate post-harvest innovation to benefit the poor validated after three years.</td>
<td>Project evaluation reports Partners’ reports Regional Coordinators’ Annual Reports CPHP Annual Reports CPHP Review</td>
<td>Crop postharvest systems have the capacity to respond to and integrate an increased range of research outputs during and after programme completion. Delivery systems deliver a range of services relevant to poor people in both focus and non-focus countries. Livelihood analysis provides accurate identification of researchable constraints or opportunities that lead to poverty reduction.</td>
</tr>
</tbody>
</table>

<p>| <strong>Purpose</strong> | | | |
| Incomes and food security of the poor whose livelihoods depend on sweet potato increased through a range of institutional arrangements that effectively and sustainably improve access to post-harvest knowledge and market to benefit the poor. | 1.1 Appropriate institutional arrangements in place and used by at least 30% of sweet potato farmers and traders in the region to improve access sweet potato markets after 3 yrs. 1.2 Storage technology and benefits of OFSP promoted to stakeholders, markets and consumers. 1.3 Linkages between coalition members established that meet needs of stakeholders in each region established and tested the end of 3 years. | 1.1 Project evaluation report 1.2 Partners reports | Resource managers, farmers and traders are able to adopt new knowledge Enabling environment exists for wide spread adoption of new knowledge Policies of Governments in Region support institutional arrangements of the coalition members |</p>
<table>
<thead>
<tr>
<th>Outputs</th>
<th>1. Characterization of market systems for sweet potato updated and current demand confirmed</th>
<th>1.1 Updated characterization and demand of sweet potato marketing systems completed by the end of year 1</th>
<th>Partners’ report</th>
<th>Government policies on price do not favour imported commodities Normal environment and market conditions exist</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.2. Market information and outlets for orange fleshed sweet potato identified by the end of year 2</td>
<td>Partners’ report</td>
<td>Availability of orange flesh sweet potatoes in the market systems which depends on increased production levels</td>
<td></td>
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<td>2. Institutional arrangement/partnership that effectively and sustainably improve access to post-harvest knowledge and market innovations developed</td>
<td>2.1 Stakeholders needs, sources of new knowledge, means of adaptation and adoption identified within 6 months</td>
<td>Partners’ report</td>
<td>Output 1 will generate conclusive reports</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.2 A working and sustainable coalition partnership established after 6 months</td>
<td>Project progress reports</td>
<td></td>
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<td>2.3 Farmers &amp; traders groups (at least 6) established in the region after 7 months.</td>
<td>Project reports.</td>
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<td>2.4 Case study and documentation of success factors produced completed after 30 months.</td>
<td>Case study report</td>
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<td>2.5. An innovative coalition-based systems approach to the uptake of post-harvest technologies described and monitored after 24 months.</td>
<td>Internal project evaluation report</td>
<td>Capabilities of coalition members maintained at least at current level constraints generated, that can not be internalised with project</td>
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<td></td>
<td>3. Promotional and dissemination strategies for uptake of technologies through the partnership developed and implemented effectively</td>
<td>3.1 Adapted technologies for current varieties suitable for promotion in the marketing system validated after 12 months</td>
<td>Project technical report</td>
<td>Background information on sweet potato marketing systems and validated technologies available on time New constraints generated that cannot be internalised with project</td>
</tr>
<tr>
<td>3.2 Storage and handling of orange fleshed sweet potato innovations adapted and validated in the marketing chain after 24 months</td>
<td>Project technical report</td>
<td></td>
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<tr>
<td>3.3. Consumer acceptance of OFSP evaluated by after 30 months</td>
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</tbody>
</table>

| 3.3 Promotional strategy developed after 18 months. | Strategy document |
| 3.4 Dissemination materials (IEC) prepared and disseminated after 24 months. | IEC materials (posters, leaflets, publications, radio air time and television programmes) |
| | Normal environment and market conditions exist whilst project being implemented |

**Activities**

1.1 Preliminary planning workshop to discuss strategies for implementing the project and formalise institutional arrangements in carrying out the project.

1.2 Assemble information from previous CHP projects and elsewhere.

1.3 Update characterization of market systems of sweet potatoes and confirm current demand.

2.1 Assess current knowledge, attitude and practices on sweet potato handling, storage and marketing by stakeholders (KAP study).

2.2 Facilitate formation of farmers and traders groups and groups to participate in validation studies.

2.3 Establish an effective and sustainable coalition partnership.

| | Normal environmental and marketing conditions exist during implementation. |
| | Little information on KAP studies. This is low risk because some coalition members have sufficient experience in community mobilisation. |
| | This activity will depend on the successful outcome of the above activity. |
| | Poor communication. This is low risk since most of the coalition members are linked with telephones, faxes and e-mails. |
| 2.4 Workshop to discuss and prioritise interventions based on the market studies, KAP studies and validation exercises. | Technical reports on the market studies will be available on time. Low risk since these will be produced by managing partner of the project. |
| 2.5 Conduct case study of the project to document success factors produced in the project | Sufficient guidelines available from CPHP for assessing coalition based approach |
| 2.6 Synthesise information on the lessons learned from the coalition based approach in a workshop and disseminate findings | All technical reports will be in place |
| 3.1 Select suitable technologies for storage, handling and marketing of sweet potatoes, adapt and validate them | Orange fleshe sweet potatoes available in the region |
| 3.2 Make economic assessment of cost-benefit to farmers, traders and consumers of technologies in specific locations. | Stakeholders able to participate. |
| 3.3 Compare and evaluate the consumer preference of OFSP with those currently available in the markets. | |
| 3.4 Produce plan for promotional strategy | Sufficient information from outputs 1 and 2 and activity 3.3 |
| 3.5 Prepare dissemination materials based on the plan | Dissemination materials may be unfocussed. This is a low risk since their preparation will be based on a strategic plan and other information gathered in outputs 1 and 2 |
| 3.6 Disseminate technologies, monitor uptake and feedback to dissemination approach. | Capabilities of coalition members maintained at least at current level and mandates remain unchanged for duration of project. |
| 3.7 Prepare dissemination materials to more widely promote project outputs | |
**Wrap-Up: What have we learnt?**

Summarise the key points of the Research Proposal Writing module

Follow-up work:

1. Discuss some of the main references and further reading for follow-up studies at home
2. Discuss the merits of some of the international development funding bodies
3. Encourage networking with the presenters and other TRC scientists for further assistance.
4.1 Outline of the Research Methods Module

This module is divided into 3 sections:
- The research process
  - Case study: TRC cassava research in your country or region
  - Case study: Relationship between the carotenoid content and sensory attributes of sweet potato
- Qualitative research including
  - Case study: Using qualitative research to understand drivers of OFSP
  - Research ethics

4.2 Purpose and aims

To encourage early career Tropical Roots and Tuber scientists to focus of future research needs and gain increased R&D support by key national and international aid donors and private enterprise.

The overall aim of this module is to increase the participants' capacity to demonstrate scientific excellence, increase the potential impact through the development of research project proposals, including their results dissemination.
and use of project results, improve the quality and efficiency of the implementation and the management of projects.

4.3 Module learning outcomes

On completion of the module you will be aware of:

- The 6 stages of the research process and how to structure and undertake research
- How to use qualitative research methods
- The need for consideration of ethical issues in undertaking research.

4.4 The Research process

Undertaking research – the research process - involves six distinct phases, though these are not always in a completely linear path.

Critical steps of the research process include:

- Defining the problem (asking questions)
- Setting the objectives of the research
- Undertaking a review of relevant literature
- Selecting the research design
- Data gathering
- Data Management (processing and analyses)
- Documentation and writing up.

Note: A good researcher is someone who does not take shortcuts and rush through the research. It is important to keep an open mind to recognise changes that must be accommodated to ensure the reliability and validity of the research.
4.5 Identifying Research Work To Undertake

4.5.1 The Research problem
Research starts with a problem to solve.

Figure 1 below sets out these processes in terms of the questions to be asked, the steps to take and the important elements of each step.
Figure 1: Steps in the Research Process

<table>
<thead>
<tr>
<th>Questions you must ask</th>
<th>Steps you will take</th>
<th>Important elements of each step</th>
</tr>
</thead>
</table>
| What is the problem and why should it be studied? | Selection, analysis and statement of the research problem | - problem identification  
- prioritising problems  
- analysis  
- justification |
| What information is available? | Literature review | - literature and other available information |
| Why do we want to carry out the research? What do we hope to achieve? | Formulation of research objectives | - general and specific objectives  
- hypotheses |
| What additional data do we need to meet our research objectives? How are we going to collect this information? | Research methodology | - variables  
- types of study  
- data collection techniques  
- sampling  
- plan for data collection  
- plan for data processing and analysis  
- ethical considerations  
- pre-test or pilot study |
| Who will do what, and when? | Work plan | - human resources  
- timetable |
| What resources do we need to carry out the study? What resources do we have? | Budget | - material support and equipment  
- money |
| How will the project be administered? How will utilisation of results be ensured? | Plan for project administration and utilisation of results | - administration  
- monitoring  
- identification of potential users |
| How will we present our proposal to relevant authorities, community and the funding agencies? | Proposal summary | - briefing sessions and lobbying |
1. Once a problem has been identified, e.g. carotenoid losses during processing of sweet potato, there is a need to move onto formulating research questions.

4.5.2 The research questions

1. Research questions identify the phenomenon to be studied. They help articulate ideas. They also help to define an investigation, set boundaries, provide directions and act as a frame of reference for assessing the work.¹ What? Why? How? What if? What type of? When? What are the potential relationships you want to explore?⁵

Identifying some research questions is just the first step. You will then need to look hard and ruthlessly at each question, since the first version of a research question almost always have major flaws so will either need to be amended or changed completely.

“The scientific mind does not so much provide the right answers as ask the right questions” (Claude Levi Strauss¹).

4.5.3 The Research hypothesis

The role of the hypothesis is to take the research questions a step further. A hypothesis is a ‘conjecture or educated guess about the nature of the relationships between two or more variables expressed in the form of a testable statement. It should be a ‘clear and concise statement of what you think you will find in relation to your variables and what you are going to test”⁶ for some forms of research, such as more descriptive, explorative or action research, a hypothesis will not be appropriate. In social sciences for instance, it is not always possible to formulate a clear hypothesis.

² Ibid.
⁶ Ibid.
4.5.4 Different perspectives, different approaches

You can approach the same topic from different perspectives, each of which gives a different insight into the problem.

Example:
Problem: cassava value chains for value-added product are under-developed in Zambia.

Nutritionists would find nutritious food (rich in potassium). Food technologists would evaluate the effect of processing on potassium. Breeders would look for varieties that have high content in potassium; Economists would look at the market value chain and supplies of cassava.

Exercise 1: Identify a problem
Split into existing groups
Formulate:
- Research questions from your specific area of expertise (minimum 5)
- Research hypotheses (minimum 2)
- Specific related objectives (minimum 5)
4.6 Literature review

A literature review is a:

- **Comprehensive study** and **interpretation** of literature relating to a particular topic

- Search and analysis of **relevant** and current literature in order to answer a **specific** question.

It is useful because it brings together all the relevant pieces of literature on a topic and ensures that no one piece is seen in isolation. If you think of an individual piece of literature as one piece of a jigsaw, then a literature review represents the made-up jigsaw with all the individual pieces of information on a topic contributing to the whole picture.

A literature review is critical to identify:

- The **gaps in knowledge**: what has been done? What has not been done?
- Where there is a gap to introduce a new idea?
- The **methodologies/methods** to use: do I need to set up a method? What method/methodology should I follow?

Sources of literature include:

- **E-resources**: databases: List of journals (Thomson Reuters)
  - Free access (science direct, Google scholar…)
  - Password protected access (Agora; Hinari; [www.aginternetwork.org](http://www.aginternetwork.org))
  - Scopus ([http://www.scopus.com](http://www.scopus.com)). Some universities offer passwords that can be obtained from the library.
- **Library**: journals, books, e-books, ‘grey’ literature (reports, theses)
• Other sources: conference papers, discussion with scientists, contacting main authors in the field, checking citation information, minor sources (media: newspapers, magazines…)
• Sources: more or less reliable e.g. Google – unregulated.
• Limited on-line access to literature: access to on-line journals can be restricted or internet can be slow or internet/library facilities limited or not available.

4.6.1 Selecting and managing the relevant literature
Read the abstract first. Evaluate the relevance of the literature to your review: clearly, possibly relevant or non-relevant. Understand what the findings, concepts, issues, gaps in knowledge are. Use a paper based or electronic catalogue system to make a summary of the issues covered. Software such as Endnote is very useful for storing, organising and using your literature references but their access can be limited.

4.6.2 Write up the literature review
Develop a structure e.g. by the topics, developments that you need to review to achieve or the arguments you wish to develop.
Include relevant findings in literature related to your topic
• Make your review critical (i.e. identify gaps in literature)
• Literature based assessment: careful reading of the literature will tell you what the key research questions other researchers have identified in your chosen field.

4.6.3 Update your knowledge
Keep yourself updated and regularly update your literature review during the course of the research.
Ensure that nobody has published something similar to your research. (Tip: set up key word alerts in Google; Science Direct) to be informed of developments in the field.
4.6.4 The writing process
The purpose of the literature review is to ‘engage, learn, inform, establish and argue.’
Be prepared to redraft the literature review several times.

Exercise 2: Find relevant and recent references related to exercise 1 (minimum of 2) on Google scholar and explain why you chose these references.

4.7 Organising the work
4.7.1 Materials
Outline clearly the materials required to undertake the proposed research
- e.g. research land, facilities, equipment, laboratory materials, data collectors etc.
Identify what are locally available to you and what you have to outsource.
For the outsourced materials/facilities, find where available and make necessary contacts.
Will they all be available prior to the project starting?
Identify any critical and necessary internal and external skills to support the proposed project
- e.g. data gathering skills, sampling skills, computing skills or statistical analysis skills that may be required to analyse the data.

4.7.2 Time Schedule
Give yourself time and set time-based objectives e.g. by the end of the month, I will finish setting up this laboratory method. Anticipate the research activities

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7 Ibid.
required. Try to imagine which stage of the research you will be in one month; one year; at the end of the project. Foresee the possible outcomes of the project. Before starting a new piece of work: field work or laboratory work: you need to make a list of the equipment and resources (budget, staff, transport…) you will require.

Always think through the process to identify all critical events that may affect the proposed project. Envisage the critical points of the work: which are the critical stages of the work where you will need help (from the literature, your supervisor, advisor(s), specialist in the area).

What degree of control do you have on the identified critical events?

- How do you plan to alleviate them if they occur?

4.7.3 Set up and use adequate methods

Pre-test your methodology to ensure workability. There needs to be a demonstrated veracity in the method to be adopted. Clearly follow step by step, the methods being adopted in implementing the proposed project. If the method is a standard method, reference it. Validate methods if no standard is available.

In case you modify methods, carefully explain how you did it. Pilot studies: Most research begins with a pilot study to check how well your plan works in reality and whether the method you want to use is really suitable. Pilot studies are usually small but may be publishable. A pilot study will give valuable insights into this question. The pilot study may quickly show that your original idea is not feasible, for reasons which were not possible to predict in advance. It may show this at the stage of data collection or at the stage of data analysis. It is always a good idea to pilot your data analysis as well as your data collection.
Practicalities: “Do remember that you need to give consideration to an array of practical issues when thinking about your research project.”

4.7.4 Data management
The proposal may include:

- Observation during experimentation
- Field visits and field measurements
- Surveys
- Production
- Marketing and Quality control processes
- Project implementation and execution.

Means of data storage

- Laboratory log books, research notes, data loggers and organizers.
- It is important to transfer data from your laboratory book to the computer and analyse it quickly. Do not forget your data into your lab. book.
- Hard copy and electronic backups (in case of theft or disasters). Make sure that there is more than one copy. Also record the GIS coordinates of any trial plot for future reference and location.

Some donors may require you to include a data management plan (see appendix 2 for an example).

4.7.5 Analysing data
The proposal should indicate that you will use adequate experimental design, sampling methods and replicate your trials where possible.

Statistics is a discipline within its own right and there are numerous good statistics books and reference to guide you. It is essential BEFORE preceding an experiment to ensure your design is robust i.e. that it captures the hypotheses that you are aiming to address. It is wise to consult a statistician or biometrician to verify your design when subject to analyses will be valid.
A common mistake made by inexperienced researchers is the failure to decide in advance how they will analyse the data that they will collect. The types of analysis possible will be constrained by data you have obtained. The data you have will be determined by the research design and by the types of measurement you have chosen.

Theory based assessment: the internal logic of your research question will also tell you what sort of data you need (e.g. continuous and discontinuous events). Using the correct analytical method is vital in making the most of your data. Incorrect analysis can lead to the wrong conclusions being made and you may miss important and exciting findings.

Check your data (Normality of data)

Analyse your data using statistical packages. For example:

- Detecting differences between samples (ANOVA; multivariate analysis);
- Representing differences between samples (PCA; cluster analysis);
- Detecting a trend (linear regression); establish correlations (Pearson).

### 4.7.6 Some free statistical software packages

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<td>Open Access</td>
<td><a href="http://cran.r-project.org/bin/windows/base/">http://cran.r-project.org/bin/windows/base/</a></td>
</tr>
<tr>
<td>GenStat</td>
<td>The GenStat Discovery Edition is a free version of for use by not-for-profit research organisations, NGOs and educational institutes based in the developing world.</td>
<td><a href="http://www.vsni.co.uk/software/genstat-discovery/registration">http://www.vsni.co.uk/software/genstat-discovery/registration</a></td>
</tr>
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</table>
5.1 Qualitative research or quantitative research

The process of testing a stated idea or assertion (hypothesis) to see if evidence supports it or not is known as **quantitative research**.

The process of engaging in interactions with parts of real world and reporting on what happens and what they seem to mean is known as **qualitative research**.

5.2 Why use qualitative research?

To improve understanding of complex issues and human relationships

To find explanation for questions such as:

- How do we know what other people feel?
- Is what people say they do different from what they actually do?

To experience:

- Seeing individuals in their situational context
- Organising and managing complex exploratory data
- Interpreting and analysing verbal data
- Writing up information that accurately reflects evidence obtained
5.3 The main steps involved in qualitative research (Bryman, 2004)

1. Formulate general research questions
2. Selecting relevant site(s) & subjects
3. Collection of relevant data
4. Interpretation of data
5. Conceptual & theoretical work
   a. Tighter specification of research questions
   b. Collection of further data
6. Write up findings/conclusions

Qualitative Research requires: Noticing, Collecting, Thinking

- Analysis is part of process
- Cycle keeps repeating - Iteration
- Process of analysis requires reflection.
5.4 Aims of Qualitative Research

To emerge with feelings, ideas, opinions, views, attitudes and perspectives that have a breadth and depth extending beyond that which a structured questionnaire can deliver (Brett Davies, 2007).

To enable researcher to gather information about:
  - actions
  - interactions
  - views

and to reflect on meanings and to put forward an interpretation of those actions.

5.5 Data collection: Interviews and focus groups

Interviews at heart of qualitative research
  - Want to know what people are thinking
  - Want to understand their attitudes; what is really important; what they dislike.

It can be difficult to get this information via surveys
  - May not ask the right questions
  - Hard to get at the complexities of human thought and behaviour.

5.6 How is qualitative data analysed

Data is words. Analysis involves intuitive effort by researcher to interpret.

Involves organising
  - Data sets tend to be large (lots of words)
  - Require intensive examination, understanding & reading
  - In order not become overwhelmed by sheer amount of data and writing

It also involves reducing and funneling data.
5.6.1 Process of Data Transformation

Need to transform data into some form of explanation or interpretation of situation.

This involves identification of themes or categories.

Researchers talk about their conceptual categories “emerging” from the data

‘almost as if they left the raw data out overnight and awoke to find that the data analysis fairies had organised the data into a coherent new structure that explained everything!’ (Thorne, 2000).

5.6.2 Important to Organise Data

Gather materials together of same theme

Facilitates easy retrieval of such linked material, but may require:

- Multiple copies of original data as same data may represent 2 or more themes.
- Carefully label material to allow checking back & examining broader context in which that data occurred.

As you notice and name things the next step is to collect and sort them.

5.6.3 Collecting and Coding

When you sort the pieces you are “collecting” them.

When you identify pieces, you are noticing and “coding” them.

Analysis is a breaking up, separating, or disassembling research data into pieces, parts, elements, or units.

- Facts are broken down into manageable pieces.

5.6.4 Coding

Makes data easier to search, make comparisons and identify patterns that require further investigation.
Coding becomes basic means of developing the analysis.
Process of pulling together and categorising series of individual events, statements and observations identified in the data (Charmaz, 1983).

5.6.5 How to Code
Comb data for themes, ideas and categories by marking similar passages of text with code label.
Codes can be based on:
- Themes, topics, ideas, concepts, terms, phrases, keywords

Things to code:
- Behaviours, events, activities, strategies, meanings (norms, values, symbols), relationships, conditions, context, consequences, ...

Undertake constant comparison: when coding a passage, compare with previously coded passages.
Give codes meaningful names.
Code any part of data that relates to code topic with appropriate label
- Involves close reading of the text (or close inspection of the video or images).

If theme is identified create a new code.
Number of codes will evolve and grow as more topics or themes become apparent.
List of codes will help to identify issues contained in data set.
Example of coding an interview script

5.7 Thinking – Goal of Analysis
1) Make some type of sense out of each collection

2) Look for patterns and relationships both within a collection, and also across collections, and

3) Make general discoveries about the phenomena you are researching.
   - Compare and contrast each of the things you have noticed in order to discover similarities and differences, build typologies, or find sequences and patterns.

“In the process you might also stumble across both wholes and holes in the data.”

5.8 Presenting Qualitative Data
What to do with 10 case studies or 30 interviews?

Preserve and capitalise on words: tell a story
• Write as a conversation - find a voice to narrate the story.

Provide a clear message, argument or storyline.

Use the ‘point, evidence, explanation’ structure for each paragraph.

Draw appropriate conclusions

• Consider your findings
  – in light of current literature
  – in light of limitations and methodological constraints.

5.9 Innovation in Agricultural Research for Development and Implications for Undertaking Research in Value Chains

Integrated Agricultural Research for Development (IAR4D) is an emerging paradigm. It seeks to address issues arising from a traditional linear, top-down approach to agricultural research that tends to result in research results being ‘sectoral and fragmented with little or no involvement of the relevant stakeholders’.

In many countries this has resulted in adoption of Innovation Platforms (IP). This focuses on encouraging engagement of multiple actors along a common value chain and promoting innovation in the agricultural sector by identifying barriers to meeting challenges.

Innovation is considered to evolve through:

  – Continuous intervention among players
  – Utilisation of feedback analysis
  – Incorporation of lessons learned

Innovation platforms are networks of market actors that considers the technical, social and institutional constraints in a value chain that facilitates learning, with ultimate aim of generating innovation rather than more research products or
technologies. It is an attempt to make research demand driven rather than supply
driven and to help develop solutions that benefit all the players in a value chain.

Although IP have predominated in developing countries, the UK government has
recently embraced this approach in finding solutions to increasing sustainable
agriculture production, via its recently created Sustainable Agriculture and Food
Innovation Platform:

“Bring government, researchers and business together to stimulate development
of new technologies that will increase food productivity, while decreasing the
environmental impact of the food and farming industries”. www.innovateuk.org

**What is a value chain?**

Successive stages during which value is created during production, distribution
and consumption of produce. It also addresses the functions, product flows and
economic actors:

Inputs & services (including research and training) → Production → Assembly →
Wholesale → Retail → Consumption.
Tropical Root Crop Value Chain Example

Value Chain Analysis

Value chain analysis is concerned with ascertaining dynamic factors of the value chain – trends, incentives, relationships and identification of researchable issues. The goal is to improve efficiency and competitiveness of the chain and its actors.
Fieldwork Exercise: Diagnosis of TRC Value Chain Research Needs

Learning Outcome: To experience talking to market actors and discussing market constraints and opportunities, particularly pertaining to research, and analysing this information.

Aim: Collection of information to compile a brief analysis of issues in TRC production, marketing and consumption to add to group research proposals.

Opportunity to ascertain
- Key players
  - Farmers
  - Traders
  - Processors
  - Transporters
- Dynamic factors of the value chain
  - Trends
  - Inefficiencies
  - Incentives
  - Relationships

Group exercise
1. Develop a checklist of questions relating to your research proposal
2. Plan to interview at least 3 traders;
   Include both men & women; young & older traders
3. How can you verify the information you have obtained?
4. Prepare a table summarising the activities, opportunities, challenges and potential research needs of interviewees; add findings to proposal
   (Thursday)
Interview at least 5 traders; ensure you speak to men and women and young and old traders

How could you triangulate (verify) the information you have learnt?

Prepare a table summarising the trading activities, opportunities, challenges and potential research needs of interviewees.

**Ideas for Interview Questions: General**

- Who (organisations, projects, individuals) do you work with in the TRC sector?
- What has been your experience of working with other stakeholders?
- What are the main opportunities for further commercialising the TRC sector?
- What are the main obstacles and constraints to commercialising the TRC sector?
- What are the main constraints to realising these opportunities/reducing constraints?

**Seed supplier**

- Who/what prompted you to start the business
- Where do you receive technical support from?
- Who are your customers?
- How do customers receive the vines?
- Do they have to pay for transport?
- Who chooses the varieties you propagate?
- Do you provide information on best planting methods?
- Where do you get your propagation material from?
- Is it virus-free?
- How much planting material do you sell?
- Do you undertake contract vine production?
- Do you export plant material?

**Ideas for Questions – TRC Traders**

- Where do you source your TRC?
- Do you go to buy or do sellers bring?
- Do you buy from the same people?
- How do you locate new suppliers?
• Do you buy TRC on credit or pay cash?
• How long do you store your TRC before selling?
• Is the quality of the TRC adequate?
• In what ways could it best be improved?
• Are people buying more TRC or less than 5 years ago
• Why do you think this is?
• Are there any particular groups that buy TRC? (age, sex, ethnic group ...)?
• Do they have specific needs?
• Where do obtain information on prices and produce availability?
• Is information shared between traders?
• What are the main benefits of trading TRC?
• What are the main difficulties you face?
• How do you/could you add value to your produce?
• If selling more than one crop which are the most profitable? Why?
• Do you provide information about the TRC to customers?
• What services would enable you to improve your business?

**TRC Processor**

• Who do you buy your cassava from?
• Do you have problems obtaining cassava?
• Do you have contracts with your suppliers?
• Is quality consistent throughout the year?
• Do you specify particular varieties?
• What proportion is acceptable for processing?
• What do you do with unusable/waste cassava?
• What amounts of TRC do you purchase?
• How is the price paid for cassava determined?
• Does it change regularly?
• Do you pay on delivery?
• How long do you store cassava?
• Would a longer shelf life of cassava benefit your business?
• What types of products are produced?
• What are customers looking for when they buy cassava products?
• What issues arise in selling products?
• What quality requirements do you have to adhere to?
• Competitive advantage compared to identified rival/substitution products
• Quantities of different cassava products per unit time
• Processing capacity (tonnes/day)
• How could research best assist cassava processing?
• Do you already work with research institutions? If yes, on what areas?

Supermarket (Direct observation)
• What root and tuber crops are on sale?
• Where do they come from?
• Is the quality good?
• How does the price compare with local markets?
• Are there any processed products?
• Who is buying root and tuber crops?
• Who supplies root and tuber crops?

It may also be possible to ask these questions of a member of staff, such as the fresh produce manager.
<table>
<thead>
<tr>
<th>Clear</th>
<th>Asks simple, easy short questions; no jargon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gentle</td>
<td>Lets people finish; gives them time to think; tolerates pauses</td>
</tr>
<tr>
<td>Sensitive</td>
<td>Listens attentively to what is said; is empathetic dealing with</td>
</tr>
<tr>
<td></td>
<td>the interviewee</td>
</tr>
<tr>
<td>Open</td>
<td>Responds to what is important to interviewee and is flexible</td>
</tr>
<tr>
<td>Steering</td>
<td>Knows what s/he wants to find out</td>
</tr>
<tr>
<td>Critical</td>
<td>Is prepared to challenge what is said, e.g. Dealing with</td>
</tr>
<tr>
<td></td>
<td>inconsistencies in respondent’s replies</td>
</tr>
<tr>
<td>Remembering</td>
<td>Relates what is said to what has previously been said</td>
</tr>
<tr>
<td>Interpreting</td>
<td>Clarifies and extends meanings of interviewee’s statements, but</td>
</tr>
<tr>
<td></td>
<td>without imposing meaning on them</td>
</tr>
<tr>
<td>Balanced</td>
<td>Does not talk too much, which may make interviewee passive, and</td>
</tr>
<tr>
<td></td>
<td>does not talk too little, which may make interviewee feeling s/he</td>
</tr>
<tr>
<td></td>
<td>is not talking along the right lines</td>
</tr>
<tr>
<td>Ethnically sensitive</td>
<td>Is sensitive to the ethical dimensions of interviewing, ensuring interviewee understands purpose of the interview, and that his/her answers will be treated confidentially</td>
</tr>
</tbody>
</table>

Source: Kvale, 1996 quoted in Bryman (2004:325)
6.1 Why ethics is importance in research

Assurance of high quality research and enterprise culture.

Applies to all staff and students doing research.

Research on the following requires ethical consideration:
- Animals
- Humans
- Human tissue
- Collection of data on individuals.

Your organisation has a duty of care towards all members of the wider community and its own staff affected by its activities.
6.2 What are Ethics?

Rules for distinguishing between ‘right’ and ‘wrong’. The rules of conduct recognized in respect to a particular class of human actions or a particular group, culture, etc. Common norms but cultures interpret differently.

Table 6.1 Ethical principles relating to research

<table>
<thead>
<tr>
<th>Trust</th>
<th>Mentoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Honesty</td>
<td>Respect for colleagues</td>
</tr>
<tr>
<td>Objectivity</td>
<td>Social Responsibility</td>
</tr>
<tr>
<td>Integrity</td>
<td>Non-Discrimination</td>
</tr>
<tr>
<td>Carefulness</td>
<td>Competence</td>
</tr>
<tr>
<td>Openness</td>
<td>Legality</td>
</tr>
<tr>
<td>Respect for Intellectual Property</td>
<td>Animal Care</td>
</tr>
<tr>
<td>Confidentiality</td>
<td>Human Subjects Protection</td>
</tr>
<tr>
<td>Publication</td>
<td></td>
</tr>
</tbody>
</table>

6.3 Examples of Unethical research

- Milgram Experiment (USA)
  [http://www.simplypsychology.org/milgram.html](http://www.simplypsychology.org/milgram.html)
- Stanford Prison Experiment (USA)
  [http://www.simplypsychology.org/zimbardo.html](http://www.simplypsychology.org/zimbardo.html)
- Vipeholm Experiments (Sweden)
- Human Experimentation, Porton Down (UK)
  [http://www.kent.ac.uk/porton-down-project/](http://www.kent.ac.uk/porton-down-project/)

**Buzz Discussion:** Does your organisation have an ethical committee?
6.4 Ethics based on the Declaration of Helsinki

- Minimal risk of harm to participants and researchers;
- Potential for benefit by society;
- Maintenance of the dignity of participants;
- Minimal risk of harm to the environment;
- Voluntary informed consent by participants, or special safeguards where this is not possible;
- Transparency in declaring funding sources;
- Confidentiality of information supplied by research participants and anonymity of respondents;
- Acknowledgement of assistance;
- Appropriate publication and dissemination of research;
- Independence and impartiality of researchers.

6.5 Vulnerable Research Participants

Some participants may be particularly vulnerable to harm and may require special safeguards for their welfare.

Particularly vulnerable participants might be:

- Infants and children under the age of eighteen
- People with physiological and/or psychological impairments and/or learning difficulties.
- People in poverty
- Relatives of sick, or recently–deceased, people
- People with only a basic/elementary knowledge of the language of the researcher.
6.6 Legal Framework, the Role of Professional Associations, and Research Councils

All research undertaken must meet statutory requirements
- Race Relations?
- Disability Discrimination?
- Human Rights?
- Data Protection?

6.7 Research Ethics for Early Career Scientists

It is recommended that you liaise with your supervisor/line manager to check if your work has any ethical issues.

The outcomes might be that there are:
- No ethical issues
- Ethical issues and assessment by an ethics committee if accessible
- Modification and review required of data collection methods.

There is a need for transparency in data collection and reporting. Plagiarism is not encouraged. It is very important to look at the cultural aspect and take into consideration the sensitivity of communities and people.

It is the responsibility of the researcher to protect the subject from any harm resulting from the research process. Regulation and guidelines play an important part in protecting the safety the subject and considers how these frameworks affect you as a researcher.

Informed consent is the overriding principle when working with human participants and that its inclusion or exclusion from a study process is subject to close scrutiny and control.

Does your country have laws related to how you handle and store data? You may need to obtain ethical clearance and find out about any data protection legislation in your country.
CHAPTER SEVEN: INTRODUCTION TO IPR

7.1 Outline of the Module
- Introduction to IPR and the importance of intangible assets including brands
- Types of intellectual property rights and protection
- The IP exploitation process
- IP infrastructure and institutions: national, regional and international
- Issues in IP value capture in tropical root and other crops

7.2 Learning outcomes for the IP training module
On completion of the module participants will be:
- Aware of the concept of IP and how it applies to TRC research
- Able to evaluate opportunities for exploiting research results
- Able to identify challenges and tensions associated with IP value capture

7.3 Why Is It Important To Know About Intellectual Property?
Research is about creating intellectual property. It is important that scientists and
researchers are aware of intellectual property exploitation, what the benefits and challenges are and whether and how to access such rights.

Researchers need to know about IP exploitation at the start of their career. It is likely that researchers will come under increasing pressure to generate financial returns from their work, such as from the licensing of a patent. It is important to know what the benefits can be off IP exploitation; whether and how to access such rights, and capture value, particularly for TRC, at the outset of the creative process.

IP is not just about scientific creations. Branding can create powerful and economically valuable IP.

Knowledge is the major factor of production in the 21st century. We operate in a ‘Knowledge economy’. Access to knowledge is at the centre of the Intellectual Property system. A functioning and supportive IPR regime is important for development and to encourage both foreign and domestic investment for the overall benefit of a country.

Modern economic life is based around knowledge and intellectual property but many developing countries’ economies are still based around natural resource exploitation and the production and sale of commodities.

In the global corporate world intangible IP assets are now far more important than physical assets. Until the mid-1980s the assets of the top global companies tended to be equally divided between physical assets (buildings, land, processing plant, equipment) and intellectual property (patents, brands etc.). By 2000, intangible assets accounted for US$5 for every US$6 of a corporation’s market value and the average value of IP rights is about 2/3rds of the value of all
intangible assets. In 1982, 62% of the market value of the top 500 companies attributable to their tangible assets. By 1998 only 15% of their assets were tangible while 85% were intangible. Their intangible assets included patents, trade secrets, trademarks and brands.

Intellectual property is not a preserve of the rich or of rich countries. IP can be created or owned by anyone but problems exist in registration in many countries. Most patent applications made in Africa Caribbean and Pacific states are by non-residents i.e. foreign multinational companies protecting their IPR in their target market.

According to Kenyan scientist and IP expert Tom Ogada⁸, ‘the low numbers of patents filed in African countries compared to other countries should not be interpreted as an indication of low levels of innovation and pioneering research and engineering activities. There is quite a lot of innovation being undertaken by African scientists and engineers in R&D institutions and universities. Most of these innovations go unnoticed because of lack of IP awareness. This is changing as the following quote indicates:

“Technology is the only way for Africa to get rich ... We don't have a proper infrastructure and we can’t compete in manufacturing ... But if you put me behind a PC and tell me to write software for a Chinese customer, than I can compete brain for brain with anyone trying to do the same thing in the US”.

Herbert Chinnery-Hesse, founder of Ghana’s SOFT tribe company (www.bbc.co.uk/worldservice/specials/1631_judges/page5.shtml)

⁸WIPO Magazine, Issue 5 2006
In fact no country is poor in intellectual capital but many ACP states lack the institutional framework to take advantage of their intellectual resources. Most patent applications made in ACP states are by non-residents (e.g. by foreign companies protecting their IPR in their target market) such as MNC pharmaceutical companies protecting their IP in their target markets.

In 2009, 156,000 patents were registered with the World Intellectual Property Office (WIPO), of which 425 originated from African countries; of these 93% were from South Africa. Sub-Saharan Africa contributed 0.28% to registered world intellectual property. In 2009, 156,000 patents were registered with the World Intellectual Property Office (WIPO), of which only a small percentage originated from ACP countries (see Table 1 below).
Table 7.1 Selected patent applications by patent office, broken down by resident and non-resident (2005-2009)

<table>
<thead>
<tr>
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<td>European Patent Office</td>
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<td>140,763</td>
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<td>Peru</td>
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<td>1,331</td>
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Source: WIPO Statistics Database, January 2011
### Table 7.2 WIPO 2006-2009 Patent Applications

<table>
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<th>2009</th>
<th>2008</th>
<th>2006</th>
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<tr>
<td><strong>OAPI</strong></td>
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<tr>
<td><strong>ARIPO</strong></td>
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<td>Non-resident</td>
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<td>Resident</td>
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<tr>
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<tr>
<td>Total</td>
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<td>10,191</td>
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</tbody>
</table>

**Source:** WIPO IP Handbook: Policy, Law and Use

Barriers to patenting by nationals include the low funding of R&D activities by ACP governments (currently less than 1% of GDP); a lack of funds to finance patent applications and maintenance; a lack of IP professionals, such as patent agents and lawyers; the lack of institutional framework, such as technology management offices in our universities and R&D institutions; and a low level of IP awareness.

Currently many ACP states have weak intellectual property rights' protection system. This requires not only improvement of the protection regime through promulgation of laws that promote IPR protection but a strong appreciation and understanding by researchers of how their IP can best be supported.
7.4 What is Intellectual Property?

Intellectual property (IP) is an intangible form of property arising out of people’s creativity, ideas and inventions which may have valuable application in agriculture, industry or commerce.

The concept of physical ownership of assets is well understood and laws exist to safeguard ownership of such property. In the case of intellectual property, rights can be obtained by the developers of the non-physical assets, to acknowledge their ownership and to reward their efforts.

As a form of property, IP has to be protected to ensure that the creator/inventor maintains the rights of exploitation. Protection of intellectual property rights (IPR) is a means to reward innovators and creators for their contribution to society through their industry and investment. This protection is, however, for a finite period of time – often 20 years. At the expiry of this period, the ownership of the IPR will return to the “public domain” whereby access to commercially exploit the IP will be open to anyone interested without having to obtain permission or make a payment for accessing the technology/process/information.

Protection is intended to provide the necessary incentives for the generation of knowledge as well as to encourage the transfer of technology through self or third-party exploitation. Intellectual property has been described as ‘a bundle of exclusive rights with exceptions and limitations granted by a legal process and normally conveyed through a certificate (except for copyrights and related rights)’. Creators of intellectual property can be individuals, groups or organisations upon whom IP rights are conferred.

Consideration of IPR and developing IPR policies is a relatively new area in many ACP universities and research stations.
In a meeting of university vice chancellors in 2002 in Kenya to develop IP policies many were initially sceptical. Many scientists connected IP to copyright and were unable to see its relevance to R&D. Others viewed the exercise as an attempt to control their IP. Tom Ogada, formerly head of Moi University’s Technology Transfer Office and now Director of the Kenya Industrial Research and Development Institute, indicated that a major cause for concern was the ‘issue of delaying the publication of research results for the sake of patentability’. There was also concern voiced over questions of ownership, benefit distribution, conflict of interests and commitments. To overcome these challenges IP awareness exercises were held and debates organised.

A number of ACP universities and research institutes are setting up IP offices and drafting institution IP policies.

7.5 Why is there Less Emphasis on IP in Agriculture in ACP States, Particularly in TRC

Research into tropical root crops tends to focus on increasing productivity (yields, pest and diseases, post-harvest handling, marketing) and improving crop nutrient content. Much research undertaken is for the common good and is largely funded from public resources (national governments and international donors) to improve food security and human nutrition. The knowledge generated is largely open-access. In ACP states, scientific plant breeding has largely been undertaken by the public sector, often stimulated by the results of international research programmes of the CGIAR centres. For example, TRC germplasm is obtained from CGIAR centres (IITA, CIAT and CIP) via Material Transfer Agreements (MTA) for local validation. The intention of such agreements is to support improved farmer livelihoods and national income. Such work does not lend itself to patenting and MTA emphasises this (for text of a typical agreement
see annexe 1). ‘Plant breeding has been seen primarily as a contributor to rural development and national food security and thus a public responsibility’.

Furthermore, TRC are mostly propagated vegetatively which makes control over ownership of the plant and capturing IP value developed via research much more complex. In addition, communities have significantly contributed to the development of their varieties and appropriation by individual researchers is controversial.

However, crop processing is more likely to lend itself to IP value capture opportunities, via patenting.
8.1 Types of Intellectual Property Protection
The appropriate type of IP protection depends on what has been created and what it will be used for. There are four main types of intellectual property: Patents, Trademarks, Designs and Copyright. In addition, in agriculture, plant breeders’ rights and geographical indications are also important. Table 8.1 summarises the main types of IP and what they protect.

Table 8.1: Summary of Types of Intellectual Property and What They Protect

<table>
<thead>
<tr>
<th>Type</th>
<th>Protects</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patents</td>
<td>protect</td>
<td>Inventions (what makes things work)</td>
</tr>
<tr>
<td>Trademarks</td>
<td>protect</td>
<td>A sign that distinguishes goods &amp; services in the market place</td>
</tr>
<tr>
<td>Industrial Designs</td>
<td>protect</td>
<td>Appearance of a product or logo</td>
</tr>
<tr>
<td>Copyright</td>
<td>protects</td>
<td>Literary and artistic work (automatic right)</td>
</tr>
<tr>
<td>Plant Variety Protection</td>
<td>protects</td>
<td>New plant varieties and seeds</td>
</tr>
<tr>
<td>Geographical Indications</td>
<td>protects</td>
<td>Agricultural produce where quality, reputation or other characteristic are attributed to a specific geographic region</td>
</tr>
<tr>
<td>Utility models</td>
<td>protect</td>
<td>Incremental inventions</td>
</tr>
</tbody>
</table>

8.2 IPR in TRC
8.3 Issues in IP exploitation
8.4 IPR exploitation in universities, national and regional agricultural research organisations
8.5 Technology transfer organisations and the patenting process
8.6 National science and technology offices
Traditional knowledge protects Genetic resources, traditional knowledge & expressions of folklore
Trade secrets protect Information (processes, ingredients)

Source: Nathan Associates Inc., 2008; IP Office, UK [www.ipc.gov.uk/types.htm](http://www.ipc.gov.uk/types.htm)

A patent grants an exclusive right to the inventor within a specified territory and for a finite duration. It gives the inventor the legal right to create a limited monopoly by excluding others from creating, producing, selling or importing the invention. This right is of limited duration from the date of filing the patent application with an appropriate IPR office. In exchange for the right of exclusion for that specified period of time, the inventor must make full disclosure giving full details describing the invention, so that when the duration of patent expires, the public may have the opportunity to develop and profit from the use of the invention.

In order for a patent to be granted it has to satisfy three conditions: being novel; contain an inventive step, and capable of use or applicable in trade, industry or agriculture. In addition, it should not contradict public law or ethics.

**Novelty**: means that it should not have been disclosed anywhere in the world and by any means. Displays of a technology at fairs or shows of such inventions render them un-patentable. A press release or even placing a copy of a PhD thesis in a library can also disqualify a new process from protection. The most common mistake people make is to reveal their invention too early.

**Inventive Step**: implies that the invention must not be an obvious modification of what is already known. If an invention can be reproduced by anyone on the street, then it is not suitable for patenting.
Industrial Applicability: The invention must be useful with some application in industry (must make a technical contribution).

Patents are granted upon submission of a successful application to an IP office by the inventor for a maximum period of twenty years. In some countries, such as Zambia, grant patent protection is currently for sixteen years.

A Utility Model is a statutory monopoly granted for a limited time in exchange for an inventor providing sufficient disclosure of his or her invention to permit a person of ordinary skill in the relevant art to perform the invention. The rights conferred by utility model laws are very similar to those granted by patent laws, but are more suited to "incremental inventions". They are particularly relevant to small-scale inventors. The scrutiny of an application for a utility model may not be as stringent as that for a patent. The period of protection is lower than for a patent. In Uganda a utility model is protected for 10 years while in Austria the time period is 8 years and in Germany three years renewable up to a total period of 10 years.

Industrial Design is an intellectual property right that make exclusive the visual design of objects that are not purely utilitarian. An industrial design consists of the creation of a shape, configuration or composition of pattern or colour, or combination of pattern and colour in three dimensional forms with an aesthetic value. An industrial design can be a two-or three-dimensional pattern used to produce a product, industrial commodity or handicraft. This has to appeal to the eye or have an aesthetic value. A Coca-Cola bottle has a specific shape that distinguishes it from other drinks bottles.

A trademark or trade mark is a distinctive sign or symbol used by an individual or a business enterprise or organisation to identify its products and/or services in
the marketplace distinguishing them from those produced or provided by others. The symbol ® signifies a registered trade mark. The symbol ™ denotes that registration has been applied for. Initial registration of a trademark is valid for ten years. It is indefinitely renewable for further periods of ten years’ each.

A collective trade mark or collective mark is a trademark owned by an organisation (such as an association), which is used by its members to identify and distinguish their products with a level of quality or accuracy, geographical origin, or other characteristics set by the organisation. Collective trademarks are exceptions to the underlying principle of trade marks in that most trademarks serve as "badges of origin"; they indicate the individual source of the goods or services. A collective trade mark, however, can be used by a variety of traders, rather than just one individual concern, provided that the trader belongs to the association.

Certification marks denote that the producer or the goods in question comply with the set standards defined by the owner of the particular certification mark. Certification marks are said to be the only evidence of the existence of follow-up agreements between manufacturers and nationally accredited testing and certification organisations. Certification organisations charge for the use of their labels and are thus always aware of exact production numbers. In this way, certification organisations can be seen to earn a commission from sales of products under their follow-up regimes. In return, the use of the certification marks enables the product sales in the market place. Marks given by the South African Bureau of Standards (SABS) and the Zambia Bureau of Standards (ZABS) are examples of such marks.

A service mark is a mark used to denote a service rather than a product. The holder of such a mark uses it to distinguish its services from the others providing
the same in the marketplace. A laboratory providing soil and leaf analysis may put a label on all results of analyses is carries out to distinguish it from other laboratories.

A **trade name**, also known as a **trading name** or a **business name**, is the name which an enterprise engaged in business trades under for commercial purposes, although its registered name used for contracts and other formal situations, may be different. For example, *Game Stores Limited* is a trade name for *Mass Discounters Limited*. An agricultural enterprise growing sweet potato which is used in the production of a sweet potato drink may be commonly known as “*Chimwando Sweet Potato*”.

A **Geographical Indication (GI)** is a name or sign used on certain agricultural and food products produced or obtained from a specific geographical location or origin (e.g. a town, region, or country). The use of a GI may act as a certification that the product possesses certain qualities, or enjoys a certain reputation, due to its geographical location and source. This mark is an “Indication of Source” or an “Appellation of Origin”. The Idaho potato is a protected name on a local and a global scale. Because of its quality of taste and texture, it is prized among the world's tubers. The certification mark is overseen by the Idaho Potato Commission. Currently, there are more than 10,000 protected geographical indications worldwide with an estimated trade value of over US$50 billion.

Aljezur is the largest and most important producer of sweet potatoes in Portugal. The sweet potato is classified with status of Geographical Indication (GI). GI status allows producers of agri-food products with special characteristics linked to their origin to effectively patent the product name.

Plant breeders' rights (PBR) also known as plant variety protection (PVP) are rights that accrue to a breeder that has developed new plant varieties. PBR enable breeders to charge royalties for protected varieties. Royalties provide a means for breeding companies to fund their work. PBR entitle the holder to prevent anyone propagating material without authority.

Patents can also be obtained for new plant varieties. Trademark protection may be relevant for the establishment of brands with commercial value. Protection of new plant varieties is normally for a term of 20 years. Both patents and PVP are enforceable only in the countries for which protection is granted.

Copyright: gives authors and other creators' automatic legal protection to benefit from the sale of their published expressions of ideas contained in a selected format, e.g. books, journals and CD-ROMs, computer programmes, etc. The right is normally held for the entire life of the author/creator plus 50 years after their death. Copyrights accrue to the originator of the works from the day of publication. There is no need to apply for copyright registration by the originator. Related rights are rights accrued through artistic performances, phonogram recordings, broadcasting, etc. of copyrighted materials. The Berne Convention for the Protection for Literary and Artistic Works (1886 and revisions) is one of the international conventions dealing with copyright and related rights protection.

Exploitation of these various IP rights in the marketplace provides the owner with an income as compensation for their work and investment in the generation of that particular IP. Protection of intellectual property rights is provided for through the laws promulgated by countries and those governed by conventions agreed to by member states for the sake of such protection.
8.2 Branding and Intangible Value

Intangible value of products has overtaken physical value as main source of income. The commodity represents very small portion of brand value. When Philip Morris paid US$12.9 billion to buy Kraft in 1988 only US$1.3bn (10%) of that price was value of physical assets i.e. food production and packaging facilities. Kraft also had an IP portfolio i.e. technological know-how, brands, trademarks, trade secrets, licences, patents. Table 2 shows the value of the world’s top ten brands.

Table 8.2: Ranking of the World’s Most Valuable Brands, 2011

<table>
<thead>
<tr>
<th>Rank</th>
<th>Brand</th>
<th>Value of Brand (US$m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Coca Cola</td>
<td>71,861</td>
</tr>
<tr>
<td>2</td>
<td>IBM</td>
<td>69,905</td>
</tr>
<tr>
<td>3</td>
<td>Microsoft</td>
<td>59,987</td>
</tr>
<tr>
<td>4</td>
<td>Google</td>
<td>55,317</td>
</tr>
<tr>
<td>5</td>
<td>GE</td>
<td>42,808</td>
</tr>
<tr>
<td>6</td>
<td>McDonalds</td>
<td>35,593</td>
</tr>
<tr>
<td>7</td>
<td>Intel</td>
<td>35,217</td>
</tr>
<tr>
<td>8</td>
<td>Apple</td>
<td>33,492</td>
</tr>
<tr>
<td>9</td>
<td>Disney</td>
<td>29,018</td>
</tr>
<tr>
<td>10</td>
<td>Hewlett-Packard</td>
<td>28,479</td>
</tr>
</tbody>
</table>

Source: Interbrand

Branding is important for creating customer loyalty. Distinctive and attractive brands vital for companies to maintain profitability, market share or loyalty of their customers. Customer loyalty plus a prominent position in market are key ingredients for commercial success. As a result, brands greet us from morning to night; they are part of our daily routine. Branded products comfort and reassure us with their presence. Like good friends we instantly recognise them. They remind us of our childhood. A brand is the name, term, design, symbol or colour that identifies a seller’s good or service. Branding is used to establish market share by convincing buyers that branded product offers a level of satisfaction not
provided by generic product. Creativity is key to developing strong, appealing brand image.

Trademarks, trade secrets, copyright and patents protect brands:

- The product’s name
- Product logo
- Slogan/strap line
- Design of the product and/or packaging
- Distinctive colours of the product or packaging
- Advertisement copy/script of commercial
- Look and feel of retail location or point of sale
- Distinctive sounds & smells associated with product
- Music that accompanies the ad campaign
- Related content created on a website.

Brand positioning involves the creation of desirable, distinctive image for a brand that has strong appeal for customers in a target market segment. It includes bespoke marketing mix programmes needed for target markets, and the type of promotional mix used, packaging & design.

Brand protection can apply to names, short verbal descriptions and visual symbols. A tangible product name and/or symbol is a trademark. This includes the words, designs, numerals, colours, smells, shape of goods or packaging. A business name is a word mark. You establish and protect rights to exclusive use of any unique trademark by registering and using it.

Branding more common in food processing sector, because it is more concentrated than the fresh produce sector. Branded fresh fruits include
bananas, pineapple and citrus owned by Chiquita, Dole and Sunquist. Vegetables such as tomatoes, mini vegetables. Successful branding emphasises qualitative attributes, particularly taste or nutritive characteristics.

8.3 Intellectual Property Rights in TRC

Intellectual Property Rights in the context of root and tuber crops in the ACP states are likely to be in the form of Patents and Plant Breeders’ Rights and Copyright for literary works (journals, manuals) etc.

The objective of many postharvest technology research programmes are often stated in terms of the development of new and improved products. Such research can produce new technology which is patentable. However, a patent does not necessarily represent a discrete step forward in the innovation process. The quality of a patent – whether measured by the research behind it, the creativity of the invention, its economic value or the clarity of its exposition – can vary widely. IP offices do not make any evaluation of an inventor’s contribution to the current stock of knowledge, beyond its judgement that the invention is original.

Rights for the Protection of new plant varieties could accrue to a scientist that has created such through plant breeders’ rights. The conditions that need to be met are that the variety must be:

**New** - not existing on the market or in the wild;
It must be **Distinct** - distinguishable from other varieties;
**Uniform** - same characteristics at same magnitude and
Must be **Stable** - reproducible characteristics over successive generations.
Protection is for a period of twenty years for most crops. These rights may have a shorter duration in some national laws especially in the Caribbean e.g. Trinidad and Tobago, where protection is for 15-18 years.

**Copyright** would accrue to a young scientist in the ACP states for journal articles and other written. It is not necessary to apply for copyright protection. However, institutional rules and regulations on publications have to be respected as violations may attract serious sanctions within institutions.

A young scientist engaged in breeding work should always recognise the source of his/her materials used in the breeding experiments. If such materials are from communities, it would be prudent to share some of the proceeds from IPR accrued from production or sale of such new varieties, etc.

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**Exercise: Who Owns IP**

*Setting the Scenario: Who owns the IP and how can it be protected*

Mary Banda, employed as a government sweet potato breeder, develops a new sweet potato variety that is not only rich in protein but in fats and oils as well minerals. It also produces a sweet and milky juice that can be extracted and drank. Further she has developed a process to convert sweet potato peel into plastic material that can be used in various applications while doing some experiments in her kitchen.

- How many IPRs can you identify?
- Who owns the IPR in the above case?
- What should she do to ensure protection of the IP?
If the creator of the IP is an employee, especially where there is no written contract/employment, and the work is done as part of their by employment and the employee uses the employer's resources, the IP belongs to the employer or the customer that paid for contracted research.

8.4 Issues in IP exploitation

Much of the IP created in ACP states in the agriculture sector either goes unrecognised, with the originator unable to capture the IPR and benefit from their work or where work is patented there is unease about the benefits of many people’s and generations’ work accruing to one organisation. Two examples of this are provided below.

Farmer Plant Breeding, India

Sebastian Joseph, a small-scale farmer from Southern India and his son, Regimon, developed a method for cross-breeding cardamom through cross pollination to increase seed pod production, from around 30 pods per bush to 120-160 pods per bush.

The new variety, Njallani, revolutionised cardamom production in the Cardamon Hills Reserve in Kerala, and most of the cardamom grown now is the Njallani variety. Clonal propagation developed by Joseph also reduces the time taken for the crop to reach maturity. In spite of developing a ‘wonder’ variety that transformed the cardamom industry, Joseph did not make a lot of money from his innovation. His innovation was recognised by India’s National Innovation Foundation and he was awarded Rs100,000 (US$2,250) in 2001 and in 2011 he received a Lifetime Achievement Award from the Indian Spices Board of Rs8 lakh (US$18,000).

Hawai‘i taro patent controversy
In the 1990s nearly all taro in Samoa died out due to leaf blight. Samoan people came to University of Hawai‘i (UH) faculty member for help. A Researcher collected taro from Hawai‘i and Palau to create new varieties which showed leaf blight resistance. UH filed for a plant patent on the 3 strains in 1991 to prevent other people using them without permission. A licensing agreement was established whereby commercial taro growers would pay US$2/seedling to cover UH costs. Growers could use strains for 3 years gratis. After that period they would pay 3% of profits. There was no charge for private use. Commercial growers had to agree to UH personnel entering their property to ascertain that they were not illegally breeding UH’s property.

Farmers criticised UH’s patented varieties, which were developed by simple cross breeding. Hawaiians say they have practiced cross-breeding for centuries and never patented the progeny. The patenting of the concept of improved bacterial blight resistance resulted in a series of protests by farmers and others concerned about the cultural, environmental and economic aspects of taro research. In 2006 two farmers wrote to UH demanding that the university give up its patents. In Hawaiian culture nothing is considered more sacred than kalo (taro). Wakea, the sky father and Ho‘ohokukalani, gave birth to Haloa, the first born, Haloa grew into kalo, the first taro plant. Their second born was man, whose destiny was to care for Haloa. Taking care of kalo, the Hawaiians prospered for over a millennia, during which time their land and water given by the gods were managed by their chiefs for the benefit of all. The concept of land ownership was introduced by Western settlers and business in 1848. Hawaiians refer to the subsequent period as ‘the Mahele’ when foreigners took over their land and carved it up, turning the gift from the gods into private property. Hawaiians saw the patenting of taro strains as a second ‘Mahele’ as it removed taro from the collective care of Hawaiians and gave it to UH.
In 2006, UH filed a ‘terminal disclaimer’ for the three patents, meaning that it would no longer make claims on the patents and the taro strains were free for anyone to use.

Source: The Taro Patent Controversy, Kauana Magazine
The Role of Taro in Hawaiian Culture, Molokai Island Times, 2006
www.friendsoftobi.org/misc/research/tarohawaii.htm

8.5 Technology transfer organisations

Most universities and many national research organisations now have a technology transfer office which is responsible for advising scientists and researchers on whether their invention is patentable as well as licensing and transfer of useful technologies to the commercial sector. The role of this office is to commercialise technologies, negotiate licenses and assist entrepreneurs with creation of start-up companies.

A premier university in the USA, the California Institute of Technology, issues between 40 and 50 licenses per year so that the “public can directly benefit from the ingenuity and creativity of our outstanding researchers e.g. drugs, devices, services to improve the quality of people’s lives (Caltech OTT brochure).
### 8.6 The patenting process

**The proposed patenting process, Makerere University, Uganda**

Inventor/originator completes IP disclosure form  
↓  
IP officer reviews invention  
(To determine whether it meets basic requirements for protection)  
↓  
Submitted to University IP Committee for approval  
↓  
IP officer submits approved application for protection to the Registrar General National Registration Services Bureau  
↓  
[In some African countries, application submitted to ARIPO/OAPI for examining]  
↓  
If successful, invention patented  
↓  
Inventor/originator, with help of IP officer explores ways to generate income

**Source:** Makerere University (2010) Process map for to-be process – INV 1.1 Protection-patenting.

### 8.7 How can you check to see if your invention is new?

To avoid a lot of costly effort in development, a researcher should carry out a search of published patents and other documents, such as trade journals, before applying.
It may be possible to do this oneself at the national patent office. The World Intellectual Property Office offers an on-line service – PatentScope.  
[www.wipo.int/patentscope/search/en](http://www.wipo.int/patentscope/search/en)

Another source of information on existing patents is Free Patents Online ([www.freepatentsonline.com/search](http://www.freepatentsonline.com/search)) which provides information on US and WIPO patent applications. Type the name of a product e.g. cassava into the search box and see what patents come up and at which patent office and country they were registered.

Google Patents [www.google.com/patents](http://www.google.com/patents) also provides information on registered patents.

### 8.7.1 Applying for a patent

If you think you have something patentable it is vital to keep it secret and not disclose it in any way.

A patent needs to be filed in each country where it needs to be protected – normally the countries in which the product is to be sold or the process licensed. Upon submission of an application, the examiners at the IP office will scrutinise the submission to see if it meets the criteria for patenting. Later, this will also be subject to wider searches to find out if this patent exists elsewhere so as to avoid infringing the rights of others. A patent system performs both protection of an invention as well as disclosure of information so that others may use it when the patent lapses. Patent information is not secret even at the time it is under protection. The technical specification can be accessed to enable a researcher to make improvements to what already exists on the market.

In Europe an inventor can obtain patent protection for all European countries under the European Convention (EPC).
Article 2 of the Paris Convention for the Protection of Industrial property obliges member states of the convention to treat nationals of fellow member states the same way as their own nationals with regard to industrial property protection. Application for protection would be done in each member county within twelve months upon the first application as it were. However, the Patent Cooperation Treaty (PCT) administered by WIPO simplifies this process by way of filing one single international application with the same effect as filing separate applications in all different countries party to the PCT. This reduces on costs for protection as well as processing of the application.

Apart from paying the necessary fees, the conditions for granting a patent have to be fulfilled and a search will be made before a patent is granted. An annual fee needs to be paid by the patent holder to maintain the originator’s property rights. It is therefore imperative for an IPR holder to find ways of exploiting his/her IP so as to justify the costs of its protection.

8.7.2 IP Exploitation

Patent exploitation can be through actual production of goods and services or through licensing whereby third parties are allowed to use the patent via payment of fees and royalties to the patent holder. However, if a patent holder deliberately refuses to allow others to exploit such an invention, non-voluntary licensing could be instituted as provided for under the article 5A (2) of the Paris Convention. There are also national laws that may allow exploitation of an invention without consent from the IPR holder especially if this is in public interest. These situations could include national defence, national economic wellbeing or public health.

The South African Patents Act 57 of 1978 provides protection to patent holders and so do the various national patent laws for Malawi, Zambia, and Zimbabwe.
A patent holder would enjoy such rights of protection for a maximum period of sixteen years in the case of Zambia. However, to be in conformity with World Trade Organisation TRIPS Agreement, this period needs to be increased to the maximum of twenty years.

It takes three to four years for a patent to be granted and takes further time to build up portfolio of patents and to successfully sell and manage many contingencies that can arise with technology licences. There is typically a 4-year lag between making an academic research discovery until first introduction of a new commercial product or process based on that discovery (Mansfield, 1991 quoted in Evenson). Slow rates of technology diffusion can mean royalties grow only slowly.
9.1 Issues in registration and IP protection

The first principle of IP rights is that the creator of IP is the owner of the rights. However, when an employee uses the employer’s resources to generate IPs, the IP rights accrue to the employer, especially if the individual or individuals in question were employed to do such work. Where a researcher is contracted to develop a process or piece of equipment or a plant variety by a customer or employer, the IP rights will normally go to the customer or employer that paid for the work. However, when an employee generates IPs in his or her own spare time with own resources and in a field totally different from his employment, that individual will own the IP. For example, if one is employed as a plant breeder but invents a novel machine or process for the production of tomato ketchup, the ownership will belong to that individual if such an invention was done with the
individual’s own resources. If one is involved in sponsored studies, it would be important to clarify the IP ownership issues at the beginning of the activities.

The University of Greenwich states its IP rights as follows:

*The University hereby asserts its rights of ownership in IP created by University Employees during the course of their employment. In accordance with the provisions of the Contract of Employment for Lecturing Staff (which includes academic and research staff) in use since 1992, all staff (and students on enrolment) employed on that contract have agreed to assign their IP rights to the university...*

*However, the University recognises the need to provide*

- Clear incentives for the creation of IP
- Clear and efficient University services which can evaluate and protect IP, and then decide on the most appropriate arrangements for its transfer into use,
- Fair and equitable arrangements for sharing any net commercial returns from commercialisation of IP, and
- Protection of the moral rights of University Employees as defined in the Copyright, Designs and Patents Act 1988.

Under normal circumstances, if a scientist is engaged by someone or an institution to develop a new piece of equipment, process or plant variety, the intellectual property rights for the product will accrue to the institution or individual that had made and paid for an order for its development. If you are engaged by a laboratory as a worker or under contract to develop a new plant variety, it is the laboratory that will own the patent. You are also under oath not to disclose such information to the competitors of the Laboratory for a given time even after leaving that particular company. You are further prevented from engaging in
production of the same equipment or materials you were engaged to do when you leave the employment of that company or laboratory. A former employee may be liable to prosecution if s/he is engaged in production of goods or services similar or the same as those of his former employer especially if this is done within a short period of leaving employment. Revelation of secrets to a new employer will also attract sanctions to the employee under the unfair competition laws.

9.2 IP Management
Most ACP states have an office that deals with IP management. For example, in Uganda, there is a Copyright Office and an Intellectual Property office, which come under the Ministry of Justice and constitutional Affairs, Uganda Registration Services bureau (URSB) in Kampala. Details about IP offices in other states can be found at: http://www.wipo.int/members/en/.

9.3 World Intellectual Property Organisation
One of the responsibilities of the WIPO is to assist least developed countries to deal with their IPR protection issues. Under its Development Sector programme, WIPO targets facilitation of the use of IP for socio economic and cultural development of the least developed countries such as those in the ACP. Through its PATENTSCOPE portal, access to full patent information is possible especially to scientists in developing countries.

A number of on-line training materials relating to IP are also available on the WIPO website (www.wipo.org).

World Intellectual Property Day is celebrated on 26th April each year. In 2012 the theme is Visionary Innovators.
9.4 UPOV
The International Union for Protection of New Plant Varieties (UPOV) is an intergovernmental organisation established by the International convention for the Protection of New Varieties of Plants for protection of plant breeders’ rights. The objective of the Convention is the protection of new varieties of plants via an intellectual property right. Currently only three ACP states are members of UPOV – Kenya, Trinidad and Tobago and South Africa.

www.upov.int.

9.5 Other IP Resources
The UK IPO has a number of resources to support learning about IP. Check out the IP Armour Game: http://www.ipo.gov.uk/whyuse/armour.htm

9.6 Summary of IP issues
Protection and enforcement of intellectual property are crucial for ACP states’ abilities to compete in the global economy. IP value capture is vitally important in the 21st century knowledge era. Consideration must be given to the need for management of IP assets, including negotiation of licenses and royalty-sharing.

Key issues include:
- Consideration of owns the IP generated by government-funded IP agricultural research activities
- Limitations to patenting in agriculture, particularly when research directed to alleviating poverty and improving food security and nutrition
- Ethics of ‘profiting’ from patenting of agricultural produce.
9.7 IP Exercise: PhD student research and IP protection

1. You are PhD student and have just finished writing your thesis, which contains an idea for storing OFSP flour that will retain its beta carotene level for 9 months. You decide there might be some commercial potential for this flour so you confide in your supervisor as to what to do next.

Your supervisor advises you to consider getting IP protection and perhaps writing to some food manufacturers to see if they would be interested. You think this would be a good idea so you make an appointment with your university’s Technology Transfer Office (TTO). Before you get started, which type of IP should first be considered?

   a) Trademark  b) Patent  c) Industrial Design

2. At the meeting with the TTO the TT manager considers your research and informs you that it may be possible to get a patent. What would you expect her to say next?

   a) “I like this idea, let me get the forms.”
   b) “This looks interesting. I would like to do some searches to see what has already been patented”.
   c) “I like this idea. Have you written this up somewhere, say, as a paper?”

3. In completing the application form the TTO manager notices you have made your invention made known to the university press officer and that the press officer has written a news article to be distributed to national and trade newspapers.

What would you expect her reaction to be?

   a) “That’s good news! It will be good for you and help our application”.

111
b) “I will ring the press officer to see if this has been published yet. If not, I will get it stopped.”

4. When you next meet the TTO manager she informs you that in undertaking some searches she has found a number of similar patents plus a couple of articles in the trade press.

What would you expect her recommendation to be?

a) “Patent applications are costly. It is best to abandon the application at this stage.”
b) “We had better review the patents and articles.”
c) “Let us make an application anyway.”

5. At the next meeting the TTO manager informs you that fortunately the press officer has not released the information and that she has told the press officer to put the release on hold until a patent application is made.

What would you expect the TTO manager to suggest as the next step?

a) “We’d better make an application immediately.”
b) “I’ll do a search to see what has already been published.”

6. You continue to tell the TTO manager that you have not told anyone about this. The TTO manager is pleased about this and tells you not to inform anyone of your ideas until a patent application has been made.

What you would expect the manager to suggest as the next step?

a) “We’d better make an application immediately.”
b) “I’ll do a search to see what has already been published.”
7. The TTO manager, along with your help, has found all the documents, both previous patents granted and applications and has made a patent application to the IP office. The IP office examines your patent application and decides it is valid. A patent grant is then issued.

What would you expect the TTO manager to suggest as the next move?

a) “Well done. I will file this away”

b) “Let’s see if we can licence this.”
CHAPTER TEN: BUILDING A COMMUNITY OF PRACTICE

One of the objectives of the EU-ACP project is to increase ‘Levels of networking with eminent and world-recognised TRC scientists and institutions to increase the impact and sustainability of useful findings for the benefit of TRC globally’.

Furthermore the development of a community of practice is considered of great importance by the ISTRC to support the development of early career scientists and development practitioners in work in tropical root crops.

To this end, a facebook webpage has been instigated where training participants are encouraged to communicate with each other; to alert members of research calls and to establish research teams. We encourage you to become a member of this group and make contact with other early career researchers working in this area:

www.facebook.com/profile.php?id=100000763661597#!/groups/221619034612519/?bookmark_t=group

In addition, course participants are offered the possibility of becoming a member of the International Society for Tropical Root Crops (ISTRC) for three years for free:

www.istrc.org
Final Proposal Presentation Content

- Concept note
  - Research proposal title
  - Background – including baseline information, fieldwork findings
  - Problem statement
  - Goal
  - Research objectives
  - Expected results
  - Activities
  - Location
  - Benefits and beneficiaries
    - Include specific gender aspects
  - Key references
  - Research questions
  - Research hypothesis
- Logframe
- Project duration
  - Gantt chart
- Organisation and management
  - Partner responsibility chart
- Budget summary
- Research methodology and analysis planned
  - Qualitative and quantitative
- Research ethics
- Intellectual property issues
- Plan for M&E and impact assessment
REFERENCES/FURTHER READING

Proposal Writing

Guide for writing a funding proposal – a selection of books to help you with writing a funding proposal
http://www.learnerassociates.net/proposal/amazon2.htm

Grant Space - Proposal writing basics webinar
http://grantspace.org/Tools/Knowledge-Base/Funding-Research/Proposal-Writing/Grant-proposals


Group of Eight (2011) Measuring the impact of research – the context for metric development

Research Methods


Cambridge University Research Methods Online teaching and learning resources http://www.cl.cam.ac.uk/teaching/0910/C00/L7/


Intellectual Property Rights

Aching, R. Leveraging agricultural science knowledge through intellectual property: Protecting Trinidad and Tobago’s indigenous food plants. Intellectual Property Office, Ministry of Legal Affairs


European Commission (2003) A worldwide vision for European research-perspectives for international cooperation in science and technology

Light Years IP Distinctive values in African exports: How intellectual capital can raise export income and alleviate poverty.

Light Years IP Value capture: Caribbean opportunities for higher income
http://www.lightyearsip.net/downloads/Caribbean%20booklet%2044%20final.pdf


Appendix 1 Understanding and Using Development Terms

Understanding terms used in the research proposal call guidelines is critical to success. The definitions below and related questions have been adapted for use from the Development Assistance Committee (DAC) of the Organisation for Economic Cooperation and Development’s (OECD) definitions of criteria for the review and assessment of development assistance, and from other sources.

**Gender equity**
Differences in economic and social indicators such as income, wealth, education, health, nutrition, and access to services and resources between women and men. These differences are referred to as gender gaps.

**Outcome**
The likely or achieved short-term and medium-term effect of a research project’s outputs.

**Output**
The product, goods, services, training or skills upgrade that result from a research project intervention.

**Lessons learnt**
Generalisations based on review (and evaluation) findings that abstract from the specific circumstances to broader situations. Frequently lessons highlight strengths or weaknesses in the preparation, design, implementation and management that affect the performance, outcome and impact of a project or programme. Lessons can be both positive and negative i.e. what to continue to do, and what not to do.
**Triangulation**
The use of three or more sources or types of information, or types of analyses, to verify and substantiate an assessment. By combining multiple data sources, methods, analyses or theories, reviewers and evaluators seek to overcome the bias that comes from single informants, single methods, single observer, or single theory studies.

**Stakeholders**
Individuals, groups or organisations that are involved or have a vested interest in a project or programme e.g. other government departments, exporters, processors, NGOs, university departments.

**Target beneficiaries**
Groups targeted by the research project to derive benefits from it e.g. farmers, women, traders, processors.
Appendix 2 Example of a Data Management Plan

Existing data
The research objectives require qualitative data that are not available from other sources. Some data exist that can be used to situate and triangulate the findings of the proposed research (e.g. surveys of poverty impacts; opinion polls), and which will supplement data collected as part of the proposed research. However, qualitative and attitudinal data are generally rare or of insufficiently high quality to address the research questions. The research objectives also require quantitative analysis of public data. Some quantitative data are available, but they are insufficiently detailed. In their current form, they would not permit as full a comparison across the cases as is desirable.

Information on data
For these reasons, the research project involves primary data collection: 1) public data; 2) semi-structured interviews; and 3) focus group discussions with people identified through profiling techniques.

1. Public data
Where possible, we will use online and/or electronic archives. This will involve extracting and processing quantitative data, including participants, objectives and outcomes. Key search terms and their translation into the relevant languages, inclusion and exclusion criteria for items, variable codes and metadata will be refined and agreed in the inception phase of the project. Preliminary searches indicate that a sufficiently detailed dataset can be generated. The researchers will log their progress, documenting potentially contentious categorising decisions, difficulties faced in categorising items, and qualitative insights which do not fit the spreadsheet format. Data will be inputted and stored in a spreadsheet format (e.g. Excel or SSPS), to ensure accessibility.

2. Semi-structured interviews with individuals
The team anticipates undertaking 25-40 semi-structured interviews in each country from a sample frame to be developed in Phase 2. Data will be collected and stored using digital audio recording (e.g. MP3) where interviewees permit. In case they do not, interviews will be undertaken in pairs to enable detailed note-taking. Interview notes will be typed up according to agreed formats and standards. Where interviews are taped and in English, the research assistant will assist with transcription.

3. Focus group discussions matched to profiles
The sample frame for the focus group participants will be derived from public data. Numbers of focus groups will depend on geographical and other variations in patterns; how quickly a robust pattern of findings emerges; and the scope for
identifying and convening the appropriate groups. Focus groups will involve two researchers, and be conducted in the vernacular. Whether recorded or not, the event will be transcribed or documented using agreed formats and standards for handling the issue of multiple voices, interruptions, labelling of participatory and visual activities. All transcripts will be in Microsoft Word. All the researchers will be fluent in English and the main language in which interviews and focus groups will be conducted, so that transcriptions will be translated into English. This will avoid unnecessary cost. During the inception Phase 2, the metadata, procedures and file formats for note-taking, recording, transcribing, storing visual data from participatory techniques, and anonymising semi-structured interview and focus group discussion data will be developed and agreed. Focus group and interview transcripts will be coded in NVivo or qualitative software suited to the different languages.

**Quality assurance**
The project leader will be responsible for overall quality assurance, with lead country researchers and the research assistant undertaking specific activities to ensure quality control. Detailed protocols for extracting data from secondary sources will be developed, piloted, refined and agreed in Phase 2. Quality will be assured through routine monitoring by the lead country researcher, and periodic cross-checks against the protocols by the research assistant. While interview and focus group protocols are being developed in Phase 2, standards and systems for note-taking, recording (if possible), transcribing and storing visual data from participatory techniques such as drawings, photographs and video, use of metadata, systems for downloading and storing SMS data (a potential follow-up research tool) will also be defined. Focus groups and interviews will always involve two researchers. Quality control for the qualitative data collection will be assured through refresher focus group discussion training during research design workshops and to junior researchers, where appropriate. The lead country researcher will check through each transcript for consistency with agreed standards. Where translations are undertaken, quality will be assured by one other researcher fluent in that language checking against the recording or notes.

**Backup and security**
Our data will need to be backed up regularly; because of possible problems with viruses and hardware. This will include regular email sharing with the research assistant, so that up-to-date versions are stored on the lead Institution’s server. Qualitative data will be backed up and secured by the researcher on a regular basis and metadata will include clear labelling of versions and dates. There are potential sensitivities around some of the data being collected, so the project will establish a system for protecting data while it is being processed, including use of passwords and back-up hardware.
Ethical issues
A letter explaining the purpose, approach and dissemination strategy (including plans to share data) of the research, and an accompanying consent form will be prepared and translated into the relevant languages. A clear verbal explanation will also be provided to each interviewee and focus group participant. Commitments to ensure confidentiality will be maintained by ensuring recordings are not shared; that transcripts are anonymised and details that can be used to identify participants are removed from transcripts or concealed in write-ups. Interviews with policymakers will not guarantee confidentiality unless this is requested, as interviewees will be expected to speak in their official capacities or institutional roles.

Expected difficulties in data sharing
Not all of the transcripts will be translated into English (see above), which will limit the accessibility of the data.

Copyright/Intellectual Property Right
The institutional partners will jointly own the data generated. Online and archival sources will be cited and clearly acknowledged in the database and research outputs. Permission will be sought from secondary sources to share the findings of the research on public websites.

Responsibilities
The project leader will direct the data management process overall, with the research assistant responsible for ensuring metadata production, day-to-day cross-checks, back-up and other quality control activities are maintained. The lead country researchers will be responsible for routine supervision of the dataset development. Data extraction, processing and inputting for the dataset will be undertaken by the in-country junior researchers. The lead Institution, lead country and junior researchers will share responsibilities for collecting and transcribing focus group and interview data. The project leader will be responsible for dealing with quality and sharing and archiving of data.

Preparation of data for sharing and archiving
The most appropriate means of sharing the data generated through the project will be online, through institutional websites. The project will have a dedicated space on the UK Institutional website to facilitate this, and all other involved institutions will also be encouraged to host the data on their websites.

Source: DFID/ERSC http://www.esrc.ac.uk/_images/Example-Data-Management-Plan_tcm8-20657.pdf
Appendix 3 Research Funding Bodies

The following information is provided to assist you seek funding from some of the key international research and development organisations. Some of the links refer to calls in 2012 which are now closed. Many donors and grant making bodies award grants annually, so bookmark the URL to be alerted to opportunities when they are next advertised. You should also seek funding from your national research and teaching institutions.

**Africa Initiative Graduate Research Grant**
The Africa Initiative Graduate Research Grant (AIGRG) is designed to support innovative, policy-relevant research on Africa conducted by graduate students enrolled in a Canadian or African university. The grant is offered to up to thirty recipients each year. Each recipient spends as many as three months in Africa or Canada conducting research funded by the program.
http://www.africaportal.org/exchange

**African Union Research Grant Call**
The AU Research Grant Call in 2012 sought proposals for research focusing on thematic priorities articulated in Africa’s Science and Technology Consolidated Plan of Action (CPA) and its Lighthouse Projects: (a) Post-harvest and Agriculture, (b) Renewable and Sustainable Energy, and (c) Water and Sanitation in Africa. The programme is financed through the Financing Agreement between the European Commission and the ACP Group of States.
http://www.au.int/en/dp/hrst/rgp/opencall

**Bill & Melinda Gates Foundation, USA**
The Foundation’s Global Development Program supports work to reduce poverty and hunger. To make grants, they periodically issue requests for proposals (RFPs) to solve the problems that are central to their funding strategy. The GDP funds aspects of agricultural development.
http://www.gatesfoundation.org/ForGrantSeekers/

**ESRC/DFID International Development (Poverty Alleviation) Research Scheme**
The Scheme seeks to fund new thinking on international development issues. Most small and medium term grant funding for development is for applied and often very context specific work only. For this scheme, applications may be for
basic research or more applied research topics. It also aims to raise the quality and impact of social science research in development. Methodological rigor is essential but it is vital that all research for development is able to demonstrate effective demand from and practical utility to policy-makers and practitioners. All proposals submitted must set out the potential impact of research on poverty reduction, show who stakeholders and potential end users of research outputs are and discuss how they will be involved in the research. It encourages multi-disciplinary research - 50% of each proposal is required to be from the social sciences. Up to the remaining 50% of funds can be invested in other academic lines of enquiry. This contributes to links between disciplines and enables new partnerships on development questions. It aims to give access to international development research funding to a broader set of actors. The partnerships created allow smaller institutions, who would not be able to develop and manage large grants, to become involved in new research. It is open to Southern institutions as bid leaders, not just as partners.

http://www.esrc.ac.uk/funding-and-guidance/funding-opportunities/international-funding/esrc-dfid/funding-calls/index.aspx

**GDN’s Global Research Capacity Building Program on Research**
An annual competition which invites the best performing researchers from Regional Research Competitions to team up with peers from around the world to collaborate on a common research project. The GRC is being piloted in 2012, followed by a full launch in 2013. Applications for GRC grants are invited from inter-regional and multidisciplinary teams of up to four early-career researchers (one applicant plus one or more co-applicants). The research topics should encourage collaboration amongst researchers from various disciplines and be of relevance to more than one region. A theme for the GRC 2012 pilot is food security. The GRC grant performance period is for 18 months. The value of individual awards varies according to various aspects of the research projects such as team size and composition, scope of the research project.


**International Foundation for Science**
The IFS provides small research grants in tropical root and other crops throughout the developing world. It’s goal is to contribute towards strengthening the capacity of developing countries to conduct relevant and high quality research on the sustainable management of biological resources, including the study of physical, chemical, and biological processes, and relevant social and
economic aspects, important in the conservation, production, and renewable utilisation of the natural resources base. To further this goal, IFS supports young developing country scientists. The criteria for eligibility for IFS support is that the scientist must be young and at the beginning of his/her research career and from a developing country, where the research must take place. The support provided by IFS is primarily in the form of an IFS Research Grant, which amounts to US$12,000 and may be renewed twice. It is intended for the purchase of the basic tools needed to conduct a research project: equipment, expendable supplies, and literature. Applications for IFS Grants must be made on the IFS Application Form.

www.ifs.se

**Leverhulme-Royal Society Africa Award**
This scheme is for scientists who want to develop a collaborative research project between the UK and research institutions in either Ghana or Tanzania. It aims to help develop and maintain excellence in science in both countries and to strengthen the research and training capacity of the African institution. The scheme provides 3 years funding towards research expenses and costs for mobility and equipment. Both the UK applicant and the Ghanaian/Tanzanian applicant must have a PhD or have extensive experience at an equivalent level; have a proven track record of training students at Master’s and Doctoral level; have a proven track record of publishing in both national and international journals; be based in the respective countries at the time of the application. The scheme covers agriculture (including animal health) and energy (including renewables).

http://royalsociety.org/grants/schemes/leverhulme-africa/

**Newton International Fellowships Scheme**
The Newton International Fellowships Scheme is delivered by The British Academy and the Royal Society. The Scheme has been established to select the very best early stage post-doctoral researchers from all over the world and enable them to work at UK research institutions for a period of two years. The Scheme covers researchers in all disciplines covered by the two academies – physical, natural and social sciences, and the humanities.

http://www.newtonfellowships.org/media/228/2012%20nif%20scheme%20notes.pdf
Research Africa
Research Africa is for African government and institutional policy makers, researchers and research managers. Research Africa aims to strengthen the African science and technology policy-making, and research community, and connects them with the world scientific community.
www.research-africa.net/getPage.cfm

Rockefeller Foundation
The Rockefeller Foundation’s Strengthening Food Security initiative includes AGRA, launched in 2006 in partnership with the Bill & Melinda Gates Foundation. AGRA is charged with sustainably increasing the productivity and profitability of small-scale farms throughout Africa. The Foundation supports AGRA across four interrelated areas of activity:
• Improving access to more resilient seeds that produce higher and more stable yields
• Promoting soil health and productivity
• Building more efficient local, national and regional, agriculture markets
• Promoting improved policies and building partnerships to develop the technological and institutional changes needed to achieve a green revolution.
The website issues calls for proposals, though they tend to focus on grain and legume crops.
http://www.rockfound.org/grants/grants.shtml

START (SysTem for Analysis Research and Training)
START is sponsored by the Earth System Science Partnership (ESSP) comprising the International Geosphere-Biosphere Programme (IGBP), the World Climate Research Programme (WCRP), and the International Human Dimensions Programme on global environmental change (IHDP). START’s grants for Global Environmental Change (GEC) Research in Africa are one-year projects in support of science-based research to build the capacity of individual scientists and their affiliated institutions in Africa.
http://start.org/programs/africangec

The Africa/Asia/Latin America Scholarly Collaborative Program
The Collaborative Tri-continental Program was launched in 2005 by the Latin American Council of Social Sciences (CLACSO), the Council for the Development of Social Science Research in Africa (CODESRIA) and the Asian
Political and International Studies Association (APISA) with the purpose of carrying out high quality social science research and enhancing the production of knowledge suitable for fostering southern perspectives on critical issues, and feeding these into global debates. The Program includes grants for advanced research. The research grants are intended to promote collaboration among researchers from the South and to stimulate analytical empirical studies on topics of relevance for their regions and for the Global South. The call for applications is open to candidates of all disciplines of the Social and Human Sciences, as well as to researchers of other sciences with projects linked to the main theme of the year. In 2012 this was “Global Environmental Change, Agrarian Transformation and Food Sovereignty in the South”.

The CGIAR Research Program on Climate Change, Agriculture, and Food Security (CCAFS)
CCAFS has an open call for proposals for a review of and strategy development for climate change communications and social learning in climate change. The call objective is to review both the current approaches to climate change communications and social learning that are applicable to the developing world and to develop a strategy for future CCAFS engagement in this area. The expected outputs include a review paper and a database of existing approaches.

The Food Security Center (FSC) University of Hohenheim, Germany
FSC’s mission is to make effective and innovative scientific contributions in research, teaching, and policy advice to eradicate hunger and achieve food security in collaboration with partner research and education organisations in Africa, Asia, and Latin America and national and international development and research organisations. FSC deals with issues of sustainable food availability, food access, food use, and food utilization. FSC awards up to four visiting Sandwich scholarships to PhD students from developing countries for a period of six months to attract outstanding PhD students pursuing a career in academia or development collaboration. The scholarship aims at increasing previously gained scientific knowledge and skills relevant to food security related issues.
https://fsc.uni-hohenheim.de/77676?&L=1
Third World Academy of Sciences
Under this scheme, grants are awarded to high-level promising research projects in biology, chemistry, mathematics and physics carried out by either individual scientists or research units in the 81 S&T-lagging countries identified by TWAS. The TWAS Research Grants Programme in Basic Sciences was established in response to the needs of promising young researchers in developing countries, particularly those attached to institutions that lack appropriate research facilities. The Programme supports research in the basic sciences. Proposals focusing on more applied research should be submitted to IFS. Deadline: 31 August.
http://twas.ictp.it/prog/grants/research-grants

World Bank – Development MarketPlace
The Development Marketplace provides early stage grant funding to support testing and development of innovative initiatives. The DM is all about bringing together social entrepreneurs to share ideas and compete against each other for funding of their projects. DM Competitions are held at the global, regional and country level. Each type of competition has specific characteristics, all loosely follow the same structure:
1. There is a call for proposals.
2. The proposals undergo rigorous scrutiny by development experts from inside and outside the World Bank who select finalists.
3. Finalists come together at a Marketplace event to present their ideas to the public and participate in networking and knowledge sharing with other applicants.
4. A jury, comprising development professionals from inside and outside the World Bank, interview the finalists and then select the projects for DM funding. The winners are announced at the close of the Marketplace event.
Appendix 4 ‘Check Your Proposal’

It can be difficult to obtain generic feedback from evaluators, other than the comments received on one’s own proposal. This section provides some general observations on proposals provided by the EC (Corn, 2010). It is also important to be aware of a research call’s evaluation criteria. You need to check whether the theme areas being considered e.g. Excellence of science and technology; Implementation and Impact carry the same or similar weight and ensure that your proposal addresses each adequately.

It is important not to:

- Focus too much effort on describing the scientific objectives and approach with insufficient attention paid to project management, impact and exploitation of the results and IPR handling.
- Submit a proposal that does not fully address the requirements of the call or is about “science for the sake of science”.
- Assume that the evaluators know about the subject you are addressing and forget to explain all the key issues.
- Overlook addressing how the results will be used; why this method is better; explaining the path to commercialization.

Typical comments from evaluators of EU research proposals (Corn, 2010)

a) Scientific and/or technological excellence

i) Soundness Of Concept And Quality Of Objectives

- The proposal does not fit or only partially fits within the call text.
- The objectives are not clear/measurable/quantified
- The objectives are not objective enough/are too ambitious/unrealistic
• The proposal mentions targets X and Y but why does it not specify other essential targets for their approach?
• Why do detailed technical objectives only come after month 6 of the project and not in the proposal?

ii) Progress Beyond The State Of The Art

• They do not explain the state-of-the-art worldwide, only their own state-of-the-art.
• They refer to an outdated state-of-the-art.
• They do not explain the advantages of their solution compared to other, existing approaches.
• Company X already has a similar device/process on the market; why is the proposed one better?
• There is no clear comparison between the proposal objective and the (potentially well identified) state-of-the-art.

iii) Quality And Effectiveness Of The S/T Methodology And Associated Work Plan

• The interaction between the tasks and work package is not described.
• It is not clear who is doing what.
• The description of methodology is very generic. How can I have confidence that they know what they are doing?
• They do not explain why they do it this way. There are better ways of doing the same.
• They have not explained how they will solve problem X. Do they even know that it will be a problem?
• There is no risk analysis and contingency plans are inappropriate.
b) Quality and efficiency of the implementation and the management

- They have not described how they will take decisions or resolve conflicts.
- The management team only meets once a year!
- What experience has the coordinator with project management?
- The consortium is missing an essential partner (e.g. end-user).
- There seems to be an overlap in expertise and tasks of beneficiaries A and B.
- Has this partner got experience with solving similar problems?
- They seem to be missing a required skill/equipment.
- They have not explained why they have a high budget for equipment and consumables.
- Why do they have such a large travel budget?
- It is not clear from the description why they need so many person months for task X.

c) Potential impact through the development, dissemination and use of project results

- They give no evidence that their solution has the potential to create the expected impact as described in the call text.
- They do not try to quantify the impact.
- They have not tried to give any targeted cost of market share figures.
- They do not compare to the competitions.
- They do not give any figures for market size.
- They only give statements that they will exploit but they give no details and no exploitation plan.
- They provide standard institutional profile or generic statements on exploitation philosophy rather than elaborated exploitation plans of
industrial partners and limited industrial participation casts doubt on real industrial commitment.

- There is no identification of exploitable project results for which meaningful exploitation plans could be developed.
- The dissemination plan is very generic.
- Intellectual property is not addressed at all (i.e. how to protect/manage/share IP generated in the project, monitoring of the worldwide evolution of IPR).
- The project is heavily based around the evolution of standards and IP is not discussed.

Final Advice from the EU/Checklist

- [ ] Read and understand the call text.
- [ ] Discuss the proposal with all partners.
- [ ] Do not submit at the last minute.
- [ ] Understand the evaluation criteria and make sure you cover the essential points.
- [ ] Explain your approach comprehensively from the very beginning (what you want to achieve; how and what for).
- [ ] More text does not equal more points. Be concise, avoid repetition and be clear! Spell out acronyms.
- [ ] Get somebody who was not involved to read your proposal and ask them their advice on how to improve.
Appendix 5 Professional Development Contract

A contract you make with yourself, by answering the following questions.

1. What do I need to become a more efficient researcher and winner of proposals?

2. What am I willing to do in order to achieve this?

3. What might get in the way of my achievements?

4. How will I overcome these obstacles?

5. How will I and others know that I have achieved this goal?

6. How will I reward myself when I have achieved this goal?