Manual on Technical Writing,

Public Awareness, Seminar Presentation and Proposal Preparation for Coconut Researchers

Paul Stapleton, Pons Batugal and Jeffrey Oliver, *editors*

"COCONUT FARMERS NEED NOT BE POOR"

Coconut farmers belong to the marginalized sector of society. Coconut is grown in rainfed areas, including the marginal and erosion-prone upland and hilly areas and in the coastal zones where the poorest people live. About 96% of coconut farmers are smallholders, tending four hectares or less, averaging about 4.5 members per household. Many of them work on land they do not own, are considered non-bankable by the formal banking sector, and most often without political clout to influence government o private sector policy

IPGRI

COGENT

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IPGRI is
a Future Harvest Centre
supported by the
Consultative Group on
International Agricultural
Research (CGIAR)

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With contributions from Paul Stapleton, Pons Batugal, Dimyati Nangju, Ruth Raymond, Jeffrey Oliver and Rudy Coronel

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The International Plant Genetic Resources Institute (IPGRI) is an independent international scientific organization that seeks to advance the conservation and use of plant genetic diversity for the well-being of present and future generations. It is one of 15 Future Harvest Centres supported by the Consultative Group on International Agricultural Research (CGIAR), an association of public and private members who support efforts to mobilize cutting-edge science to reduce hunger and poverty, improve human nutrition and health, and protect the environment. IPGRI has its headquarters in Maccarese, near Rome, Italy, with offices in more than 20 other countries worldwide. The Institute operates through three programmes: (1) the Plant Genetic Resources Programme; (2) the CGIAR Genetic Resources Support Programme; and (3) the International Network for the Improvement of Banana and Plantain (INIBAP).

The international status of IPGRI is conferred under an Establishment Agreement which, by January 2003, had been signed by the Governments of Algeria, Australia, Belgium, Benin, Bolivia, Brazil, Burkina Faso, Cameroon, Chile, China, Congo, Costa Rica, Côte d'Ivoire, Cyprus, Czech Republic, Denmark, Ecuador, Egypt, Greece, Guinea, Hungary, India, Indonesia, Iran, Israel, Italy, Jordan, Kenya, Malaysia, Mauritania, Morocco, Norway, Pakistan, Panama, Peru, Poland, Portugal, Romania, Russia, Senegal, Slovakia, Sudan, Switzerland, Syria, Tunisia, Turkey, Uganda and Ukraine. Financial support for IPGRI's research is provided by more than 150 donors, including governments, private foundations and international organizations. For details of donors and research activities please see IPGRI's Annual Reports, which are available in printed form on request from ipgri-publications@cgiar.org or from IPGRI's Website (www.ipgri.cgiar.org).

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Foreword

Coconut research has been constrained by lack of adequate institutional and financial support to make it relevant and effective. This is partly due to the inadequate and discontinuous funding of this vital activity. The International Plant Genetic Resources Institute (IPGRI) and its International Coconut Genetic Resources Network (COGENT) believe that if research activities and research results can be reported effectively, it could generate more public awareness, concern and action for supporting the coconut industry in general and coconut research in particular.

In the last ten years, COGENT and its 38 member countries and partner institutions have conducted the following activities to strengthen coconut research capability: organized 34 country missions involving 24 experts to help 29 countries conduct research needs assessment and to identify priority research and training activities; conducted 37 workshops and meetings involving 530 coconut researchers to share information and technologies, discuss issues and common problems and opportunities and how to address them; conducted 25 training courses involving 269 participants from 41 countries; supported 156 research projects in 32 member countries; developed the International Coconut Genetic Resources Database (CGRD) containing the passport and characterization data (including molecular marker data) of coconut accessions worldwide to help coconut breeders effectively select materials for developing improved varieties; conserved 1416 accessions in national coconut genebanks and collections in 23 countries; established a multi-site International Coconut Genebank (ICG), consisting of four regional genebanks; and promoted *in situ* and on farm conservation in 15 countries worldwide. Recently, COGENT has been developing cryopreservation techniques for long-term conservation; evaluating farmers' varieties to identify farmers' varietal preferences and adapted ecotypes for sustainable production. More recently, COGENT has initiated its "Poverty reduction in coconut growing communities" project to identify, package, test and share profitable coconut-based village-level technologies from around the world to support the testing of sustainable livelihoods interventions in coconut growing communities and to test the hypothesis that coconut farmers need not be poor.

The above activities and other initiatives in the future need to be reported adequately and effectively to generate interest and support to coconut research. This ”Manual on technical writing, seminar presentation, public awareness and proposal preparation for coconut researchers” will provide coconut researchers a guide on how to effectively write and present, in high-quality form, research activities, research results and proposals so that these could be better appreciated and supported by peers, research administrators, partner institutions, donors and the general public. In preparing the manual, the editors largely used materials in the IPGRI-organized workshops on technical writing held in Los Baños, Laguna, Philippines in September 1998 and in Hanoi, Vietnam in March 2002. It is also hoped that national programmes can use this manual to train coconut researchers to increase the cadre of effective researchers worldwide.

We thank the Common Fund for Commodities for funding the pre-testing of this manual at the technical writing course in Merida, Mexico on 6-8 November 2003 and the publication thereafter.

Percy Sajise
Regional Director
International Plant Genetic Resources Institute
Regional Office for Asia, the Pacific and Oceania

Contents

PART V: WRITING PROJECT PROPOSALS

Introduction

Few scientists find communicating easy. For some, it is a tremendous effort. English has become the common language of science but the majority of scientists are non-native English speakers. So communicating in science is even harder. There are many guides written to assist in the process of communicating in science, but most are written by English speakers for English speakers. This guide sets out with the non-native English speaker as the primary target – the scientist in a developing country trying to produce material of a standard that will be taken seriously throughout the world.

This Manual came about through the initiative of Pons Batugal, the Coordinator of the International Plant Genetic Resources Institute's International Coconut Genetic Resources Network (IPGRI-COGENT). It was developed out of material that was prepared for a workshop in March 2002 in Hanoi, Vietnam with members of COGENT. It aims to give a straightforward account of many aspects of communication in science, like writing project proposals and putting together a presentation, which many researchers, especially from developing countries, find difficult.

This guide does not set out to be exhaustive. Rather it is drawn from many years' experience training scientists from countries all over the world in different aspects of communication. Much of the material is original, but some is drawn from the websites of other organizations. While every effort has been made to acknowledge those sources, I apologize if I have missed some attributions. I have not included many specific website references. Since these go out of date quickly, a simple search on "editorial resources" or "science writing" will turn up a whole host of recent material.

The Manual is arranged in several parts and attempts to give an introduction, in the simplest terms, to many of the most common aspects of communication in science today. Part I of the Manual looks at arranging ideas and preparing to write. This section gives a short introduction to the need for logical thinking, looks at the approaches to writing scientific English and deals with some of the detailed requirements of science publishing. The second part of the Manual looks in detail at the structure of technical writing for refereed journals, conference posters and theses, the most important writing that many scientists do. This is followed by a section on making presentations, and area that many developing country scientists are often very weak in. Failing to deliver a convincing paper at a conference at a meeting can have a very significant impact on any scientist's career.

An area that many scientists neglect is making their work available and interesting to the wider public. With increasing competition for resources, making donors, policy makers and the wider public more aware of the impact of one's work will increase its chance of being funded. Part IV deals with using practical public awareness in science, with a simple introduction to the idea and examples of public awareness tools like press releases.

The final part of the Manual deals with proposal writing which is an essential part of most scientists' work – finding funding to continue work. The four chapters in this section break down the research proposal into its separate elements and describe what donors expect to see in each part. This is followed by an explanation of logical frameworks, and how to construct them. Concluding the section are chapters on developing projects for IPGRI and the perspective of the Asian Development Bank on proposals.

I would like to thank Pons Batugal, the coordinator of IPGRI-COGENT, for his energy in getting this material in print, despite my best efforts to avoid doing the work, and to Jeffrey Oliver, Communications Officer of the IPGRI-APO office, for his attention to detail.

Paul Stapleton
Science Communicator

PART I
FUNDAMENTALS of COMMUNICATION

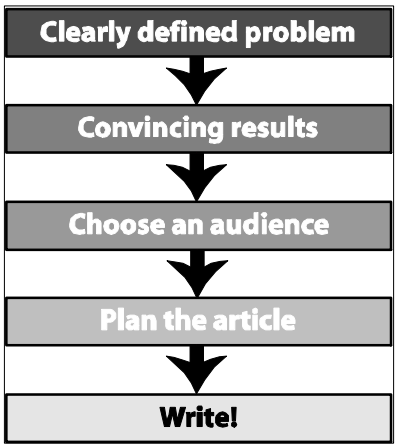
Chapter 1. Communicating in Science

Paul Stapleton

Science and scientific research are essential components in the process of development. Developing skills in communicating the results of that science are just as important as the research skills themselves. There is a massive overload of information in the scientific world today. Learning the techniques of writing up scientific research and being able to communicate that research will allow scientists of developing country to take their place in the world information order.

Scientific communication

What is scientific communication? To many people it involves sitting in a seminar listening to someone talk, or sitting in a library reading a journal. This is a passive, one-way process. But successful communication should be more than that. It should be at least a two-way process, where the person needing the information is able to exert some influence over the supplier of the information.



Usually information flows from the top down. What is needed is the ability of individuals in the system to direct information in a suitable form to a target audience. To do this, the scientist must understand the needs of the audience; extension workers need information in a form different to the audience of an international conference. Information must flow in an understandable form between the producer and the consumer, from the source to the target.

Most communication today is done in the written form - even the internet and computerized information services deal in words. There are many avenues of communication that a scientist can use to deliver information (see box).

Avenues of communication
research journals
websites
books
reviews
seminars and conferences
television
radio
banners and billboards
cartoons
newsletters
leaflets
extension groups

Effective communication is based on the people involved in the system, but none is more important than the interpreter in the middle, who is able to see what sort of information should go where, and to the best effect. Most scientists do not communicate well or write well, but good communication is extremely important in science.

There are many types of scientific publication; research journals, conference proceedings, reports, newsletters, web pages, etc. Research journals are the most common way of communicating in science. When published, they are widely disseminated, but in their secondary form, where titles, or titles and abstracts, are published in collections - their readership is increased to the worldwide level. Web publication has the same effect.

Publishing research results internationally stimulates debate and encourages further work on the subject. It will produce information exchange, advance knowledge and open up new opportunities for research. The findings in most international research articles are believed to be facts because they are known to have been refereed by experts in the

field before they are accepted for publication. The high standards usually required of articles in international and even regional journals make it difficult for the inexperienced research writer to have their papers accepted.

The skills of a scientist are assessed by the quality of his/her research. But most people see this research in the scientific press. Many institutions use the papers a scientist has published as a measure of his/her success and a basis for promotion. If scientists do not publish papers from his/her research in good quality journals, they cannot obtain funding for their research. A system like this is good for science. The whole basis of the system is to make available work that is worth publishing. Scientists are not being rewarded for writing a paper; they are being rewarded for performing such good work that they can write a publishable paper about it.

Logical thinking

Critical analysis

Any writing in science needs the capacity for critical analysis, that is, analytical thought. Very little that is written in science is accepted outright. Most statements have to be supported with evidence, unless they are self evident or widely accepted, for example DNA is a double helix or the speed of light cannot be exceeded. However, what is obvious in one field is not in another. What is evident to one person, like a researcher, is not obvious to another, like a donor. Thus, when you are writing anything, you need to consider your ultimate objective and lay a clear trail of evidence that support the claims that allow you to reach your objective.

When you are writing, you need to establish an air of confidence and mastery of your subject that will allow your reader to believe the claims that you make. To do this, you must use evidence to construct a logical structure in your document that leads inescapably to your conclusion. However, you must understand the level of knowledge that your reader has and write within that capacity. If your reader cannot understand your arguments, then they will not be inclined to believe your conclusions. You need to use language and science on a level with the lowest common denominator. However, it is also a mistake to use language that is too simplistic. This again will lose your audience by undermining your credibility.

You must learn to distinguish among a mass of information and select that which is most relevant to your argument. Use a series of findings or statements to come to a clear conclusion. This conclusion must match your originally stated objective.

Expect your reader to ask at every stage, "Why should *I* believe *that*?" Alternatively, the reader, such as a donor, might ask, "Why should *I* do this," and a supervisor might ask, "Why did *you* do this?" Again, you might need to convince your supervisor that you should be allowed to do something, i.e. "Why should *I* let *you* do this?" Or answer the question, "What have you done that is *significant* in the past year?"

All these situations require the practice of critical analysis and selective thought. These skills only come with practice, although some basic principles can be learned. Another invaluable way to understand the process is to look at examples that are both good and bad, and apply this analysis to your reading at all times. Much material that is written is also flawed in some way, so you need the confidence to look at a piece of text and be ready to recognize the errors it may contain. On the other hand, you should also look out for pieces that particularly impress you. When you find one, keep it and analyse it, even copying its basic structure for your own use later. As you become more confident, you will learn to modify standard formats to suit your purposes.

The hypothesis

If you are writing any sort of paper, you will need a central theme or hypothesis. In a

research project, the central theme is what you want to test; you can describe it as 'a reasonable scientific proposal'. It is not a statement of fact but a statement which takes us just beyond known facts and anticipates the next logical step in a sequence of facts. It has to have two attributes to be useful in scientific investigation: it must fit the known facts and it must be testable.

To comply with the first attribute, you must have read the literature to know the facts. To comply with the second, you have to do an experiment. Your job in the 'Introduction' is to convince the reader that you have chosen a sensible course.

Your writing should have a clear objective set out in a logical form that presents a reasonable expectation of the results based on the known facts. You should avoid writing about work that was done to 'see what happened', or 'it seemed of interest to examine this phenomenon further', or 'There are no reports in the literature of a study of this, so one is presented here'. Few people in science have time to read such unfocussed work.

Developing an introduction

An introduction should start out with a broad definition of the area you are working in, and then quickly zero in to form a logical series of statements that leads to your central objective. Any introduction is a very tight, clearly defined piece of writing the moment that you settle on the final form of your hypothesis.

Making good arguments

Your hypothesis, premise or objective gives you the logical framework to arrange your evidence in support of your central claim. In the world of research you are expected to make claims that you think are new and important enough to interest your readers. You are also expected to explain those claims as if your readers were asking you why you believe them.

The readers will always question your evidence and your logic so you must explain your thinking very clearly, breaking your argument into subsidiary claims that are supported by further evidence. You need to show the reader why a particular piece of evidence logically supports your particular claim. Readers will also think of objections and alternatives, so you must answer them as they are likely to arise.

The answers to the questions you ask yourself make up your argument, which contains:

- **A claim** - this states what you want your readers to believe
- **An evidence** - this supports your claim with reasons why the readers should believe.

Claim

The central element in every report is its major claim or its main point. You cannot just make the claim. You need:

- Good reasons for the claim; and
- Reliable evidence to support it.

Your evidence needs to be substantive, contestable, specific and explicit:

- **Substantive:** having a firm basis in reality and so important or meaningful
- **Contestable:** able to be defended during an argument
- **Explicit:** clear and detailed, with no room for doubt

Evidence

Your claim is supported by evidence, which must be accurate, precise, sufficient, authoritative (reliable because it is true and accurate) and representative.

Accurate (correct)
Your data must be correct above everything else. Any suspicion that your information is not accurate will make the reader disbelieve your work. Ask yourself, "What evidence am I certain of?" Then question what evidence could be more reliable. You can include questionable evidence if you acknowledge its quality, and you explain anomalies in the data. In fact, highlighting such problems reinforces the credibility of your other data.

Precise
You should be precise in presenting your data or making claims, using levels of precision that correspond to your data-gathering techniques. Do not be over-precise, or too vague, and always quantify your claims. You should also present evidence that the readers can understand easily. You need to present data in the form that best illustrates what you want to demonstrate. You also need to digest raw data so the underlying patterns and trends are obvious. This is usually done with statistics, tables, figures and graphs. Spell out what you want readers to understand. Do not assume that a trend that is obvious to you will be obvious to the reader. Introduce a figure or table by pointing out what you want readers to notice, and explain why this is interesting.

Sufficient
You need to present enough data to convince your reader that the claims you make are based on enough evidence. For example, many agriculture journals will not accept papers based on data from one growing or cropping season. They want to see demonstrated repeatability in the data.

Authoritative
All of your claims need to be supported by evidence, either your own data or from the literature. Reference material needs to be primary, i.e. from journals or conference proceedings, and current. A list of references that is out of date is not convincing. Secondary sources, such as book references, also need to be authoritative rather than popular. Check in particular the dates of conference proceedings - there may be a long gap between the conference and the final publication.

Representative
Data are representative when their variety reflects the variety of the population from which they are drawn. Information needs to reflect the range of available evidence. Taking the opinions of a few members of a population will not represent the general view, and taking data from a few trees will not represent the true variation. Readers need to feel sure that your evidence is reliable because it included both ends of the scale of variety.

Chapter 2. Writing Scientific English

Paul Stapleton

The most important thing in writing is that your message is clear. Style is secondary to the message. The content of the material is most important, and style should never become more important. Today, English style and scientific English style are different. English is a difficult language to write well; even native English speakers have problems. Editors will correct your language but to do that they must be able to understand what you are trying to say.

Try to be as definite and specific as possible when you are writing. Avoid all vague statements. Be sure of what you want to say. Good scientific style consists of these qualities:

- Rational construction of paragraphs and sentence
- Logical progression
- Absolute accuracy of expression
- Directness
- Conciseness
- Clear expression

You can learn these with practice. Read magazines like 'New Scientist' and other semi-technical material that uses clear English. Applying the following approach will make your English writing clearer and easier to read. Most of the techniques are purely mechanical and easy to use (see Annex 3.1):

- Use simple language and direct expression
- Consider both active and passive voices
- Consider personal pronouns
- Minimize the use of abstract nouns
- Avoid using nouns from verbs
- Avoid compound nouns
- Use short sentences
- Avoid errors of meaning and form
- Define jargons and abbreviations

Use simple language and direct expression

Always choose the simplest way of saying something. Choose a simple word rather than a difficult one; a concrete word over an abstract one; a familiar word over a rare one. Do not be influenced by the modern scientific literature. Much of it is extremely badly written. Never be impressed by a complex, hard-to-understand sentence. It is not a good sentence. Good scientific writing communicates in simple terms, even though the subject may be complicated. Repeated use of unnecessarily difficult, remote language not only prevents the subject being understood, it also makes the text hard to read.

Use a vocabulary level and language appropriate for your reader. The people reading an article in a research journal will have a different level of understanding compared to someone who reads extension bulletins. Adapt your language. If you are not certain your reader will understand a technical term, use the term with a more common synonym or a definition.

Do not try to say a thing in a complicated way. Choose the simplest expression. You are more likely to get it right. Instead of writing:

"The efficacy of the nutritional supplement utilized was undeniable."

It is much better if you write:

"The drug used was very effective."

Use simple verbs like 'use' instead of 'utilize'. Cut out phrases like "It is interesting to note that..." Many writing guides and grammar texts give lists of verbose words and the shorter alternatives. Always try to use the easiest expression, and avoid 'buzz words', words that are suddenly popular but are not well defined, such as 'empower', 'bottleneck', 'backstop', etc.

Consider both active and passive voices

Most books on English writing will tell you not to use the passive voice because it makes text boring and dull. This is true, but in scientific style the passive voice is often essential. In the phrase: "We detected the mutation" (active), it is clear that the subject (we) did something (detected) to an object (the mutation). In the passive voice the object comes first and has something done to it by the subject: "The mutation was detected by us." However, in the passive voice you can also say: "The mutation was detected." You can leave out the subject and the sentence still makes sense. And that is why the passive is useful in scientific style. Because most of the time the subject is you, the writer. The subject is not important. Readers do not need to be told that "you detected the mutation". They already know that, because your name is on the title page of the paper.

Use the active voice where it fits, because it will add variety and interest to your writing. But you should only do it where the subject is important:

"Stapleton (2003) found that..."
not:
"It was found by Stapleton (2003)..."

Consider personal pronouns

If you use the active voice you will have to say "I …" and "We did something". There is nothing wrong with this. If you did the work, or if you think something is right, then you should say it. Do not say "It is felt by us that..." Classical science writing encourages the use of 'impersonal' language, at the expense of readability. Using the personal pronouns sometimes makes a more lively style and easier reading.

Minimize use of abstract nouns from verbs

These are also called abstract nouns. Using too many abstract nouns is the single most common fault in science writing today. After vocabulary, the greatest barrier to reading and comprehension is using nouns instead of verbs. What you are doing is hiding verbs in nouns. This is called nominalization:

Nominal	*Their recommendation was to plant earlier.*
Verbal	*They recommended earlier planting.*
Nominal	*Varieties must have tolerance for environmental stresses.*
Verbal	*Varieties must tolerate environmental stresses.*

You can make a noun from a verb quite easily. 'To collect gives you 'collection', a normal English word that has its uses, but because it is a noun you have to put a verb with it, e.g. "Germplasm collection was done" [or carried out]. Often it is much easier to use a verb and say that something was collected. So you do not write: "Germplasm collections were done." You write: "We collected the germplasm."

Other common examples of this are 'production' from 'produce, 'interpretation' from 'interpret'. Using such abstract nouns too often produces long sentences and text that is hard to understand quickly. The extra length comes from the length of the '-tion' nouns and from the need to use extra verbs. The abstractness of these nouns and the usually passive, weak verbs that must go with them complicate the text. Replacing an abstract noun with a verb gives you more chance to bring the subject into the sentence and make it more alive and specific.

Abstract nouns are extremely common and easy to spot. When you are reviewing your manuscript, highlight all the nouns ending in -tion, -ance, -sion, -ment, -ness, -cy. Usually you can replace them by rewriting the sentence using the original verb. These changes may also shorten a sentence and put its elements into a clearer sequence. For example, take:

> *"It is possible that the pattern of variation now found at the site is **a reflection of** past disturbances."*

Better, and using fewer words, say:

> *"The pattern of variation at the site now **may reflect** past disturbances."*

Avoid using compound nouns

These are simple to define. They are strings of nouns put together to form a phrase. To some they sound impressive. But in fact they hide the meaning of what you are trying to say, and also make the message unclear. There may also be more than one way to interpret what you are saying. Poor writers and poor communicators frequently use these words.

Avoid these compound nouns wherever you can. They are very hard to understand and reflect a terrible style. Use simple English. Note that compound nouns are usually made up of nouns from verbs, or abstract nouns. Sometimes you can go back to the verbs and make a proper sentence, with a clear meaning. For example, look at the way you can build up a compound noun. We can start with:

> *Research*
> which leads on to
> *Research dissemination*
> then
> *Research result dissemination*
> then
> *Research result dissemination improvement*
> and
> *Research result dissemination improvement methods.*

This final phrase is very hard to understand and 'unstrung'. It is much easier to use verbs and break it up to say:

> *Methods of improving the dissemination of the results of research.*

Unfortunately, compound nouns are too common in science writing today, and they are a sign of writers with a bad style. Two nouns together are easy enough to understand; more, and the meaning can be lost. As you are looking through your text, mark the places where two or more nouns occur together and go back and try to rephrase the sentences using verbs instead of nouns.

Use short sentences

Avoid long sentences where you can. Use short sentences instead. Sentences should average no more than 20 words. Keep the main clause short and place it at the beginning or end of the sentence. Examine each sentence you write to see if:

- All the ideas in it are related;
- The sequence of ideas is logical;
- The main idea is easy to find; and
- Subject and object are close to each other.

However, in scientific papers it is sometimes hard not to use a long sentence. In that case you should go ahead and use one and not worry.

How long is a long sentence? Any sentence that is more than two typewritten lines may be too long. However, remember that a mixture of short and long sentences gives variety and interest to your writing.

The problem with long sentences is that you have to remember so much before you get the message. There are several types of too-long sentence. Below are three common examples.

1. Too much information in the sentence

There is so much information all strung together that it is impossible to understand the message. Go back and look for a place to split the sentence up into separate parts. Try to read a long sentence straight through, then ask yourself if you understood it all. The main problem is the lack of punctuation. Breaking the whole thing up often makes the sentence more understandable. It may take up more space and use more words, but it is worth the effort because it is clearer.

2. Hiding the subject under conditions

Often you may have a list of conditions that describe the main topic of the sentence, but by including them all you bury the main statement. Sometimes you can make a series of sentences, but at other times it may be better to take the conditions out of the way. You can either start a new sentence after you have said the most important thing, or make a list.

3. Qualifications

This can also be called 'hedging', when you are not certain of the truth of what you are writing, so you use conditional verbs and qualify what you want to say. It is good to say 'perhaps' when you are not sure of something, but it can be taken to extremes. You can still stop short of being too definite by using a single conditional.

Avoid errors of meaning and form

Make sure you understand the meaning of all the words you are using. Do not use a long word that you think sounds impressive unless you are certain of the meaning. If you have used it wrongly you will look very foolish, and also hide what you are really trying to say. It is much better to use several simple words that give the proper meaning and are easily understood. There are also many words in English that look almost the same, but have different meanings.

Define jargon

Jargon is 'a system of signs or characters having an arbitrary meaning', which means that if you do not know what the jargon stands for, you cannot understand the sense of the sentence. All scientific disciplines have their own special language of technical words, but you must be very careful not to use them in your manuscript without defining them.

English has become the 'universal language' of science because so many people understand it nowadays. But it is all useless if the reader cannot understand the specialized terms you are using. You might think that everyone knows what they mean, but you will be wrong. The researchers outside your field will not understand the terms. So be careful. Review your manuscript to make sure you have defined all the 'jargon' that you may have included.

Annex 2.1. Example of poor writing and alternatives

Original English	Error	Corrected text
The Coconut Authority launched the programme in 2004 to uplift the plight of the poor coconut farm households and enhance rural area food security.	• wrong use of words • hyphen needed • compound noun	The Coconut Authority launched the programme in 2004 to improve the livelihoods of poor coconut-farming households and enhance food security in the rural area.
To implement the programme, the Authority designed coconut farm utilization models.	• qualifier before subject • "implement" verbose • compound noun	The Authority designed models for the coconut farmers to use to put the programme into practice.
To promote sustained technology adoption that was introduced in this programme, there is an attempt to elicit coconut farmer participation in farm development monitoring evaluation and earnings-related livelihood improvement.	• noun cluster - verbose • impersonal/verbose • noun string • compound nouns and nouns from verbs	To increase the time that the farmers used the introduced technology, Authority staff encouraged the coconut farmers to join in evaluating and monitoring how farms are developed as well as how livelihoods are improved through increased earnings.
It was assumed by the Authority that the programme, if it were implemented correctly, the weather patterns remained standard, support was provided as required and the people understood the objectives, would be a success.	• passive voice • subject hidden by a string of qualifications	The Authority assumed that the programme would be a success if it were implemented correctly, the weather patterns remained standard, support was provided as required and the people understood the objectives.

Chapter 3. Numbers, Units, Abbreviations and Nomenclature

Paul Stapleton

There are many different ways of presenting and using numbers, units and abbreviations. Science publishers are very particular in the way they present data, but different journals and institutions follow different rule. The styles used in science writing are much specialised and differ from those used in the humanities and journalism. This chapter presents the most common rules and methods of handling numbers, dates, units, nomenclatures, abbreviations, etc.

Numbers

A number is more quickly read and understood than a word. Compare reading "One thousand, nine hundred and ninety nine" with "1999." Because of this, most journals recommend that if there is no unit, then write out the numbers from one to nine in words, and use figures for numbers of 10 and above, e.g. `more than two' and `over 500'. In a series with some numbers over 10 and some under, use numbers, e.g. 4 dogs, 8 cats, 25 cows.

A very common standard is to use numbers that designate anything that can be counted or measured:

1 tree *3 fields* *24 cows* *2 examples*

In either style, always use a word rather than a figure to start a sentence:

Sixty percent of the sample was …

Both styles recommend using numbers with all units of measurement, even those below 10:

2 ml *5 m* *10 kg* *5000 ha*

In technical and scientific papers, put a single space in between the number and the unit (i.e., 5 ml), unless the style guide specifically states otherwise.

Figures between a thousand and below ten thousand should be written without any space, comma or point:

1000 and 7689

Five-digit numbers should be written with a space after the third figure:

29 567

There is a very good reason for this. In some parts of the world, the decimal point is marked with a comma, but in other parts it is a full stop or period, so 10,500 means ten point five to some people and ten thousand five hundred to others. To avoid this, the Systéme International d' Unités (SI) recommends using a point for the decimal (10.5 = ten point five) and a space for every three zeros from the decimal (21 000 = 21 thousand; 42 000 000.5 = 42 million point five).

In a table or column with a mixture of values, 4-digit figures should also be written with a space so they line up neatly:

23 678
10 456
6 990
3 000

It is better to use a word instead of a lot of zeroes:

25 million, not 25 000 000

Adjust your units to avoid too many zeroes in figures less than one, e.g. 45 mg, not 0.0045 g. Another way to avoid this is to use numbers with factors of 10 after them:

3 500 000 = 3.5 x 10^{6}

SI recommends using `negative exponential' with units, e.g. 560 mg kg^{-1}, rather than 560 mg/kg. Using more than one slash mark is confusing and can be avoided by using the exponential form:

11 kg/ha per month or 11 kg ha^{-1} mo^{-1}

The numbers in ranges are usually written in full, e.g. 1992-2003, to avoid any ambiguity. Some journals require the form 1982-03. Check in the instructions to authors. Note that the American usage '1994 through 1996' is very convenient as it means 'from the start of 1994 up to the end of 1996', although some journals will discourage this use.

Dates

It is most clear to write dates out using a word for the month: 10 November 2003 or 10 Nov 2003. Using all numbers can be confusing, as 10/11/2003 would be read as 10 November in much of the world but as October 11 in the USA.

No punctuation is needed in a date (4 December 2003), nor is it necessary to write 4th December.

It is most logical to use the series day, month, year, as that goes from smallest to largest, but the International Standards Organization (ISO) recommends an all numeric expression (often in computer use):

20031110 or
2003-11-10 or
2003 11 10 also
2003 11 10 1240 (time) and
2003 11 10 1240 45 (time and seconds)

Units (International System of Units)

Most journals have very strict rules about using units. The units they recommend will almost certainly be metric or SI units. You should be familiar with most of these. You should always express all your quantities in terms of SI. If you are using traditional or local units, or a unit that may be well known in one country only, you should always include an SI equivalent so that other workers can fully understand the amounts you are talking about.

SI base units and symbols

SI was adopted by the eleventh General Conference on Weights and Measures and endorsed by the International Organization for Standardization in 1960. The system is an extension and refinement of the traditional metric system and is superior to any other in being completely coherent, rational and comprehensive. In the system there is only one unit for each physical quantity and the product or quotient of any two SI units yields the unit of the resulting quantity; no numerical factors are involved. The system is based on seven basic and two supplementary units, as shown below:

Base units

Length	metre (meter)	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	k
Amount of substance	mole	mol
Luminous intensity	candela	cd

Supplementary units

Plane angle	radian	rd
Solid angle	steradian	sr

Prefixes for SI units

Fraction	Prefix	Symbol	Multiple
10^{18}	exa	E	1 000 000 000 000 000 000
10^{15}	peta	P	1 000 000 000 000 000
10^{12}	tera	T	1 000 000 000 000
10^{9}	giga	G	1 000 000 000
10^{6}	mega	M	1 000 000
10^{3}	kilo	k	1 000
10^{2}	hecto	h	100
10	deca*	da	10
10^{-1}	deci	d	0.1
10^{-2}	centi	c	0.01
10^{-3}	milli	m	0.001
10^{-6}	micro	µ	0.000 001
10^{-9}	nano	n	0.000 000 001
10^{-12}	pico	p	0.000 000 000 001
10^{-15}	femto	f	0.000 000 000 000 001
10^{-18}	atto	a	0.000 000 000 000 000 001

*May be spelled as 'deka'

Nomenclature

The dictionary defines `nomenclature' as `a system of names for things; terminology of a science, etc.; systematic naming'. There are different systems of nomenclature for different fields of science. There are nomenclatures for animals and micro-organisms, chemical and biochemical nomenclatures, physical and mathematical nomenclatures.

The important point is that each system of nomenclature is well recognized, published and understood by a wide circle of scientists, with strict rules, so that any new name made up under these rules is instantly understandable to anyone who knows the rules, or who knows where to look for them.

Very often, the `Instructions to Authors' of a journal will have detailed explanations of the nomenclature needs for papers submitted to that journal, and the editors of the journals will be glad to give you advice.

Species names

Taxonomy is a complicated subject, and the names of particular species need to be given very clearly in any paper you are writing. You should take care to find out and give the complete species name (i.e. the full binomial name in Latin) in the title, abstract and the first time it appears in a paper, in italic type, or underlined. Afterwards the generic name may be abbreviated to a single letter, e.g. *Escherichia coli* becomes *E. coli.*

However, as mentioned, if two or more genera with the same initial letters are studied, abbreviations such as *Staph.* and *Strep.* should be used to avoid confusion.

The genus name always begins with a capital letter; the species name always with a small letter. The same rule applies to subgenera and subspecies.

Rousettus (Rousettus) obliviosus – R. (R.) obliviosus

A genus name can be used alone, but a species name must always be preceded by the name (or the initial) of the genus. If the species is unknown, or if you are referring to several species in a genus, you can use ‘sp’ (for one species) or ‘spp’ (for more than one species):

Acacia sp Acacia spp

The words or abbreviations that are not part of the Latin scientific name itself are not put in italics: sp., spp., var., cv., etc.

Celtis durandii Engl. Var. *ugandensis* Rendle

Scientific names of all categories above genus – family, order, phylum – start with a capital letter but are not italicized:

Compositae Diptera Arthropoda

Often a scientific name is the same as the common name:

A*cacia* acacia

Or it may be ‘anglicized’, that is given an English ending:

Compositae composite

In these cases, the word is not put in italics or capitalized.

Symbols

Symbols are similar to abbreviations or acronyms (see below), but they are usually shorter, e.g. A_{260nm} for absorbance at 260 nm, Pi for inorganic phosphate, OO for ohm. Many symbols are widely accepted and do not need definition (e.g. %), but you should be careful to define any new or uncommon symbol.

Acronyms, abbreviations and contractions

Abbreviations, or shortened forms of a word or term, are very common in science today.

Many scientific, technical and industrial bodies have adopted standard forms of abbreviation. The objective of using shortened forms is to save space and make reading easier. For example, it is much easier to read GPG than glycerolphosphorylglycerol.

The danger with abbreviations is that what is obvious to you and common in your specific field may be completely unknown to other workers outside that area. If you do not know what a strange abbreviation stands for, you cannot work out what it means. If you use abbreviations, symbols or terms that the reader does not understand, you make the message that much harder to follow. What might be obvious to all workers in a one field or one country may not be so easily understood by scientists in another country or discipline.

Explaining the terms

The safest way is to use the term in full the first time it occurs in the text, and give the abbreviation you intend to use in brackets. From then on you can use it quite safely. You can also include a list of the abbreviations or acronyms you use so that readers can look them up easily.

Journal editors are always watching for correct use of abbreviations in the papers published in their journals. Most have a list of terms that may be used, and others that may not be. Different journals will have different policies. You will find a description of the use of symbols and abbreviations in almost every `Instructions to Authors'.

Acronyms

These are words made up out of initial letters from a name, e.g. WHO for the World Health Organization, IUPAC for the International Union of Pure and Applied Chemistry. An acronym can be made for any long name, term or title, but you should define all of them the first time you use them.

Contractions

A contraction is an abbreviation, but special in that letters are removed from the middle of the word so that the last letter is the same as the full word, e.g. Dr = doctor; concn = concentration. Usually contractions will not have a full stop (point) at the end, whereas abbreviations (e.g. temp. = temperature) will. However, this may differ in different journals.

Recommended forms and spellings

Abbreviations and symbols can have several forms; simple English words can appear in various forms as well. In fact, many words in English can have different forms, each one of them correct, e.g. appendices, appendixes. Journal editors like to see consistency in the papers in their journals, and so will always use one form of a particular word as opposed to any other. Some of these choices may seem illogical, but they are journal policy and you cannot change them. You should carefully study papers in previous issues of the journal, and look at the `Instructions to Authors' for guidance.

Mathematical symbols and equations

When you are writing equations in your paper, you should take extra care that they are clear to the editor and typesetter in your typescript. A letter or symbol in the wrong place can change the meaning of an expression. Consider the following points.

Write your expressions in the simplest possible form so that they are easy to set into type. For example,

$$\frac{a + b}{c}$$

is more easily typed as:

$(a + b)/c$, and means the same thing.

All letters that substitute for a value should be set in *italics*, except for vectors, which are printed in ***bold italic***. Make sure your subscripts (e.g. V_i), superscripts (e.g. I^c) and spacing are clear to the editor.

Use exclusives like parentheses or brackets in this order: (parentheses) first, then [brackets] outside these, then {accolades} outside those. For example:

$\{ [x\ (a+b)\ ] / [y\ (c+d)\ ] \}$

Some have a special meaning, e.g. $[N^+]$ stands for `concentration of sodium ion', and $[^{14}C]$formate is formate labelled with radioactive carbon.

If you are not sure how to write mathematics as equations, you should always get the advice of an expert, or look at a standard guide.

PART II
JOURNALS, POSTERS, THESES and PRESENTATIONS

Chapter 4. Writing Journal Papers

Paul Stapleton

Much research is done, some is successful, less is written up, only part of this published, and only a small proportion is read. So you need to target your writing and publishing to maximize the chances of someone reading it and making use of your findings.

There is a whole science developing on impact assessment and citation analysis. Information analysts are keeping careful note of which papers are being cited and who is writing them. Careers depend on it, as does the success and prestige of journals and research applications, reputations of universities, departments and research institutions.

Before planning your article, you should decide on the journal in which you are going to try to publish. Very often the choice of journal will influence the format and style of your article. Different journals have different styles and different rules of presentation for the material they publish.

Choosing a journal

Most journals today receive many more papers than they can possibly publish, so be sure to make the right choice or your paper will be returned to you immediately. The best journals have a high rejection rate, so it may be better that you select a less important journal to stand a better chance of acceptance. It may seem like more effort to write a paper for an international journal, but this must be balanced against the much larger number of readers who will see it compared to publishing it in a local journal. You have to take all the factors into account. Is your paper really good enough to send to the very best journal? Perhaps not. Then it is much better to send it to a less well-known journal and have a better chance of getting it accepted.

What is the scientific level of the journal?

What you have to do is look at past issues of the journal and ask yourself the question, is my work as good or better that the material that the journal is publishing? Does the journal want complete research projects, or will it accept accounts of work in progress and preliminary papers?

What are the scope and aims of the journal?

These are usually printed on the inside of the cover of the journal. Read them very carefully. It is no use sending a research paper to a journal that only publishes reviews, and it is no use sending a theoretical paper to a journal that only publishes practical research.

How often is the journal published?

Scientific publishing is a slow process usually, and a journal that is published twice a year will have a much longer potential publication time than a journal that appears once every two weeks. You have to ask yourself "Will a 15-month publication time affect the relevance of my article?" If the paper should be published quickly then you can send it to a fast-publication journal, but if rapid publication is not essential, then the editors of such a journal are bound to reject your paper immediately.

What types of article does the journal publish?

Will yours fit this pattern? Many journals have a specific format for the articles they publish. If your article does not fit, the paper may be rejected. If your paper is going to be 20 printed pages long and the journal only publishes papers up to 5 pages, this again will mean that yours will be rejected. Not because of the scientific content, but just

because of the form of the paper.

Are there any conditions to submitting to the journal?

In some journals, one of the authors must be a member of the society which publishes the journal. Sometimes there are certain types of statistical analysis that must be used, and the experiments must have been repeated a number of times. Many journals have page charges, where you have to pay the journal to publish the paper. The charges are based on the number of pages in the final published paper. These charges can be extremely high. Some journals even expect money to be sent with the manuscript to cover the cost of considering the paper. You should look for these conditions carefully in the journal and think if you have enough money in your budget. However, some journals will not charge authors from certain countries.

Does your paper have any special requirements?

You might have a series of micrographs or electron micrographs that are very important to your paper. You should then look for the journal that prints such photographs well. If you have coloured photographs, you will have to find a journal that will accept them without too much trouble. You might have very complex tables that are essential to the understanding of the paper, maps, soil profiles and other material that makes your paper special.

Journal style

Once you have decided on a journal, you should prepare your manuscript in that journal's style and format. Most journals publish detailed guides to authors or 'Information to Contributors' either in the first issue of the year or as a separate booklet. You should ask for one, or make a copy from the journal. And also make sure that the person typing your paper reads and follows the instructions. It is no good reading a guide yourself, putting it in a drawer then giving the manuscript to a secretary to type.

To write well, it is first necessary to plan - effective writing is systematic, with the words arranged in a logical order and in the right proportion. But before you can start planning, you must have something to say, a message to describe. Unless you are very experienced, you should never sit down and try to write a research paper from start to finish. The basic technique of research is a planned approach to a clearly defined problem. This is how you should approach writing a paper. The structure of the paper will come from the subject itself, the purpose of the paper, and the intended audience.

It is difficult to write a paper when you do not have enough to say. You will have problems and give up halfway through because "writing papers is too hard." This is not true. If you are sure of what you want to say, you can apply some of the simple principles described here. These will help you start and finish writing a paper quite easily.

Many of the statements of scope in the research journals include the word 'significant'. They are looking for `significant results' or `papers reporting a significant advance in knowledge'. That will be one of the first questions that the editors of the journal will ask themselves when they receive your paper. Is the information in the paper significant, new and worth publishing?

You have to be sure that what you think will make a good paper is, in fact, good enough. To do this, you must try to look at your work objectively, as if someone else had written it. Try to put yourself in the place of an editor or a referee. They will be asking themselves the question `Why should I publish this paper?'. You have to make sure that the answer is `Because it is a good piece of work.' You must be sure of the worth of your work, because what you write will have to stand up to the examination of the editor and the criticism of the referee.

Begin by writing a title for the paper. You can usually start with the title of your original research proposal, then try to write a summary of your results and what they show so far. Then you can look at these and try to decide if your results are worth publishing.

Once you have convinced yourself that you should be writing a paper, and that you have a paper to write, you must then start thinking about your audience. Why are you writing the paper anyway? You are writing it so that it will be read, and to do that it must be published. Many authors do not consider this. They see the paper as an object in itself and do not think about who will be reading it. From the very start you should aim at getting the paper seen by the right audience. To do this you should direct your paper at a specific journal that is read by the people you want to contact.

Making a plan for the article

Look at the way the articles in the journal you have chosen are subdivided. The layout will give you a valuable clue about how to start planning your article. Most types of research article follow the classic pattern of:

Section heading	Answering the questions:
Introduction	What led to the work and what are my objectives?
Materials	What did I use?
Methods	What did I do?
Results	What happened?
Discussion	What does it mean?
Conclusions	What are the implications?
Acknowledgements	Who helped?
References	Who have I referred to in the text?

It is best to use the layout or plan of the article that is most common in the journal. The editor will prefer it and so will the readers, as they are all familiar with the format. A logical arrangement makes specific information easy to locate. However, if you have good reasons for making up your own divisions, you should go ahead and do it. If it is sound, the editor will usually accept your plan. So long as the layout you decide on is suitable for the material, most journals will respect your decision.

The parts of the paper

The questions you answer when planning a paper help you break the paper down into its elements (see Annex 4.1), which can be explained as follows:

- What was known and what was not known before the investigation was started
- What the work was expected to show, or the objectives, and the hypothesis under test
- The setting and the conditions of the experiment that eliminate variation
- The experimental plan
- The methods used
- How the data were collected
- The methods of analyzing the data and the statistical techniques
- The results obtained
- The validity and meaning of the results and the conclusions to be drawn from them
- Implications of the results in relation to other work
- Directions for future work
- References to other work in the field

Make up the figures and tables

It is usually best to draw your results in graph and table form before or while you are writing. Usually you will have a lot of data, and you must select parts of it to support the arguments in your paper. While you are doing this, you will also be deciding exactly what you want to show, and the best ways to illustrate your findings. Remember that the figures and tables are two of the most effective parts of the paper in giving information so you should put a lot of thought into them.

Handling the figures and tables

Most publishers prefer that contributors collect all the tables at the end of the paper and submit all the figures as separate files. Many authors prefer to paste their figures into the computer file where they are mentioned. But this will cause problems for the publisher. It is better to send the figures as Microsoft Excel® files, or the native illustration files and let the publisher's graphic artists manipulate and place them.

You should ask yourself "Are all the figures and tables present, and are they numbered correctly?". You may have deleted or rearranged the figures and tables as you were writing the paper. Check that all the tables and figures with the paper are mentioned in the text, and that all the tables and figures mentioned in the text are included with the paper.

Check also that the figure number on the original figure corresponds with its legend and its citation in the text.

Building up the plan

The basic idea is that you should approach writing a paper systematically, building it up step by step, rather than trying to do the whole thing at once. You must have a plan, and the best way to develop a plan is to look back at the previous questions and start thinking about the answers. Look at each of the questions in turn, and make notes of the answers. This will help you start developing an outline of the paper. The outline will be a summary, in note form, of the entire article, a framework that you can gradually build up into a complete paper.

First, you should decide on the main divisions of the article. That means you have an overall plan that will help you in your next task, which should be to make separate plans for what you will include in each division. Look at a single heading, for example the Materials and Methods. You can immediately break that down into a `Materials' section and a `Methods' section. Now think about what materials you did in fact use. You can write down headings such as `Chemicals', `Animals', `Equipment', `Soils', etc. That is, you start making a list of subdivisions or sections.

Once you have done that, review all these headings. Many word processing programmes such as Microsoft Word® have an outline facility that allows you to do this very easily. What you have is a list of titles of the sections that will go together to make up, for example, the `Materials' part of the `Materials and Methods' section. You are already developing a plan of the paper. You can do this with each part of the article in turn. Systematically you take each section and ask yourself what you want to say. What should be included here? Work through each of your subdivisions, writing down notes on what you should describe. Most of these sections will be easy to recognize. You will have done your experiments in separate parts and taken the results in certain ways, or for specific purposes. These form natural sections which you can consider individually.

This approach will be easier once you are sure what should go into each section. Go through the whole paper like this, making lists of headings so that when you have finished you have the plan of the article laid out in front of you. Now you can stand back and think. What have you left out? Is there a title for every part of your work? Have you repeated something? Should a certain heading be moved to another section? Spend some

time doing this, because it will make your work much easier in the end. Writing from a plan is always easier than making the whole thing up as you go along.

Using your plan

Now that you have your master plan, what should you do? Some people will start writing, because they feel confident that they know what they want to say. That is good for them. But, if not, you can continue your step-by-step approach even further, before you start writing. You should not feel that you have to plan the whole paper in one sitting. You should split up the planning and the writing to fit your time. Carry a notepad with you, or some cards, and whenever a thought comes to you, you can quickly write it down. This process is especially useful for the Discussion section, which always requires a lot of thought and interpretation. Very often an important idea or a few fine sentences suddenly occur to you, apparently from nowhere. You should be able to make a record of it all as soon as it comes or you will forget it.

As you make your notes, you collect them all together in boxes or files, each separately labelled. As you finish making each note you store it away with all the other notes for that particular section, and cross out that part of your master plan. Once you have everything crossed out and your desk is covered in files and boxes of notes, you have finished making notes. No more sections to consider. In fact, what you have really done is finished writing the paper. All the hard work, the thinking, is over. All you need to do now is take each list of notes and write them out in proper sentences. From now on the paper will write itself.

Remember the references

As you go through the paper planning the sections and making your notes, you should also remember to make notes about all the references you will want to mention in the text, so that at the end of the planning you will have an outline of your reference list as well.

Review the raw material

Now is a good time to look back at what you have done. Examine all your evidence again. Is it all relevant and vital to the paper? Do you still want to publish this paper? Could a table be better expressed as a graph? Do you really need all those boring tables? Can they be expressed more simply as figures? If you do not do it now, the editor and referee will certainly ask you to do it later.

Will a line drawing be better than the fuzzy little photograph you have? Have you left anything out? Is there going to be too much detail, or not enough? Try to ask yourself the most difficult questions now so that you can change the structure of the paper before you are too involved in writing.

Make a complete plan before you start writing

To repeat the point, think clearly about what you want to write, and save time later, by making comprehensive notes before you begin writing. Split each section up into subsections, make a detailed plan using topic headings; and using those, make detailed notes on what you want to say. Only then should you begin to start thinking about writing.

Making a start

Sometimes it is difficult to start. One way around this is to begin with the easiest section, the Materials and Methods, which is a simple description of what you used and what you did. Then you could go on to the Results, again because you only have to describe exactly what happened. By then you should be involved with the paper and ready to

start on the most difficult task of interpreting the results in the Discussion. Another way is to try to write the most difficult section first, the Discussion, which contains much interpretation and independent thought. Everything after that is easier.

Consider your working day, and when you can work on your paper. Most people do not have long periods of time to sit down and write. They must do an hour here, and a few hours there. Some people can work at home with family life going on around them. Being interrupted at work disturbs your thoughts. What you need to do is develop a working method that will suit the way you write during the time available to you.

Your approach should be that you work on your writing whenever you have time. At this early stage you should imagine each part of the paper to be separate parts of a complete paper. When you have the time, take out your master plan and pick out one of the headings. Take this single heading and start thinking about what you want to say about it. Start making quick notes, pieces of sentences, a plan of a paragraph. You may find that you need to subdivide the section even further. Go ahead and do it. Then, when it is time for a break, you can put away your notes and start again whenever it is convenient. Doing this means that you do not have to remember the whole plan of the article every time you want to start working. You only deal with individual sections one at a time.

Writing the first version

Once you have organized all your material, prepared the figures and made up the tables, written all your notes, and assembled them in the order you want, you are ready to start writing. Once you start, you should write as fast as you can. Do not worry about language, grammar, style or spelling. Just write down as much as possible while the flow of whatever section you are working on is clear in your mind. Try to write simply. In this way you will lay down a basis to work on later. It is always easier to come back to something than to start filling in a blank piece of paper. This first draft can be as untidy as you like. Only you will see it. Concentrate on scientific content and nothing else.

If the paper is for a journal that publishes in English, it may be better for you to write your first draft in your own language and translate it later. However, some people find this harder than writing in English from the start because of the problems of translating the patterns of their own languages. You can even write in a mixture of languages, using English for the technical terms and your own language in other places.

As you are writing, you can use any abbreviations that are useful, especially code words or names for longer terms. However, the use of abbreviations is strictly regulated in most journals, as are accepted nomenclature and terminology. When you are preparing later drafts of your paper you should take care to use international units and nomenclature, and abbreviations and forms of words, species names, etc. that are acceptable to the particular journal.

Questions to ask at the first draft stage:

- Are all the parts of the paper properly described?
- Are there any major changes needed?
- Is the logic of the paper sound?
- Is the order of presentation satisfactory?
- Is all the text needed?
- Can any figures or tables be eliminated or combined?
- Is each piece of text in the correct section?
- Is the sequence of paragraphs correct?
- Are there enough or too many headings and subheadings?

Most important at this stage is to turn your notes into written language. Finish with each section before going on to the next one. Do not go back and start revising parts of what you have written until you have completed your writing. Be practical as well. If you are writing by hand, use wide margins and leave plenty of space between the lines. You are certain to be revising what you are writing and you will need physical space on the page to include

all the additional and/or inserted words once you write them out. If you are writing by hand, it may be best to use lined paper to keep your handwriting under control.

Revising the first draft

Once your first attempt is finished, you can start revising the paper. Remember that there are many steps in the publishing process, and the manuscript usually needs changes at every one of them. You should never think that what you have just written is perfect. You should always be prepared to revise what you have written.

Remember also that at this stage the scientific content of the paper is the main thing you should be worrying about. Do not waste energy worrying too much about grammar and style yet.

Aims in drafting/revising

There are several things you should do in drafting the first version of your paper. You should:

- Review the scientific content of the paper until you are certain it is correct
- Put the paper aside for several days or weeks and then reread it
- Give a version of the paper to someone else to review it
- Check the paper for language and style
- Prepare the manuscript so that it can be submitted to the journal.

These steps should make the paper understandable on all levels. They can be dealt with in order to give second and third versions or drafts. There is no need to keep to this system, so long as you consider all the above points at some time in the process.

The second draft

Once you have finished revising the first draft of your paper, you will, logically, have a second draft in your hands. From the practical point of view, there is only a certain amount of revision you can physically fit on to a page of your manuscript. Once a page is full of changes, you should retype it so that you can see where you are, then carry on editing and revising. Your main concern should still be the scientific content of the article. Do not start worrying about such minor things as correct spelling if you still have to make major changes to the text.

Once you are satisfied with the standard of your work and you think you have a `second draft', format the paper, preferably in the format of the journal. Then give the article to other workers in the same field as yourself and ask them to comment on the scientific content for you, pointing out errors of logic and interpretation, noting where your writing is clumsy, and recommending further improvements.

Also, and this is an important note, you should put the article away for a few days or a week, then come back to it and re-read it. You will be surprised at how many changes will be obvious if you do this. A short time away from the work gives you a perspective that will allow you to judge what you have written. Include all your changes and those of your `reviewers' to produce a new version of the paper, the `third draft'.

The third draft

By now you should be confident of the content and structure of the article, and its scientific aspect. Now you have to make sure that the paper can be read easily and your message understood. This is a very important point, because no matter how good your results are, if the reader cannot understand what you are trying to say, you are wasting your time writing the article. Every section of the paper should be completely clear to the reader. This is one of the things that editors will be looking for. You should look for that as well.

If you are writing on a computer, run the spell checker, but leave the grammar checker turned off – it will not be able to handle scientific text. Some people can easily read and edit a paper on the screen. Others need to print out the text and work on paper, before transferring their changes to the computer file.

Check the references

At this stage, you must check that all the references listed are mentioned in the text. Then look at it the other way around and check that all the references or literature 'cited' in the text are included in the reference list. Why? Because you have been adding and deleting sections of the paper and you might have added or deleted references without changing the reference list.

One careful way of checking the references is to lay the pages of the list out in front of you, then work through the paper, stopping each time a reference is cited in the text. Does the reference correspond to the reference cited in the list? You might have changed things around at some stage so that the two no longer agree.

If you are using the numbering system, tick each reference in the list as it is cited in the text and carry on. Make sure that all references are numbered in the order they are mentioned. If you are using the name/date system, you have to be more careful. Check first that the references in the list are in the correct order, either in order of citation or more commonly in alphabetical order. Check then that the spelling of the authors' names in the text corresponds with that in the list. If they are not the same, check the original and check the date also.

How many authors are there in the reference? If there are two, then both names should be given in the text. If there are more than two (or sometimes three) names in the reference, you should use the first author's surname and 'et al.' in the text. Should et al. be in italics? That is another question you should answer by looking in the journal.

Is the date in the text the same as that in the list? Should you also be using a, b, c to distinguish references from the same authors from the same year?

Work through and check every page of the typescript and every reference. When you have finished, check that you have ticked every reference in the list. If some are not marked then you have to go back and look again to see where they should be cited in the text, or delete them. Then, when you have done all that, go back and check with the original reference, wherever possible, to make sure that all the information in the reference is, in fact, correct.

The final manuscript

Remember that the paper you send to the journal must be prepared according to the rules of publishing and the instructions of the journal, in the right format, using proper units, nomenclature, etc. and providing the correct number of copies. You might not think this is very important, but the journal editor will. You only have to worry about your own article. The editor has to worry about the whole journal. The editor wants all units, abbreviations, etc. to be the same in every paper in the journal. That is, the editor is looking for consistency throughout the journal. You should make sure that you prepare your final paper just as the editor wants to see it.

Look again at the journal and its `Instructions to Authors'. Some of these are very detailed. Note how wide the margins of the page must be, the line spacing, if headings should be on the left or in the middle of the page, how to indicate bold face and italic letters, etc., and make sure that you, and the person typing the final version of the paper, follow the guidelines.

Number all the pages of the manuscript. This is most important in case the pages get out of order. Insert a header in the computer file and include your name, short title of the paper and page numbers.

On the title page, make sure that you have given a title, the correct spelling of the authors' names, an accurate list of addresses of the authors, an abstract or summary, and keywords if required. You should also make clear on the manuscript to whom the proofs of the paper should be sent. That is, who is responsible for the paper and who the editor or publisher should contact? If you do not state it, then the publisher will assume it is the first author on the title page. Some journals ask for a covering letter that gives a lot of this information.

Submitting the paper

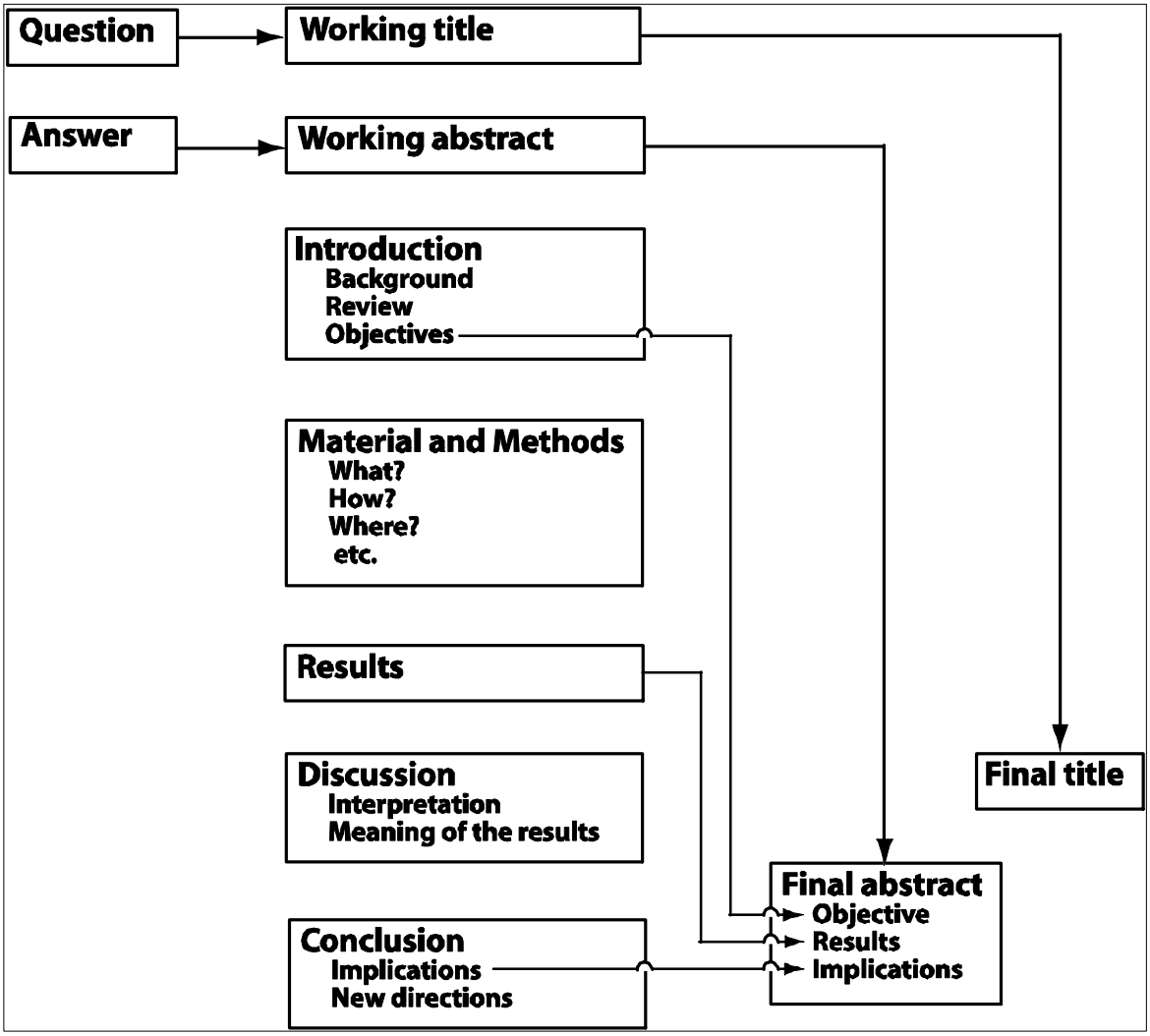
Many journals today actively encourage you to submit your paper by email. Read their instructions very carefully. In this case, it is important not to include all the figures and tables as part of the word-processing file, as that will make it very large. Compose an email that summarizes your paper briefly and list which files you are attaching, then make sure you attach all those files before you send it off.

If you are submitting a paper copy, and some journals require this as a supplement to email submission, check that you have the right number of copies, then wrap up the whole package very well. Then look in the journal and find the correct address. You will often have to send the paper to an editor or editorial board at an address that is different to the publisher's address, so make sure you choose the right one. Some journals have different editors dealing with different parts of the world, or different subject areas. All this information is usually on the inside front cover of the journal, so make sure you read all the information carefully. Send the manuscript airmail and wait for an acknowledgement.

If you do not receive a letter from the publishers within six weeks or two months, you should write asking them to confirm that they received the package.

Make sure that you have a good quality copy of the same version of the article you sent off. If the manuscript is stored on a computer, make sure you have a backup copy. Why? Because if the paper is lost, you will have to send new, good quality copies to the publisher again.

Annex 4.1. How a research paper fits together



Annex 4.2. Parts of a research paper and their characteristics

Title

The perfect title tells the reader what the paper is all about. It should be concise, accurate and informative. Remember, the title is what the reader will first see in a contents list, and it will have to compete with all the other for attention with titles around it.

The object is to give the reader as much information as you can in as few words as possible. It should contain all the key words of the paper. Do not waste space with terms like "Observations on...", "A Study of...", etc. Put the most important part of your work at the start of title, where it will be easiest to see by a reader scanning a list.

Some journals have a limit on the length of the title, a maximum number of words or a maximum number of letters. By choosing the words carefully, most papers can be described accurately in a fairly brief title. Some journals or editors have very low limits, for example 10 words or less. In those cases, you will probably not be able to write a full title. You will have to do your best.

- **Concise, accurate, informative**
- **Key words**
- **Most important phrase first**
- **Description or statement**

Some journals will consider papers in a series, others will not. If a paper is a report of a complete study, it is logical that you write only one paper about it. This is how some journals look at it and they will not accept papers that are in a series. If you start writing a series of papers, numbered I, II, III, etc., it means that you are committed to publishing the whole series in the same journal. Very few journals will even look at a paper that is from the middle of a series that has been published somewhere else. Papers in a series can also cause you problems, as the author, because what are you going to do if No. 3 is accepted and published and No. 2 rejected?

You can write your title as one statement, or use the main/subtitle format. Some journals and editors approve of this, others do not. One advantage of this style is that it is easy to make the main subject stand out. The main thing is to put the most important key phrase first. For example, you can say:

Effects of drought, ageing and phosphorus status on leaf acid phosphatase activity in wheat

or you can write:

Acid phosphatase activity in wheat leaves: effects of drought, aging and phosphorus status

There is a third way of writing a title, which is to make a statement:

Acid phosphatase activity in wheat leaves is decreased by drought, ageing and phosphorus status

Many editors actively dislike this third type of title, others encourage it. It gives information immediately to the potential reader so that is an advantage. It is very different from the classical title and that could be a disadvantage.

Many journals will ask you for a "running title" or "short title". This will be printed at the top or bottom of every page of the article when it appears in the journal. Usually it should be between 30 and 50 characters. If you do not supply one, the editor will write one for you, so you should do it yourself to make sure it is done properly. The obvious running title from the example above is:

Acid phosphatase activity in wheat leaves.

The authors

Give the names of all the authors in the style the journal wants them. For example, the first name in full, the middle initial only, and the last name in full. Most journals do not publish the qualifications or affiliations of the authors.

The addresses

You should give an address for each author you mentioned on the title page. That is, the address (or the "affiliation") of the author at the time the work was done, which should represent the place at which the work itself was done. If any authors have moved, then include a footnote with their present address.

Remember to indicate the senior author, or the person to be responsible for later correspondence with the readers, and the full postal address of that person.

Abstracts

An abstract is defined as an abbreviated, accurate representation of the contents of a document, without added interpretation or criticism and without distinction as to who wrote the abstract. It should be as informative as is permitted by the type and style of the document; that is, it should present, as much as possible, the quantitative and/or qualitative information contained in the document. In the abstract, it is even more important than in other parts of the paper to keep sentences short and simple, dealing with just one topic each and excluding irrelevant points.

- **Objective**
- **Methods**
- **Results**
- **Significance and implications**

Abstracts are usually described as informative or indicative (descriptive) (see Annex 6.1 for examples) or as both informative and indicative. Informative abstracts are best for papers describing original research. Indicative or informative-indicative abstracts contain general statements about the subjects covered in the document and are used for field reports, for long papers such as review articles, and for books or chapters in books. Structured abstracts covering specified topics may be required by some journals, as discussed below. Abstracts for meetings are also discussed below.

Informative abstracts

An informative abstract answers, typically in 100-250 words, the questions:

- Why did you start?
- What did you do, and how?
- What did you find?
- What do your findings mean?

If your paper is about a new method or apparatus, the last two questions might be changed to

- What are the advantages (of the method or apparatus)?
- How well does it work?

These questions are of course the ones answered in the different sections of the text, but readers often have no access to the full text or no time to read it. The abstract must therefore be written so that it can stand on its own, without the text. As the title and abstract are always read together, do not waste words by repeating or paraphrasing the title in the abstract. Keep to 250 words or less for an article of 2000-5000 words, and to about 100 words for a short communication, depending on the journal's requirements.

If the reason for doing the study is not clear from the title or the rest of the abstract,

state the purpose. If the type of document (report of original research, review article, case history, etc.) is not clear from the title or the rest of the abstract, mention what it is early in the abstract. Say what you studied and what methods you used. Give your main findings concisely and summarize your conclusions.

Try to include in the abstract all the main information covered in the paper. Be as brief and as specific as possible, and write with non-specialists in mind. Emphasize the different points in proportion to the emphasis they received in the body of the paper. Do not, under any circumstances, refer in the abstract to information that is not in the paper.

Generally speaking, a short abstract should be written as a single paragraph. However, split a longer abstract into two or more paragraphs if this is clearer for readers and is allowed by the journal. Number the paragraphs or sentences only if the journal requests this. Write complete sentences that follow each other logically. When possible, use active verbs, and use the past tense for what was found.

To help computerized text searching, use significant words from the text in the abstract. Avoid unfamiliar terms, acronyms, abbreviations, or symbols; if you must use them, define them at first mention. Use generic names, not trade names, for chemicals and drugs, except when trade names are the most accurate way to describe such substances. Identify living organisms by their Latin names.

Do not include tables, diagrams, equations, or structural formulae in an abstract unless it is intended for consideration by a conference organizing committee rather than as part of a journal article (see 'Conference Abstracts' below). Avoid citing other work; if you must include a citation, for example to a paper that inspired your investigation, include a short form of the bibliographic details in the abstract itself – 'as A.B. Smith pointed out (J Geogr Info 1990; 20:11-13)' – for the benefit of readers who see the abstract alone.

Indicative abstracts

Indicative abstracts for long articles such as reviews give readers a general idea of the contents of the paper but little, if any, idea of specific methods or results.

Summaries

Strictly speaking, a summary restates the main findings and conclusions of a paper and is written for people who have already read that paper. An abstract is an abbreviated version of the paper written for people who may never read the complete version. A summary is not the same as an abstract; although some journals call the abstracts of the articles they publish 'summaries'. Nor is a summary the same as the conclusions.

Structured abstracts

Some journals now ask for 'structured abstracts,' especially in the medical area, for reports of clinical trials and maybe for other kinds of contributions too. Structured abstracts usually contain a maximum of 400 words and in clinical journals are divided into sections with the headings: Objective, Design, Setting, Patients, Treatment, Results and Conclusion. This sort of abstract is written mostly as a series of points, although the Results and Conclusions sections should be in sentence form. Structured abstracts may evolve into a new kind of publication, with the main text available only in electronic form – or they may disappear altogether. If your target journal wants a structured abstract, the 'Instructions to Authors' will tell you what headings to use and how long the abstract should be. Examples of abstracts published in the journal will demonstrate what is required.

Conference abstracts

A few conference organizers ask for structured abstracts but most abstracts for meetings

should be written in the same way as a conventional informative abstract – except that you may be allowed to include a table or graph if you can fit it into the space available.

Conference abstracts often have to be prepared on a form or blue-lined sheet of paper supplied by the meeting organizers or submitted by email in a precise format. If your abstract is accepted for the meeting, the typed form you submit may be used as camera-ready copy for the printed abstract. You must therefore follow the organizers' instructions closely, check the typing carefully, and keep the abstract within the required limits of length and position on the page. To make sure that the abstract will keep within those limits, type or print out a draft on a copy of the form before you prepare the final version.

Key words

Key words or phrases for indexing and cataloguing entries are often printed at the end of an abstract, or sometimes after the title in the journal's contents lists. If the journal asks for key words, choose the most important and most specific terms you can find in your paper. Put the key words in the place required – usually on the title page or at the end of the abstract.

To help the readers find your paper, keep the key words specific. Do not include general topics, like 'soil' or 'amino acid'. Be specific, to allow readers to focus on you work. But include more general terms if your work has interdisciplinary significance.

Keywords from titles

A title such as "Econometric estimate of the elasticity of substitution between jute and synthetic substitutes" would give the following keywords:

- *Corchous* spp.
- demand elasticity
- economic model
- economic substitution
- jute
- synthetic fibres

The 'Introduction'

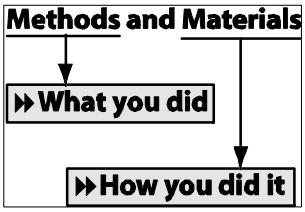
The Introduction should answer the questions "Why did you do the work?" and "What did you want to find out?". To do this, it should contain three parts:

- The background to the work, to allow the reader to evaluate the present work.
- A brief review of the relevant literature and the logical development that led you to do the work.
- A clear statement of the objectives of the work as well as your hypothesis.

Background/perspective
Brief review of literature
Logic leading to work
Hypothesis and objectives

You are showing the logical development of your theory or objective. You are telling the readers why they are reading the paper. Put the experiment in its scientific context. Explain how your hypothesis came about, reviewing very briefly previous work published on the subject. If a recent article has summarized work on the subject, you can include that. Remember that you should have references to support everything you say. The Introduction should be short. If you have exceeded two pages of typing, you have probably written too much. You are not writing a review, so be brief.

Methods and materials



Here the questions are "What did you use and what did you do?". This is a simple section where you only describe the materials you used, and the methods you used in the work. You do not need to interpret anything in this section, so it is an easy part of the paper to write. However, you must make sure you have described everything in enough detail. The skill in writing a good 'Materials and Methods' section is in knowing what can be left out. Take a hard look at what you could describe and see what can be cut out without reducing the meaning of the paper. The criterion for a well-written 'Materials and Methods' section is that a reasonably knowledgeable colleague could repeat your experiment after reading the description. The best way of checking is to find a knowledgeable colleague and ask him if your effort meets this criterion. If you are describing a technique with which you are almost contemptuously familiar, you run a high risk of leaving out important details quite unconsciously. The view of an outsider can prevent this from happening.

Justify your choice of one method or treatment over the others available. State the assumptions that you have made. This will allow your readers to understand the purpose of the methods you are about to describe. The important thing is to give just enough detail to allow other scientists to assess the validity and accuracy of your results, and to repeat your experiments to get the same results. Follow a logical order. This section falls naturally into two sub-sections: the Materials and the Methods.

Materials

Describe what you used: all the materials, chemicals, animals, plants, equipment, geographic locations, etc. so that another worker will be able to create exactly the same conditions that you had. Clearly identify chemical compounds, fertilizers, etc., so that other workers will be able to obtain the exact same material, or use the same concentration of active ingredient. If you use trade names then you should include a full chemical name or active ingredient the first time you mentioned it. Some journals want you to give the name and address of the supplier or manufacturer of the material.

Use internationally recognized standards for naming materials, and also use metric units, standard nomenclature, etc. Give the full genus, species, race, strain, cultivar or line of any experimental plants, animals or microorganisms you used. Species names can be abbreviated once they have been fully described, but be careful not to create confusion. Give full descriptions of any strains that you might have developed yourself.

Different disciplines have different nomenclatures; be sure to check in the 'Instructions to Authors' of the journal for the correct terminology.

Methods

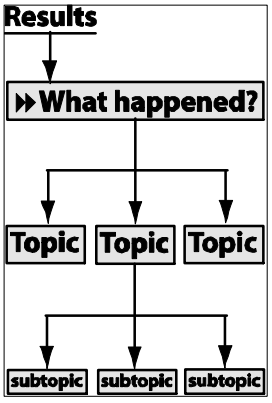
In this section you answer the questions "What did you do?" and "How did you do it?". Describe your experiments in a logical order, for example, in order of time, size or importance. This will help make the plan of your work easy to understand for the reader.

If you have used well-known methods just give their names and a reference, but if you made any changes then these should be explained. The people reading the paper will be scientists themselves so you do not need to describe familiar things in detail. Be brief, but do not leave out important information like sizes or volumes, centrifugation speeds or number of replications.

Mention any statistical techniques that you used, but do not go into unnecessary detail. Most tests are well known and do not need description. If a technique is not so well known, then you can give a reference. Only if the method is new or original should

you describe it thoroughly. However, as mentioned earlier, a specific journal might demand a certain type of statistical treatment. Then you must follow the recommendations exactly, or the paper will be returned to you to do the analysis that is required.

Results



This is basically a simple descriptive part of the paper, dealing with what happened in your experiments. There are several ways of writing a Results section. One is to present your results making no comment on them. You will give your own interpretations later in the Discussion section. Another approach is to interpret the results up to a point, to make some connections between the different statements, but give more detail in a separate Discussion section. A third way is to combine the results with a discussion of each point. This last method will work best in a short or simple experiment. You can become very confused with this last method if you are not careful.

Whichever way you choose, you should present the results in a sequence that logically corresponds to your original objectives. Report any negative results that will influence your interpretation later on. Present all the relevant results in this section. Do not be forced to introduce new material in the Discussion, or worse, discuss results that you have not mentioned.

Remember your original purpose. In an experimental paper, your objectives tell you what you should be writing about. Results that do not relate to them should not be mentioned. This seems logical enough but it is easy to forget when you look at all the information you have collected. You may have to leave some of it out, but it will mean a much more readable paper in the end.

Using the figures and tables

Write in relation to the tables and figures that you have already made up, but do not rely on them to write for you. Do not say "The results of Experiment A are reported in Table 1", say instead "The treatment used in Experiment A gave 50% greater yield than the control (Table 1)". But do not repeat boring lists of figures in the text when they are already in the tables or figures. Describe the overall results and not individual values.

Do not ignore the tables and figures. Make sure you mention every one of them in the text. If you do not, then why are you including them? Remember that you will be referring to certain results in the Discussion, so make sure that the most important sections are fully described.

Presentation of the results as tables or figures

The way you present the results can have a great effect on the reader. If you are comparing treatments then the final values from these should appear close together. If you are showing trends or gross changes then a graph will have the most effect. If you want a strict testing of results, where the exact value is important, then it is best to use a table. Do not use graphs to duplicate information already in tables or text.

Many authors submit papers with too many figures and photographs. If you are working with coconut, there is no need to include a photograph of a coconut palm. Most people will know what a coconut palm looks like. There is no need to have a photograph showing the experimental plots. In fact, photographs are often not necessary. Certainly colour photographs are seldom needed. But they may be useful to show disease symptoms, variation among types or diagnostic characters.

Statistics

It is often appropriate to describe statistical techniques. For some reason statistics often appear to receive preferential treatment in that the most obvious manipulations are described in great detail. Statistical analyses, like chemical analyses, are normally the research worker's tools of trade, not the finished product. If you merely carried out a standard procedure like an analysis of variance, 'T' test, or chi square, then simply say so. If the technique is more 'off beat' but well described in a published paper or standard text then a reference to the source will be sufficient. Only if you have performed some original mathematical gymnastics do you need to describe them and, even then, a reference or two can often shorten the task.

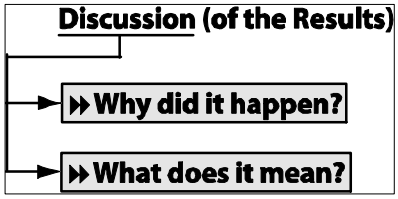
Remember, it is the responses or the differences that are important, not the statistical technique which has given you the confidence to claim them. You should ensure that levels of probability are clearly stated, but you do not need to present tables to describe how you derived the levels of probability. They are no more essential to your paper than intermediary chemical analyses may be to your final conclusions about chemical constituents.

There are good techniques which enable you to present the statistical information in the same tables or graphs you are using for presenting the data. For clarity, it is preferable to reduce large masses of data to means. If you do this, you can indicate the degree of variation in your original data by presenting the standard error of means or the standard deviation of individual records. These are not the same thing, so you should not simply write '12.6 + 1.3' because it is not clear whether 1.3 is the standard error or standard deviation. Putting (SE) or (SD) in parenthesis behind the '12.6 + 1.3' can clear this up. If numerical data are presented to allow a comparison among treatments, an order of significance should be included. Without it, results cannot be reliably interpreted. The word 'significant' has other meanings than the statistical one but because in modern scientific literature 'significant' usually means 'statistically significant', it is a good idea to avoid using it in any other sense.

Some journals specify the exact sort of statistical treatment that the results must receive. If you use statistics, the test should be briefly described and, if necessary, supported by references. When appropriate, the number of individuals, the mean value and a measure of the variability should be stated.

Some papers will not have any statistics, for example in a paper describing a new technique or a description of a new disease or biotype. However, where you have performed a series of experiments, you should analyse your results statistically, wherever possible, so that you can give probability levels. This avoids the possibility that your results are due to chance. Use statistics but do not let them take over the paper. State the levels of probability and only give essential statistical information.

Discussion



In the Discussion you must answer the questions: "What do my results mean and what are their implications?" This is the most thoughtful and demanding section of the paper. You must interpret your results for the readers so that they can understand the meaning of your findings. There must be clear relationships drawn to previous work. Here you can discuss why something happened and why things did not, and highlight the strengths and weaknesses of your work. You can also discuss the relevance of your research to the specific field, point out how it relates to other fields, and make recommendations from your work. You should also mention work in progress and point

out unanswered questions and possible avenues of further research.

You should use the Discussion to interpret your results, giving particular attention to your hypothesis or objectives that you put forward in the Introduction. In a research paper, 'Discussion' is really short for 'Discussion of Results'. It is not a section in which you review the literature on the subject. All literature cited must have the function of supporting arguments about your results.

No matter how simple an experiment, it needs to be interpreted for the readers. This section requires very careful thought. Using your original argument and calling on your results, you can make the whole meaning of your findings absolutely clear. Relate your findings to previous work, and if they do not agree with your work then discuss why. Discuss any negative results.

Your aim is to draw a sound conclusion by deduction, induction or a mixture of both. For example, you may believe that your results allow you to make a new generalisation. Or your results have a new application. State what is important. Say things like "The most important aspect of these results is . . ." However, do not use this too often as readers will quickly tire of hearing how important your work is.

One of the most common faults of the Discussion is that it is too long. It may be difficult to follow, or too much data may have been repeated from the Results. In the Discussion, you should generalize, make comparisons and draw conclusions.

Conclusions

Very often you will not need to write a Conclusions section, because you will have already stated your main conclusions in the final section of the Discussion. You should certainly never include a Conclusion just to repeat what you have said in the Discussion. However, if your results and the subsequent discussion have been especially complicated, it may be useful to bring all your findings together.

The Acknowledgements

Acknowledge technical help and advice that you received from others. Bodies or individuals granting money which supported either the research or the authors of the paper should be thanked. Keep this section short.

Reference lists

Before having the manuscript typed, always check the way references are mentioned or 'cited' in the journal to which you are going to submit. Take care that you use the correct form in the manuscript. Do not let the departmental secretary, who usually types the entire department's papers in the same style, type yours in the same way. It may be easy at the time, but it makes a lot of work for the journal editor, and it may mean that your paper is returned to you to retype it. A badly typed list can make a lot of work for the editor. In the text, there are three main ways of citing references:

- Number references in the order you cite them, with a figure in brackets, for example [1] or (1);
- Use a superior number (superscript), [1]; or
- Cite them by name and date, e.g. (Winarno 2003).

Using the first two methods, in the Reference list, you would number and list the references in the order that they were mentioned in the text. In the third case, you list them in alphabetical order. In either case, you must take care to type the entry exactly as it is given in the journal. This means taking note of the use of commas and brackets, full stops, abbreviations, etc. For example, the date may appear as 1984., or (1984); the authors' names may have initials before or after the surname after the first author, e.g. Jones, A.G. and P.S. Smith, or Jones, A.G. and Smith, P.S. Such detail may seem minor

but it is extremely time-consuming for the journal editor to correct and can affect the chances of your paper being accepted immediately for consideration. It can be difficult to put some names in alphabetical order, especially names from different countries. Seek further guidance, for example from the Internet, for advice on this.

Note that some journals use the following style, without full stops (periods). This is known as the Vancouver style:

11 Nadel JA, Jones DGH. Heatstroke and running. Br Med J 1978; 1:21-25.

This style is becoming more common. It is very hard for an experienced typist to type properly, because the commas and points that are usually put in automatically are not used. Take special care when you are checking a list that has been typed in this style.

Essential elements of a reference list

When you cite a paper from a journal, you should have the following information:

- The names and initials of all authors
- The year of publication
- The full title of the article (sometimes not necessary)
- The unabbreviated title of the journal, and the correctly abbreviated version (This will usually be printed in the journal)
- The series, if there is one
- The volume number (sometimes the issue number as well)
- The first and last page numbers. Some journals only require the first page number

For material from books, you will have to cite:

- Names and initials of all authors
- Year of publication
- Full title, and subtitle
- Edition number, if any
- Chapter or Section number, if any
- Range of page numbers
- Names of all the editors
- Name of the publisher and city and country of publication

For symposia and conferences, you will need:

- Names and initials of all authors
- Year of publication
- Title of chapter
- Title of symposium or conference
- Name of the place where the conference was held
- Range of page numbers
- Names of all the editors
- Name of the publisher and city and country of publication.

You may not think that your references are very important, but they are, and the editors of journals are very keen to make sure that they are correct. You should always double check your references against the original citation, as stated in the previous section on revising your paper. A random check of 300 references in six medical journals showed that 15% of them misquoted the original author's name. So do not be so confident that

the reference you copied out of a journal months ago is right. Go back and check it.

Digital Object Identifiers (DOI)

The Digital Object Identifier (DOI) is a system for identifying and exchanging material in the digital environment. DOIs are unique names made up of characters and digits that are given to electronic journal articles, images, learning objects, e-books, images or any kind of content. They are assigned to a document by the publisher on the initial electronic publication. They are used to provide current information, including where they (or information about them) can be found on the Internet. Information about a digital object may change over time, including where to find it, but its DOI does not change. When you use the DOI to create URL hyperlinks to documents on the web, they are guaranteed never to change.

The system is managed and directed by the International DOI Foundation (www.doi.org). Several million DOIs have been assigned by DOI Registration Agencies in the USA, Australasia and Europe. Many of the world's leading learned publishers have come together to build a DOI-based article-linking scheme known as CrossRef (http://www.crossref.org/).

How does a DOI look like and how do they work?

A DOI looks like this: **doi:10.1016/j.buildenv.2003.08.001**. This number will take you to the article entitled "New low-cost insulation particleboards from mixture of durian peel and coconut coir" by Khedari *et al.* in the Journal Building and Environment, Volume 39, Issue 1, January 2004, Pages 59-65, Copyright © 2003 Published by Elsevier Science Ltd.

How do you use a DOI?

Open the DOI site with your Internet browser: http://dx.doi.org (you do not need 'www'). Enter the entire DOI citation in the box and then click 'Go'. The article or object that matches the DOI citation appears in your browser window.

Annex 4.1.1 Sample abstracts

The following example is an indicative abstract, because it indicates or describes what is in the article – it does not give any details.

Desiccated coconut industry of Sri Lanka: opportunities for energy efficiency and environmental protection

S. Kumar, G. Senanayakeb, C. Visvanathana and B. Basua

Abstract

The desiccated coconut (DC) industry is one of the major export oriented food processing industries in Sri Lanka. This paper discusses the production processes, types of fuel used, energy use pattern and the overall specific thermal and electrical energy consumption in the DC sector. An analysis of the energy use highlights the inefficient processes and the key energy loss areas. Options for energy conservation in the DC mills have been discussed, and carbon dioxide emissions from this sector and its mitigation potential are estimated. Other options to improve efficiency and reduce other pollution and policy aspects have been presented.

Fuel and Energy Abstracts
Volume 44, Issue 6, November 2003, Page 395
doi:10.1016/S0140-6701(03)92568-9

The example below is an informative abstract, because it gives details of the article.

Exhaust emission and combustion evaluation of coconut oil-powered indirect injection diesel engine

M. A. Kalam, M. Husnawan and H. H. Masjuki

Abstract

This paper presents the results of experimental work carried out to evaluate the exhaust emissions characteristics of ordinary Malaysian coconut oil (COCO) blended with conventional diesel oil (OD) fuelled in a diesel engine. This project complies with Malaysian Government strategy on biofuel research activity. The results showed that the addition of 30% COCO with OD produced higher brake power and net heat release rate with a net reduction in exhaust emissions such as HC, NOx, CO, smoke and polycyclic aromatic hydrocarbon (PAH). Above 30% COCO blends, such as 40 and 50% COCO blends, developed lower brake power and net heat release rate were noted due to the fuels lower calorific value; nevertheless, reduced emissions were still noted.

Renewable Energy
Volume 28, Issue 15, December 2003, Pages 2405-2415
doi:10.1016/S0960-1481(03)00136-8

Chapter 5. Preparing Conference Posters

Paul Stapleton

Agricultural research results are sometimes presented as posters, which are usually mounted on walls of rooms or along the corridors of research institutions.

During national and international conferences, it is common to find many posters on display. In some cases, special poster sessions are organized where scientists stand by their posters to answer questions from people reading them.

In a way, a poster is a shortened form of a research paper, which is presented visually on one or more large sheets of paper. A poster can also be effectively used to present pictures that tell a full story of a research activity as well as the results.

The main point about posters is that the information is provided through the use of visuals in a well-coordinated and organized combination of text and illustrative matter.

A good poster should:

- Be simple and highly informative
- Be easy to read and understand with relevant legends
- Be visually appealing and attractive, to encourage people to read it
- Contain text and illustrative matter harmoniously combined to produce an effective presentation
- Tell the story completely.

The major elements in a poster

The following two examples illustrate how the subject matter of a poster determines its elements. See Appendix 7.1 for another approach.

A poster that reports the results of research would contain the following:

- Title of poster (text)
- Introduction (text)
- Materials and methods (text and illustrations)
- Results (text and illustrations such as graphs, histograms, photographs, line drawings, or actual specimens)
- Conclusions (text and illustrations)

A poster that describes the life cycle of a coconut disease and its damage to the nuts would contain the following:

- The life stages of the disease
- Photographs or drawings with short legends
- Palms and nuts at different stages of the disease
- Distribution of the disease.

Preparing a poster

Before you start preparing a poster, decide on the precise topic and subject matter you wish to communicate; then proceed to plan the poster in the same way that you plan the writing of a research article.

Write the complete text of the story. Revise it thoroughly until you are satisfied that all the information you wish to convey has been included. Edit the text conscientiously to keep it brief.

Note the parts of the text that you wish to illustrate. Approach a graphic artist and describe exactly what you wish to show in the poster. The artist will produce a design of the poster for you to review and approve. Study this design carefully. When you are satisfied with it, give approval for the artist to proceed with the production of the final

poster.

If you do not have access to a good graphic artist, you can prepare a good poster yourself. Here are a few hints to assist you in preparing a poster for a conference poster session.

Plan, write and edit your text. Decide what you want to illustrate. Arrange to make large prints of the photos you need. Make a large sketch of the graphs and diagrams you plan to include in the poster. The importance of the material being illustrated will determine the relative sizes of your illustrations.

Set the text in large type, about 14 to 18 point size. Make the text concise and brief. Paste the text groups on separate sheets of paper; the sizes will vary according to the amount of text.

Check on the size of your poster. If you are preparing the poster for a conference, the organizers will give you this information. Prepare a rough layout diagram to scale, indicating the exact place where each element will fit in the final poster. Using this diagram as a guide, measure the actual sizes of the text and illustrative materials and fit them on a full-size dummy of the poster sheet.

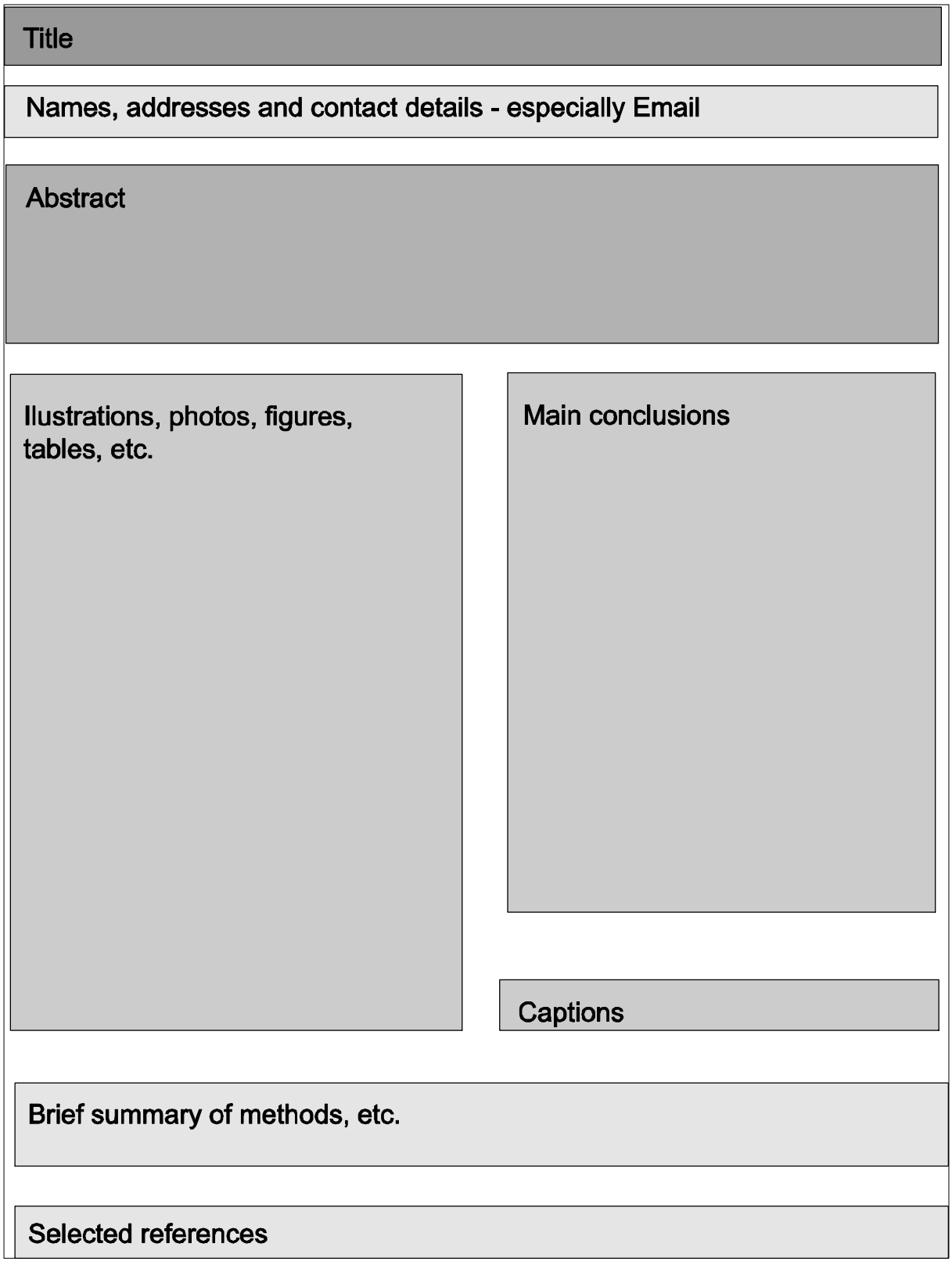
Paste the text on separate sheets of paper and cut out the extra paper areas. Make sure to paste the section in straight lines vertically and horizontally.

To enhance the appearance of your poster, you can print the text on coloured paper or print it on white and then paste the text blocks on contrasting colour paper such as black, green, orange or red. Photos, drawings and graphs can also be posted on contrasting colour backgrounds.

You can also use computer-driven graphics programmes like Adobe Illustrator or CorelDraw, or even PhotoShop to make your poster. In that case you can easily scan and incorporate photographs, import figures and graphs, and use different colours.

To print the poster, you can prepare the poster in sections and print it out on A4 paper. Your printer might be able to handle A3 sheets. You might also be able to prepare the poster as one sheet, perhaps 80 cm x 1 m, and print it on a large format machine, such as a plotter, or take it to a commercial service to have it printed for you. In that case, you will have the poster in one single piece, which you then have to carry with you rolled up in a strong tube.

Annex 5.1. A typical poster layout



Chapter 6. Writing a Thesis

Paul Stapleton

A thesis is basically a very long scientific article. Theses are the written evidence of a sustained body of research. A typical thesis consists of:

- Introduction
- Literature review
- Materials and methods
- The experiment
- Discussion
- Summary
- Reference list

The 'Introduction'

The Introduction presents your hypothesis, or what you are setting out to investigate. It makes the purpose of the thesis clear to the reader from the very beginning. The construction is like the introduction of a scientific paper. A logical sequence of known facts leads you to a testable hypothesis which is presented at the end of the introduction.

Literature review

The literature review must show that you are familiar with all of the material written on the particular subject, that you have read and understood it, and used that information to develop your theory. Even though it is usually very long, it is important that all of the material introduced into the literature review has a purpose; either to develop arguments for use in the experiments to be described later on, or to unify these arguments.

Materials and methods

Although the approach is the same as a research paper, you may well be using a series of methods in different experiments. They may have some features in common, so it is common to include a chapter that gathers together the techniques used in most of the experiments.

The experiment

The experimental section may have one or more chapters, each dealing with one or more experiments. Each chapter takes the same basic form as a research article with sections for 'Introduction', 'Materials and Methods', 'Results', and 'Discussion'. The 'Introduction' is very short because a great deal of the background has already been given. Only specific information, unique to the experiment, needs to be given.

The results are given in full, with tabulated material and more extensive data given in appendices. Each experiment is discussed in this section in such a way that your conclusions will lead you to an overall discussion of your hypothesis in the final section.

Discussion

The Discussion will bring together all of your conclusions and allow you to apply them to your hypothesis. Most will support your theory, but some will not. It is up to you to integrate these negative findings into your account so that you can explain how they relate to your underlying idea. A complete integrating discussion in a separate final chapter can be logically arranged and is usually the most informative section of the thesis, leading to a clear conclusion.

The 'Summary'

The summary contains your main conclusions and is often difficult to prepare because you have so much material to consider. However, you need to restate your hypothesis and then describe the results to support your conclusion.

Reference list

Assemble the reference list as you would for a publishable article. There are a number of computer-based referencing programmes and if you have been conscientious in using one, you will be able to generate the reference list easily and in a consistent way. If not, you will have to do it by hand, which means carefully checking all the data and preparing the text in a consistent style from the start.

Chapter 7. Making Presentations

Paul Stapleton

The importance of presentations

Presentations are an essential part of professional scientific life. They are an important way of communicating with colleagues, peers, superiors and students. A good presentation technique is a powerful aid to promoting your work and your career. A poor presentation technique can result in missed opportunities and a negative impression of your work.

Many organizations require applicants to make a presentation as part of the selection process for a new job. This is an opportunity to show your capabilities to a highly critical audience. They will be comparing you with all the other candidates so you need to do well to have any chance of getting the job. Presentations in your institute or at conferences give you the chance to present your work in the best possible way – by the person who knows most about it – you.

Often, when you are making a presentation, you are not just representing yourself but representing your colleagues, institute, employer or even your country, so it is very important to give the best impression that you can.

A good rule is *"Say what you are going to tell them, say it, then say what you have told them"*. That does not mean that you should just repeat everything twice, but that you should introduce the subject, give the main points, and then summarize what you have just said.

You can only get a few key points over in an oral presentation. Do not expect to just read out a research paper and expect people to remember it all. If the audience remembers just a few key points, you have succeeded. So stress those in your introduction. Build them up in the presentation and repeat them as a conclusion as your critical message.

Developing your presentation

There are different ways of developing your presentation. You can start with an existing paper and convert it to a presentation format (see Appendix 9.1). This is very easy if you are working on a computer. Just reduce the text to a series of bullet points and separate them with page breaks. Then open that file in Microsoft PowerPoint® and the programme creates all the slides for you. It is then very easy to adjust the styles and headings to have a professional-looking presentation ready very quickly.

Some people prefer to write their presentation as a set of bullet points first, adding illustration, etc. as necessary. Whichever way you choose, you should also prepare a full paper to use as a handout at the meeting.

Your presentation

You cannot just stand up and talk at an audience for 20 minutes. Many will fall asleep and few will remember what you said, because talking is a very inefficient way of transmitting information. You will need lots of pictures. At the very least, you need pictures of the main points of your presentation. In that way, the audience knows where you are going. It also gives them something to look at, and adults remember things better when they can see them.

Do not try to include everything that you plan to say in your overheads. If you can just read out your slides as your presentation, you have put too much on your slides. Just put the main points.

How many slides should you use? Use one slide per minute if they are simple. If they

are more detailed then show one slide every two or three minutes. It all depends on how much explanation is needed for each one.

Illustrations

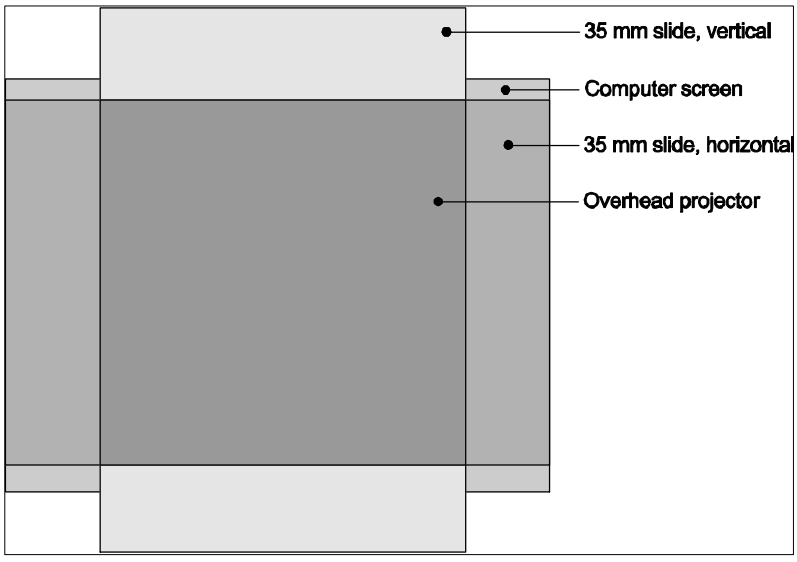
The next sections describe the different types of graphics you can use. Each gives information in a different way with advantages and disadvantages for a particular situation. In general, an effective presentation uses a mixture of typefaces and graphics to provide variety and interest. Many presentations consist mostly of bullet points, which can get pretty boring. Illustrations, graphs, tables and photographs add variety and interest.

Contrast and colour

Contrast is the difference between the darkest and lightest parts of anything. The greater the contrast, the easier something is to read. Black and white has the greatest contrast, which is why black type on white paper is used in printing. That is fine for printing, but black type on a white screen has too much glare and is too bright to look at.

You can use negative – white text on black - or use a grey or pale coloured screen behind the text to reduce the glare, but in most presentations you will be using colour. Colour can help attract or focus attention, set a mood or liven up a presentation. But it is very tempting to use too many bright colours. PowerPoint or other presentation programmes offer you all sorts of templates for presentation, and some of them are very colourful. But remember, too much colour on the screen can be very distracting for the audience. It is best to limit yourself to a simple design with just a few colours and the same style throughout your presentation.

Use colour to highlight something, like headings, lines on a graph, key words, etc. Remember that people who are colour blind cannot tell the difference between red and green, so do not use these two colours one on top of the other.



Format

When you are planning your presentation, take into account the shape of the area from the projector. A video projector is rectangular, as is a slide projector. An overhead projector is usually square. Most computer screens are landscape format, so it is usual to use that shape in PowerPoint. But there is nothing wrong with a vertical format, except that you might have trouble getting the entire image on the screen.

For overheads, always leave a generous margin around the edge - about 4 cm. If you are not sure of the quality of the overhead projector, it may be best to allow more margin to the left and right in case the light is weaker towards the sides. You will want the entire image to be visible at the same time. If you have to move the overhead around to project different parts of it, this will be very distracting for the audience and will break the flow of your presentation.

Text

The easiest presentation to make is a list of key points with bullet points. These serve as headings and you explain each one in turn. Do not overload the screen with too much text. It should be easy and quick to read. If you can print your presentation and use it as a handout, you have put too much text on them.

Screen after screen with lists of words can be boring. Think up ways to introduce some variety. Use the presentation programme to make 'builds,' where lines of text appear on the screen each time you touch the mouse. Or think about inserting a photograph of a figure or line drawing.

Typeface

Choose one or two simple typefaces that are easy to read and give a professional impression. Serif type (like Times) has small points or serifs on each letter. It is rather formal and usually reserved for printed documents and books. Sans serif type (Arial, Helvetica) has no serifs. It is usually used for headings and informal text.

Different typefaces. On the left are some of the most common display typefaces, used for headings, etc. On the right are the faces more often used for text**.**

Sans serif type is easier to read and it is a good choice for presentations. Your computer programme will have a huge choice of types. Avoid all the fancy ones because they are hard to read. Just choose a few simple ones and stick to them.

A mixture of capitals and lower case type is easier to read than a line of capitals. For headings and emphasis, use larger, bold type. Do not use all capitals as they are hard to read quickly, especially if there are a lot of them.

On an overhead, the smallest type should be around 14 points and the largest no bigger than 36 point. Follow the general rule that projected lettering should be 1 cm high for every 3 metres of viewing distance. So if the back row of the audience is 30 metres from the screen, letters must be projected 10 cm high.

Tables

Tables let you present data in a very precise way. Use a table if the actual values are important. The disadvantage is that most people use too many figures. Prepare simplified tables for a presentation, do not just scan a table off a journal, it will be useless.

Graphs

Graphs convey statistics faster and more efficiently than tables. There are different types of graph: bar graphs, line graphs and pie charts.

Bar charts

These are good for showing comparisons at different times, locations, conditions, etc. They are easy to understand. They can be either vertical or horizontal. Horizontal bars work best when you need to place the label directly on the bar. Avoid the "3-D" function because it adds a needless complication that makes things harder to distinguish.

Line figures

These graphs are good to show overall patterns in continuous data. Line figures generally track changes over time with the data points joined by lines and this implies change. Therefore, you should not use a line graph when there is no logical connection between the points. Again, resist the temptation to use 3-dimensional graphs. They look very impressive, but they are hard to interpret and are not really necessary unless it is essential to present three variables at one time.

Pie charts

These are best at showing what parts make up the whole and comparing proportions. They are most effective with six or fewer sections or slices. More than that, it gets hard to separate and compare the parts.

Schematics

These are used to explain institutional structures (organigrams), processes (flow diagrams), geographical features (maps), structures of objects etc. They help explain concepts, processes, relationships or structures that cannot easily be represented by words or a photograph. They are used to present essential detail, leaving out extraneous information.

Photographs

Photographs taken at the site of your work add interest and liven up your presentation. We all like to look at other people. So put people in your photographs if you can.

Handouts

Handouts are usually provided to the audience at the end of a presentation. They can be distracting if you hand them out before, because people will spend all their time reading them. They may stop listening and start reading ahead of the presentation. Even worse, they may pick up a copy of your handout then go shopping while you make your presentation. However, they can also be useful, especially if the audience are non-native language speakers. If you provide printouts of your overheads, the audience can make notes against each slide then look up the words they did not understand later. The best handout is the complete paper on which you based your presentation. That will contain all the details and you can refer to it while you are making your presentation.

Preparing a presentation

There are different ways to prepare a presentation. Most people use PowerPoint® or a programme like it that runs off a laptop computer through a video projector. You can also use photographic slides or overhead transparencies. Each has advantages and disadvantages as described below.

PowerPoint® presentations

Advantages

These give a very professional impression. The material is all prepared ahead of time but it is easy to modify. It is easy to convert a Microsoft Word® file into a PowerPoint® presentation (see Annex 9.1). Production is instantaneous. There is no film, processing or printing. Pre-designed templates make it easy to produce stylish presentation. Colour is integrated and costs nothing. You can insert photographs, spreadsheet illustrations, data plots, links to web pages, Acrobat files. Just about anything.

Disadvantages

The computer is vulnerable to crashes and power failures or slow telecommunications

connections for on-line presentations. Incompatibility between software, computers or projection devices can cause problems, so you need to resolve these beforehand. Unless the video projector is a good quality model, the resolution can be very poor and unsuitable for viewing by large audiences. Some audiences find such presentations too high tech and lose the human touch.

Photographic transparencies (slides)

Advantages

Slides can make colourful, lively presentations and focus the audience's attention on the screen. A series of good photographs with you providing the commentary can be really effective in getting your message across.

Disadvantages

The auditorium will normally be darkened. This means that you will lose face-to-face contact with the audience. The audience tends to become passive, and even fall asleep. If you are speaking after the lunch break, you have better make your presentation lively to keep your audience awake.

Once the slides (usually 35-mm) have been loaded, you cannot change the sequence during your presentation. It is not easy to find a slide, for example to respond to a question. You need a long lead time (2 to 5 days) to prepare slides.

Overheads

Advantages

The projector is located at the front of the room and near you for easy access. It will be effective even in a lighted room. The audience is more likely to stay awake and take notes. You will be able to see the members of the audience yourself and make eye contact with them. You will be able to modify your transparencies during the presentation and highlight important points with a pen. It is easy to discard sections of your talk if you are running out of time. It is easy to re-show a transparency. There is a short lead time (minutes for hand written and simple computer generated overheads) and the cost for black and white overheads is low.

Disadvantages

Overheads can be distracting to use; you need to practice changing the transparencies in a smooth way to give a professional impression. If the overheads are not clearly numbered and you do not keep the used and unused overheads in separate piles, you can easily lose your place in the presentation. It can be complicated to transfer information from books or other materials that need to be photographed into transparencies. Photographs, especially coloured ones, do not project well.

Speaking in public

Speaking is a slow and inefficient way of transferring information. Most speakers prepare too much material for the time available to them. Normal speech is 100 words per minute. In a 30-minute period, that means about 3000 words or six double-spaced pages of print.

The larger the room and the more people in the audience, the slower you should speak. If you are speaking to an audience with a different first language from your own, you will need to slow down even more and use simple language.

You will probably be speaking in English. Do not worry about speaking perfect English. Almost everyone in the scientific world is using English as a common language and most people do not speak it perfectly. The most important thing is that your

message is clear. And do not worry about your own accent. Just talk. Speak naturally; whenever possible, use personal pronouns ("you" and "we") and active verbs ("I prepared this overhead" rather than "This overhead was prepared").

Nervousness

Most people are nervous before a presentation. It is normal. The audience will recognize the signs and probably be sympathetic, because when they are in the same position they are nervous too. Your hands may shake or your voice may tremble, especially at the beginning of your presentation. You will get over the worst once you are into the rhythm of your presentation. Anyway, nervousness releases adrenalin, which will make you more alert.

The best way to reduce nerves is to be confident about what you are going to say. Giving a presentation is just like performing. And like a performer you have to rehearse. Know your material well. Rehearse your talk using your slides and check the timing. You can do this alone or in front of family or colleagues. This will give you more confidence, and they can give you comments from the audience's point of view.

Before you start

Try to arrive the day before your presentation and get a good night's sleep so that you will be physically and mentally alert. Check out the room before the day of your presentation. Find out about the arrangements for plugging in your laptop, loading your presentation on to the network or dedicated computer, or using your overheads. There may be a room specially set aside for you to do this.

Try to watch at least one other speaker so that you are familiar with the route to the stage and the way of handling the microphone, arranging your materials, etc. Then when your turn comes, you will know what to do. Identify yourself to the session chair, if necessary. Find yourself a seat reasonably close to the podium and at the end of a row so that you do not have to climb over a lot of people to get to the front. When the chairperson calls you, walk promptly to the podium and get ready to speak. The chairperson may give an introduction to each speaker and then hand over the floor to the speaker but check what the routine is in advance.

The presentation itself

Starting your presentation

The Chairperson will have introduced you, but it is always a good idea to have a slide/overhead that gives your name, what you do, your institute and the title of your paper. This gives your talk a natural start and lets the audience settle down and get used to you and your voice. Confident speakers start their talk with a joke to break the ice. If that does not come naturally to you then forget it.

Voice

Speak to the middle of the audience, raising your chin slightly to project your voice. Try not to shout at the audience. If you have a microphone, talk normally and let the organizers worry about the acoustics. If in any doubt, check early on in your presentation that the audience can all hear you. Adjust the microphone so that you can stand in a comfortable position. Remember that if you move away from the podium or turn to the screen to point at something, the microphone will not pick up your voice.

Vary your speaking voice, as you do in normal speech. Raise it as you ask a question. Changing the tone adds interest and variety to the spoken words. Silence is not bad and can actually be used to your advantage. Pausing before or after a critical point will add emphasis and give the audience time to think.

Making contact with the audience

You should try to act naturally in front of an audience. They will then respond more warmly to you. It is important not to freeze rigid when you are presenting. However, too much movement is distracting as well. Ask colleagues who help you practise your presentation if you have any nervous mannerisms, such as waving your hands about, walking up and down, or playing with pens.

Look at the audience. Do not turn your back to them to point at something on the screen, especially while you are reading from the screen. If you are using overheads, point down at the original with a pencil so that you stay facing the audience. Use a long pointer or a laser pen to point at slides on a screen.

A good technique to involve the audience is to make eye contact with individuals and hold it for a few seconds. This will engage the individuals and make them feel as if you are talking to them. However, do not fix on one poor person and stare at him / her the whole time. Do not glance wildly about the room without pausing on people; that makes you look very nervous. When you receive questions or comments from the audience, be sure to look directly at the person speaking.

Handling your graphics

A fundamental piece of advice is never to apologize for your overheads. Most people will not notice whatever problem you point out. If you have had a problem, like the photos not looking good, just ignore it and get on with the presentation.

Remember that when you flash a new graphic up on the screen, the audience will start reading it. This is what you want, but it means they have stopped listening to you. Either stop talking altogether until they start looking at you again, or tell them what they are looking at. Once they have absorbed the illustration, you can carry on.

Do not flash up one slide after another as it will be too tiring for the audience. If you are using a projector or overheads, do not leave it shining on the screen without a slide or overhead in place. The bright light is very distracting. Turn the machine off if you are not going to use it for a while, or cover it up with a dark slide. Turn the screensaver off on your laptop to avoid the thing suddenly flashing up some totally unrelated image while you are talking.

Timing

Time always passes faster than you think, especially if your presentation is going well. Put your watch on the podium; you will be able to check the time more easily. The Chairperson may have a routine of telling the speaker when there are 5 or 10 minutes left. Do not go over your allotted time. Using up another speaker's time is very impolite and unprofessional. When the Chairperson asks you to stop, do it immediately. If you are running out of time, it is better to cut out some of your material so that you can make a good conclusion.

A closing slide that sums up the main points will give your presentation a natural ending. You can then thank the audience for their attention or for listening to you and they will know that you have finished. Try not to say "That is all I have to say" or "I think that is my last slide" or worse, just stop. This is unsettling for the audience. You should try to come to a graceful conclusion that makes it obvious you have finished.

Questions

There is usually a time for questions. Remember that at the end of a successful presentation, you may be feeling euphoric but do not become over-confident or you may be careless. Listen carefully to each question and do not be afraid to ask for the question to be repeated or to paraphrase it yourself to ensure that you have understood it correctly. Give yourself time to think about your response and then answer as concisely

and clearly as you can. Let the Chair worry about managing this session, choosing people to speak and closing things down gracefully so that you can tidy up your materials and step down.

Annex 7.1. Making overheads from text

Original text	Final overhead
	Making contact with the audience
You should try to **act naturally** in front of an audience. They will then respond more warmly to you. It is important not to freeze rigid when you are presenting. However, too much movement is distracting as well. Ask colleagues who help you **practise your presentation** if you have any nervous mannerisms, such as waving your hands about, walking up and down, or playing with pens. **Look at the audience**. Do not turn your back to them to point at something on the screen. Especially while you are reading from the screen. If you are using overheads, point down at the original with a pencil so that you stay facing the audience. Use a long pointer or a laser pen to point at slides on a screen. A good technique to involve the audience is to **make eye contact** with individuals and hold it for a few seconds. This will engage the individuals and make them feel as if you are talking to them. However, do not fix on one poor person and stare at him/her the whole time. Do not glance wildly about the room without pausing on people; that makes you look very nervous. When you receive questions or comments from the audience, be sure to look directly at the person speaking.	• **Act naturally** • **Practise your presentation** • **Look at the audience** • **Make eye contact**
	Community-managed coconut seedling nurseries
Community-managed coconut seedling nurseries will be established to produce **seedlings for sale** to community members. Participants in all income generating activities will be encouraged or required to plant at least **10 coconut seedlings** around their homes. Seedlings will be derived from selected **local varieties and introduced** varieties which have potential for **high-yield and high-value products**. To avoid the transmission of major diseases, the imported varieties will be introduced to each country through **embryo culture-derived seedlings**, which techniques of production will be developed through a DFID-funded project. This activity will serve as a twin mechanism for **income generation** and for deploying coconut diversity and promoting its **on-farm conservation through use.**	• **Seedlings for sale** • **10 coconut seedlings each** • **Local and introduced varieties** • **High-yield and high-value** • **Embryo culture** • **Income** • **On-farm conservation**

PART III
WRITING WORKSHOPS (Writeshops)

Chapter 8. The Writeshop: Fast-tracking Quality Publications

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What is a 'writeshop'?

It is a workshop where writer-practitioners and experts are gathered together to produce a publication from a compilation of related articles / papers or reports with the help of a production team of editors, artists and desktop publishing staff. It usually lasts for about 10 to 15 days, but may either be longer or shorter depending on the topic, the number of papers / articles and the number of participants. The papers or articles starts off 'raw', usually very long and text heavy, which are then appropriately edited, shortened, illustrated and desktop published within the period of the workshop. The resulting output is a packaged material that is camera-ready and all set for commercial printing. The whole process, from the start of the workshop to the printing and distribution of the final output, usually only takes about a month or, at the most, two.

Why a writeshop?

The writeshop process allows inputs from all participants to be incorporated into an article or report, taking advantage of the diverse experiences and expertise of all present. The concentration of resource persons (authors and practitioners) and production staff (editors, artists and desktop publishers, as needed) at one time and within one place enables materials to be produced more quickly and, in most cases, more comprehensively, than is typical for similar publications or reports.

When is a writeshop ideal?

The writeshop can be used to: 1) produce a compilation of related articles from different people situated in different places; 2) integrate several reports from different project implementers located in various sites; or 3) compile best practices or success stories from a project across organizations or geographic locations. The process is an ideal option when one needs to produce a publication or compilation under time limitation or deadline and when the authors are not controlled directly by the one needing the publication, whereupon giving them deadline for submission of reports or articles and allowing them to work on their own do not provide assurance that a high quality report or article is developed on time. It is also a good option to ensure adequate and accurate data and information, having inputs from a number of experts and practitioners present during the writeshop.

…and when is it not ideal?

A writeshop, however, may not be ideal under any or in combination of the following circumstances: 1) when funds are inadequate; 2) when producing a report of a small and simple project; 3) when the project leaders have exhibited good writing skills based on the reports submitted during the earlier part of the project; and 4) when authors are not so dispersed and that fast and reliable communication facilities are available.

How to go about the process?

The writeshop as a process is a dynamic tool to produce quality output in a shorter period than otherwise required producing similar document or publications. The steps

and procedures described herein are not rigid or static. The process is flexible and organizers are encourage to innovate and modify the processes involved depending on the resources available and the type of publication they want to produce (see Figure 1 for process flow diagram of a typical writeshop). The following are the steps and procedures in conducting a writeshop:

A. Pre-writeshop

1. A Technical Committee needs to be convened to plan, organize and manage the writeshop and post-writeshop activities, until the material or manuscript is ready for printing. The Technical Committee can be composed of the Chairperson that can be the Project Coordinator and if the writeshop is intended to produce a report of a project, an editor and few others (3-4) should preferably be participants in the writeshop. The Chairperson of the Technical Committee should act as the Technical Coordinator of the writeshop and be responsible for the technical soundness of the expected output of the writeshop. He/she shall be responsible for decisions on technical issues during the writeshop. The Editor shall be the Writeshop Coordinator primarily responsible for coordinating and managing the writeshop activities and ensuring the efficiency of the editors, artists and desktop publishing staff in coming up with the expected draft materials. In case the subject is a terminal report for donors, representatives from partner organizations who are actively involved in the project implementation can be invited as members of the committee.

2. The Technical Committee has to plan the writeshop. It has to design the outline and guidelines for the preparation of manuscripts. If it is a writeshop to produce a report, the requirements of the funding agency should be taken into considerations in preparing the guideline. In addition to the outline of the article being solicited, other details have to be indicated in the guideline for submitting article/report to the committee, i.e. size and type of font to be used, spacing required, approximate length of the article and of each heading or subheadings, margins, and the programme to use in sending the papers (pdf, zip or Word).

3. The guideline should be sent to the prospective participants of the writeshop way before the expected dates of the workshop. The lead time will depend upon the length of the article or report being solicited.

4. The concerned author/writer should then prepare the first draft of the article or report for submission to the Technical Committee.

5. The Technical Committee can call a meeting to formulate the parameters for reviewing the submitted articles/papers. The committee can apportion the papers/articles for review among the members. The papers should be reviewed to assess the relevance of each topic/paper for the publication.

6. Once articles are found to be relevant and adheres to the outline sent earlier, a notice should be forwarded accepting the author's participation to the writeshop. Informing the participant earlier (especially those based from abroad) would allow sufficient time for preparing travel documents (i.e., visa, medical certificate, etc). Authors with "deficient" articles should also be notified for improvement of the papers submitted.

7. Major comments and suggestions can already be fedback to the author/writer for his/her preparation of 'clean draft' to be presented during the writeshop. The

Technical Committee should be able to advise prospective participants what necessary reference materials to prepare and to bring during the writeshop. This process allows participants to already fill in major data gaps, if any, thereby lessening the length of the writeshop duration.

8. Depending on the expected length of each article or paper, the number of participants and the length of the writeshop, a production staff of editors, artists and desktop publishing staff should be organized to work hand in hand with the authors. Each author should have an assigned editor and artist to help enhance his/her paper. Having confirmed the number of participants, assignment should already be given as to who will work with identified participants.

9. The Technical Committee should meet with the production/publishing staff to brief them about the editorial requisites, i.e. lay out format, style, margins, font size and type on heading, sub-heading, etc. based on the standards being used by the Institute.

> The production team should be brief also on where to save the 2nd draft, 3rd draft and 4th draft respectively. A dedicated folder should have to be assigned for the purpose to avoid confusion on which one is the latest version.

10. The dates and venue of the writeshop should be communicated to the participants well ahead of the schedule, including arrangement for pick-up, and room and food accommodation.

11. A number of computers, photocopier and other supplies, plus a team of support staff should be available for smooth proceedings of the writeshop.

12. Sufficient number of the 'clean draft' should be photocopied for the participants and the Technical Committee. The manuscript should also be copied in a transparency to be used by the author-participant in his/her presentation during the writeshop.

> If an LCD projector will be used, there is no need to make transparencies of the materials for presentation.

B. During the writeshop

> The writeshop can be made participatory. One of the participants could serve as moderator or chair 2-3 presentations.

1. Each participant-author should be asked to present each page of his/her paper using either overhead or LCD projector. Copies of each draft should also be given to all the participants, composed of the Technical Committee and other authors or writers who then shall critique the draft and suggest further revisions in terms of technical content.

2. During the process of critiquing, the concerned author and the assigned editor should take note of the comments and suggestions from the group, writing on the manuscript itself.

3. After the first presentation, the author, the editor and artist team should sit down

and discuss the improvement and revision/editing of the draft and the drawing illustrations necessary to accompany the text (while the next author participant is presenting his/her paper). .After which, the author should get back to the session and join in critiquing the presentations that follows. Meanwhile, the editor and the artist should work on the paper. The edited draft and artwork should be desktop published to produce a second draft.

Second draft papers that are edited, illustrated and desktop published should be reproduced again for participants' reference. A copy should also be displayed on the board where others can put their additional comments or suggestions that they may have failed to raise during the plenary. The author and editors should also take note of the additional inputs written on the copy. The same process also goes for the 3rd draft.

4. The same process of presentation follows, the author going out of the session to discuss with the assigned editor and artist on the needed improvement of the paper and the author going back again to the presentation in session, until all have presented their papers.

5. The revised/second draft should likewise be presented following the same procedures done during the first draft presentation. Again, the audience should critique and suggest revisions to the paper. This time not only the technical content should be given focus, but should also include the style, language, grammar, illustrations, etc. After the presentation, the editors, (artists and desktop publishing staff) should again help the author to revise the paper/report and developed the third draft.

Some papers presented earlier may not be ready for second presentation in chronological order as in the first round presentation. At this stage, whatever papers that are ready are deck in for 2nd draft presentation. The same process follows until the 3rd draft is presented.

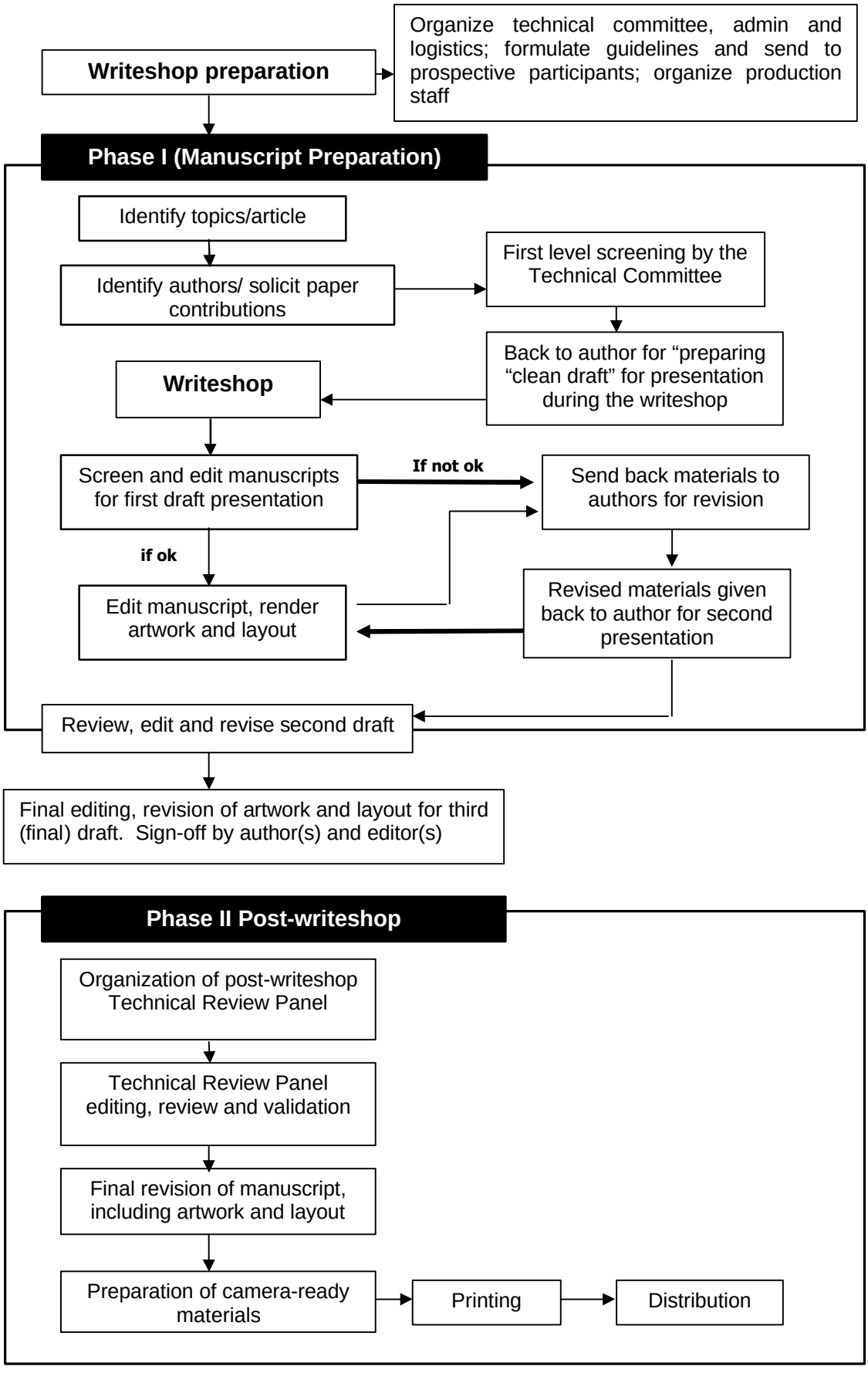
6. Towards the end of the workshop, the third draft should be made available to the participants for final comments and revisions. A semi-final draft should then be 'signed-off' by the author signifying his/her approval and satisfaction over the developed article/paper.

At the end of the writeshop, the Technical Committee should make sure that the final output (4th draft) are saved on a CD (with back-up copies) and hard copies are secured from the author and/or editor.

C. Post-writeshop

1. The Technical Committee can be expanded to include few more from the participants to enhance participation and ownership of the output. This body can be called the Technical Review Panel. They should discuss the final layout of the whole publication: cover layout, main title, headings and subheadings and the order of the article. Eventually, they should review the consolidated final draft manuscript.
2. The neatly desktop published materials should then be routed for final comments of stakeholders and programme management team (if required). After all the suggestions have been collected, an editor should be assigned to finally review and edit the whole document for consistency in style, font sizes, margins, spacing, etc.
3. After the final editing, the camera-ready copy should be prepared for final printing for eventual distribution.

Figure 1. Process flow diagram of a Writeshop



PART IV
PUBLIC AWARENESS IN SCIENCE

Chapter 9. Practical Public Awareness in Science

Ruth Raymond

> *"... **public awareness** is critical for promoting sustainable development and improving the capacity of the people to address environment and development issues. It is also critical for achieving environmental and ethical awareness, values and attitudes, skills and behaviour consistent with sustainable development and for effective public participation in decision-making*."
>
> Agenda 21, Chapter 36.3

Introduction

In recent years, various factors have led scientists and development workers to recognize the need to convince people outside their field of the value of their work. These factors include the world's growing development challenges, the revolutionary potential of information to bring about large-scale change, and greater competition for fewer resources.

In particular, the remarkable growth of the Internet over the past decade has transformed us from a society of one-way information providers into a society of communicators that is based on open debate and transparency. At the same time, as the lines between national, regional and international development concerns have started to blur, there have been greater incentives to seek common approaches to global problems. Multilateral approaches to problem-solving are terrifically complex -- not to mention expensive -- hence the need for broad popular support for development activities is particularly important.

Most recent international agreements concerned with agriculture and the environment stress the important role that can be played by public awareness in the promotion of sustainable development. Agenda 21 devotes an entire chapter to the subject. The Convention on Biological Diversity also emphasizes the importance of public awareness. More recently, the Global Plan of Action for plant genetic resources, adopted in Leipzig, Germany in 1996 by 160 countries, identified public awareness as one of its 20 priority activities.

But these international commitments to awareness raising have not altered the fact that the public is not really concerned about the environment or development. Only about 20% of the general population are even somewhat knowledgeable about science.

Public awareness is an important tool for mobilizing popular opinion and for generating and sustaining action and political and funding support within countries and globally. A targeted public awareness programme can promote the development of international linkages and collaborative mechanisms. Within the International Coconut Genetic Resources Network's (COGENT) member countries, public awareness can facilitate efforts to involve communities and local and non-governmental organizations in coconut genetic resources activities, thus ensuring a broader base for conservation.

Start with a strategy

Identify your objectives

A truly effective public awareness effort begins with the development of a strategy that includes objectives, target audiences, key messages, tools and approaches. Use the worksheet in Annex 10.1 to map out the elements of your strategy.

The first step is to identify a specific objective or set of objectives for your public awareness programme. The objective might be, for example, increased funding for research on coconut genetic resources or a national commitment to support conservation. COGENT has identified a number of objectives for the public awareness work of the network. COGENT members may wish to adapt these objectives for public awareness work in their own countries or add other objectives suited to their needs.

COGENT's Public Awareness Objectives

- * Policymakers in partner countries have a better understanding of the importance of coconut genetic resources
- Public opinion influences stakeholder concern and action to support research on coconut genetic resources
- The operational activities of COGENT receive sustainable support

Identify your target audience

Once you have identified the objectives of your public awareness strategy, the next step is to determine your target audience. This should include the people who have the power to make your objectives a reality. You should consider both primary and secondary audiences. The primary audience consists of those people and groups that are in a position to directly influence policies and resource decisions affecting coconut genetic resources in your country. More than likely, your primary audience will include government officials. Because governments change constantly, it is important to keep up to date with who is in power and who their key staff members are. You will probably have to do some research on the political and funding process relative to biodiversity conservation.

The secondary audience includes the groups and individuals whose goodwill and support are important to the members of the primary audience. Secondary audience members vary from country to country, but might include farmers, private industry, researchers, university faculty, government agencies, donors, the news media, non-governmental organizations and other special interest or advocacy groups.

Choose your messages

Once you have identified your target audience, you will need to determine the extent to which they are knowledgeable about your issue. Does the audience currently support coconut genetic resources research? Does it understand the importance of coconut to smallholders and its potential to make a major contribution to development in poor countries if fully exploited? Then consider the message you want to convey to the audience. The extent of your audience group's knowledge will dictate the degree of sophistication of your message. Each audience group requires a different communications strategy; there is no one approach that will be appropriate for all audiences.

The most basic and fundamental rule of public awareness is this: **Know Your Audience.** Put yourself in the shoes of the people you are trying to communicate with and imagine the sorts of issues they care about, such as the economy, the weather, their health. Relate your message to their concerns and you will get their attention.

Select your tools

There are many communication tools that can be used to reach specific audiences. These include mass media such as news releases, television, radio, and the Internet; targeted media such as direct mail, periodicals, newsletters; formal or informal meetings; personal visits, speeches, exhibitions, letters and telephone calls. Teleconferencing, interactive video and electronic mail are also excellent channels of communication.

When selecting a means of communication, first consider the target audience. If you want to reach a very large audience, such as the general public, then mass media may be the best vehicle to use. If a smaller group or an individual – like a government official – is your target, try to establish regular direct contact with these groups or individuals and keep them well informed and up to date on your issue.

Reaching the media

In most every case, your public awareness strategy will include the media among its target audiences. Why? Because media coverage of an organization or an issue provides credibility. An article in the newspaper or in a magazine says that the world considers your work to be important. The media is able to reach thousands and sometimes millions of people that you may not be able to reach in any other way. It is also a key medium for reaching government officials, who read newspapers, watch television and listen to the radio.

What is news?

How do you decide whether your story is newsworthy or not? Start by asking yourself the following questions. If your answer is "yes" to one or more of the questions, your story could be news.

Does your story concern an event that has occurred within the past 24 hours?

Timing is important in determining whether or not something can be considered as news. Look at the front page of your local newspaper. The headlines most often concern something about today that is different from yesterday (*Gore gains Democratic nomination*, or *British, Norwegians join Russians in trying to rescue stricken sub*).

If you can find a link between your story and an event that is already receiving attention in the press, it will be news.

Is your story surprising, unexpected or counter-intuitive?

The more unusual your story is, the more likely it is to be considered news. In the classic illustration of this point, *Dog Bites Man* would not be considered a news story. But *Man Bites Dog*? That's another matter!

Is your story important?

Obviously your story is important to you, but how important is it to the rest of the world? How great is the impact? The announcement of a research breakthrough that will significantly improve the livelihoods of millions of coconut producers and consumers around the world is an important news story. The fact that a workshop on coconut genetic resources is taking place is not. Another factor that might determine importance: is your story about something that might be considered the first, the biggest, or the most comprehensive effort that has ever taken place in the field? An example of this might be *World's First Environmental Atlas Will Help Reduce Deforestation in Latin America.*

Are there any prominent people involved in your story?

A visit to your institute by a high ranking government official or a statement by a celebrity about the importance of your work is news.

Is your story happening close to home?

Your story will be considered news if it concerns an event or activity taking place near where your audience lives or that will affect their lives directly.

What's not news

Staff promotions and other inter-institutional administrative changes, board meetings, training programmes, and scientific meetings are not generally considered newsworthy by the media. However, they still may be of interest to your donors and other partners and you might consider writing them up for direct distribution to these groups if they are part of your target audience.

Sometimes, your story might lend itself better to a feature article or backgrounder (see Annex 10.2). Features differ from news in that they are not time sensitive, and do not require a specific release date. Features generally address a timely problem and have a high human interest quotient. Research often lends itself nicely to this sort of treatment. A what-if-we-succeed story describes a research programme in progress, its goals, and the potential benefits if it succeeds. You should be careful not to give the impression that the programme has already succeeded in its goals. But properly qualified, such stories of work-in-progress are valuable for keeping donors up to date on what their money is paying for and the general public aware of key issues receiving current research attention.

Even if it does not strictly qualify as news, your story can still be used to write a letter to the editor, brochure, fact sheet (see Annex 9.3), poster, display, presentation or material for the Internet. Many of the tips on writing news stories described below are also relevant for the development of other public awareness materials.

Writing a news story

Once you have determined that your story has news value, you will need to write it up in a form that can be used or adapted by the media. News stories share certain common characteristics:

- They have press conference potential
- They require a news release
- They are time sensitive

Good news stories are easy to understand, are entertaining or enlightening, and contain people and situations to which the reader can relate.

Headlines and the lead

Most editors and reporters receive vast numbers of news release every day, far too many to read in their entirety. If you want them to run your story, you must grab their attention right away. Therefore, the headline and the beginning of the release -- known as the lead -- are critical. Try to put the 'meat' of your story into your headline. The headline should be thought-provoking and to the point; it should contain a verb. The lead should simply expand on the headline. The details of the story should appear lower down in the news release.

The concepts in the news release should be stated simply. Quotations from leading experts are a great way to humanize your story. No sentence should be longer than 21 words. And the paragraphs should be short. The majority of your sentences should contain only one idea. If your first sentence is too long and complex, if it does not make the news value of the story jump out, it's likely to end up in the bin.

In writing up news releases (see Annex 9.4), always be sure to answer the following questions:

- Who?
- What?
- Where?
- Why?
- When?

- How?

The order in which you address these questions does not really matter. Just start with the most interesting. In scientific stories, the why and how are often the best place to start.

Brevity plus simplicity equals clarity

The techniques and objectives of public awareness communications are quite different from those of science writing. Technical words and narrow scientific jargon may be appropriate when communicating with your colleagues, but there is no faster way to lose a non-expert audience.

Crisp, clear communication is based on a number of basic principles:

Use short words whenever possible. 'Use' is more effective than 'utilization' and 'explain' is a lot friendlier than 'elucidate'.

Condense wordy phrases. A public awareness effort can be 'of low cost and high efficiency' or it can be 'cheap and efficient'. 'At some future point in time' does not communicate anything different than 'sometime.'

Beware of 'nouning.' Upon completion of the project,' 'through the use of this technology,' 'the greatest challenge in the implementation of the Global Plan of Action' are examples of phrases made less comprehensible by converting verbs to nouns. A related phenomenon is 'verbing.' Olympic athletes now "medal", mountain climbers "summit", and apartments can be "applianced."

Use the active voice whenever possible. "The dog chewed on the bone" is far more immediate and effective than "The bone was chewed on by the dog."

Say what things are, not what they are not. Phrases like 'not insignificant' and 'not inconsistent with' are confusing.

Avoid jargon. The jargon associated with your field is likely to be so firmly entrenched in your language that you do not notice it anymore. But your audience will notice it. Do not use technical terms unless there is a very good reason for it. Let the audience concentrate on your ideas, rather than puzzle over your words.

Minimize the use of acronyms. They are elitist and anti-social.

Keep it short and sweet: Long words and their shorter substitutes *(Source: Gastel, B. 1983. Presenting science to the public. ISI Press, Philadelphia. p. 12)*

Long word	Better choice	Long word	Better choice
Approximately	About	Necessary	Needed
Attempt	Try	Numerous	Many
Complicated	Complex	Opportunity	Chance
Concerning	About	Optimal	Best
Construct	Build	Perform	Do
Currently	Now	Possess	Have; Own
Demonstrate	Show	Previously	Before
Elucidate	Explain	Primarily	Mainly
Essential	Needed	Principally	Mainly
Fabricate	Make	Subsequently	Later

Long word	Better choice	Long word	Better choice
Fundamental	Basic	Sufficient	Enough
Illustrate	Show	Superior	Better
Indicate	Show	Technique	Method, Way
Initiate	Begin	Terminate	End
Instrument	Tool	Uncommon	Rare
Manually	By Hand	Unnecessary	Needless
Modify	Change	Utilize	Use
Multiple	Many	Verify	Prove

How to reach the media

Seek them out

Unless you are playing an important role in a major news event, the media will probably not contact you. You must make the contacts. The Ministry of Information in your country, the Press Office of the Ministry of Foreign Affairs, the local press association or press club should have a list of publications and broadcast outlets. These lists normally include information about circulation, audience size and political orientation. Check out newsstands, libraries, the radio and television for other news outlets.

Remember that reporters are human, too

As with all people, some journalists will be knowledgeable, ethical and professional. Others may not be. But all journalists have one important thing in common - they are all looking for a good story.

The reporter is your partner, not your enemy

You know far more about your subject than any journalist and this gives you the advantage. The journalist needs you and your expertise in order to get the story right. If you are prepared and keep your thoughts straight, you can be the master of any interview.

Create or seize opportunities to engage the media

You do not need to wait for a special occasion to publicize your work. You can invite local journalists to visit your institute or a project site, plan an activity to coincide with an existing 'event' (e.g. World Food Day), or contract with a freelance journalist to write about your work.

Use the Internet

Today, many journalists gather their information while sitting at their computers. They surf the Internet looking for stories and sources. A well-designed website can make your stories instantly available to anyone with Internet access. Be sure to keep your site up to date. You should have your best and newest stories on your home page. If you have a six-month-old story displayed on your website, journalists will quickly lose interest.

Make a list of good story ideas in advance

Journalists are busy people. They will not appreciate it if you waste their time. Carefully think through in advance what you want to say to them. Write a list of stories that you think might be of interest. Try to anticipate what the questions might be and prepare your responses. You might want to hold a mock interview with a colleague to practice handling difficult questions.

Nurture long-term media relationships

Do not let your media contacts lapse. Stay in touch, checking in periodically with a story you think might be of interest to the journalist. They will appreciate the personal treatment.

Do not become complacent

Review your media strategy every so often. Brainstorm with colleagues on possible media opportunities.

The Press Conference

Organizing a news conference requires careful planning but it can give you great exposure. You might wish to call a news conference when:

- Your story qualifies for detailed treatment;
- You need to provide more information than you can include in a news release;
- The news is 'big' and will attract wide attention; and
- You want to give your story a very high profile.

If there is media interest in your work but you do not have any real news to present, you can hold a briefing for reporters. This will allow you to provide some background on the work you are doing. While the briefing may not lead to any immediate media coverage, it will give you the opportunity to make contact with local journalists.

Dos and Don'ts of speaking to the media

Do…

Be clear and concise

Keep your answers short, straightforward and candid. Avoid using jargons. If during an interview you feel trapped in a confusing web of thoughts, or do not like the answer you have given, simply stop and rephrase your answer. Do not hesitate to ask the interviewer to repeat the question if you did not understand it the first time.

Put people first

Emphasize the human side of the story. Be passionate about your subject. Details about new conservation techniques mean nothing to journalists. Explain the consequences to people if coconut genetic resources are not conserved.

Respect deadlines

Journalists normally work under extremely tight deadlines. Return phone calls promptly. If you agree to provide the reporter with additional information within a certain timeframe, be sure that you do.

Correct incorrect statements

If inaccurate information is printed or you are misquoted, immediately contact the reporter. If the error is a serious one, ask the reporter or his /her editor if a correction can be published or broadcast. Follow up with a letter to the editor providing the correct information.

Don't…

If you don't know the answer to a question, do not guess or speculate
If you cannot or do not know the answer to a question, say so. No one is expected to know everything. However, do volunteer to supply the information as soon as you have had a chance to check on the facts. Ask when the reporters' deadline is and make a point of calling back in time.

Do not answer hypothetical questions
Do not get trapped into answering 'what-if' questions. Journalists may pose these when they feel they are not getting a good enough story. Tell the journalist that you are not willing to speculate. However, if the situation ever does arise, you will be willing to comment at that time.

Do not exaggerate
Journalists do not want hype or exaggeration. Support your statements with facts and evidence. Do not tell journalists that yours "is the greatest project in the world" or that "as a result of our work in Africa, famine has been averted."

Do not argue or attack
Do not get into an argument with the journalist. Stay calm and friendly. Give factual answers. Do not debate over positions.

Off-the-record
Off-the-record, in the sense of 'just between you and me', does not really exist in relationships with journalists.

Never get sidetracked into unrelated areas
If the reporter turns the focus of the interview to non-relevant issues, take the initiative and draw attention back to the story you want to tell.

Never let the journalist put words into your mouth
You decide what you say publicly, not the reporter.

Annex 9.1. Public awareness strategy worksheet

Objectives
If successful, your public awareness campaign will have the following results:

Target audience
These are the groups and individuals that can make your objectives a reality:

Messages
What do your target audience groups care about? How can you use your message to link your issue to their different concerns?

Public awareness tools
What are the most effective and appropriate tools you can use to convey your message to your different target groups? Note that different audiences will almost certainly require different tools.

Annex 9.2. Sample feature story

POETS, FARMERS UNITE IN NEPAL TO SAVE NATIVE CROPS

Poets are famously fond of writing about nature, making them a perfect ally for conservationists. A series of *Gramin Kabita Yatra* (literally, rural poetry journeys) was held during 1998 and early 1999 in four Nepali villages – three in Begnas, Pokhara and one in Bara. The villages are participants in IPGRI's global on-farm conservation project, which supported the journeys. An NGO (Local Initiatives for Biodiversity, Research and Development), the Nepal Agricultural Research Council and the Pokhereli Youth and Cultural Club jointly organized the programme, whose purpose was to sensitise farming communities to conservation issues and to document knowledge about local genetic resources using poems and songs.

Ten nationally renowned and local farmer poets travelled from village to village to learn why communities maintain diverse types of genetic resources. At each village, the itinerant poets visited farmers' fields and got to know the local people and their crops. Village innkeepers were encouraged to prepare foods using local crop varieties. The next day, the poets recited their odes to biodiversity for the community before moving on to the next village.

The impact of the poetic pilgrimages is being felt far beyond the four villages where they occurred. The poems were published in newspapers throughout Nepal and have figured in the development of training materials for IPGRI's on-farm project. The village poetry readings were audio-taped and it is planned to feature them in regional radio broadcasts. The best of the poems have been published in a collection called *Sampada* (meaning ‘heritage’). The book will be sold to generate revenue for community conservation and use programmes. Copyright belongs to the local communities and the project site team. A future issue of *Geneflow* will feature some of the biodiversity poems.

The wandering minstrels do not intend to rest on their laurels for long. Inspired by their new knowledge of the ties between people and plants, they plan to make their poetic pilgrimage an annual event.

Annex 9.3. Sample fact sheet

THE INTERNATIONAL COCONUT GENETIC RESOURCES NETWORK (COGENT)

The coconut, *Cocos nucifera L.*, is a smallholder crop, grown on about 11.6 million hectares in 86 countries. It is widely known as the 'tree of life' because it provides more than 100 separate products, including food, drink, fuel, livestock feed, fibre and building materials. If the coconut were to be exploited to its full potential, it would increase food production, improve nutrition, generate income, create employment opportunity, enhance equity and help conserve the environment. But the coconut, however, faces several problems that affect its production and competitiveness such as low yield, unstable market for its traditional products, pests and diseases, natural calamities, aging of palms, and genetic erosion. National research capabilities to address these problems are limited and patchy and need to be strengthened.

In 1992, IPGRI, with the endorsement of the CGIAR, established COGENT to promote a worldwide programme for the conservation and use of the genetic resources of this important crop. The network's goal is to help national programmes address their common problems and opportunities around coconut.

COGENT's priority action areas include the establishment of an international coconut genetic resources database; collecting, conserving and evaluating representative diversity and promoting its use; and developing strategies and techniques for efficient germplasm conservation and use. At present, COGENT has 38 member countries, which have committed to collaborate in research, and share germplasm and information.

COGENT's current workplan includes the development of an international coconut genetic resources database, collecting and conservation of representative diversity in all member countries; development of improved techniques for embryo culture, cryopreservation, *in situ* conservation and development of molecular markers techniques for locating diversity and for promoting safe movement of germplasm; the establishment of a multi-site International Coconut Genebank; and studies of diversity in coconut traits including drought resistance, suitability for high value products, and compatibility for intercropping.

More coconut facts:

- Coconut is believed to have first grown in the Western Pacific.
- Now it grows on about 12 million hectares in 90 countries.
- About 50 million people make their living from growing coconuts, of which about 30 million are in Asia.
- 96% of the world's coconut crops grow on small plots of less than four hectares.

Annex 9.4. Sample press release

PLANT EROSION THREATENS WORLD FOOD SUPPLY, EXPERT WARNS

For further information, contact:
IPGRI Regional Office for Asia, the Pacific and Oceania
P.O. Box 236, UPM Post Office
43400 Serdang, Selangor Darul Ehsan, Malaysia
Tel: (603)8942 3891; Fax: (603)8948 7655
Email: p.quek@cgiar.org or r.raymond@cgiar.org

Kuala Lumpur, June 12. Warning that the world's food supply is more vulnerable now than at any time in history, a leading international scientist today called for stronger measures to protect the earth's plant diversity. "The continuing erosion of agricultural biodiversity particularly menaces poor countries where more than half the labour force works in agriculture," cautioned Dr Geoffrey Hawtin, Director General of the International Plant Genetic Resources Institute (IPGRI), the world's largest international organization devoted to the conservation and use of plant diversity.

Speaking at an international conference on plant genetic resources, which opened today in Kuala Lumpur, Dr Hawtin said, "the wise use of plant diversity can help improve the livelihoods and food security of poor farmers and can lead to a more environmentally-friendly agriculture." Dato' Haji Zainal Bin Dahalan, the Deputy Minister, Ministry of Science, Technology and the Environment, Malaysia opened the conference. It brings together nearly 300 experts from 60 countries to forge a strategy for employing new tools and technologies to improve the conservation and use of plant genetic resources. "This important conference is most timely," said the Deputy Minister, "as Malaysia has recently launched its National Policy on Biodiversity, following the signing of the Convention of Biodiversity at the Earth Summit in Brazil, 1992."

Throughout the world, thousands of people die each day of starvation or diseases related to starvation. An ever-increasing world population means that by the year 2025, food production will have to double to keep pace with new demand. The genetic resources found in plants provide the raw materials that allow farmers and professional plant breeders to modify their crops in response to changing global climate conditions, land degradation, and diseases and pests. Genetic resources can improve the livelihoods of poor farmers by reducing their vulnerability to stresses and seasonal changes. Given access to a new seed variety that produces higher yielding, disease resistant crops, farmers can produce more food than their families need so they can sell their surplus at the local markets. And the use of genetic resources can improve the resilience of agricultural systems and increase the efficiency of the use of water and land resources.

Large numbers of traditional crop varieties disappear each year. Significant genetic diversity of crops may have already been lost from farmers' fields. In China alone, nearly 2000 rice varieties have been lost over the last 30 years. Without access to a continuous supply of genetic material to draw on for crop plant breeding, there is little hope of meeting the needs of future generations.

The conference, which was organized by IPGRI and the Malaysian Palm Oil Board, continues through the week.

PART V
WRITING PROJECT PROPOSALS

Chapter 10. Writing Project Proposals[1]

Paul Stapleton

Fundamentals

Planning and preparing good research proposals is one of the best investments you can make. But a lot of advance planning and preparation are needed to be sure that a proposal is accepted. The organizations granting research money want to fund good research because of the benefits it brings. However, most of these organizations receive far more applications for funds than they can possibly meet. One international research foundation cited the most frequent causes for rejecting proposals as the following:

- The research proposed does not correspond to the priority concerns of the organization.
- The proposal does not clearly state the hypothesis or question to be investigated.
- The proposal does not contain enough detail on the methods and materials to be used for each proposed operation.
- The proposal does not show that the principal investigator has enough experience of the proposed research topic, lacking published literature on the subject.

These sound obvious and simple but are based on real experience.

Identifying research projects

Identifying research projects should come from the general research goals and objectives of a research programme. Large-scale objectives point towards areas that need more specific research. These can be grouped into research activities that can be developed into well-defined projects.

The problem that faces all researchers is deciding which level to situate projects in the hierarchy of objectives. At the higher levels, there are fewer projects, each with more objectives. At lower levels, there are more projects, with narrower objectives. The scale of the project is often dictated by the donor that is chosen. The World Bank (WB), the International Fund for Agricultural Development (IFAD) and the Global Environment Facility (GEF) look for large, multi-million dollar projects. Other donors, for example the Australian Centre for International Agricultural Research (ACIAR), will consider projects with budgets as low as US$ 20 000. The size and duration of a project depend on:

- The type of research;
- The nature of the investigations;
- The scope of the project objective; and
- The availability of resources, both financial and human.

Choosing a project

The first and most important requirement for a grant proposal is to have a research question that is worth answering. Then you need to show how the research you propose will lead to a solution. It will help if you have already done some work on the problem.

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[1] Some sections of this chapter were developed from the excellent resources that are available from ISNAR (http://www.isnar.cgiar.org) and CIFOR (http://www.cifor.cgiar.org). Material from donor web pages has also been incorporated into the text to increase its usefulness, especially from ACIAR (http://www.aciar.com.au) and the International Development Research Centre (IDRC) (http://www.idrc.ca). These sources are acknowledged with thanks.

You also need to show why you or your institute should be doing the research and what your advantage is over other groups. This is known as 'comparative advantage.' However, most donors agree that the fact you have already done some research on a topic is not enough to justify continuing the research, i.e. "We want to do more research because we are already doing it".

Another thing the donors want to see is a clear finish. The project should have a beginning, middle and an end. The donor needs to see that a time will come when the work is finished and measurable objectives have been achieved. Few donors will fund an open-ended project. They may also be put off if the first proposal describes the need for a second phase of research and funding to come to a firm conclusion.

Donors have strategies and goals themselves, and they lend money for work that will contribute to achieving those goals. A goal is a large target (like poverty eradication) that will require many projects to achieve, or may never be achieved. Your project contributes to the donor's goal through its objectives and results. These must be achievable within the life of the project. The project is implemented to achieve outputs. Outputs must be tangible, like a new technology or piece of equipment.

A successful project will also have a positive impact on some individuals or groups or both. That impact should be described in terms of the project goal. Impact is usually defined as people being better off in some way. The most likely duration for a fundable project is two to five years.

Picking the right topic is the first step to getting research funded. When picking a fundable research topic, you should look for something that is:

- Important enough to be worth doing;
- Useful and valuable to others;
- Achievable in a reasonable amount of time;
- Balanced in risks and returns; and
- Attractive to partners.

Choosing a donor

Every donor agency is different, but all share certain features. Most have broad development goals that evolve from national policies and public opinion. If you are thinking of a specific project, start looking around among the funding bodies for groups that are interested in work like yours. Your institute might already have a connection with a particular donor. You might have a donor in mind while you are developing a project. Sometimes donors approach institutes because they have a particular type of research that they want to pursue. The donor might be attracted to an institute because of its scientific reputation.

Senior members of your institute will be able to suggest potential donors. Libraries should be able to help too, but the best source of information today is the internet. Most major donors have many resources available on their websites specifically for potential research partners. They specify the priorities of the donors, with whom they want to work, where they want to work and what they want to fund.

It is also important to identify where to go in the donor structure. All donors will have different sections, split into subject areas, so it is important to understand the way a donor is organized. Donors like the European Union (EU) and the GEF are huge, with complex structures, so spending time understanding how they work will greatly increase you chances of having a project considered.

You need to know as much as you can about a donor agency, including its staff, purpose, interests, politics and its budget. Look in donor publications and especially search their websites.

Types of proposal

The most straightforward proposal is written by an individual and submitted direct to a donor. This type of proposal relies on the quality of the preparation, its topic and the reputation of the institutes involved for its success. There are several other types.

Invited proposals

The donor will invite a particular institution to submit a proposal on a particular subject that the donor wants to pursue. This is usually the result of previous contact between the donor and the institution.

Calls for proposals

Donors may decide they want to start a particular line of research and invite proposals. These notices are published in the scientific literature as well as on the web and they are a ready source of very specific funding. They will have specific deadlines.

Contacting donors

Donor representatives regularly attend scientific conferences, so every time you are reading a paper at a meeting you are talking to potential donors as well as an audience of your peers. You should always remember this and be ready to speak to representatives. They will be listed in the participants list so you can also seek them out and talk to them. Always travel with some literature about your institute, or ask your communications department to make up a 'donor pack' of publicity material and some recent reprints, annual report, etc. All of this should convey the impression that your institute is a serious, successful organization worthy of investment.

When you meet a donor, always invite them to visit you in your institute. Even if you do not have a specific research proposal to fund, you can discuss with them how the research in your organization matches the donor's mandate and objectives. You can arrange a seminar, or ask them to talk about how they fund research. Show them your research facilities, arrange a meeting with the director and other senior staff, and even plan a field trip. These sorts of public relations visits can be very effective in bringing your institute to the attention of the donor. Be sure to put them on your centre's VIP mailing list so that they receive annual reports, press releases, posters, calendars and season's greeting cards.

Many donors have offices in capital cities. Find out who the local representatives are and get to know them. Some organizations arrange their duty travel so that they can visit the headquarters of a donor, and even lead missions there, with a selected group of staff and a pre-arranged schedule. Some donors will even arrange for you to make a presentation to their staff.

Donor requirements

When you have chosen one or more target agencies, obtain their guidelines for applicants and any necessary application forms. Some funding bodies are very bureaucratic and may reject an application because you did not satisfy some minor requirements, such as the number of copies of the application you send. Some funding bodies encourage applicants to talk about projects with their staff before submitting a full application. The International Development Research Centre (IDRC), in its web page http://www.idrc.ca/institution, writes that "individuals and research centres interested in IDRC support should begin familiarizing themselves with IDRC's approach and programme priorities." Then they go on to give very extensive information of constructing a proposal.

Try to locate copies of successful applications. Many agencies have samples available, especially on their websites. Many donors ask for a written outline or a concept note (see

below) on first contact. One agency recommends, for example, that applicants send two or three single-spaced pages describing the proposed research and including a brief curriculum vitae, a list of publications and an approximate costing of the project. If this is interesting, they ask the applicant to submit a full proposal on the appropriate forms.

Some donors have deadlines for project proposals, because they have an internal reviewing mechanism that has a firm timetable. Others may have a fixed procedure. ACIAR's procedure is interestingly called a project development cycle. ACIAR does not invite complete proposals. It invites preliminary proposals which it then develops in close collaboration with the research institute.

Some donors will only accept proposals that are not being considered by another organization. If the funding body to which you are applying allows duplicate applications, say whether an application for the same or a related project has been sent to another agency.

Donor agencies have many things in common, but each has its own constraints. The World Bank does not make grants, but often out-sources research relevant to its projects. It will do this through requests for proposals. Regional development banks only fund projects and research in their geographic regions, and will only make grants to member country organizations. The EU only funds projects that are a priority of the host country. The United States Agency for International Development (USAID) cannot fund any project or research that: (a) might lead to or in any way support abortion; and (b) might provide direct competition for US farmers. Study the donor to find out these constraints. Study their literature so that you understand who you want to work with.

The concept note

A concept note is a short summary of your project idea, usually not more than two or three pages. Preparing a concept note takes a fraction of the time needed to prepare a good proposal. If a donor does not list what they require from a concept note, consider writing a few paragraphs under the following headings:

Problem and justification

- What is the problem and why is it important?
- What research has already been done in the area?

Objectives

- What are the objectives that when met will indicate the success (and the end) of the project?

Methodology

- How will each of the objectives be achieved?

Results and dissemination

- What outputs do you expect and how will they be disseminated?
- What impact can you expect and how will you measure it?

Institution and personnel

- Why is your institute equipped to do this work?
- Who are you, what are your qualifications and experience?
- Who will you be collaborating with and what interest have they shown in the work?

Timetable and budget

- Length of time and funding required, also a starting date.

Evaluation

- How will you evaluate the project's achievements?

The concept note is also useful for submitting your idea to your superiors for discussion, and to send to potential partners for their comment when you invite them to join you in the work. Time invested in preparing a good concept note is not wasted, especially if the project goes ahead, when you will use the note as a basis for a full proposal. It is often your first contact with a donor about a potential project, so in some ways the concept note is more important than the full proposal.

Parts of a project proposal:

- Table of contents
- Abstract of proposed research
- Introduction: a progress report on a previous project or the reasoning that led to the current proposal
- Details of collaborating institutes, especially counterpart organizations in developing countries
- Description of the research plan
- Time frame
- Methods and materials
- Results expected
- Discussion of the significance of the project
- Indicators of success and impact assessment
- Reference list
- Budget and budget justification
- Details of publications arising from previously supported projects
- Curricula vitae of applicants, including a list of publications of each
- Details of existing funded research
- Details of collaborating research organizations supporting or approving the research plan and budget

Elements of a project proposal

Once the donor has expressed interest in the idea in the concept note, they will ask for further details or even request a meeting. Only much later will they invite you to start developing a full proposal. Preparing a complete, comprehensive, costed proposal is a time-consuming process. Large projects may require committees and meetings between the country coordinators. The process can take months and even years for large projects.

The donor's guidelines for applicants may supply you with an application form or a *pro forma* on how to arrange your proposal, what headings to use, how long each part should be and other requirements. Some even specify the size and name of the typeface to use.

If there are no guidelines or application forms, you can arrange the application as you wish. The physical preparation is an important part of the process. Remember that the assessors will judge you on the presentation and organization of the proposal as well as on its content.

Once drafted, you should discuss the proposal in-house and with partners before submitting it to the specific person in the agency you deal with. This person may well be highly qualified and be able to offer advice on defining the problem in the proposal and advising on how to proceed. Proposals are usually reviewed and revised several times before the final version is submitted for approval. The important thing to note is that the longer the review process continues, the more likely it is that the proposal will be acceptable.

Some of the assessors who review the final proposal will be experts in your topic but others may not be: keep both categories in mind when you are writing. For most grant proposals you should write as clearly, concisely and simply as possible.

The language of your proposal, usually English, should be perfect, if possible. Investing in the services of a language editor may well be a good investment. A well-written, easily read proposal will make a much better impression than one that is hard to understand.

A research proposal is basically half of a research paper. It is a justification of a programme of work with the aim of producing measurable outputs that will reach a clearly defined objective. The proposal, like a research paper, describes how you start out with a hypothesis that has led to a proposed course of action and a programme of research designed to test the concept. The only difference is that you are looking for the money to do the research rather than having finished the work. Because of this, you should use all the techniques you use to write research papers when you are writing a proposal.

The title

As in a research article, the title is one of the most important parts of the proposal. It will immediately attract or lose the interest of any potential donor, so it should be concise and above all reflect accurately the content of the project. Write a title that is accurate, concise, informative and preferably memorable as well as easy to understand. ACIAR asks for "A short descriptive title containing unambiguous informative terms."

There is also the colon structure: short and simple: technical and informative:

- *Nuts for the Future:* identification and characterization of endangered coconut species in the coastal plains of Southeast Asia
- *Why Should the Palms Die?*-- Developing low-cost and simple technologies for disease determination in Chinese coconut varieties.

Project leader

You will need to nominate a project leader and include a curriculum vitae with most proposals. Many donors have clear requirements that are detailed in the application forms. If not, give at least name, institutional and correspondence address, details of qualifications, a list of posts held, previous projects managed and a brief list of publications.

Participating institutions

Very few projects are designed or implemented by one institution. Most involve partnerships. Donors like to fund partnership projects, because such projects have a higher chance of success. Participatory research, in which the beneficiaries help to design and implement projects, has been shown to be highly cost-effective. Projects designed by teams of people with different backgrounds are more innovative and have a higher chance of success than projects designed by people from a single discipline. Provide a list of the major institutions that will be involved and include letters of agreement from the institutions for the research. Briefly state the responsibilities of each partner.

The summary

Write the summary last because then you know what the project is really about. The summary explains what the proposal is all about. It is a vital selling tool for the project, since it comes first in the presentation and may be the only part that some people read.

If a proposal is short or in the form of a concept note, then there may not be a need to summarise it. However, some donors want you to supply a synopsis or abstract so that they can quickly get an idea of the proposal and include it in their activity reports. If no length is specified, try to limit the abstract to not more than 250-300 words. Say briefly why you think the project should be done, your objectives, what you plan to do and how you plan to do it, what you expect the results will be and what the significance and

impact of those results will be. Mention staffing. Some donors want you to give a budget total. Apply the techniques you use when abstracting your own research papers. Be sure to include definite statements rather than vague generalisations.

Background

Briefly outline the nature and size of the problem, the current state of knowledge and the origin of the project idea. Summarize previous research and the reasoning that led you to your idea. Describe the present knowledge of the subject, with references to earlier work. It is also important to review the scientific literature in the field, to show you are basing your work on firm scientific foundations. Are there other approaches to the problem that have or could be taken? Does the proposal build on previous successful projects?

Priorities

If possible, say what priority the proposed research has been given within the country, as well as your institutional priorities.

Objectives and outputs

List the overall aim and specific objectives of the proposed research, preferably in point form. Briefly outline the proposed research strategy. Refer to the project outputs expected under each objective. It may be appropriate to have two or three major objectives or sub-projects or activities with objectives for each.

The defined research results or outputs and their relation to the objectives of the project are extremely important. Specific objectives should be expressed in verifiable terms, for example, using words like 'identify' rather than 'study'. The outputs should be defined in quantitative terms and in a time frame that is as precise as possible.

You will need to organize your outputs and impacts by categories. One approach is to show the effects on each group of people involved in the sector in which you are working. Another is to show outputs and impacts by objective, by site or by project component.

Activities

You will need to expand the activities section of the concept note considerably. For all major elements of the project, describe who will do what, when and where.

Expected impact of the project

All donors will want to know the impact that the project will have, often in terms of their own objectives, such as eliminating poverty, protecting biodiversity, etc. You will need to describe how you intend to measure impact. Many donors want you to describe any economic and environmental impacts, as well as gender issues.

Another important point to consider is the role of beneficiaries in the research itself. Will local scientists benefit from the research? What community benefits might be expected from the project? These benefits might be economic, social and environmental. State the main beneficiaries of impacts and the likelihood of the research being taken up in the country.

ACIAR has an impact assessment programme that will help you with advice, if necessary. They will also read and comment on drafts of this aspect of the proposal.

Intellectual property and other legal matters

Some donors have requirements for intellectual property and you will need to resolve these with all the institutions involved. Indicate briefly whether these are likely to be significant issues. For example, who will hold the copyright of publications from the project? Who will own the intellectual property of any innovations, discoveries or new

products, such as marketable software, that the project might produce?

Methods and techniques

Just as in a research paper, describe the methods you intend to use in full. Special reference should be made in this section to the equipment and supplies required which may not be currently or readily available in the country. Describe your experimental plan, how you will collect and analyse your data and the statistical techniques you will use. This will allow the assessor to judge whether your experimental approach will yield valid results.

Each project objective should have clearly specified activities and measurable indicators or outputs, so that the people monitoring and evaluating the project at a later date can accurately determine whether the objective has been achieved or not.

Indicate the locations of the work, as well as any field sites you may be using. Mention ethical rules or codes of practice that will be followed.

Work plan

In this section you are explaining what combination of inputs will be needed, when and in what quantities, to achieve the desired outputs. Consider using sub-sections like:

- Project management
- Inputs
- Supplies and services
- Time line
- Reporting plan

Break the research project into operations and operations into activities. Work out the time you need to conduct the research and provide a schedule of the work process. You can use a spreadsheet or a Gantt chart. Gantt charts show visually how work is planned to proceed, and how one activity is related to the next.

It is important to present research objectives / subprojects / activities in a ***logical order***, and to maintain that order, wherever possible, when describing outputs, and later, methods. Often a chronological order is the most logical, with one output leading or linking to the next objective / activity and, in turn, to its output. In other projects some or all objectives are pursued in parallel, with linking through outputs before the end of the project, or not at all. Thus, the outputs of the project may be linked or independent.

Monitoring and evaluation

Give a brief summary of the management techniques to be used to monitor and evaluate the project. Identify finite project “milestones.” Milestones are outputs that occur at a specific time. They are primary indicators defined for monitoring purposes and the means of measuring progress. They are things like "three staff trained after two years", "Workshop held in 2003", "GIS system established and distributed by 2002", "500 accessions duplicated by the end of Stage II." These milestones indicate significant progress toward planned objectives. They are absolute, independent evidence of your progress and your project's success.

Reporting

Having collaborators report regularly on their progress is an important way of managing the project and monitoring progress. Reports should contain real information, not generalizations. Include achievements, milestones reached and a summary of the next stage of work intended. The reports should describe problems that delay.

Drafting the budget

The budget should be accurate and well-researched. Most donors will have a clear idea of how much a project should cost, from the cost of other projects, so be as realistic as possible. You will usually be asked for a detailed list of proposed spending on personnel, equipment, supplies, travel and other items. If you are applying for a small grant, a summary of the budget may be sufficient. The detail required depends on the donor. Budgets are generally looked at very carefully and any irregularities or unrealistic claims, especially travel expenses to conferences, will be picked up and devalue your proposal. In general, this section includes:

- Personnel (staff -- senior, junior, partners, consultants);
- Travel (international, national, *per diem*, etc.);
- Supplies and services (expendable supplies, research stations support, communications);
- Collaborative (scientific consultants, grants to partners, sponsoring participants, etc.);
- Evaluation / impact assessment (salary and supplies, separately costed);
- Capital costs (purchase or rental and maintenance of vehicles, equipment, office space, etc.);
- Indirect costs;
- Inflation and contingency (charge on second and subsequent years); and
- Total costs.

ACIAR's website has a lot of detail on budgeting. Preparing the budget section of a proposal is one of the most important tasks in moving from the concept note to proposal stage. A lot more work will need to be done on the initial budget and you will probably need to involve your financial office for their unit cost. However, you are still responsible for identifying all the inputs needed for a project.

If a donor offers less money than you request, try to revise the objectives of the project. Otherwise you will be doing the same work with less money. This can lead to problems. Include an exchange rate in the budget table so that it is clear. Then maintain that throughout the budget process. Most donors will be prepared to adjust budgets if there are significant changes in the exchange values.

This section should also contain a schedule of costs, i.e. when you plan to be spending the budget. You must also explain the necessity for each category or each major item of expenditure. If you are asking for extra equipment, say what equipment is already available in the department and why it is insufficient for the project. If you want money for travel to meetings or to other laboratories, explain why it is necessary to the success of the project.

Include a schedule of how you will spend the budget during the project. This is probably best done on a year by year basis, because that corresponds with salary payments for staff. Also say how the money can be transferred, handled and disbursed.

Final stages

Once your final version is submitted, the process is not finished or certain. The proposal might well be returned for several more cycles of modification before final approval is granted. Once a proposal is finalised, the donor representative may have to present it for approval to a committee or a board. At that stage, it is competing with many other proposals being put forward by other staff members. Money might be limited and then perfectly good projects might be accepted or postponed just because the funds are not available.

Never rely on a proposal being accepted. The procedure may be cancelled at any stage for different reasons. It is important to generate a constant flow of proposals and

ideas so that the failure of one will still allow you to continue your work.

Covering letter

Even though you might have been in continuous contact with a donor representative, it is always best to write a convincing covering letter for your proposal. It is even more important if you are approaching the donor for the first time. There are a number of aspects to cover very briefly in your letter, such as:

- The title and short summary of the research you propose;
- The interests of the donor and how your project relates to them;
- How your proposal links with previous research the donor might have funded;
- The importance and urgency of the research; and
- Your partners and the participating countries.

Chapter 11. Making Logical Frameworks[2]

Paul Stapleton

Introduction

The logical framework (logframe) is a useful planning tools and a way to break a project down into its elements. They show the internal structure of a project. Some donors will not consider a proposal unless it contains a logframe.

The logframe shows the key elements of a project and the logical linkages between activities and results (see Annex 11.1). The logframe requires indicators of progress, or milestones and methods to verify this progress.

Parts of a logical framework				
	Horizontal logic ➔			
	Narrative summary	**Measurable indicators**	**Means of verification**	**Important assumptions**
	Goal: The higher order objective to which the project contributes	Ways to verify that the broad objectives have been reached	Sources of data that show the status of goal-level objectives	External factors needed for success or threats to success
	Purpose: The effect or impact of the project	Ways to show that the purpose of the project has been accomplished (end of the project)	Sources of data to show that the purpose of the project has been accomplished	
	Outputs: Specific results of project activities that must be delivered on time	Ways to show the outputs have been produced successfully	Sources of data to verify the outputs	
➔ Vertical logic	**Activities:** The main activities that must be done to produce the outputs	Project **milestones** with specific quantities, qualities and time	Sources of data to verify the project activities or milestones	

The logframe consists of a table where the rows represent different levels of objectives and the activities that are necessary to achieve them (the vertical logic). The columns show how achieving these objectives can be verified (the horizontal logic).

Logframes look at cause and effect. Successful activities produce results that are called outputs in 'logframe language.' If these outputs (or deliverables) are produced, then the purpose of the research will be achieved. If the purpose (project objective) is achieved, then the project will contribute to achieving the goal (the higher order objective).

The logframe defines the different levels of objectives (outputs, purpose and goal) and the activities necessary to achieve them. The terms objective, purpose and goal take on their own separate meanings within the logframe. Keeping this clear in your mind is one of the challenges in learning how to construct logframes.

A logframe also describes indicators of achievement or milestones that measures

[2] Much of this material has been adapted from comprehensive resource material that is available on ISNAR's web page (http://www.isnar.cgiar.org). This source is gratefully acknowledged.

progress. Indicators have to be measurable in terms of quantity (five students), quality (earn PhDs) and time (by a certain date).

The logframe also considers the environment that the project will operate in and identifies external factors that threaten the project, like weather, lack in partner interest or political change.

Basic steps in developing a project logframe

Goal

Write the overall development goal you are contributing to in the top left hand box

Go to the narrative summary

Start at the bottom left and work up, defining activities, their outputs and how they contribute to the overall goal

Define the critical assumptions

List the things like inputs and achievements you are assuming will occur at each level

Define the indicators that monitor the research

Show how you are going to verify the work you have done.

Using the logframe

From the bottom to the top in the left column is a "narrative summary" of the four levels of objectives of a project, including the activities, outputs, purpose and goal. From a project's inputs to its ultimate goal there are connections: one between activities and outputs, one between outputs and purposes, and one between purposes and the ultimate goal.

In the logframe, the inputs achieve the outputs. Outputs achieve the purpose and achieving the purpose contributes to achieving the goal. However, a single project is seldom enough to achieve the goal. Other related projects will all contribute to a goal.

The vertical logic

Activities

Activities achieve each output. In research projects, these include experimental tasks, training, capacity building, improved management processes, information exchange, etc.

Inputs

Activities are accomplished with inputs like staff, infrastructure, equipment, supplies, support services and funds. The specific requirements are defined by the work plan.

Outputs

Outputs include research results, training courses, workshops or other results derived directly from activities.

Purpose

The purpose is what the project is expected to achieve once completed.

Goal

The goal is the greater reason for doing the research project. In the broad context of national development, it is usually a desired achievement that the project objectives contribute to.

Assumptions

The last column, *important assumption*s, lists those factors which are not controlled by the project but which influence its implementation and chances for success. Assumptions at this level are often difficult to influence, but they should be defined in advance and monitored. They are statements about uncontrolled factors that can influence the achievement of objectives. Some examples of important assumptions are that farmers will use recommended cultivation methods, that inputs will be available, or that there will be good weather. If the assumptions are not met, the project may not achieve its objectives.

Beware of 'killer assumptions' like "the institute will provide full laboratory facilities." A killer assumption is one that will completely wreck the project if it fails to happen. A donor will immediately reject a project that depends on a killer assumption.

The horizontal logic

Narrative summary

The narrative summary is a brief statement of each of the project's goals, purposes, outputs, activities and inputs. The *goal* is the ultimate objective of a programme. A series of projects normally shares a common goal. The *purpose* is a statement of the desired impact of the project. The *outputs* are what the project aims to accomplish - the specific results for which the project manager can be held directly accountable. *Activities* are the actions necessary to achieve each output. *Inputs* define what is needed for implementing the project, including personnel, funds, facilities and management procedures.

Indicators

In the second column of the logframe, *indicators* describe the evidence that objectives have been achieved. They should be stated in terms of quantity, quality and time.

Objectively verifiable indicators

Objectively verifiable indicators specify the type of evidence needed to verify the achievement of objectives at each activity level. These define the data collecting and reporting requirements during the implementation of the activity (monitoring). Indicators and their means of verification must be carefully selected.

The indicators should clearly indicate the criteria for attaining objectives. They:

- Specify the nature, quantity, quality and time required for the objective to be achieved;
- Have an appropriate scale;
- Focus on key processes;
- Are sufficient in number and detail to adequately measure the achievement of objectives;
- Are independent of the biases of evaluators; and
- Are objectively verifiable and unambiguous.

Means of verification

The means of verification in the third column indicate how evidence can be found and measured. These inputs are usually specified and can be measured or assessed; verifying that activities are proceeding as planned requires tracking actual inputs against proposed inputs in a given timeframe.

When selecting indicators at the outputs level, it is helpful to think of the expected output and purpose of the activity in terms of targets, answering the questions of *What? How many? With which characteristics?* and *When?* Documents, research reports, research proposals, survey results and scientific publications can be used.

Measuring impact

To measure the project's impact, you need to do some baseline studies of what you are investigating. If you want to raise outputs by 40%, you have to know what the original yields are. If you want to reduce poverty, you have to have indicators of that poverty and ways to measure your effect on it. You need to build in ways to monitor and evaluate your progress, by establishing benchmarks to evaluate later progress.

Annex 11.1. Sample logframe of a coconut research project

Narrative Summary	Measurable Indicators	Means of Verification	Assumptions
Goal:			
Sustainable development through increased livelihoods amongst coconut farmers as a contribution to food security	Increased food security of country's farmers	Assessment of standards of living	Sustainable development continues to be a priority in the political system
Purpose:			
Agencies use new coconut varieties in reclaimed land	Twenty plantations using new varieties by 12/2006 Average production increases each year until 2006.	Documentation, national agricultural surveys, land use surveys	Price policies, infrastructure, and extension support for spreading the use of the technology
Outputs:			
New coconut varieties adopted for use in reclaimed land	Four plantations established each year until 2005 Production of coconuts increased by 10% per year until 2006	End-of-Project reports	Funds and mechanisms available to produce coconut varieties for local planting
New varieties identified	At least three new varieties identified by 12/2003	Research reports, peer review, publications	Germplasm available from international genebanks
Seedling multiplication capacity increased in country	National seedling company producing 2000 seedlings per year after 2003	Company records, monitoring reports	Seedling company is well managed
Information network for plantation farmers established	Cultivation methods disseminated through extension agents	Newsletters, posters, extension products	Trained staff continue to work for research project
Activities			
1.1 Seedlings multiplied and distributed 1.2 Plantations established and maturing 2.1 Obtain germplasm 2.2 Plant test plots 2.3 Harvest and measure yields 3.1 Develop institutional capacities 3.2 Define equipment needs 3.3 Procure land 4.1 Develop extension products 4.2 Train extension workers			1.1 Constraints have been adequately analyzed and problems identified 2.1 Seed companies have good management and germplasm is available in sufficient quantity 3.3 Land available as required 4.1 Qualified extension workers available for training

Chapter 12. Developing Project Proposals for IPGRI/COGENT

Pons Batugal

Introduction

The International Coconut Genetic Resources Network (COGENT) is one of the networks of the International Plant Genetic Resources Institute (IPGRI). It has 38 member countries from five regions, indicated in the table below. In its capacity as the executing agency for COGENT, IPGRI develops project proposals in consultation with COGENT member countries and submits proposals to donors. Once the proposal is approved for funding, IPGRI through COGENT requests selected country research institute to submit more specific proposals to IPGRI/COGENT. This simple but comprehensive proposal is evaluated by IPGRI and, if approved, is funded for implementation. Once the proposal is approved, a letter of agreement is signed between the implementing institution and IPGRI, and funds are released.

COGENT member countries

Southeast and East Asia	South Asia	South Pacific	Africa/Indian Ocean	Latin America/ Caribbean
1. China 2. Indonesia 3. Malaysia 4. Myanmar 5. Philippines 6. Thailand 7. Vietnam	1. Bangladesh 2. India 3. Pakistan 4. Sri Lanka	1. Cooke Islands 2. Fiji 3. Kiribati 4. Papua New Guinea 5. Solomon Islands 6. Tonga 7. Vanuatu 8. Samoa	1. Benin 2. Côte d'Ivoire 3. Ghana 4. Kenya 5. Madagascar 6. Mozambique 7. Nigeria 8. Seychelles 9. Tanzania	1. Brazil 2. Colombia 3. Costa Rica 4. Cuba 5. Guyana 6. Haiti 7. Honduras 8. Jamaica 9. Mexico 10. Trinidad-Tobago

Proposal format and sample proposal

The proposal for submission to IPGRI need not be long (i.e., five pages) would be sufficient. However, a format is required to be followed so that the proposal is comprehensive and clearly specifies agreed objectives, outputs and activities, approach and methodology, external and counterpart funds, implementing arrangements and roles of implementing institutions.

The proposal format is shown in Annex 12.1 and a sample project proposal is shown in Annex 12.2.

Annex 12.1. Format of project proposals for submission to IPGRI/COGENT

A. Background and justification (maximum of three paragraphs)

1. What is the problem or opportunity that your proposed project will address?
2. What is known about the constraint or opportunity (summary of state of knowledge) that your project will address and how will your results improve the situation? (Cite relevant literature, as appropriate)
3. How will your results help the coconut industry, the economy and the environment?

B. Objectives

1. Indicate specific objective(s) that your project aims to achieve in a given period
2. Number the objectives if more than one.

C. Project component and expected outputs for each component

1. Indicate the outputs that your project will produce in a given period. Outputs should be specific, measurable and quantifiable, if possible.
2. Each specific objective should have a corresponding output.

D. Activities

1. Indicate the specific activities that you will undertake to achieve each specific output.
2. Number each activity to correspond to each output.

E. Approach and specific methodology

1. Based on items A-D, indicate the general approach that you will use to undertake your proposed activities in the most cost-effective manner
2. Describe the specific methodology that you will use to undertake each activity (cite references as appropriate)

F. Implementation arrangements

Indicate the implementing arrangements of implementing and collaborating agencies and briefly describe their roles and responsibilities.

G. Estimated budget for given number of years (US$)

Item	Requested External Funds	Your agency's counterpart funds	Total
1. Personnel			
2. Supplies and services			
3. Travel			
4. Equipment			
5. Sundries and contingency			
Grand Total			

Annex 12.2. Sample country proposal for submission to IPGRI/COGENT

Poverty reduction in coconut-growing communities in the Philippines

Project background and justification

Philippine coconut farmers are resource-poor smallholders (tending less than four hectares) who are non-creditworthy with traditional lending institutions. In the last decade, coconut farmers have been suffering from low coconut productivity, which gave them an average annual gross income of only US$180-200 per hectare per year. The resulting net income of US$40 per hectare is below the poverty line. The low income is due to declining yield and farm productivity and unstable markets for copra (dried kernel), their traditional product. The low farm productivity is attributed to senility of existing plantings, pest and disease outbreaks, use of low yielding and poor quality planting materials, poor management practices and inefficient processing practices. In many cases, monoculture is practiced with income derived only from the coconut crop.

To improve the situation, there is a need to provide coconut farmers with high-yielding, adapted and high-value varieties to increase the yield and promote sustainable coconut production; and to develop efficient coconut-based village level income-generating technologies to increase their income, enhance food security and improve nutrition. There are documented cases of successful farmer-managed coconut-based production and processing enterprises, here and abroad. COGENT has demonstrated that resource-poor coconut farmers could substantially increase their incomes through sustainable livelihoods interventions (Batugal and Oliver 2003).

This project proposes to deploy and test in four strategically located project sites COGENT's three-pronged strategy consisting of: 1) Increasing coconut yields by 3-5 times by promoting the use of high-yielding, adapted and high-value coconut varieties; 2) Increasing incomes by 5-10 times through the production and marketing of high-value products from the coconut kernel, husk, shell, water, wood and leaves and promoting the use of suitable varieties for this purpose; and 3) Increasing total farm productivity by 2-3 times through intercropping and livestock/fodder production. If successful, the project will convince the Philippine Government and development organizations to replicate the model nationwide to promote wider benefit in terms of poverty reduction and germplasm conservation.

Objectives:

1. To develop the capacity of resource-poor farmers and unemployed and underemployed women in four communities to establish and manage sustainable livelihoods and become village level entrepreneurs;
2. To diversify the production of high-value coconut products and expand existing and develop new markets for these products;
3. To conduct trials and test, refine and promote income-generating technologies in the production and marketing of coconut products, intercrops and livestock/fodder for increasing incomes, enhancing food security and improving nutrition of coconut farmers;
4. To identify, characterize and conserve high-yielding, adapted and high-value coconut varieties in farmers' fields; and
5. To disseminate information about the project to farmers, extension workers, researchers, policy makers and donors.

Project components

Project Component 1: Capacity building

Output 1. Four coconut growing communities empowered to establish and manage sustainable livelihoods

Activity 1.1 Site assessment of recommended four coconut growing communities (Sanchez Mira, Cagayan; Tanjay, Negros Oriental; Biliran, Leyte; and Maitum, Sarangani) and baseline survey to determine socio-economic status of members and to identify, constraints and development opportunities

Activity 1.2 Establish or strengthen community-based organizations (CBO) with a minimum of 300 members per site with complete set of officers and register the CBO with relevant government agencies

Activity 1.3 Develop a project framework and farmers' and women's action plans using participatory methods to address poverty reduction through cost-effective income-generating interventions

Activity 1.4 Establish a microcredit system and a revolving fund to support collateral-free loan requirements of income-generating sustainable livelihoods interventions

Activity 1.5 Train farmers and women on CBO, microcredit management and on the use of tested income-generating technologies, and researchers and extension workers on providing technical support to sustainable livelihoods interventions

Activity 1.6 Link viable interventions to existing development projects of the Department of Agriculture, Department of Agrarian Reform (DAR) and other international organizations like ADB, IFAD, UNDP and the World Bank.

Activity 1.7 Enhance inter-agency collaboration with research, extension, microcredit and marketing organizations

Activity 1.8 Conduct socio-economic survey at the beginning and at the end of the project to measure project achievement and impact at individual member and community level.

Project Component 2: Market survey to identify marketable products and testing of suitable machineries for high-value coconut products

Output 2: Diversified high-value coconut, intercrops and livestock products and new and expanded markets developed

Activity 2.1 Market survey to identify marketable high-value coconut, intercrops and livestock products and establish market channels for each of the four communities

Activity 2.2 Development and strengthening of expanded and new markets and market channels for high-value products

Activity 2.3 Fabrication and testing of efficient village-level machineries and equipment for producing high-value coconut products from all parts of the coconut

Project Component 3: Evaluation and documentation of viable technologies

Output 3: Income-generating village-level technologies which are technically feasible, financially viable, socially acceptable and environmentally safe

Activity 3.1 Production trials and profitability analysis of marketable high-value coconut products from the coconut kernel, husk, shell, wood, water, leaves and roots (at least 3 products per community), involving at least 100 CBO members with at least 20% women

Activity 3.2 Production trials and profitability analysis of annual cash and food security crops (at least 3 each), involving at least 100 CBO members with at least 20% women

Activity 3.3 Production trials and profitability analysis of livestock (at least 3 kinds), involving at least 50 CBO members with at least 20% women.

Activity 3.4 Production trials of forage (grass and legumes) and feed formulation for at least three types of livestock per community.

Activity 3.5 Process documentation from planning to marketing and documentation of success stories

Project Component 4: Sustainable conservation of coconut germplasm

Output 4: High-yielding, adapted and high-value coconut varieties identified, characterized and conserved in farmers' fields

Activity 4.1 Characterize farmers' coconut varieties in each of the four communities, and develop and publish a Catalogue of farmers' varieties

Activity 4.2 Identify and introduce high-value coconut varieties, sowing of seednuts of selected palms in CBO nurseries and planting in farmers' fields

Activity 4.3 Establish a community-managed coconut seedling nursery in each project site to serve as an informal seed system for growing and selling recommended farmers' varieties and introduced high-value germplasm (exclude hybrids)

Activity 4.3 Planting of at least five coconut seedlings per CBO member per year purchased or loaned out from the community-managed nurseries.

Project Component 5: Dissemination of research results

Output 5. Research results disseminated to farmers, extension workers, researchers, policy makers and donors

Activity 5.1 Field days conducted every year to showcase research results of the project

Activity 5.2 Production and dissemination of at least three extension bulletins featuring the tested income-generating technologies produced and disseminated every year per community.

Activity 5.3 Publish newspaper articles about the results and activities of the project

Activity 5.4 Technical paper about the project presented in a seminar, conference and meeting at least once a year

Activity 5.5 At least one scientific paper about the results of the project published in a refereed journal

Approach and methodology

The project will utilize a farmer participatory approach in which community members will make decisions on what sustainable livelihoods to undertake. The project will only help provide options by helping them identify and test income generating technologies to ensure that they are technically feasible, financially viable, socially acceptable and environmentally safe. Viable technologies will be incorporated into sustainable

livelihoods activities and the project will help provide the natural (coconut varieties), physical (efficient village-level machineries and technologies), social (CBO), financial (microcredit and revolving fund) and human (training and capacity building) capitals to make them sustainable.

To ensure sustainability of income generating livelihoods, there is nothing free except training and capacity building. All materials used in production trials involving farmers and women members will be paid by CBO participants. To make this possible, a microcredit system with revolving fund will be established and managed by CBO officers to support income-generating activities for the production of high-value coconut products, intercrops and livestock. Amount of interest on loan will be decided by the CBO members and officers. Loans will be made in kind and repayment may be in cash or in kind.

The project will test and refine a poverty reduction model in strategically selected four coconut growing communities, with one community in Luzon, two in the Visayas and one in Mindanao. If successful, these sites will serve as the nucleus for replication nationwide.

Implementing arrangements

The project will be implemented by the Philippine Coconut Authority (PCA) and coordinated by the Philippine Council for Agriculture and Resources Research and Development (PCARRD) which will provide services for financial administration and technology packaging. IPGRI will execute letters of agreements, provide administrative support, technical backstopping, monitoring and prepare and submit reports to the donor.

A Project Leader devoting about 50% of his/her time and a full-time Community Coordinator in each community will be provided by PCA.

Annual project meetings will be held to review progress of work and to develop work plans for the succeeding year.

PCA will provide a six-monthly technical and annual report to PCARRD and IPGRI every 30 June and annual technical and financial report every 15 December. IPGRI will submit an annual technical and financial report to DA-BAR every 15 January.

Budgetary requirements (in US$)

Item	Amount requested from IPGRI/COGENT	Amount to be provided by DA-BAR*
1. Personnel		6545.45
2. Supplies and materials		10 909.10
3. Travel		5454.55
4. Training and other services		6654.55
5. Machineries and equipment		11 345.45
6. IPGRI Administrative cost and technical backstopping		13 636.35
Grand Total		**47 890.90**

** Converted from contribution provided in Philippine Peso (Php) at US$ 1 = Php 55.00*

Literature cited

Batugal, Pons and Jeffrey T Oliver. 2003. Poverty reduction in coconut growing communities, Volume 1: The framework and project plan. IPGRI-APO, Serdang, Malaysia.

Chapter 13. Project Proposal Formulation: The ADB Perspective

Dimyati Nangju

Why is it important to prepare a high-quality project proposal?

- To set the priority or importance of the proposed project vis-à-vis other projects;
- To obtain approval of the proposal from management;
- To seek funding from an external funding agency; and
- To use the project proposal as basis for monitoring, supervision and implementation of the project after it has been approved for implementation.

A sample project proposal is included as Annex 13.1.

What is the classification of technical assistance projects in ADB?

In addition to financing investment projects under various types of loans, ADB also provides the following technical assistance (TA) grants:

- Project Preparatory Technical Assistance (PPTA). This TA is aimed at preparing feasibility study of a project that will be considered by ADB for financing. The feasibility study is generally undertaken by a team of consultants over a period of 3 to 12 months depending on the complexity of the project;
- Advisory Technical Assistance (ADTA). This TA is aimed at providing advice to a specific country in an area of capacity building of an institution, preparation of a master plan or other activities which are relevant to Bank operations in that country; and
- Regional Technical Assistance (RETA). This TA is provided to a number of countries (at least two) to undertake research, training, conferences and other activities that will promote cooperation in Asia and the Pacific.

What are the criteria used by ADB in evaluating the quality of the project proposals?

Every year, ADB receives a large number of research proposals from international agricultural research centres. To select high priority project proposals that can be financed by ADB, the proposals are evaluated on the basis of the following selection criteria:

1. Whether the proposal is relevant to ADB's operation in the agriculture sector, including agro-industry, forestry, livestock, fisheries and rural development;
2. Whether the proposal is in line with the Bank' Policy on Agriculture and Natural Resources Research dated December 1995;
3. Whether the proposal addresses cross-cutting issues, such as poverty reduction, environmental protection, women in development and human resource development;
4. Whether the proposal is technically sound and will have significant impact in achieving its objectives;
5. Whether the proposal is well-prepared and follows the ADB's format for regional technical assistance proposal;
6. Whether the proposal is able to mobilize funding from other donors;
7. Whether the countries included in the proposal have indicated their commitments to support the proposed project and to contribute toward the cost of the project; and
8. Whether the research agency has adequate capacity and track record in implementing regional technical assistance projects financed by ADB.

What is the Bank's format for project proposal under the regional technical assistance (RETA)?

The Bank's standard format for RETA proposals is as follows:

I. Introduction
II. Background and rationale
III. The proposed technical assistance
    a. Objectives
    b. Scope
    c. Cost estimates and financing plan
    d. Implementation arrangements
IV. The president's decision or recommendation

Appendices
1. Project framework
2. Cost estimates and financing plan
3. Terms of reference for consulting services (if relevant)
4. List of implementing agencies (if relevant)
5. Tentative implementation schedule (optional)
6. Other important appendixes (optional).

What are the guidelines for preparation of a good project proposal?

I. Introduction

Discuss the history of the proposal briefly, indicating how it was identified, formulated and processed internally.

II. Background and Rationale

- Discuss the significance of the issues or problems to be addressed under the proposed project.
- Discuss the need to implement the project on the basis of analysis of the relevant sector / subsector; government policies and plans, and past and ongoing efforts to address the problems.
- Explain the rationale for the project in terms of how the proposed project will promote the sectoral strategy of the government and external funding agency (to whom the proposal is to be submitted for funding) and enhance its efficiency in planning and / or implementing projects in the same sector. Discuss also the benefits or advantages of the project to the region or participating countries if the project is of a regional nature.

III. The Proposed Project

A. Objectives

Describe the short term and long terms objectives (goals) of the project. Refer to the project framework (Annex 13.1, Table 4) for details.

B. Scope

Describe the scope or activities to be undertaken in order to achieve the objectives of the project. Summarize the outputs and inputs as well as the targets for evaluating the outputs and inputs in the project framework.

C. Cost Estimates and Financing Plan

Describe the cost estimates of the project over the duration of the project. Discuss how these costs will be financed by indicating the amounts to be financed by own institution, government, and / or other agencies, either in cash or in kind. State the financing gap that needs to be financed by an external funding agency. Refer to the Cost Estimates and Financing Plan table (Annex 13.1, Table 5) for details.

D. Implementation Arrangements

- Describe the executing and implementing agencies that will be involved.
- Describe the services, facilities, and equipment that will be provided to the project and by whom.
- Describe how the research will be undertaken.
- Describe the number of work-months, areas of expertise and source of consultants / resource specialists (international or domestic, a firm or individuals) if consultants or resource specialists will be required to help implement the project.
- Describe any training and workshop that will be undertaken
- State the date of commencement and completion of the project.
- Discuss the reporting and monitoring systems to be used.

IV. Summary and Recommendations

Summarize the main features of the project and make a brief recommendation on how the project should be financed or implemented.

Principles and concepts on project framework

The main purposes of project framework or logical framework:

1. It is used to clarify and define more precisely and logically project's goals, objectives, outputs and inputs, and to make apparent the linkages between these elements of a project design as well as the assumptions on which they are based.
2. It is used as a tool to improve project implementation, monitoring, supervision and consequent evaluation.
3. It is used as a participatory planning tool and it facilitates the incorporation of a range of views from various stakeholders of the project (the beneficiaries, the implementing agencies, concerned NGOs, and other private and public sector bodies).

Thus, the project framework is used as a planning and monitoring tool.

The nature and usefulness of the project framework is based upon the following premises:

1. That we design projects to achieve quantifiable and measurable objectives and outputs.
2. That project success and quality need to be monitored and measured by the extent to which these projected objectives and outputs are actually achieved.
3. That the projected achievement of these objectives and outputs is based on a series of hypotheses of cause and effect relationships, which should be clearly agreed and monitored.
4. That the key parties to the project (i.e. the stakeholders) are in agreement on the validity of these hypotheses which are the basis of project design.

Overview of the process

The logical process of the preparation of project framework consists of six steps:

Step 1. Assess sector performance: sector performance is assessed by using indicators that reflect the contribution of the sector to the larger economy and to the quality of life of people.

Step 2. Identify sector performance problems and opportunities: problems or opportunities are identified as issues of concern.

Step 3. Cause-effect analysis of problems and opportunities: a core problem or opportunity is selected to improve sector performance. It is analysed to identify the causative factors as well as consequent effects. It is usually presented diagrammatically in the form of a cause and effect tree.

Step 4. Objectives tree: the cause effect tree is converted into an objective tree, thereby providing the spectrum of possible actions that can be taken to address the problem or opportunity.

Step 5. Alternative analysis: various courses of possible actions are derived from the objectives tree. The options are assessed against each other using specific criteria, leading to the choice of the most appropriate option in the circumstances.

Step 6. Project design using the project framework: the chosen course of action is translated into a project framework that provides the basic design of the project or program in terms of the intended goals, objectives, outputs and inputs (Figure 1).

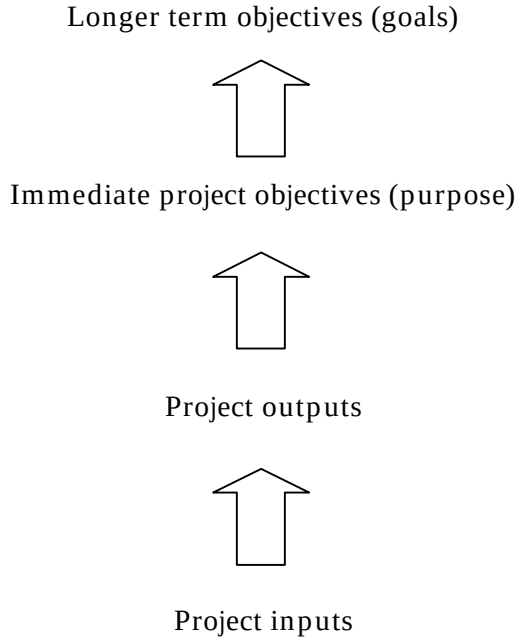

Figure 1. The project framework

The project framework matrix consists of 16 frames organized under four major headings as shown below:

Key elements of the project framework

Design Summary	Project Targets	Project Monitoring Mechanisms	Risks/Assumptions
Goals			
Purpose			
Outputs			
Inputs			

Design Summary: Provides information on the basic building blocks of the project and presents them as a cause-effect chain drawn from a preceding cause-effect analysis.

Goals: These are long-term objectives of the project. There may be more than one goal for a given project.

Purpose: The immediate objective of the project is the key anchor or the project design. This is the level of achievement that the project must deliver. This objective should become evident by the end of the project implementation period. A project's scope and outputs will be designed around this objective to specifically ensure that it is achieved by the end of the project. It is therefore advisable to have only one immediate objective for the project.

Outputs: Refer to the project's scope, i.e. the physical and/or tangible goods and/or services to be delivered by the project. Project outputs consist of four categories: (1) infrastructure outputs, such as a power plants, schools, and irrigation facilities; (2) service-type outputs, such as health care, agriculture extension service, and research; (3) policy-type outputs, such as fertilizer subsidy, price support, and irrigation regulations; and (4) Institutional strengthening-type outputs, such as enhancement of staff skills, upgrading operating standards, and institutional diagnostic studies.

Inputs: These are resources required to deliver project outputs. Inputs generally fall within four main categories. These are personnel/consultants, equipment, civil works, and project management.

Performance targets: These are specific, tangible and/or quantifiable measures of achievement for each level in the design summary. These indicators are important in both monitoring and assessing success.

Monitoring mechanism: Sources and/or methods that will be used to collect data for monitoring performance at each level of the cause-effect chain in the design summary.

Assumptions and risks: Identify other conditions, which are external to the project but are needed to ensure that one level indeed causes the next level of performance to happen. Typical areas in which assumptions influence the outcomes of project include:

- Market conditions or prices
- Macroeconomic policies or conditions
- Political and social conditions
- Environmental conditions
- Private sector capability

- Government administrative capability
- Community / NGO support
- Counterpart funding

Assumptions can also be written as risk statements. For example, a new high yielding variety distributed by a project (output) will result in increased crop production (immediate impact) on the assumption that the monsoon rain will be adequate and timely.

Options for dealing with assumptions:

- Do nothing if the assumptions and risks are not serious to endanger the achievement of the project's objectives.
- Change the project design by adding outputs and / or inputs to address the assumptions and risks, if they are serious.
- Add a new parallel project if the risk is large, and it is possible to implement another project.
- Abandon the project if the risk is too great and the preventive or contingency measures are too expensive.

Annex 13.1. Developing sustainable coconut-based, income-generating technologies in poor rural communities

International Plant Genetic Resources Institute

Introduction

In 1994, ADB provided a Regional Technical Assistance (RETA) to the International Plant Genetic Resources Institute (IPGRI) which enabled it to collect and conserve threatened coconut genetic resources in 13 Asia Pacific countries.[1] In 1998, ADB provided a second RETA to IPGRI involving 20 countries[2] to further conserve important germplasm in national and regional coconut genebanks and to enhance national capabilities to conserve, evaluate the performance of important varieties and hybrids and share data with coconut breeders of the Asia-Pacific region. These RETAs enabled participating countries to conserve and characterize 1338 accessions and identified over 20 varieties and hybrids which could increase coconut yields by three to six times those of traditional varieties. It also identified varieties and hybrids with high-oil content, and high-value aromatic, tender nut, soft-endosperm, high-sap, big-sized nut, thick shell and high-husk content varieties. The latter RETA also supported four MSc scholars at the University of the Philippines at Los Baños (with six counterpart scholarships from SEARCA), three of whom have already graduated, three will graduate in October 2001 and four in October 2002 all of whom are bonded to return to their home institutions.

In 1998, the International Fund for Agricultural Development (IFAD) provided a technical assistance grant for IPGRI to undertake a farmer participatory research to identify common constraints and opportunities of coconut farmers in the Asia Pacific region and income generating coconut-based farming systems technologies that could increase their incomes and promote food security. Under this project, it was found that incomes of coconut farmers and socio-economically disadvantaged women can be increased five to ten times through household and village-level production of high-value products from the coconut meat, husk, shell, water, wood and leaves (Tables 1, 2 and 3); while coconut farm productivity per unit area per unit time can be increased three to five times through intercropping and livestock/fodder production. It also demonstrated that working with NGOs, like the Banchte Sheka Foundation (a women's NGO called "Learning to Survive") in Bangladesh, could be an effective way of helping women earn incomes at home.

Based on the above-mentioned research results, eight coconut-growing ADB developing member countries (DMCs)[3] have requested ADB to support a RETA on "Developing coconut-based income generating technologies in poor rural communities". They would like to build on the success of the international collaborative research to share and adapt income generating technologies and address the constraints to their effective deployment in the DMCs. The eight countries grow about 9.6 million hectares of coconut which directly support about 45 million resource-poor farming populations.

[1] India, Indonesia, Malaysia, the Philippines, Fiji, Papua New Guinea, Samoa, Solomon Islands, Sri Lanka, Thailand, Tonga, Vanuatu and Vietnam.

[2] The above countries plus Bangladesh, China, Cook Islands, Kiribati, Marshall Islands, Pakistan and Tuvalu.

[3] Bangladesh, Fiji, India, Indonesia, Papua New Guinea, the Philippines, Sri Lanka and Vietnam.

Background and Rationale

Coconut is a multipurpose smallholder crop grown by resource-poor farmers who earn an average income of US$ 200 annually which is way much below the poverty line. The crop directly supports about 50 million resource-poor people. About 90 percent of the world coconut production comes from the Asian and Pacific region. In several Asian and Pacific countries, coconut contributes 15% to 50% percent of export earnings.

In the past two decades, coconut farmers have been suffering due to low farm productivity and unstable market prices for copra and coconut oil, which are the traditional but currently low-priced internationally-traded products from coconut. Due to their low incomes, farmers lack the resources to invest in new technologies, varieties and hybrids, fertilizers and other inputs for increasing yields. Despite this low income, however, farmers continue to grow coconut as the crop provides a regular, although marginal, source of family income when harvested every 45 days. Likewise, coconut is traditionally a part of the rural food system and is a major source of nutrition for many rural communities. While there is tremendous potential to tap idle community labour force, including women, to generate income from high-value coconut products and other income-generating technologies, these activities and strategies are not yet effectively in place.

The previous RETAs demonstrated that incomes in poor growing coconut communities can be increased from five to ten times by introducing a three-pronged strategy: a) increase coconut yields by deploying high-yielding and adapted varieties and hybrids; b) increase incomes through the production and marketing of high-value coconut products from the kernel, husk, shell, water, wood and leaves; and c) enhance total farm productivity through intercropping and livestock/fodder production. However, the RETAs also identified technical, institutional and market constraints that hinder the effective utilization of research results to benefit the poor, namely: a) affordable processing equipment, technological know-how and extension materials are not readily available from local sources and especially from other countries; and coconut growing communities are not receiving adequate support in this regard from government agencies; b) coconut growing communities are not organized and there is a need to strengthen leadership and increase participation of community members and women in income-generating projects; c) lack of trained researchers and extension officers and inadequate collaborative linkages between these two groups and with farmers to source, introduce, adapt and sustain income-generating technologies; d) lack of access to high-yielding varieties and good-quality planting materials in adequate numbers and at affordable cost; e) lack of affordable credit to support the application of promising socio-economic interventions; and f) lack of markets for small volume of products and weak access to market information and market linkages.

To utilize the above technologies and germplasm to establish income generating activities in poor communities, there is a need to effectively source them from several participating countries, introduce, refine and promote their adoption in strategically selected poor coconut growing communities in major coconut producing countries through the following activities: (i) capacity building through the development of community-based organizations (CBOs) and training of farmers and women members, research and extension officers; (ii) development of inexpensive equipment for producing high-value coconut products; (iii) market survey to identify marketable products and specific markets, including selected established products such as cushions for upholstery, coir dust, activated carbon and shell handicraft products; (iv) pilot production and marketing of high-value coconut products from the kernel, husk, shell, water, wood and leaves in CBO facilities, including the development of women groups to undertake home-based income-generating activities; (v) introduction and promotion of promising intercropping and livestock/fodder production technologies; (vi)

development of community-managed income-generating coconut seedling nurseries and deployment of promising selected local and introduced coconut varieties with potential for high yield, adaptation and for production of high-value products, including piloting this community seedling nursery activity as an income generating and diversity enhancement strategy in an atoll; and (vii) promotion of research results through technoguides, extension bulletins and public awareness materials. These proposed activities aim to eliminate the technical, institutional and marketing constraints to the application of research results as a socio-economic intervention in poverty reduction initiatives.

The proposed project is therefore the next logical step to promote the use of and maximize benefits from the results of the previous ADB- and IFAD-funded RETAs to help reduce poverty in coconut growing communities. Through the proposed project, IPGRI would also move away from purely technical research to research in a socio-economic context, through capacity building of national agricultural research systems (NARS), national agricultural extension system (NAES) and community based organizations to help farmers and women beneficiaries establish income-generating, village-level industries and make coconut a more attractive crop. This will enhance incomes of coconut farmers, empower socio-economically disadvantaged women and help reduce poverty and conserve precious genetic resources through use. This will promote the full socio-economic impact of research results from the previous RETAs.

The Bank's Medium-Term Strategic Framework places considerable emphasis on economic growth and poverty reduction. Within the agriculture sector, crop diversification is given a high priority as a means to achieve these goals. The project is consistent with and supportive of the Bank’s strategy. The project results would not only help the coconut farmers in 24 coconut producing communities but would also establish community models for poverty reduction that could be replicated nationwide in eight major coconut growing countries which currently grow about 9.6 million hectares of coconut. This replication can be funded by national budgets or through bilateral investments of ADB, IFAD or other development organizations. The project would also achieve two cross-cutting benefits: that of empowering socio-economically disadvantaged women and enabling coconut farmers to conserve important coconut germplasm on farm which would significantly contribute towards sustainable natural resource management.

Proposed Project

1. Objectives/Scope

The objective of the RETA is to develop sustainable coconut-based rural communities through the production and marketing of high-value coconut products, intercropping and livestock/fodder production and production and marketing of quality planting materials to deploy precious coconut diversity in eight ADB DMCs: Bangladesh, India, Indonesia, Fiji, Papua New Guinea, the Philippines, Sri Lanka and Vietnam.

The goal is to increase the incomes and food security of poor people in 24 coconut-growing communities. The participating countries were selected based on the size of hectarage and number of coconut farmers (Indonesia, India and the Philippines being the biggest), willingness to share technologies (India, Philippines, Sri Lanka and Vietnam), prospects for developing a bilateral investment projects (Bangladesh, Vietnam and PNG) and willingness to conduct research for possible application of results in fragile Pacific atoll islands (Fiji) through the support of a regional organization (Secretariat of the Pacific Community in Fiji). The atoll islands (parts of Fiji, PNG, the Federated States of Micronesia, French Polynesia, New Caledonia and Tonga and significant parts of the Cook Islands, Kiribati, Marshall Islands, and Tuvalu) of the

Pacific represent a special challenge for agricultural development. They are characterized by low economic development, extreme isolation and a very fragile ecology with high water salinity, brackish nature and low nitrogen content of the soil, high temperature and typhoon prone, but where coconuts are one of the few agricultural crops grown. Adapted Dwarf varieties that are good for tendernuts and toddy need to be identified and introduced. Value adding component needs to include the production of products for household consumption and the local market (i.e., soap products, vinegar and other products) that are often imported.

The scope of the RETA consists of five components: (1) capacity building through the development of CBOs and training of farmers, women members, research and extension officers; (2) developing simple equipment, pilot production and marketing of high-value products for CBOs and women; (3) introduction of promising intercropping and livestock/fodder production technologies to augment farm incomes and food security; (4) development of community-managed income-generating coconut nurseries and deployment and conservation of promising selected local and introduced coconut varieties; and (5) dissemination and promotion of research results. The project framework is shown in Table 4.

2. Outputs

The expected major outputs include: (i) trained CBO members and leaders capable of managing business enterprises and researchers and extension workers capable of supporting and replicating sustainable community-based income generating activities and development efforts; (ii) efficient inexpensive equipment for the production of high-value products developed and adopted; (iii) market surveys completed and new and larger consumer markets for coconut products identified; (iv) viable post-production techniques for the production of high-value quality products adopted; (v) viable intercropping and livestock/fodder production techniques adopted; (vi) profitable community nurseries and successful deployment and on farm conservation of important coconut varieties; (vii) viable technologies and benefits from the project disseminated and promoted for potential replication nationwide.

3. Cost Estimates and Financing Plan

The project will have a total budget of US$ 3M. It will require a budget of US$ 1M from ADB. The International Fund for Agricultural Development (IFAD) will provide US$150 000 to co-finance the project in India, Indonesia and the Philippines; the International Development Research Centre of Canada (IDRC), US$ 12 000, to support feasibility studies and catalogue documentation of the production of high-value products; and the UK's Department for International Development (DFID) US$ 112 000, to identify and socio-economically characterize the 24 project sites and to refine the embryo culture technology to be used for the safe movement of germplasm. The participating DMCs will provide counterpart funds of US$ 1 080 000. IPGRI will also provide counterpart funds for the project valued at US$ 646 000. Details of the cost estimates and financing plan are shown in Table 5.

4. Implementation Arrangements

IPGRI will serve as the executing agency (EA) of the project. It will coordinate the project through its Regional Office for Asia, the Pacific and Oceania in Serdang, Malaysia by working with the NARS and NAES of eight participating countries to provide them with technical and administrative support for technology, equipment and germplasm sourcing and sharing, community organizing and mobilization, technology evaluation, capacity building and information dissemination. The lead implementing agencies will be the eight NARS agencies in the participating DMCs. An internationally recruited

project coordinator will be assigned by IPGRI to supervise the RETA, and each participating NARS will designate a National Project Coordinator and Community Coordinators. Although IPGRI will take the lead in this project, it will work with NARS, NAES and NGOs to enhance their capacity to initiate and continue the activities after project termination. The project will also link with the ADB-funded bilateral projects in participating countries, as appropriate, such as the Northwest Bangladesh' Crop Diversification Project and Sri Lanka's Southern Province Rural Economic Advancement Project to promote project complementation and synergy. As this RETA is a research project, the lead implementing national agency will be the research agency dealing with coconut in each country which will collaborate with the extension agency country. The Project Co-Coordinators of the NARS and NAES agencies that will implement the projects are listed in Table 6.

Consultants will be hired to assist the project in activities needing expert advice such as in the areas of community organizing and cooperatives/farmers' association management, development of processing equipment, high-value product design and production, food processing, intercropping, livestock and economic analysis.

The project will also hire a Scientific Assistant, a Communications Assistant and a Training Assistant to support the IPGRI Project Coordinator in planning, monitoring, documenting and analyzing research data and preparing project reports to participating countries, IPGRI and ADB; documenting and translating research results into technoguides, bulletins and public awareness materials and publishing project reports and a newsletter; and in developing training modules and training materials for each area of activity and in the planning, coordinating and conduct of training courses in the eight participating countries.

The implementing agencies will select 24 coconut growing communities (average of three per country) as project sites, based on agroclimatic (dry, medium, wet) and socioeconomic conditions (most members living below poverty line) and community commitment. CBOs and women's groups will be organized and trained to manage the identified viable business enterprises. Farmers will be supported to undertake intercropping and supported in kind for planting materials, livestock inputs and equipment which will be repaid to the CBOs from earnings, to build long-term capital for the community for expanding its number of beneficiaries. Livestock consisting of 3 female cattle, 10 goats or pigs and 100 free-range breed chicken will be provided to the CBO as multiplication stock and progenies loaned to farmers and women beneficiaries who will repay the loans in cash or in kind. Counterpart funds from NGOs, national and international development organizations will be solicited and utilized using the same scheme.

5. Value-adding activities to be deployed in the eight participating countries

The tentative list of value-adding activities to be deployed in the eight participating countries is shown in Table 7 which will be validated at the project initiation meeting. Inexpensive processing equipment for the production of high-value products from fibre/kernel/leaves and coconut shell/wood will be imported from Vietnam and Thailand, respectively, and where suitable, these equipment will be modified and multiplied locally in collaboration with the private sector and introduced in each project site as appropriate. Technologies for intercropping will be introduced from India and the Philippines.

Researchers, extension technicians and farmers will be trained by IPGRI and implementing agencies on the techniques of producing high-value coconut products, intercropping and livestock/fodder production (including cut-and-carry schemes) and on selecting coconut varieties and nursery growing. For the livestock component, the project will collaborate with the International Centre for Tropical Agriculture (CIAT)

project at the International Rice Research Institute (IRRI) on using the two-tier (grass / hedge) system of fodder production. As Bangladesh and Vietnam plan to expand their coconut production and their coconut research programmes through bilaterally funded projects in the near future, they have requested that ADB support one PhD scholarship each in which the grantees will be bonded to return to duty station to lead the expanded programmes. Counterpart scholarships to support additional six MSc degree awardees from the participating countries will be negotiated with the SEAMEO Regional Centre for Graduate Study and Research in Agriculture (SEARCA) as in previous RETAs.

Community-managed coconut seedling nurseries will be established to produce seedlings for sale to community members, who, in turn, will be encouraged or required to plant at least 10 coconut seedlings around their homes. Seedlings will be derived from selected local varieties and introduced varieties which have potential for high yield and high-value products. To avoid the transmission of major diseases, the imported varieties will be introduced to each country through embryo culture-derived seedlings, which techniques of production will be developed through a DFID-funded project. This activity will serve as a twin mechanism for income generation and for deploying coconut diversity and promoting its on-farm conservation through use.

A market survey will be undertaken by the implementing agency to identify marketable products that will be produced and specific markets. Marketing will involve the traditional and new local, national and regional market channels and new opportunities such as e-marketing will be explored, initially in collaboration with the IDRC-Singapore-managed Pan Asia E-Commerce Mall.

Research results will be documented and translated into technoguides, bulletins and public awareness materials and promoted in ongoing and planned development projects of each country.

The project will be implemented over a period of three years (2002-2004). The inaugural annual meeting will be held at the beginning of the first year to finalize the project goal, objectives, strategies and workplan and to set directions and priorities. The succeeding annual meetings will take place at the beginning of the second and third year to assess the progress made and determine the work programme for the succeeding year. IPGRI will submit to ADB semi-annual progress reports, and semi-annual financial statements to account for the use of RETA funds, and the audited annual financial statements. Funds will be drawn down every six months based on estimated expenditures of each ensuing six-month period and subject to satisfactory liquidation of expenditures financed under previously disbursed funds. A comprehensive completion report will be submitted to the Bank by IPGRI within four months of completion of the RETA.

Within the Bank, the project will be assigned to a project officer with appropriate technical expertise. The project officer will monitor the progress of work and conduct reviews as appropriate.

Procurement of goods and services and recruitment of expert consultants will be undertaken by the executing agency in accordance with the Bank's Guidelines for Procurement and Guidelines on the Use of Consultants or through arrangements acceptable to the Bank for engaging local consultants.

Table 1. High-value coconut products from Vietnam

No.	Products	Net income/unit/person/household (US$)
1.	Handicraft from Coconut Shells	34.50/person/month
2.	Handicraft from Coconut Wood	2.33/person/day
3.	Coconut Shell Charcoal	62.10/person/month
4.	Coconut Midrib Baskets	1.24/person/day
5.	Coconut Single Ropes (Yarns)	1.14/person/day
6.	Coconut Coir Tapes	1.20/person/day
7.	Doormats from Coir Fibre	1.20/person/day
8.	Snow Mats	1.00/person/day
9.	Geotextile	1.40/person/day
10.	Coconut Fibre Panel	-
11.	Coconut Candies	1.30/person/day
12.	Coconut Paper Cakes	1.30/person/day
13.	Nata de Coco	42.20/household/month
14.	Coconut Cheese	55.25/household/month
15.	Coconut Yoghurt	49.12/household/month

Table 2. High-value coconut products from Thailand

No.	Products	Net income/factory (US$)	Net income/unit/person/household (US$)
1.	Coconut Shell and Wood Handicrafts	-	200-400/household/month
2.	Coconut Fibre	2715/month	-
3.	Coconut Monkey	-	4.20/piece
4.	Coconut Midrib Broom	-	0.21/broom
5.	Coconut Midrib Basket	-	0.19/basket
6.	Coconut Calyx Flower	-	4.16/flower
7.	Coconut Guinit Flower	-	4.0/flower
8.	Coconut Chip	3559/year	-
9.	Coconut Sugar	2382/ha/year	-
10.	Nata de Coco	238/ton or 2857/year	-
11.	Young Coconut with Opener	17 565/week	-
12.	Canned Coconut Milk	714/10000 units or 85,000/year	-
13.	Coconut Nectar	11.42/box of 24 bottles	-
14.	Roasted Young Coconut	125/day	-
15.	Honey Roasted Coconut	833/week	-
16.	Coconut Toffee	-	8.57/person/day
17.	Coconut Baking Custard	-	17.86/person/day

Table 3. High-value coconut products from the Philippines

No.	List of products	Net income/factory (US$)	Net income/unit/person/ household (US$)
1.	Coconut Furniture Manufacture	ROI of 20%	-
2.	Coconut Wood Parquet Flooring	ROI of 15%	-
3.	Coir-Wood-Cement Board (CWCB)	36 000/year	-
4.	Stitched Fibre from Mixed Coir Fibre	24 000/year	-
5.	Beds from Manually Produces Coir Fibre	51 064/year	-
6.	Mixed Fibre (CH-3 Grade) from Coconut Husk	120 000/year	-
7.	Coconut Water Vinegar	559/month	-
8.	Coconut Sap Sugar	226.80/ha/month	-
9.	Macaroons	-	4.00/person/day
10.	Coco Sap Syrup	826/month	-
11.	Nata de Coco	720/month	-
12.	Bukayo	-	11.80/household/day
13.	Lambanog	562/ha/month	-
14.	Dehydrated Buko	ROI of 18%	-
15.	Coconut Burger	80/day	-
16.	'Buko' Pie	-	23/household/day
17.	'Buko' Drink	ROI of 70%	-
18.	Maja Blanca	-	9.40/person/day
19.	Coco Jam	-	59.36/person/ month
20.	Coconut Cookies	-	50.00/person/ month

Table 4. Project framework

Design Summary	Targets	Project Monitoring Mechanism	Risks/Assumptions
1.0 Sector/Area Goals			
To increase incomes and food security of poor people in coconut- based communities	• Increased incomes and food production from coconut-based farming • Increased coconut production • Increased conservation of coconut genetic diversity	• Department of Agriculture statistics • APCC Statistics • Bank review missions • Project reports	• Government support to coconut-based farming • Farmers convinced to conserve their important coconut varieties
2.0 Purpose/Objectives			
To develop sustainable coconut-based communities in eight ADB developing member countries (DMC): Bangladesh, India, Indonesia, Fiji, Papua New Guinea, the Philippines, Sri Lanka and Vietnam.	• Financially-viable and commercially attractive technologies for producing high-value coconut products • Viable intercropping and livestock/fodder production technologies • Important coconut varieties planted and conserved	• Semi-annual reports • Seminars and workshops • Publications • Bank review missions	• Willingness of coconut producing countries to share technologies • Commitment of farmers in chosen project sites
3.0 Activities			
3.1 Capacity building by developing community-based organizations (CBOs), training of farmers, women, research and extension officers	• 24 coconut-based communities selected as project sites based on agroclimatic and socio-economic conditions • 24 CBOs organized and strengthened • CBO members and officers and women trained on organizational and technical skills • Research and extension officers trained and two PhD coconut scholars supported • One motorcycle provided per community project coordinator to facilitate coordination	• Project meetings and workshops • Project reports	• Effective collaboration between research, extension staff and community leaders • Availability of suitable research and extension staff to be trained • Commitment and leadership capability in selected communities
3.2 Developing simple equipments, pilot production and marketing of high-value products from the kernel, husk, shell, water wood and leaves for CBOs and women groups (using NGOs)	• Viable processing equipments developed for producing high-value products • Markets identified locally and abroad for high-value products and intercrops • At least three viable high-value products produced and marketed per community	• Number of equipment produced and used • Actual production and cost and return data	• Effective collaboration between farmers, NGOs, research, extension officers • Farmer and community acceptance of equipment • Efficient marketing developed

Design Summary	Targets	Project Monitoring Mechanism	Risks/Assumptions
	• CBO postproduction activities established • Women's and NGO activities established	• Project reports	• Availability of counterpart national staff
3.3 Introduction of promising intercropping and livestock/fodder production technologies	• At least 3 viable intercropping technologies adopted by each of 24 communities • At least one livestock and/or fodder production technology adopted in each of 24 participating communities	• Actual production and cost and return data • Project reports	• Effective collaboration between farmers, research and extension officers • Availability of counterpart national staff
3.4 Development of community-based coconut nurseries and deployment of promising selected local and introduced coconut varieties	• At least two community nurseries established in each of 24 participating communities • At least three promising coconut varieties propagated and planted by farmers per community	• Number of seedlings sold • Number of varieties deployed per community • Project reports	• Collaboration between researchers and extension workers • Willingness of communities and countries to share germplasm • Support of farmer communities
3.5 Dissemination and promotion of research results	• 3 project annual meetings conducted • At least one computer and printer provided to each country for documentation and information dissemination • Technoguides, extension bulletins and public awareness articles published and distributed to farmers, researchers, extension workers, the private sector and other development agencies • Project linked with other development/investment projects	• Publications • Project reports	• Effective collaboration between researchers, extension workers and the media • Support of development and investment institutions

Table 5. Cost estimates and financing plan (in US$ '000)

	Item	Bank	IDRC	DFID	IFAD	IPGRI	DMCs	TOTAL
A.	**Personal**							
	International							
	1. Coordinator					250		250
	2. Consultants (10 PM)	50						50
	3. Scientific/Training Experts					250	400	650
	Local							
	1. Scientific Assistant (36 PM)	54					80	134
	2. Communication Assistant (24 PM)	36					80	116
	3. Training Assistant (24 PM)	36					50	86
	4. NGO staff support	24						24
	5. Programme Assistant (36 PM)					20		20
	6. Documentation Assistant (36 PM)					40		40
	7. Secretary (36 PM)					36	42	78
	Subtotal (A)	**200**				**596**	**652**	**1448**
B.	**Project activities**							
	1. Capacity building						50	50
	a) Development of CBOs	12						12
	b) Training of farmers, women, research and extension officers	64						64
	c) 2 PhD scholarships	36						36
	2. Development of simple equipment	40					48	88
	3. Market survey and market linkages	24						24
	4. Production and marketing of high-value products						50	50
	a) Production in CBO facilities	48						48
	b) Development of women's group income generating activities	24						24
	5. Intercropping/livestock raising						48	48
	a) Intercropping	30						30
	b) Livestock raising	30						30
	6. Community seedling nurseries							
	a) Nursery and seedling production	12					24	36
	b) Variety introduction	35					48	83
	7. Dissemination/promotion of results	24						24
	8. Annual project meetings, workshops	60						60
	Sub-total (B)	**439**					**268**	**707**
C.	**Project support**							
	1. Technology documentation		12					12
	2. Project site selection			30				30
	3. Embryo culture			82				82
	4. Farmer participatory research				150			150
	5. Travel	75					80	155
	6. Communication and incremental office supplies	34						34
	7. Equipment (computer, printer/country)	16						16
	8. Motorcycle for community coordinators (1 each)	36						36
	Sub-total (C)	**161**	**12**	**112**	**150**		**80**	**515**
D.	**Administrative cost (15%)**	120				50	80	250
E.	**Contingencies (10%)**	80						80
	GRAND TOTAL	**1000**	**12**	**112**	**150**	**646**	**1080**	**3000**

Table 6. List of implementing agencies and NARS and NAES country coordinators

Country	Designated Coordinator
1. Bangladesh	Mr Nazirul Islam, Senior Scientific Officer, Horticulture Research Centre, Bangladesh Agricultural Research Institute (BARI), Joydepur, Gazipur 1701, Bangladesh Tel: 880-2-9332340, Fax: 880 -2-9353395/9800441, Email: baridg@bttb.net.bd
2. Fiji	Tevita Kete, Research Agronomist for Coconut, Koronivia Research Station, PO Box 77, Nausori, Fiji Tel 679-477044, Fax 679-9400 262, Email:tkete@yahoo.com Mr Miseli Naulivou Nailavu, Director of Extension Services, MAFF Private Mail Bag, Raiwaqa, Suva, Fiji Tel: 679-384233, Fax: 679-383426 Email: dextension@is.com.fj
3. Indonesia	Dr Doa Dekok Tarigans, Central Research Institute for Estate Crops, Jl. Tentara Pelajar (Cimanggu) No. 1, Bogor 16111 Indonesia Tel: 62-251-313083/336194 Fax: 62-251 336194, Email: criec@indo.net.id
4. India	Dr V. Rajagopal, Director, Central Plantation Crops Research Institute, Indian Council of Agriculture Research, Kasaragod 671 124, Kerala, India Tel: 91-499-430333/4330894/430895/430864 Fax: 91-499-430322, Email: vrg_44@yahoo.co.uk Dr Rethinam, Chairman, Coconut Development Baord, Kochi 682011, India. Tel: 91-484-354216/371089, Fax: 91-484-354216 Email: cdvkochi@vsnl.com/Rethinam95@hotmail.com
5. Papua New Guinea	Dr James Kaiulo, Director Cocoa and Coconut Research Institute, P.O. Box 1846, Rabaul, East New Britain, PNG Tel. 675-9839131, Fax: 675-9839115, Email: ccri@datec.com.pg Mr Uron Salum, Director, Cocoa and Coconut Extension Agency, P O Box 1227, Madang, PNG Tel: 675-8521379, Fax: 675-8521381, Email: usalum@datec.com.pg
6. Philippines	Mr Carlos Carpio, Deputy Administrator for Research, Philippine Coconut Authority Elliptical Road, Diliman, Quezon City, Philippines. Tel. 632-9200415, Fax: 632-9254537, Email: cbcarpio@mozcom.com Mr Romulo N Arancon, Jr, Manager, Coconut Extension Training Center, Ago-Oshiro, Davao Center, 8000 Philippines. Tel: 63-82-2930117 Fax: 63-82-2930118 Email: pca-cetc@philwebinc.com
7. Sri Lanka	Dr Neil Fernando, Senior Economist, Coconut Research Institute, Bandirippuwa Estate, Lunuwila, Sri Lanka Tel: 94-31-55300 Fax: 94-31-57391 Email: rescri@sri.lanka.net Mr Henry Nimal, Extension Division, Coconut Research Institute, Bandirippuwa Estate, Lunuwila, Sri Lanka Tel: 94-31-55300 Fax: 94-31-57391 Email: rescri@sri.lanka.net
8. Vietnam	Mr Vo Van Long, Senior Researcher, Oil Plant Institute of Vietnam (OPI), 171-175 Ham Nghi St. District 1, Ho Chi Minh City, Vietnam. Tel: 848- 829-7336/8243526 Fax: 84-8-824352 Email: opi.vn@hcm.vnn.vn/vovanlong@hcm.vnn.vn Dr. Le Hung Quoc, Director, Department of Agricultural and Forestry Extension, Ministry of Agriculture and Rural Development, 2 Ngoc Ha St., Bach Thao, Ha Noi, Viet Nam Tel: 84-4-7332218 Fax: 84-4-8236403 E-mail: lhq@hn.vnn.vn

Table 7. Value-adding activities to be deployed in the eight participating countries

Value-adding Industries/ activities	Bangladesh	Indonesia	India	Philippines	Sri Lanka	Vietnam	Fiji	PNG
1. Developing simple equipment	Husk beating and decorticating machines and rope, doormat, geotextile equipment; shell and wood handicraft equipment	Husk beating and decorticating machines and rope, doormat, geotextile equipment; shell and wood handicraft equipment	Husk beating and decorticating machines and rope, doormat, geotextile equipment; shell and wood handicraft equipment	Husk beating and decorticating machines and rope, doormat, geotextile equipment; shell and wood handicraft equipment	Husk beating and decorticating machines and rope, doormat, geotextile equipment; shell and wood handicraft equipment	Husk beating and decorticating machines and rope, doormat, geotextile equipment; shell and wood handicraft equipment	Husk beating and decorticating machines and rope, doormat, geotextile equipment; shell and wood handicraft equipment	Husk beating and decorticating machines and rope, doormat, geotextile equipment; shell and wood handicraft equipment
2. Production/ marketing of high-value products for CBO	Fibre products, geotextiles, shell/wood handicrafts, cooking oil	Fibre products, geotextiles, shell/wood handicrafts	Fibre products, geotextiles shell/wood handicrafts	Fibre products, geotextiles shell/wood handicrafts	Fibre products, geotextiles shell/wood handicrafts	Fibre products, geotextiles, shell/wood handicrafts	Fibre products, geotextiles shell/wood handicrafts	Fibre products, geotextiles shell/wood handicrafts
3. Developing women's groups and income generating activities	One-ply ropes, doormats, baskets, confectionaries, coconut candies, other food products	One-ply ropes, baskets, doormats, geotextiles; confectionaries, coconut candies, other food products	One-ply ropes, doormats, baskets, confectionaries, coconut candies, other food products, vermicomposting, mushroom production	One-ply ropes, doormats, baskets, confectionaries, coconut candies, other food products	One-ply ropes, doormats, baskets, confectionaries, candies; coconut other food products	One-ply ropes' doormats, baskets, confectionaries, coconut candies; other food products	One-ply ropes, doormats, baskets, confectionaries, coconut candies, other food products	One-ply ropes, doormats, baskets, confectionaries, coconut candies, other food products

Value-adding Industries/ activities	Bangladesh	Indonesia	India	Philippines	Sri Lanka	Vietnam	Fiji	PNG
4. Intercropping	Cash crops : banana, pineapple Other marketable cash crops: vegetables, papaya, cacao, ginger, black, pepper Food security and livestock feed crops: cassava, sweet potato, taro, yam, corn	Cash crops: banana, pineapple Other marketable cash crops: vegetables, black pepper Food security and livestock crops: cassava, sweet potato, taro, yam, corn	Cash crops: banana, pineapple Other marketable cash crops: black pepper, ginger, turmeric Food security and livestock feed crops: cassava, sweet potato, taro, yam, corn	Cash crops: banana, pineapple Other marketable cash crops: vegetables, papaya, cacao, ginger, black pepper Food security and livestock feed crops: cassava, sweet potato, taro, yam, corn, upland rice	Cash crops: banana, pineapple Other marketable cash crops: vegetables, black pepper, lime Food security and livestock crops: cassava, sweet potato, taro, yam, corn	Cash crops: banana, pineapple Other marketable cash crops: vegetables, sweet corn, condiments Food security and livestock feed crops: cassava, sweet potato, taro, yam, corn	Cash crops: banana, pineapple Other marketable cash crops: taro, kava Food security and livestock crops: cassava, sweet potato, taro, yam, corn, cooking banana	Cash crops: banana , pineapple Other marketable cash crops; black pepper, vanilla, kava, beetle leaf Food security crops: cassava, sweet potato, taro, yam, corn, cooking banana
5. Livestock production	Animal stocks: 3 female cattle, 10 goats, 100 range chicken	Animal stocks: 3 milking cows, 10 goats or pigs, 100 range chicken	Animal stocks:3 female cattle, 10 goats or pigs, 100 range chicken, swine	Animal stocks: 3 female cattle, 10 goats or pigs , 100 range chicken	Animal stocks: 3 female cattle, 10 goats or pigs, 100 range chicken	Animal stocks: 3female cattle, 10 goats or pigs, 100 range chicken	Animal stocks: 3 female cattle, 10 goats or pigs, 100 range chicken	Animal stocks: 3 female cattles, 10 goats or pigs, 100 range chicken
6. Fodder production	Fodder: napier, guinea grass, kukuriu grass Pasture legumes: tropical kudzu, *Centrosema*, *Stylosanthes*; hedge species	Fodder: napier, guinea grass, kukuriu grass Pasture legumes: tropical kudzu, *Centrosema*, *Stylosanthes*; hedge species	Fodder: napier, guinea grass, kukuriu grass, PBN 16 Pasture legumes: tropical kudzu, *Centrosema*, *Stylosanthes*; hedge species	Fodder: napier, guinea grass, kukuriu grass Pasture legumes: tropical kudzu, *Centrosema*, *Stylosanthes*; hedge species	Fodder: napier, guinea grass, kukuriu grass Pasture legumes: tropical kudzu, *Centrosema*, *Stylosanthes* hedge species	Fodder: napier, guinea grass, kukuriu grass Pasture legumes: tropical kudzu, *Centrosema*, *Stylosanthes*, hedge species	Fodder: napier, guinea grass, kukuriu grass Pasture legumes: tropical kudzu, *Centrosema*, *Stylosanthes*; hedge species	Fodder: napier, guinea grass, kukuriu grass Pasture legumes: tropical kudzu, *Centrosema*, *Stylosanthes*; hedge species
7. Community seedling nurseries	2 nurseries/ community	2 nurseries/ community	2 nurseries/ community	2 nurseries/ community	2 nurseries/ community	2 nurseries/ community	2 nurseries community	2 nurseries/ community

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Paul Stapleton, Pons Batugal and Jeffrey Oliver, *editors*

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