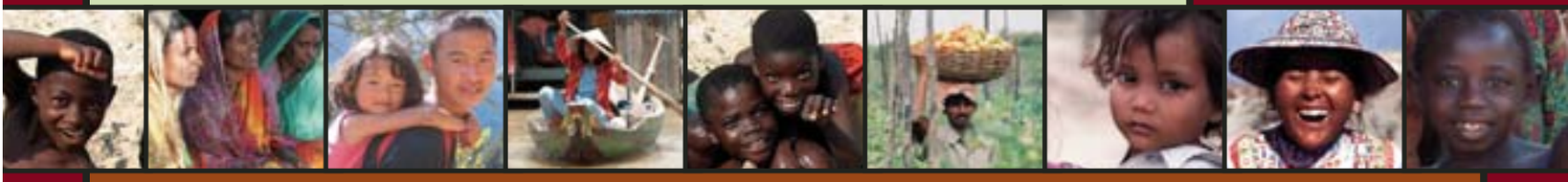
DID YOU KNOW...?



A focus on 17 natural resources projects across the developing world, managed by **NR INTERNATIONAL**

If you like the book, you may like to watch the selection of videos on this CD. These films were all produced by local teams with limited resources. They are used as training tools and a method of communicating the work of the projects to a wider audience.

nr international

successfully managing development

DID YOU KNOW...?

NR International is one of the UK's leading project management companies, specialising in the development sector. With a tradition of natural resources management, we have over 600 person years' experience, working in more than 80 countries worldwide. We work with and for the poor - but we do not receive or deliver aid to them. We believe in the creation of trusted partnerships and we aim to enhance peoples' livelihoods by improving their quality of, and access to, natural resources. Our philosophy is a simple one, adopting the Chinese proverb:

"If you give a man a fish he can eat for a day, but if he is taught how to fish he can eat every day".

NR International is owned by three leading UK universities: Imperial College London; the University of Greenwich; and the University of Edinburgh. They recognise the value of independent and cost-effective management.

Our current portfolio covers over 200 projects we manage on behalf of a variety of donors including the European Commission (EC), World Bank and the UK Department for International Development (DFID). We manage five of DFID's Renewable Natural Resources Research Strategy programmes:

- Crop Protection Programme (CPP)
- Crop Post Harvest Programme (CPHP)
- Livestock Production Programme (LPP)
- Forestry Research Programme (FRP)
- and Post Harvest Fisheries Programme (PHFP)

Did You Know...? provides a view of a world rarely seen by most people. Project and team leaders have allowed us in to experience their life and work. The stories inside have come from the following institutes and organisations, which specialise in research for development and poverty reduction: NRI; PROINPA; CIP; the University of Reading; KENDAT; PPRI; UNEP Conservation Monitoring Centre; and ICIPE. **We would like to thank these organisations for all their support, without which much of this work would not have been possible.** See contacts page for more information.

This publication provides a unique insight into the work of the projects. Projects featured in this book were funded by DFID and the EC and managed by NR International.

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DFID Department for International Development
the University of Greenwich
Imperial College London

ACKNOWLEDGEMENTS

This publication would not have been possible without the wholehearted enthusiasm and commitment of all those who submitted entries and members of NR International staff who worked on it from concept to finished product. Special thanks to Bryony Johnston, of NR International, for the original idea and to the project and team leaders who trusted us to represent their hard work, often carried out over many years, in an unconventional way. Also, many thanks for the supplementary photos used, taken on their travels by: Jean Noël Perrin and NR International staff. We hope you like the results!

Winner

We wanted this book to be picked up and understood by anyone, whatever their line of work or interests. That's why we asked young people – one of the toughest audiences around - to judge which entry was the best. Students from year nine and ten (aged 13-14) at nearby **Rochester Grammar School** in Kent, very kindly agreed to help us. Overall they chose **Steve Belmain's** entry on rodent management in Bangladesh. Here are some of the reasons why:

"I don't like rats and, therefore, I think that rat control is a good idea and that the methods are good"

"Very interesting pictures, very interesting information"

"Keeps you wanting to read more"

The prize for winning is for Steve to make a donation to a charity of his choice, worth £250.

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What about reporting the good news – things that are working in Africa – instead of just seeing it as the continent where things go wrong?

Hilary Benn MP

Secretary of State for International Development, November 2004

In the UK we have a history of talking about poverty - Oxfam, Live Aid, Comic Relief, documentaries – it's of historical importance, if people have no idea about poverty they won't do anything about it.

Richard Curtis

Co-Founder Comic Relief, TV & Film scriptwriter, April 2005

What we need are practical ways to address poverty

Jeffrey Sachs

Special Advisor to the UN Secretary General & Author of *The End of Poverty*, April 2005

Everyone has to do their bit – there is no easy answer – the strange thing about Natural Resources is how it has passed out of fashion. How can this be with issues that are so central to survival – how can food and water cease to be crucial?

Tony Worthington

Member of Board of Directors, Parliamentary Network of the World Bank & Former MP, April 2005

INTRODUCTION: Did You Know...?

Innovative work is changing lives
Across the developing world, work is taking place in communities that are remote and rarely seen by the rest of the world. Researchers and specialists are working with these communities to help them to help themselves improve their quality of life and break out of poverty. In the Dominican Republic, banana farmers are learning how to meet stringent regulations to export their produce to Europe. In Bangladesh, rats destroy crops and have the ability to chew through virtually anything! A project there has come up with simple, affordable solutions to enable farmers to protect their crops and, therefore, their incomes. In India, a new interactive tool is able to help even illiterate farmers to educate themselves on how to best manage their livestock and help guarantee their food security. What's going on in these areas deserves our attention. That's why we've produced Did You Know…?

A unique glimpse
Did You Know..? offers you a chance to immerse yourself in some incredible stories of lives changing for the better. It combines straightforward coverage of the projects that we manage, as well as promoting the cultural and historical richness of the countries in which we work - through the eyes of those who live and work there.

Communicating science
NR International-managed projects are dedicated to improving the well-being of the poor in developing countries. We specialise in renewable natural resources - that is crops, forestry, fisheries and livestock. This often involves scientific research, in the lab, but more often in the field. Project and team leaders work directly with the community to translate their findings into practical solutions – so that smallholder farmers and their families don't go hungry, can afford to educate their children and can improve their health with better farming methods. Science is often a scary word, but in reality it provides amazing and ground-breaking solutions to the problems of the world's poorest. These stories rarely reach the public. As Baroness Susan Greenfield CBE commented to the Editor:

If you're going to write a book, you might as well have it read by as many people as possible, rather than one man and a dog! For me, writing a science book that only scientists could understand – what's the point? Clear, user-friendly English, I love it!

Baroness Susan Greenfield CBE
Director The Royal Institution of Great Britain
Interviewed in April 2005

You can judge for yourself with the stories from the field in this book.

BANGLADESH, SOUTH AFRICA

8 Ecologically based rodent management for small-scale farming systems

Did you know...?

- There are more than 1500 species of rodents – more species than all other mammal groups on the planet.
- In Vietnam, rats are traditionally eaten during marriage ceremonies and fed to guests at weddings. Indeed, rats are eaten in many African and Asian countries where they are highly sought after delicacies.
- Rats can easily chew through almost any material including aluminium, tin, concrete, electrical wires, plastic pipes, wood.
- The word 'rodent' comes from the Latin word, rodere, meaning to gnaw or chew.
- Rats are worshipped by Hindus as servants of the gods. Fear of rats is common to many cultures where their presence is associated with bad omens or bad magic.
- Rodents are the most widely used animals for human medical research.
- Rats have such a good sense of smell that they are being used to detect landmines (by smelling the explosive in the soil) and to screen for TB (by smelling the bacteria present in patient sputum samples).
- Rodents are famous animals, thanks to Mickey Mouse, The Pied Piper and many other stories and folklore found in all cultures.
- Rats can attack and damage almost any agricultural crop that we try to grow.
- Rats can harbour and transmit more than 60 different diseases to people and our livestock. The most famous rodent-borne disease, bubonic plague, which killed about half the population of Mediaeval Europe, still persists in many countries in Africa and Asia where outbreaks occur each year.
- Although it is unknown how many people get sick and die from rodent diseases worldwide, some lethal diseases such as lassa fever have no cure or vaccine.
- Rodents make good pets because they are clean, smart and affectionate!

Behind the scenes...

Killing the rat pack

"The most satisfying aspect of our research on rodents in developing countries is when farmers and householders start independently to adopt the rodent management strategies and tools we have recommended. In Bangladesh, we have seen farmers and village communities begin to change how they store their livestock fodder haystacks. By storing it off the ground, they have reduced the number of rats living in haystacks. Farmers have also realised an additional benefit from the new haystacks which provide shelter to their ducks, chickens and goats. In South Africa, we have seen communities stop using highly dangerous and illegal poisons to kill rats, and instead use 'new' types of killer traps that are now being sustainably manufactured by a South African company.

Rodents are certainly the most successful group of mammals and have been highly adaptive to their environments, living in the extreme heat of the desert and the cold of the artic. Of the thousands of rodent species only a handful are considered pests. So-called 'commensal' rodents have long been associated with human civilisation, eating our food and living in our buildings and hitching a ride on our transport. In the UK, rodent pests have been found successfully living deep inside coal mines, in warehouse freezers storing meat, and thriving in areas of poor hygiene and sanitation on farms and in cities. The mobility of rodents, their intelligence and adaptability make them a challenging adversary to control. But, they can be effectively controlled in a cost-beneficial and sustainable way in nearly all pest situations. However, if left unchecked, rodent pest problems will only increase with agricultural intensification and urbanisation pressures. It is unlikely that rodent pest management can be sustainably improved without continued long-term donor support by attracting young scientists to understand localised rodent pest problems."

Steven Belmain
Natural Resources Institute

Community trap barrier systems have been shown to protect rice fields from rodent damage. They work by attracting rodents from large distances to an early ripening crop inside a fence where the rodents get caught by multi-capture traps.

New designs of rat traps make them better at catching rats and reducing rodent populations. Although they can be labour-intensive to use appropriately, they are cheaper and safer than poisons for poor communities in developing countries.

Steven Belmain Project leader

WINNER

9

Bandicota benegalensis, the common rice field rat of South Asia.

Rodents are an important source of protein and highly sought after delicacies in many countries.

Our work...

Oh rats!

Rodent pests are a well recognized problem in most countries in both rural and urban situations and affect people's lives by destroying many different crops, transmitting diseases to people and livestock, contaminating food and water, and damaging buildings and other possessions. Almost any agricultural crop grown can be attacked by rodents, and they are known carriers of more than 60 different life-threatening diseases that can be transmitted to people. The numbers of rodent pests are on the increase worldwide and are likely to continue increasing.

Although effective rodent control methods exist, their poor application and adaptation to particular situations often results in treatment failures, leading to apathy and widespread acceptance of rodent pests in the environment. Generally, perception about the impact of rodents on people's livelihoods is poor. This is partly due to their multiple impacts (agriculture and health), the difficulty to assess some of the problems (e.g. crop loss) and low public awareness (e.g. disease transmission) about the damage caused by rodents. Without a good holistic understanding about rodent pest problems and the cost-benefits of rodent control, it can be difficult to convince people that rodent control is achievable and can lead to real benefits in their lives. Rodent pests disproportionately affect the poorest people who are less likely to possess appropriate knowledge and access to proven technology. By giving people appropriate knowledge and experience, they can develop strategies to increase food, financial security and health.

Current rodent control practices are often based on the use of poisons, rodenticides. Research funded by the Crop Protection Programme and Crop Post-Harvest Programme and led by scientists at the Natural Resources Institute, has been working with communities and local institutions in Africa and Asia to evaluate and understand their rodent pest problems and develop appropriate strategies that can reduce the problems rodents cause for them. Because rodenticides can be expensive and difficult to use safely, other rodent management methods involving trapping and environmental management are more appropriate for the situations found in developing countries.

R8184: Ecologically-based rodent management for small-scale farming systems
Funded by: DFID Crop Protection and Crop Post Harvest Programme, co-funded with World Vision and with the Poverty Elimination Through Rice Research Assistance Programme (PETRRA)

Project leader: Steven Belmain, Natural Resources Institute
Photos: Steve Belmain, Ken Alpin, Adrian Meyer, Emil von Maltitz, Moses Zimba

BOLIVIA

10 Integrated management of major insect pests of potatoes in hillside systems in the Cochabamba region of Bolivia

Did you know...?

- The potato (*Solanum tuberosum*) originated in the highlands of South America, where it has been consumed for more than 8000 years.
- The Spanish conquistadores first encountered the potato when they arrived in Peru in 1532 in search of gold. The potato, not gold or silver, however, is the true treasure of the Andes.
- Brought to Europe by Spanish sailors, potatoes were fed to livestock long before they became a staple in people's diets.
- Nutritionally potatoes are high in vitamin C and potassium, very high in protein – for a vegetable – and almost fat free.
- Andean potato is the principal staple food for Bolivians and also a major cash crop, grown nationally by 400,000 small-farm families. Most potato farmers are poor, and yields are low, due to damage by potato tuber moths and Andean potato weevils
- The use of insecticides is the control method traditionally used by the farmers, producing negative effects in the ecosystem and on the health of the farmers because they are applied at very high dosages.
- *Chuño* and *tunta* are dried potatoes that are commonly eaten both in the cities and in the Andes region where, during the winter, people make them. To make chuño fresh tubers are put on the ground and frozen for two or three days, then they are pressed by trampling to squeeze out the water and left to dry. For tunta, the frozen tubers are covered with a layer of straw before the sun rises, and after two to three days are placed in running water for 10–15 days and then left to dry.

Source: http://www.cipotato.org/WPA/samerica/Bolivia.htm & http://www.proinpa.org/Catologos.htm

Potato farmers, Sankayani, near Cochabamba

Behind the scenes...

Kids' stuff

"This project has a new way of looking at transfer of technology by targeting school children as the potential promoters in the fight against poverty – it is after all the women and children who are often responsible for potato cultivation. Training was carried out with farmers and children in grades 5 and 6 (aged 10–12) at three rural schools in different communities located in Cochabamba, Bolivia. The selection of the issues for training was the result of a base-line survey previously carried out in the area, where the main pest problems are the potato tuber moth (PTM), the Andean potato weevil (APW), and the inadequate and risky use of toxic pesticides.

Training materials were prepared for teachers and pupils, including a guide for the teachers and a notebook for the children. The four main issues included: history of the potato crop; biology of the pests and methods to control them; and the safe use of pesticides. Many teachers did not come from rural areas and did not know about the potato crop and its associated pests and diseases, or anything about pesticides. As a result, teachers were motivated to learn through training sessions at PROINPA (Promotion and Research of Andean Products). They also learnt from the teaching materials produced by the project and from their pupils' hands-on experience.

Insect surprises!

When life cycles and different insect stages were taught, most were astonished – they had not previously related the different stages with the same insect! They indicated that they knew the larva stage very well, because this stage causes severe damage in the tubers and can be seen at harvest, but they did not relate the larva to the other stages of the insect. Part of the training included visits to the PROINPA research station by the children, to see different laboratories and the various growth stages of insects.

Out of the mouths of babes...

During a science fair in a nearby town, Tiraque, children from one of the participating schools were able to talk about biological control of PTM and APW – acting as unofficial Field Promoters. They also answered questions from the public, thereby providing a unique way of spreading the word on potato pests. Children often take on adult roles at a younger age in developing countries, so by offering them training at a young age they are better equipped to provide for their families in later life. The other effect noted in this project was that, once children were taught, they in turn passed the information on informally to adults in their community, thereby sharing the knowledge for the collective gain of their community."

Javier Franco and Rayne Calderón
PROINPA

Rayne Calderón
and Javier Franco Project leaders

Church in Tiraque

Our work...

Training future farmers

Most potato farmers are poor, and yields are low, due to damage by potato tuber moth and Andean potato weevil. This project, managed by the DFID Crop Protection Programme and implemented by PROINPA in Bolivia and the Natural Resources Institute in the UK, is developing new, non-chemical methods for control of these pests for use by poor farmers. The project objective was to improve food security and increase the family incomes of poor farmers in Bolivia and hillside systems of South America, by developing improved methods for the sustainable management of major potato pests. The project trained farmers in Integrated Pest Management (IPM) of potato and, during these activities, it became apparent that the impact could be greatly increased by involving children. Schools provide an untapped opportunity for introducing large numbers of children to the concepts of IPM at an early age and facilitate a way to reach and be more convincing to parents.

Environmentally friendly biological control methods – rather than chemical pesticides – and IPM techniques were used. For example, it is possible to create a suspension of insects infected with a virus as a spray or powder. When this is applied to a crop, attacks of this pest on the plants are reduced. Another option is to use pheromone traps and lures to attract harmful pests so that they fall into the trap, rather than attack a crop. The idea was to understand local pest knowledge and raise awareness of IPM among farmers and also among policy makers who could help promote IPM.

Andean Vista

Children at PROINPA's research site

R8044: Integrated management of major insect pests of potatoes in hillside systems in the Cochabamba region of Bolivia . **Funded by:** DFID Crop Protection Programme
Project team: Rayne Calderón, Javier Franco, Luis Crespo and José Olivera, PROINPA Foundation (Promoción e Investigación de Productos Andinos or Promotion and Research of Andean Products), Bolivia.
Collaborators: David Hall and Mark Downham, Natural Resources Institute . **Photos:** Javier Franco and Benedikte Siderman-Wolter

INDIA

12 Tomato leaf curl virus

Did you know...?

- Fresh tomato has replaced tamarind in Indian cuisine and is used in the preparation of almost every meal.
- Tomato leaf curl virus (ToLCV) symptoms are often attributed to "something in the soil" or "too strong sunshine", rather than to a virus transmitted by whiteflies.
- Apart from tomato production, Kolar District is the centre for gold-mining in India – this project takes place in Bangalore and Kolar District in Karnataka State.
- Resource-poor farmers can produce their own true-breeding seed from ToLCV-resistant tomato varieties developed by the project.
- The insecticide-resistant B-biotype of the whitefly, *Bemisia tabaci*, first arrived in Kolar District in 1999 and is associated with epidemics of ToLCV disease. (Tomato leaf curl disease, also known as tomato leaf curl virus disease (ToLCVD), is caused by a range of circular single stranded DNA virus species in the *genus Begomovirus*, family *Geminiviridae* and are transmitted by *B. tabaci*).
- Nylon netting, which is used to protect tomato seedlings against ToLCV disease, is commonly used by tomato farmers in Karnataka and organically grown tomatoes are becoming popular in India.

Tomato farmer carrying a load, Kolar, a peri-urban site outside Bangalore

Behind the scenes...

A tomato they can't resist!

"When an opportunity arose to apply for funding through the DFID Crop Protection Programme to work in India on whiteflies and geminiviruses, I wrote to several people in India asking them if they were interested. About a month later, a letter arrived from an old contact, Prof V. Muniyappa, to say that he would certainly like to be involved and that he thought we should concentrate on ToLCV disease.

Since then, there have been many occasions when the project could have been derailed but, each time, Prof Muniyappa and the staff at the University of Agricultural Sciences, Bangalore (UASB), were extremely supportive and resourceful, ensuring that the work continued. When the non-indigenous B biotype first arrived in India and caused the collapse of tomato production in Kolar District, which supplied Bangalore with tomatoes, we were extremely worried that the ToLCV-resistant varieties we were testing would also collapse under the intense disease pressure. When this didn't happen, the relief of the farmers, project and USAB staff was clear. In fact, after this severe test, the value of the technology that we were developing became apparent to everyone, including the representatives and breeders of commercial seed companies, who attended the farmer field days.

Throughout the project, the UASB has set new precedents with regard to the project and, for example, the three ToLCV-resistant varieties were sold to 10 commercial seed companies under a non-exclusive licence to use them in the development of resistant hybrids and to market them. In addition, the National Seed project has now set up a 'revolving fund', where receipts from the sale of seeds are used to produce more seed for sale, to ensure the sustainability of seed production after project funding ends. This activity will also ensure that seed of the varieties will be available for the poorest of the tomato growers at a minimal cost.

The project is now entering a promotional and dissemination phase. Telecommunications have moved on a lot since the start of the project, when Bangalore had only a single internet café! The project now has a web site being built, which will shortly be sited within the UASB's web site under Breakthrough Research."
www.mensacomp.com//tomato

John Colvin
Natural Resources Institute

John Colvin Project leader

Our work...

Stronger tomatoes mean a better life

In the past decade, whiteflies and the plant viruses they transmit have become an increasingly important global agricultural problem. In India, the whitefly *B. tabaci* is currently the most important pest of tomatoes, causing direct damage, as well as transmitting ToLCVD. Crop losses experienced by resource-poor farmers frequently reach 100 per cent, affecting both household food security and income from tomato sales.

The pest management practice favoured by farmers in south India has been to spray cocktails of insecticides in an attempt to kill the whitefly, a carrier of disease, with harmful effects on human health, the environment and farmers' income. Women are involved in weeding and harvesting the crop and they in particular are exposed to high levels of insecticides. This situation has been exacerbated by the recent discovery in India of an insecticide-resistant strain of *B. tabaci*, the B-biotype, by scientists from the Natural Resources Institute, University of Greenwich, and the UASB. The B-biotype has already caused failure of the tomato crop in an important vegetable growing area near Bangalore.

In order to combat this threat to the livelihoods of poor people in south India, scientists funded by DFID's Crop Protection Programme and the Asian Vegetable Research and Development Centre developed high-yielding tomato varieties with strong resistance to ToLCVD. These varieties performed extremely well in trials where insecticides were not used. There is enormous demand for these tomato varieties, particularly by the poorest farmers, because they allow farmers to produce their own seed for the next season's crop. The varieties were tested at other locations in Karnataka State and – provided they continue to perform strongly – will be promoted officially through the UASB and local NGOs. It is also likely that the varieties will be suitable for cultivation in other parts of India. Ultimately, there will be benefits for other regions where *B. tabaci* and ToLCVD cause serious losses: North Africa, the Middle East, the Caribbean and Central / South America.

Research-farmer interaction

Tomato farmers

Farmers in the field

R8247: Promotion and impact assessment of tomato leaf curl virus disease resistant tomatoes: phase III of sustainable management and molecular characterisation of *Bemisia tabaci* and tomato leaf curl virus (ToLCV) on tomato in India

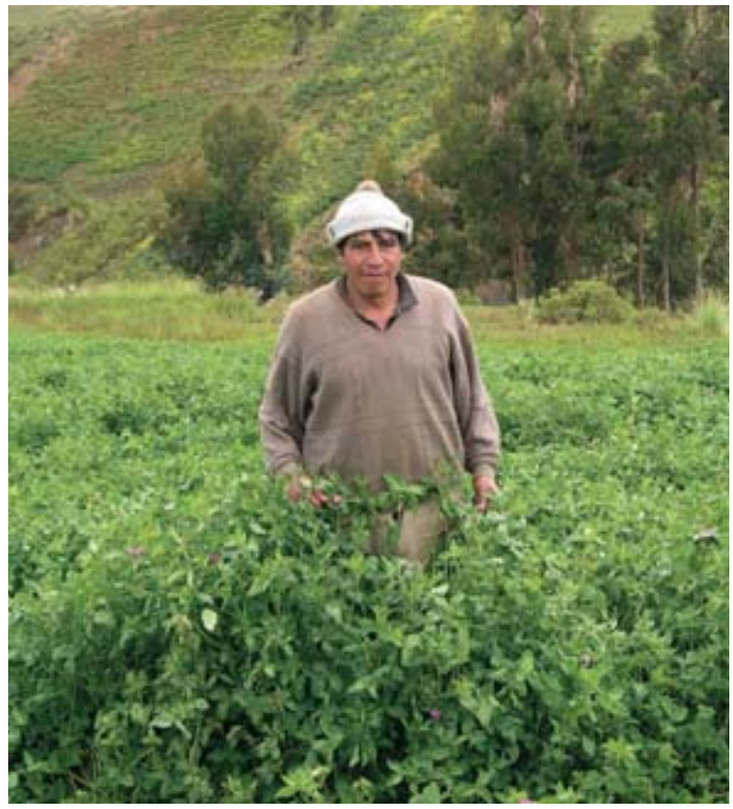
Funded by: DFID Crop Protection Programme
Project leader: John Colvin, Natural Resources Institute
Photos: Kerry Albright

BOLIVIA

14 INNOVA

Did you know...?

- Bolivia, named after the liberator Simon Bolivar, broke away from Spanish rule in 1825, and was previously known as 'Upper Peru'.
- Bolivia is the poorest country in South America – over 60 per cent of the Bolivian population lives under the national poverty line. According to the Human Development Report, it ranks at number 114 among 174 countries (http://hdr.undp.org/).
- Bolivia and Peru were one of the cradles of agriculture – the potato, cotton, peanut, quinoa and various 'forgotten' crops were domesticated here, besides the llama and the alpaca.
- Bolivia stretches from the spine of the Andes to the Amazonian lowlands. It is one third the size of India, with 9 million people. It is one of the most indigenous countries in the Americas; about half of the people still speak one of the native languages, especially Quechua or Aymara.
- Bolivia is landlocked, but shares Lake Titicaca, the world's highest navigable lake (elevation 3805m), with Peru.
- Agriculture accounts for 15 per cent of Gross Domestic Product. Forty per cent of the population live in rural areas.
- The potato is the staple food of many people, especially the poor and the smallholder farmers in the highlands. It is their main crop.



Nelson Vallejos shows off his purple clover. The plants grow close together and choke the weeds.

Behind the scenes...

Half-baked is better than raw

"Satisfying smallholders' demand for innovations is not like taking an order in a restaurant. The demand for new technology is not always something that researchers and farmers can chat about in the abstract. We studied the farming system. We talked to the people. We organised groups. We did participatory trials. Even so, the demand came out little by little, with experience."

André Devaux
CIP, Peru

Potato is the main crop of the poor. For several years after the harvest, people plant maize, native tubers, beans, and then, when the weeds have built up and the soil fertility has declined so that little else will grow, they plant oats or barley, and then leave land fallow for a few years. Cows and sheep eat the oats, barley and even the weeds growing in the fallow. So, at INNOVA, we thought that planting a forage crop in fallow potato fields would improve the soil while feeding the livestock; it seemed an appropriate response to demand. The goal was to help ease poverty by improving potato cultivation by introducing what used to be called 'appropriate technology'. INNOVA had several dozen half-finished technologies, which had been researched by earlier DFID projects with national research partners in Bolivia. We wanted to finish these technologies, but specifically in response to farmer demand. So, we went back to our pilot communities, one in the high, arid Altiplano of La Paz, a Quechua-speaking one in the high Andean valleys, and a Spanish-speaking town in the low valleys, and asked them what they wanted. They said they wanted more fodder for their sheep and cows.

Purple clover (*Trifolium pratense*) is hardier and larger than regular clover, but it takes a while to establish. Then it forms a dense, deep carpet that may live for 15 years. It is a forage crop (for fodder) and it prevents soil erosion. A farmer, Nelson Vallejos, planted oats with purple clover which he had bought at an INNOVA meeting. His neighbours were sceptical; the clover plants were small, and people doubted that they would survive the winter.

Two years later, in February 2005, Nelson was happy with the clover. "We cut it four times a year, not twice, as with alfalfa." He added, "The cows that eat purple clover give a whole bucket of milk, 10 litres, but when they don't eat it they only give half a bucket".
We learned that collecting demand is difficult, mostly because the farming systems are complex and highly evolved. Anything new must be wedged into farms that are already full of crops, animals, and competing demands on people's time. There is no magic formula for measuring demand and then satisfying it. Perhaps the best way is to take half-baked ideas out to communities, and finish them there.

Source: Jeffery Bentley, Claudio Velasco, André Devaux, Graham Thiele, Salomón Pérez, Fredy Almendras and Félix Rodríguez
www.innovabolivia.org

André Devaux Project leader

Llamas in Sankayani village, near Cochabamba

Farmer surveys his field

Different potato varieties

Old-style next to an improved plough - farmers expressed a demand for this technology innovation

Our work...

Bolivian networks

INNOVA has piloted a different approach to the funding and management of agricultural research. While INNOVA was designed to fit the Bolivian context, valuable lessons and results can be applied elsewhere. INNOVA works across the disciplines of crop protection, crop post-harvest and livestock production and it responds explicitly to demands for technology innovation by poor farmers. It is driven by local agendas and priorities and it links production-related research with the need to give poor farmers better access to markets. INNOVA has combined analytical and institutional concerns, linking technology supply and demand, which is unique.

Innovative design

INNOVA built on previous agricultural research and development work in Bolivia and takes forward previous renewable natural resources results in a series of activities whereby 'demand' by poor armers for technology innovation is confronted with the research 'supply', on an ongoing basis. The project focuses on a range of problems affecting smallholders in mid-Andean valleys, including pest, disease and weed control, soil erosion, declining soil fertility, lack of fodder and labour shortages.

Project success

One of the important achievements has been to bring three research and development organisations together to work on a common agenda. In the past, each organisation was engaged in promoting technological innovation, but worked in relative isolation. The project has been developing during a period of extreme political and institutional instability in Bolivia, which make the achievements all the more noteworthy.

R8182: Strengthening technical innovation systems in potato-based agriculture in Bolivia
Funded by: DFID Crop Protection, Livestock Production and Crop Post Harvest Programmes
Project leader: André Devaux, Centro Internacional de La Papa (CIP), Peru.
Project coordinator: Claudio Velasco, INNOVA
Implemented by: Centre for Research in Tropical Agriculture (CIAT) Bolivia;
Foundation for Promotion and Research of Andean Products (PROINPA) Bolivia;
Universidad Mayor de San Simon (UMSS), Bolivia.
Managed by: Papa Andina, a regional potato development programme of the International Potato Centre (CIP)
Funded by: DFID's Crop Protection, Livestock Production and Crop Post Harvest programmes.
Photos: André Devaux and Benedikte Siderman-Wolter

BHUTAN

16 Renewable Natural Resources-Extension Support Project

Did you know...?

- The department of tourism pursues a policy of 'low volume, high quality'. Fewer than 8000 people were granted visas to enter the country in 2000. The cost of a tourist visa is approximately $200 per day.
- Bhutan is roughly the size of Switzerland and about half the size of Indiana.
- Forests make up 72.5 per cent of the total area of Bhutan.
- The Bhutanese name for Bhutan, Druk Yul, means 'Land of the thunder dragon". The people are known as the Drukpas. English is taught in schools and it is used as the official working language, but national leaders advocate the use of Dzongkha, Bhutan's national language.
- Bhutan first broadcast national TV in 1999, making it one of the last in the world to have television.
- King Wangchuck declared that Gross National Happiness is more important than Gross National Product. The King is married to four sisters.
- Bhutanese police have the power to detain nationals who are not wearing traditional dress.
- Smoking has been outlawed in public and tobacco sales have been banned.

Extensions specialists at the RNR-ESP office, Thimphu, Bhutan

A local Thimphu mother, wearing the traditional kira, and her child

Behind the scenes...

Gross Personal Happiness!

"The most personal satisfaction I have had from working in Bhutan has been from working with committed staff at Dzongkhag (District) level to provide new ideas and different ways of working, helping them to improve their skills and develop small projects with farmers that allow them to develop their confidence and abilities.

The biggest contribution of RNR-ESP (Renewable Natural Resources Extension Support Project) will be in initiating, and being part of, systems and procedural initiatives that have already formed the standards for implementing RNR policy and laws of Bhutan. For example, contributing to the design, development and institutionalisation of a policy for sustainable use of two-wheeler motorbikes to allow extension agents to meet with and assist a greater number of farmers.

What I will miss the most are the welcoming smiles and reverence for all living beings and nature that most Bhutanese villagers have. This is, despite having to make a living from one of the most rugged and diverse landscapes on earth and, perhaps, because of their religious and cultural independence. And of course, the enjoyment that I get from walking through this wonderful landscape meeting people, even though the altitude and slopes does my head and knees serious damage!"

Euclid D'Souza
NR International
team specialist

Our work...

Bhutan and Development

Situated in the eastern Himalayas between India and Tibet, with a population of about 600,000, Bhutan is a landlocked country endowed with an unusually rich natural heritage. It has been identified as one of the 10 global bio-diversity 'hotspots'.

Development in Bhutan started in the beginning of the 1960s with the construction of the first national highway connecting Phuentsholing, a town on the southern border of India, with the country's capital, Thimphu. Development started during the rule of the late Third King and was accelerated when His Majesty Jigme Singye Wangchuck ascended the throne. Development has been tempered by the concept of Gross National Happiness (GNH), rather than Gross Domestic Product. The concept of GNH gives direction to the Kingdom's five major developmental aspirations: human resource development; conservation and promotion of culture and heritage; sustainable and equitable socio-economic development; good governance; and environmental conservation.

EU support for Bhutan

Two-thirds of the population is dependent on Renewable Natural Resources (RNR) use for their livelihoods. Therefore, it was natural that the European Union's (EU) assistance to Bhutan, which began in 1982 through the European Commission (EC), should give priority to the RNR sector. EC assistance to Bhutan over the two decades until 2002 has totalled €46 million. Some €15 million has been allocated for the 9th Five Year Plan period (9th FYP), ending in 2007. The emphasis of the EU assistance during the 9th FYP will be in the area of environmentally sustainable growth.

The aim of this project is to establish a more effective and efficient RNR extension service at field, district and central levels, in order to better satisfy the needs of farmers. The project team works with the Royal Government of Bhutan, strengthening their capacity to deliver extension services to the rural poor in isolated and mountainous environments. Efforts have focused on: technology and information; delivery of extension; extension management; information and communications. During the life of the project, the Government has gone through a major restructuring and the NR International team has played an important advisory and facilitating role.

The spectacular Tiger's Nest monastery outside Paro in Bhutan

Bhutan renewable natural resources extension support project (RNR-ESP), Bhutan
Funded by: EC . **Team specialist:** Euclid D'Souza
Managed by: NR International . **Implemented by:** Ministry of Agriculture, Bhutan
Photos: Benedikte Siderman-Wolter

UGANDA

18 Promotion of improved IPM practices for banana diseases and pests in Uganda

Did you know...?

- Banana occupies 30–40 per cent of all agricultural land under crops in the Great Lakes region of East and Central Africa where it is the staple food for more than 20 million people.
- Uganda is one of the largest producers of bananas in the world, producing about 10 million tonnes annually, but little is destined for export because it is a major staple food crop for over seven million people. It is commonly eaten as a cooked starchy vegetable known as matooke.
- Average annual consumption per person is about 350 kg which means that many people may eat 1 kg every day. However not all of the fruit is cooked as it can also be made into drinks which provides extra income for farmers. Banana juice is produced on farm, and even a spirit, and is a cause for a social occasion.
- Despite the cultural traditions associated with the use of bananas, the crop is not native to Africa and probably arrived on the continent around the year 1000 having been brought by traders from India or South East Asia where the crop originates.
- Given its importance in Uganda, researchers at the Ugandan National Banana Research Programme (NBRP) , are continually monitoring threats and opportunities to banana crops. They are currently sensitising farmers about the recent threat of a new strain of bacterial wilt which threatens to devastate the crop.

Behind the scenes...

"The experience gained and friendships moulded during our periods of study in the UK have been the foundations of our careers; giving us the confidence to tackle difficult technical and managerial issues."

W.Tushemereirwe and **Josephine Namaganda** reflecting on their career development, are two of the seven scientists from the Banana Programme working on CPP projects who have completed PhD studies in the UK during the last 10 years.

Bananas for a cow

"To explain the tangible difference better bananas can make to farmers' lives, I'll give you the example of Mr and Mrs Umaru Lubega, from Luwero District, Uganda. They have recently bought a cow, a bicycle and a mobile phone and attribute their ability to buy these from the additional income they are now receiving from their banana crop. Mr Lubega has been harvesting 30 kg bunches of fruit from his mulched plots, twice the size of the fruit from the disease-susceptible varieties. What is more, the Lubegas are confident that now they have access to transport, up-to-date communication and a better income, they are well positioned to break the cycle of poverty."

Simon Gowen
University of Reading

UNBRP scientist viewing bunch of the new disease resistant variety Kabana 3 (FHIA 17)

Matooke variety of banana

Village banana group, Bamunanika, Luwero district

Researchers in the field

Our work...

Going bananas

The Luwero District of Uganda is a traditional banana cropping area although production has steadily declined over recent years, largely because of the damage caused by leaf diseases, nematodes (microscopic worms) and weevils, which have become established in the district.

Since 1995 the DFID Crop Protection Programme has been actively involved with the priority issues identified by the National Agricultural Research Organisation, Uganda, and addressed through the Uganda NBRP.

These priorities were:

- Diagnosis of diseases.
- Nematode control using tissue cultures.
- Biocontrol (without the use of pesticides) of weevils: the fungus Beauveria bassiana can be used as an effective control agent.
- Banana streak virus: how infection can cause significant yield loss.
- Validation and promotion of crop management practices and new, disease resistant, cultivars - the use of which has given bunches weighing 33 kg for the variety *FHIA 17*, compared with 16 kg for local variety *Mbwazirume*.
- Capacity building with PhD studies.
- Data management.

The main impact of results from the CPP projects has been in the introduction, to farmers, of disease-resistant varieties of banana; demonstrating the benefits, in terms of pest and crop management, of using a mulch; and demonstrating the benefits of planting pest-free tissue culture-produced planting material. The new varieties have resistance to fungal diseases and tolerance to nematodes. Partnerships with major NGOs have enabled the outputs from these CPP banana projects to be promoted to 15,000 farmers in the central region

Ugandan and British-based collaborators meeting at the university of Reading, January 2003

R8342: Promotion of improved IPM practices for banana diseases and pests in Uganda
Funded by: DFID Crop Protection Programme
Project leaders: Simon Gowen, University of Reading, and Mike Rutherford, CABI Bioscience
Photos: Simon Gowen, Uganda National Banana Research Programme, Barbara Pembroke

INDIA, KENYA, BOLIVIA

20 The Livestock Guru

Did you know...?

- Today 1.2 billion people in the world are living in extreme poverty subsisting on less than $1 per day. For 70 per cent of the poor, livestock represent an important livelihood asset.
- Livestock are important for urban as well as rural populations. However, livestock-based livelihoods are often insecure due to easily solved or treated livestock production and health problems.
- A wide-scale study on three continents found that the primary way the poor obtain information regarding livestock production and health was via friends and family.
- The study also showed that poor households prioritised knowledge regarding the management and health of livestock as one of their greatest needs.
- Traditionally, information within development was transferred via an extension officer, or printed media or the radio. Today, more dynamic means such as information communication technologies (ICTs) and the World Wide Web are being explored.
- To be effective, development practitioners must understand how the poor learn. When we learn, we can process only a minute proportion of the information or 'data' in our environment which the brain filters and selects, to understand the world.
- There is evidence to suggest that memory is greater for pictures than for words and research has shown that concrete objects can more easily be remembered than abstract concepts.
- Illiterate people have different needs with regard to knowledge transfer than those with even one or two years of formal education.

School in Kibeira, a slum area in Nairobi

The Guru appeals to young and old

Behind the scenes...

The Livestock Guru: fighting poverty with knowledge

"For the global community of the poor, access to information, and the subsequent knowledge derived, is one of the largest barriers to success in their fight for livelihood security. However, the ability of the poor to both uptake and adapt new information systems and technologies is often underestimated by development agencies. Recent studies have demonstrated that in many countries the poor are both aware of and desire greater engagement in, the IT revolution. Indeed, India is one example of how, if given appropriate access, new technologies can have a tremendous impact on the lives and livelihoods of the poor. Equally, in Africa, studies have shown that ICT training initiatives have high uptake and interest by stakeholders. For example, in Kenya, ICTs were virtually unknown prior to 1992. The rapid expansion of the internet has put ICTs on the agenda.

The aim of our project has been to build effective tools for knowledge transfer to increase the capacity of the poor to engage in the IT revolution and enhance the sustainability of livestock-based livelihoods."

Claire Heffernan
University of Reading

Our work...

A trilingual guru

The Livestock Guru is a multi-media, action-learning software program developed specifically for the poor. It has been developed in Kenya, India and Bolivia. As such, four different versions of the programme have been created: Tamil, Oriya, Spanish and Swahili and an Aymara (indigenous Bolivian) language version is under development. The software is delivered via touch-screen kiosks to farmers making the need for any prior knowledge or use of computers unnecessary. It has proved extremely popular with both adults and children. There has also been a huge demand by in-country institutions and agencies.

This study has shown that, rather than simply being receptors of knowledge, the poor are active consumers of information which they view to be of quality and relevance.

Knowledge goes interactive

Traditionally in development, most of the emphasis has been given to developing appropriate messages when transferring information to the poor. This project, however, has demonstrated that the form of knowledge is equally important. The research tested a variety of formats such as video, written material and multi-media tools under various conditions, individually and in groups. The team found that learning was enhanced with increasing levels of interactivity.

Fight poverty with knowledge

The poor are not the only stakeholders who require accurate and timely information. The Livestock Guru enables the demands of farmers for information to be measured and transmitted directly to decision makers.

The Livestock Guru is part of the National Virtual Academy Project in India. The project initiated by the MS Swaminathan Foundation aims to network 600,000 villages (the entire country!) by 2015. The Guru is placed in two satellite or hub centres for the project in Tamil Nadu with a roll out to further centres planned this year. The National Virtual Academy was officially opened by the Prime Minister of India in October 2004.

Bolivian farmers, Tiwanaka

Children use the Guru and show their parents

Lifelong learning
"My name is Valliyammal. I am from Mannadipet and I have two cows. I come to the cooperative to sell my milk and I came to know about the computer programme. By using the programme I learnt about mastitis and that will be very helpful for me. I never had any training and now I would like to learn more."

ZC0262: The Livestock Guru – Bolivia, Kenya, India
Funded by: DFID Livestock Production Programme
Project leader: Claire Heffernan, University of Reading
Photos: Claire Heffernan

KENYA

22 KENDAT (Kenya Network for Draught Animal Technology)

Did you know...?

- In Kenya, donkeys are the second most common draught animals, numbering over 540,000, and play an important role in supporting poor communities. People rely on them for essential transport services – moving crops from farms to homesteads or to markets, transporting fuelwood, water, building materials, etc.
- In some rural communities especially around the Lake Victoria region, a donkey is used as a night guard to keep vigil at night. Donkeys have been reported to have chased robbers attempting to break into homes! Some cultures in western Kenya accord full burial rights to a donkey as their way of recognising her as a faithful worker.
- Some communities claim that donkey milk has curative powers but this is not yet documented by research. Some of our people, like the Samburu of northern Kenya consider the donkey a delicacy which is reserved for special occasions like bride price negotiations and visits from honoured guests.
- Donkeys suffer from few parasitic diseases and have strong resistance to those they are susceptible to. Most of the health problems that donkeys suffer from arise from human abuse.
- Despite the large contribution that donkeys make to poor rural and peri-urban households, the social value of this animal remains low. Most people in Kenya consider donkeys 'taboo' animals and even users regard themselves as lowly. This low prestige results in the animal having a low priority when it comes to allocation of household resources to improve its welfare.

Donkeys at market

Donkeys with milk churns

Behind the scenes...

The donkey's tale

Donkeys in Kenya are often worked for long hours without food or water. The most common traditional harnesses are 'necklaces' made of rubber tubes and wooden saddles with little or no padding. These rub against and chafe the skin causing sores and lesions. They are often overloaded and caned repeatedly, because their owners view them as having no feelings, and there is very little awareness of animal welfare. They therefore tend to end up underfed and carrying injuries from maltreatment.

In order to improve their lot, messages about the welfare and management of donkeys needed to reach those who own them, or use them, especially teenage donkey drivers. These are the Kenyan equivalent of "boy racers" – showing off to girls by driving their animals as fast as possible up mountain slopes. This often results in crashes and injury for the donkey. These young men have little or no education, and their main source of entertainment is the radio, which they regard as an authority and trendsetter.

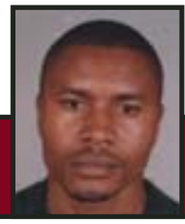
Lessons from human health initiatives, such as in the control of HIV/AIDS, have shown that a multimedia approach works best at raising awareness of the problems and gradually changing human behaviour.

So, KENDAT (Kenya Network for Draught Animal Technology) set up a pilot radio project funded by Brooke Hospital for Animals (BHA), the Society for Protection of Animals Abroad (SPANA) and DFID's Livestock Production Programme (LPP). The approach was to make it 'cool' to treat your donkey well and to make economic sense, by giving practical advice on treating the donkeys better in order to make them perform better and live longer. Keen to sustain their incomes and impress their teenage girl peers, drivers responded positively by treating their donkeys better.

There is evidence that the popular FM radio stations used have had a significant effect on their behaviour. Many letters from listeners have either requested extensions, or nationwide coverage for the programme.

This is an extract from an article in DFID's Developments magazine:
Ground Breaking Research: Why scientific research is so important to the livelihoods of farmers in the developing world. Issue 23. Third quarter 2003.

Pascal Kaumbutho
and Fred Ochieng Project leaders



Our work...

Donkey know-how

The theory behind KENDAT's donkey projects is that, if you improve knowledge and awareness of good practice in donkey handling, you increase the health and useful length of a working donkey – ultimately improving livelihoods, a positive benefit to owners and handlers. LPP has been commissioning research on DAP since 1976. Research has focused on: the nutrient requirements of various draught and pack animals; optimal harnessing for efficiency and comfort; new DAP implements particularly for cultivation and weeding; animal welfare etc. Many of the products of the research have been promoted by intermediary institutions like extension services (which help link researchers' results to farmers) and non governmental organisations (NGOs) and adopted by poorer farmers. However, much useful information remains 'on the shelf'. Therefore, LPP has commissioned KENDAT to put together a toolbox of DAP tools, enabling those who advise resource-poor farmers to have access to all available research findings in one place. The DAP toolbox will be field tested shortly; and those who wish to participate should contact the LPP Programme Manager (details listed at the end of this book).

The Equus asinus asinus *or domestic donkey*

ZC0235: Design of production of radio message and programmes to improve donkey use, welfare and environment for transport and tillage in rural communities.
ZC0204: Development of a draught animal toolbox (Kenya, Tanzania, Uganda, Ethiopia)
Funded by: DFID Livestock Production Programme . **Project leaders:** Pascal Kaumbutho and Fred Ochieng, KENDAT, Kenya . **Photos:** Dave Smith and stock library image

SOUTH AFRICA

24 Information Core for Southern African Migrant Pests (ICOSAMP) PROJECT

Did you know...?

- The Southern African Development Coordination Conference (SADCC) was formed in Lusaka, Zambia, on 1 April 1980 – it is now known as the Southern African Development Community (SADC).
- Current member states are Angola, Botswana, Democratic Republic of Congo (DRC), Lesotho, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe.
- The Southern SADC Treaty is a legally binding and all-encompassing framework by which countries of the region coordinate, harmonise and rationalise their policies and strategies for sustainable development in all areas of human endeavour.
- It is estimated that the agricultural activities of nearly 123 million people in the SADC region (about 67 per cent of the population), are threatened by migrant pests.
- ICOSAMP (Information Core for Southern African Migrant Pests) provides an up-to-date picture of migrant pest activity in the region through monthly bulletins and via its website hosted by EcoPort (http://icosamp.ecoport.org). The bulletins are sent to IPMnet News (with a readership of nearly 5000 in at least 128 countries), to the United States Agency for International Development for inclusion in their email bulletins, and posted on the South African National Department of Agriculture website (www.agis.agric.za).
- In one of the local provinces where entomological research was carried out in South Africa, researchers came across an interesting traditional belief. Locals believe that the Mopane worm, a popular traditional food product, when going into the ground to pupate, is actually returning to its ancestors. They were unable to see the link in the life-cycle between the worm and the later emerging moth – vital for the survival of the species – and therefore saw nothing wrong in harvesting as many worms as possible.

African armyworm
Spodoptera Exempta

Brown Locust
Locustana Pardalina

Behind the scenes...

Strength in numbers

"The best thing for me about working on this project has been the wonderful working relationship that has built up over the last four years between myself and the SADC team.

The biggest contribution of our project has been twofold, strengthening national capacity and establishing a SADC regional early warning system for migrant pests. There have been various project highlights, but the one that stands out from the rest, is the workshop we held in conjunction with the annual South African Entomological Society Congress held in Pretoria, July 2003. ICOSAMP collaborators were thrilled with the opportunity of mingling and interacting with scientists from South Africa as well as international researchers."

Margaret Keiser
Plant Protection Research Institute

Red-billed Quelea (Quelea quelea)

Our work...

Uniting the Nations

Regular outbreaks of migrant pests such as African armyworm, four species of locust, and red-billed quelea birds often occur in the SADC region. These highly mobile pests readily cross political boundaries, making active management and cooperation between neighbouring countries vitally important. To manage or control an outbreak – before it becomes a serious problem – it is necessary to determine its current status, distribution, and scale of infestation. This is especially true in the case of armyworm where its sudden appearance, rapid development and disappearance necessitate quick action. Where more than one country is at risk from the outbreak, communication between control organisations is imperative.

An exciting collaborative project between the Plant Protection Research Institute of the Agricultural Research Council in South Africa, and the Natural Resources Institute in the UK was initiated in January 2001. This project, funded by the DFID Crop Protection Programme, assists decision makers in the SADC with essential tools to improve migrant pest forecasting, and to implement timely control strategies.

ICOSAMP is a collaborative network of southern African migrant pests officers and is gaining international recognition. Modern computer technology and mapping software (such as the geographical information system, or GIS) is used to ensure detailed and timely reports are received, monthly bulletins are distributed, and the website is maintained.

SADC collaborators have recently received equipment and undergone training on their specifically designed country systems.

ICOSAMP contributes to cross-border communication and cooperation and has established itself as an internationally recognised forum for the status and distribution of migrant pests in the SADC region. Regional cooperation means that migrant pest information is now exchanged throughout southern Africa and pest problems are being controlled, saving money and reducing the potentially devastating impact of these pests.

R8315: Establishment of an 'Information Core for Southern African Migrant Pests' (ICOSAMP)
Funded by: DFID Crop Protection Programme
Project leader: Margaret Kieser, Plant Protection Research Institute, South Africa . **Photos:** Margaret Keiser, Robert Cheke and Judith Pender

BANGLADESH

26 Fish distribution in coastal communities

Did you know...?

- Bangladesh means the land of the Bengalis.
- Civilisation has existed in the region for 4000 years, although the Republic of Bangladesh was only established in 1971.
- Farms are small as traditionally, on the father's death, the land is divided between the sons.
- People have large families: infant mortality rate is high and children are seen as part of the family economic unit and as carers for their parents in old age. Therefore, there is a reluctance to restrict their number.
- Average life expectancy in Bangladesh is about 58 years.
- The 1970 cyclone killed over 500,000 people. In 1998 floods devastated two-thirds of the country. On 26 December 2004, an earthquake under the sea near Aceh in north Indonesia (8.9 on the Richter scale) produced the tsunami causing flooding and destruction in Bangladesh (and Sri Lanka, Thailand, Indonesia etc).
- Bangladeshi soil is among the most fertile in the world because it is regularly enriched by the mud deposited by the floods.
- If global warming brings about climatic change, sea levels could rise by up to a metre, and low-lying countries such as Bangladesh could find much of their territory submerged. Bangladesh has a number of archaeological and historical sites dating back as far as the third century BC, but the frequent floods and the damp climate have destroyed much of the country's heritage.
- The President of Bangladesh is Professor Dr Iajuddin Ahmed and the Prime Minister is Khaleda Zia. Ms Zia was the first female prime minister in Bangladesh and is the widow of former President Ziaur Rahman, who was assassinated in a coup attempt in 1981.

Sources:
www.worldinfozone.com/facts.php?country=Bangladesh
www.news.bbc.co.uk/1/hi/world/south_asia/country_profiles/1160598.stm#leaders
www.bangladesh.gov.bd/

Behind the scenes...

A better life for fisherfolk

"Aside from city states such as Singapore, Bangladesh has the highest population density in the world, with just under 150 million people occupying 56,000 square miles. This is reflected in intense competition for resources. In particular, open access natural resources such as coastal fisheries represent a last resort for many poor people. At the same time, this also leads to overexploitation of these resources. Although preservation and handling methods could be improved, very little fish is wasted in the marketing chain. In fact, fish sold at discounted prices because it is not very fresh is often bought by poor consumers who find it difficult to afford higher value fresh fish.

Due to population density and scarcity of resources there are a lot of poor people living in coastal areas of Bangladesh. I hope that the policy recommendations produced as part of this project will make a real impact for their benefit."

Ulrich Kleih
Natural Resources Institute

Poor sharks!

Fishing boats

Ulrich Kleih Project leader

Our work...
Fish for life

Access to fish is the traditional livelihoods asset of households in coastal fishing communities in Bangladesh. This asset is complemented by gear such as boats and nets. Other assets include land and means of agricultural production, transport, health, education and financial resources in the form of savings, cash, or credit.

Factors that contribute to poverty in the communities include, declining fish catches, lack of security (mainly due to piracy in the fishing grounds), natural disasters such as cyclones or floods, lack of capital, lack of employment opportunities and education/skills, and poor health. Both fishermen and traders see declining fish supplies and piracy in the sea and on the rivers as their main problems. Where catches will decline beyond a certain level, this may well lead to uncompetitive situations to the extent that traders and moneylenders will pull out of affected locations. This may well result in a less efficient marketing system in that trading competition will decrease.

Fish processing

Globalisation, livelihoods and credit issues

This project has provided an improved understanding of the trading and credit system, and its impact on poverty in coastal fishing communities. Amongst other things, this was achieved through the development of a 'methodology' that integrates market and credit analysis techniques with the sustainable livelihoods approach. The latter is the approach to development concentrating on peoples' strengths, rather than weaknesses, with an understanding that the poor's vulnerability is shaped by policies, institutions and other external factors, beyond their control. The project examined a range of constraints identified by stakeholders, and developed appropriate policy recommendations. Together with another DFID Post-Harvest Fisheries Research Programme project implemented in South Asia, it has been successfully integrated into a *Guide to the Analysis of Fish Marketing Systems* that provides the main elements which need to be considered when analysing a fish marketing chain from a livelihoods perspective. Recommendations arising from the project are primarily aimed at decision makers in the Government, the donor community, NGOs and the private sector.

Life on the beach

R7969: Fish distribution from coastal communities in Bangladesh – market and credit access issues
Funded by: DFID Post Harvest Fisheries Programme . **Project leader:** Ulrich Kleih, Natural Resources Institute
Project partners: Natural Resources Institute, Community Development Centre (CODEC), and the University of Chittagong, Bangladesh . **Photos:** CODEC

UGANDA

28 Draft Animal Power

Ms Akudi's house and donkey

Head-loading women

Did you know...?

- The use of oxen as draught animals has been common in north-eastern Uganda since the colonial period.
- The number of oxen has been severely depleted during the last two decades due to prolonged periods of insurgency and cattle rustling and, currently, restocking efforts are ongoing to increase the number of cattle.
- Donkeys have been preferred by farmers in areas prone to cattle rustling since they are less likely to be stolen.
- Farmer Groups, in Iganga, asked to describe how their daily lives had changed since they had owned their donkey or ox-carts, listed 12 differences, the main ones being: time saving; reduced workload; better health; easier bulk transport; and more income generating opportunities.

  (Source: D O'Neill (2004), Project report on ergonomics considerations)
- Donkeys have a negative image in most parts of Uganda (except in those districts close to the border with Kenya). The animals are said to be difficult to manage and of little value. Only substantial amounts of sensitisation and training by the local project partners has led to changes in attitudes of farmers and other stakeholders.

Behind the scenes...

"When visiting villages in Uganda, it is striking to what extent crops and other loads are carried by people on the head or back. In particular, women are responsible for the bulk of the burden in that they often also have to carry a young child. In mountainous parts of the country such as the hills of Kasese District, farmers simply don't have options other than the use of donkeys as pack animals.

Farmers often told the research team how useful the newly introduced means of transportation were for them. As a researcher, such statements make it all worthwhile. At the same time, I hope that the research results are taken up beyond the immediate reach of the project."

Ulrich Kleih
Natural Resources Institute

My head-loading days are over!

Before the project, Betty Akudi used to 'head-load', carrying 10 jerrycans (or 200 litres) of water every day from the well to her home. With a large family to support, she would sometimes make five return trips of 2 km while her children were at school. At times, she produced a local gin, waragi, to sell which required another 200 litres – regularly she carried head-loads of cassava weighing 30–40 kg. During harvest season, it was common for her to walk the 1 km between her plot and home up to six times a day. Now, as part of a farmers' group, she has access to three donkeys and a cart, which means she can transport everything in one go. She also has more time to rest and, where she previously complained of head and backaches, she feels much healthier now.

Betty belongs to a farmers' group with 10 members. They own two donkeys, a foal and a cart, and she is the donkeys' caretaker. As part of the risk/cost sharing arrangement of the project, the group had to pay 60 per cent of the USh96,000 cost of the cart (£1 = 3100 Ugandan shillings). She charges farmers, who are not group members, to hire the donkey cart. She has earned about USh70,000 net over a six-month period. Any money remaining after bills is used for domestic purposes.

Ulrich Kleih Project leader

Our work...

Improving the road to market

Greater mobility for farmers increases their access to markets and market price, leading, in turn, to increased production, less dependency on agricultural traders, and improved income. This action research (learning by doing) project adopted the 'innovation systems' approach, outlined by the DFID Crop Post-Harvest Programme. Instead of a traditional transfer of knowledge from the research organisation to passive farmers, this system recognises that anyone touched by the research process will affect its outcome and that the role they play may change over time.

Human porterage is the main mode of transport in the villages of the three project districts, Iganga, Kasese and Katakwi and women bear the bulk of the burden (on their heads or backs) when it comes to transport of crops to and from markets and collection of water or firewood. As in most parts of Uganda, bicycles are the main intermediate means of transport (IMTs). In the villages surveyed, there was no ownership of donkeys, donkey carts, tractors, trailers, cars or pick up trucks. Any physical assets are owned predominantly by men, whilst ownership by women is only prevalent in areas with a higher number of female-headed households.

Payment in foal!

Participants of the Golden Milestone Workshop formulated a research action plan for the introduction of the IMTs in the three districts. The key principles were: IMTs introduced would be donkeys as draught and pack animals; the project would cover 40 per cent of the cost of IMT introduction; mostly pregnant female donkeys would be purchased for the project with one or two males placed in each sub-county to promote sustainability through breeding; poor farmers unable to pay cash could pass on the first foal to another farmer, in lieu of payment. The Kasese farmers described how donkeys were taking the domestic transport burden away from women and children, and were making markets more accessible to the community than roads ever have.

Policy impact

Successes of this project include: improved cart design; communication between participants; project partners taking ownership of the welfare of the animals; sustaining the donkey population established by the project; and Local Government taking up the research findings and budgeting for future IMT distribution to farmers.

Donkey carrying water, Kasese

Kasese landscape

R8114: Improved food crop marketing through appropriate transport for poor farmers in Uganda
Funded by: DFID Crop Post Harvest Programme
Project leaders: Ulrich Kleih, Natural Resources Institute, Charles Kaira, Uganda Transport Forum Group
Photos: Ulrich Kleih, Dave O'Neill, Peter Owor

MEXICO AND BOLIVIA

30 Commercialisation of non-timber forest products in Mexico and Bolivia: factors influencing success (CEPFOR)

Did you know...?

- 70 per cent of Bolivia's population, some 5.9 million, live on less than $2 dollars a day and almost all the rural population is poor (Bolivia Poverty Reduction Strategy Paper, 2001).
- Bolivia is losing forest cover at a rate of 2,000 square kilometres each year –the 2nd highest annual rate of deforestation in South America (FAO 1997). Mexico has lost more than half of its forest cover over the last 50 years, and currently loses 2,300 square kilometres every year (World Bank, 1995, report 13114).
- Only 1 in 2 people have access to sanitation.
- 26 per cent of Mexico's population, or 11.5 million people, live on less than $2 dollars a day (Earthtrends.wri.org.povlinks/country/mexico.cfm).
- 18 million Mexicans live in forests and wild lands (World Bank, 1995, report 13114).
- 10 per cent of all known species on this planet live in Mexico making it the fourth most diverse country in the world (World Bank, 1995, report 13114).

Behind the scenes...

A latin love affair

I first stepped off a plane in Mexico City when I was 21. It took much less than the 15 month stay to realise that Mexico had left an impression on me that would last a lifetime and motivate me to explore Latin America, ending up in Bolivia. Working with the rural poor in Mexico and Bolivia had its inevitable challenges, tough times and frustrations, but one common thread throughout it all was the amount of enthusiasm, hope and resourcefulness that many individuals along the way possessed. It continues to be an inspiration and a motivation for me to work directly with communities and, indirectly, through in-country organisations, in the rural development and tropical forest conservation sector.

Elaine Marshall
UNEP World Conservation Monitoring Centre

Flying into the Amazon basin to undertake field work with cocoa and rubber communities, Bolivia

From the Amazon to the football pitch, rubber bladders for footballs, Bolivia

Interviewee farmers

Madidi National Park, Bolivia

Mexican children smiling in the sunshine

Ilimani towers above La Paz, the highest capital in the world

Our work...

Lasting legacy

CEPFOR (commercialisation of non-timber forest products in Mexico and Bolivia: factors influencing success) is a four year research project carried out in eight communities in Bolivia and ten in Mexico. It considered ten different plant non-timber forest products (NTFPs) - such as cocoa, rubber, palm fibre, mushrooms - and their communities. Products were chosen to highlight different marketing strategies and characteristics. CEPFOR was designed to address issues that had been neglected by previous research and the multi-disciplinary team involved specialists in social science, economics and environmental science. It was a collaborative venture between six partner organisations. The Latin American project partners had years of rural development experience working in some of the poorest regions of Mexico and Bolivia and their previous research had indicated that family economy and income is largely dependent on NTFPs.

Although trade in NTFPs has been widely promoted as an approach to rural development, recent research indicated that NTFP commercialisation is often not successful. In order to ensure that NTFPs fulfil their potential contribution to sustainable development, it is important to understand the reasons for success and failure, and the conditions under which NTFP commercialisation can make a positive contribution to the lives and livelihoods of the poor. Therefore, the research examined the impact of NTFP commercialisation on the poor, women and land ownership issues. Opportunities and restrictions to commercialisation of NTFPs were identified for households and communities, and market structure and function were analysed for the case study NTFPs, to identify what it was necessary to do for successful commercialisation.

Our project identified a growing need for information and tools to support the decisions being made by a wide range of stakeholders, including: local communities considering investing in the establishment of a commercial enterprise; development and conservation agencies; government agencies and NGOs that work with them; and the private sector institutions involved in trading and marketing forest products. We have designed a means of identifying what influences success at community, household and marketing chain level. We have also written a short book documenting new research methodologies and providing an in–depth analysis of how NTFP producer-to-consumer chains work.

We have also developed a "decision-support tool" and "methods manual" to help select appropriate NTFPs for sustainable development and poverty reduction. The aim is that the toolkit will guide and support the efforts of organisations working with the rural poor on NTFP commercialisation initiatives, thereby increasing the value of forests by sustainable development of NTFP resources.

R7925: Commercialisation of non-timber forest products in Mexico and Bolivia: factors influencing success (CEPFOR)
Funded by: DFID Forestry Research Programme
Project leader: Elaine Marshall, UNEP World Conservation Monitoring Centre, Cambridge, UK

CEPFOR Partners: The UNEP World Conservation Monitoring Centre, The Overseas Development Institute (UK), Bournemouth University (UK), and the non government organisations "CARE Bolivia", and in Mexico, "Methodus Consultora", "Grupo de Estudios Ambientales", and "Grupo Mesófilo".
Photos: Elaine Marshall

TANZANIA, KENYA AND MALAWI

32 Promotion of IPM strategies of major insect pests of *Phaseolus* beans in hillsides systems in eastern and southern Africa

Did you know...?

- Common beans are the main legume grain crop for human and animal food as well as a source of household income in eastern, central and southern Africa.
- The crop is predominantly grown by smallholder farmers in rural areas. Beans are regarded as a woman's crop – it is women who look after the crop in the fields and stores and make decisions on how much to eat, save as seed and sometimes also the quantity to sell.
- Some 40% of the total production in Africa is marketed at an annual value of US$452 million.
- The bean plant is capable of fixing atmospheric nitrogen into the soil thereby improving soil nutrient levels for subsequent crops.
- The majority of families in urban and rural areas consume beans at least once every two days. Beans form part of the traditional dishes for families in the hillside systems of the region and, in some countries like Kenya, Burundi and Rwanda, for example, the annual bean consumption per person is over 60 kg.

Behind the scenes...

It's bean amazing!

"It has been gratifying to work with these enthusiastic and determined farmers in their different groups, with bean pest management as the entry point. Do you know that smallholder farmers can unite into research groups, report their own results, catalyse the formation of new groups, and can start and run their own small village libraries? Also other stakeholders, including government ministries and other institutions, NGOs, the private sector etc., are now using the bean Integrated Pest Management (IPM) groups for planning and implementing various development activities in the target communities? Such farmers have participated in this DFID Crop Protection Programme project which has been in operation for four years at target sites in Malawi, Tanzania and Kenya. Currently, we have over 250 farmer groups in eastern, central and southern Africa. Malawi has 50 groups with 1000 farmers, Uganda has 20 with 2500 farmers, Kenya has 40 with over 4000 farmers and Tanzania 150 with more than 50,000 farmers."

Eliaineny Minja
International Centre for Tropical Agriculture (CIAT)/Selian Agricultural Research Institute

Bean farmer at a meeting

Some myths and sayings

Beans cook faster and with better taste (also no stomach gas) if bicarbonate of soda is used.

Practised by several ethnic groups in northern Tanzania

Eating beans frequently is a sign of poverty.

Most well-to-do family members in rural communities (e.g. chiefs) and urban communities (e.g. civil servants, businessmen) consider eating beans frequently instead of meat, fish, milk, etc. as a sign of poverty.

We love eating beans. They are a healthy food for our growth.

Some children in primary schools in northern Tanzania

White beans are for foreigners.

Kinshasa residents in DR Congo, and consumers in western Kenya and northern Tanzania consider that white beans are for canning and for consumption by foreigners in hotels. Hence they are sorted out and sold at higher prices than mixtures.

Eliaineny Minja Project leader

Our work...

Innovative farmers

The common bean (Phaseolus vulgaris L.) is a major source of protein and calories in the diet of poor people in eastern, central and southern Africa. Grown largely for subsistence, and mainly by women, the leaves are used as a vegetable and the beans are eaten fresh or dried, while the haulm (stems and pod shells) is fed to livestock. Insect pests and diseases are a major constraint to bean productivity causing annual losses of 430,000 tonnes in eastern and southern Africa alone. Previously, pest management technologies have been developed but their adoption has been limited to pilot sites.

This project aims to empower farmers through enhancing their capacity to understand pest problems and encouraging them to seek pest management options. In this project, the International Centre for Tropical Agriculture (CIAT) is in partnership with national agricultural research and extension services and locally active NGOs in Tanzania, Malawi and Kenya. Involving the farmers in evaluations of traditional methods, such as use of pesticides made from plant extracts, has restored farmers' faith and confidence in their indigenous knowledge, which until recently they perceived as being backward and something to be ashamed of. It has also empowered them to research on other constraints that limit agricultural production in their locations.

The initial research activities of this project were thought up by 12 innovative farmers in Sanya Juu village, Hai District, in northern Tanzania. These and other farmers in the district were faced with a sporadic but serious problem of bean foliage beetle (Ootheca spp.) infestations in their fields. The farmers requested help from the district who in turn informed the research teams in Arusha. Traditional methods (using wood ash, cow urine, soap, kerosene, etc.) and improved strategies (high-yielding pest tolerant bean varieties, row planting, etc.) were tested and demonstrated in farmers' fields. The positive results allowed farmers to select the most suitable strategies, blending traditional and improved methods. Additionally, these innovative farmers requested that they themselves disseminate the successful results to other farmers and sensitised local leaders to set up village libraries.

The benefits of beans!

Government and political leaders participated in project activities and are supportive of project initiatives. In western Kenya, for example, a village library (or Village Information Centre-VIC) was partly furnished by the Ministries of Health and Education, interested in using the centre for HIV/AIDS awareness and adult literacy campaign activities. Benefits that participating farmers at different project sites have gained from this project, include: confidence and knowledge; access to improved crop varieties; loans for farm inputs and other services that have helped them to increase bean grain yields from 1–1.5 to 4–5 bags and maize from 7–10 bags to 12–18 bags; household food security; ability to pay children's school fees; training; better human health and a cleaner environment. And, according to some of the participating women farmers, some male farmers now spend more time in the fields and with their family members, compared to the period before their participation in project activities!

Village children, Tanzania

Bean farmer meeting

R7965: Promotion of IPM strategies of major insect pests of *Phaseolus* beans in hillsides systems in eastern and southern Africa
Funded by: DFID Crop Protection Programme
Project leader: Eliaineny Minja, International Centre for Tropical Agriculture (CIAT) / Selian Agricultural Research Institute, Tanzania . **Photos:** Eliaineny Minja and Kerry Albright

KENYA

34 Development of private sector service providers for the horticultural industry in Kenya

Did you know...?

- The founder of Kenya's Green Belt Movement, Wangari Muta Maathai, became the first African woman to win the Nobel Peace Prize in 2004.
- Agriculture is the mainstay of the economy, accounting for 30 per cent of gross domestic product and more than 60 per cent of export earnings. Tea and coffee are traditionally among the country's leading foreign exchange earners, but horticulture products have become increasingly important.
- At least 2 million Kenyan employees earn all or part of their income from horticulture. Previously, smallholders sold mainly to middlemen, without direct contact with exporting companies or an understanding of where or how their products were sold. But from 1st January 2005 horticultural and foodstuffs imported to the EU will have to meet mandatory traceability requirements.
- EUREPGAP (Euro-Retailer Produce Working Group for Good Agricultural Practice) certification was devised in response to the demands of consumers, retailers and global suppliers.
- Kenyan agricultural products include: tea, coffee, corn, wheat, sugarcane, fruit, vegetables, dairy products, beef, pork, poultry, eggs.
- Life expectancy is about 45 years.
- About 50 per cent of the population is below the poverty line.
- Kenya has acted as an important mediator in Sudan's north-south civil war; Kenya and Uganda are working together to stem cattle rustling and violence by Lord's Resistance Army along the border.

Sources: www.cia.gov/cia/publications/factbook/geos/ke.html#People www.new-agri.co.uk/05-1/develop/dev01.html and www.worldinfozone.com/facts.php?country=Kenya

Child on farm

Behind the scenes...

Bridging the EUREPGAP

"As I was trying to share my experiences with my colleagues in the UK last December 2004, I was shocked to hear that a high ranking official of the UK Government wanted somebody to educate him on what EUREPGAP is! I went haaa!! And my eyes almost popped out of their sockets. As I was digesting this piece of information, it dawned on me that the Kenyan farmer is more informed than the would-be consumer, who imposed the new EU traceability and EUREPGAP on the supply chain. Then, I smiled to myself. Know why? The race for EUREPGAP certification was on and Kenya was in high gear determined to win, thanks to efforts and contributions from many willing partners, because the doors of the EU supermarkets, the key client for the fresh vegetables and fruits, were about to be slammed shut! Reason: Non-compliance to EU traceability and EUREPGAP protocols by 1 January 2005.

We had been busy trying to capacitate small-scale outgrower groups to set up internal control systems, a pre-requisite for EUREPGAP certification, but it was proving more difficult than we thought. The sub-sector was in disarray due to confusions and uncertainties. Reason – what if the EU supermarkets closed the doors come 1 January 2005? What will happen to the 250,000 families in Kenya whose livelihoods depend so much on the sub-sector? The discussion went on and on, and will continue, because there are likely to be new requirements – and we know this is true. Then on 17 December 2004, one of the outgrowers groups was EUREPGAP certified, after two years of training and technical support! We have done it! It can be done, given adequate resources and an enabling policy environment. As I left to go home for Christmas, I had a good reason to smile – yeeeeeees! We have done it! Now we have a role model after two years of investment, so we will succeed!"

Brigitte Nyambo
International Centre of Insect Physiology and Ecology (ICIPE)

Extension provider trainees discuss issues with farmers

Maize in a sack

Our work...

Making the grade:

private sector service for horticulture industry

The recent expansion in the export horticulture sector in Kenya has provided smallholder farmers with exciting opportunities to boost their income. However, increasingly demanding requirements for produce to conform to standards in the EU market threaten to exclude many of these farmers who currently provide 75 per cent of the fresh produce. Extension services are unable to assist the smallholder farmers in becoming compliant; this jeopardises farmers' income and implies loss of employment opportunities in small/medium units. Therefore this DFID Crop Protection Programme project is working to establish private service providers for advice, input supply and plant protection through hands-on training to ensure that smallholders can comply with rules and regulations of the trade.

Candidates were selected from the large number of respondents to a newspaper advertisement, and each of the collaborating export companies nominated one member of their field staff. Nineteen candidates started training In November 2003. Training covered: extension communication skills; working with farmer groups; integrated pest management; safe and effective use of pesticides; hygiene standards for fresh produce; business management; and EUREPGAP requirements and preparation of outgrowers' groups for certification. Trainees on attachment to outgrower groups (one trainee per group) have been able to improve group organisation by linking groups with reliable exporters, preparing for EUREPGAP compliance, and providing services to smallholder horticultural producers against payment. Three of the trainees found the initiative so attractive and rewarding that they resigned from their previous employment to seek a full-time position in private service provision!

The project is a joint initiative between ICIPE, the Natural Resources Institute, Winrock International, Kenya Horticultural Exporters Ltd, Myner Exporters Ltd, East Africa Growers Ltd and Greenlands Agroproducers Ltd. The support and enthusiasm of collaborating export companies has been encouraging.

The initiative, the first of its kind in East Africa, has attracted the attention of large sectors of the industry and other development agencies. The Horticulture Development Centre funded by the United States Agency for International Development (USAID), for example, has shown a lot of interest.

R8297: Development of private sector service providers for the horticultural industry in Kenya
Funded by: DFID Crop Protection Programme
Project Leader: Brigitte Nyambo, International Centre of Insect Physiology and Ecology (ICIPE), Kenya.
Photos: Brigitte Nyambo and Kerry Albright

KENYA

36 Agriculture/Livestock Research Support Programme

Did you know...?

- Kenya is as large as France or Texas.
- Agriculture forms the backbone of the economy accounting for nearly 80 per cent of its employment and 60 per cent of its income. It is therefore no surprise that most Kenyans regard the agricultural sector as the main hope in combating poverty, particularly among Kenya's rural population.
- Around 80 per cent of Kenya's land mass is arid and semi-arid land supporting about 50 per cent of the country's cattle, 60 per cent of the sheep, and 70 per cent of the goats and without doubt, 100 percent of the camels.
- The Salato Women's Group from Ngurunit, Marsabit District – one of the groups working with Kenya Agricultural Research Institute/Agriculture/Livestock Research Support Programme, Phase II (KARI/ARSP II) – recently received the German UNIFEM Award 2004. The group was nominated by the project partner, University of Hohenheim (http://www.troz.uni-hohenheim.de/news/UNIFEM).
- Following the KARI/ARSP II research on camel milk processing, a 3000 litre per day dairy is being established by private entrepreneurs in Nanyuki, Laikipia District, assisting camel herders within a radius of about 200 km to market their milk, and supplying the lucrative urban markets with healthy, nutritious and medicinally advantageous quality-controlled products.

Women on road to market

Masai woman, Kenya

Behind the scenes...

Woman power in Kenya

"During the implementation of ARSP II, one project dealt with processing and preservation of milk and other animal products in pastoral areas of northern Kenya, where the population receives food aid almost continuously. Research was geared towards increasing food security and availability of nutritious food in dry seasons, but also towards improving household income and, in particular, women's and children's nutritional status.

In order to make clean milk available and produce marketable products, education in basic milking and processing hygiene was essential – and this is where we hit the first snag. When clean, transparent plastic milking containers (with a lid) were introduced to the communities, the men intervened. In the public meetings that were held to ensure the full support of all community members for the establishment of small-scale dairies with a regular and sufficient milk supply from the pastoralists, men stood up and said that God had given them the cows and camels together with the gourds. These gourds are traditional milking containers made from animal hides and skins or baskets woven very tightly from wild asparagus plants. Changing to different containers, and particularly transparent containers, would cause 'bad eye' disease in their animals and was, therefore, not possible. It took a survey and laboratory tests to identify what 'bad eye' really was: sub-clinical mastitis, caused mainly by Staphylococcus aureus *bacteria!*

The research team showed the connection between unhygienic milking techniques (not washing hands when milking and between milking different cows, etc) and the fact that some of the teats were dry so that they lost valuable calves. Consequently some men allowed the wives to test the new techniques but insisted the containers needed to be non-transparent. One very courageous woman took the plunge and 'milked' into the new containers. When her cow gave birth to a female calf, the last men were convinced that this new technology was something good since a female calf is regarded as a special blessing!"

Helga Recke
NR International team leader

Helga Recke Team leader

Rural road

Our work...

Flagship for the future

"A brilliant and innovative scientist, dynamic and committed worker, a sincere, visionary and inspiring manager."

Romano Kiome Director of KARI, about Helga Recke on the news that she had won the award of Individual of the Year 2004 in the British Expertise Awards

This project was managed by NR International, financed by the EC and implemented by KARI. It focused mainly on resource-poor women and covered a huge geographical area with many environmental and institutional challenges. Now, sustainable solutions are being adopted by these communities, and scientists in KARI are more aware of their role in poverty reduction.

Agriculture and rural development emerged overwhelmingly as the people's leading development priority during consultations held in formulating Kenya's poverty reduction strategy paper. Yet the agricultural sector has been most noteworthy for its consistent underperformance due to numerous constraints, not least of which is that the bulk of Kenya's land mass is arid and semi-arid lands (the so-called ASALs). The soils in these areas are poor, rainfall is insufficient for most crops and there are frequent droughts. Because the soils are also fragile, ASALs are prone to degradation upon the slightest disturbance, such as overgrazing, improper land use and ill-considered exploitation of resources. Most of this land is therefore best used for livestock production and very limited irrigated agriculture. The importance of livestock to the pastoralists, particularly in terms of cash income and food security, cannot be overstated. These animals are the primary source of red meat, and additionally supply draught power and manure for major towns and cities in the country. There is now real potential for development into a food producing area providing job opportunities and hope for Kenya to banish the food relief dependency that seems to characterise most ASAL communities.

Agriculture/Livestock Research Support Programme, Kenya
NR International team leader: Helga Recke
Managed by: NR International
Implemented by: KARI
Funded by: EC
Photos: Jean Noël Perrin and John Esser

DOMINICAN REPUBLIC

38 PROBANANO, A Project to Support Competitiveness in the Banana Sector.

Did you know...?

- The earliest clear descriptions of bananas are given in ancient Greek writings on the 327 BC expedition of Alexander the Great, in India.
- The centre of greatest diversity of the wild musa species, and the presumed centre of origin of the banana group, is in Indochina and South East Asia.
- Introduction of bananas into the "New World" is thought to have been made by a priest who took plants from the Canary Islands to the Dominican Republic, which is now the major exporter of organic bananas in the world.
- Bananas are considered a holy plant in the Koran and in India the banana is sacred to one of the forms of the Goddess Kali and is worshipped on the third day of the month sravana.
- In East Africa beer is produced from bananas.
- The banana was seen as a symbol of economic prosperity in communist Eastern European countries.
- Although banana plants can grow up to three metres high, they are not trees but herbs, similar to grasses.
- Bananas can be eaten in their unripe form, i.e. green skin, but have to be cooked first.
- Bananas are the main fruit in international trade and the most popular in the world.
- Around 98 per cent of world production is grown in developing countries.
- World banana exports are valued at over US$5 billion per year making them a vital source of earnings. India is the world leader in banana production (23.69 per cent in 2000) and Ecuador is the world leader in banana exports (33.70 per cent in 2000).

Behind the scenes...

The European Union banana regime, a slippery business

"Consumers in the European Union pay up to 90 per cent more for their bananas than US consumers; this is due to the EU banana market being protected by a quota and tariff system that effectively limits the amount of bananas that can enter the EU. Why? The brief answer is to protect European Union banana producers (principally the Canary Islands, and Martinique and Guadeloupe in the French West Indies), and also African, Caribbean and Pacific Producers (that have preferential access to EU markets). By the first of January 2006 the regime will change with the market opening up as the quota system is removed and a tariff-only system introduced. This will probably result in a decline in prices to the consumer and, possibly, the destruction of the banana industry in some ACP countries, notably the West Indies (Saint Lucia, Saint Vincent and Dominica - not to be confused with the Dominican Republic – unfortunately, Columbus wasn't a very creative person and discovered both islands on a Sunday, which in Spanish is "Domingo"!).

Is the change in the market worthwhile? This, at least politically, depends on where you live. While the governments in Germany, Poland (a new EU member state), Italy etc. support the opening of the market, the governments in the UK, France and Spain oppose it. Well at least the British and French Governments agree over something!"

John Stanley
NR International team leader

Researchers on site at the banana plantation

Bunches of bananas

Our work...

Banana production, a small family business?

Legislative retail and consumer pressure has a marked and sometimes detrimental influence on the supply chain, particularly on small scale producers; the banana industry is one example. PROBANANO is a project to promote the competitiveness of the banana sector and is funded by the EC and the Junta Agroempresarial Dominicana, and managed by NR International. It contributes to the social and economic development and commercial capacity of banana growers. An important part of the project was the establishment of three demonstration farms to illustrate to farmers the facilities and standards required to gain access to European markets. They also provide training on health and hygiene standards, as well as a great opportunity for farmers to share knowledge on business issues such as cropping, irrigation and ways to combat pests.

Although commercial banana plants are sterile, in that they do not produce seeds, they do produce children (or "hijos" in Spanish - most commercial banana plantations are in Spanish speaking countries). From the base of the mother plant (corm) several "hijos" sprout up. Each of these "hijos" would become a mature plant if they were not cut back to allow only one to develop to maturity, (a slightly macabre form of family planning you might think!). The immature banana fruit rises through the centre of the trunk of the mother plant and enters into the world after approximately nine months following the initial planting. Following emergence the fruit requires another three months before it develops to maturity when it can be harvested. At harvest time the banana bunch is cut from the mother plant and immediately the mother plant is destroyed, allowing for only one of her "hijos" to develop into the next mother plant. This process can, theoretically, continue forever and there are plantations that have been in continual banana production for over fifty years.

The harvested fruit is transported to a Pack House where the bananas suitable for export are washed and packed. Commercial yields can range from 30 to 60 tonnes per hectare (12 to 24 tonnes per acre). Bananas are one of the highest yielding commercial crops in the world.
Despite the amount of care that is taken over their production, harvest and packing, there are always considerable amounts of waste bananas that are rejected. Very often these rejected bananas are sold on the local markets, or are fed to livestock. In at least one farm in Ecuador the waste bananas are fed to dairy cattle with the milk being exported to the United States, generating an additional source of income for the farm owner. And, no, the milk doesn't taste of bananas!

Tops of banana plants

Banana plantation workers

A Project to Support Competitiveness in the Banana Sector (PROBANANO), Dominican Republic
Funded by: EC and the Junta Agroempresarial Dominicana
NR International team leader: John Stanley
Client: ONFED
Photos: John Stanley

INDIA

40 Western Orissa Rural Livelihoods Project (WORLP)

Did you know...?

- Orissa, in East India, has a population of about 36 million of whom over 20 per cent are members of 62 distinct tribal communities.
- Following the exceptionally bloody defeat of the Kalinga Empire near the modern state capital, Bhubaneswar, in 261 BC the victorious emperor Ashoka became a pacifist, abandoning warfare and adopting Buddhism.
- The Oriya language of Orissa has its own beautiful and distinctive script, evolved for writing on palm leaf paper.
- Orissa is home to 'Odissi' one of India's most graceful classical dance forms.
- The temple of Lord Jagannath ('Lord of the Universe') at Puri is one of the most sacred pilgrimage spots in India and the central deity is the focus of religious life throughout Orissa. During the annual 'car festival' the deity, Lord Jagannath, is transported through Puri town. His imposing vehicle is built afresh each year from carefully selected traditional materials and is the origin of the word 'Juggernaut'.
- Rice feeds more than half of the world's human population and can grow virtually anywhere, with the right irrigation. Orissa is the centre of origin for rice, inspiring the botanic name Oryza sativa. Almost 50,000 local rice varieties are grown in India and over 4,700 varieties have been collected in Orissa. These are maintained by farmers for home consumption as well as traditional festivals and ceremonies; each farmer has their own favourites. Continued survival of local varieties is threatened by the spread of high yielding commercial varieties.
- In Orissa as a whole about 70 per cent of the population is dependent on agriculture. In rural areas the infant mortality rate is around 97 per 1000 births, amongst the highest in India. In rural areas more than 35 per cent of the population has no access to safe drinking water and around 96 per cent do not have adequate sanitation. In rural areas, over 82 per cent of families do not have electricity.

Behind the scenes...

Partnerships for change

"The Western Orissa Rural Livelihoods Project (WORLP) works with 100,000 households and 1,500 village-based Self Help Groups (SHGs). Women play a very active role in the project, making up over 90 per cent of the SHGs.

Inevitably, in rural areas where over 80 per cent of the population are dependent on agriculture, WORLP focuses on land and water management. However, villagers are particularly concerned about health and expend a lot of their meagre resources in dealing with health problems. One of the most interesting and promising developments has been the integration of natural resource management with health issues, initially through water supply, sanitation and village hygiene; later through medicinal plants, malaria control and training of traditional birth attendants.

Effective partnerships are a plank of WORLP strategies and have been negotiated with international, national and local actors from civil society and government sectors. These partnerships offer exciting opportunities for WORLP to engage in a wider range of activities, to more exacting standards, than would otherwise be possible. The ability to make partnerships work effectively has emerged as a particularly vital feature of WORLP."

Martin Stewart
NR International team leader

Ghumra performance, Bamadruga self-help group, Babedir, Boden district

Woman with child, Saliped village, Sunabeda Plateau

Martin Stewart Team leader

Our work...

Empowering Communities

The four project districts of Bargarh, Balangir, Kalahandi and Nuapada, in the State of Orissa, are amongst the poorest in India. Health indicators for the population are exceptionally poor, there is an acute shortage of safe drinking water and the districts suffer from regular drought. WORLP, implemented by the Government of Orissa and supported by the UK Department for International Development (DFID), is addressing poverty by promoting livelihood initiatives for the poorest.

The approach that has been adopted focuses on working with, and building upon, people's existing strengths and resources. It involves all sections of the rural community and seeks to create an environment in which individuals, families and communities are empowered to make appropriate choices for their long-term well being.

Developmental activities in WORLP include agriculture (land improvement, cropping systems and horticulture), village-based social and institutional development, health and hygiene, pisciculture and small business promotion.

In 2001, an NR International-led consortium was selected to provide support to the Government of Orissa on the management and implementation of WORLP. The project support team has been instrumental in encouraging the adoption of a livelihoods approach to the development of watershed areas and support for the poorest and most marginalised groups. The "livelihoods approach" is a tool to plan and implement development. The approach seeks to identify and build on people's strengths; including their financial, physical, human, social, natural and political assets. It starts with people that need assistance. It focuses on issues that cause poverty and helps to understand, from people's perspectives, how to improve the way that they make a living. In addition, the team has been responsible for providing technical assistance across a wide range of activities. The success of the project is evident in the high level of replication of WORLP approaches outside the project districts.

Left: Self-help group, Larki village, Kamna district
Below: Village scene, Kalmidadar, Nuapada district

Western Orissa Rural Livelihoods Project (WORLP), India . **Funded by:** DFID UK . **NR International Team, Orissa:** Martin Stewart, David Gandhi, Sudin K, Nazma Sultana
Consortium: Led by NR International & ERA Consultancy Pvt. Ltd. of Orissa, with the Natural Resources Institute of the University of Greenwich
Client: The Orissa Watershed Development Mission of the Government of Orissa . **Photos:** Bishnu Das Pradhan, Balakrishna Hota and Girish Kumar Manik

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