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CABI in review 14

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John Ripley, Chair

Foreword from the Chair

I am delighted to report another year of strong performance, both financially and operationally, and am proud to be leaving an even healthier organization than the one I joined in 2009.

Over that five year period, CABI has achieved significant growth of close to 50% in revenue and increased operating surplus by £1.5m, despite difficult economic conditions. We have continued strong profit performance from Publishing with a second year of small surplus from International Development. Furthermore, our donors, members and stakeholders increasingly recognize the value delivered by the organization; staff morale and motivation is high; and the Board is working positively and collaboratively with management.

During 2014, in addition to its usual focus on business risk and performance, the Board has encouraged the organization to develop stronger capabilities in monitoring, evaluation and impact analysis so that CABI is now better able to report its effect in human, as well as financial, terms. We have focused on strategies for developing the long-term sustainability of Plantwise and CABI's mobile agro-advisory service, Direct to Farm. Both of these initiatives have made excellent progress and will be key factors in helping CABI achieve its 2020 vision of being the preferred source of agricultural information worldwide – for everyone from ministers to farmers. This report shows how the organization has taken significant steps towards that vision through delivery against its four key strategic objectives of:

- **putting know-how into people's hands**
- **helping farmers trade more of what they sow**
- **bringing science from the lab to the field**
- **combating threats to agriculture and the environment**

I will be stepping down in July 2015 having completed two three-year terms as a Board member, with some personal sadness, but joy in CABI's strength, and handing the baton to Philip Walters MBE, who takes over as Chair in July 2015. I would like to acknowledge the major contribution made by Andrew Bennett, who also will be stepping down mid-year after 6 years. His knowledge of the international agricultural development scene together with his perceptive contributions to our Board discussions will be sorely missed.

The process of Board succession is well underway, with the appointments of Paulus Verschuren from the Netherlands and Xiangjun Yao from China. We continue to search for candidates, who can bring further expertise in finance and science to the Board, as well as diversity in gender and culture.

Foreword from the CEO

The past 12 months have seen CABI deliver good growth of revenue and operating surplus, while also making excellent progress towards our long-term vision of being the 'go to' place for information on agriculture. Through Plantwise, Direct to Farm, the African Soil Health Consortium and the Good Seed Initiative, we have delivered more information, with greater impact, to more farmers than ever before, as well as put in place studies and systems to measure that impact objectively.

Overall, our revenue grew by 12% driven by a strong performance from International Development which, including Plantwise and non-Plantwise activities, grew at 20%. Our Publishing business also maintained solid revenue growth, reaching £12m in total. Operating surplus grew by 25%, reaching over £1m for the first time ever, delivering a greater project load while also managing administrative and overhead costs tightly and improving value for money to all stakeholders.

We must invest this surplus in the science and IT to deliver our first strategic objective of **putting know-how into people's hands**, particularly through making more of our data and information freely available and delivering much of it via mobile devices. We began this journey by making the Invasive Species Compendium and Plantwise Knowledge Bank open access and it was great news that CABI will host the Secretariat of the initiative for Global Open Data in Agriculture and Nutrition (GODAN).

Our second key objective, **helping farmers trade more of what they sow**, has continued to be a core focus of many of our projects. Better plant health systems and common standards of pest risk analysis are important steps in removing trade barriers to help farmers access national, regional or international markets that will pay for the added quality. In 2014, funded by ACIAR, in partnership with the Plant Biosecurity Cooperative Research Centre of Australia, we began to build and strengthen the plant biosecurity capabilities in 10 African countries. This will be complemented by a project on trade standards, delivered in partnership with COMESA and funded by STDF of WTO. In Pakistan, CABI is working with USDA to build capacity for pre- or post-harvest management of pests at national, provincial and farm level.

Bringing science from the lab to the field improves livelihoods and food security for smallholder farmers. Plantwise continues to be a major focus, working in 34 countries, most with successful scale-up and some already showing signs of long-term sustainability with plant clinics embedded in their national plant health strategies.

A major external evaluation by EuropeAID gave a very positive report on the programme in Africa while the Plantwise Knowledge Bank won the Open Data Award for Social Impact. In Africa, CABI continues to help farmers adopt better practices in soil health, fertilizer usage and seed health, complementing Plantwise.

12%
revenue growth in 2014

50%
revenue growth over 5 years

25%
operating surplus increase

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We must remain vigilant in our fourth objective – **combating threats to agriculture and the environment**. Papers and presentations by CABI scientists have led to a growing awareness of the threat to agriculture from climate change, pests and diseases. In developing countries, invasive species have major impacts on water availability, food security, health and livelihoods. We have been building the economic case to generate significant funding for a major initiative in Africa and Asia to combat the 10 worst weeds affecting farm outputs on the continent.

We are convinced of the potential benefits to smallholder farmers offered by mobile information and communication technologies. In 2014, CABI further developed the **Direct2Farm (D2F)** project profiling over 300,000 farmers in India, and we look forward to seeing the results during 2015. The D2F scale-up aims to establish scalable, self-sustaining services, making available location specific information and knowledge to farmer households and other user groups such as extensionists, thus putting agriculture research into use and fostering positive behavioural change in the agrarian community.

I hope that this report gives you a better insight into the varied, valuable and exciting work that CABI is doing around the world, delivering knowledge and driving innovation through research into use for the benefit of farmers, their families and their communities around the globe.

Trevor Nicholls, CEO


Putting know-how into people's hands
– by creating, managing, curating and disseminating information
Bringing science from the lab to the field
– supporting farmers by increasing their capacity to grow better quality crops, and fight pests and diseases
Combating threats to agriculture and the environment
– by protecting biodiversity and livelihoods from invasive species and other threats
Helping farmers trade more of what they sow
– with improved food security through climate smart agriculture and good agricultural practices

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mission

CABI improves people's lives worldwide by providing information and applying scientific expertise to solve problems in agriculture and the environment

partnership

The world we live in today faces challenges that require concerted efforts to resolve. Global problems are often too complex or too interconnected to be addressed by any one single organization. That is why partnerships are at the heart of everything we do.

We work together with policymakers to help develop strategies to support agriculture and the environment and improve livelihoods. Our project teams around the world work together with local and international research partners, private companies and NGOs to implement their work. Our publishing team works with authors, content providers and partner organizations to develop our information services.

We work in partnership with extension workers, governments and development partners, giving trusted advice and sharing knowledge to support smallholder farmers. We partner with smallholder farmers to ensure they lose less of their crops to pests and diseases, improve crop quality and yield, and get better prices for their produce.

We believe that real answers are found when organizations and individuals, countries and regions, work together to solve problems and build sustainable livelihoods.

"There's a great collaborative spirit between CABI and its partners, driven by the shared vision and dedication to achieving a real, on-the-ground difference to people's lives and futures."

Dr Lutz-Peter Berg, Chair, CABI Executive Council

PUTTING KNOW-HOW INTO PEOPLE'S HANDS

Everyone in the world is born with potential but circumstances can crush opportunities to use it. I think that has a lot to do with knowledge and how much access a person gets to it.

For me, what's important is the impact that sharing knowledge has on people's lives – knowing that we can provide the piece of information that will allow someone to send their children to school or put running water in their home. It's the reason I get up in the morning.

We're always considering how our work in knowledge management and publishing will help achieve the overall CABI mission. I think our combination of work in development and publishing allows us to make a unique and tangible difference.

Andrea Powell, Chief Information Officer

What's important is the impact that sharing knowledge has on people's lives.

Supporting Global Open Data for Agriculture and Nutrition

"Over 870 million people are malnourished or hungry according to the United Nations' Food and Agriculture Organization. As the world grows more interconnected every day, it is imperative that we reach across borders to help other countries solve issues as fundamental as the ability to feed their people."

Dr Catherine Woteki, Chief Scientist and Under Secretary for Research, Education and Economics, US Department of Agriculture (USDA)

Open data – the idea that certain information should be freely available and increasingly machine-readable for everyone to use – is a vital resource for tackling global food security and human health. Knowledge that is freely available has no barriers to access anywhere in the world. Making data machine-readable allows efficient mining of large amounts of data and its re-use in different contexts and combinations.

If we take pioneering agriculture and nutrition research and make it openly available to the people who need it most, we can help reduce global food poverty and malnutrition.

When people come together with new information about agriculture and nutrition, new ideas can grow. Sharing knowledge around these subjects at the community, national and international levels helps people innovate and put in place sustainable ways to grow more nutritious food.

Based on CABI's track record of expertise in agriculture, nutrition, knowledge management, and building strong partnerships, our organization was selected to host the secretariat for **Global Open Data for Agriculture and Nutrition (GODAN)** in 2014.

With over 120 partners, GODAN supports global efforts to make agricultural and nutritional data accessible, available and usable for unrestricted use worldwide. The initiative focuses on building high-level policy, and public and private institutional support for open data.

It also encourages collaboration and cooperation among existing agriculture and open data activities, bringing together stakeholders to solve long-standing global problems like food and nutritional security.

"The GODAN initiative will improve the quality, reliability and accessibility of data on agriculture and nutrition. This will enhance accountability and transparency, improve service delivery, increase innovation and spur economic growth."

Prof Tim Wheeler, Deputy Chief Scientific Adviser, UK Department for International Development

In 2015, CABI will focus on setting up GODAN's secretariat, advocating strongly for change and communicating to a growing constituency.

"We hope to launch a movement that will close the gap of scientific achievement between the developing and developed nations. We will empower farmers and agricultural producers from Uganda to Bangladesh with the knowledge gained by those in other countries so that they can be as fruitful and productive as producers anywhere. And together, we hope to build a future of economic prosperity and food security that we only dream of today."

Dr Catherine Woteki, Chief Scientist and Under Secretary for Research, Education and Economics, US Department of Agriculture (USDA)

Opening access to agricultural research is critical for improving the economic development of smallholder farmers. CABI's ongoing collaboration with the Regional Universities Forum for Capacity Building in Agriculture (RUFORUM) gives 46 universities in Africa full access to **CAB Abstracts** – the world-leading abstracting and indexing database covering applied life sciences.

Richard Mutuku explains how CAB Abstracts is helping researchers in Africa access valuable agricultural information.

"We're in a dynamic world where everything is on the move. It's certain that if you go online and search CAB Abstracts, you will get information that's up to date. This gives the user confidence that their research is the best. Whenever students come to me and I direct them to CAB Abstracts, I see that I've achieved my target as a librarian. It gives me motivation and morale."

Richard Mutuku, Librarian, College of Agriculture and Veterinary Sciences, Nairobi, Kenya

CAB Abstracts is the most comprehensive database of its kind, giving researchers instant access to over 7.9 million records from 1973 onwards, with over 360,000 abstracts added each year.

"Information is a valuable and vital tool for development. If you share it, you open up opportunities. If you don't share it, its value depreciates into nothing."

Grace Akao, Plant Health Officer, African Union-InterAfrican Phytosanitary Council, Yaoundé, Cameroun

Donors and Partners

GODAN

DONORS
CABI
CGIAR
The Technical Centre for Agricultural and Rural Cooperation (CTA)
Department for International Development (DFID)
Food and Agriculture Organization of the United Nations (FAO)
The Global Forum on Agricultural Research (GFAR)
Netherlands Ministry of Economic Affairs
The Overseas Development Institute (ODI)
Federal government of the United States

PARTNERS
www.godan.info/partners

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Knowledge Management Group, CABI Head Office

360,000
new records added to CAB Abstracts each year

7.9m
abstract records

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Improving lives with mobile information

When you put know-how into people's hands, you change lives.

In many developing countries, where a large percentage of the population are farmers growing food to eat and sell, practical agricultural advice is limited. Farmers often go without the vital information that could help them grow better quality and more nutritious food, which, in turn, would benefit their health and their livelihoods.

The availability of affordable, simple mobile phones and 2G-connectivity has created a potential information source for smallholder farmers.

Farmers can pay a small fee for mobile advisory services, which help them to improve their crops and increase their profitability. CABI is helping to find innovative ways to reach farmers and deliver agricultural and nutritional information to them, maximizing the mobile technology revolution. These mobile agro-advisory services are helping to change farmers' lives.

E-Zaraat

Building on the rapid increase in the use of mobile phones in Asia, CABI's **E-Zaraat project** is an IT-based system that supports extension activities in three districts of the Punjab, Pakistan. Through the use of mobile technology, like tablets, it is changing the way that agricultural advice reaches farmers, benefiting their crop yields and profitability.

Innovative systems streamline the work of extension staff, foster a culture of continuous learning among them and help them get timely agricultural advice to a greater number of farmers than ever before.

"Through E-Zaraat, we're connected to the internet. We can keep abreast with changing technologies and keep pace with a fast changing world."

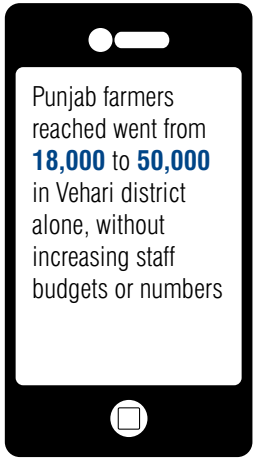
– Agricultural Officer, Pipli

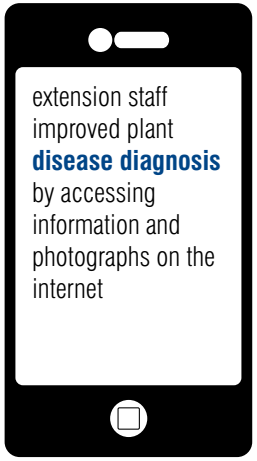
"It's been a dream in our department to have a comprehensive database for quick access and reference. This dream has been realized through E-Zaraat."

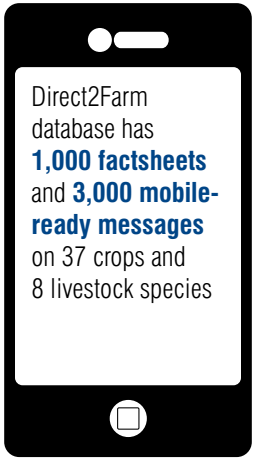
– Cotton Inspector, Mailsi

"Last year, we downloaded pictures of kitchen gardening from the internet by using the tablets, developed a training module and delivered it to 25 women with the help of a local NGO in Vehari city."

– Agricultural Officer, Vehari







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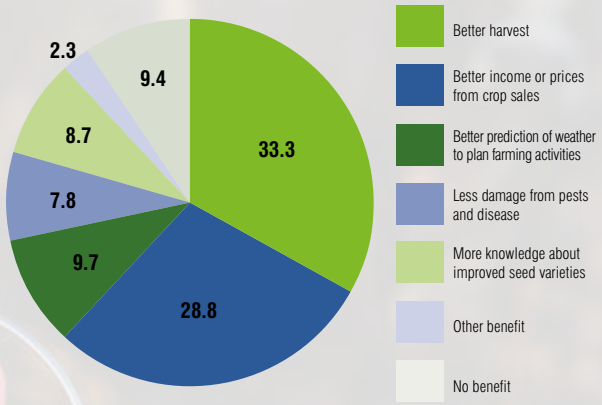
mKisan

CABI's **mKisan project** provides practical farming advice to mobile subscribers in six states in India.

Our research shows that most people join to learn new farming techniques. From 2012-14, well over two million farmers used mKisan with remarkable results:

- 2,370,833 users 2012-2014
- one third of customers said that they shared information from mKisan with fellow farmers outside their household
- one third of the repeat users reported that mKisan had changed their farming practices
- of those customers who reported making changes based on advice from mKisan, 33.3% reported a better harvest



mNutrition

After its successes with mobile agro-advice, CABI is scaling its services out to include nutrition advice. Malnutrition is the largest single contributor to child mortality worldwide.

In 2014, the GSMA Mobile for Development programme appointed a CABI-led consortium as the global content provider to the **mNutrition initiative** – a DFID-funded project that aims to improve the nutritional status of more than three million people in 14 countries in sub-Saharan Africa and South Asia. The initiative tackles malnutrition and helps beneficiaries to access vital nutrition-based agricultural and health information using mobile technology.

CABI has hired local content providers and built relations with regional mobile network operators to make the project sustainable and easy for the community to continue once CABI's work is completed. The project recommends agricultural interventions for better nutrition outcomes, for example, helping smallholder farmers make agricultural decisions that benefit their health and nutrition. This includes helping them to grow kitchen gardens, intercrop or rotate crops that can be consumed in households or sold for profit.

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E-Zaraat

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International Initiative for Impact Evaluation (3ie)
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mKisan

DONORS
Groupe Speciale Mobile (GSM / GSMA)

PARTNERS
Digital Green
Handygo technologies
International Livestock Research Institute (ILRI)

LEAD CABI CENTRE
CABI in India

mNutrition

DONORS
Groupe Speciale Mobile (GSM / GSMA)
Department for International Development (DFID)

PARTNERS
Global Alliance for Improved Nutrition (GAIN)
Oxfam GB
International Livestock Research Institute (ILRI)
The British Medical Journal (BMJ)

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Knowledge Management Group, CABI Head Office

Recognising the importance of mobile information, nutrition and health, CABI produces two key products.

The **Nutrition and Food Sciences Database**, which offers research, news and information covering the whole food chain. Compiled by food and nutrition specialists, it contains over 1.2 million records dating back to 1973.

Global Health is mobile optimized on our own platform, CAB Direct. Global Health gives researchers access to over 2.5 million records covering public health over the last 40 years from across the world.

2.5m
records of global public health

64%
of journals are unique to Global Health

1.2m
records dating back to 1973

188,662
abstracts added to Global Health in 2014

Educating the next generation of crop experts

A high percentage of the population in developing countries works in agriculture, contributing substantially to the economy, and yet food production and food quality remain relatively low. One of the reasons is a shortfall in the number of people trained with the right mix of knowledge resources. In search of answers to protect and increase crop yields, they often rely on unsafe or untested practices, which may harm the farmers themselves, consumers and the environment they depend on.

Educating the next generation of agricultural experts and helping them to put know-how into farmers' hands can make a world of difference, for example, CABI's new Masters in Advanced Studies in Integrated Crop Management (ICM) teaches sustainable agricultural best practice. The goal of this first higher education degree by CABI, working in partnership with the University of Neuchâtel and Switzerland's Canton Jura, is to create a domino effect of benefits starting with the students, filtering into national institutions, and then to the farmers back home.

"It is a pleasure to work with such passionate people. It is important to recognize the importance of the work of CABI and regional partners in the field of scientific discovery and to see the first students, engaged and passionate."

Elisabeth Baume-Schneider, Minister for Education, Culture and Sports, Canton Jura, Switzerland

Martin Busobozi is a Plantwise Plant Doctor from Rwanda. He has worked with the CABI-led Plantwise food security programme since 2010. He recently joined the ICM degree. He sees farming problems first-hand and the solutions that are needed to overcome them.

"As an agronomist, I see how people in my country lack the skills to grow healthy crops, especially with minimal pesticide residues. It's difficult for farmers to get good information.

Most times, they rely on agrodealers, but these are business people. They lack knowledge of insect pests and diseases. Tackling maize lethal necrosis, for example, starts with an understanding of field management like crop rotation. Many farmers rely on instructions that come with the pesticides and seeds that they buy, but the challenge is reading and interpreting them correctly.

I hope with the knowledge I gain here, I'll be in a better position to impact many farmers' lives through improved yields back in Rwanda. With this degree, I know I'll get the knowledge I need to help others and change people's lives for the better."

In 2014, **CABI and the University of Neuchâtel in Canton Jura, Switzerland prepared to embark on a new, unique degree programme in ICM**. Students from around the world applied to the programme. Their aim: to learn about ICM, including managing crops, in order to optimize yield and profitability with minimal negative impact on the environment.

The academic programme aims to address today's most critical agricultural and environmental challenges and help equip students with knowledge to form new ideas and innovations about ICM.

The hope is that students will be qualified to apply ICM in their home countries upon completion of the course, and go on to help others by sharing their knowledge, creating truly sustainable solutions.

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"I'm really looking forward to certain aspects of the course," says Martin, "like tackling some of the most challenging plant pests and diseases with ICM. We'll be looking at creating integrated crop management guidelines to help control them. I also train plant doctors, and coordinate several in my region, so the knowledge I gain will give me the confidence to help teach new doctors and improve the knowledge status of existing ones."

The training also helps the students, who come from all over the world, to build lasting relationships that they can take with them throughout the rest of their careers.

"With the ICM degree, I'm meeting new people from around the world," says Martin. "I can see what others are doing in this field and learn from them. It's good for graduates to have exposure to a wider world of agriculture. It motivates you to achieve more and reach higher. Otherwise you keep yourself locked away; you stay in your comfort zone. This degree is helping me to grow."

Martin Busobozi (left), attending the ICM degree in Switzerland

Scholarship opportunities were made available from the Swiss Agency for Development and Cooperation (SDC) to help this programme reach high-calibre individuals from all over the world: Costa Rica, Ethiopia, Ghana, Kenya, Pakistan, Rwanda, Sierra Leone, Sri Lanka, Tanzania and Zambia. The students are excited about the possibilities that lie ahead for them and their communities.

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DONOR
Swiss Agency for Development and Cooperation (SDC)

PARTNERS
University of Neuchâtel

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CABI in Switzerland

Relevant Publications

In 2014, CABI celebrated the 20 year anniversary of its award-winning Compendium Programme. The first compendium – the **Crop Protection Compendium (CPC)** – began in 1994 and was published in 1998. For two decades, the CPC has been helping farmers all over the world to get the best yields from their crops.

Covering pests, diseases, weeds, invasive plants and natural enemies, the CPC includes over 26,000 datasheets, information on an additional 22,400 species and over 8,000 pictures allowing for easy identification and tutorials when needed.

22,400

species covered in the Crop Protection Compendium

HELPING FARMERS TO TRADE MORE OF WHAT THEY SOW

The world's consumption of commodities, like cocoa and coffee, is growing, creating a substantial opportunity for smallholder commodity farmers to supply markets, increase their incomes and lift themselves out of poverty… if they can tap into the supply chains that feed local, regional and global markets.

But things stand in their way: crops lost to pests and diseases for example; 30-40% of what's grown in the world is lost to them. When the crop has gone, so too has the cash to buy food to put on the table and schooling for their children. Imagine the difference we can make to farmers' lives if we can help them access flourishing trade markets.

Joan Kelly, Executive Director, Global Operations

Imagine the difference we can make to farmers' lives if we can help them access flourishing trade markets.

Protecting commodities, safeguarding livelihoods

Joseph Merib is a cocoa farmer on Epi, Vanuatu, a nation of more than eighty islands located in the South Pacific. Joseph's cocoa farm was badly affected by black pod disease and rats. He could harvest cocoa pods but nowhere near the farm's real potential. He did not know how to manage the problems he was facing and, living on a remote island, he had limited access to plant health information. Joseph was unable to make the most of the growing demand for cocoa, so missed out on an opportunity to increase his income and invest in his family and future.

Joseph Merib, Cocoa Farmer, Vanuatu

The vast majority of global commodity production comes from the world's 500 million smallholder farmers – farms of half a hectare, or less – in developing countries. But despite commodity crops forming a substantial proportion of a country's exports, farmers often face many practical problems that bar them from engaging in regional and global trade in some of the world's most lucrative markets.

Pests can destroy farmers' crops. Inadequate storage conditions can lead to post-harvest losses. Poor production and processing techniques can result in food that fails to comply with Sanitary and Phytosanitary Standards (SPS). In 2014 alone, nearly 40% of agricultural exports from Africa to Europe were rejected and sent back.

The most lasting and sustainable way to secure farmers' livelihoods is to help them overcome these problems and access trade markets. If smallholders can trade more quality produce, they can generate better incomes, while contributing to meeting the increasing global demand for commodities.

CABI works to break down barriers in agricultural trade to support smallholders and help get safer quality produce from farmers to consumers.

> An ounce of trade can be worth a pound of aid.
>
> **Ban Ki-moon**, Secretary General, United Nations

up to

800%

increase in cocoa yield

Rehabilitating cocoa in Vanuatu

A decade of low world cocoa prices led farmers in Vanuatu to abandon cocoa production. Despite cocoa prices rising again, attempts to encourage production have had little impact and cocoa yields have continued to fall.

Since 2011, CABI has been working with partners to investigate how labour constraints impact **cocoa production and management in Vanuatu**. The project has helped create sustainable solutions to increase cocoa yields.

In 2014, a team returned to villages where the project had taken place and found that farmers were seeing benefits.

Increasing cocoa yields

Results from a 12-month trial found that effective Integrated Pest and Disease Management (IPDM) offered up to 138% greater cocoa yield than current farmer practice. The same trial found that effective IPDM offered up to 50% improvement in returns to labour. Following the training, the majority

of farmers increased their annual cocoa yields: several farmers reported increases of 40-55%; six other farmers reported much bigger gains, ranging between 165% and 800%.

Increased management levels

Of 17 interviewed farmers who received cocoa management training, 15 were implementing high or medium-level management in their cocoa plantations 18 months later.

Sharing knowledge

Lead 'apostle' farmers spread knowledge about new practices to fellow farmers. 14 farmers shared their training with others in their community.

Managing labour

Importantly, discussions indicated that the trained farmers were allocating more time to cocoa than previously and were regarding the crop as a valuable source of income, worthy of greater labour investment. Nine farmers were employing additional labour to help them manage their cocoa crop and 14 were planning to increase their time spent on cocoa in the following year.

Joseph Merib participated in the project. After learning cocoa rehabilitation techniques from the project, the incidence of black pod disease and rats on his farm decreased significantly. He increased his yield threefold from 3,000 kg to 9,000 kg. In addition, the cocoa pods that Joseph grows are bigger and produce better quality beans.

He increased the number of cocoa trees on his farm from 2,000 to 8,000 and aims to reach 10,000 within the next few years.

His enterprise is expanding: he now employs five people to prune his cocoa trees and keep the farm clean, which helps to reduce the rats. He has trained more than 120 women and men farmers in pest management practices so that more Ni-Van cocoa farmers can benefit from improved livelihoods.

"For smallholder farmers living in remote island nations like Vanuatu, rehabilitation projects help tackle plant health problems and strengthen access to markets further afield. These projects can give people working in agriculture, in this case cocoa production, a reason to invest in commodity crops as a way to generate income and safeguard their livelihoods, their communities and their futures."

Sarah Thomas, Plant Pathologist, CABI

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PARTNERS
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Commonwealth Scientific and Industrial Research Organisation, Australia (CSIRO)
Alternative Communities Trade in Vanuatu (ACTIV)
Vanuatu Organic Cocoa Growers Alliance, Vanuatu (VOCGA)
Vanuatu Agricultural Research and Training Centre, Vanuatu (VARTC)
Department of Agriculture and Rural Development, Vanuatu (DARD)
Mars Asia Pacific, Australia
Cocoa Growers Association, Vanuatu (CGA)
Ministry of Agriculture and Fisheries, Samoa

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CABI in the UK

Joseph increased the number of cocoa trees on his farm from

2,000 to 8,000

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Increasing African trade with plant biosecurity

Agricultural trade is a powerful engine for economic growth, poverty alleviation and food security, but harnessing it can be difficult, not only at the farm level but at national, regional and global levels too. Today's increased movement of goods and people raises the risk of spreading dangerous plant pests and diseases, meaning collaborative and global research efforts in plant biosecurity are more important than ever before.

In 2014, CABI helped establish the **Australia-Africa Plant Biosecurity Partnership**, a two-year AUS$1.6m programme to strengthen skills in plant biosecurity in Africa based on experiences shared by Australian experts. The initiative aims to facilitate trade, including intra-regional trade, by addressing plant pest and disease problems that hinder agricultural exports and threaten food security.

"Diseases really affect agricultural trade in Kenya. Maize is of great value here. In 2013, it was worth 100 billion Kenyan shillings. You can imagine the impact that a disease like maize lethal necrosis could have on Kenya's economy. It's very expensive to test all the maize seed that comes through Kenya. We have to find a cost-effective way to make agricultural trade secure."

George Ngundo, Laboratory Manager, Plant Quarantine and Biosecurity Station, Kenya Plant Health Inspectorate Service (KEPHIS)

"We've had a number of biosecurity risks that have impacted on food security and trade, like aflatoxin. In Kenya, we've seen aflatoxin harming, even killing, people and prohibiting trade."

Martha Byanyima, Sanitary and Phytosanitary Expert and Head of the Sanitary and Phytosanitary Programme, Common Market for Eastern and Southern Africa (COMESA)

Mellissa Wood, Director, AIFSRC, ACIAR

"As an island nation, Australia knows only too well the significant impact that pests and diseases can have on plant industries and trade."

Mellissa Wood, Director, Australian International Food Security Research Centre (AIFSRC) within the Australian Centre for International Agricultural Research (ACIAR)

The partnership commenced with a regional workshop in Nairobi, Kenya, in October 2014, which identified key areas of plant biosecurity needed in Burundi, Ethiopia, Kenya, Malawi, Mozambique, Rwanda, Uganda, Tanzania, Zambia and Zimbabwe. These included diagnostic skills, risk analyses, emergency response and eradication, surveillance and management of key pests and diseases, and early warning.

"On the one hand, this project is about helping nations to trade their way to prosperity, particularly though sustainable agriculture – and biosecurity is a big part of that. On the other, it's about improving agricultural productivity and tackling the issue of food security. If farmers produce and sell more, because they're better at managing pests and diseases, then we've succeeded."

Dr Michael Robinson, CEO, Plant Biosecurity Cooperative Research Centre (PBCRC), Australia

An innovative part of the programme is the cadre of biosecurity 'change champions', who will be trained to improve plant biosecurity through matched training, mentoring and placements in relevant Australian agencies. The champions will work to improve regional biosecurity to impact farmer incomes, food security and safe regional trade of agricultural products, ensuring that the programme continues and becomes self-sustaining.

"We hope to create a ripple effect, where we share knowledge with a group of fellows, who then share their knowledge with other groups of relevant people, making lasting connections.

One of the most satisfying things to come from October's workshop was the personal interaction between plant biosecurity and industry professionals, who were often talking to each other for the first time, but who showed so much enthusiasm for keeping those interactions going, sharing ideas and solutions."

Dr Michael Robinson, CEO, Plant Biosecurity Cooperative Research Centre (PBCRC), Australia

The programme will leverage support from other international agencies and complement other work underway on plant biosecurity issues in Africa. CABI is responsible for the delivery of the project in Africa.

In 2015, the project will focus on selecting 15 senior fellows to complete internships in Australia with host organizations.

In 2016, we aim for the project to run a series of workshops in Africa, where the senior fellows take a lead and connect with and train other fellows.

"The project with the Australian government is a Godsend. It's really going to improve our technical capacity to detect some of these diseases before they come into the country, to prevent their entry, establishment and spread."

George Ngundo, Laboratory Manager, Plant Quarantine and Biosecurity Station, Kenya Plant Health Inspectorate Service (KEPHIS)

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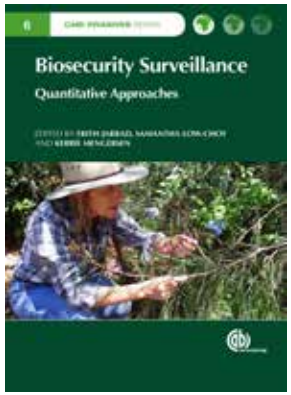

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BRINGING SCIENCE FROM THE LAB TO THE FIELD

We're constantly finding ways to turn scientific research into actionable knowledge, taking it from the lab to the field. Our commitment to knowledge sharing means that we share and gather data in more than 30 countries.

In November 2014, **Plantwise won the Open Data Award for Social Impact**, celebrating innovation and excellence in the ways open data are used and published. Plantwise has made the important transition from being CABI-led to integrating into national frameworks in countries like Kenya, Sri Lanka and Pakistan. CABI has also continued to lead the Africa Soil Health Consortium (ASHC) to share valuable knowledge about soil health.

Dennis Rangi, Executive Director for International Development, CABI

Our commitment to knowledge sharing means that we share and gather data in more than 30 countries.

Plantwise goes from strength to strength

Meet Basana Thakuri. She lives in Kathmandu, Nepal with her husband and three children. Basana depends on tomato crops to support her family, but unknown pests are destroying her produce and production has been low. She is one of thousands of urban farmers – a new generation of people who grow on small plots in the city and part of an increasing trend in future farming.

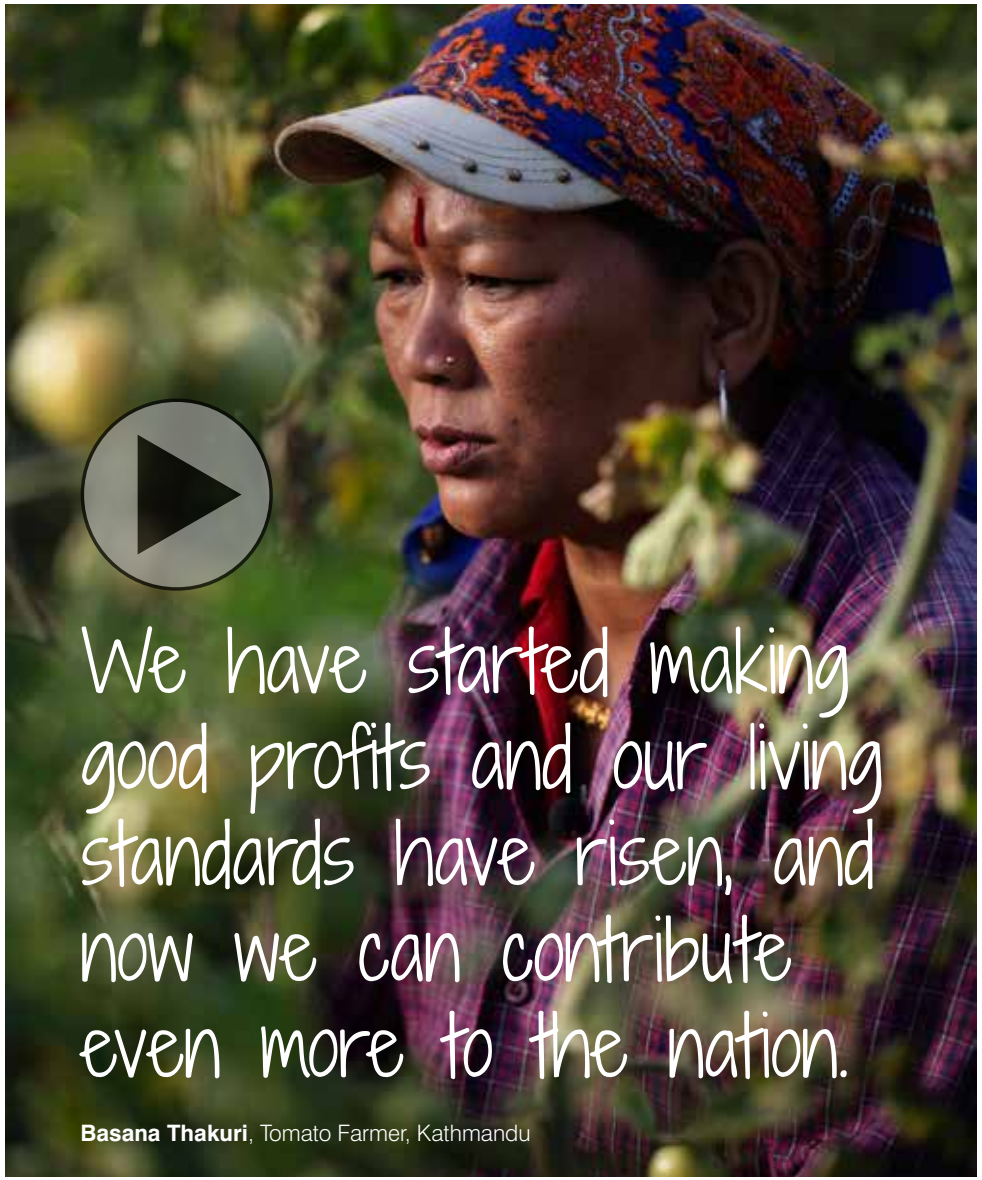
"There are many ongoing challenges in my life. For example, adopting the practice of using improved seeds, running my family smoothly, getting my children educated. I am trying to find solutions to all of these challenges."

For people like Basana, tackling crop pest problems in a safe and sustainable way can be a major challenge, affecting their livelihoods and futures, and those of their families. Unfortunately, many farmers share her story. Over 500 million smallholder farmers depend on crops for food and income, but each year an estimated 30-40% of crops are lost to pests worldwide. Reducing crop loss by just 1% could potentially feed millions more people.

While the knowledge and technology exist to reduce losses, vital plant health information remains out of reach for many people working in agriculture like Basana. She explains how she tried to find solutions by talking to her friends, but they did not know how to improve their crops either. They tried insecticides and pesticides, but they did not work.

"We are farmers and we invest hoping to get a good return. The losses are very frustrating. We are totally devastated. We depend on this crop to support ourselves," she says.

The solution came when Basana visited the local plant clinic, run by Plantwise-trained plant doctors from the national plant protection department. Plantwise trains doctors to identify farmers' problems and provide appropriate plant health advice. Plant doctors in Kathmandu were able to identify the pests destroying her crop and advise Basana to get her back on the right track.



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"We have been given advice on organic farming at the clinic. They told us that this would be beneficial to us and also to our health. We are very satisfied at the moment and will continue to adopt better farming practices. We have started making good profits and our living standards have risen, and now we can contribute even more to the nation."

Since its launch by CABI in 2011, **Plantwise** has provided an innovative approach to national agricultural development, working with countries to manage plant health better and support farmers in the fight against pests and other threats to healthy crops.

Plantwise works with national partners in more than 30 countries to set up plant clinics, like those for human health, where trained plant doctors provide farmers with practical, science-based diagnosis and advice to prevent and manage crop loss. These plant clinics and the data they gather from the field can act as a catalyst to stimulate and strengthen interactions among plant health system stakeholders, leading to a more effective national support system for farmers.

Want to see a plant clinic in action? Watch PhD student, Andrew Tock, of the Warwick Crop Centre, report on three months of monitoring plant clinic success in Uganda as part of a Biotechnology and Biological Sciences Research Council (BBSRC)-funded Doctoral Training Partnership.

In 2014, Plantwise went from strength to strength, making important steps in the transition from being CABI-led to being integrated into partners' national structures in many countries.

Plantwise is here to stay. You want it institutionalized; that it becomes part of the national system. Working together like this, we can achieve more and have impact.

Joyce Mulila Mitti, Plant Production and Protection Officer, FAO sub-Regional Office for Southern Africa, Zimbabwe

"Ministers are involved in the plant health clinic system. The President himself is very interested in the running of plant clinics."

Dr Ibrahim M. O. Shamie, Assistant Chief Agriculture Officer, National Coordinator, Plantwise, Ministry of Agriculture Forestry and Food Security, Sierra Leone

By the end of 2014, Plantwise had reached nearly two million farmers, spreading the knowledge to overcome plant health problems. The information, materials and training introduced through Plantwise has been, and will continue to be, used by partners in non-Plantwise activities. Altogether, Plantwise aims to have reached a total of 30 million farmers, directly or indirectly, by 2020.

An important part of Plantwise is its innovation in technology. In just two years, the programme's online Knowledge Bank plant health database has become a vital tool to support plant clinic operations in over 30 countries. In 2014, it had over 120,000 visits and over 250,000 page views. The Plantwise Factsheet Library mobile app, downloadable onto Android smartphones and tablets, enables plant doctors to access information while on the move and in remote locations.

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ROYCO
1,289
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75%
quicker data collection by tablet
12
languages on the factsheet App
103,315
plant clinic records online

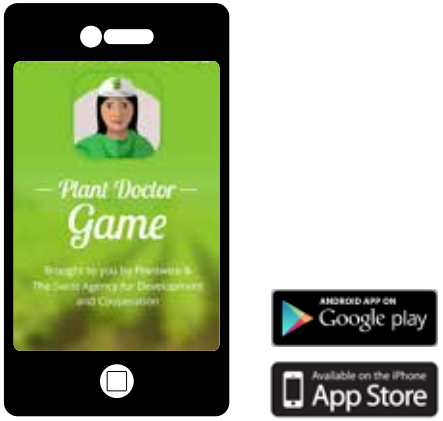
The Plantwise Online Management System (POMS) allows partners and Plantwise coordinators to store and manage operational information and plant clinic records in their countries.

In 2014, Plantwise held forums with the International Plant Protection Convention (IPPC) Secretariat and the Food and Agriculture Organization (FAO) in Nairobi, Kenya, and Accra, Ghana, bringing together expert officials from across Africa to discuss plant health, including coordinated pest management and pesticide risk reduction. The goal: building linkages to enable safe and sustainable food security at a local, national, regional and global level. The next such forum will be held in the Caribbean in 2015.

The Plantwise Knowledge Bank Team, CABI

In November 2014, Plantwise won the Open Data Award for Social Impact, celebrating innovation and excellence in the ways open data are used and published. Feeding nine billion people by the year 2050 is a challenge that can only be addressed through a spirit of collaboration and innovation. Plantwise's approach to collating and opening access to pest data could act as a new model for sharing the benefits and uses of information to improve lives, information that has not been available to farmers in rural communities until now.

In December 2014, the Swiss Agency for Development and Cooperation (SDC) invited Plantwise to join the Swiss Pavilion at the 2015 'Feeding the Planet' World Expo in Milan. Celebrating this great honour, the Plantwise programme will provide an interactive exhibition for the public, including a plant health game app, the 'Plant Doctor Game'.



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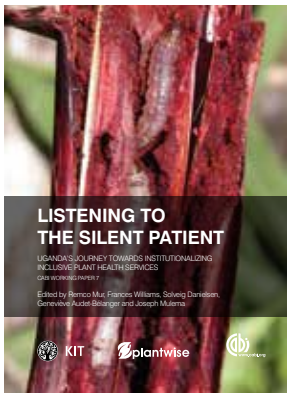
Download the FREE PDF of the first Plantwise book



This first Plantwise book reflects on over a decade of plant clinic implementation in Uganda, including the impressive evolution of the national plant health system and useful lessons for farmer-focused development projects everywhere.

	FARMERS REACHED	PLANT DOCTORS TRAINED	PLANT CLINICS	
2012	280,000	1,335	413	127 PARTNERS IN 24 COUNTRIES
2013	600,000	2,077	720	168 PARTNERS IN 31 COUNTRIES
2014	NEARLY 2 MILLION	3,591	1,413	201 PARTNERS IN 33 COUNTRIES
2020	30 MILLION FARMERS REACHED			

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Fostering innovation in soil health to change lives

In 2014, CABI continued leading the **Africa Soil Health Consortium (ASHC)** and the **Optimising Fertilizer Recommendations in Africa (OFRA)** project. The ASHC, financed by the Bill & Melinda Gates Foundation (BMGF), seeks to improve the livelihoods of smallholder farmers in Africa through better access to practical information about Integrated Soil Fertility Management (ISFM). OFRA, financed by the Alliance for a Green Revolution (AGRA), contributes to improved efficiency and profitability in fertilizer use.

Our work in partnership with more than 40 organizations, sharing knowledge about soil health, is changing lives. Veronica Victorice of Mtegowa Simba village in Tanzania now plays a new role in her family's farm and has a better relationship with her father – all thanks to a comic about soil health.

In 2012, ASHC commissioned a six-page story that was included in the Kenyan publication, Shujaaz, an award winning youth communication initiative. The aim was to see how young Kenyans could help share information on ISFM.

The comic featured a young woman, Malkia, and her grandmother reviewing options for planting maize. They looked at what their neighbours were doing and decided to apply three approaches – improved seed, fertilizer and manure. Through this, they discovered principles for managing soil fertility and growing better harvests.

In 2014, this comic was translated into Kiswahili and distributed by FIPS-Africa village-based advisers to16,000 smallholder farming families in Tanzania. But did it work?

After the harvest, FIPS-Africa talked to young people about the impact the comic had on their families and their farming practice. The results were interesting: the advisers noticed that in areas where the comic had been distributed (in addition to their extension activities) there was a 25% increase in smallholders following the recommendations for the correct crop spacing.

The comic also helped overcome gender stereotypes about women and farming and, in one case, brought a father and daughter closer together and helped them introduce new farming practices.

> It will help the country in mitigating the challenge before it becomes a countywide issue. If we can stop the problem, it will be a big achievement.
>
> **Martin Busobozi**, Agricultural Officer and Plant Doctor, Rwanda Agricultural Board

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In the past, Veronica saw her father as rigid and hard to engage with on important farming issues. But after reading the Malkia comic to him, they could now brainstorm crop production improvements.

"My dad and I engage in discussions freely, unlike before when he would wait to instruct me," says Veronica. "The comic led to discussions on maize farming."

As the two shared and compared the modern and traditional ways of planting, a special bond was building between father and daughter. Veronica explains: "Dad argued that there was no need to use fertilizer on our farms, only manure. I made him understand that it was necessary, because soils get depleted every season we plant."

Veronica remembers her dad's position on manure application before the comic and how his perspective changed after reading it. "It brought out the message so clearly that my dad and I easily understood the need for a combination of good practices, such as spacing, use of improved seed and planting one seed per hole as the core requirements for a good harvest." The practices helped reduce the time that Veronica spent weeding. And less weeding meant more time studying.

"We had conversations, just discussing Malkia, and I loved these discussions. I also had an opportunity to discuss my career with dad. He is really keen to ensure that I progress to university."

> The comic has helped me bond with my dad, I love the fact that we implemented things from the comic and they worked.
>
> **Veronica Victorice**, Mtegowa Simba village, Tanzania

Dad, Msise, is changing his farming practices: "After reading the comic, I bought the two kg of DK8053 [maize seed] for two reasons: one was that I had tried the seed on a five metre by five metre plot and liked its performance, and another because my daughter would help me refer to the comic as we implemented new things," says Msise.

Veronica has also been sharing the comic and spreading the news about new farming practices with her friends. Seven of them shared the comic so their neighbours also received these messages.

Shujaaz was launched in Tanzania in early 2015 and 200,000 copies of the comic were distributed for free, with stories on a range of topics, supported by radio, social media and text message, helping to inspire young people like Veronica to change their lives through agriculture.

Solving soil pest problems sustainably in Rwanda

Soil pests can have a devastating effect on the livelihoods of rural communities. Concealed underground, the pests can go undetected for a long time, causing substantial crop damage. But by bringing together people across the world who have knowledge of fighting soil pests, building partnerships and sharing ideas and innovations, sustainable solutions can be found and shared.

Over 90% of the population is dependent on agriculture for their income in Rwanda. In 2011, farmers in Rwanda experienced devastating crop losses due to a major outbreak of a soil dwelling white grub. With no other options available, they had been removing thousands of grubs by hand.

In 2014, CABI embarked on a two-year project to transfer technology from China to Rwanda. **The project** (www), financed by the AgriTT programme, was based on biological crop protection technology using insect-killing roundworms, or nematodes, to control soil pests in vegetable production.

The CABI team from China and Africa has been working closely with the Rwandan Agricultural Board to find nematodes in Rwanda that can be used to help prevent future losses from white grubs.

Together, the team has conducted 60 field surveys of soil insect pests, taken over 400 soil samples and found eight nematodes, which could potentially provide a solution.

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AgriTT

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MOA-CABI Joint Laboratory for Biosafety, China
Rwandan Agricultural Board

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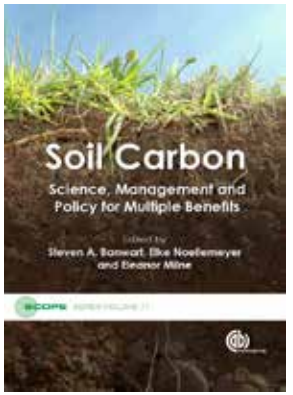
Relevant Publications



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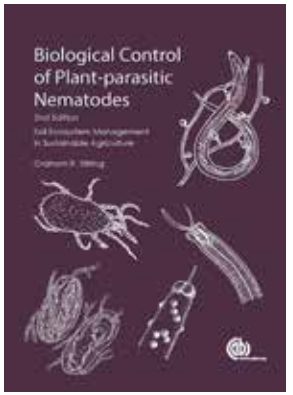

(www)

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"This is a new technology; a first in terms of using biological control to stop soil pests in vegetables in Rwanda. By the end of it, I believe it will have a positive impact in terms of vegetable production, increasing yields."

Bancy Waithira Waweru, Research Scientist, Rwanda Agricultural Board

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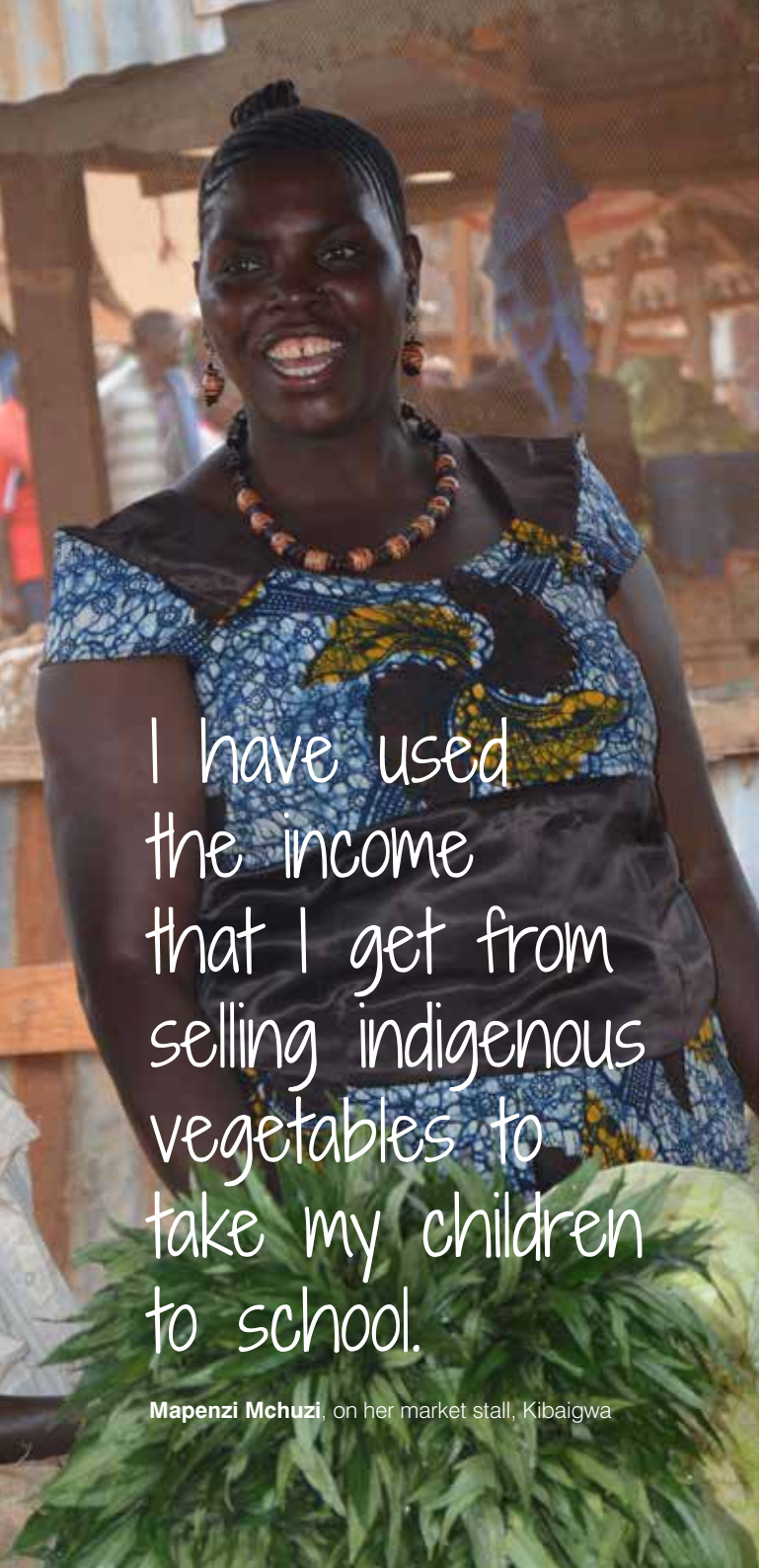

Mapenzi Mchuzi, on her market stall, Kibaigwa

Tackling poverty with AIV seed innovation

Vegetable market trader, Mapenzi Mchuzi, is a single mother of five children. She lives and works in the Dodoma Region of Tanzania. Like any mother, she wants to be able to put nutritious, healthy food on her children's plates, ensure they get a good education and safeguard their futures by making a steady income.

For smallholder farmers and market traders like Mapenzi, a new opportunity has arisen in the production and sale of **African indigenous vegetables (AIVs)** www. Rich in vitamins and minerals, awareness of the nutritional benefits of AIVs has grown amongst many African consumers, and so too has demand.

But the opportunities for people like Mapenzi are limited by a lack of access to good quality AIV seed and markets in which to sell the vegetables. A new innovative approach is helping to change the picture.

The CABI-led Good Seed Initiative helps address challenges that arise in Tanzania and Uganda throughout the AIV 'value chain' – the stages of producing, regulating and selling AIV seeds and produce. CABI is helping to bring people and organizations involved in this process together, through meetings and workshops. When they come together, best practice and innovative ideas can be shared, and mutually acceptable win-win ways found for everyone to benefit from the AIV opportunity.

Through these innovation meetings, seed companies discuss how to make improvements to the processes they use, seed growers reach out to markets in order to sell their seeds, and market traders connect to farmers growing vegetables.

CABI's work focuses on brokering or facilitating local innovation, largely by recombining existing approaches, knowledge and tools. We bring together a network of diverse partners, strengthening relationships and promoting AIV marketing.

In Central Tanzania, farmers have had limited access to quality seed due to their remote locations and the lack of seed companies in the area. To solve this problem, a less formal system for AIVs has been introduced, which provides local farmers with access to quality seed. CABI has been working to support these local level systems to help farmers access better seed and to become seed growers.

Antony Ngewe is an indigenous vegetable seed grower from Tubugwe Village, Dodoma Region, in Tanzania. Originally a vegetable grower, Antony received training to become a registered quality-declared seed grower. He supplies his seed to nearby vegetable growers, who recognize its good quality.

The project is also benefiting people like Mapenzi, helping her to build a stronger future. Thanks to the project, she sells nearly 500 kilos of vegetables a week.

"I am a single mother. I have used the income that I get from selling indigenous vegetables to take my children to school and I have also started building a house."

Mapenzi describes how she benefited from the innovation meetings in terms of access to new information and training, and connections to AIV producers. While attending an innovation meeting in 2014, Mapenzi met local farmers and dealers. The farmers at the meeting complained about there being no market for the vegetables they grew. But Mapenzi told them that at Kibaigwa market there was ready demand for their produce, especially during the dry season.

The farmers now sell to Mapenzi, who distributes to other sellers in the Kibaigwa market. She has a regular supply of two orders per week, but if there is a deficit of nightshade, for example, she can call a farmer directly to bring her more produce.

Since making these connections, she can supply bigger customers such as a local restaurant and a school with fresh vegetables. With her improved income, Mapenzi is able to comfortably pay for her children's education and finish building her house.

AIVs are improving food security and generating income for rural and urban communities in Africa. Ultimately, the aim is to hand over the role of innovation broker to local stakeholders, making this project truly sustainable and working towards the wider goal of improving livelihoods and nutrition in Tanzania.

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INADES-Formation Tanzania
Mukono Zonal Agricultural Research and Development Institute (MUZARDI)
National Crops Resources Research Institute (NaCRRI), Uganda
The World Vegetable Centre, Eastern and Southern Africa (AVRDC-ESA)

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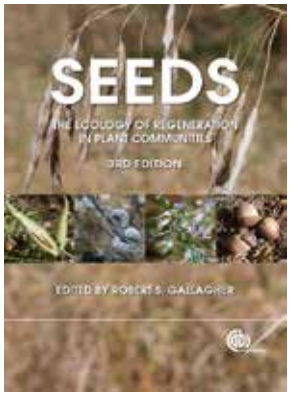

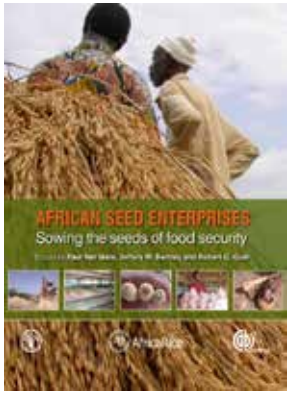

"The innovation meetings are the perfect place where stakeholders meet and interact. I have noticed during the meeting we have farmers and traders and agrodealers and other stakeholders, and when they come together, they exchange information."

Ruth Chiwanga, Seed Inspector, Mpwapwa District Council, Tanzania

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Since I received training and I have become a seed producer, I have got a lot of customers. This business is now in my blood. Personally, my family have benefited from this project through increased income and in a way just made me famous in the village because they know that I sell to them good quality seed.

Antony Ngewe, Indigenous Vegetable Seed Grower, Tubugwe Village, Dodoma Region, Tanzania

COMBATING THREATS TO AGRICULTURE AND THE ENVIRONMENT

Invasive species are costing people's lives. But despite this, the problem isn't getting the attention it should. By invasive species we mean non-native insects and plants, for example, that take over natural habitats. They occur all over the world and in many places they're getting worse – especially in developing countries where people don't have the resources to tackle them and are totally dependent on natural resources for their livelihoods.

The sad thing is, there's a solution and we can do something to make life easier for them. But lots of people just don't see invasive species as a problem. Maybe that's the real problem. If we take action and apply science, we can go a long way to solving it. If we don't do anything, the future looks bleak for communities living with invasive species.

Carol McNamara, Executive Director, Commercial

If we don't do anything, the future looks bleak for communities living with invasive species.

Invasive species, the threat to livelihoods

"In the beginning the maize used to be healthy, the soil was fertile. But now, with time, the soil fertility has gone down and the yields have declined. We are not able to control this weed (chromalaena) because it is very aggressive."

Robie Fidely, Farmer, Sirusimbia Village, Kenya

"When I started harvesting the tomatoes and taking them to the market, customers said they had too many spots and were no good. I would say I have suffered losses amounting to 90% (due to the invasive insect Tuta absoluta). I have no other source of income. I was relying on this crop to feed my family."

Elias Kamuga, Farmer, Mount Kenya Region, Kenya

"No grass grows underneath the prosopis (invasive weed), so the livestock from the village are eating the prosopis instead. But its thorns are poisonous and animals are dying. There is less land available for grazing, which is fuelling conflict between families and driving people to move to escape the weed."

Grace Kiseku, Assistant Village Chief, Lake Baringo, Kenya

Invasive species are a global problem – a livelihoods problem. Invasive species not only threaten biodiversity, they also cause economic losses, threaten crop and pasture production, and impact on human health.

Invasive species have been identified as the second greatest threat to biodiversity after habitat loss. (Vitousek *et al*, 1996)

The estimated damage from invasive non-native species worldwide is more than $1.4 trillion per annum. (Pimentel *et al*, 2001)

All around the world, millions of people living in rural communities face similar problems with invasive plants, insects, diseases and animals that are out of control and are threatening their livelihoods.

"They understand that there's a problem with invasives, they just don't know what to do, or where to get more information, or who's responsible. They feel helpless. They see the land destroyed and they know they face a massive challenge."

Simon Choge, Principal Research Scientist, Kenya Forestry Research Institute (KEFRI)

Parthenium is colonizing our fields. Now when we plant potatoes we have to weed the crop three times, where before we only used to weed once. Because the weed is poisonous, livestock won't eat it as fodder and the weed is rapidly taking over large tracts of land.

George Achilla, Farmer, Kikopey, Kenya

George Achilla, tending his fields

Tackling the problem: CABI's action plan

Plant and animal species are introduced to countries in many different ways, with some establishing and spreading quickly. But with the right interventions – prevention, early detection and mitigation – they can be managed and livelihoods can be protected.

CABI has been working on invasive species for over 100 years. We research and implement workable approaches to tackling the biggest threats.

By working in partnership and applying scientific expertise, we can put in place sustainable solutions that tackle invasive species and protect people's livelihoods. This includes natural control methods or classical biocontrol, where natural enemies of the invasive species such as host specific and damaging insects are used to control its spread.

In 2014, we released a cochineal bug to control the invasive cactus, *Opuntia stricta*, in Laikipia, Kenya, which was reducing available pasture, impacting on livestock health and forcing pastoralists from their land. We predict the cochineal will bring about more than a 90% reduction in cactus abundance. Land prices are already increasing again as the grazing lands begin to be restored.

We also worked on the biocontrol of parthenium in Tanzania – a really tough weed to control, which may need the release of more than one natural enemy in order to bring about a significant reduction in its spread.

We investigated ways to protect post-harvest grain stores in Ghana and Tanzania from invasive pests like the larger grain borer. This insect can account for over 60% post-harvest losses. We are developing natural biopesticides to help tackle this pest problem.

We also undertook socio-economic surveys focusing on five invasive plant species in four countries in eastern and southern Africa, providing good baseline data on the impacts of invasive species on livelihoods.

And we are interested in confirming whether there are links between increased incidences of malaria in areas dominated by certain invasive plant species.

Making a difference in South East Asia

In 2014, CABI, together with United Nations Environment Programme (UNEP) and in partnership with national agencies in Cambodia, Indonesia, Philippines and Vietnam, continued work on **a project to manage invasive species in the forests of South East Asia**. In Indonesia, the project, amongst other activities, aims to develop best management practices for the invasive plant, *Acacia nilotica*, which is having a devastating impact in Baluran National Park on the island of Java.

Acacia has taken over the landscape. It has displaced valuable forage plants and is threatening the survival of wildlife species like the endangered banteng cow, as well as domestic cattle. It is also destroying the islanders' coffee plantations.

CABI's involvement in the project includes the development and implementation of integrated management strategies, of which biocontrol is a key component. In the case of *Acacia nilotica*, a moth larva, *Chiasmia assimilis*, is being considered for introduction. These larvae only eat the leaves of Acacia and cannot survive on other plants or crops.

Watch Gracia Paramitha, a Youth Ambassador for UNEP, discover more about this problem and the impact that invasive plants are having on crop production and farmer livelihoods.

"The invasive alien plants not only affect the banteng and its ecosystem. They also have a negative impact on our economy."

Gracia Paramitha, Youth Ambassador, UNEP

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Managing invasives in South East Asia

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Department of Environment and Natural Resources, Philippines

Environment Administration, Ministry of Natural Resources and Environment (MONRE), Vietnam

Foreign Assisted and Special Projects Office (FASPO), Philippines

General Department of Administration for Nature Conservation and Protection (GDANCP)

Ministry of Environment, Cambodia

Ministry of Forestry, Indonesia

United Nations Environment Programme (UNEP)

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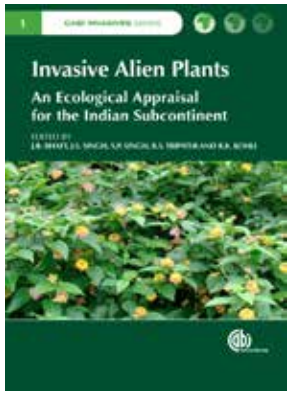
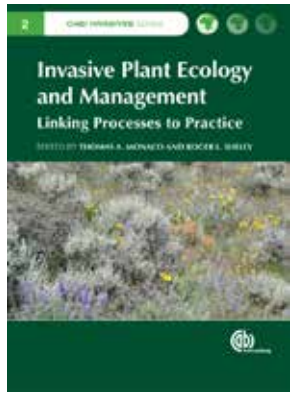
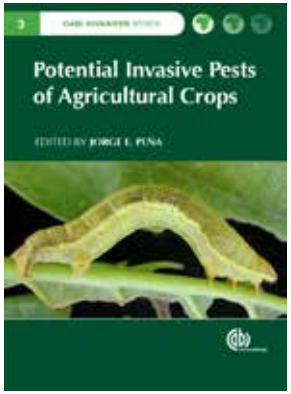
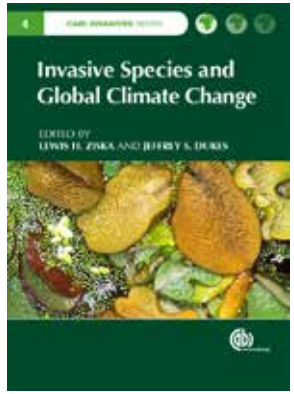
CABI in Malaysia

Relevant Publications









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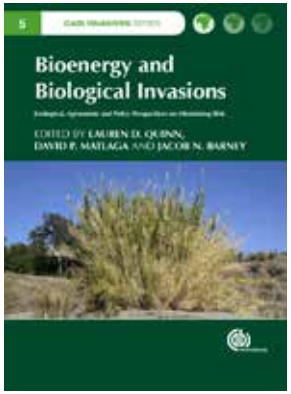

VIDEO AND WEB LINKS WILL TAKE YOU TO AN EXTERNAL WEB PAGE

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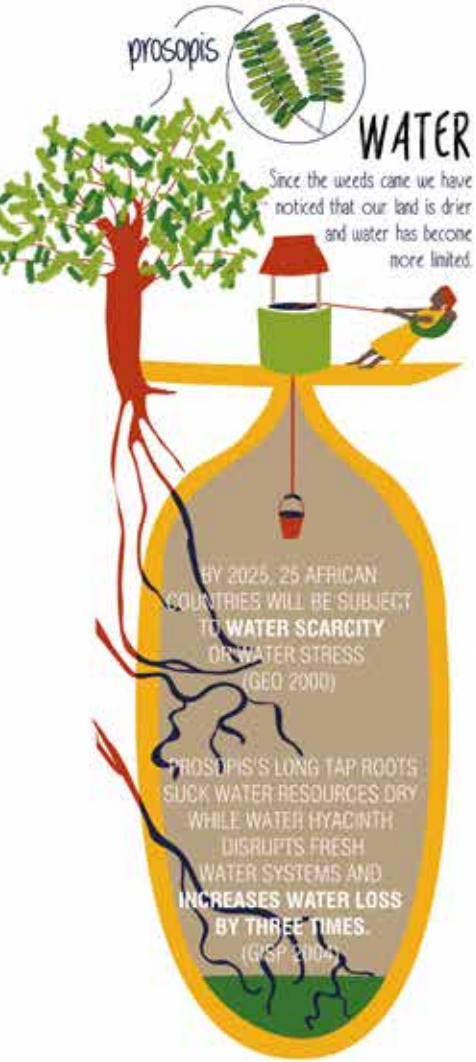
PEACE'S STORY

INVASIVE SPECIES AFFECT OUR LIVES IN MANY DIFFERENT WAYS

I am Assistant Head of my village and live here with my children and husband. We have a small plot of land where we grow crops and rear animals to sell at market.



WATER

Since the weeds came we have noticed that our land is drier and water has become more limited.

BY 2025, 25 AFRICAN COUNTRIES WILL BE SUBJECT TO **WATER SCARCITY** OR WATER STRESS (GEO 2000)

PROSOPIS'S LONG TAP ROOTS SUCK WATER RESOURCES DRY WHILE WATER HYACINTH DISRUPTS FRESH WATER SYSTEMS AND **INCREASES WATER LOSS BY THREE TIMES.** (GISP 2004)

CROPS

I need all the help I can get to keep the weeds at bay, so I have to get my children and my friends to help, otherwise my crops are smothered. What plants remain are being destroyed by the insects!

LIVESTOCK

The plants our animals graze on are being choked by these weeds. They try and eat the weeds instead but some of them are poisonous or have thorns. Our animals are dying.

EDUCATION

Because we have less to sell now, it's harder to send our children to school and live well.

CONFLICT

The weeds are forcing our friends to abandon their land and move. But land is limited and it is causing conflict between people.

NATURAL RESOURCES

Our environment used to provide us with materials to build with, food for our animals and traditional medicines. But now the weeds mean we can't get to them or they have smothered the plants we need.

HEALTH

Our animals and village members are getting sick from these plants – some are poisonous and some cause skin allergies and asthma.

We are not alone in our suffering, many people across the globe have similar problems to ours from invasive weeds and pests.

Coffee and climate change: the future has arrived

Climate change is often thought of as a future challenge, one that we will have to face in the next few decades. However, climate disruption is already causing substantial losses to crops including coffee crops in places such as Brazil, Central America, Colombia, Tanzania and Vietnam. The future has arrived; the problem is now.

"In recent times, the rainy season has not been consistent. It rains for a week, stops for a week, starts again for another week."

El Salvadorian Farmer from Chalaltenango, Metapán

"The weather no longer meets my expectations."

Vietnamese Farmer from Cu M'gar, Vietnam

Farmers have adapted to past climate shocks. Brazilian coffee production moved further north after the severe frosts of the mid 1970s, but these new areas are more drought prone. Other farmers are moving further up mountainsides or experimenting with more trees that provide shade.

We can learn from these activities, but what is needed now is a more comprehensive and systematic approach to these problems.

Two principal factors affect farmers' incomes: climate and market price volatility. In recent decades, coffee farmers have been faced with long periods of low market prices; now they have to contend with increasingly adverse growing conditions as well.

The **initiative for coffee & climate (c&c)** aims to develop a toolbox for coffee farmers and step-by-step guides on how they could protect and improve their yields in the face of climate change. This innovative toolbox is a compilation of methodologies, guidelines and training materials. They aim to foster the development of networks of relevant stakeholders in the field who can support farmers by enabling them to adapt. It is anticipated that over time this initiative will build a complete system to help farmers make difficult decisions about future investments, either in coffee or other crops.

Within the pilot, c&c has developed a systematic and participatory methodology to enable coffee farmers to respond better to climate change. The aim is that coffee farmers and service providers can develop the adaptation options they need within a given context in order to make coffee production systems more resilient to climate change and to build local adaptive capacity.

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By working in partnership with those in the coffee production chain, the c&c step-by-step guide is designed to be used mostly by extension workers and those doing near-to-market, practical research. A key output of the initiative is the c&c five-step process, which introduces climate change adaptation at the farm level, helping farmers and those who support them put theory into practice.

Pilot projects in countries like Brazil, Central America, Tanzania and Vietnam are already underway and are proving to be beneficial for those involved.

In Vietnam, the initiative worked with farmers to help them introduce ways to reduce irrigation without compromising yields.

In Tanzania, a pilot project is testing different adaptation methods for improving soil health and coffee crop yield. By replacing dry mulch with live mulch, extension workers in the area hope to improve infiltration and soil moisture, as well as soil structure and fertility, and minimize soil erosion.

Similar work in Central America has shown that a mulch layer reduces peak soil temperatures by as much as 10°C, to an operating range where feeder roots no longer suffer heat damage. An encouraging sign of success is technology diffusion: non-project farmers are observing and copying from our field trials.

We have positive indicators that changes in farmer practices are beginning to happen. Maiko Roba from Tanzania talks about beneficial changes he made to his farming practices after working with c&c:

"My field plot is elevated so water runs off and washes out the soil and its nutrients. In November last year, I did a trial in my field plot by digging five basins in a zigzag way in between the coffee trees. The basins created by this new way of digging provided the plant roots with more water. The coffee leaves look healthier now. After seeing positive impacts, I decided to dig the whole plot like this."

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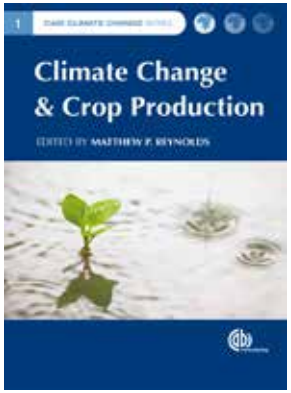
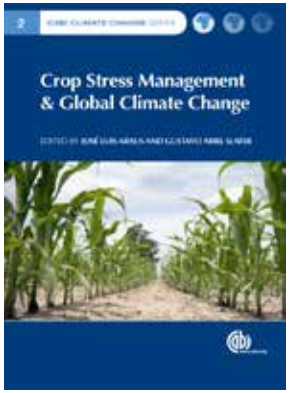
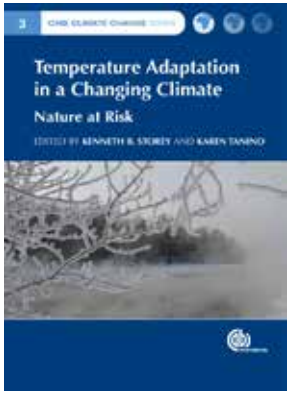
Tchibo GmbH
Tim Hortons

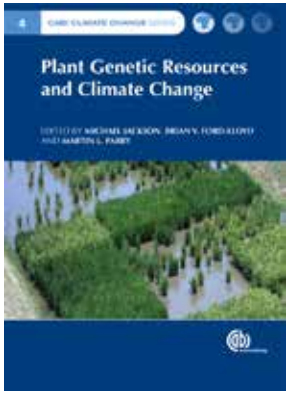
LEAD CABI CENTRE
CABI in the UK

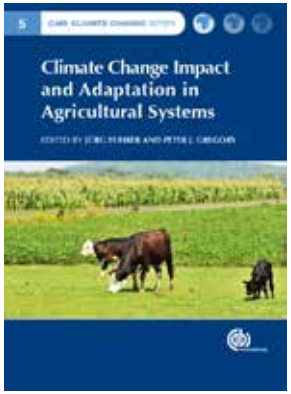
Relevant Publications











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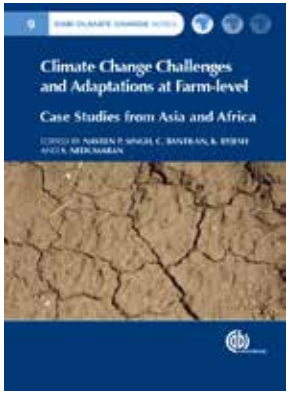

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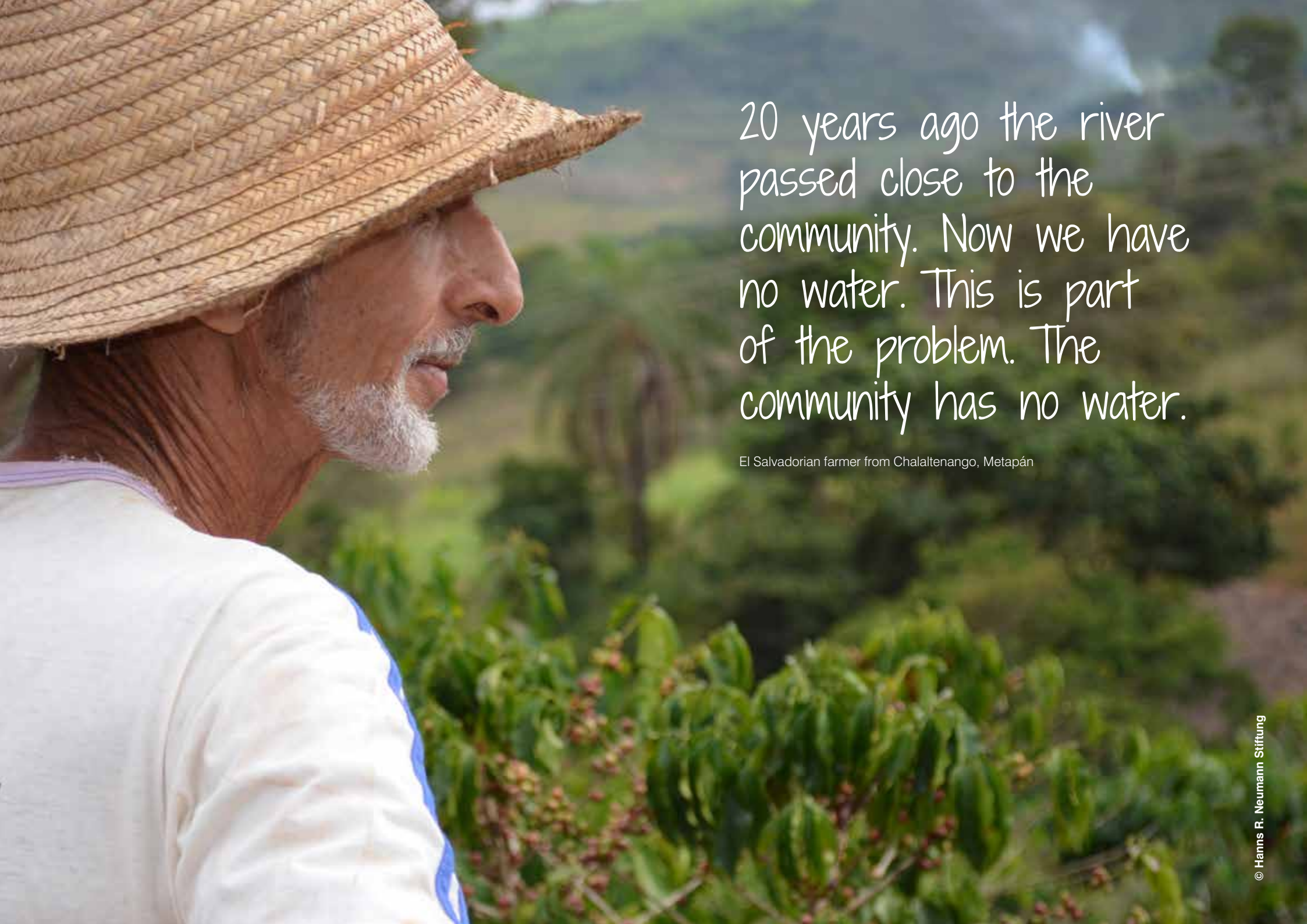

Thank you

CABI's ability to improve lives worldwide is made possible by the generous contributions of the many members, donors and partners we work with. For this, we want to say a big thank you.

Your ongoing support has enabled us to help …

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UKaid
from the British people

BILL & MELINDA GATES foundation

Ministry of Foreign Affairs of the Netherlands

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GLOBAL ENVIRONMENT FACILITY
gef
INVESTING IN OUR PLANET

Irish Aid
Rialtas na hÉireann
Government of Ireland

Australian Government
Australian Centre for International Agricultural Research

IFAD

defra
Department for Environment Food and Rural Affairs

STDF Standards and Trade Development Facility

Ministry of Agriculture People's Republic of China

Landcare Research
Manaaki Whenua

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Financials


35
30
25
20
£m
15
10
5
0
2010
2011
2012
2013
2014
income from ID
income from publishing
income from other sources
operating surplus

Statement of comprehensive income

for the year ended 31 December 2014

	2014 £'000	2013 £'000
continuing operations		
income		
sales and project income	29,667	26,274
member contributions	1,192	1,192
CABITAX recovery	1,283	1,177
miscellaneous income	93	99
	32,235	28,742
expenditure		
staff costs	(8,911)	(8,183)
direct project costs	(14,773)	(12,124)
production	(3,142)	(3,111)
facilities and maintenance	(1,406)	(1,396)
sales and distribution	(647)	(717)
travel	(632)	(733)
depreciation and leasehold amortization	(629)	(622)
consultants, freelancers	(449)	(387)
restructuring costs	(65)	(233)
provision for arrears of Member Country contributions	(64)	(52)
associated company (loss)/profit	57	(12)
other costs	(624)	(431)
	(31,285)	(28,001)
operating surplus before interest	**950**	**741**
interest receivable	65	69
	65	69
operating surplus for the year	**1,015**	**810**
other comprehensive income/(deficit) items that may be subsequently reclassified to operating surplus/(deficit)		
cash flow hedges	(242)	90
movement between funds	(150)	(150)
other losses on defined benefit pension schemes	(8,207)	(2,350)
	(8,599)	**(2,410)**
total comprehensive deficit for the year	**(7,584)**	**(1,600)**

Financials

As you have heard from the Chair and CEO, CABI enjoyed another strong financial performance in 2014. In addition to the growth in revenue and operating surplus, we again generated cash of around £2m and our net cash deposits stood at £11.6m at the end of the year. Although since 2013 we have had to include the full value of the UK pension fund deficit in our balance sheet, in all other areas our balance sheet is strong and, excluding the impact of the pension fund liability, we would have net reserves of over £12m.

We have continued to improve our risk management and control processes. Our internal auditors, BDO, confirmed their "moderate assurance that there is a generally sound system of internal control" and we passed a major 'Pillars Assessment' carried out by KPMG on behalf of the EC.

We have focused considerable attention on our carbon footprint and in 2014 for the first time set ourselves a target of a 5% reduction over the year. I am pleased to report that in fact we reduced our carbon usage by 13%.

During the year, we reached agreement with Cala Homes on the redevelopment of our headquarters site at Wallingford in Oxfordshire. As previously reported, this development will be entirely self-funding and will provide CABI with a first class, environmentally efficient, headquarters for the future. A full planning application is due to be submitted in June 2015, although we already have outline consent for our office building.

I will be stepping down as CFO in 2015, handing over my finance responsibilities to Rob Sloley, our Finance Director, but I will continue at CABI to manage the redevelopment project until the new office is completed.

Ian Barry, Chief Financial Officer

Statement of financial position

for the year ended 31 December 2014

	2014 £'000	2013 £'000
assets		
non-current assets		
land and buildings – held at revalued amounts	10,207	10,169
plant and equipment – held at cost	1,525	1,318
intangibles – held at cost	132	99
investments accounted for using the equity method	366	309
	12,230	11,895
current assets		
inventories	1,538	1,741
trade and other receivables, net of provisions:		
– sales receivables	1,878	1,463
– sums owing by project sponsors	1,330	713
– from Member Countries	-	190
other financial assets:		
– derivative financial asset	-	137
– cash and cash equivalents	11,636	9,917
other receivables	1,757	1,325
	18,139	15,486
total assets	**30,369**	27,381
equity and liabilities		
equity		
revaluation reserve	(1,921)	(1,921)
cash flow hedges	105	(137)
designated fund	(150)	(298)
accumulated fund	47,862	40,520
total equity	45,896	38,164
liabilities		
non-current liabilities		
post-employment benefits	(58,051)	(49,844)
	(58,051)	(49,844)
current liabilities		
sales income received in advance	(3,572)	(3,989)
sums held on behalf of project sponsors	(11,013)	(9,322)
trade and other payables:		
– trade payables	(1,622)	(633)
– other payables	(1,902)	(1,757)
other financial liabilities		
– derivative financial liability	(105)	–
	(18,214)	(15,701)
total liabilities	(76,265)	(65,545)
total equity and liabilities	**(30,369)**	(27,381)

Statement of cash flows

for the year ended 31 December 2014

	2014 £'000	2013 £'000
cash flows from operating activities		
cash generated from continuing operations	2,561	4,082
net cash generated from operating activities	2,561	4,082
cash flows from investing activities:		
payments to acquire tangible fixed assets	(857)	(1,729)
payments to acquire intangible assets	(77)	-
loss on disposal of property, plant, equipment	27	-
interest received	65	69
net cash used in investing activities	(842)	(1,660)
net increase in cash and cash equivalents	**1,719**	**2,422**
NOTES TO THE CASH FLOW STATEMENT		
(i) reconciliation of operating surplus to net cash inflow from operating activities		
operating surplus before interest	652	639
depreciation charges	629	622
share of associated company (profits)/losses	(57)	12
decrease/(increase) in inventories	203	(180)
(increase)/decrease in trade and other receivables	(842)	658
increase/(decrease) in trade and other payables	1,134	174
increase in income in advance	1,274	2,510
(increase) in other receivables	(432)	(353)
	2,561	4,082
(ii) movement in net cash during the year		
net cash at 1 January	9,917	7,495
net cash at 31 December	11,636	9,917
movement in net cash during the year	**1,719**	**2,422**

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CABI staff

Our people are our greatest asset – they're at the heart of everything we do. It's only with the determination and dedication of our people that we can deliver great results and make a real difference to lives around the world.

We are proud that over 400 staff working from more than 20 locations globally provide huge amounts of expertise in many fields, and we are equally proud that CABI encourages and invests in development and learning throughout the organization.

Neil MacIntosh, Executive Director, HR

Staff publications in 2014

104 scientific publications

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