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The CABI Development Fund (CDF)

Mid-term report to DFID

2011-12

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KNOWLEDGE FOR LIFE

CABI improves people's lives worldwide

by providing information and applying scientific expertise to solve problems in agriculture and the environment

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KNOWLEDGE FOR LIFE

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For further information about any of the projects outlined in this report, or to request the more detailed reports available for some of our activities, please contact Janet Stewart, Project Development Director (**j.stewart@cabi.org** T: +44 1491 829464)

CABI and the CDF

CABI is an international not-for-profit organization.

Its mission and direction is influenced by its 47 member countries who help guide the activities undertaken.

through our work:

- smallholder farmers are lifted out of poverty: they lose less of their crops to pests and diseases, improve crop quality and yield, and sell their produce for better prices
- extension workers can give better advice on agricultural practice
- researchers and policymakers have the information they need to develop strategies to support agriculture and the environment, and to improve livelihoods

CABI's activities contribute directly to achieving global development objectives, particularly those concerned with poverty reduction, environmental sustainability and partnership for development. Our governance structure not only reviews and reports on performance and cost efficiency, but also ensures that our core values of integrity, objectivity, excellence, leadership and accountability underpin everything we do.

CABI's international development work in the fields of agriculture and environment is diverse and multidisciplinary, but may be broadly grouped into four areas which define our strategic direction:

supporting farmers

CABI's principal focus is on plant health, and a key element of this work is Plantwise, which is:

- helping countries establish community-based plant clinics which deliver practical advice to farmers when their crops have a problem.
- helping to connect the research community and farmers, by translating researchers' knowledge into practical, accessible advice.
- bringing together the best of the knowledge in the plant health field, including local pest distribution data, and making it freely available from a central resource.

improving food security

CABI is working on a number of initiatives that aim to improve food security and the lives of the rural poor. CABI projects deal with a variety of commodity crops, empowering smallholder farmers to improve the quality of their seeds and crops, to access markets more effectively, and to retain a greater value share.

protecting biodiversity

CABI has a number of programmes that reduce the spread and impact of invasive weeds and insects on agricultural crops and the natural environment. We have a wide range of projects using classical biocontrol methods to control weeds and insect pests. Other initiatives address options for the prevention, control and management of biological invasions, from national and international policy processes to practical on-the-ground interventions.

sharing knowledge

CABI has unique experience in creating, managing and communicating scientific knowledge in the agricultural and environmental sciences and public health.

We promote effective communication of agricultural and environmental knowledge between farmers, extensionists, researchers and other stakeholders, including the use of new technologies. We have also developed expertise in designing, building, managing and maintaining global and institutional knowledge management tools. Our scientific publishing products include books, e-books and a wide range of multimedia tools as well as the world's foremost agricultural database, CAB Abstracts.

global reach and local knowledge

Our activities are carried out through our network of global offices:

Africa	**Americas**	**Asia**	**Europe**
Kenya	Brazil	China	Switzerland
	Costa Rica	India	UK
	Trinidad & Tobago	Malaysia	
	USA	Pakistan	

The CABI Development Fund (CDF) is used to implement scientific research and development projects that respond directly to the needs of our 47 member countries, with the aim of working towards the Millennium Development Goals and therefore the aims of the Fund's supporters. CDF funding may be leveraged and is often co-financed, either by donors or through commitments from institutions in our member countries, creating active partnerships to deliver our joint goals and creating greater impact in key areas of agricultural development.

Currently the fund is supported by:

- Department for International Development
- Swiss Agency for Development and Cooperation
- Australian Centre for International Agricultural Research
- Government of China

This interim report describes all activities funded by the CDF during the period April to September 2011. The Fund is treated as a single entity supported by the four contributing donor organizations, so the work described here is the composite output from all four funding sources.

lose less, feed more: CDF initiatives in 2011

supporting farmers (see pages 10-15)

A strong element of CABI's work worldwide relates to plant health, and to helping farmers to lose less of their crops to pests and diseases. We help farmers to improve crop quality and yields, thus contributing towards poverty alleviation and increased food security. Plantwise is CABI's flagship plant health initiative. Launched in 2010, Plantwise supports national and regional plant health systems through an expanding network of plant clinics run by extension providers in developing countries, supported by the creation of a global plant health knowledge bank. Plantwise is aided through a major part of DFID's and SDC's support to the CDF.

improving food security (see pages 16-20)

CABI aims to ensure that subsistence and smallholder farmers have access to and benefit from the outcomes of scientific research. We translate research findings into practical, accessible information that can have a direct, positive impact on their livelihoods, particularly with regard to food security. By advising on trade and quarantine issues and good agricultural practice (GAP), we empower farmers to access higher value markets for their produce. At the request of our member countries, we are developing a strategy on sanitary and phytosanitary (SPS) issues that will enhance our ability to strengthen SPS capacity in developing countries, enabling them to more effectively exploit the opportunities provided by trade. CABI's cocoa and coffee projects in Southeast Asia aim to increase production for smallholder commodity farmers by reducing the losses caused by pests and diseases. In Cameroon, improved processing facilities will enable smallholder coffee farmers to bring a higher quality product to market. Meanwhile, a new project in 2011 on revitalisation of the cocoa industry in the South Pacific is promoting improvements in both production and post-harvest practices to give smallholder farmers better access to lucrative global markets for high quality fine flavour cocoa.

protecting biodiversity (see page 21)

CABI's work on the prevention, control and management of biological invasions protects both agricultural crops and native ecosystems against the threats posed by alien invasive species. The Global Environment Facility (GEF) project on invasives in the Caribbean, co-financed through CDF since 2009, aims to protect valuable native biodiversity by strengthening national quarantine systems and implementing practical measures to contain and manage a range of invasive species.

sharing knowledge (see pages 22-24)

Improving farmers' access to knowledge is key to effecting positive change and improving rural livelihoods and food security. We use information communication technologies (ICTs) to make agricultural and environmental information available to farmers and extension providers as well as government policy makers and the wider development community. CDF funding supports the Direct 2 Farm project in India which uses mobile phones as the vehicle for information dissemination to farmers and extension workers. The fund also promotes African buy-in to CABI's Invasive Species Compendium (ISC) by supporting the participation of the Forum for Agricultural Research in Africa (FARA) in the ISC consortium. In 2011, we have also continued to use CDF funds to support CABI's Biofuel Information Exchange, which provides an authoritative and impartial forum for the debate on biofuels.

evaluating impact (see pages 26-27)

In response to requests from our donors, as well as internal science reviews, CABI is investing CDF funds in a programme of impact evaluation to demonstrate how investment in CABI activities is contributing to the realization of development goals. By building a solid body of evidence on our effectiveness in meeting project goals, CABI is appraising its investment performance and its accountability to its core mission. In 2011, we continued work on evaluation of plant clinics in Uganda, which started last year. We are also evaluating our horticulture projects in Pakistan, and extending our assessment of CABI's Good Seed Initiative, which focused on Bangladesh in 2010. We are examining work on seed systems, particularly for vegetables, in Africa.

communication and partnerships (see pages 28-30)

CDF funding has enabled CABI to work in partnership with the Chinese Government through the Joint Laboratory for Biosafety in Beijing, as well as to engage with a wide range of development partners in new initiatives. We have also used CDF funding to disseminate the results of our work through peer-reviewed journals and at major international conferences, with an emphasis in 2011 on empowering scientists at our regional centres to present their research in high quality journals.

Plantwise

The Plantwise programme is the key development programme run by CABI with its success underpinned by the financial support of the CDF. The collaborative programme to support farmers by delivering practical plant health advice and strengthening national extension service, now involves over 70 locally-based organisations. These include farmer associations, universities, technical institutes, NGOs, local departments of agriculture, government ministries and some private companies. Working together, such organisations are beginning to enable the formation of national plant health systems, including regular plant clinics operated by local, CABI-trained, staff.

As of July 2011, over 180 clinics were operating regularly, disseminating advice to rural farmers which helped them increase productivity. Successful take-up and usage is evident early on: clinics only began in Kenya in 2010, and already 18 are being held regularly. In the first six months of working in Kenya, over 4,000 treatments were prescribed, helping those farmers lose less and feed more.

New clinics are now running in Suriname, with advanced plans to launch in Cambodia and the Caribbean. Meanwhile pilot clinics have also commenced in Pakistan, Peru and Rwanda. CABI has held a series of internal workshops to define or update protocols and procedures, and to train a broader cohort of CABI staff as plant doctor instructors, in readiness for an increase in the expansion of clinics in multiple countries in 2012 and beyond. Overall, CABI has set a target of reaching five million farmers through Plantwise support to countries over the next five years.

Impact on livelihoods and quality assurance remain core drivers for Plantwise. Newly-defined data capture and validation procedures ensure that plant doctors are recording the necessary qualitative and quantitative information to enable us to prepare reports and provide the country concerned with valuable pest and disease status information. An impact study on the quality of advice given in Uganda will be published imminently. Our revised standard operating procedures and training modules now clearly set out the expectations of clinics and doctors, to ensure maximum outreach to both female and male farmers, and to standardize the quality of advice given, hours of operation and ethical policy.

The plant doctors need access to the latest research insights and support materials. The information can also be repurposed and passed on to farmers. We are continuing to identify content partners who can provide information and data to be integrated into the Plantwise knowledge bank. Fact sheets from various CG centres and other authoritative sources have been supplemented by several hundred farmer-validated factsheets written by extension workers in workshops run by CABI staff, as well as other newly digitised sources, such as seed health sheets from East West Seeds.

The requirements for the next phase of the knowledge bank are now fully defined after extensive market research and the database is being built in readiness for its release in 2012. Its initial focus will be on supporting plant doctors and clinics, providing plant health identification tools and pest and disease treatment advice. It will also provide geo-specific distribution maps with geographic detail of distribution previously not seen. In the interim, an open access prototype containing information on over 2,500 pests has been released for testing by users. The prototype is available on the newly designed website, **www.plantwise.org**.

supporting farmers

Plantwise clinics supporting plant health systems

The number of countries currently running plant clinics has increased to 15 and there are now over 180 running regularly (Table 1). More than 70 organisations run or support plant clinics, a broad measure of the increased commitment by public, civil society and private organisations to improving advisory services. During the reporting period, training courses were held for plant doctors in nine countries. Nearly 1,000 people have now attended Module 1, the introductory course on 'How to become a plant doctor', since it was first held in 2005. Module 1 plays a vital role in explaining the potential of plant clinics and getting buy-in from individuals and their organisations, as shown with the start of plant clinics in Suriname. Another successful new start-up was Rwanda. In-depth discussions with senior government officials in agriculture from the outset have ensured a close integration of plant clinics with existing extension roles and activities.

The increasing involvement of governments in Nepal and Kenya is a good sign of the widening official involvement in the development of **plant health systems** - an approach that is now a central part of Plantwise strategy. Current work in all countries with plant clinics is looking carefully at how they fit within a wider framework (Figure 1) that attempts to link extension, research, input supply and regulation. Table 1 summarises the types of engagement by country, and general progress in establishing a plant health systems approach.

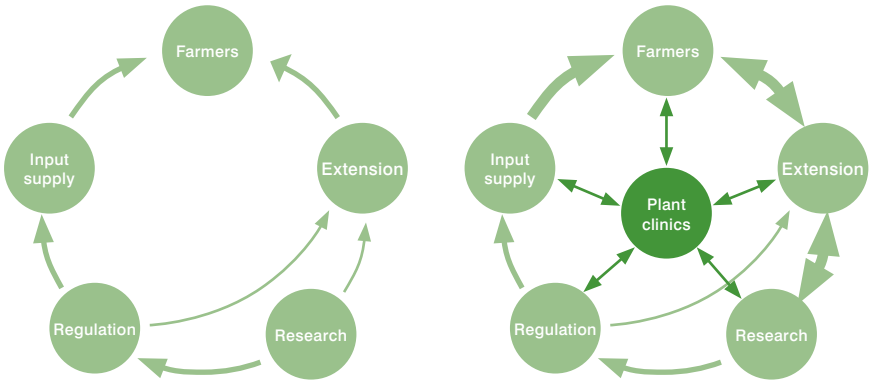

Fig 1. Interactions between components of a plant health system with (B) and without (A) plant clinics
The width of the arrows shows the strength of interactions. Extension includes public, civil society and private providers; Research includes institutes, universities (and diagnostic labs); Input supply means agro-dealers and their trade associations; Regulation refers to the Ministries of Agriculture and phytosanitary bodies [prepared by RR, PT, EB]

Plant clinics are an entry point and catalyst for establishing links and creating interdependencies that increase the reliability and stability of advisory services. Further work has begun to explore how these links function, why interdependencies benefit sustainability and how a plant health systems approach reduces reliance on project interventions. Public investment is needed to ensure continuity of advisory services, and our experience so far in Kenya shows that this is a realistic prospect - provided plant clinics are accepted and valued by public extension providers and that requests for funding are part of budget planning.

In Sierra Leone new investments have helped train new plant doctors and plan for 14 more plant clinics in one region. Progress in Sierra Leone and the Democratic Republic of Congo has been remarkable compared to the situation before the plant clinics started. Innovative mechanisms are being used in North Kivu to increase coverage of nine plant clinics to include over 6,000 (organic cacao) farmers registered with Esco, the private company that runs the plant clinics in the Democratic Republic of Congo.

supporting farmers

Table 1 Status of plant clinics and preliminary indicators of plant health system development in 15 countries

Country	Clinics	Links to agro-dealers	Diagnostic support	Regulatory bodies	Diversity of clinic organisations and general notes
Bangladesh	19	++			Broad range of extension providers involved and innovative approaches developed. Government involvement needs to improve
Bolivia	20	++	++	+	Broad range of organisations involved, from national to provincial levels
DR Congo	15				Poor plant health infrastructure and national government absent. Excellent progress with private company
India	6	++	+		Clinics run by private companies. Strong interest by Karnataka State
Kenya	18		+	+	Good all round engagement and effective collaborations with extension via information desks
Nepal	12	+		+	Strong involvement of Ministry of Agriculture
Nicaragua	8	++	++	++	Plant health system approach formalized
Pakistan	4				Clinics just started
Peru	5		+	+	Clinics just started
Rwanda	5			+	Clinics just started, good engagement with government
Sierra Leone	27	+		++	Poor infrastructure but strong engagement with Ministry of Agriculture
Sri Lanka	20		+	+	Effective coordination of diverse clinic organisations by Department of Agriculture via research institute
Suriname	2	+	+	+	Just started
Uganda	21	+	+	+	Plant health system approach applied; plant clinics official policy of Ministry of Agriculture
Vietnam	1	+	+		Small scale scheme
Total	**182**				

+ work with plant clinics, but weak or irregular engagement; ++ regular links

supporting farmers

Evidence of clinic successes has helped attract new investments in Karnataka, where a private company running clinics (BCRL) has run plant doctor courses with funding from the state Department of Agriculture for over 400 people from grassroots organisations. New opportunities have also arisen to establish extensive networks of plant clinics. BCRL and Esco in North Kivu are two vibrant examples of companies using plant clinics successfully to support constituent farmers. Plant clinics are valued by the companies because they demonstrate support for customers. The clinics gather systematic information on performance of products (BCRL produces biopesticides) and on pest and disease status of key commodity crops (e.g. cacao), the core business of Esco.

In Uganda the numbers of public extension providers wanting to establish more clinics has increased in response to official (government) sanction for clinics, now enshrined in policy. This small step has made a dramatic difference, encouraging many of the providers to become involved in establishing local clinics. Innovation is often hindered unwittingly because official approval is needed (or perceived to be necessary) for new actions by staff. This no longer applies to plant clinics in Uganda and opens up many new opportunities to expand networks and build a supportive and effective national plant health system.

The Universities of Copenhagen and Makerere (funded by Danida) are jointly developing impact evaluation methods for plant clinics in Uganda. These methods will be used in late 2011 to measure the attributable benefits obtained by farmers who use the clinics. The first study of farmer benefits was published (Bentley et al 2011 [1]) and describes productivity (net income) gains made in response to advice received on two damaging insect pests that previous DFID-funded research has investigated. Potato farmers earned on average around $700 more per hectare using recommendations provided by plant clinics. The Bolivia study and a similar one of Bangladesh farmers have given useful indications of benefits received, but have also highlighted methodological weaknesses in these first impact studies and the need to improve study design and implementation.

Collaborations in Uganda are addressing improvements needed to the impact study methods. Improved protocols for gathering data before and after a farmer visits a clinic will be available soon and introduced to a number of countries. Monitoring and evaluation schemes are also being reviewed so that lessons are learnt early and enable quick responses to improve clinic operations and inform an expanding number of potential investors of progress with plant clinics and plant health systems development work.

DFID, together with SDC, are the two most prominent investors in Plantwise to date. The support of DFID, together with other new investors in Plantwise, will enable an intensification and expansion of efforts to improve guidelines, develop new materials and describe methods, tools and general principles for strengthening Plantwise. We have developed a Theory of Change for plant health systems (Figure 2) which sets out an ambitious series of steps needed to establish plant health systems and create the national capacity to maintain efforts after projects have finished.

The global operational implementation of Plantwise is currently undergoing a review to ensure there is a stronger common vision and focus for the programme. As the network of plant clinics expands, it will be built within the framework of a consistent operational approach to ensure a uniformly high quality of service across multiple countries and regions. At the same time the approach must be flexible enough to give due regard to the local and national context in terms of customs, culture, existing systems, agricultural mix and market mechanisms. To achieve this, plant clinics operating under the Plantwise brand will be required to adhere to a defined set of standards for training, operating procedures, and code of conduct. These standards were developed during workshops held in Switzerland in May and June 2011.

As a basis for the workshop discussions on plant clinic performance standards, all plant clinics previously established worldwide were reviewed, with a particular focus on existing ownership systems and their associated strengths and weaknesses. Two main plant clinic partner categories were defined: local implementation organizations (LIO) and national responsible organizations (NRO), and potential candidate organizations were identified to fill these roles.

1. Bentley, J.W., Boa, E., Almendras, F., Franco, P., Antezana, O., Díaz, O., Franco, J., et al. (2011). How farmers benefit from plant clinics: An impact study in Bolivia. *International Journal of Agricultural Sustainability*. 9, 393-408 DOI: 10.1080/14735903.2011.583482

supporting farmers

The workshops also explored the links between plant clinics and the knowledge bank, looking in particular at areas of synergy between them and possible pathways for a two-way flow of information. The plant doctor training modules (see box below) were revised and expanded to ensure a good fit with the objectives of Plantwise.

All plant doctor candidates will now be required to complete Modules 1 and 2 with a written assessment at the end of the course. Those who successfully complete the assessment will be certified as competent plant doctors and will be considered qualified to run a clinic. Those who take the training but do not pass the exam will be able to act as clinic assistants supporting the plant doctors. Module 3 is targeted at sub-groups who will take responsibility for the production of locally relevant information materials. Module 4 will provide the knowledge and skills to run a network or group of clinics to consistent standards.

Training modules for plant doctors and other key personnel

Module 1: How to do a field diagnosis by observing the plant's symptoms and listening to farmers, and how to run a clinic.

Module 2: How to give locally relevant advice, using available and affordable inputs and how to recognise when to seek expert help.

Module 3: How to translate recommendations and knowledge into simple fact-sheets that can be understood by farmers, shared among clinics and used as the basis for talks, radio programmes or other formats.

Module 4: Establishing quality assurance to improve clinic services (includes data management).

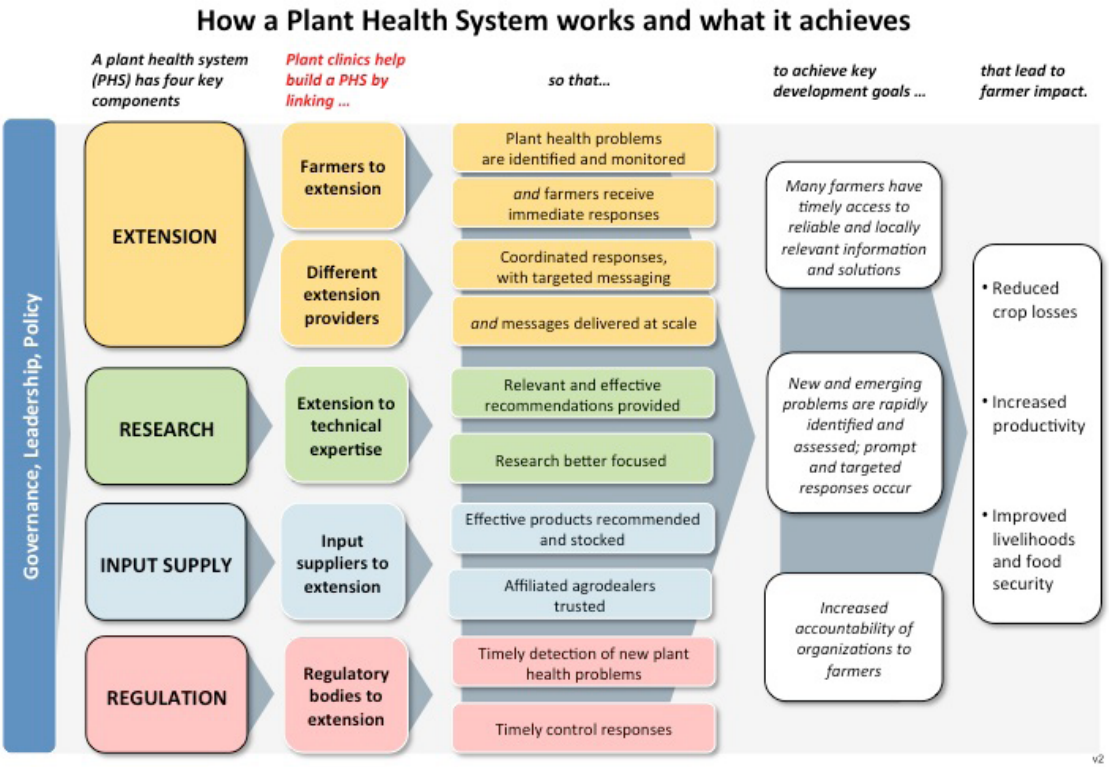

Fig 2 Theory of Change underpinning the plant health systems approach

supporting farmers

the Plantwise knowledge bank

In 2010, in response to guidance from our member countries, and supported by CDF funding, development began on a central resource for plant health information: the Plantwise knowledge bank. The knowledge bank forms an integral part of Plantwise. By gathering on-the-ground intelligence at the clinics about what is happening in a particular region – what crops are brought in by farmers, what pests are affecting them and what treatment techniques are being used –national extension programmes can be better informed and extension materials for farmers can be made more relevant. Plantwise will provide an early warning system for pests which are a particular threat to food security, allowing for swift response by diagnostic centres who will verify the existence of the pest and report it through the necessary plant protection channels.

In addition to information from the plant clinics, and CABI's own scientific resources, the knowledge bank provides access to data and information from a wide range of partner organization and initiatives including: the International Maize and Wheat Improvement Centre (CIMMYT), the International Rice Research Institute (IRRI) and the UK Food and Agriculture Research Agency (FERA). This gives researchers and extension workers instant access to a true network of plant health information sources, saving them time and giving them the support they need to better inform research and extension activities.

Between January and April 2011, development on the first version of the knowledge bank was completed, with a live launch of the prototype site on 31 March. The new functionality completed in this time included an advanced diagnostic search tailored to the needs of plant doctors and other extension workers, including crop and symptom filters, improved usability of the interactive pest distribution map, inclusion of distribution data from plant clinics and a vast increase in the number of searchable factsheets.

The official Plantwise website (**www.plantwise.org**) was launched on 6 June. It incorporates the beta version of knowledge bank tools and more comprehensive information on Plantwise and its donors, local collaborators and content partners. Clinic information is available on a country-by-country basis, with individual clinic locations displayed on an interactive map.

An intensive market research phase for the Knowledge Bank ran from late March until early June 2011, during which over 40 individuals were interviewed from research, national and international plant protection programmes, extension programmes and agro-chemical industries. The interviews used a questionnaire about plant health and pest distribution information needs, followed by a demonstration of the knowledge bank. Feedback from each interview was consolidated into a set of user requirements for each market. A workshop in early July collated and prioritized user requirements, to inform the development plan for the next version of the knowledge bank, due for release in March 2012.

strengthening pest and disease diagnosis through remote microscopy

Remote microscopy enables plant health professionals to share high quality microscope images over the Internet. Using this technology, in-country labs can show images to experts in diagnostic laboratories anywhere in the world and discuss the diagnosis in real time. The system allows rapid identification of pests and diseases and can also be used to build diagnostic capacity. Quicker identification and diagnostic turnaround time increases the possibility of rapid response to pests and diseases, and of effective mitigation measures. If the pest can be examined in the country where it occurs, freight costs are reduced and quarantine problems avoided.

In 2011, CDF investment is being used to set up remote microscopy in two CABI Regional Centres, in Africa (Kenya) and China. Two sets of Nikon digital cameras and associated equipment will be purchased and installed by staff from CABI's Centre in Malaysia. This equipment will enable plant clinic staff in Africa and China to get information and advice from CABI's diagnostic facility in UK, without having to physically send samples.

improving food security

improving access to international markets

Trade is seen as an “engine of development”: one third of all official development assistance is now classed as Aid for Trade by the World Trade Organisation.

Trade, however, carries risks for the importing country. Shipments of food can harbour microbes that can cause sickness or even death to consumers. Pests and diseases can inadvertently be transported, threatening the importer’s agricultural production. Food and feed may also be contaminated with pesticide residues or other toxins.

To reduce these risks, the World Trade Organization’s Sanitary and Phytosanitary (SPS) Agreement allows importing countries to adopt SPS measures. These must be scientifically justifiable, and preferably based on international SPS standards recognized by the WTO SPS Agreement. Exporting countries that want to access markets must therefore be able to comply with the importing country’s public (government) and private (market) standards. Farmers, packers, processors, transporters and shippers all have a part to play. Developing countries are also importers, but often more attention is paid to supporting exports than managing the risks of imports, resulting in breaches of biosecurity.

CABI is already undertaking some work in this area and we have a range of skills in plant health and food safety that could be usefully deployed in trade-related capacity development. CABI’s member countries have also requested assistance in this area. CDF funding is being used to support a review of CABI’s relevant capacity and experience, and to develop a strategy through which we can best meet the needs of our member countries.

Key CABI staff from Asia, Europe and Africa met in Nairobi to develop a draft strategy. There are many skills in CABI that are relevant to the SPS area, but some awareness building is needed. The relationship between the SPS area and CABI’s current themes as well as Plantwise was investigated, and it was agreed that SPS should be addressed as a cross-cutting area, to be taken up across all the themes.

Early in 2012 a training workshop for CABI staff will be held to build awareness on how their existing skills can be brought to bear in the context of trade, and to identify specific opportunities for doing so. A working paper will also be prepared, outlining the issues and CABI’s role in addressing them.

improving food security

management of cocoa pod borer in Papua New Guinea

The cocoa pod borer is a devastating pest, capable of effectively wiping out a cocoa crop by inflicting up to 90% losses. CABI has been working on cocoa pod borer in Papua New Guinea since it was first reported in East New Britain Province in 2006. Attempts at early eradication were not successful and it re-emerged in the Gazelle Peninsula in March 2007. Management of the pest then became an urgent priority.

CDF investment is enabling us to assist Papua New Guinea to implement systematic long-term management of cocoa pod borer. The project is enhancing the knowledge and awareness of stakeholders, and strengthening surveillance and monitoring efforts, in addition to developing integrated pest management (IPM) programmes. A practical surveillance system to detect cocoa pod borer is supported by improved monitoring, using pheromone traps and statistical sampling methodology. The IPM programmes build on a series of previous ACIAR-funded projects in Papua New Guinea and Indonesia and include cocoa pod borer management strategies to establish on-farm best practice plots, verification of insecticides and their application and the development of participatory training curricula for farmers. The extension materials (both print and multi-media) will also be useful for other Melanesian cocoa-growing countries.

All our projects are implemented through partnerships. Our main partners in this project are the Faculty of Agriculture, Food and Natural Resources, University of Sydney; the Cocoa and Coconut Institute, Papua New Guinea (CCI-PNG); and the National Agricultural Quarantine & Inspection Authority, Papua New Guinea (NAQIA-PNG).

In 2011, we continued to support ongoing ACIAR-funded efforts to control cocoa pod borer in Papua New Guinea. We completed sampling studies to determine the level of infestation in the project area, inspecting at least 70% of evenly-distributed trees in sample blocks of 2-5 ha., and recording presence and degree of infestation. An acceptable level of control is considered to be an infestation rate below 10%, with all infested pods still usable. In addition, chemical and physical (pod sleeving) control methods were compared. Pod sleeving gives the best results and is the most suitable method for smallholdings, where adequate labour is available but chemical methods (target pod spraying with 0.2% lambda-cyhalotrin) are needed in large commercial plantings where sleeving is impractical.

We disseminated the project findings to all partners by producing two posters on cocoa pod borer biology and management, as well as a multimedia DVD which will also be used in the ACIAR funded (plus CDF) project on rejuvenation of cocoa in the Pacific (see below).

In June, the Project Completion Workshop was held in Tavilo, Papua New Guinea. It was attended by about 20 scientists from partner organizations and their associates (CABI, CCI-PNG, NAQIA-PNG, Sydney University, Mars and AGMARK). Ten presentations covered topics including the current status of cocoa pod borer in Papua New Guinea and the South Pacific, development in management of cocoa pod borer in Papua New Guinea and sampling studies for infestation. The full report of the meeting and its recommendations will be prepared.

improving food security

management of coffee berry borer in Papua New Guinea and Indonesia

The coffee berry borer is the most serious pest of coffee, causing premature fruit-fall and reduced bean weight and quality. In this project, which has been running since 2009, we are applying our experience in coffee berry borer management in Africa and Latin America to address the coffee berry borer problem in Indonesia (Sulawesi and Papua) and Papua New Guinea. In Indonesia we are promoting better management, whilst in Papua New Guinea, where the pest has not yet been recorded, we are putting in place prevention and incursion management procedures. The project focuses on situation-specific surveillance and awareness raising, integrated pest management (IPM) research, and technology dissemination through participatory training. Prevention and incursion management focuses on capacity building in quarantine procedures, early detection and emergency response.

Our partners are the Indonesian Cocoa and Coffee Research Institute (ICCRI), the Ministry of Agriculture Indonesia (MOAI), the Coffee Industry Corporation (CIC) and the National Agricultural Quarantine Inspection Authority (NAQIA) of Papua New Guinea and the University of Queensland. The project also works closely with the new ACIAR-funded project on coffee green scales in Papua New Guinea, which is also being implemented by CABI. The previous phase of the coffee green scales project received CDF funding in 2008-2009.

During the current reporting period the project focused on Indonesia, with activities at two sites in Sulawesi (Enrekang and Tana Toraja), where we had previously carried out IPM trials. A baseline survey of coffee farmers at both sites was completed in April 2011 to collect data on family size, level of education, main income, and aspects of their coffee farming practices including area cultivated, management methods, experiences of coffee berry borer and their coffee berry borer management practices.

Two farmer field schools on IPM of coffee, which had started in 2010, were completed in May 2011. 25 coffee farmers participated in each group, which comprised 24 sessions held every two weeks. Using participatory techniques, participants worked in small groups in which they identified and prioritised coffee pests (insects, diseases and weeds), and learned about their symptoms, control measures adopted by farmers and those recommended by the government. They also conducted their own demonstration trials to compare five possible control methods.

The project mid-term review meeting was held in Makassar, Indonesia in May 2011. It was attended by 22 officers and scientists from project partner organizations and their associates. 16 presentations covered the current status of coffee berry borer in PNG, a national coffee development plan in Indonesia and coffee IPM in South Sulawesi. The meeting included a field trip to Enrekang and Tana Toraja, Indonesia.

improving food security

improved processing to revitalise the coffee industry in Cameroon

Coffee is important to the economy of Cameroon. The crop is produced by around 400,000 rural households, representing about 2.8 million people. It also provides direct and indirect jobs to an estimated 160,000 people. Coffee production in Cameroon has declined over the last 30 years from an average of 100,000 metric tonnes annually to just over 40,000 tonnes currently. The value of exports for the country has likewise declined, falling from a peak of US$ 303 million in 1980 to about US$ 66 million by 2008.

In response to the declining production, quality and therefore income from coffee exports, the Government of Cameroon has put in place initiatives to revive the coffee sub-sector. This project aims to support the implementation of this strategy by introducing innovative coffee processing units (CPU) on a pilot basis. This was to be implemented over a period of 18 months from mid 2010, during which two coffee harvesting seasons would have been covered. The project was funded initially by the European Union's All ACP Agricultural Commodities Programme (AAACP) and the World Bank.

A number of factors have now made it necessary to extend the project:

- installation of project equipment was delayed since it all had to be imported from Colombia in compliance with with the rigorous procurement procedures of the World Bank and European Union. This equipment was needed to allow processing on a large enough scale for in-depth analysis of the technical and economic efficiency of the new processing method.
- the harvesting season started later than normal this year and the peak harvesting period for Robusta coffee will fall in 2012. There is also a large separation in the harvesting seasons for Robusta and Arabica coffees and some of the activities which would normally be undertaken together are now being undertaken separately, thereby increasing the cost of implementing the project.
- due to huge interest in the outcomes, all the stakeholders are keen to have an in-depth socio-economic analysis of the CPU concept, to demonstrate the economic viability and sustainability of the approach.

CDF funding has enabled us to co-finance these aspects of the project so that activities could continue beyond the original end date. It has also made it possible to initiate the socio-economic study requested by the stakeholders, which will provide a blueprint for expanding the beneficial aspects of the pilot project.

improving food security

rehabilitating cocoa for improving livelihoods in the South Pacific

A decade of low world cocoa prices has led smallholder farmers in the South Pacific to neglect their cocoa trees, resulting in a decline in cocoa production. However, with market prices forecast to rise during the next decade, the time is ripe for a significant rehabilitation effort in the South Pacific. In addition, the emergence of higher-value certified organic or single origin cocoa markets provides an additional incentive for farmers to intensify management and to improve production, as they possess the fine-flavour varieties of cocoa and favourable climatic conditions for producing premium cocoa. Constraints to cocoa production in this region include pests and diseases such as Black Pod (*Phytophthora palmivora*) and damage caused by rats. Cocoa production could be increased through integrated pest and disease management (IPDM), while quality could be improved through attention to the fermentation and drying processes.

In this project, CDF investment is being used to complement the activities of an ongoing ACIAR-funded project. The overall objectives are:

- to evaluate the opportunities for smallholder cocoa growers to enter into higher value niche markets
- to introduce, evaluate and disseminate best-bet crop management practices within conventional, single origin/fair-trade and organic supply chains
- to evaluate and disseminate best practices for improved quality of cocoa
- to evaluate and recommend best practices for selection, conservation and dissemination of improved germplasm.

CABI is working in partnership with:

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

In February-March, CABI staff conducted a survey of cocoa farmers in Vanuatu to assess their current level of understanding about cocoa pests and diseases. They discussed and demonstrated control methods, particularly for Black Pod Disease and for rats. A project flyer and farmer training materials have been prepared, and in June CABI staff conducted farmer field schools explaining the infection cycle of the Black Pod organism. Farmers now have a good understanding of how the disease is spread, and have been shown a straightforward management technique which they will test over the next year. This involves careful pruning and shade management to reduce the spread of the disease and to make harvesting easier. The farmer field school also taught farmers about rat control, including better management practices and the safe use of rat baits. Some progressive farmers have been trialling these techniques since March and are already encouraging their neighbours to try them.

protecting biodiversity

a regional approach to tackling invasive species in the Caribbean

Since 2009, CABI has been managing a project funded by the Global Environment Facility (GEF) and implemented through the United Nations Environment Programme (UNEP) to address the threats posed by invasive species in the Caribbean. Invasive species severely threaten terrestrial, freshwater and marine ecosystems as well as rural livelihoods, and island ecosystems are particularly vulnerable. The project, *Mitigating the Threats of Invasive Alien Species in the Insular Caribbean*, is working in five island states: Bahamas, Jamaica, St Lucia, Trinidad and Tobago and Dominican Republic. The CDF is providing co-finance for this project, having previously also supported project preparation during 2007 and 2008.

The project supports policy processes relating to invasive species at both national and regional level. A regional working group convened by the project completed the draft *Regional Invasive Alien Species Strategy and Action Plan 2011-2015* at a meeting in the Bahamas in March 2011. After further consultation the final version is expected to be formally adopted by the CARICOM Secretariat. In parallel with this, the project's National Steering Committees are developing or (in the case of Jamaica and the Bahamas) adapting their National Invasive Species Strategies (NISS) to fit with the draft regional strategy.

Public awareness-raising is an important element of the project. The regional website, **www.ciasnet.org**, launched by the project in 2010, now includes pages for the Caribbean Invasive Species Working Group and the Caribbean Plant Health Directors' Forum. The project's yahoo list serve continues to distribute articles, news and views on invasive species to a growing membership including policy makers, technicians and the NGO community. We have published a paper, *Caribbean Biodiversity, Alien Species and the Transformation of Agriculture*, in the Situation and Outlook series published by CTA and IICA, and collaborated in the production of *Strategies and Practices for Invasive Lionfish Control: a Guide for Managers*, to be launched at the 64th GCFI Meeting in Mexico in November 2011. We also promote our work through national media and we aim to publish a magazine on invasives in the Caribbean in September 2011.

In parallel with strategy development, training and awareness-raising, each country is also addressing pressing problems with invasive species through pilot projects relating to prevention, early detection and rapid response, management and eradication. In St Lucia, the Maria Islands Marine Reserve was demarcated in May 2011 to protect the endemic whiptail lizard from invasive predators. Trinidad and Tobago is developing a risk mitigation and prevention plan for the introduction of frosty pod rot, a devastating cocoa disease, into the Caribbean from South and Central America. In 2011, we completed a pathway analysis to quantify the risk of this introduction and trained key stakeholders to identify the disease.

Other pilots focus on eradication and control and management of established invasives. The Bahamas and Jamaica are working on control strategies for lionfish. Baseline surveys and eradication strategies have been developed to remove cats, donkeys and cattle from an island in the Dominican Republic where they threaten a protected iguana species, whilst in St Lucia dogs will be used to detect invasive iguanas.

sharing knowledge

Biofuels Information Exchange

CABI's Biofuels Information Exchange website (**www.cabi.org/biofuels**) provides an opportunity for informed debate amongst experts in biofuels. It was launched in 2009 with CDF funding, in response to requests from CABI's member country representatives and in recognition of the need for a place where experts in this field can discuss their research, experiences and findings. The site is free to join and offers both information resources and online discussion facilities to researchers, policy makers and other interested parties.

The objectives of the site are:

- to provide impartial information to members on all types of biofuels
- to provide a moderated forum for discussion on biofuels
- to provide a website where organizations external to CABI can showcase their biofuel project outputs

The information resources we provide include 35,000 research records relating to biofuels, from our CAB Abstracts database, as well as review papers commissioned by CABI and links to third party biofuels reports and books.

We are continuing to improve and develop the Biofuel Information Exchange, in terms of design and information available to members and to commission papers to be posted on the site. In 2011, we have commissioned a paper "Biofuel crops as invasive species" by Arne Witt, and a position paper "Biofuel crops with invasive potential: microorganisms, pests and biocontrol" by Carol Ellison, Corin Pratt and Matthew Cock.

We are actively encouraging contributions to the discussion forum by key biofuels research scientists. A quarterly summary, 'Recent developments in the world of biofuels', is posted on the site, selected news items are added regularly and the latest biofuels news is fed to the site by Google hour by hour. An "Events Tab" on the Biofuels Information Exchange home page shows forthcoming conferences, meetings and workshops on biofuels.

Membership of the site is now over 500 (up from about 400 in late 2010), and we are seeking to increase it further, particularly in the South.

sharing knowledge

FARA membership of the Invasive Species Compendium

In partnership with the United States Department of Agriculture, we are developing a global Invasive Species Compendium to document all known invasive species, to map their distribution and to provide information on their management. We are working with a consortium of partners who provide direction, advice and funding for its development. Until 2010, however, there were no partners from African countries or organizations. Through CDF investment we have supported the membership of the Forum for Agricultural Research in Africa (FARA), in return for their commitment to provide direction and advice on invasive species that are of particular importance to Africa's agriculture and environment. We see FARA as a central point of communication within Africa.

The Invasive Species Compendium became open access in June 2011 and fundraising continues to focus on the reaching a sustainability fund target, guaranteeing open access for five years. There will be a strong emphasis on developing training and outreach programmes, especially in Africa.

The Invasive Species Compendium contains full, peer-reviewed datasheets on around 1,500 invasive species and related topics, prepared by specialists from around the world and edited by CABI. For each species the datasheet covers the species' identity, distribution, biology, ecology, impacts and management. The Compendium also contains more than 63,000 references and abstracts of the published literature on invasive species, full text of 2,500 relevant documents and basic datasheets on a further 2,000 species. A review of the Invasive Species Compendium, and its coverage of invasives of importance in Africa, is being carried out and existing datasheets will be edited or new datasheets commissioned where gaps are identified.

Details of the release of the openly accessible Invasive Species Compendium have been communicated through the FARA RAILS network. FARA RAILS has also been used as a communication channel for news and developments within the consortium of partners.

sharing knowledge

Direct 2 Farm initiative

IFFCO Kisan Sanchar Limited (IKSL) is a tri-lateral venture between the Indian Farmers' Fertiliser Cooperative Ltd (IFFCO) - the largest farmers' cooperative in India, Airtel - the largest mobile network operator, and Star Global Resources Limited – who are rural telephony experts. IKSL is supported by the GSMA mAgri Programme, and provides voice-based agricultural information for farmers and extensionists. It distributes Airtel SIM cards branded 'Green SIM' to its IFFCO members and other farmers. The Green SIM functions as a normal SIM as well as providing agricultural value-added services (Agri VAS). The user receives five recorded voice messages, free of charge, each day covering both local and national agricultural topics. Green SIM users can also access an Agri Helpline where they can get answers from experts in agriculture to any farming question.

During 2009 and 2010, CABI provided knowledge backstopping support to IKSL. To build upon the experience we have gained in working with IKSL, in 2011 we are investing CDF funds in the development of a database of actionable information which is not linked specifically to a particular mobile service provider. The first stage will be to test the requirements and information architectures needed to build such a database. Activities during the reporting period have focused on setting up a project team, recruiting staff in India and confirming the project scope. It is anticipated that the infrastructure built in India will eventually service a global database of agricultural advisory information. This will provide extension services and workers with base level accurate and quality controlled information which can be translated into local languages.

evaluating impact

Since 2009, CABI has invested CDF funds in an ongoing programme of impact evaluation. Its objectives are:

- to put in place systems for monitoring and evaluating rollout of plant health systems under the country scheme component of the CABI Plantwise programme
- to evaluate and narrate the impact of plant health activities in selected countries
- to evaluate and document the impact of selected projects

Through our impact evaluation programme, we aim to demonstrate how investment in CABI activities is contributing to the realization of development goals. By building a solid body of evidence on our effectiveness in meeting project goals, CABI is appraising its investment performance and its accountability to its core mission.

evaluating plant health systems in Uganda

Plant health systems, incorporating mobile plant clinics supported by networks of stakeholders including technical experts, agro-dealers and diagnostic laboratories, are now a major focus for CABI, under the Plantwise programme. The clinics offer farmers unprecedented access to expert advice on pests and diseases, and facilitate mutually beneficial interactions between farmers and researchers. Evaluating the impact of clinics at farm level, and learning lessons about the most effective ways to establish clinics and plant health systems, is critical to planning the wider rollout of plant health schemes.

CABI is working with the Universities of Copenhagen and Makerere (funded by Danida) to develop and implement methodology to evaluate the household level impacts for clinic users, with technical support from an impact evaluation specialist in the Food and Agriculture Organization of the United Nations (FAO). In 2010, an exit survey to establish the profile of clinic clients was tested in Butema and Katine, Uganda and a survey using a revised questionnaire undertaken in the Teso sub-region of Uganda (Seroti, Serere and Kumi Districts) in the second half of 2011. These profiles will be used to screen randomly selected control households in the survey to be carried out in November. This panel survey, to be carried out over two seasons, will focus on orange and cassava, which represent approximately 60% of all the queries made at the clinics. A total of 250 households will be targeted of which approximately 2/3 will be “treatment” households randomly selected from clinic records. The results will be disseminated through both formal journal articles and a range of other communication products.

In 2010, CABI established links with the 1,000-member-strong Uganda National Agro-Input Dealer Association (UNADA), the national organization in Uganda. Agro-dealers play an important role in supporting and backstopping clinics, so we developed a questionnaire to explore their knowledge of pests and diseases, the nature of their links to farmers, their understanding of the chemicals they sell and product turnover. We are administering the questionnaire to around 600 recipients of UNADA training, and analyzing their responses.

During the reporting period we have also held a number of meetings with a range of stakeholders in Uganda to discuss the future development of a two-way plant health information system. The uptake of plant disease information by agro-dealers remains a key benefit of their interaction with the plant clinics, given their local/national capacity and regular interaction with farmers. Enhancing the capacity of registered agro-dealers through training in plant health and data collection will ensure that CABI receives an accurate description and diagnosis of local farmers’ plant health problems. The main challenge is that it is difficult to persuade the agro-dealers to collect good, reliable data.

evaluating impact

evaluating horticulture projects in Pakistan

Pakistan is the sixth largest producer of mango in the world, but quality problems, particularly damage by fruit flies, severely limit exports. Several countries including Japan, USA, Australia and Korea have imposed bans and import restrictions on Pakistani mangoes owing to non-compliance with certification and quarantine requirements and sanitary and phytosanitary (SPS) standards.

To address this challenge, the CABI Central and West Asia office in Pakistan worked with local partners in Punjab Province to increase farmers' income from high value fruits and vegetables. The Fruit and Vegetable Development Project aimed to improve production and quality of mango and other fruits through an integrated orchard management strategy. The focus was on capacity building for both public and private sector stakeholders, including components on extension, research, marketing and evaluation. CABI assisted the provincial research and extension systems to develop training modules, and trained the trainers. Farmer training, including the dissemination of mango production technology, was conducted through farmer field schools. In addition, CABI implemented a fruit fly management programme in Multan and Rahimyar Khan Districts to enhance the quality and quantity of exportable mangoes using non-pesticide control measures.

A study carried out by the Punjab Economic Research Institute (PERI) showed that in 2007 and 2008 fruit fly infestation was effectively controlled by farmers trained in the farmer field schools. Two mango growers in Rahimyar Khan obtained GlobalGAP certification, bringing the number of mango orchards with this certification in Pakistan to more than 20, and enabling these farmers to export mangoes to EU countries. The study showed that the farmer field schools greatly enhanced the mango growers' awareness and understanding of recommended practices relating to irrigation, fertilizer application, plant protection and cultural practices. The training increased the growers' awareness of recommended irrigation practices from 40% in the benchmark survey to 98% in the post project evaluation, while the percentage adopting the improved practices increased from 32% to 89%. Similarly, the adoption rate for improved fertilizer application practices increased from 14% to 81%, and for cultural practices (pruning, irrigation, fertilizer application, pests and disease management) from 41% to 68%. After the training, almost all the farmers (94%) understood improved plant protection practices, and 79% had adopted them. Overall, the trained farmers increased their per-acre net earnings to Rs. 41,471 over the project period, compared to Rs. 29,200 for the untrained farmers. The project also significantly improved both yield and quality of mango. The untrained farmers also benefited, by observing and learning from their trained neighbours.

evaluating the Good Seed Initiative

CABI Africa is in the process of conducting a review and qualitative assessment of the Good Seed Initiative, which comprises a range of projects involving work on seed systems. The assessment will include the achievements of the programme, outcomes and impacts and lessons learned from these projects, which seek to develop farmers' capacity in quality seed production. We plan to complete the assessment in the fourth quarter of 2011 and to produce a working paper analyzing CABI's seed systems projects, with particular focus on vegetable seed in Africa.

communication and partnerships

working with China on biosafety

In 2008, CABI joined with the Chinese Ministry of Agriculture to establish the Joint Laboratory for Biosafety at the Institute of Plant Protection in the Chinese Academy of Agricultural Sciences (IPP-CAAS), Beijing. The partners are working together on invasive species, integrated pest management technologies and development of biopesticides. This joint initiative offers a platform for research collaboration, a centre for training and scientific exchanges, an open platform for joint collaboration with third parties and a consultancy service. In 2010, CABI incorporated Chinese funding for the Joint Lab into the CDF.

In the first half of 2011, substantial progress was made on two ongoing biological control projects, *Apolygus lucorum* and *Cirsium arvense*. *Apolygus lucorum* is a mirid insect and the most serious pest of Bt cotton in China. We have studied the biology of a natural enemy, the parasitoid wasp *Peristenus spretus* in the lab prior to mass releases against the pest.

Cirsium arvense, the Canada Thistle, is native to Europe and Asia and has become a major weed in North America. This project is looking for an effective biocontrol agent against this weed and a potential candidate, the white blister rust *Pustula* (*Albugo*) *tragopogonis*, has been selected for further testing and preliminary host range testing. In 2011, we have also started work on a biological control project for the box tree caterpillar, *Diaphania perspectalis*, a newly-reported invasive insect pest causing serious damage to box (*Buxus* spp.) in several countries in Europe. An initial field survey in China has identified some parasitoid wasps as potential biocontrol agents.

A EuropeAid-funded project, *Agricultural innovation for smallholder farmers in the Greater Mekong Subregion to improve food security, in the context of impact and adaptation to climate change and in favour of economic development*, started in January 2011. IPP-CAAS are leading, CABI is the major partner and the Joint Lab provide project support. The Joint Lab has organized the inception workshop as well as a technical meeting. Seven consultant missions have been conducted in the region to implement project work with local partners in South West China, Laos and Myanmar. *Trichogramma* strains have been recovered from field surveys in the region and maintained for mass reproduction at the rearing facility. Baseline information for the formulation of a locally-adapted integrated pest management strategy has been collected through literature reviews, stakeholder surveys and participatory rural appraisals.

In addition to project work, the Joint Lab has organized an International Radar Entomology Workshop, bringing together around 30 leading experts to share their knowledge and seek sustainable solutions to control regional migratory pests. We have also responded to a EuropeAid Call for Proposals, *Technology Transfer for Food Security in Asia*, with a project proposal on maize IPM in the Greater Mekong Subregion.

communication and partnerships

building partnerships

CDF funds enable CABI to engage with a range of development partners to design projects to make the best use of our skills to address donors' funding priorities, as well as building solid relationships with key partners that will provide a solid base for future collaboration.

Initiatives in 2011 have included development of a proposal on plant health systems to the Bill and Melinda Gates Foundation (BMGF); a proposal to AusAID resulting in additional funds committed from the Africa budget for a Plantwise master class; engagement with the Grameen Foundation to support development of proposals linked with the BMGF-funded Africa Soil Health Consortium; a proposal to the mAgri Challenge Fund set up by GSMA, the global association of mobile phone operators; and interactions with the International Fund for Agricultural Development (IFAD) to pursue the possibility of linking Plantwise activities to their country funding programmes.

In Africa, we have been developing a regional initiative on alien invasive species in Zimbabwe, Malawi, Botswana, Mozambique, Kenya, and Tanzania. The intention is to develop or strengthen policy on invasive species, create awareness of their impact and management, build capacity, and develop best management practices. After reviewing all current National Biodiversity Strategies and Action Plans (NBSAPs) and reports to the Convention on Biological Diversity (CBD) for their relevance to invasive species issues, and to identify policy gaps, we have developed Country Briefs which have been sent to each country's CBD focal point. We are also addressing weed problems in Africa through classical biocontrol methods. With CDF support, we have developed concept notes to establish a permanent mass rearing centre for biocontrol agents for waterweeds on the shores of Lake Naivasha, and to introduce biocontrol agents for the control of *Parthenium hysterophorus* and *Chromolaena odorata* in Kenya. *Chromolaena odorata* biocontrol in the Democratic Republic of Congo is addressed by a proposal submitted to the World Bank and the National Plant Protection Organization.

CDF funding has also supported our work on commodity crops through developing a capacity-building project on spices in East Africa, with a range of potential partners including the Common Market for Eastern and Southern Africa (COMESA) and the United Nations Industrial Development Organization (UNIDO).

At CABI's newly opened office in Brazil, CDF funds are supporting the strengthening of links with EMBRAPA, Brazil's national agricultural research network, the Universidade Estadual Paulista Júlio de Mesquita Filho (UNESP) in São Paulo State, and the University of São Paulo State (ESALQ-US). CABI is working with these partners on biological control of the aquatic weed floating pennywort (*Hydrocotyle ranunculoides*), as well as planning future studies on invasive weeds in Brazil.

communication and partnerships

dissemination: plant health and food security

CDF funding continues to enable CABI scientists to publish research in peer-reviewed journals and to present it in international forums, for example at the meeting of the Cadang-Cadang Viroid Task Force in Kuala Lumpur in June 2011. In 2011, we are also targeting CDF funding specifically to support and encourage staff across our regional centres to produce high quality scientific outputs.

Papers prepared during the current reporting period include:

1. Cooper, R.M., Flood, J., & Rees, R.W. *Ganoderma boninense* in oil palm plantations: current thinking on epidemiology, resistance and pathology. *The Planter* (in press).
2. Rees, R. W., Flood, J., Hasan, Y. & Cooper, R. M. *Ganoderma boninense* basidiospores in oil palm plantations and evaluation of their possible role in stem rots of *Elaeis guineensis*. *Plant Pathology* (in press).
3. Virdiana, I., Flood, J., Hasan, Y., Aditya, R. & Nelson, S. Integrated disease management to reduce future *Ganoderma* infection during oil palm planting. Proceedings of International Palm Oil Congress (PIPOC), November 2011.
4. Gintin, P.A., Virdiana,I., Flood, J., Ritchie, B. & Nelson, S. Preliminary *in vitro* and nursery results to screen for *Trichoderma* isolates antagonistic to *Ganoderma*. Proceedings of International Palm Oil Congress (PIPOC), November 2011.
5. Lum, K.Y. & Flood, J. (2011). Biosecurity planning and Cadang Cadang viroid in oil palm. Presented at the Task Force on Cadang-Cadang Viroid organized by the Malaysian Palm Oil Board (7th-8th June 2011).

A paper on invasive and naturalized plant species in East Africa is also under preparation and will be submitted in early 2012.

the CABI Development Fund (CDF)

income and expenditure account

April – September 2011 (£)

		Balance b/fwd as at 1st April 2011		**1,134,203**
income		China	60,590	
		Switzerland: SDC	656,416	
		UK: DFID	300,000	
expenditure	CABI code		**1,017,006**	**2,151,209**
	WP60001	Development of Plantwise Knowledge Bank	38,244	
	PK1	Plantwise Knowledge Bank Consortium membership: ACIAR (2011)	97,656	
	PK2	Plantwise Knowledge Bank Consortium membership: DFID (2011)	97,656	
	GK10001	Plantwise clinics: Rwanda	14,178	
	GK10002	Plantwise clinics: Kenya	37,803	
	GP10001	Plantwise clinics: Pakistan	10,066	
	GU10002	Plantwise clinics: Vietnam	3,507	
	GU10003	Plantwise clinics: Sri Lanka	4,909	
	GU10004	Plantwise clinics: Nepal	10,690	
	GU10005	Plantwise clinics: India	11,465	
	GU10006	Plantwise clinics: Bangladesh	4,454	
	GU10007	Plantwise clinics: Uganda	8,718	
	GU10008	Plantwise clinics: Sierra Leone	29,704	
	GU10009	Plantwise clinics: DRC	16,800	
	GU10010	Plantwise clinics: Peru	3,417	
	GU10011	Plantwise clinics: Nicaragua	15,899	
	GU10012	Plantwise clinics: Bolivia	16,667	
	GU10001/ GU10013	Plantwise clinics: UK (coordination of country activities)	179,141	
	GS10001	Plantwise roll-out programme (SDC funding)	289,525	
	GP10002	Plantwise: coordination of clinics roll-out programme	15,159	
	DN60007	Remote microscopy for diagnostics	13,837	
	DR60004	SPS strategy to improve access to international markets	12,210	
	CC60006	Management of Cocoa Pod Borer (CPB) in PNG	15,998	
	CF60009/ CF60010	Management of Coffee Berry Borer (CBB) in PNG and Indonesia	20,749	
	CF60012	Improved coffee processing in Cameroon	5,500	
	CC60008	Revitalising Cocoa in the Pacific	1,288	
	VM60015A	Tackling invasive species in the insular Caribbean	8,031	
	CR60018	Biofuels Information Exchange	6,928	
	KH60012A	FARA membership of the Invasive Species Compendium	12,305	
	KH60014	Direct 2 Farm Initiative	37,686	
	DR60002A	Impact evaluation	22,824	
	VM10051	Joint Lab programme, China	25,364	
	DR60001	Building partnerships (Plant health & knowledge systems)	11,699	
	CR60020	Building partnerships (Commodities)	2,640	
	VM 60020/ VM60022	Building partnerships (Invasive species)	4,217	
	CR60017/ VM60021	Scientific dissemination: plant health, food security & invasives	14,612	
	CR60019	Scientific dissemination: capacity building	5,630	
	PT2	CDF Management Fee	20,000	
	DR60003	New variety of kale seed for smallholders in Kenya (2010 project)	268	
			1,147,444	
		Excess income over expenditure		**1,003,764**

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