



# Annual Report

# 2016



Handwritten notes on a piece of paper, possibly a checklist or field notes, with some text that is partially obscured and difficult to read.

			
			
<p>Leaf Gall</p>		<p>Leaf Gall</p>	

The leaf is yellow compared to a normal colored leaf  
The difference of colour is present on the entire leaf  
plant



# Plantwise at a glance



Plantwise introduced to **34 countries** (cumulative).



**4 new countries** assessed for possible introduction.



**9.8 million farmers** (cumulative) reached by the end of 2016 through direct and indirect reach of plant clinics, plant health rallies and mass extension campaigns.



**1,789 plant doctors** trained in 2016, of which 25% are female; for a cumulative total of 6,787 plant doctors.



**433 plant clinics** established in 2016; for a cumulative total of 2,292 clinics.



**Positive outcomes** from four external evaluations (the most recent in Bolivia, Nicaragua and Peru), special studies on change in farmers' knowledge and impact on yield finalised and preliminary findings of the impact assessment in Kenya documented, with a second assessment in Pakistan initiated.



**432 tablet-equipped plant clinics** established in 10 countries.



**318,000 Plantwise Knowledge Bank visits** in 2016 (37% of visits from Plantwise countries). This represents an increase of 65% from 2015 and 1 million cumulative visits since launch.



**253,000 plant clinic queries** from all 33 active Plantwise countries reported in the Plantwise Online Management System; China using a further 33,500 records within its own POMS-based system.



Over **12,500 factsheets** available through the online Plantwise Knowledge Bank.



User testing of the Plant Doctor Simulator app and development of the Crop Management Simulator app completed.

## Acronyms

ACIAR	Australian Centre for International Agricultural Research
AIR	American Institute of Research
ATT	Activity Tracking Tool
CPM	Commission on Phytosanitary Measures
DFID	Department for International Development (UK)
DG DEVCO	Directorate General for Development Cooperation of the European Commission
DGIS	Directorate General for International Cooperation of the Netherlands
GAC	Global Affairs Canada
EMT	Executive Management Team (CABI)
FAO	Food and Agriculture Organisation of the United Nations
FFF	Factsheets for Farmers
ICT	Information Communication Technology
IFAD	International Fund for Agricultural Development
IPPC	International Plant Protection Convention
KB	Knowledge Bank
M&E	Monitoring and Evaluation
OECD-DAC	Organisation for Economic Co-operation and Development – Development Assistance Committee
PMDG	Pest Management Decision Guide
POMS	Plantwise Online Management System
PWPB	Plantwise Programme Board
PW	Plantwise
SDC	Swiss Agency for Development and Cooperation

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# Introduction

## Helping farmers lose less and feed more

Plantwise is a global programme, led by CABI, to increase food security and improve rural livelihoods by reducing crop losses. Working in close partnership with relevant actors, Plantwise strengthens national plant health systems from within, enabling countries to provide farmers with the knowledge they need to lose less and feed more.

This is achieved by establishing networks of locally owned plant clinics, run by extension staff trained as plant doctors, where farmers can find practical plant health advice. Plant clinics are reinforced by the Plantwise knowledge bank, a gateway to online and offline actionable plant health information, including diagnostic resources, pest management advice and basic pest data for effective global pest surveillance.

The donors contributing to Plantwise in 2016 include the UK Department for International Development (DFID), the Swiss Agency for Development and Cooperation (SDC), the European Commission through DG DEVCO-EuropeAid, the Directorate General for International Cooperation (DGIS Netherlands), Irish Aid, the International Fund for Agricultural Development (IFAD), the Australian Centre for International Agricultural Research (ACIAR), the Ministry of Agriculture of the People's Republic of China and the Hunger Solutions programme of Dow AgroSciences (DAS).

Plantwise is managed by a Plantwise Programme Board and implemented in participating countries through three interconnected components:

- **Plant Health Systems Development**
- **Plantwise Knowledge Bank**
- **Monitoring and Evaluation (M&E)**

This publication represents an update on programme implementation between January and December 2016. The report lists key highlights from the reporting period and then provides a narrative on progress, lessons learned and next steps for each of the three programme components. In addition, there is an update on

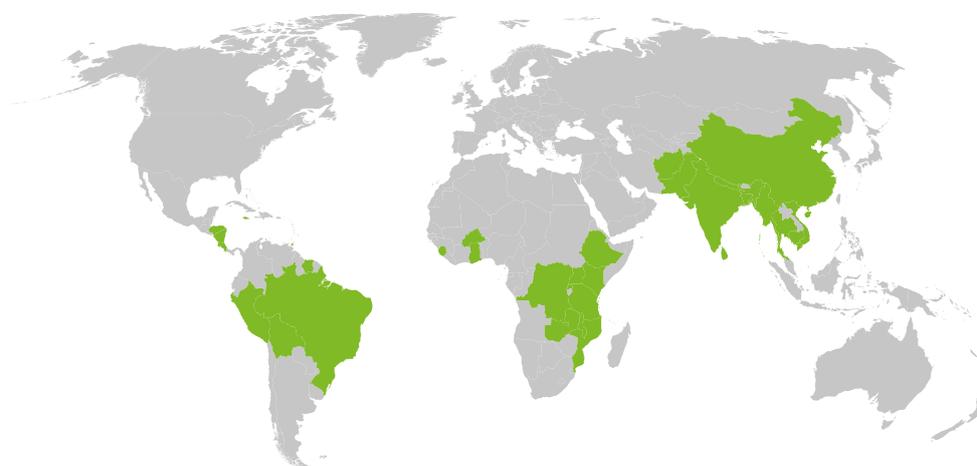
donor engagement. The report is accompanied by annexes, including (1) the final programme milestones report for 2016; (2) new programme milestones for 2017; (3) 1-page country reports showing highlights, challenges and lessons learned; and (4) a summary of compiled management response to Plantwise external evaluations.

### Plantwise countries by year of programme launch

Pre-2009	2009-2011	2012	2013	2014	2015
Bangladesh	India	Afghanistan	Brazil	Costa Rica	Jamaica
Bolivia	Kenya	Barbados	Burkina Faso	Myanmar	
DR Congo	Nepal	Cambodia	Ethiopia		
Nicaragua	Pakistan	China	Malawi		
Sierra Leone**	Peru	Ghana	Mozambique		
Uganda	Rwanda	Grenada	Thailand		
Vietnam	Sri Lanka	Honduras	Zambia		
	Suriname*	Tanzania**			
		Trinidad & Tobago			

\* exited in 2014; \*\* Limited activities in 2016

### Geographic distribution of Plantwise countries



This report seeks to highlight the continued and substantial progress made by Plantwise in 2016, as well as considering important lessons learned and the improvements we intend to make in 2017 and beyond. Specifically, our forward strategy has four key elements:

1. To scale up clinic networks and push for sustainability in all the countries served by Plantwise
2. To continue to innovate in all dimensions of service and technology in countries where Plantwise is well established
3. To push for greater private sector engagement
4. To continue building an evidence base of outcome and impact.



# Programme Highlights

## Programme Level

- 5.3 million farmers reached in 2016 (9.8 million cumulative) through plant clinics, plant health rallies, and mass extension campaigns
- Facilitated external evaluation by independent consultants in Central and South America (Peru, Bolivia, Nicaragua), who reported that the Plantwise model is a cost-effective means to provide technical advice to farmers and that the IPM approach contributes to more rational use of pesticides
- Developed an action plan for engagement with private sector organisations to help steer the testing of private sector linkages for increased sustainability, quality and scalability of plant clinic operations
- Completed formal assessment of 4 new countries (Chile, Colombia, Cote d'Ivoire and DPR Korea) as potential candidates to join the Plantwise programme
- Hosted the 5th Plantwise Donor Forum at DG DEVCO in Brussels (Belgium)
- Won the OECD DAC Prize 2015, for taking development innovation to scale

## Plant Health Systems Development

- Supported National Plant Protection Organisations to detect, identify and/or monitor the spread of at least 5 new pest problems in 9 countries through local plant clinics and the UK-based Plantwise Diagnostic and Advisory Service
- Established 433 new plant clinics
- Conducted training of trainers (ToT) for 78 local trainers (20% female) in 5 countries
- Facilitated training for 1,789 plant doctor trainees (25% female) in 27 countries
- Facilitated training for 84 local partners (24% female) in 5 countries on producing extension messages and drafting of 572 factsheets in 25 countries

## Monthly highlights



MARCH

Plantwise wins the OECD DAC Prize for bringing innovation to scale



MAY

Dr Ulrich Kuhlmann presents Plantwise innovations at the G20 Agricultural Chief Scientists Meeting in China



JULY

In Southeast Asia, Plantwise helps farmers combat climate change in “pest-smart” villages



SEPTEMBER

Myanmar adopts the Plantwise framework for its national plant health system strategy



OCTOBER

Working with Farm Radio International, Plantwise develops a radio show for cassava farmers in Malawi



NOVEMBER

Afghanistan's Chief Executive Dr Abdullah Abdullah praises Plantwise's work in the country

- Facilitated data management training for 804 participants (21% female) across 19 countries, covering topics such as data entry, harmonisation, validation and analysis
- Finalised the Crop Management Simulator serious game, which provides extensive realistic scenarios to supplement training on IPM-based advice

## Knowledge Bank

- One million visitors (cumulative) to open access online knowledge bank
- Over 190,000 factsheet views on the Factsheet App
- Over 12,500 factsheets available in the Knowledge Bank
- 253,000 rows of clinic data in POMS, including 30,000 directly loaded by country partners in 2016
- Data increasingly being used by stakeholders in the PHS
- Ten countries now running e-plant clinics
- Local solutions increasingly delivered through ICT-connected in-country networks

## Monitoring and Evaluation

- Results from special studies completed in 2016 showed that;
  - 61% of farmers attending plant clinics had an increase in crop yield
  - 70% had an increase in crop-related income
  - 87% had an improvement in quality of life
  - 97% of clinic users were willing to share the plant clinic advice with non-users
- Preliminary findings from the Kenya impact assessment by the American Institute of Research (AIR) indicated that Plantwise-Kenya has a strong logic and a great potential for improving the plant health system and suggested improvements that can further increase impact
- Study in Pakistan to lay ground for a second impact assessment concluded
- Results from gender outreach showing proportion of women amongst plant doctors is greater than the proportion amongst agricultural extension staff, with plans in place to further extend inclusivity
- Training for 181 personnel from partner institutions on monitoring plant clinic performance conducted in 7 countries
- Stakeholder assessment workshops conducted in 5 countries to identify critical relations, essential interactions and roles and responsibilities of in-country partners in Plantwise implementation
- 5 new peer-reviewed papers and four research briefs published





# Plant Health Systems Development

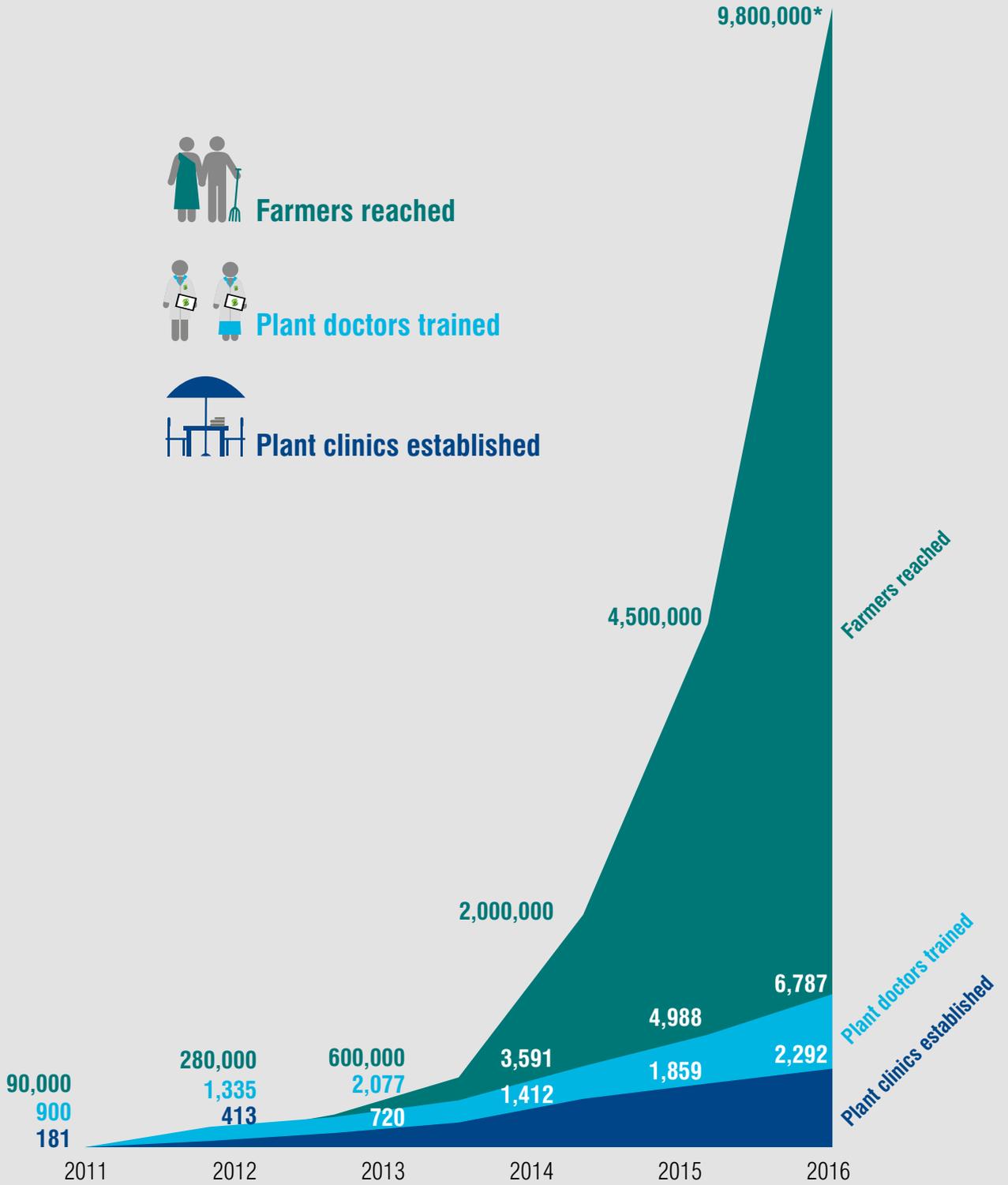
## Progress in 2016

The Plantwise programme in 2016 continued to support delivery of advisory services at farm level through the gradually expanding plant clinic networks and other complementary methods, such as plant health rallies, mobile messaging, print media, radio and television. Across all participating countries, an estimated **5.3 million farmers were reached in 2016** directly through these collective methods and indirectly through farmer-to-farmer sharing (9.8 million cumulatively since programme launch).

Additional **countries established steering committees** in 2016 to improve oversight and management of programme activities, as well as to increase in-country ownership. For example Afghanistan and Bangladesh held their first steering committee meetings in 2016 to discuss matters such as opportunities for expansion of the plant clinic network, lessons learned from and potential uses of clinic data, and programme impact. In total, 100 steering committee meetings or stakeholder forums were held in 29 countries to discuss implementation progress and plan future activities. Within countries, the networks of programme partners continue to grow as needs and priorities change. For instance, there is rapidly increasing interest among agricultural colleges and universities, as well as private sector advisory services, to integrate aspects of Plantwise in their trainings.

In 2016, a **Plantwise private sector engagement action plan** was developed to test the interest of private sector entities to support or run plant clinic operations. Preliminary investigations showed that around 70 different private sector entities in at least 25 countries have engaged with Plantwise (e.g. contributing to programme governance, operating plant clinics, collaborating in the production and dissemination of factsheets). The action plan has a particular aim of testing if private sector plant clinics can contribute to sustaining Plantwise while maintaining quality of advice to farmers and enhancing scalability. Over the past several years, plant clinics have been run by both 'upstream' private sector actors, who are interested in expanding input sales to farmers (e.g., agro-input suppliers, micro-finance agencies), as well as 'downstream' actors, who are interested in buying high quality farm produce for trade (e.g., farmer cooperatives, commodity exporters). Private sector plant clinics will tend to serve primarily the more commercial oriented farmers; however, there is an opportunity for Plantwise to provide the technical, financial and marketing information required to empower small scale farmers to shift production to commercially oriented agriculture.

# Continuing to deliver at scale



\*determined through estimations of primary reach (farmers reached directly through Plantwise activities) and secondary reach (farmers reached indirectly, e.g. as a result of plant doctors operating outside of Plantwise and farmers receiving advice from peers who visited plant clinics). Diagram not to scale.

The 2016 targets for **plant doctor training and new plant clinic establishment** were surpassed by mid-year. A total of nearly 1,800 staff (25% female) from partner organisations were trained as plant doctors and 433 new plant clinics established across 18 countries in Africa, Asia and the Americas. This rapid growth is partly due to the handing over of training responsibilities to local partners. Seven training of trainers (ToTs) in Module 1 and 2 for 78 people (20% female) were conducted in 2016 across 5 countries.

As plant clinics and the associated data management processes continue to improve, CABI is increasingly promoting the use of **complementary extension methods** to enhance reach and expand the influence of Plantwise. Plant health rallies are still a common activity in certain countries, with a total of 329 such rallies run in 12 countries in 2016. There have been more than 1,000 plant health rallies held from 2013-2016, delivering targeted messages to approximately 70 plant health problems on more than 30 different crops. There has also been an increase in mass extension activities, in some cases using plant clinic data to identify key crop problems or using Plantwise factsheets as source materials for broadcast messages. Such events were organised in at least 8 countries in 2016 and focussed on different topics of local relevance. For instance, a campaign was conducted in Tamil Nadu, India to inform farmers on how to manage the tomato leaf curl virus, a new problem affecting the egg-plant (*Solanum melongena*), in the area. This campaign involved newspapers, phone-in radio programmes, mobile-based advisory services, plant clinics, field visits and other meetings. In Uganda, illustrations on pesticide safety issues (calibration of sprayers, personal protective equipment and disposal of containers) were published in 3 popular magazines and printed as posters.

The growth of national plant clinic data sets has led to a visible increase in the number and **diversity of data analyses and uses by Plantwise partners**. Across the programme, clinic data is being used by plant health system stakeholders for different purposes, such as: pest surveillance and pest alerts; advocacy for plant health, monitoring performance of plant doctors; internal reports; identifying extension and research priorities; papers for journals and conferences; testing observed indigenous concepts and monitoring pesticide use. Across the different countries, the data gets discussed in different fora, such as plant doctor cluster meetings or Plantwise steering committee meetings, a process still heavily guided by CABI.

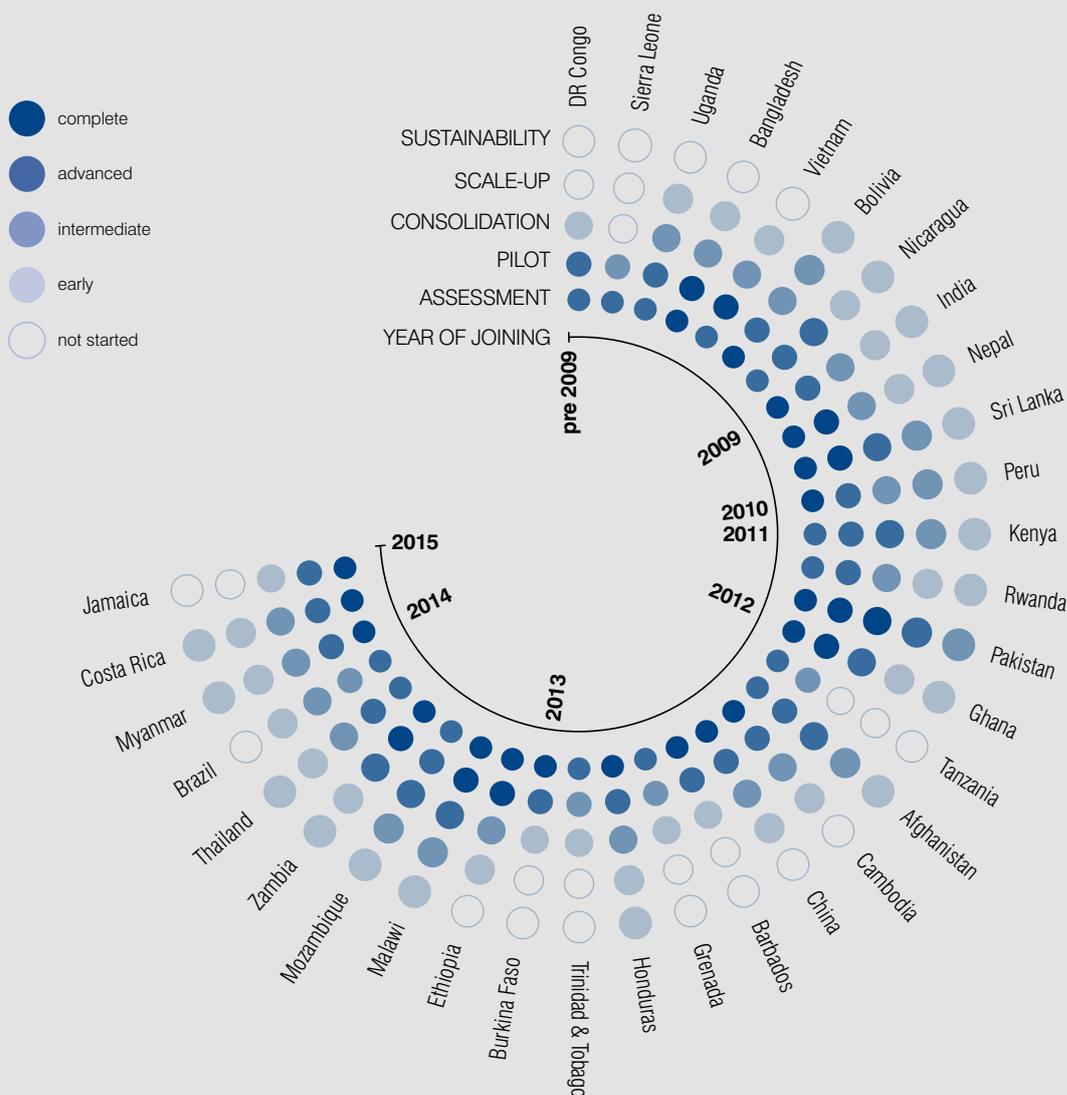
There is also increasing use of plant clinic data outside of the Plantwise countries. More than 50% of the 12 international students participating in the 2016 **Masters of Advanced Studies in Integrated Crop Management (MAS-ICM) programme**, used clinic data from their countries for their thesis work in the following areas: monitoring farmers' use of recommended crop varieties and the possible breakdown of disease resistance in improved varieties and assessing how plant doctor performance may be influenced by personal characteristics (age, education, gender). In 2016, CABI also launched its own process for data analysis to investigate more rigorously the opportunities created by the data, as well as its limitations. These analyses will investigate factors that influence plant doctor performance (determined by validation of diagnoses and recommendations) and possibilities to overlay multiple data sets to predict pest dynamics. At the global level, CABI and its partners are using the data to ground-truth pest models and long-range observations, and to feed into systems looking at the security of food supply chains.

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## Progress towards sustainability

Sustainability, defined as positive changes continuing beyond the lifetime of the programme and independent of direct support from CABI or Plantwise donors, is a key objective in Plantwise. The term 'sustainability' is often interpreted differently by partner institutions and CABI; therefore, the Plantwise sustainability roadmap, based on five phases of implementation, was introduced. The overall progress towards sustainability by end of 2016 of all Plantwise countries using the sustainability roadmap can be seen below.



1. **Assessment** – Understand country context to evaluate suitability for the Plantwise approach
2. **Pilot** – Test Plantwise approach and relevance for the country
3. **Consolidation** – Strengthen in-country activities based on lessons learned to establish a critical mass of plant clinics with the necessary links to key stakeholders
4. **Scale-up** – Embed the organisational changes and new practices to enable expansion of Plantwise activities by national partners
5. **Sustainability** – National institutional capacity developed with ownership of responsibilities ensuring that Plantwise approach is fully integrated into institutional functions and budgets

## Lessons Learned

The rate of **progress of Plantwise implementation and adoption** by local partners is highly variable across the 34 participating countries. The Plantwise sustainability roadmap has assisted in harmonising programme expectations from both CABI and its partners. This roadmap is also an assessment tool that enables a more objective analysis of a country's progress through the five phases (assessment, pilot, consolidation, scale-up, sustainability) towards full integration of Plantwise principles in the national plant health system. Pakistan is considered to already be in the final phase ('sustainability') of the roadmap in programme implementation, given significant contribution to operational costs for large networks of plant clinics and its adoption of programme principles, such as the use of clinic data for service quality assurance. Five countries are in the 'scale-up' phase, where they are building on the successes of previous implementation to extend the reach of Plantwise across the country. A further 18 countries are in the 'consolidation' phase, which is a period when the experiences from the 'pilot' phase should be evaluated and the approach modified to achieve maximum impact and sustainability prior to moving to scale-up. The consolidation phase, therefore, can be a lengthy segment of programme implementation, where many of the supporting processes and feedback loops are strengthened, if not established for the first time. By the end of 2016, nine countries were still considered to be in the pilot phase. These are generally countries where the traditional plant clinic-focussed Plantwise approach does not fit so well or where local conditions (disease, conflict, etc.) have impeded programme implementation.

In 2016 there was evidence from 23 countries that partner organisations were allocating **official budgets for Plantwise implementation**. The confirmed amount (over £850,000 in total) excluded in-kind contribution e.g. staff time. In some countries, it has emerged that partners view Plantwise as a CABI-owned programme. Therefore, CABI will continue to promote integration of Plantwise into national plant health systems.

Linkages created under Plantwise e.g. provision of diagnostic support through local, national and international experts and laboratories enables identification of new pests and formulation of appropriate strategies for their management, thereby helping farmers reduce crop losses.

There is a lot of interest in routes to sustain Plantwise operations in countries beyond the duration of donor support. As a result, we are assessing the interest of **private sector entities in supporting plant clinic operations** to enhance scalability without compromising on quality of service to farmers. A preliminary analysis using clinic data in China, for instance, found no major differences in the quality of advice given to farmers by public and private sector plant doctors. There were however, differences in the attendance rates by farmers (more recorded visits at private sector clinics) as well as the sex ratios of farmers using the service (a higher relative proportion of female farmers recorded at public sector clinics). Overall, there are different experiences with private sector run plant clinics. There are a number of private sector actors who successfully ran plant clinics throughout 2016. The majority of these are farmer-based organisations in Nicaragua and Honduras. A review of

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farmer-based organisations with business models based on exportation of produce and diversification have better capacity for running a plant clinic

these plant clinics in Central America found that farmer-based organisations with business models based on exportation of produce and diversification have better capacity for running a plant clinic. One organisation in Nicaragua even reported a 30% increase in productivity as a result of the plant clinic service. On the contrary, certain private sector partners who started running plant clinics have since stopped, typically as a result of financial difficulties or the absence of financial incentives. These include; ESCO-Kivu (a commodity exporter based in DR Congo) and AgExtension Africa (input credit and advisory service in Ghana). Some of these claim that they would resume providing the plant clinic service to their client farmers once their financial situation improves.

## Next Steps

As countries advance through the phases of Plantwise implementation, CABI's role in the country will change. In the consolidation and scale-up phases, CABI personnel on the ground will generally shift their effort and resources from operational and technical assistance to aspects of quality assurance in the areas of data use, monitoring and evaluation plus further capacity development. In countries where the standard Plantwise implementation has failed to gain much traction in terms of adoption and ownership, CABI will have to make decisions on how to proceed. Over the next year, a clearer decision-making process will be established for determining under what circumstances to re-shape the intervention in a low-performing country, scale back or, in certain cases, withdraw.

In-country **use of the plant clinic data** by diverse stakeholders will remain another priority area for Plantwise into 2017 and beyond. The increased use of digital devices for data collection will significantly decrease data processing times, making the uploaded data more current and, therefore, more valuable in responding to emerging plant health related issues e.g. pest outbreaks and pesticide risks.

CABI will continue to promote and **test new plant clinic models**, such as clinics owned and operated by both upstream and downstream private sector organisations. An assessment of private sector needs will guide the engagement process. Particular attention will be given to the quality of advice provided by plant clinics associated with agro-input dealers, as an on-going study of how the conflict of interest (best advice for a farmer versus input sales) affects the advice given to farmers. CABI will also evolve its private sector engagement strategy, taking cognisance of the fact that private sector priorities may not fully align with those of Plantwise, such as with regard to the types of farmers served, the crops addressed and data sharing. CABI will explore opportunities to expand its traditional Plantwise framework, with the support of private sector partners in an endeavour to create market opportunities for farmers.

CABI will continue to explore opportunities to increase uptake of Plantwise content and tools by making them available to a wider range of stakeholders, such as universities and private sector organisations. Assessment of potential users of training materials developed for plant doctors such as the Plantwise Factsheet Library app and the serious games (Plant Doctor Simulator and Crop Management Simulator) will continue.



# Knowledge Bank

## Progress in 2016

Knowledge bank content is becoming widely used by Plantwise partners as it is increasingly available through a variety of different media. The **open access online resource has had over one million visits** since launch and usage continues to grow. There were 318,000 visitors in 2016, 116,000 from Plantwise countries, an increase of 65% over 2015. Views of the factsheet app (now available on both Android and IOS) have reached 190,000 to date, with 172,000 from Plantwise countries, and there has been a doubling of usage in 2016 over 2015. Analysis shows that information on key pests, like *Tuta absoluta*, is frequently accessed on both offline and online sources in countries where the problem is established (e.g. in Kenya) and emerging (e.g. in India). Plant doctors can be shown to be the predominant users of the factsheet app as in-country use surges following the establishment of new clinics that are using tablets (e-plant clinics). The generic Green Lists are very popular with app users, perhaps because they are widely applicable to many countries. To feed increasing usage, there is a continued effort to expand content. Over 12,500 factsheets, photo-sheets and videos are now available through the online Plantwise Knowledge Bank. These include 2,500 Plantwise-produced Factsheets for Farmers and Pest Management Decision Guides of which 100 are on invasive weed species. A paper on the innovative Plantwise approach for delivering actionable knowledge to smallholder farmers has been published.

Users from all active Plantwise countries have accessed the **Plantwise Online Management System (POMS)**, which now holds 253,000 records, and 257 partners logged into the system in 2016. New developments allow these partners to handle and use their plant clinic data more independently. The data harmonisation and upload tools are in use in over 20 countries with 30,000 records uploaded directly. Integration with the new data collection app (see below) has resulted in e-plant clinic data being loaded far more rapidly, entering POMS in one to a maximum of six days. Feedback from partners has resulted in the development of a more user-friendly interface including a 'human readable' download to Excel. In addition to data in POMS, China also holds and analyses 33,500 clinic records in its independent POMS-based system.

Following careful initial analysis of the **use of tablets** and their added value, these devices have been rolled out more widely. Pilots in Uganda, Ghana, Zambia, Peru,

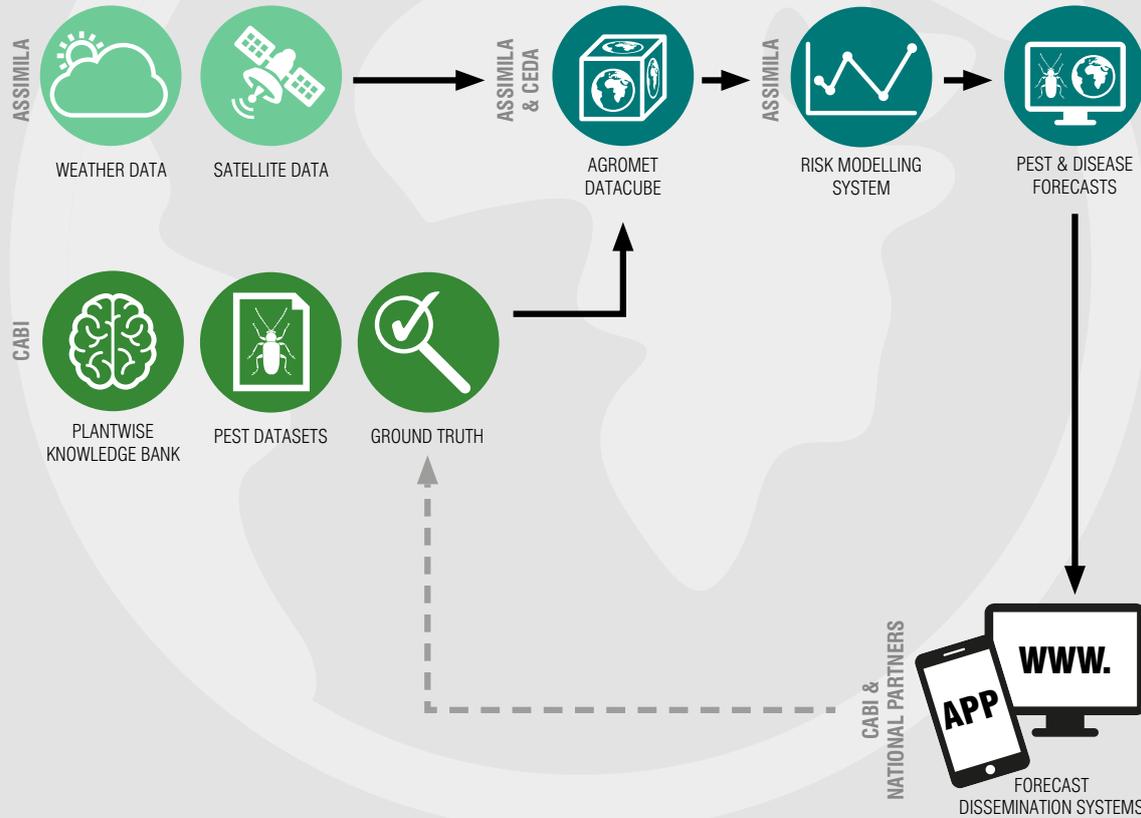
# Using earth observation data to predict pests

The recently-launched PRISE project will create a pest risk forecasting system based on earth observation and Plantwise data over the coming years. The aim is to provide pest risk predictions in time for farmers to take preventive action and thus increase the resilience of smallholder farmers to pest outbreaks.

## STATIC SOURCES



## DYNAMIC SOURCES



Pakistan and Afghanistan have been implemented. All plant clinics in Kenya have now been converted to e-plant clinics and activities in Sri Lanka have been substantially scaled up with the in-country partner shouldering half of the cost. By year end there were 432 plant clinics using tablets across 10 countries and 30,000 records have been delivered to POMS via this route. Building a proprietary Plantwise data collection app has considerably improved the workflow and reduced the cost. Communication in the self-help groups set up through use of tablets is now substantial with over 12,000 messages being sent in 2016. Word cloud analysis shows that the vast majority of these are about plant health matters, not chatter. Twenty percent of the messages contain images which are increasingly being used locally, regionally and internationally to help ensure accurate diagnostics.

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## Lessons Learned

This year there has been a rapid increase in the use of POMS by partners, as they have seen the value of the plant clinic data. The greater number of visitors to POMS has resulted in the need for an expanded access control system, as different user subsets should only see data from relevant fields. In addition, options now exist on the POMS for loading and downloading data for different activities, including: validation; re-harmonisation; use by humans; and use by machines. As a result, it is important to ensure that the user interface can be easily navigated. **POMS will now be rationalised** to focus on the clinic data and ensure that it meets the key in-country partner needs for entering and analysing data.

As country partners start to look at their data they increasingly see the value of cleaning it up, i.e. ensuring clinic codes and plant doctor names are standardised. This time-consuming activity will grow as more data comes in and needs to be addressed by pushing quality issues back to the source of problems. Ensuring the information is correct at the start of the workflow results in far less overall effort and so there will be an ongoing focus on workflows and tools, such as tablets, that facilitate this. Measures will also be put in place to ensure that the critical information POMS holds, such as names of plant doctors and plant clinic codes, are both accurate and linked to all other data handling resources, such as drop-down menus on the data collection app.

New validation workshops have been implemented and countries find the process very valuable. However, they find it hard to implement this as a sustainable, ongoing activity. It will be important to find fresh ways of improving the quality of plant doctor outputs and trawling the data for problem pests, two major outcomes of validation.

Data is now collated in every active Plantwise country and shared with POMS by all except China. Even though there may still be reluctance to place data in POMS, a substantial number of clinic records (over 33,500) are still being collected, stored and analysed within China. Hence it is fully in line with the Plantwise principle of ensuring that data is put into use within the in-country Plant Health System.

The roll out of tablets into new countries has been very well received but has presented fresh challenges to the programme and the countries. Increased factsheet content in the appropriate language is often needed to improve the country-based material available to the factsheet app, feeding back into potential blockages in in-country content generation. Some countries implement the tablet technology very rapidly but others can be slower and need more support. **Countries are investing in purchasing tablets** (e.g. Sri Lanka, Zambia, Bangladesh, Mozambique) and airtime themselves, showing their commitment to the new technology. However, it can be a challenge to match the enthusiasm of the partners to the availability of core Plantwise support for building the necessary capacity for optimal use of this technology. Other moves towards sustainability, such as requiring plant doctors to pay for airtime, are being tested. The development of the tailored, proprietary data collection app has been a major step forward, cutting costs and improving data flows.

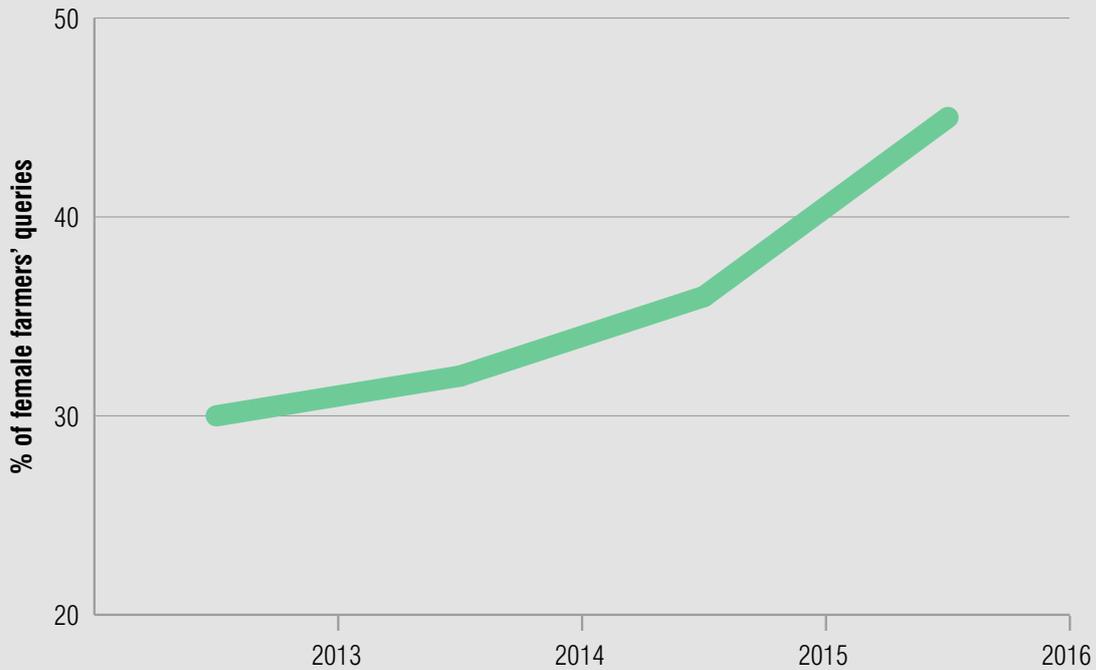
## Next steps

CABI Country Coordinators and country partners have become much more aware of the **value of knowledge and data** and taking on the responsibilities of the processes associated with managing it. This engagement will be built on further as increased data availability results in increased opportunities for use. There will also be continuing effort to open up the data to provide new insights into tackling pest problems. Application Programme Interfaces will be designed to allow the material to

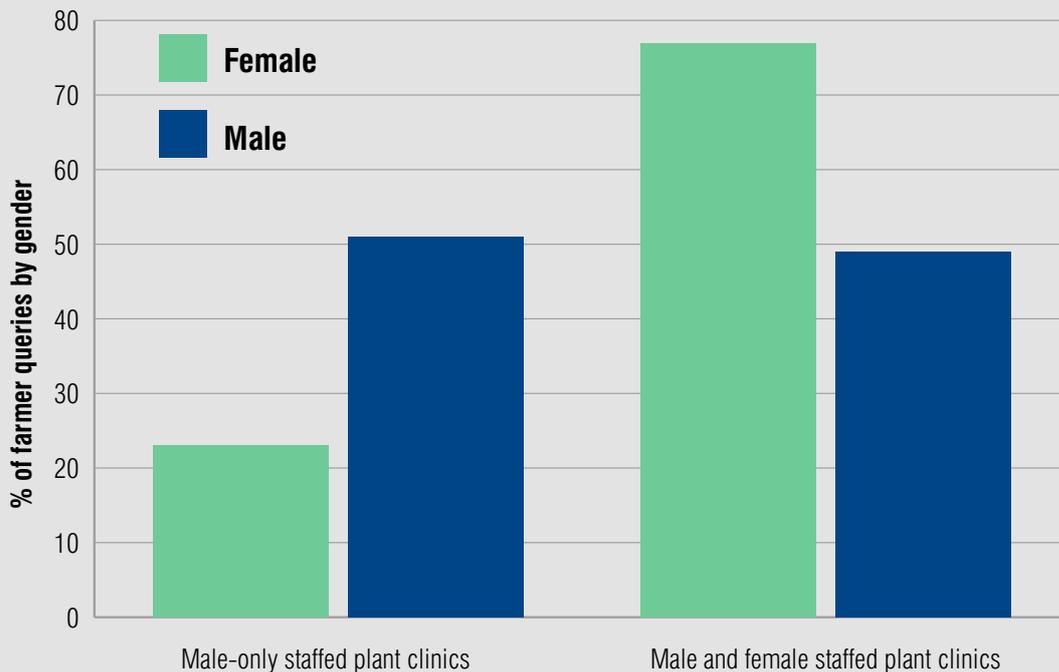
## Putting plant clinic data into use

Analysing data from plant clinics can provide valuable information and actionable recommendations. The example below comes from Julius Banda (Department of Crop Development of Mzimba District, Malawi), who used the data as part of his thesis for the Master of Advanced Studies in Integrated Crop Management.

Data from across Malawi show that the percentage of female farmers coming to plant clinics has increased over the past few years.



Data from some individual districts in Malawi indicates that plant clinics staffed by both male and female plant doctors get more queries from female farmers.



be machine readable and data will be linked to other growing local and international datasets. To facilitate this, knowledge bank data and content will be integrated into the central CABlcore system. This will ensure that both Plantwise assets have a sustainable future, fully aligned with CABI's overarching information architecture, and can be easily re-used and integrated into other internal and external products and projects.

**Substantial use of ICT** has been introduced within Plantwise for delivering information, facilitating local communication, and acquiring and analysing data. ICT is used widely to build capacity, streamline workflows, disseminate knowledge, monitor progress and deliver impact. Plantwise has constructed an ICT structure that not only informs and links together every single actor in the plant health system but also broadens the reach of Plantwise actionable knowledge out to millions of farmers who will never attend a clinic. There are extensive metrics available for, and from, the ICT systems and many of the components, such as the factsheet app and online knowledge bank, are used in every single country in the world, let alone every Plantwise country. A unique selling point of the programme is its ability to use ICT to interlink real-time problems, observed by experts on-the-ground, with a wide range of specialist stakeholders to trigger action by all to reduce losses. While keeping implementation as simple as possible, it is now time to drive forward the opportunities ICT brings, e.g. to deliver improved advice, including targeted messaging, directly to farmers as the availability and use of smartphones increases.

**Tablets will become basic tools** and pilots for e-plant clinics will be run in 2017 in new countries, including Mozambique, Nepal, Malawi, Nicaragua and Honduras. In Ghana, there are plans to equip all clinics with tablets. We will need to study more closely any blockers that may exist to enabling this new technology to benefit the stakeholders and farmers. Across Plantwise, rapid collection of data from the tablets means that near real-time monitoring of the regularity and reach of the clinics is possible and new tools will be given to country partners for that purpose. Systems will be investigated for auto-checking data, looking for new pests, erroneous advice or threats of new outbreaks. Processes will be established to improve the quality of data input to ensure that the plant clinic records are cleaner and hence more usable. Diagnostic experts will be associated with each of the self-help groups to ensure identifications are correctly made by plant doctors. Beyond Plantwise, the factsheet app can be made widely available to all extension workers, particularly in places like Zambia and Pakistan where government plans are in place to widely distribute tablets and smartphones through other programmes. Similarly, the data collection app, or simpler systems, can be used beyond the Plantwise circle to bring in more data on pest presence, for example within new projects. To keep content relevant for such delivery systems, updating of factsheets will be undertaken where appropriate.

Plantwise is becoming well known and well respected throughout the international research community. To ensure that Plantwise activities are integrated with other research targeted at improving plant health, proposals **for new associated projects** will continue to be prepared for non-Plantwise funding. For example PRISE, the new five year project that has been won for using Earth Observation data for pest forecasts, builds the capability to bring together data from a variety of sources, develop new expert systems and deliver enhanced information out to a wider audience. While integrating the activities of Plantwise with such major new projects is highly encouraging as well as a challenge, such **innovation places Plantwise at the centre of new and exciting fields of research** and enables it to strengthen its influence in developing countries.





# Monitoring & Evaluation

## Progress in 2016

The Plantwise log frame was reviewed and updated to include indicators that best reflect the recent evolution of the programme. Systematic monitoring and evaluation procedures have been further consolidated to enable better monitoring of programme performance in all countries. Building capacity for monitoring plant clinic performance continued (181 national partners trained in 7 countries). To broaden the stakeholder base and align roles and responsibilities with the institutional mandates of implementing countries, stakeholder analyses were carried out in 7 countries. A 2-day lessons learned workshop was held with partners from 7 countries to identify gaps, learn lessons and improve Plantwise implementation.

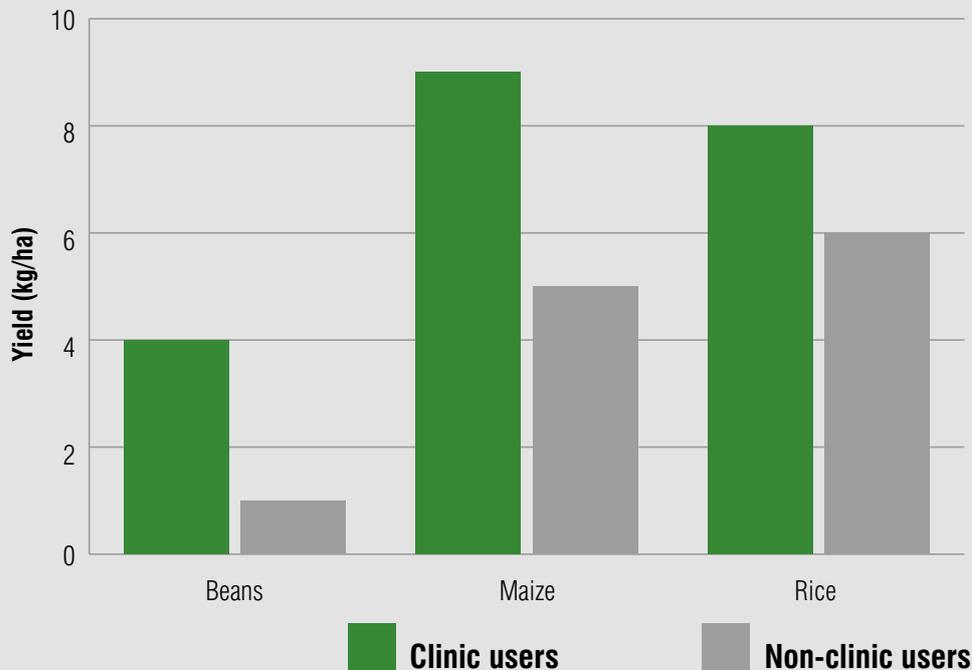
An external evaluation was successfully conducted in Bolivia, Nicaragua and Peru with the findings indicating that the Plantwise model is a cost-effective means of providing technical advice to farmers and that the IPM approach contributes to more rational use of pesticides. The **impact assessment** by AIR continued with preliminary findings indicating that Plantwise-Kenya has a strong logic and a great potential for improving the plant health systems but also suggested improvements that can further increase impact. The final data collection phase will be completed in 2017. A second impact assessment is planned for Pakistan in 2017.

**Gender outreach** work continued in 25 countries. Progress includes the establishment of links with gender units in partner countries (Costa Rica, Nicaragua, Honduras, Ethiopia, and Kenya) and new partnerships with gender projects and local women's associations (Nicaragua, Honduras, Ethiopia, India and Nepal).

**Special studies** from several Plantwise countries have shown many examples of farmers receiving positive benefits, in terms of reduced crop losses and/or reduced cases of unnecessary use of pesticides. A study comparing pesticide use before and after Plantwise introduction in Cambodia showed a decrease in mean number of pesticide sprays, average expenditure on pesticide treatments, and rice crop losses per season. In addition, the number of farmers using cultural practices increased. Another study by Plantwise partners in Thailand found that the use of pesticides on rice has dropped by approximately 50%, while rice crop loss has declined by 40% with farmers' income quadrupling. Results from Rwanda and Ghana showed that farmers who use plant clinics have increased awareness and knowledge on how to

## Special studies: measuring on-farm impact on yield and pesticide use

Comparison of yields between users and non-users of clinics in Rwanda for a variety of crops



Comparison of pesticide use before and after the introduction of Plantwise in Cambodia

### PARAMETERS

PRE-PW POST PW

#### Indicator 1: Use of pesticides and non-pesticide measures

Mean number of pesticide sprays	3.6	<b>3.1</b>	
Average spend on pesticide treatments (in USD)	\$30.54	<b>\$14.71</b>	
Farmers using other non-pesticide measures	56%	<b>99%</b>	

#### Indicator 2: Crop loss and yield (in rice)

Rice crop losses per season	18%	<b>12%</b>	
Rice yield per hectare	3.2 tons	<b>3.9 tons</b>	

manage pests and diseases. In Rwanda, significant differences in the yield of maize (8.5 tons/ha vs 4.8 tons/ha) and rice (8.1 tons/ha vs 5.6 tons/ha) between clinic users and non-users were recorded for both male and female farmers. In contrast, no differences in yield between clinic users and non-users were observed in Ghana for groundnut, cowpea and maize. Follow-up will be necessary in order to identify the reasons for these differences. Other studies on estimation of secondary reach based on primary reach data of Plantwise (Zambia, China) through the use of social network analysis, influence of communication on farmers' perception and uptake of advice (Malawi, Nepal, Costa Rica) and assessment on the use, management and functioning of the Plantwise data management system (Kenya, Myanmar) were conducted.

Studies in Kenya and Myanmar concluded that there were strong indications of national interest in the plant clinic data by some stakeholders due to potential multiple uses. As a result, a generic framework to assess the functioning and use of data management systems is under development.

Collaboration with the **MSc internship programme of Wageningen University** was initiated in 2016 leading to new insights on plant clinic operations in Rwanda. Although the plant clinics have similar basic conditions in terms of staffing, logistics and funding, some have consistently higher farmer turnout than others. Personal and organisational commitment combined with good publicity and proactive communication with farmers and local leaders were key factors explaining the higher attendance.

The research and lessons learned in 2016 contributed to the production of five **peer-reviewed papers** and four **research briefs**.

The findings will be used by CABI to feed into discussions with partners on ways to adapt the approach and improve its performance.

Social network analyses in China (study co-funded by Ministry of Agriculture of China) and Zambia revealed that for most clinic users, plant clinics and plant health rallies are the most important sources of information on plant health. Further, it was found that plant doctors provide services to users beyond clinics. The study also found that farmers shared information received from clinics with other farmers but the messages from the clinics often change as they are passed on.

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Plantwise has the potential to impact farmers' livelihoods through better plant health management

## Lessons Learned

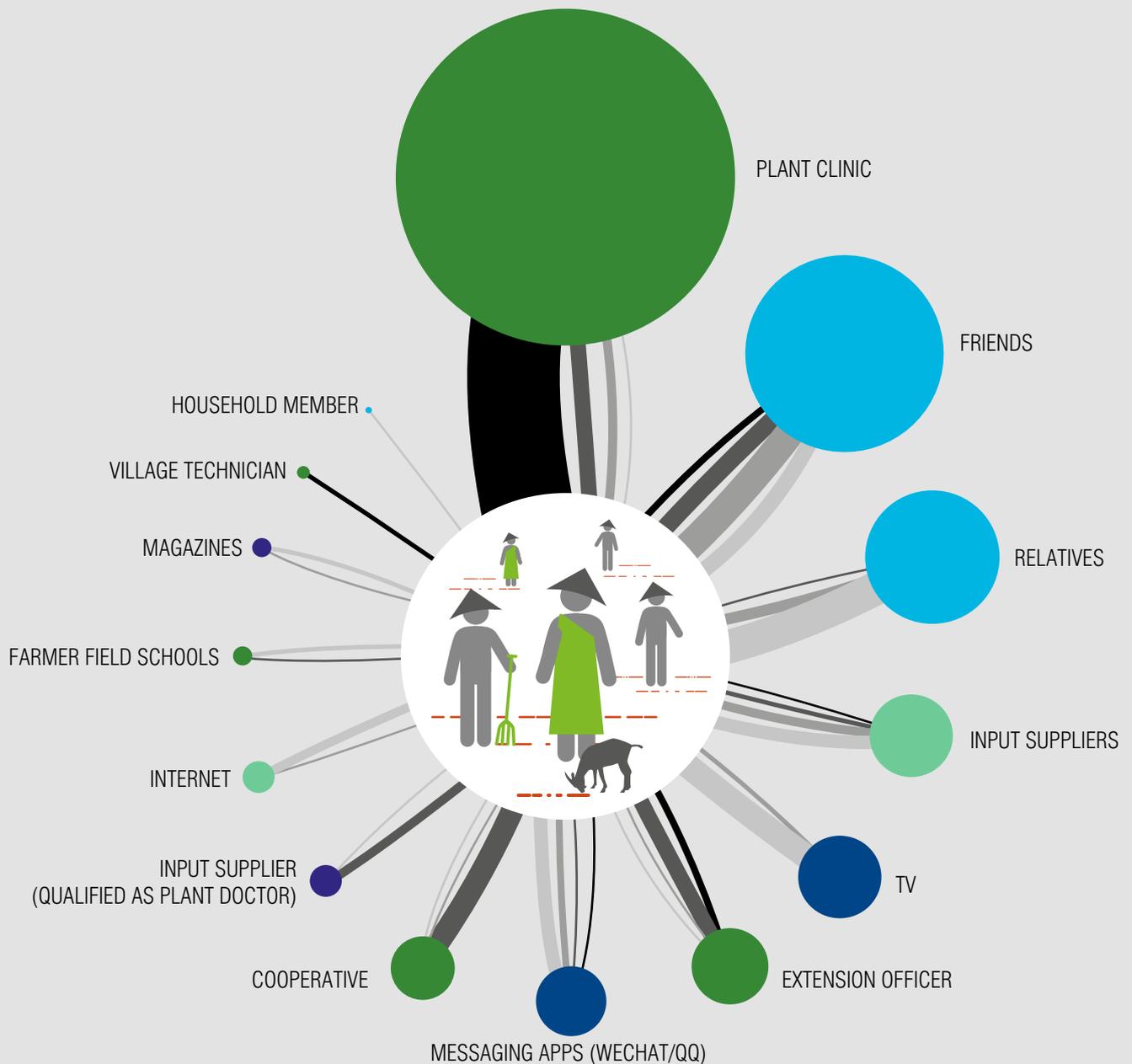
Observations from the **external evaluation** of Latin America countries suggest that Plantwise has the potential to impact farmers' livelihoods through better plant health management but it would be more effective if the programme responded to specific country situations and addressed social diversity groups to address needs that lead to empowering farmers' communities. It was also recommended that the programme could target more women participants and use baseline information to assess impact.

A **study** to determine the suitability of Pakistan for a second impact assessment concluded that such an evaluation is possible and best done only after elaborating the Plantwise Theory of Change and developing the country-specific log frame with targets.

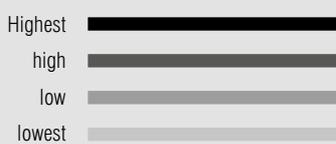
Preliminary findings from impact assessment of **PW-Kenya by AIR** recommend the need to focus on some key issues regarding implementation such as to promote in country data use, further build capacity of plant doctors for better diagnosis, embrace

# Special study: value of plant clinic information to farmers

Sources of plant health information and their relative importance in Changqing district, China. The larger the circle, the higher the number of farmers connected to that information source. The individual lines show how farmers value each source: the darker the line, the more highly the source is valued; the thicker the line, more farmers expressed that value. Taken together, this indicates that plant clinics are not only the most accessed source of information but also the most valued.



### Key 1: How the source is valued



### Key 2: Type of source



ICT, and strengthen the coordination at national and county levels and address low clinic attendance.

From the regional 'Lessons Learned' workshop held in Kenya in June 2016, participants recommended that the programme should:

- Allow plant clinic adaptations to suit country needs and context for increased reach and efficiency: e.g. having plant nurses to support the plant doctors, running mobile clinics, working with women's groups and farmer groups;
- Demonstrate impact, especially at farmer level, in order to build in-country support for continuation of activities beyond the duration of external funding;
- CABI must use the sustainability roadmap more widely to clearly communicate its exit strategy;
- Prioritise advocacy at all levels as a requisite to incorporating Plantwise concepts into Government strategies, and thereafter for inclusion in planning, budgeting and job descriptions for sustainability;
- Simplify data validation processes to make them sustainable, less cumbersome and cheaper.

## Next Steps

Going forward, two **impact pathways** targeting adoption of plant clinic advice and plant health system change have been developed. These will have structured criteria for measuring outcomes and impact referenced on **retrospective baselines**. To this effect, focus will be on four key outcome and impact indicators: (i) farmers' adoption of appropriate practices, (ii) changes in crop loss, (iii) crop productivity and, (iv) farmer income. Various methods and study designs will be used. At least 20 countries will carry out *impact case studies* describing key impact areas including cases of new pest/pest outbreak detections and response. *Economic modelling* will be conducted on selected cases to quantify the outcomes and impacts of loss prevention due to early/rapid detection of pests. For 2017, evaluations will be done on:

- On-farm impact using a quasi-experimental design in Rwanda and Malawi;
- Impact of Plantwise interventions on plant health system responsiveness in Nepal and Ethiopia;
- Cost effectiveness of plant clinics, including data management and use, versus other extension messages in Vietnam, and Malawi;
- Use of ICT use in data collection and use in Uganda, Rwanda and/or Mozambique.

**Gender and diversity** activities will be conducted in 25 countries to increase the involvement in and access to plant clinic services by women and youth. This will involve operationalizing gender outreach plans and promotion of use of the new gender resource pack and tools with a minimum of two publications on gender issues.

The impact assessment in Kenya by AIR is on-going and the final data collection will be completed in 2017 while a second impact assessment will commence in Pakistan.

**Country-specific log frames** will be developed for specific countries with defined targets for all countries in 2017 and outlined for 2018-2020 for all countries based on the Plantwise programme level log frame.

In addition research briefs, case studies, peer-reviewed papers and study reports will be published.





# Medium-term Opportunities

## Developing commercial products from Plantwise activities

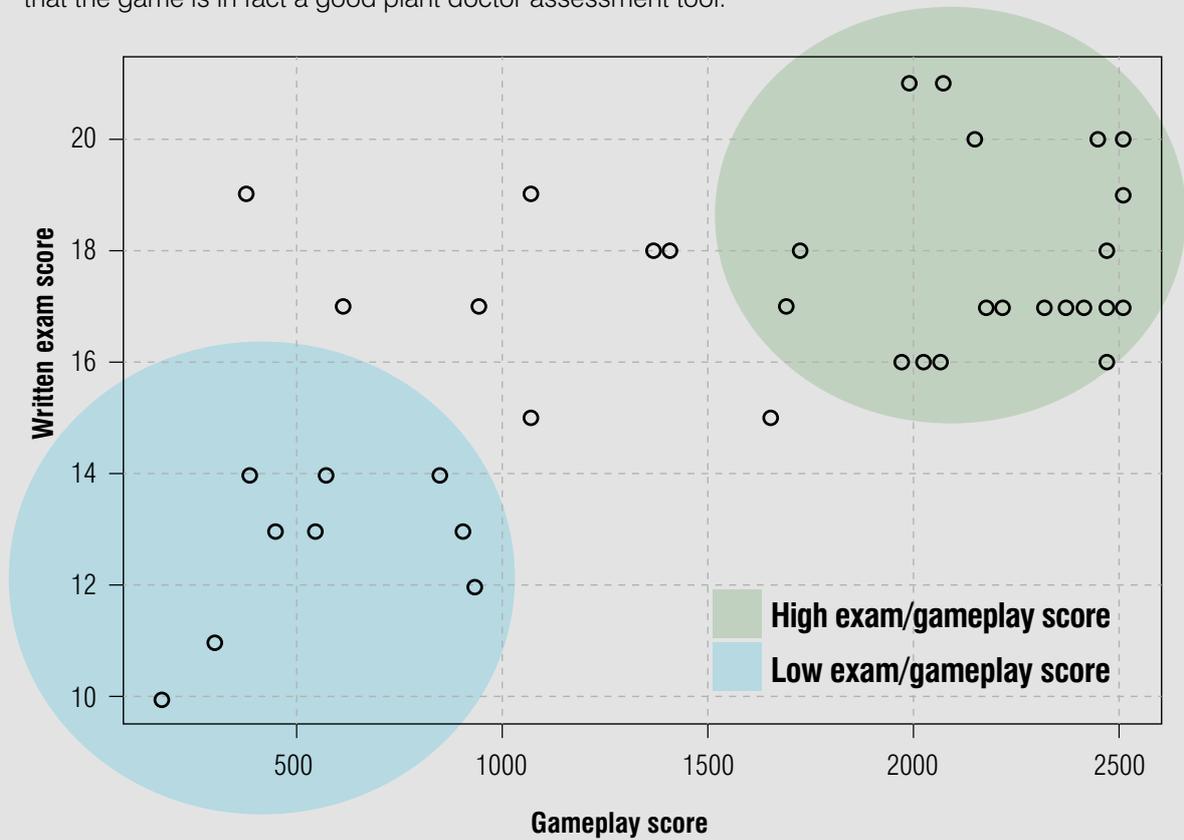
In 2015 CABI, in collaboration with Bondi Labs in Australia, produced a first simulation app entitled “Plant Doctor Simulator”. The game, designed for use on Android tablets, presents players with interactive 3D models of crop plants showing symptoms of poor health and tests their diagnostic skills by challenging them to diagnose the problems they encounter. Throughout 2016 the game underwent user-testing by plant health advisors to gather feedback and to assess its potential for measuring diagnostic competency. In total, 293 plant doctors from Kenya, Uganda, Ghana and Myanmar were given the game to play in a ‘controlled’ release. Overall, 78% of the users reported that the game play increased their diagnostic knowledge, with some playing for over 7 hours in an effort to top the leader board. Moreover, there was a statistically significant correlation between the game players’ performance and their scores in a traditional written examination.

CABI and Bondi Labs completed a second simulation app, “Crop Management Simulator” in September 2016. This game aims to teach the principles of pest and disease management using an integrated pest management (IPM) approach. It achieves this by creating a realistic virtual environment in which players can test out management approaches and strategies to deal with over 400 pests and diseases attacking 18 different crops. Among the options to combat pests and diseases are a range of cultural and physical controls, as well as biological, botanical and synthetic chemicals. Training hints delivered throughout the game help to guide players towards the most appropriate management strategy that will assist in preventing and controlling pests and diseases in the most effective and cost-efficient manner. Alpha testing was successfully completed at the end of the year to test for bugs and stability. Further user testing is planned in 2017.

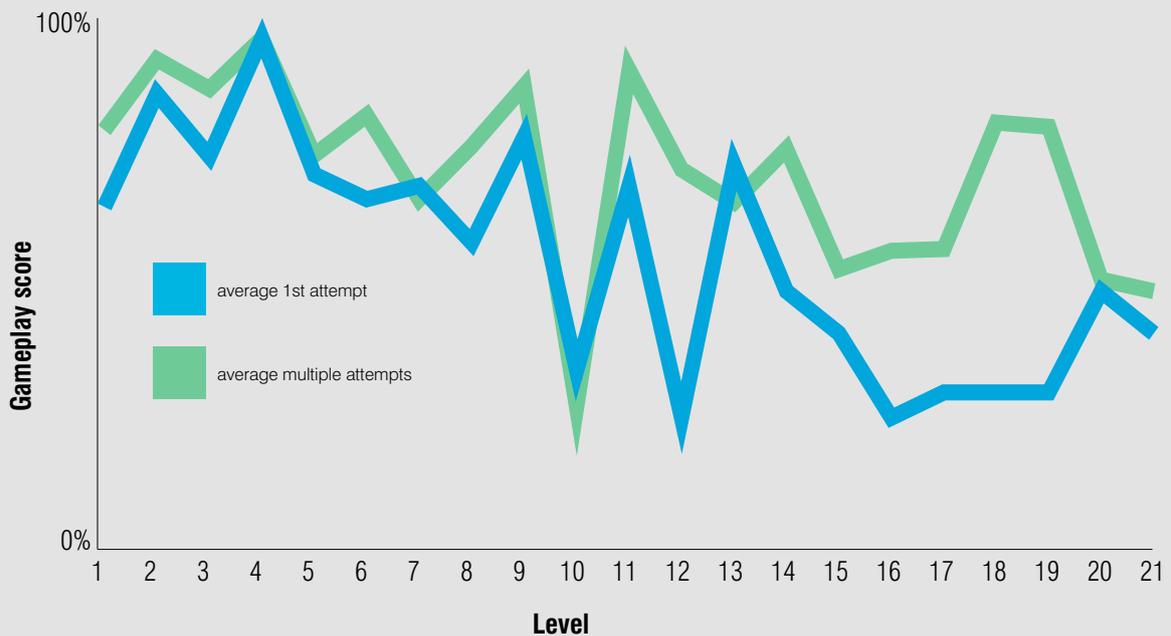
These tests confirmed the hypothesis that educational games can significantly enhance the learning experience. As a result, CABI has been undertaking market research among educational institutions and private sector entities to make an assessment of whether products developed from Plantwise activities can attract interest for use beyond agricultural extension service providers. Demonstrating the use of the two games has attracted a lot of interest from some institutions

# Simulators reflect plant doctor competency

The scatter plot shows the correlation between competency measured via a traditional written exam, and competency measured via performance in the Plant Doctor Simulator which indicates that the game is in fact a good plant doctor assessment tool.



The graph shows plant doctors improved over time. Initial scores are lower compared to average scores, especially on more difficult levels.



that have sought to know if they can be commercially available. Pending the results of the assessment, CABI would invest in developing training modules in pest diagnosis and pest management, along with a suite of complementary learning resources. These include the Plant Doctor Simulator and Crop Management Simulator apps, as well as a Pest Diagnostic Field Guide in e-book format and Pest Management Guides made available via a new dedicated Android app. These can potentially generate income to fund some aspects of the programme, thereby sustaining it beyond donor funding.

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## Leveraging Trade and Commodities Theme on Plantwise

Plantwise has been largely implemented through work with public sector organisations and has focused its efforts in trying to address food insecurity from a production perspective, having its core interventions targeted at addressing access to plant health information by small holder farmers. However, there is increasing evidence that the usefulness of such information may vary between non-commercial and commercial oriented small scale farmers. For the latter, market access for some of the farm produce is also important. As a result, developing and delivery to these farmers of information on production practices that enable produce to meet market quality and safety standards has been identified by Plantwise and CABI's Trade & Commodity theme as an important link that would be beneficial to some of the Plantwise clientele. In response to this need CABI is starting to also implement value chain based Plantwise activities in a few selected countries. This will mean identifying and working with stakeholders in plant health not only at production stages of selected crop value chains but also those involved at post-harvest i.e. aggregators, processors, traders and even consumers.

Starting in 2017, Plantwise will be introduced in Cote d'Ivoire with the services targeting the cocoa value chain alongside common food crops. In Vietnam, the Plantwise stakeholder base will be expanded to enable implementation to also address the needs of players in the pepper value chain. In both cases, the focus will be to contribute to improving the information systems and the introduction or use of existing tools (including ICT) to improve how production systems of the two crops embed good agricultural practices that ensure compliance with sanitary and phytosanitary standards. In the implementation of this, CABI will work with partners in Cote d'Ivoire to collate existing information on the gaps or constraints to SPS compliance and put into databases to be used to train agricultural advisory service providers as plant doctors using modules adapted from the current Plantwise training modules. One of the key products of this initial phase of work will be suitable reference materials to be used to aid certification of products and production methods for SPS compliance.

In Vietnam, the Pepper Association has already identified the exceedance of maximum residue limits for pesticides by produce placed on the market as the initial problem that needs to be solved in endeavours to enhance market access opportunities. In response to this need CABI will repurpose Plantwise training and information delivery systems to empower agro-advisory service providers and farmers to adapt the pepper production processes and practices to meet these market

needs. For both countries, therefore Plantwise has to be implemented with a broader stake-holder base including commodity boards and private sector entities particularly, produce-buying companies and agro-input suppliers; training modules have to be repurposed to address specific rather than general farmer needs with the scope expanded to include post-harvest processes and practices and information material repackaged into self-assessment guides for easy access and use by extension officers and farmers. While doing this, the connection to Plantwise needs to be kept obvious. While Plantwise-like training will certainly be needed, the core activities may ultimately be something completely different from what Plantwise currently offers. For both cocoa and pepper value chains, traceability of food on the market back to the farm and the associated records at critical points along the value chains are important for credible certification. CABI will therefore repurpose the use of ICT tools already tested under Plantwise, or in use by players in these value chains, to help support certification processes.

The lessons learnt in Cote d'Ivoire and Vietnam will further inform how Plantwise may contribute to agricultural transformation in the coming years. The lessons will also pre-test the potential to run plant clinics as paid-for services as well as the interest of private sector entities in owning and running plant clinics. Cognizance must, however, be given to the fact that the type of intervention will depend on the specific needs identified. These may vary from country to country because country scenarios are not necessarily similar. As such there may be limited scope for the lessons from one country to be applied to the others.

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Traceability of food  
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# Publications

## Published in 2016

### Peer-reviewed journal papers

**Cameron, K.H.**, Somachandra, K.P., **Curry, C.N.**, Jenner, W.H. and **Hobbs, S.L.A.** (2016) Delivering actionable plant health knowledge to smallholder farmers through the Plantwise program. *Journal of Agricultural & Food Information*, 17, 212–229.

**Danielsen, S.** and Matsiko, F. (2016) Using a plant health system framework to assess plant clinic performance in Uganda. *Food Security*, 8, 345–359.

**Lamontagne-Godwin, J., Williams, F.**, Bandarac, W.M.P.T. and Appiah-Kubid, Z. (2017) Quality of extension advice: a gendered case study from Ghana and Sri Lanka. *Journal of Agricultural Education and Extension*, 23, 7–22. (Published online first in 2016).

**Mugambi, I., Williams, F.**, Muthomi, J., **Chege, F.**, and **Oronje, M.** (2016). Diagnostic support to Plantwise plant doctors in Kenya. *Journal of Agricultural Extension and Rural Development*, 8, 232–239.

**Thakur, M., Pandit, V., Chaudhary, M.** and Rajkumar, R. (2015) ICT interventions in crop health knowledge management for smallholder farmers. *Journal of Global Communication*, 9, 35–46.

**Wright H.J., Ochilo W.**, Pearson A., **Finegold C., Oronje M.**, Wanjohi J., Kamau R., **Holmes T.** and **Rumsey A.** (2016) Using ICT to Strengthen Agricultural Extension Systems for Plant Health. *Journal of Agricultural & Food Information*, 17, 23–36.

### Others

**Boa, E., Franco, J., Chaudhury, M.**, Simbalaya, P. and Van Der Linde, E. (2016) Plant Health Clinics. Note 23. GFRAS Good Practice Notes for Extension and Advisory Services. GFRAS, Lausanne, Switzerland, 4 pp.

**Boa, E., Papania, P., Mulema, J.**, Harun-Ar-Rashid and Franzel, S. (2016) Extension campaigns. Note 24. GFRAS Good Practice Notes for Extension and Advisory Services. GFRAS, Lausanne, Switzerland, 4 pp.

**Colmenarez, Y.**; Vásquez, C.; **Corniani, N.**; **Franco, J.** (2016) Implementation and Adoption of Integrated Pest Management Approaches in Latin America: Challenges and Potential. In: Gill, H. K.; Goyal, G. (eds.) *Integrated Pest Management (IPM): Environmentally Sound Pest Management*. InTech, Rijeka, Croatia, pp. 1-18.

**Colmenarez, Y.**; Wyckhuys, K.; Ciomperlik, M.A.; Rezende, D.T. (2016). Uso do Manejo Integrado de Pragas e Controle Biológico pelos Agricultores na América Latina e no Caribe: Desafios e Oportunidades. In: Vieira, B.A.H. et al. (eds.) *Defensivos Agrícolas Naturais: Uso e Perspectivas*. Embrapa, Brasília, DF, pp. 802-853.

**Heeb, L., Jenner, W. and Romney, D.** (2016) Promising innovative extension approaches for climate-smart agriculture: The Plantwise example. In: Sala, S., Rossi, F. and Davis, S. (eds.) *Supporting agricultural extension towards Climate-Smart Agriculture: An overview of existing tools*. Compendium Climate-smart agriculture & extension. Global Alliance for Climate-Smart Agriculture (GACSA). FAO, pp. 50-57.

Mudenge, H and **Otieno, W.** (2016). Modernization of Agriculture through Digital Technology. Africa. Agriculture Status Report. Progress towards Agricultural Transformation in Africa, pp 172-196.

**Otieno, W.** (2016) Plantwise – An innovative approach to reduce crop losses by sharing plant health knowledge. Proceedings of Crawford Fund Parliamentary Conference: *Waste Not, Want Not – The Circular Economy to Food Security*. 26-30 Canberra.

**Thompson, M., Taylor, P., Reeder, R., Kuhlmann, U., Nolan, C., Mason, J. and Hall, J.** (2016) Exploring the value of simulations in plant health in the developing world. In: Marsh, T., Ma, M., Oliveira, M.F., Baalsrud Hauge, J.B. and Göbel, S. (eds) *Serious Games. Proceedings, Second Joint International Conference, JCSG 2016, Brisbane, QLD, Australia, September 26-27, 2016. Lecture Notes in Computer Science 9894*. Springer, pp. 153-162.

## In press in 2016

**Colmenarez, Y.; Corniani, N.; and Jenner, W.** Plantwise: improving food security through better Plant Health System (Book chapter)

## Submitted and under review in 2016

**Dougoud, J.; Cock, M.J.W.; Edgington, S.; Kuhlmann, U.** A baseline study using Plantwise information to assess the uptake of augmentative biological control of arthropods in developing countries. Submitted to *BioControl*

Karubanga, G., Matsiko, F.B. and **Danielsen, S.** Access and coverage: Which farmers do the plant clinics reach in Uganda? Submitted to *Development in Practice*

## Annex 1 – Report on progress against 2016 milestones

General (2016)			
Key Milestones	Timing	Status	Comments/Progress
2 new countries identified for introduction of PW (36 cumulative) following thorough assessment phase	Q3		Plantwise introduced in 34 countries and is currently active in 33. An additional 4 countries (Cote d'Ivoire, Colombia, DPR Korea, Chile) have been formally assessed for consideration for introduction of Plantwise.
Cumulative 10.0 million farmers reached (directly and indirectly) through clinics, mass extension, mobile, etc.	Q4		Approximately 9.8 million farmers (cumulative) reached. In 2016; 1,061,000 farmers reached directly through plant clinics, plant health rallies and mass extension campaigns, plus an estimated further 4,244,000 reached indirectly through farmer-to-farmer sharing.
Total of 7 PW countries at scale-up phase plus an additional 18 at consolidation phase, as defined by PW strategy	Q4		1 country at sustainability, 5 countries at scale-up and a further 18 countries at consolidation phase.
2015 PW Annual Report submitted to PW donors	Q1		2015 Annual Donor Report sent to all 8 Plantwise donors on 1 April 2016.
Second phase of plant doctor simulator (serious game) development completed	Q3		Second Plantwise serious game, Crop Management Simulator (CMS), completed in early September 2016. The game underwent critical error testing in Q4 and is considered to be a stable build. More thorough testing of the game is planned for 2017.
Linkages with international organisations (e.g. FAO, IPPC) strengthened	Q4		CABI delegation attended the 11th session of the CPM meeting in Rome, Italy, 4-8th April. CABI also facilitated the first attendance of a DPR Korean delegation; Letter of intent still not signed by IPPC in order to facilitate collaboration activities. CABI represented at the FAO led Technical Committee of the ASTF project meeting in Namibia, 31st May-1st June and Zambia 29th November – 1st December; IPPC and FAO invited to attend the CABI Review Conference in July. PW presentation given at 5th Meeting of G20 Agricultural Chief Scientists in China, 30th-31st May 2016. CABI participation in the Commission on Food Security event in Rome FAO Hq, 17th -20th October 2016
Positive external evaluation conducted in the Americas, including evidence of better linkage between actors in plant health system	Q3		External evaluation completed in three countries: Peru, Bolivia and Nicaragua. Report on findings presented at the Plantwise Donor Forum in October '16 in Brussels and management response to recommendations of the evaluators prepared.
External impact assessment (AIR) continued according to agreed plan/timelines in Kenya, plus an additional impact assessment commenced in Pakistan or Sri Lanka	Q3		Assessment of PW Kenya by AIR on-going. Pakistan PW programme Evaluability Assessment completed and a recommendation has been given to continue with an impact assessment in 2017. Additional impact assessment in a third country is under consideration for 2017+.

Donor Forum meeting and global implementation team meeting organised	<b>Q4</b>		Plantwise Donor Forum held on 6-7 Oct in Brussels (Belgium), hosted by DG DEVCO; global team meeting held on 13-19 November at Interlaken, Switzerland.
Programme-level analysis of POMS data conducted by a newly established cross-cutting team to generate insights on gender, plant clinic performance, red list chemicals, etc.	<b>Q1/Q4</b>		First meeting of the cross-cutting data analysis team held on 21 March to expose all members to POMS data and discuss analysis plans. Data projects agreed on and on-going.
PW core principles established to provide guidance and cohesion as differing country models evolve to ensure local ownership and sustainability	<b>Q2</b>		Finalised and approved by PWPB
Strategy and operating procedures (e.g. PW policy doc) developed for engagement of the private sector (e.g. farmer associations, agro-food corporates, agro-input dealers, financial institutions)	<b>Q1</b>		First draft and action plan finalised and presented to EMT in June; Draft shared with donors for their input which will be collated and shared with PWPB during the January 2017 PWPB meeting; Implementation of the action plan on-going.
<b>Knowledge Bank (2016)</b>			
<b>Key Milestones</b>		<b>Timing</b>	<b>Comments/Progress</b>
New PW-affiliated projects planned and delivered with £120k gross income achieved (delivering £60k net profit from total PWKB budget)	<b>Q4</b>		CHAP funding secured for e-plant clinics (£300k over 3 years); DAS funding for tablets in Kenya secured (\$38k); Study proposal from UK Space Agency secured (£23k to CABI) and full Pest Risk Information Service project secured (£6.38 million over 5 years); New proposal with North Carolina State University submitted for NIH funding (\$185k over 3 years); Several GCRF proposals submitted with Rothamsted.
Expanded business models developed through relevant engagement with planned CABI central content management system developments and new initiatives, such as Invasive Species and Open Data. Value of GIS and other PWKB skills and tools further integrated in CABI ID projects	<b>Q4</b>		PWKB expertise provided to IS Technical Management Team; CABI informatician now engaged with ASHC data handling project; solutions planning for merging PWKB with CABICore underway; funding secured from PMI (£28k through CABI-CH) and from GEF (\$40k through CABI-Africa) for digital information delivery tools; GIS being used to produce maps of invasive species (CDF funded); BMGF pilot funding (through CABI-Africa) for GIS methods of tracking plant species as source of food for malaria.
Tablets piloted in 6 new countries (10 cumulative) with appropriate follow-on plans. Proposals developed for move to consolidation in current pilot countries. New version of data collection app rolled out successfully. Plant Doctor Toolkit (diagnostic and solutions app) produced	<b>Q4</b>		Pilot training completed in Peru, Uganda, Ghana, Zambia, Pakistan and Afghanistan; Full roll out to all PCs in Kenya and expansion of coverage in Sri Lanka; 432 clinics in 10 countries now using tablets entering 31,000 records to date; planning for piloting, leading to full rollout, in Mozambique in early 2017; new data collection app deployed to all; completed survey of availability of digital devices in all PW countries.

<p>New ICT uses and applications investigated, such as: linking with CABI's newly established Mobile programme; facilitating social media use by plant doctors and other relevant plant health system stakeholders; encouraging use of Plant Doctor Simulator (serious game)</p>	<p><b>Q4</b></p>		<p>ICT now firmly embedded in PW strategy and operations and embraced by PW donors and partner countries; PW content in regular use in mNutrition factsheet development in 3 countries; investigations into integrating Pestpoint undertaken in E Africa; Major use of Telegram and Whatsapp as communication tools in e-plant clinics with 12,000 messages YTD; Analysis of Telegram usage in self-help groups shows PW 25% of messages about diagnosis and 55% about advice and other work related issues. PDS introduced to PDs during e-plant clinic training in Ghana, Uganda and Zambia and analysis available.</p>
<p>Tools and training provided to allow greater autonomy in data processing and analysis in 7 countries. Data harmonisation occurring in 12 countries, data agreements signed with 24 countries; 300,000 plant clinic records on POMS being analysed in 20 countries</p>	<p><b>Q4</b></p>		<p>Data harmonisation tool now in active use in over 20 countries with direct loading of over 30,000 records; 253,000 records in POMS with all 33 active PW countries accessing the system; China using a further 33,500 records within its own POMS-based system.</p>
<p>High quality content supplied to all PHS actors in PW countries using all appropriate means. 10,000 factsheets available on the online knowledge bank leading to 650,000 visits and 150,000 sessions on the factsheet app</p>	<p><b>Q4</b></p>		<p>Over 12,500 factsheets available through the online PWKB including 2,500 PMDGs and FFFs with 100 on IS weeds; 318,000 visits to the PWKB in 2016 (37% PW countries), an increase of 65% from 2015, 1 million cumulative visits since launch; 190k cumulative views of factsheet app since launch (90% PW countries); analysis of app access shows vast majority of users are PDs</p>
<p><b>Plant Health Systems Development (2016)</b></p>			
<p><b>Key Milestones</b></p>	<p><b>Timing</b></p>	<p><b>Status</b></p>	<p><b>Comments</b></p>
<p>Country-specific implementation plans with budget details finalised for all active PW countries</p>	<p><b>Q1</b></p>		<p>All country plans and associated budgets finalised and approved by PWPB.</p>
<p>Partnership Agreements signed with NROs in 25 countries (cumulative) and national coordination units (national forum and/or steering committee) operational in 25 countries (cumulative)</p>	<p><b>Q4</b></p>		<p>Partnership Agreements signed with key partners in 28 countries (cumulative). In 2016, 100 new partnerships were formalised (predominantly through Partnership Statements rather than Partnership Agreements, the latter being required for situations where programme funds are to be advanced to the partners); 69 steering committee or national stakeholder meetings held in 29 countries</p>
<p>Plantwise activities written into partners' policies and/or supported by partners' budgets in 25 countries (cumulative)</p>	<p><b>Q4</b></p>		<p>Total confirmed budget contribution from in-country partners to Plantwise country activities in 2016 is at least GBP 850,000.</p>
<p>Plant clinic schemes consolidated and expanded with an additional 220 new plant clinics globally (2,100 cumulative)</p>	<p><b>Q4</b></p>		<p>433 new plant clinics established in 2016 for a cumulative total of 2,200 clinics.</p>
<p>600 new plant doctors (4,900 cumulative) trained in Modules 1 and 2, increasingly through the ToT process</p>	<p><b>Q4</b></p>		<p>1,789 plant doctors trained (25% female) in Module 1 &amp; 2 (6,787 cumulative); Seven ToTs conducted for 78 local trainers (20% female) of Module 1 &amp; 2.</p>

Funding models for existing plant clinics reviewed	<b>Q1</b>		Review of past and present private sector plant clinics conducted in Feb/Mar, with results documented in a report on private sector linkages in Plantwise; Case study produced about a farmer cooperative-run plant clinic in Nicaragua.
250 Factsheets/Pest Management Decision Guides developed and locally validated, plus 100 on invasive weeds impacting food security	<b>Q4</b>		415 new PMDGs, and 152 FFFs and 5 photosheets drafted in 2016; 110 invasive weed-focused factsheets (61 PMDGs and 49 FFFs) published on the KB
Data validation process simplified to increase uptake by partners in 18 countries (cumulative)	<b>Q4</b>		Data validation training held in 14 countries (cumulative) and validation workshops to process large sets of data held in multiple countries; 7 countries have uploaded validated clinic data to POMS; Delays on progress in 2016 due to diversion caused by resource-intensive serious game development.
Plant clinic data used by national stakeholders for monitoring and decision making in 7 countries (cumulative)	<b>Q4</b>		Evidence of data use in more than 8 countries, including for pest alerts, identifying training needs for plant doctors, topics for extension activities and priority areas for research and reporting to senior officials etc.
Pilot test linkages with private sector in at least 5 countries including analysis of paid-for business models to sustainably run plant clinics	<b>Q4</b>		Private sector-supported plant clinics piloted in 8 countries. In-depth assessment of agro-input dealer-run plant clinics in China conducted through data analysis (publication under development) and results of associated farmer survey expected by Q2 2017; reports compiled with lessons learned from private sector clinics in Ghana, DR Congo, Nicaragua and Honduras. Further opportunities for private sector clinics explored in Vietnam, Nicaragua, Bangladesh and India; plans for exploration in additional countries including Cote d'Ivoire (for cocoa).
All PW training modules reviewed/updated and a strategy for integration with universities/colleges developed	<b>Q4</b>		MPCP module updated based on user feedback; Basic review of Module 1 and 2 launched to identify best way to package the concept for different user groups, however, process delayed due to other priorities; Case study produced about plant doctor training integrated into a university in Nicaragua.
<b>Monitoring and Evaluation (2016)</b>			
<b>Key Milestones</b>	<b>Timing</b>		<b>Comments</b>
PW programme-level logframe updated to align it with the evolving direction of the programme	<b>Q3</b>		M&E conducted first review and aligned logframe with PW strategy. Exercise to be finalized by Q1 2017.
Basic and systematic M&E established for Plantwise in all countries (e.g. disaggregated by gender, clinic user satisfaction)	<b>Q4</b>		Systematic M&E plan revised and distributed to all CCCs for continued implementation.
M&E design and planning workshops held in 6 countries (2 per region)	<b>Q4</b>		Country M&E Plans developed and agreed for Nepal and Pakistan, Sri Lanka, and Peru. Annual M&E activities, tools, responsibilities and targets agreed.

Implement MPCP course in 11 countries	<b>Q4</b>		A total of 181 trainees have received the course in 7 countries: Peru (15 trainees), Zambia (16 trainees), Pakistan (76 trainees), Rwanda (21 trainees), Afghanistan (13 trainees), Bangladesh (25 trainees), and Uganda (15).
M&E resource pack and a Gender resource pack, including 8 new tools/guides, developed and promoted	<b>Q4</b>		Gender Resource Pack finalized and uploaded for use by country staff. National M&E tool pack will be uploaded
Gender outreach action plans/studies embedded in 15 countries to increase the involvement in and access to PW by women and youth	<b>Q1/Q4</b>		Gender outreach plans agreed in 28 countries, with activities started. Progress on-going in all countries.
Stakeholder analysis workshop conducted in 7 countries:	<b>Q4</b>		Stakeholder analysis workshop conducted in 7 countries: Vietnam, Afghanistan, Thailand, Ethiopia, Costa Rica, Peru and China.
4 special studies conducted to collect evidence against top-level logframe indicators (e.g. outreach, uptake of information/methods by farmers, outcomes)	<b>Q4</b>		One study completed in Rwanda, and Ghana. All field work has been completed for the rest of the three studies to be completed by Q1 2017.
6 research briefs/outputs, 4 high quality case studies and 3 papers published, including 2 showing impacts at scale on food security and gender	<b>Q2</b>		7 high quality case studies prepared (2 for Bolivia, 2 for Peru and 2 for Nicaragua, 1 for Ethiopia). Three peer-reviewed journal paper published (gender; plant health systems analysis; using ICT in extension) Four research briefs produced (Kenya, China and two on Rwanda) on Plantwise outcomes/impact and plant health systems dynamics.
One regional lessons learned workshop facilitated in Africa to share experiences for enhanced performance in individual countries	<b>Q4</b>		Done, report written and disseminated.
Utility of country activity tracking system enhanced and linked with POMS	<b>Q4</b>		Monthly ATT and reporting dashboard in place and on-going successfully.

on track    minor delay    major delay



## Annex 2 – 2017 Milestones

<b>General (2017)</b>	
<b>Key Milestones</b>	<b>Timing</b>
15 million farmers (as measured through direct and indirect reach including plant clinics, plant health rallies and other extension campaigns) received plant health information	Q4
Total of 7 PW countries at scale-up phase plus an additional 20 at consolidation phase	Q4
Country level targets determined for 2017 and outlined for 2018-2020 for all countries based on PW programme level logframe	Q4
2016 PW Annual Report submitted to PW donors	Q1
User testing, handover from Bondi Labs and dissemination plan developed for PDS and CMS	Q3
Annual Donor Forum meeting and PW implementation team meeting organised	Q4
10 publications submitted/published	Q4
2 distinct mass extension campaigns are started in 3 countries; One new Mobile (mPlantwise) service fully scoped	Q4
Private sector engagement with specific focus on value chains for market access Investigated/piloted and operation of private-sector supported plant clinics piloted in 4 countries (9 cumulative)	Q4
Milestones in PW strategy reviewed based on progress made and evolving priorities	Q2
<b>Knowledge Bank (2017)</b>	
<b>Key Milestones</b>	<b>Timing</b>
KB maintenance funds of at least £100k generated through net profit from total PWKB budget; projects developed to satisfaction of funders and partners and linked closely into PW activities	Q4
Plant doctors and other relevant stakeholders using ICTs (e.g. tablets, POMS, Plant Doctor Simulation, Factsheets Library app) in 30 countries. ICT use integrated into PHS responsibilities, e.g. for diagnosis	Q4
Tablets piloted in 5 new countries (15 cumulative) with appropriate follow-on plans. Proposals developed for move to consolidation in current pilot countries	Q4
Expanded business models developed through relevant engagement with planned CABI central content management system developments and initiatives	Q4
Tools and training provided to allow greater autonomy in data processing and analysis in 10 countries. Data harmonisation occurring in 15 countries, data agreements signed with 28 countries; 450,000 plant clinic records on POMS being analysed in 20 countries	Q4
High quality content supplied to all PHS actors in PW countries using all appropriate means. 11,000 factsheets available on the online knowledge bank leading to 1.3 million visits and 250,000 sessions on the factsheet app	Q4
<b>Plant Health Systems Development (2017)</b>	
<b>Key Milestones</b>	<b>Timing</b>
2017 activity plans and budgets in place for all active PW countries	Q1
2016 country annual reports finalised for all active PW countries	Q1
Partnership Agreements signed with key national partners in 28 countries (cumulative) and national coordination units (steering committee and/or national forum) operational in 30 countries (cumulative)	Q4

Plantwise activities written into partners' policies and/or supported by partners' budgets in 28 countries (cumulative)	Q4
Plant clinic schemes consolidated and expanded with an additional 200 new plant clinics established (2300 cumulative)	Q4
400 new plant doctors (5300 cumulative) trained in Modules 1 and 2, increasingly through the ToT process	Q4
250 Factsheets/Pest Management Decision Guides developed and locally validated	Q4
Methodology developed and piloted for programme-level assessment of plant doctor performance through validation of diagnoses and recommendations	Q4
In-country data validation processes consolidated in 3 countries	Q4
Plant clinic data used by national stakeholders for monitoring and decision making in 10 countries (cumulative)	Q4
Plant doctor training modules 1&2 reviewed and modalities for integration with education institutions clarified in a guide	Q3
<b>Monitoring and Evaluation (2017)</b>	
<b>Key Milestones</b>	<b>Timing</b>
Evidence of outcome and impact reported for male and female farmers on adoption of appropriate practices, including better pesticide use, productivity change, crop loss avoided, and income change through quasi-experimental study with retrospective baselines in 2-3 countries	Q4
At least 20 countries carry out case studies describing evidence of impact in key impact areas and cases of new pest/pest outbreak detections and response	Q1/Q4
Impact of Plantwise interventions on plant health system performance and responsiveness studied and reported in at least two countries	Q4
Cost effectiveness of plant clinic extension method, including data management and use, versus other extension studied and reported in two countries	Q4
Bio-economic modelling conducted to quantify the outcomes and impacts of loss prevention due to early/rapid identification of one pest	Q4
Evaluation of ICT use in data collection and application (IFAD study) conducted in either Uganda, Rwanda or Mozambique	Q4
Specific gender and diversity activities ongoing in 15 countries to increase the involvement in and access to Plantwise by women and youth	Q4
Finalize 3 special studies from 2016 reports and prepare for publication	Q2
External impact assessment (AIR) continued according to agreed plan/timelines in Kenya; including a clean data set	Q4
Impact evaluation initiated in Pakistan according to Evaluability Assessment guidelines	Q4

# Afghanistan

## Partners

- Plant Protection and Quarantine Directorate (PPQD), Ministry of Agriculture, Irrigation and Livestock (MAIL) – NRO; also responsible for national data management and provides diagnostic support
- National Horticulture and Livestock Project (NHLP), MAIL – LIO
- Department of Agriculture, Irrigation and Livestock (DAIL) – LIO; also supports in data management and M&E
- Danish Committee for Aid to Afghan Refugees (DACAAR) – LIO
- Agha Khan Foundation-Afghanistan – LIO
- Agriculture Faculty, Baghlan University – LIO; also provides diagnostic support

Quick Stats	New in 2016	Cumulative Total
Plant clinics established	52	121
Plant doctors trained	104	255
PMDGs drafted	15	35
Factsheets drafted	15	55

## 2016 Highlights

- Funds (£ 35,423) allocated to Plantwise activities by National Horticulture and Livestock Project (NHLP)
- Facilitated the establishment of a national steering committee meeting with regular meetings
- Plantwise National M&E Manager officially assigned by partners
- Facilitated the establishment of 52 new plant clinics by DAIL & NHLP, for a total of 119 active plant clinics
- CABI trainers conducted 'Module 1 & 2' refresher training for 12 national trainees
- 7 of the 12 national trainers conducted 'Module 1 & 2' trainings for 104 new plant doctor trainees (104 male); 3 of the 12 national trainers conducted 'Module 1 & 2' refresher training for 25 plant doctors
- Facilitated writeshop with 7 participants (7 male), leading to the development of 15 new pest management decision guides and 15 factsheets yet to be published on the knowledge bank
- Conducted 'Monitoring Plant Clinic Performance' training for 11 participants, leading to the development of plant clinic monitoring performance criteria
- Facilitated participation of key stakeholder in M&E planning workshop in Cambodia to learn concepts for establishment of a national M&E system for Plantwise
- Conducted 'Data Management' training for 14 participants in new provinces
- Conducted 'e-plant clinic' training for 14 participants (14 male) to introduce use of digital devices
- Conducted 'National Data Validation and Analysis' refresher training for 6 participants (6 male)
- Facilitated the entry of 4,000 plant clinic queries into the Plantwise Online Management System (POMS)
- Facilitated sharing of plant clinic data for clinic performance monitoring and identification of local pest problems by PPQD to DAIL
- Observed new interactions between plant health stakeholders (e.g. engagement of trained plant doctors with pest survey for winter pest control campaign and other extension activities; analysing plant clinic data to identify specific pests such as *Tuta absoluta*)
- Piloted the use of digital devices at 6 plant clinics for data collection and improved access to information
- Promoted use of ICTs tools (e.g. data collection and factsheet library app) for NHLP, DAIL and DACAAR
- Participated in one International and one national AgFair at Kabul for awareness raising on Plantwise

## Key Challenges and Lessons Learned

- A significant increase in the volumes of clinic data has led to delays in reporting and uploading data to POMS which limits use of data for analysis and decision making; the introduction of digital devices at plant clinics has been an effective approach to streamline data collection
- Plant clinic data sharing via the Plantwise Online Management System is not yet adopted by the stakeholders; CABI will conduct data sharing workshops to demonstrate the value of plant clinic data



# Bangladesh

## Partners

- Ministry of Agriculture (MoA) – NRO; facilitating collaborations and partnership with DAE
- Plant Protection Wing (PPW-DAE) – LIO
- Bangladesh Agricultural Research Council – Member of steering committee
- Bangladesh Crop Protection Association – Member in national forum
- Sustainable Peoples Initiative for Economic Development (SPIED) – LIO

Quick Stats	New in 2016	Cumulative Total
Plant clinics established	10	30
Plant doctors trained	26	77
PMDGs drafted	11	30
Factsheets drafted	15	31

## 2016 Highlights

- Plantwise National Data Manager and National M&E Manager officially assigned by partners
- Facilitated the establishment of 10 new plant clinics for a total of 30 active plant clinics in 5 new districts
- Conducted a training of trainers (ToT) for 12 local staff (all male) on the plant doctor training Modules 1 and 2
- 5 of the 12 national trainers conducted 'Module 1' training (field diagnosis and plant clinic operation) and 'Module 2' training (giving good advice) for 26 plant doctor trainees (3 female, 23 male)
- National partners starting to take the lead on clinic data management
- Conducted 'Extension Messages' training (producing extension materials) for 18 participants, leading to the development of 11 pest management decision guides and 15 factsheets
- Conducted 'Monitoring Plant Clinic Performance' training with 25 participants (1 female, 24 male), leading to the development of a plant clinic monitoring system and performance criteria
- Conducted 'Data Management' training for 20 participants (7 female, 13 male) to support clinic data management in new districts and conducted refresher training to master trainers in existing districts
- Local partners using the administrative information in the Plantwise Online Management System (POMS) to track activities
- Facilitated participation of key individual from partner organisation to a plant pathology training in the UK
- Facilitated the entry of 2,839 plant clinic queries into the Plantwise Online Management Systems (POMS)
- Facilitated sharing and use of plant clinic data on a regular basis by national partners
- Facilitated linkage between existing MoA extension programme (Farmer Information and Advisory Centres, FIAC) and Plantwise to scale-up plant clinics
- Private sector stakeholder (Bangladesh Crop Protection Association) identified with whom to pilot private sector run plant clinics

## Key Challenges and Lessons Learned

- Highly political and volatile environment in civic life expressed as curfews and violence made the situation unpredictable
- Operation of data system in English leads to delay in data transfer from district to central data hub; it will be necessary to explore if a local-language based data management system is more likely to be manageable by local partners and sustainable
- Variable internet connection is a constraint to the accessibility of the online knowledge bank content for plant doctors; tools such as the offline knowledge bank memory stick and/or the factsheet library app have proved to be an effective vehicle to overcome internet access issues



# Bolivia

## Partners

- Foundation for the promotion and investigation of Andean products (PROINPA) – LIO
- Department of Agricultural and Food Safety (DSA) – LIO
- Centre for Tropical Agricultural Research (CIAT) – LIO
- Valles Foundation – LIO
- University of Benni – Trinidad – LIO
- Tarata Agricultural Technology Institute – LIO & technical collaborator
- National Service for Agricultural and Livestock Health (SEDAG) – LIO

Quick Stats	New in 2016	Cumulative Total
Plant clinics established	4	37
Plant doctors trained	34	371
PMDGs drafted	–	29
Factsheets drafted	10	127

## 2016 Highlights

- Facilitated the establishment of 4 new plant clinics, for a total of 36 active plant clinics
- National trainers and CABI trainers conducted 'Module 1' training (field diagnosis and plant clinic operation) for 34 plant doctor trainees (4 female and 30 male)
- National trainers and CABI trainers conducted 'Module 2' training (giving good advice) for 34 plant doctor trainees (4 female and 30 male)
- CABI trainers conducted refresher training on 'Modules 1 and 2' for 10 plant doctor trainees (1 female and 9 male)
- CABI trainers and PROINPA facilitated workshop on 'Pest and Disease Diagnostics' for 5 faculty members from the Tarata Agricultural Technology Institute
- CABI trainers facilitated workshops with 8 participants (3 female and 5 male) to reinforce the data management system
- Facilitated workshop with national experts, leading to the development of 10 new factsheets (yet to be published on the knowledge bank)
- Facilitated 15 plant health rallies, reaching 200 farmers (18 female, 23 male and 159 without gender reporting) with technical advice on different plant health topics
- Local partners using administrative information in the Plantwise Online Management System (POMS) to track activities
- Produced two case studies (*'Diagnostics in action: A proactive plant laboratory in Comarapa, Bolivia'* and *'A plant clinic linked to research and teaching in Mairana, Bolivia'*) to demonstrate evidence of outcome and impact
- Facilitated assessment of in-country implementation by independent consultants as part of an Latin America-focussed external evaluation

## Key Challenges and Lessons Learned

- Institutional instability causing high staff turnover due to intra-political conflicts challenged implementation of the programme at national and regional levels; it is necessary to often reintroduce the Plantwise approach to key officials to ensure continuous programme implementation
- Limited responsiveness on the subject of gender by local implementing organisations. However, raising awareness among local coordinators on the importance of gender and diversity has led to gender disaggregated data to be incorporated into monthly reporting by local partners
- Data managers had been struggling to get prescription forms from plant doctors on time; the introduction of the Plantwise data collection app has shown positive effect on data collection and transfer to the Plantwise Online Management System (POMS)



# Brazil

## Partners

- Brazilian Research Corporation – EMBRAPA Mato Grosso – NRO/LIO
- Ministério de Agricultura Pecuária e Abastecimento (MAPA) – LIO
- Local Government – Municipalities – LIO
- EMPAER (Empresa Mato-grossense de Pesquisa, Assistência e Extensão Rural); Instituto Federal de Educação, Ciência e Tecnologia de Mato Grosso – São Vicente; Universidade Estadual do Mato Grosso – Cáceres; Instituto Federal de Educação, Ciência e Tecnologia de Mato Grosso – Sorriso; Universidade Estadual do Mato Grosso – Alta Floresta. – LIOs
- São Carlos Federal University – LIO
- Luiz de Queiroz College of Agriculture (ESALQ) and Universidade Estadual Paulista (UNESP) – Provide technical assistance to plant clinics

Quick Stats	New in 2016	Cumulative Total
Plant clinics established	–	6
Plant doctors trained	–	39
PMDGs drafted	–	10
Factsheets drafted	–	17

## 2016 Highlights

- Funds (approximately £ 8,000) allocated to Plantwise activities by partners in 2016
- CABl trainers conducted 'Module 1' training (field diagnosis and plant clinic operation) for 46 plant doctor trainees
- Facilitated 1 writeshop with national experts, leading to the development of 3 new pest management decision guides and 2 factsheets, plus a further 3 of each developed by trained university students (all still under peer review)
- Facilitated specific, need-based training on extension materials production for 3 trainees
- Promoted use of ICTs tools factsheet library for EMPAER, EMBRAPA and UFSCar
- Promoted gender awareness among partners and participation of women and youth by training young undergrad students to operate plant clinics with support from field technicians and researchers at UFSCar
- Local partners using the administrative information in the Plantwise Online Management System (POMS) to track activities
- Established a network of experts to validate extension materials within UNESP
- Established a group of graduate students to follow up production of Extension Materials in local language (Portuguese)

## Key Challenges and Lessons Learned

- The political environment in Brazil is quite volatile since the impeachment of the president and strong austerity measures have been adopted, temporarily affecting the available budgets for implementation
- Plant doctors are very committed with other activities and have limited time to digitalize the clinic data from the paper form. This is delaying the process of sending the information to POMS. Plantwise Brazil will consider pilot e-plant clinics next year to reduce work/time between the collection and data input on POMS



# Burkina Faso

## Partners

- Ministère de l'Agriculture et des Aménagements Hydrauliques (MAAH) – NRO
- Direction de la Protection des Végétaux et du Conditionnement (DPVC) – LIO; working in conjunction with the Regional and Provincial Extension Directorates
- Self Help Africa (SHA) – LIO in two regions where the BRACED project (Building Resilience and Adaptation to Climate Extremes and Disasters) is operating

Quick Stats	New in 2016	Cumulative Total
Plant clinics established	–	47
Plant doctors trained	11	111
PMDGs drafted	–	10
Factsheets drafted	–	32

## 2016 Highlights

- Obtained signed Partnership Agreement and Data Sharing Agreement from Ministry of Agriculture
- Continued support from the BRACED project to Plantwise activities in two Regions (Centre-Nord and Plateau-Central) under the aegis of SHA and Welthungerhilfe with CABI providing technical support in the form of training and data management
- Deputy National Data Manager officially assigned by partners and 9 regional plant protection officers designated as regional data clerks and coordinators of plant doctors in their respective regions
- Conducted 'Data Management' training for 2 national data managers and 9 regional officers (2 female, 9 male) to support clinic data management
- National Data Managers trained on the use of the harmonisation tool to ensure legacy data and current clinic data are uploaded to the Plantwise Online Management System (POMS)
- Data management system established to ensure collection and transfer of clinic data from the region to central data hub
- CABI trainers conducted 'Module 1' training (field diagnosis and plant clinic operation) and 'Module 2' training (giving good advice) for 11 plant doctor trainees (1 female, 10 male)
- CABI trainers conducted refresher course on Modules 1 and 2 for 32 plant doctors (8 female, 24 male)

## Key Challenges and Lessons Learned

- Plant clinic operations have assumed a mobile character where the doctors go out into the Communes holding plant clinic sessions; this attracts a large group of farmers with similar problems but makes it challenging to issue a prescriptions sheet for each farmer
- Delays in finalisation of 10 new pest management decision guides and 32 factsheets because the NPPO depends on the National Agricultural Research Institute for some relevant information needed for validation; it will be necessary to include all relevant institutions already during the writeshop stage to avoid substantial delays with finalisation of extension materials
- A CABI Associate was appointed by the NPPO but later there was an objection that his new role will conflict with his normal work and that of the National Coordinator so the contract was abrogated. In future such conflict of interests should be well discussed or the CABI Associate should come from an organisation other than where the National Coordinator is from



# Cambodia

## Partners

- Department of Plant Protection Sanitary and Phytosanitary, General Directorate of Agriculture (GDA), Ministry of Agriculture, Forestry and Fisheries (MAFF) – NRO
- Three provincial Departments of Agriculture (PDA) – LIO
- Royal University of Agriculture (RUA) – LIO; also provides diagnostic support
- Cambodian Agricultural Research and Development Institute (CARDI) – LIO; also provides diagnostic support

Quick Stats	New in 2016	Cumulative Total
Plant clinics established	0	30
Plant doctors trained	0	58
PMDGs drafted	10	65
Factsheets drafted	10	65

## 2016 Highlights

- Conducted an M&E planning workshop with 11 local participants (9 male, 2 female) to introduce concepts for a national M&E system
- Conducted refresher training on 'Data Management' for 7 participants (5 male, 2 female) to support clinic data management
- Supported local partners in using the administrative information in the Plantwise Online Management System (POMS) to track activities on provincial level
- National partner fully responsible for clinic data management
- Facilitated the entry of 898 plant clinic queries into the Plantwise Online Management System (POMS)
- Facilitated sharing and use of plant clinic data during cluster meetings with the various provincial plant doctors
- Conducted specific, need-based training on rice pest management for 28 trainees (plant doctors and plant advisors from other extension initiatives)
- Conducted 2 plant health rallies, reaching 70 farmers with targeted messages (62 male, 8 female)
- Facilitated the development of 10 factsheets and 10 pest management decision guides for mango (yet to be published on the knowledge bank)
- Facilitated M&E study on pesticide use by farmers, demonstrating that Plantwise intervention decreases dependency of farmers on pesticides

## Key Challenges and Lessons Learned

- Commitment of the Ministry of Agriculture, Forestry and Fisheries (MAFF) for Plantwise activities needs to be affirmed; it will be necessary to engage at higher level within MAFF (as per recommendation of the stakeholder workshop) and form a fully functional National Steering Committee to mainstream Plantwise as an integral part of the national extension system
- Weak linkages between the various GDA departments and the LIOs impacted the available resources and expertise and further decelerated the road towards sustainability of the Plantwise programme; it will be necessary to hold focus group discussions with key stakeholders and various heads of departments to enhance in-country collaboration

# Caribbean

(Barbados, Grenada, Jamaica, Trinidad & Tobago)

## Partners

- Rural Agricultural Development Authority (RADA), Ministry of Industry Commerce, Agriculture and Fisheries (Jamaica) – LIO
- Ministry of Agriculture, Lands and Fisheries (Trinidad & Tobago) – LIO
- Ministry of Agriculture, Food Fisheries and Water Resources Management (Barbados) – LIO
- Ministry of Agriculture, Forestry, Fisheries and the Environment (Grenada) – LIO

Quick Stats	New in 2016	Cumulative Total
Plant clinics established	3	21
Plant doctors trained	16	184
PMDGs drafted	0	41
Factsheets drafted	3	86

## 2016 Highlights

- Facilitated the establishment of an in-country programme governance system in Jamaica, with a national steering committee meeting on a quarterly basis
- Plantwise has been incorporated into RADA's strategic planning (Jamaica) as having a key role to monitor the quality of advice given to farmers
- Local trainers conducted 'Module 1' training (field diagnosis and plant clinic operation) for 17 trainees (13 female, 4 male) in Trinidad & Tobago and for 4 trainees (3 female, 1 male) in Grenada
- Local trainers conducted 'Module 2' training (giving good advice) for 12 trainees in Trinidad & Tobago and for 4 trainees (3 female, 1 male) in Grenada
- Facilitated the establishment of 3 new plant clinics by Ministry of Industry Commerce Agriculture and Fisheries in Jamaica, for a total of 5 active plant clinics in Jamaica and 13 in the Caribbean region
- Conducted 'Data Management' training for 13 participants (8 female, 5 male) in Jamaica
- Completed a study that examined the reasons for poor plant clinic attendance in Trinidad & Tobago
- Supported identification of unknown pests/diseases through the UK-based Plantwise Diagnostic and Advisory Service, leading to rapid response and emergency action, e.g. the case of frosty pod rot on cocoa in Jamaica
- Completed a research project with a Brazilian intern on managing the gummy stem blight in christophene with report submitted to the Ministry of Agriculture in Trinidad and Tobago
- Facilitated a specialised training for 30 christophene farmers in Trinidad & Tobago on an integrated approach to controlling gummy stem blight
- Facilitated the production of a video documenting how the plant health system in Trinidad & Tobago responded to gummy stem blight in christophene production
- Presented two papers, one on major diseases of christophene and one on vegetable farmers' attitudes, knowledge and practices at the International Conference on Integrated Disease Management

## Key Challenges and Lessons Learned

- Senior ministry staff changes in Trinidad & Tobago and Grenada have limited high-level buy-in to the Plantwise programme; therefore, the programme will explore more diversified partnerships
- Due to various demands on the staff time of trained plant doctors in Barbados, plant clinic activities remained very limited; a possible option is to have plant clinics run by the private sector, with the Ministry of Agriculture, Food Fisheries and Water Resources Management undertaking a monitoring and quality control function
- Low attendance at plant clinics and minimal capture of clinic data continue to be a problem; piloting e-plant clinics may be a possible solution, simplifying the data entry process and making it easier for plant doctors to take their clinic service to the field
- The survey in Trinidad & Tobago found that around 70% of farmers agreed that information from agro-input suppliers is timely and reliable, while only around 50% agreed that information from government staff is timely and reliable



# China

## Partners

- Ministry of Agriculture (MoA) – Helping to steer the programme
- Institute of Plant Protection, Chinese Academy of Agricultural Sciences (IPP-CAAS) – NRO and diagnostic support
- Beijing Plant Protection Station (BPPS) – LIO
- Sichuan Plant Protection Station (SCPPS) – LIO
- Xing'an Plant Protection Station (XAPPS), Guangxi Province – LIO

Quick Stats	New in 2016	Cumulative Total
Plant clinics established	13	56
Plant doctors trained	50	148
PMDGs drafted	12	47
Factsheets drafted	35	114

## 2016 Highlights

- Funds (£56,800) allocated to plant clinic activities in Beijing area by BPPS and in Sichuan by SCPPS
- Facilitated the establishment of 13 new plant clinics by BPPS and SCPPS, for a total of 48 active plant clinics
- Plant doctors issued 12,517 prescription forms (11,407 in Beijing, 330 in Sichuan, 780 in Guangxi), and LIOs entered, harmonized and validated all of them
- Conducted a training of trainers (ToT) for 8 local extension staff (4 male, 6 female) in Sichuan province on the plant doctor training Module 1 and 2
- 12 of the 22 national trainers conducted two Module 1 trainings (field diagnosis and plant clinic operation) and two Module 2 trainings (giving good advice) for 50 plant doctor trainees (28 male, 22 female)
- Facilitated 2 writeshops with national experts, leading to the development of 12 pest management decision guides and 35 factsheets for farmers (some now published on the Plantwise knowledge bank)
- Conducted 'Data Management Refresher Training' for 17 participants (10 male, 7 female) from Beijing and Sichuan to support clinic data management
- Conducted 'data validation and analysis' training for 6 participants (3 male, 3 female) in Sichuan province
- Conducted 'Plant Health System Stakeholder Analysis Workshop' to further map stakeholders, and to understand the linkage between stakeholders at the local and country level
- Facilitated 1 mass extension campaign on the control of three soil-borne diseases in strawberry in Beijing using newspapers reaching an estimated 5000 farmers with targeted messages
- 2 special studies conducted through (a) clinic data analysis and (b) farmer interviews to investigate difference in performance between plant doctors with different levels of agri-business engagement
- Facilitated a special study led by KIT on understanding the primary and secondary reach of Plantwise through social network analysis
- 'Plant Clinic' & 'Prescription Sheets' integrated into provincial implementation guidance of a national Area Wide Pests Management policy in Beijing area
- Organized a national stakeholder annual meeting attended by 30 participants (16 male, 14 female) to link relevant organizations and to plan next steps for the country programme

## Key Challenges and Lessons Learned

- Lack of national level engagement limits potential clinic network scale-up. Need to concentrate forces to scale-up clinic network in current implementation provinces to demonstrate value of clinic data at provincial level first, and not going to any new provinces without major local interest and funding secured
- No clear incentives for the private sector-connected plant doctors to continue recording clinic data when the project stops providing incentives. Suggestion: Identify other government funds (e.g. government-pay-for-service programme) or design data capturing to be more interesting/useful to these plant doctors
- Without a signed Data Sharing Agreement, Chinese partners cannot enjoy the benefits from POMS, particularly the diverse data analysis and reporting tools. Need to improve the Chinese e-clinic version to provide more assistance for Chinese partners on clinic data management



# Costa Rica

## Partners

- Extension Department, Ministry of Agriculture (MAG) – NRO & LIO
- Plant Health Department, Ministry of Agriculture (MAG) – LIO

## 2016 Highlights

- Facilitated integration of the plant clinic approach into 17 farmer based organizations to increase reach and sustainability
- Facilitated 17 plant health rallies reaching 567 farmers (416 men and 151 women) with targeted messages
- Conducted data processing and analysis workshop for 9 representatives of MAG
- Piloted use of mobile devices at plant clinics to enhance data collection and improve access to information
- Conducted a seminar presenting the plant clinic concept to 28 greenhouse farmers (8 women and 20 men) followed by a distribution of technical material generated by the programme and information on how to access resource materials available on the knowledge bank
- Facilitated a review and planning meeting with 14 participants (13 male and 1 female) where plant doctors presented plant clinic progress and proposed strategies for improving clinic services
- Conducted refresher training on the Monitoring Plant Clinic Performance concept for 14 participants (13 male and 1 female) followed by discussion about the utility of a monitoring plan for plant clinics
- Special M&E study conducted to investigate communication efficiency between plant clinics and farmers
- Conducted training on identification of microscopic structure of plant pathogenic fungi for 23 plant doctors (4 women and 19 men) to improve the capacity for providing microphotographs of diagnostics for remote support from experts connected through internet and social media
- Promoted plant clinics in 4 national agricultural fairs, explaining the concept to 507 participants (324 male, 183 female) and 375 students
- Promoted plant clinic concept to 132 agrochemical retailers (127 men and 5 women) to explore possibilities of linking the programme with the private sector
- Promoted Plantwise extension material to owners of agro shops to encourage them to make use of the offline and online content of the knowledge bank

Quick Stats	New in 2016	Cumulative Total
Plant clinics established	–	11
Plant doctors trained	–	29
PMDGs drafted	–	37
Factsheets drafted	–	–

## Key Challenges and Lessons Learned

- Data collected by extension agents is used for accountability only; data availability for analysis and decision making may improve the planning capacity of the extension agencies at regional level
- The extension department has its own data collection system but due to the low level of details recorded, carrying out analysis on quality of diagnosis and recommendation is not possible
- Regional directors and extension officers perceive Plantwise tools and methodologies as a useful mechanism for achieving their extension goals; this has led to integration of the plant clinic model into their day-to-day working scheme
- The extension system reaches only a fraction of the total farming population; this reach could be increased by running plant clinics through farmer associations in coordination with MAG
- Both extension agents and farmers are used to a system where the extension agent visits the farm to detect problems and give advice for its management. The obvious problem with this system is that only a small percentage of farmers have access to the extension service. It will be necessary to lobby more for the advantages of a plant clinic setting on both extension officers and farmers side
- All plant clinics are currently run at the extension office, leading to clinic attendance below expectations; it will be necessary to try new locations to increase farmer attendance



# DR Congo

## Partners

- Department of Crop Protection, Ministry of Agriculture and Rural Development – NRO & LIO

## 2016 Highlights

- CABI trainers conducted 'Module 1' training (field diagnosis and plant clinic operation) for 14 plant doctor (14 male) trainees
- CABI trainers conducted 'Module 2' training (giving good advice) for 14 plant doctor (13 male, 1 female) trainees
- Conducted 'Extension Messages' training for 13 participants (13 male), leading to the development of 18 new pest management decision guides (yet to be published on the knowledge bank)
- Facilitated the establishment of 1 new plant clinic by Department of Crop Protection, for a total of 11 active plant clinics
- Facilitated sharing and use of plant clinic data for presentation to senior management staff by Department of Crop Protection
- Employed CABI Associate to support coordination of in-country activities on a day-to-day basis
- Organised stakeholder forum to raise awareness about the programme and create interest of potential future partners

Quick Stats	New in 2016	Cumulative Total
Plant clinics established	1	11
Plant doctors trained	13	163
PMDGs drafted	18	32
Factsheets drafted	–	8

## Key Challenges and Lessons Learned

- Process towards signing of partnership agreement has been slow and led to uncertainties for Plantwise implementation; formalization of the partnership should be treated as a priority
- Precarious political and security situation is a challenge to the implementation of Plantwise activities; it will be necessary to closely follow the evolution of the situation



# Ethiopia

## Partners

- Ministry of Agriculture and Natural Resources (ANR) (Plant Health Regulatory Directorate) – NRO
- Oromia Region Bureau of ANR – LIO
- Amhara Region Bureau of ANR – LIO
- Tigray Region Bureau of ANR – LIO

## 2016 Highlights

- Strengthened the in-country Plantwise governance system by conducting a National Steering Committee meeting
- Conducted National Stakeholders Analysis Workshop with 21 participants to identify, map and assess key stakeholders that have an interest in and influence on the Plantwise initiative
- Conducted a two-day national stakeholder forum with 30 stakeholder representatives to discuss programme activities, which attracted significant media coverage through print, radio and digital media
- Conducted gender-assessment on accessibility of the current locations of plant clinics to women farmers
- Conducted gender awareness-raising activities to sensitise regional partners, which led to partners selecting more women extension workers for the new plant doctor trainings
- Facilitated the establishment of 60 new plant clinics, 50 of which were launched in the Tigray region with regional budget and funds sourced from other projects such as HABP and AGP; a case study was produced on the adoption and up-scaling of plant clinic activities in this region
- CABI trainers conducted Training of Trainers (ToT) for 12 local staff (2 female, 10 male) on the plant doctor training Modules 1 and 2
- National trainers conducted 'Module 1' training (field diagnosis and plant clinic operation) and 'Module 2' training (giving good advice) for 23 plant doctor trainees (5 female, 18 male), with backstopping by CABI
- Facilitated integration of Plantwise discussion during the annual meeting of the National Agricultural Development Partners Linkage Advisory Council
- The National Coordinator and CABI Country Coordinator were invited to talk about Plantwise in a stakeholder workshop inaugurating the new National Pest Management Strategy, which provided an opportunity to create greater awareness about Plantwise among all key plant health actors in the country
- Partners conducted several local or sub-cluster meetings, without any support from CABI, to discuss and improve performance and quality of clinic services
- 37 participants took part in a cluster exchange and shared lessons and experiences, carried out assessment of quality of clinic services and identified take-home messages
- Facilitated the entry of about 800 plant clinic queries into the Plantwise Online Management System (POMS)
- Promoted use of the administrative information in POMS by partners to track activities

Quick Stats	New in 2016	Cumulative Total
Plant clinics established	60	91
Plant doctors trained	23	126
PMDGs drafted	–	47
Factsheets drafted	–	19

## Key Challenges and Lessons Learned

- Severe drought and the recent unrest in some parts of Oromia and Amhara regions had some influence on plant clinic operations
- There is frequent and massive turnover of trained plant doctors and key partner staff due to promotion, transfer, further education and retirement, which create gaps in clinic operations; it will be necessary to engage with partner institutions to negotiate solutions to minimize transfer of trained staff
- Clinic data collection and management faces major challenges caused by lengthy prescription forms, cumbersome data entry requirements, and language issues; plant doctors are being encouraged to use local language in completing prescription forms and the form for Ethiopia is under review to shorten it

# Ghana



## Partners

- Plant Protection and Regulatory Services Directorate (PPRSD), Ministry of Food and Agriculture – NRO
- Directorate of Agricultural Extension Services (DAES), Ministry of Food and Agriculture – LIO
- Council for Scientific and Industrial Research (CSIR) – through its Soil Research Institute (SRI), Crops Research Institute (CRI) – Provides diagnostic support
- Adventist Development and Relief Agency (ADRA) – LIO

Quick Stats	New in 2016	Cumulative Total
Plant clinics established	12	99
Plant doctors trained	41	201
PMDGs drafted	79	103
Factsheets drafted	1	6

## 2016 Highlights

- Facilitated the establishment of 12 new plant clinics, for a total of 86 active plant clinics
- 4 national trainers conducted 'Module 1' training (field diagnosis and plant clinic operation) and 'Module 2 training' (giving good advice) for 41 plant doctor trainees (2 female, 39 male)
- Conducted 'Data Management' training for 38 participants (2 female, 36 male) to support clinic data management processes
- Conducted Data Validation workshop to validate a total of 5,530 plant clinic records
- National partners taking the lead on the whole plant clinic data management process
- Local partners using the administrative information in the Plantwise Online Management System (POMS) to track activities
- Facilitated the entry of 9,500 plant clinic queries into the Plantwise Online Management System (POMS)
- Facilitated specific need-based training on the identification and management of rice pests and diseases as well as general identification of insect pests for 53 plant doctors in collaboration with the Crop Research Institute of Ghana (CRIG)
- Facilitated 25 plant health rallies, reaching 2,622 people (1,168 female, 1,454 male) with targeted messages covering anthracnose on pepper, mango fruit fly and pepper mottle virus
- Facilitated 5 mass extension campaigns on various radio stations in five regions with an estimated reach of 310,000 farmers
- Observed and documented new interactions between plant health stakeholders (staff of PPRSD and Research Institutions jointly analysing clinic data)
- Special study conducted to investigate the impact of plant clinic advice on farmer's productivity and income
- Facilitated writeshops with national experts leading to the development of 87 pest management decision guides and 1 factsheet (yet to be published on the knowledge bank)
- Piloted the use of digital devices with 30 plant doctors and 7 supervisors covering 42 plant clinics
- Facilitated the airing on the national television of a documentary on Plantwise in Ghana for awareness raising

## Key Challenges and Lessons Learned

- Retirement of key plant doctors and supervisors; it is necessary to encourage the various regional and district directorates to put in place a succession plan to ensure a continuation of Plantwise activities
- Agreement with CSIR for the provision of diagnostic support has not been formalized, which makes it difficult to provide well organized diagnostic support to plant clinics; formalization of the partnership should be treated as a priority
- Limited central government funding support for the agriculture sector, including extension services, makes it difficult for plant doctors to run clinics without the support of Plantwise; it will be necessary to seek other sources of funding to ensure sustainability of the intervention

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# Honduras

## Partners

- SENASA – NRO & LIO
- Instituto Obdulio Lezama (technical school) – LIO
- Asociación de regantes Cane-La Paz, CENOC, APROALCE (farmer organizations) – LIOs
- Instituto Técnico Polivalente Lamaní (technical school) – LIO
- CEDACE (Army's agricultural training centre) – LIO
- CENOC (farmer organization) – LIO
- Aldea Global (NGO) – LIO
- JICATUYO (non-for-profit association) – LIO
- APROALCE (farmer cooperative) – LIO

Quick Stats	New in 2016	Cumulative Total
Plant clinics established	5	24
Plant doctors trained	–	70
PMDGs drafted	5	69
Factsheets drafted	2	21

## 2016 Highlights

- Facilitated linkage between farmers organisation with plant clinics and regional initiative aiming to support women farmer groups
- Facilitated the development of a video for broadcasting on national TV and social media, showing evidence of female participation in agriculture and their experience with plant clinics
- Conducted rational pesticide use & crop disease management course for 14 farmers from the women's groups
- Conducted need-based training for 11 plant doctors (2 female and 9 male) on integrated pest management
- Facilitated training on entomological pests and biological alternatives for pest control for 12 trainees
- Facilitated exchange visit between plant doctors and agro-input suppliers to showcase the usefulness of Plantwise extension material and tools (e.g. pest management decision guides, factsheet library app)
- Facilitated the establishment of 5 new plant clinics, for a total of 13 functioning plant clinics
- Facilitated successful linkage between Plantwise and an association of 7 cooperatives (with over 500 women associates) with plant clinics now supporting cooperative associates to produce aloe vera for local market
- Facilitated the local development of 5 new pest management decision guides and 2 factsheets
- Conducted data processing training for 12 participants (2 female and 10 male)
- Facilitated 1 mass extension campaign, involving multiple stakeholders and using plant health rallies, farmer meetings and school-based events, reaching 1,600 farmers with advice on Paratrypa in potato
- Facilitated need-based training for 13 (3 female and 10 male) agro-input suppliers on control of potato zebra chip vector Paratrypa and discussed with SENASA opportunities to improve availability of approved products in the country

## Key Challenges and Lessons Learned

- Limited availability of extension workers at MoA regional offices continues to be a constraint for scaling up; this is being addressed by incorporating new partners, such as NGOs
- Inclusion of JICATUYO (NGO focussing on backstopping farmer cooperatives) creates new opportunities for Plantwise to increase reach and linking with private sector stakeholders
- Working with women's groups and ethnic minorities has increased not only the participation of women in the programme but has also helped plant doctors to appreciate the importance of women in agriculture
- Integrating plant clinics into the training at technical schools appears to be a valuable strategy for creating awareness and interest among students to become plant doctors
- Despite changes of senior officials within MoA, the Plantwise initiative continues to benefit from strong buy-in and support from local partners
- Joint action involving plant clinics, agro-input suppliers, municipality and other agricultural organisations has been shown to substantially increase reach



# India

## Partners

- M S Swaminathan Research Foundation (MSSRF) – LIO
- Department of Agriculture, Jammu, J&K state (DAJ) – LIO

## 2016 Highlights

- Obtained a signed Partnership Agreement from Department of Agriculture, Jammu (DAJ), Jammu & Kashmir state
- Obtained a signed Data Sharing Agreement from Department of Agriculture, Jammu, Jammu & Kashmir state
- Plant clinic operational costs made as part of departmental activities by allotting job description to plant doctors
- Facilitated the establishment of an in-state governance system, with state forum meeting held by DAJ
- Plantwise Programme Coordinator, Data Manager, M&E Manager officially assigned by partners
- Facilitated the establishment of 15 new plant clinics by DAJ and 5 new clinics by MSSRF for a total of 39 active plant clinics
- MSSRF covering costs of its 5 new plant clinics, as well as the data management for those clinics, through a different programme 'Climadapt'
- CABI trainers conducted 'Module 1' training (field diagnosis and plant clinic operation) and 'Module 2' training (giving good advice) for 22 plant doctor trainees (11 female, 11 male)
- Facilitated 1 writeshop with national experts, leading to the development of 18 new pest management decision guides all published on the knowledge bank
- Conducted 'Data Management' training for 19 participants (9 female, 10 male) to support clinic data management
- Facilitated the entry of 10,050 plant clinic queries into the Plantwise Online Management System (POMS)
- Facilitated 1 mass extension campaign, using radio, mobile phones, TV, newspapers reaching an estimated 38,000 farmers with targeted messages
- Promoted use of ICTs tools (e.g. data collection app, factsheet library, serious games) for MSSRF and DAJ
- Promoted gender awareness among partners and participation of women and youth in the programme through cluster meeting

Quick Stats	New in 2016	Cumulative Total
Plant clinics established	20	39
Plant doctors trained	22	32
PMDGs drafted	18	92
Factsheets drafted	–	43

## Key Challenges and Lessons Learned

- Relatively small progress was made in 2016 in securing new sources of funding to run plant clinics under MSSRF; however, results for 2017 are expected to be more positive as there are more agencies seeing the positive results of plant clinics and showing interest in supporting the activities
- Establishing a partnership with the state government of Maharashtra is delayed due to the lengthy bureaucratic approval process. CABI is continuing to engage with India's central government to establish an umbrella agreement that would permit CABI to work in different R&D fields and with different stakeholders in the country



# Kenya

## Partners

- Ministry of Agriculture, Livestock and Fisheries – NRO, LIO
- Kenya Agriculture and Livestock Research Organization (KALRO) – Member National Steering Committee (NSC) and of various technical subject teams, also provides diagnostic services
- Kenya Plant Health Inspectorate Service (KEPHIS) – Member of NSC and of various technical subject teams
- Pest Control Products Board – Member of NSC and of various technical subject teams
- Agrochemical Association of Kenya (Croplife Kenya – Member of NSC and of various technical subject teams)
- University of Nairobi (UoN) – Member of NSC and of various technical subject teams
- Katoloni Mission Community Based Organization – LIO

Quick Stats	New in 2016	Cumulative Total
Plant clinics established	0	122
Plant doctors trained	179	383
PMDGs drafted	36	154
Factsheets drafted	–	7

## 2016 Highlights

- Obtained a signed Partnership Statement from Kenya National Farmers Federation (KENAFF) and an MoU with Equity Bank Foundation
- Funds (£ 15K) allocated to Plantwise training activities by five County Governments
- National M&E Manager officially assigned by the NRO
- 14 of the 38 national trainers conducted 'Module 1' training (field diagnosis and plant clinic operation) and 'Module 2' training (giving good advice) for 179 plant doctor trainees (105 men, 74 women), 118 of whom were sponsored by 5 County Governments as part of scaling up
- Facilitated 2 writeshops with national experts, leading to the development of 36 new pest management decision guides (5 published on the knowledge bank / 31 still under peer review)
- Conducted 'Data Management' training for 179 participants (105 men, 74 women)
- Conducted 'e-plant clinic' training for 160 participants (105 men, 55 women) to introduce use of tablets
- Conducted training of trainers in 'Data Management' for 13 participants who will support data management
- Facilitated the entry of 11,557 plant clinic queries into the Plantwise Online Management System (POMS)
- Local partners using the administrative information in the POMS to track activities
- Facilitated validation of 6,192 data records in POMS from a data set through a new sampling method
- Facilitated use of plant clinic data for checking the incidence of pests by partners (KALRO and KEPHIS)
- Facilitated 20 plant health rallies, reaching 2,992 people (1,308 men, 1,320 women, 364 children)
- Facilitated 1 mass extension campaign using TV, reaching an estimated 100,000 relevant farmers with targeted messages on Mango Powdery Mildew
- New interactions between stakeholders jointly diagnosing plant health problems on digital devices
- Promoted use of ICTs tools (factsheet library) for Equity Bank Foundation extension staff
- Special M&E study conducted to investigate reasons for low clinic attendance particularly by women farmers
- KEPHIS initiated investigations to confirm crop problems reported through KB pest alerts

## Key Challenges and Lessons Learned

- The study on low clinic attendance revealed that some women don't use plant clinics because they perceive the service to be for men and not for them. Also, the recommendations are sometimes too expensive for them. Therefore, extension staff are being encouraged to make the clinics more gender-sensitive, to encourage women to bring 'their crops' to the clinic as well as hold the clinics at women's forums
- The Plantwise yearly planning model (with no specific end date) makes it much more challenging to plan on an exit strategy with partners; partners have identified key priority areas (scaling up and building sustainability) for investment in the next few years



# Malawi

## Partners

- Department of Agricultural Extension Services (DAES), Ministry of Agriculture, Irrigation and Water Development – NRO & LIO
- Self Help Africa (SHA) – LIO, Implements plant clinics in collaboration with DAES
- Department of Agricultural Research Services (DARS), Ministry of Agriculture, Irrigation and Water Development – Provides diagnostic services and expertise for plant doctor backstopping
- Department of Crop Development (DCD), Ministry of Agriculture, Irrigation and Water Development – Coordinates activities at district level and provides backstopping to plant doctors
- Concern Universal – Implements plant clinics in collaboration with DAES

Quick Stats	New in 2016	Cumulative Total
Plant clinics established	26	116
Plant doctors trained	119	398
PMDGs drafted	14	34
Factsheets drafted	–	30

## 2016 Highlights

- Funds allocated to Plantwise activities by Malawi Government (£117,937), Self Help Africa (£63,251) and Concern Universal (£8,000)
- Facilitated in-country governance system, with national steering committee meeting on a regular basis
- Facilitated the establishment of 26 new plant clinics by Department of Agricultural Extension Services, Concern Universal, and Self Help Africa, for a total of 100 active plant clinics
- 10 of the 15 national trainers conducted 'Module 1' training (field diagnosis and plant clinic operation) for 119 plant doctor trainees (93 male, 26 female)
- 10 of the 15 national trainers conducted 'Module 2' training (giving good advice) for 119 plant doctor trainees (93 male, 26 female)
- Conducted 'Extension Messages' training for 16 participants (12 men, 4 women), leading to the development of 16 new, and revision of 14 previously developed pest management decision guides
- Local partners using the administrative information in the Plantwise Online Management System (POMS) to track activities
- Facilitated the entry of 3,890 plant clinic queries into the Plantwise Online Management System (POMS)
- Facilitated using plant clinic data for informing senior management
- Facilitated 82 plant health rallies, reaching 10,646 people (4,781 men, 5,016 women, 740 youths) with targeted messages
- Facilitated 3 mass extension campaigns, using radio and mobile phones reaching about 360,000 farmers with targeted messages
- Observed and documented new interactions between plant health stakeholders on identifying new pests, such as *Tuta absoluta*
- Promoted use of ICTs tools, especially the factsheet library app and serious games
- New pest (*Tuta absoluta*) identified for the first time through plant clinics
- Special M&E study conducted to investigate communication at plant clinics
- Promoted gender awareness among partners and participation of women and youth in the programme
- New research projects initiated by national partners to find solutions to crop problems identified through clinic data by the crop protection team

## Key Challenges and Lessons Learned

- Frequent transfer of extension personnel results in challenges regarding continuity of plant clinic services in some locations; it will be necessary to develop a strategy with local partners on how to minimise the continuous training needs for new plant doctors



# Mozambique

## Partners

- Ministry of Agriculture and Food Security (MASA) – NRO
- Departamentode Sanidade Vegetal (DSV)-MASA – LIO; also provides diagnostic services and data management support

## 2016 Highlights

- Obtained a signed Partnership Statement from MASA through the Directorate for Agrarian Services (DNSA)
- Obtained a signed Partnership Agreement from MASA through the National Directorate of Agrarian Extension (DNEA)
- Funds (£361,000) allocated to Plantwise activities by MASA for the period 2016 and 2017 and additional £225,000 allocated for the same period in collaboration with Eduardo Mondlane University and Instituto Superior Politecnico de Manica
- Facilitated the establishment of an in-country governance system, with national steering committee meeting on a regular basis
- Plantwise National Coordinator, Assistant National Coordinator, National Data Manager and CABI Associate officially assigned by partners
- Facilitated the establishment of 70 new plant clinics by MASA
- Conducted a training of trainers (ToT) for 14 local staff (4 female, 10 male) on the plant doctor training Modules 1 and 2
- 14 national trainers conducted 'Module 1' training (field diagnosis and plant clinic operation) and 'Module 2' training (giving good advice) for 125 plant doctor trainees (22 female, 103 male)
- Facilitated 1 writeshop with national experts, leading to the development of 14 new pest management decision guides and 7 factsheets (all published on the knowledge bank)
- Conducted 'Data Management' training to support clinic data management
- National partners starting to commit resources to clinic data management
- Local partners using the administrative information in the Plantwise Online Management System (POMS) to track activities
- Facilitated sharing and use of plant clinic data on a regular basis by partners
- Facilitated linking of Plantwise with Farmer Field School programme
- Promotion of mobile devices at plant clinics led to MASA purchasing 100 tablets and 5 desktop computers for the establishment of future e-plant clinics

Quick Stats	New in 2016	Cumulative Total
Plant clinics established	70	79
Plant doctors trained	125	137
PMDGs drafted	–	14
Factsheets drafted	–	7

## Key Challenges

- Country is in the process of shifting to the e-plant clinic system; for successful roll-out, it will be necessary to train all plant doctors on how to use mobile devices at plant clinics
- Limited availability of relevant country specific content to support plant doctors at plant clinics; it will be necessary to boost production and validation of additional PMDGs and factsheets, and make these available in digital form for use at e-plant clinics

# Myanmar

## Partners

- Plant Protection Division (PPD), Department of Agriculture, Ministry of Agriculture, Livestock and Irrigation (MoALI) – NRO & LIO
- Yezin Agricultural University – Provides technical support
- Department of Agricultural Research (DAR) – Provides technical support

## 2016 Highlights

- Integrated Plantwise components into the Governmental-led 'Myanmar Plant Health System Strategy 2016-2020'
- Facilitated the establishment of 10 new plant clinics in 4 new agro-ecological zones
- CABI trainers conducted 'Module 1' training (field diagnosis and plant clinic operation) and 'Module 2' training (giving good advice) for 15 plant doctor trainees (14 female, 1 male)
- Conducted 'Data Management' training for 15 participants (14 female, 1 male) to support clinic data management
- Conducted 'National Data Validation and Analysis' training for 15 participants (14 female, 1 male)
- National partners taking the lead on clinic data management
- National partners using the administrative information in the Plantwise Online Management System (POMS)
- Facilitated the entry of 3,776 plant clinic queries into the Plantwise Online Management System (POMS)
- Facilitated and documented new interactions between plant health stakeholders (PPD & DAR) during data analysis and validation training
- Promoted use of ICT tools like factsheet library app for Plant Protection Division
- Facilitated study by external company on 'Factors that influence effective management and use of plant clinic data'

Quick Stats	New in 2016	Cumulative Total
Plant clinics established	10	25
Plant doctors trained	15	45
PMDGs drafted	–	10
Factsheets drafted	–	10

## Key Challenges and Lessons Learned

- Initial poor buy-in to the programme of the Plant Protection Division has stalled progress; lobbying at higher level within MoALI has proven to be effective and led to a request from permanent secretary to roll-out Plantwise at national scale
- Limited Governmental funding available to support scaling-up the implementation of plant clinics; together with MoALI it will be necessary to organise a donor forum in order to seek to finance the implementation of the Myanmar Plant Health System Strategy
- Despite a number of opportunities, engagement with the private sectors has been low; it will be necessary to include private sector stakeholders in the roll-out of the Myanmar Plant Health System Strategy
- Submission of plant clinic data has been irregular; it will be necessary to explore if digitalisation of data collection is feasible by leveraging on existing ICT-projects



# Nepal

## Partners

- Plant Protection Directorate (PPD); Ministry of Agriculture Development (MoAD) – NRO
- District Agriculture Development Offices (DADOs) – LIO
- Regional Plant Protection Laboratories (RPPL) – LIO

## 2016 Highlights

- Funds (£33,000) allocated to Plantwise activities by PPD
- FAO allocated funds (£3,500) to link plant clinics with the Farmer Field Schools (FFS) Programme by training FFS facilitators as plant doctors, with the intention of increasing the number of farmers reached
- Extra funds (£3,500) allocated for data management training, which is a big step towards absorbing programme activities shows a gradual increase in the use of the KB and POMS by local officials
- National Coordinator, National Data Manager, National M&E Manager officially assigned by partners
- Facilitated the establishment of an in-country governance system, with national forum committee meeting on a regular basis
- Facilitated the establishment of 5 new plant clinics by PPD, for a total of 38 active plant clinics
- Linkage formed between PPD and Caritas Nepal to discuss possible training and plant clinic establishment with full-fledged internal support of resources (funding and manpower)
- 4 of the 12 national trainers conducted 'Module 1' training (field diagnosis and plant clinic operation) and 'Module 2' training (giving good advice) for 38 plant doctor trainees (22 male, 16 female)
- Conducted an M&E planning workshop to introduce concepts for a national M&E system for Plantwise
- Conducted 'Data Management' training for 20 participants to support clinic data management
- Conducted 'National Data Validation and Analysis' training for 10 participants (10 male) and, following demonstration of validated data to national forum, the government agreed to allocate funds (£3,500) for more data management training
- Facilitated the entry of 3,474 plant clinic queries into the Plantwise Online Management System (POMS)
- Promoted use of ICTs tools (data collection app, factsheet library, serious games) for NRO and LIO officials
- Special M&E study conducted to investigate satisfaction of plant clinic clients
- Promoted gender awareness among partners through women group meetings
- New interactions between plant health stakeholders for gathering and sharing information, e.g. linkage between Plantwise and the MoAD's mega-programme 'Agriculture Information Management System'

Quick Stats	New in 2016	Cumulative Total
Plant clinics established	5	45
Plant doctors trained	38	109
PMDGs drafted	14	34
Factsheets drafted	–	78

## Key Challenges and Lessons Learned

- Management of clinic data, particularly data entry and harmonization, is a big challenge at field level because it is time consuming; one possible solution would be the introduction of tablets to reduce data processing time
- Frequent staff transfers are one of the big challenges to retaining trained plant doctors for continuation of regular plant clinics. Despite numerous discussions with senior levels in the government, several policy issues remain as barriers
- Increasing the reach of plant clinics in Nepal to more farmers will be a challenge due to the limited number of appropriate staff and local funding available to run plant clinics



# Nicaragua

## Partners

- UNAN-León (University) – NRO & LIO; also provides diagnostic support
- UNA Managua (University) – Coordination
- UCATSE (University) – LIO; also provides diagnostic support
- CUR Jinotegaa (University) – LIO
- 7 farmer-based organisations (CCAJ, Flor de café, Juan Francisco Paz Silva (JFPS), Coop 20 de Abril, Santiago, SOPROCOM, CECOOP) – LIOs
- Abonatura (fertilizer input company) – LIO
- 4 NGOs (INPRHU, Foro Mirafior, Norwalk Nagarote, Humboldt Center) – LIOs

Quick Stats	New in 2016	Cumulative Total
Plant clinics established	3	31
Plant doctors trained	21	146
PMDGs drafted	10	75
Factsheets drafted	–	91

## 2016 Highlights

- Obtained a signed Partnership Agreement from UNAN Leon
- Local trainers conducted 'Module 1' training (field diagnosis and plant clinic operation) and 'Module 2' training (giving good advice) for 21 participants (8 female, 13 male)
- Facilitated the establishment of 3 new plant clinics by the farmers' association CECOOP, the NGO Humboldt Center and the private enterprise Abonatura, for a total of 14 active plant clinics
- Local trainers conducted 'Modules 1 & 2' training for 68 agronomy students (50 from UCATSE University (12 female, 38 male) and 18 from the University of Commercial Sciences (UCC)) as part of their preparation for community field work
- Facilitated 7 plant health rallies, reaching 198 people (175 male and 23 female) with targeted messages
- Facilitated a plant health campaign reaching 114 farmers (27 female, 87 male) and 95 school students
- Conducted 'Data Management' training for 8 participants (7 male and 1 female)
- Facilitated specific need-based training on identification and management of mites for 10 male plant doctors
- Facilitated the development of ten new pest management decision guides by trained collaborators
- Conducted preliminary meetings for several new initiatives with partners, e.g., establishment of a diploma based on the training modules of Plantwise (REDAF), integrating plant clinics into the governmental plant health system (MEFCCA), including plant clinics in the national strategy for plant health (REDAF, IPASA)
- Promoted gender awareness among partners and participation of women through a talk by a local expert on gender and UNA Managua started giving support on gender strategy at the steering committee meetings
- Facilitated a review and planning meeting for 20 participants (5 female, 15 male) to share lessons learned
- Two case studies prepared covering the stories of plant clinics implemented by the farmer cooperative Juan Francisco Paz Silva in Achuapa and UCATSE (Universidad Católica del Trópico Seco)
- Facilitated an external evaluation of the implementation of Plantwise

## Key Challenges and Lessons Learned

- The use of Plantwise training materials by universities for training students is having a positive effect on the programme at the country level, and can be considered an indirect impact of the programme on the national plant health system
- More private organizations are showing interest on running plant clinics, with some considering to charge a fee for the service to make it sustainable
- Reach to farmers in the field with mobile teams (e.g., for plant health rallies) has proven to be inefficient because of the low population of farming communities, long distances and poor transportation; for better results, these activities should be linked with other events such as cooperative meetings, market days and fairs to assure farmer attendance
- Time taken to fill in prescription forms is a main constraint, coupled with an absence of a culture for data collection; the use of mobile devices might be an option for encouraging plant doctors to keep record of their plant clinic activity

# Pakistan

## Partners

- Ministry of National Food Security & Research (MNFS&R) – NRO; coordinating Plantwise at national level
- Directorate general of Agriculture Extension and Adaptive Research, Punjab – LIO; also providing plant doctor training and technical expertise for developing resource material
- Directorate general of pest warning and quality control of pesticides, Punjab – LIO; also providing plant doctor training and technical expertise for developing resource material
- Department of Agriculture Extension, Sindh – LIO; also providing plant doctor training and technical expertise for developing resource material

Quick Stats	New in 2016	Cumulative Total
Plant clinics established	130	501
Plant doctors trained	206	1110
PMDGs drafted	–	42
Factsheets drafted	–	59

## 2016 Highlights

- Obtained a Partnership and Data Sharing Agreement from Department of Agriculture Baluchistan
- Funds (£ 64,285 for three years) allocated to Plantwise activities by Directorate General of Agriculture Extension Punjab
- Department of Agriculture Extension Sindh received funds (£ 361,500) from provincial government to scale up Plantwise activities
- Facilitated the establishment of 130 new plant clinics
- 10 of the 12 national trainers conducted 'Module 1' training (field diagnosis and plant clinic operation) for 206 plant doctor trainees (200 male, 6 female)
- 10 of the 12 national trainers conducted 'Module 2' training (giving good advice) for 206 plant doctor trainees (200 male, 6 female)
- CABl trainers and national trainers conducted 'Monitoring Plant Clinic Performance' training for 89 participants (89 male), leading to the development of a plant clinic monitoring system
- Conducted National M&E Planning workshop with 28 participants (28 male) to introduce concepts for a national M&E system
- Conducted 'Data Management' training for 234 participants (218 male, 16 female) to support clinic data management
- National partners taking the lead on clinic data management
- Conducted "Data validation, processing and analysis" training for 51 participants (45 male, 6 female)
- Conducted refresher training on 'Data validation, processing and analysis' for 12 participants (11 male, 1 female) to support clinic data management processes
- Local partners using the administrative information in the Plantwise Online Management System (POMS) to track activities and using pest data collected at plant clinics to monitor pests
- Facilitated the entry of 26,050 plant clinic queries into the Plantwise Online Management System (POMS)
- Conducted 50 cluster meetings by national partners with 1,035 male 27 female participants
- Conducted 'e-plant clinic' training for 20 participants (20 male) to introduce use of tablets at plant clinics

## Key Challenges and Lessons Learned

- Delay in release of funds allocated by government and complex procurement process in the national system caused delay in scale-up of activities in some districts of Punjab & Sindh
- National Plantwise management structure is important for sustainability and buy-in; further engagement with the Pakistan Agriculture Research Council (PARC) is needed to establish a fully functional National Forum
- Implementation of monitoring strategy at district level helped to improve local level monitoring and learning; however, the establishment of a monitoring and evaluation system at national level remains a challenge

# Peru

## Partners

- National Institute for Agricultural Innovation (INIA) – NRO & LIO
- National Service for Agricultural Health (SENASA) – LIO
- Local Government – Municipalities – LIO
- Regional direction for Agriculture San Martín – LIO
- “La Molina” Agricultural University – Provides technical assistance to plant clinics
- Entomological Society of Peru – Provides technical assistance to plant clinics
- International Potato Centre (CIP) – Technical collaborator

Quick Stats	New in 2016	Cumulative Total
Plant clinics established	–	37
Plant doctors trained	23	370
PMDGs drafted	–	34
Factsheets drafted	8	78

## 2016 Highlights

- 17 bilateral agreements signed between INIA and public/private entities (Municipalities, Regional Government, Local Extension Offices, Farmer Associations) to support plant clinic operations and scale-up
- Facilitated training of trainers (ToT) for 27 local staff (4 female and 23 male) on rational pesticide use
- National trainers conducted rational pesticide use training for 49 farmers (10 female and 39 male)
- Conducted ‘Monitoring Plant Clinic Performance’ training and facilitated M&E lessons learned workshop with 15 plant doctors (6 female and 9 male) to share experiences and elaborate a monitoring plan for inter-regional plant clinic monitoring visits
- National trainers conducted ‘Module 1 & 2’ training for 23 plant doctors trainees (4 female and 19 male)
- Conducted ‘e-Plant Clinic’ training for 12 participants to streamline clinic data collection and management
- Facilitated writeshops with national experts, leading to the development of 8 factsheets and 4 photosheets (yet to be published on the Knowledge Bank)
- Facilitated 18 plant health rallies reaching a total of 627 farmers (143 female, 313 male and 171 without gender reporting) with targeted messages
- Produced a case study (*A plant and livestock clinic to win ‘the gold medal of life’*) focusing on farmer experiences in visiting plant clinics in Cajamarca
- Facilitated assessment of in-country implementation by independent consultants as part of the Latin America-focussed external evaluation

## Key Challenges and Lessons Learned

- To guarantee sustainability and maximum outreach of the programme, it will be necessary to incorporate the plant clinic methodology in INIA’s institutional planning framework and established strategic alliances with Agrarian Agencies
- Due to staff turnover, some plant doctors that have been trained are no longer involved in running of plant clinics; in order to guarantee continuity of the implementation, it will be necessary to establish government driven mechanisms for replacement
- Engaging plant doctors who speak native languages (e.g. Quechua) has proved to be an efficient mechanism to break cultural barriers and attract more farmers to visit plant clinics
- Data flow from clinics to POMS has been slow, reducing also the opportunities for data use; the introduction of the Plantwise data collection app has shown positive effect on data collection, transfer and use
- Raising awareness on the importance of gender and diversity has led to selection of two female plant doctors to mainstream gender engagement through plant clinics

# Rwanda

## Partners

- Rwanda Agricultural Board (RAB) – NRO
- Local Government – Supports plant clinic operations with personnel/human and financial resources
- Directorate of Agriculture and Livestock Inspection and Certification Services – Chairs the National Steering Committee
- National Agricultural Export Development Board (NAEB) – Provides inputs in the development of pest management decision guides especially for coffee
- College of Agriculture, University of Rwanda – Training of plant doctors and will be involved in future development of undergraduate Plantwise curriculum
- FAO – Participates in National steering committee meetings

Quick Stats	New in 2016	Cumulative Total
Plant clinics established	–	65
Plant doctors trained	68	259
PMDGs drafted	–	51
Factsheets drafted	–	33

## 2016 Highlights

- Obtained a signed Partnership Statement, Partnership Agreement and Data Sharing Agreement from RAB
- Rwamagana District Authority allocated £1,400 to Plantwise activities
- In-country governance system established, with national steering committee meeting on a regular basis
- Plantwise National Coordinator, National Data Manager and National Assistant Coordinator officially assigned by partners
- CABI trainers conducted 'Module 1' training (field diagnosis and plant clinic operation) and 'Module 2' training (giving good advice) for 28 plant doctor trainees (12 female, 18 male)
- 10 national trainers conducted 'Module 1' training (field diagnosis and plant clinic operation) for an additional 27 plant doctor trainees (7 female, 20 male)
- 6 national trainers conducted 'Module 2' training (giving good advice) for an additional 13 plant doctor trainees (1 female, 12 male)
- Conducted a ToT for 21 local staff on 'Monitoring Plant Clinic Performance' training (5 female, 16 male)
- Conducted 'Data Management' refresher training 25 participants (7 female, 18 male)
- Conducted 'e-plant clinic' training for 22 participants to introduce use of digital devices at plant clinics
- Facilitated the entry of 2006 plant clinic queries into the Plantwise Online Management System (POMS)
- Local partners using the administrative information in POMS to track activities
- Facilitated 43 plant health rallies, reaching 4,357 people (2,167 female, 2,190 male) with targeted messages
- Facilitated 1 mass extension campaign, using radio to reach an estimated 7,700 farmers
- Observed and documented new interactions between plant health stakeholders by presenting national Plantwise programme at the national extension learning conference
- Piloted the use of digital devices at 10 plant clinics to enhance data collection system
- Promoted use of ICTs tools (e.g., data collection app, factsheet library and serious games) for RAB
- Special M&E study conducted to investigate impact of plant clinics with gender included as a parameter

## Key Challenges and Lessons Learned

- Changes in MINAGRI, RAB: with new DG RAB, New Permanent Secretary, New State Minister in charge of Agriculture and regular staff transfers by the districts caused delays of planned activities. Plantwise has to train more plant doctors, not to start new clinics, but to fill the positions left by the transferred plant doctors



# Sierra Leone

## Partners

- Ministry of Agriculture Forestry and Food Security (MAFFS) – NRO & LIO

## 2016 Highlights

- Signed a work and funding contract with Ministry of Agriculture Forestry and Food Security (MAFFS)
- Conducted a national stakeholder’s meeting to discuss the implementation of Plantwise post ebola crisis
- Divided all plant clinics into 10 clusters to facilitate monitoring and evaluation

Quick Stats	New in 2016	Cumulative Total
Plant clinics established	–	93
Plant doctors trained	–	148
PMDGs drafted	4	38
Factsheets drafted	2	13

## Key Challenges and Lessons Learned

- Massive early retirement of ministry staff resulting in the loss of several plant doctors, national data manager and accountants; it will be necessary to lobby so that replacements are at least 5-10 years away from retirement to enable continuity of the intervention
- Inadequate staff to run Plantwise in-country resulting in the National Coordinator and other support staff being over worked with other responsibilities; it will be necessary to continue to lobby for additional support staff to enable implementation of the programme
- Activities have been hampered by inconsistent financial reporting from the country; more local capacity will be needed to handle financial procedures according to required standards

# Sri Lanka

## Partners

- Ministry of Agriculture – Top level programme steering
- Plant Protection Service (Department of Agriculture) – NRO
- Provincial & Inter Provincial Extension Service of DoA – LIOs

## 2016 Highlights

- Funds of \$40,000 spent on Plantwise activities by Department of Agriculture, Provincial & Inter Provincial Extension Service of Departments of Agriculture in 2016
- Facilitated the establishment of 30 new crop clinics by Provincial & Inter Provincial Extension Service of Departments of Agriculture, for a total of 198 functioning active clinics
- Appointed 30 district coordinators to lead programme implementation in each district
- Conducted a training of trainers (ToT) for 30 district coordinators (19 male, 11 female) on the plant doctor training Modules 1 & 2
- 10 of the 16 national trainers conducted 'Module 1' training (field diagnosis and plant clinic operation) for 286 plant doctor trainees (167 male, 119 female) and 'Module 2' training (field diagnosis and plant clinic operation) for 195 trainees (127 male, 68 female)
- Facilitated 2 writeshops to develop 18 new pest management decision guides
- Conducted an M&E planning workshop with 36 participants (21 male, 15 female) from all districts to introduce, design and implement the national M&E system for Plantwise
- Conducted 'Data Management' training for 35 participants (21 male, 14 female)
- Completed e-crop clinic pilot study in Nuwara Eliya district and submitted report to steering committee
- Conducted 'e-crop clinic' training for 28 participants (16 male, 12 female) to introduce use of tablets
- Conducted 'National Data Validation and Analysis' training for 19 participants (11 male, 8 female)
- Facilitated workshop on sharing and use of clinic data for all possible uses by department of agriculture
- Piloted the use of tablets at 30 more crop clinics to enhance data collection and access to information
- Special M&E study conducted by external consultant to investigate farmers and crop clinics in Sri Lanka: attendance drivers and barriers, knowledge use and dissemination and satisfaction
- Paper on 'Delivering Actionable Plant Health Knowledge to Smallholder Farmers Through the Plantwise Program' published in Journal of Agricultural & Food Information
- Poster presentation on 'The "Permanent Crop Clinic Programme" in Sri Lanka: making use of data to resolve crop health problems' presented national partners at national conference of ASDA 2016.

Quick Stats	New in 2016	Cumulative Total
Plant clinics established	30	198
Plant doctors trained	195	711
PMDGs drafted	18	83
Factsheets drafted	–	13

## Key Challenges and Lessons Learned

- Submission of clinic data was very poor. In addition to streamlining data collection and processing in each district, the use of tablets in clinics appears to be working well for direct data entry. Therefore, the e-crop clinic concept is being scaled up in more districts
- The quality of clinic data should be improved to make subsequent analysis and use of it easier. Now that district coordinators were trained as master trainers on Modules 1 & 2, they can identify weaknesses and quickly resolve issues
- There are substantial barriers to more frequent operation of crop clinics, e.g., fortnightly instead of monthly. Further discussion with the NRO and LIOs is needed to examine if and how the crop clinic activities can be more integrated into routine duties of extension staff



# Tanzania

## Partners

- Ministry of Agriculture Food Security and Cooperatives (MAFSC) – NRO
- Selian Research Institute (SARI) – LIO
- Tropical Pesticide Research Institute (TPRI) – Provides information on pesticide registration and advice on legislation

## 2016 Highlights

- Report of internal audit of Plantwise submitted to CABI by the NRO confirming irregularities in operation of project accounts and recommended that administration of project funds should in future be authorised by the office of the PS
- CABI presented to the Ministry a proposed new structure for coordination of Plantwise activities for consideration by the ministry as pre-condition for resuming activities
- A national stakeholder forum was later convened to review the proposed structure but instead preferred the previous structure with a different fund authorisation procedure
- A new collaborator contract with additional due diligence requirements on the NRO was drawn up and presented for signature to enable activities be initiated in one region in 2017
- Resumption of Plantwise activities in 2017 is dependent on the NRO signing the new collaborator contract
- At the stakeholder meeting, CABI was informed that despite suspension of activities in the country since January 2015, some clinics in the Morogoro region continue to run

Quick Stats	New in 2016	Cumulative Total
Plant clinics established	–	44
Plant doctors trained	–	86
PMDGs drafted	–	42
Factsheets drafted	–	54

## Key Challenges and Lessons Learned

- Lack of adherence to the provisions of collaborator contract hence the need to spell out the roles of each partner before initiation of annual activities. In this case, activities were initiated before the signing of the contract
- Lack of response to queries on the internal audit of Plantwise



# Thailand

## Partners

- Rice Department, Ministry Of Agriculture and Cooperatives – NRO & LIO

## 2016 Highlights

- Funds (£33,000) allocated to Plantwise activities by Rice Department
- Facilitated the establishment of 5 new plant clinics by Rice Department, for a total of 15 active plant clinics
- CABI trainers conducted 'Module 1' training (field diagnosis and plant clinic operation) and 'Module 2' training (giving good advice) for 11 plant doctor trainees (9 female, 2 male)
- Conducted stakeholder analysis workshop with 15 participants (10 female, 5 male) representing current and potential new stakeholders
- Conducted 'Data Management' training for 11 participants to support clinic data management
- National partners taking the lead on clinic data management
- Local partners using the administrative information in the Plantwise Online Management System (POMS) to track activities
- Facilitated the entry of 677 plant clinic queries into the Plantwise Online Management System (POMS)
- Observed and documented new interactions between plant health stakeholders (e.g. participation in stakeholder analysis workshop and pre-National Forum)
- Promoted use of ICT tools (e.g. Plantwise factsheet library app) for Rice Department

Quick Stats	New in 2016	Cumulative Total
Plant clinics established	5	15
Plant doctors trained	11	47
PMDGs drafted	–	7
Factsheets drafted	0	27

## Key Challenges and Lessons Learned

- High staff turnover (e.g. National Data Manager) and low number of plant clinic data coupled with delays in data transfer; it will be necessary to emphasize the importance of having a National Data Manager to higher authorities within the Rice Department
- There is a single point of contact focused on the Rice Department and low engagement with other public and private sector partners leading to farmers' attendance at plant clinics and outreach of the intervention being below expectations; it will be necessary to explore possibilities to broaden Plantwise scope by engaging with the Department of Agriculture and the Department of Agriculture Extension

# Uganda

## Partners

- Department of Crop Protection (DCP) – NRO; also provides plant doctor training and diagnostic support
- Directorate of Agricultural Extension Education; National Agricultural Advisory Services (NAADS); Uganda National Farmers Federation; Uganda National Agro-Input Dealers Association – National Steering Committee members
- Uganda National Agro-Input Dealers Association – National Steering Committee member
- Makerere University, Uganda Christian University; Bukalasa Agricultural College; Gulu University – Provide plant doctor training
- Rwenzori Information Centres Network; Soroti Catholic Diocese Integrated Development Organization; District Local Government (96 DLGs) – LIOs

Quick Stats	New in 2016	Cumulative Total
Plant clinics established	–	191
Plant doctors trained	102	102
PMDGs drafted	10	154
Factsheets drafted	–	45

## 2016 Highlights

- Obtained a signed Partnership Statement from 48 from District Local Governments (DLGs)
- The Government of Uganda, through the Department of Crop Protection, approved and released £ 34,000 to procure plant clinic equipment, train plant clinic staff, and monitor and supervise plant clinics
- Facilitated the establishment of an in-country governance system, with national steering committee meeting on a regular basis
- Plantwise National Data Manager officially assigned by the National Plant Protection Organization
- 5 national trainers conducted 'Module 1' training (field diagnosis and plant clinic operation) and 'Module 2' training (giving good advice) for 102 plant doctor trainees (84 male, 18 female)
- Facilitated 1 writeshops with national experts, to review and validate 76 pest management decision guides
- Conducted 'Monitoring Plant Clinic Performance' training for 16 participants (11 male, 5 female), leading to the development of a plant clinic monitoring plan for six District Local Governments
- Conducted 'Data Management' training for 102 plant doctor trainees (84 male, 18 female)
- Conducted 'e-plant clinic' training for 11 participants (4 male, 7 female) to introduce use of tablets at plant clinics
- Conducted 'National Data Validation and Analysis' training for 12 participants
- Facilitated 78 plant health rallies, reaching 4,165 people (2,986 male, 1,179 female) with targeted messages
- Piloted the use of digital devices at 13 plant clinics to enhance data collection and improve access to extension materials
- Promoted use of ICT tools (e.g. factsheet library app) during steering committee meetings and through the Plantwise WhatsApp group
- Conducted a workshop to develop extension material for mass extension campaign on safe use of chemicals, attended by 12 participants from DLGs and Uganda National Agro-input Dealers Association
- Conducted a stakeholder workshop on 'ICT for Agriculture' (ICT4AG) attended by 34 participants from 18 key ACT4AG organisations in Uganda to explore synergies and identify ways of cooperation

## Key Challenges and Lessons Learned

- Most plant doctors who were laid off from employment in 2015 after restructuring of the National Agricultural Advisory Services (NAADS) have not yet been reinstated in most of the District Local Governments; in order to avoid investments in training which do not lead to long-lasting plant clinics, it will be necessary to conduct plant doctor trainings only if the LIOs are willing to take over the full training costs
- The use of digital devices at plant clinics has proved to be an efficient mechanism to streamline data collection, but as yet, in-country partners have not committed their own resources to scale-up e-plant clinics; before scale-up of the concept, Plantwise and national partners will need to agree on a sustainable financing plan



## Partners

- Vietnam Academy of Agricultural Sciences (VAAS), Ministry of Agriculture and Rural Development (MARD) – NRO
- Plant Quarantine Diagnostic Centre, Plant Protection Department (PQDC-PPD), Ministry of Agriculture and Rural Development (MARD) – LIO
- Plant Protection Research Institute (PPRI) – LIO
- Southern Horticultural Research Institute (SOFRI) – LIO
- Western Highlands Agriculture and Forestry Science Institute (WASI) – LIO

Quick Stats	New in 2016	Cumulative Total
Plant clinics established	5	25
Plant doctors trained	20	88
PMDGs drafted	–	35
Factsheets drafted	20	63

## 2016 Highlights

- Facilitated the establishment of 5 new plant clinics by Western Highlands Agriculture and Forestry Science Institute (WASI), for a total of 25 active plant clinics
- CABl trainers conducted 'Module 1' training (field diagnosis and plant clinic operation) for 20 new plant doctor trainees (8 male, 12 female)
- CABl trainers conducted 'Module 2' training (giving good advice) for 20 new plant doctor trainees (8 male, 12 female)
- Facilitated writeshop with national experts, leading to the development of 20 factsheets in local language (yet to be published on the knowledge bank)
- Conducted 'Data Management' training for 20 participants to support clinic data management
- Conducted 'National Data Validation and Analysis' training for 11 participants (5 male, 6 female)
- National partners (VAAS) taking the lead on clinic data management
- Local partners (VAAS) using the administrative information in the Plantwise Online Management System (POMS) to track activities
- Observed and documented new interactions between plant health stakeholders (participating in data validation training, tackling private stakeholders for setting up of new plant clinic)
- Promoted use of ICT tools (e.g. Plantwise factsheet library) for VAAS
- Special M&E study conducted to investigate satisfaction of plant clinic clients
- Promoted gender awareness among partners and participated in a gender workshop organised by ACIAR Vietnam where gender responsiveness of Plantwise was presented
- Facilitated development of a paper ('Plantwise: an innovative plant health system for Vietnamese farmers') presented by national partners (VAAS) at national conference

## Key Challenges and Lessons Learned

- Plantwise activities are largely dependent on Plantwise funding because to date little financial commitment from local partners has been observed; it will be necessary to engage at higher level within the ministry to seek financial support and source funding from private sector stakeholders
- Minimal direct involvement of the National Coordinator and weak linkages between NRO and LIOs (especially with PPD); it will be necessary to explore the possibility of transferring the data management and coordination role from VAAS to PPD

# Zambia

## Partners

- Ministry of Agriculture (MoA) – NRO
- Self Help Africa – LIO
- Department of Extension; Zambia Agriculture Research Institute – LIO; provides plant doctor training
- Zambia Agriculture Research Institute – LIO; provides plant doctor training
- University of Zambia – Provides plant doctor training
- Nature Resource Development College – Supporting organisation
- Zambia national farmer union – Steering committee member

Quick Stats	New in 2016	Cumulative Total
Plant clinics established	20	65
Plant doctors trained	26	103
PMDGs drafted	11	41
Factsheets drafted	9	39

## 2016 Highlights

- Obtained a signed Partnership Statement from University of Zambia (UNZA)
- Facilitated in-country governance system, with national steering committee meeting on a regular basis
- Facilitated the establishment of 20 new plant clinics for a total of 62 active plant clinics
- 10 of the 16 national trainers conducted 'Module 1' training (field diagnosis and plant clinic operation) and Module 2 training (giving good advice) for 26 plant doctor trainees (4 female, 22 male)
- Conducted 'Extension Messages' training (producing extension materials) for 12 participants (3 female, 9 male), leading to the development of 11 new pest management decision guides and 9 factsheets
- Conducted 'Monitoring Plant Clinic Performance' training for 16 participants (3 female, 13 male)
- Conducted an M&E planning workshop to introduce concepts for a national M&E system for Plantwise
- Conducted 'Data Management' training for 26 participants (4 female, 22 male)
- Conducted 'e-plant clinic' training for 15 participants to introduce use of digital devices at plant clinics
- Conducted 'National Data Validation and Analysis' training for 7 participants (7 male)
- Facilitated the entry of 2,035 plant clinic queries into the Plantwise Online Management System (POMS)
- Facilitated use of plant clinic data for determining crop protection research areas by ZARI, and for use in identifying topics for agricultural extension support by the Department of Agriculture
- Facilitated 7 plant health rallies, reaching 1,121 people (481 female, 640 male) with targeted messages
- Facilitated 2 mass extension campaigns, using radio, SMS, TV and newspapers reaching 10,000 farmers
- Observed and documented new interactions between plant health stakeholders developing strategies to tackle emerging crop problems and gathering and sharing information on Tuta absoluta
- Piloted the use of digital devices at 6 plant clinics to enhance data collection and improve access to extension materials
- Promoted use of ICTs tools for plant doctors, other extensionists and researchers
- New pest Tuta absoluta identified for first time through plant clinics
- Special study initiated to assess social networks in order to determine extent of how far the advice from plant clinics reach
- Promoted gender awareness among partners and participation of women and youth in the programme

## Key Challenges and Lessons Learned

- Zambia is a big country and getting data after plant clinic sessions is extremely slow. This will be solved through increasing the use of tablets at plant clinics (e-plant clinics)

Plantwise is a global programme, led by **CABI**, to increase food security and improve rural livelihoods by reducing crop losses

Plantwise is supported by:



## Contact

To find out more and discuss how you can get involved in this exciting new initiative, contact either of the following:

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