

# Plantwise

**SDC contribution Phase 1 (2012-2013)**

**External Evaluation**

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## Executive summary

Plantwise is a global program led by CABI and active presently in over 30 countries in Asia, Africa and Latin America. Plantwise integrates three components:

- 1) A network of “plant clinics” staffed with trained “plant doctors” typically set-up in village markets where farmers can seek advice on crop health problems;
- 2) A knowledge bank containing a database with the data provided by plant doctors on problems diagnosed and recommendations given to farmers in a restricted access part as well as an open access comprehensive collection of factsheets, diagnostic tools and pest distribution maps
- 3) An effective national plant health systems based on strengthened links and enhanced flow of information between the different actors.

Plantwise was officially launched as a program in 2010, building on previous pilot activities with plant clinics in a few countries. It is presently supported by 8 donors, among them the Swiss agency for Development and Cooperation (SDC). An external evaluation was conducted by two consultants in August 2013, mandated by CABI and SDC. They traveled to Kenya, Tanzania and Rwanda to talk to Plantwise national stakeholders and visit plant clinics.

The evaluation found that in Kenya, Tanzania and Rwanda Plantwise is a highly relevant, effective, efficient and well managed program, which substantially contributes to more sustainable crop protection at farm level on the one hand and to a more efficient national plant health system on the other.

Observed minor shortcomings could be tackled with the following set of measures:

- Identify pilot countries for out-scaling of the plant clinic network and establish comprehensive country plans together with the national partners
- Develop and communicate concepts for future arrangements for globally centralized services (e.g. Knowledge Bank) after donors’ phasing-out
- Search for independent partners to instruct farmers in rational and safe use of pesticides
- Strengthen links and cooperation with international organizations (e.g. CGIAR-Centers, AVDRC or ICIPE) and NGOs (e.g. Biovision)
- Establish and strengthen links with local authorities (district, county, region) to ensure commitment and sustained support
- Strengthen links and dialog with input suppliers to improve the availability of IPM compatible crop protection products
- Streamline work-planning and budgetary processes at country level
- Establish agreements with referral labs in order to improve free access for plant doctors to professional diagnostic services
- Improve Web access to Knowledge bank and other relevant web sites or offline accessibility of digital info material for plant doctors
- Assess recommendations of plant doctors as to their effectiveness, profitability and congruency with IPM principles in general and design ways of improving them



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## Acronyms

AVDRC	Asian Vegetable Development and Research Center
CABI	Commonwealth Agricultural Bureaux International
CGIAR	Consultative Group on International Agricultural Research
CIAT	Centro Internacional de Agricultura Tropical
CIP	Crop Intensification Plan (Rwanda)
EET	External Evaluation Team
ICIPE	International Centre of Insect Physiology and Ecology (Nairobi)
IFDC	International Fertilizer Development Center
IITA	International Institute for Tropical Agriculture
IPM	Integrated Pest Management
KARI	Kenya Agricultural Research Institute
KEPHIS	Kenya Plant Health Inspectorate Service
LIO	Local Implementing Organization (Plantwise)
M&E	Monitoring and Evaluation
MAFC	Ministry of Agriculture Food Security and Cooperatives (Tanzania)
MLND	Maize Lethal Necrotic Disease
MoA	Ministry of Agriculture
NPPO	Department of Agriculture and Livestock Inspection and Certification
NRO	National Responsible Organization (Plantwise)
NSC	National Steering Committee (Plantwise)
PC	Plant clinic
PCPB	Pest Control Products Board (Kenya)
PW	Plantwise
RAB	Rwanda Agriculture Board
SDC	Swiss agency for Development and Cooperation
UoN	University of Nairobi

# 1. Introduction

Plantwise is an innovative global partnership, led by CABI which is connecting farmers to the information they need, enabling them to lose less, grow more and improve the quality of their crops (CABI, Plantwise Strategy). By gathering and collating data from the farmers seeking advice, Plantwise also creates valuable information for policy makers at local, national and global levels.

Plantwise's approach is based on three interlinked components:

- a) Specially trained **plant doctors**, normally recruited from existing extension staff, advise farmers on any crop health problem in easily accessible **plant clinics** typically set up in village markets (a new, demand-driven extension service). Usually farmers come with plant samples; plant doctors diagnose the problem and give recommendations on how to solve it, respecting the principles of IPM.
- b) Information which is gathered in the plant clinics is compiled first at national level and then in a global online database, the Plantwise **knowledge bank**. This information allows to monitor pests and diseases and to detect new emerging species and changes in agro-ecosystems due to climate change. In addition to this restricted access part of the knowledge bank, its open access area also is a warehouse for diagnostic tools and advisory documents such as factsheets and green and yellow lists created by national plant health actors or relevant information documents from third parties. The knowledge bank represents the central platform for collaboration and exchange of validated plant health information for all partners of the plant health system from plant doctors to scientific researchers.
- c) The improved flow of information strengthens the links and fosters collaboration between all actors of the **plant health system** (extension, research, input suppliers, regulators and policy makers).

Up to now Plantwise is active in more than 30 countries. Since local commitment and ownership are major concerns of the program, CABI acts as a facilitator and coordinator rather than an operator in the partner countries. CABI provides the basis for the training of the plant doctors; it encourages the collaboration between the different actors of the plant health system; it supports the establishment of pilot plant clinics and provides the centralized structure for the exchange and sharing of information. However, the staff for the plant clinics and the resources for the necessary out-scaling of the plant clinic network have to be made available by the local governments. Typically, CABI chooses the Ministry of Agriculture as the main partner of the program. By this, established structures mandated by the governments are used for implementation.

The Swiss agency for Development and Cooperation SDC has been a donor to the Plantwise program since 2012. After two years of SDC's contribution, SDC and the CABI Board agreed to conduct an external evaluation of the program in Kenya, Tanzania, Rwanda and Sierra Leone with the following objectives:

- Assess the Plantwise programme as a whole with regard to its relevance for stakeholders, effectiveness, efficiency and risks/potentials for the mid-term future, as described below. The evaluation should consider the programme as a whole, with a focus on country activities in Africa, particularly in the SDC target countries.
- Provide relevant and feasible recommendations for the improvement of country-specific interventions; global strategies and activities for subsequent SDC project phases

The analysis and resulting recommendations should provide a basis for decision making by SDC on continuing funding, deliver information for other present and future donors and yield insights that can be used for designing ex-post impact assessment.

An external evaluation team consisting of two consultants was entrusted to realize the review.

## 2. Methodology

The External Evaluation Team (EET) consisted of:

Urs Scheidegger (Team leader), Bern University of Applied Sciences, School of Agricultural, Forest and Food Sciences HAFL, Zollikofen, Switzerland, head of the EET, agronomist specialized on seed production, farming systems research and extension networks

Benno Graf, Swiss Agricultural Research Institute Agroscope, Wädenswil, Switzerland, agronomist and entomologist, specialized in crop protection and fruit and vegetable crops

The external review included field visits by the EET from August 26 through 31, 2013. Originally it was planned that both consultants would visit Kenya together and then split up to visit Tanzania and Rwanda (Urs Scheidegger) or Sierra Leone (Benno Graf). During the visit in Kenya it turned out that the visit to Sierra Leone had to be cancelled and Benno Graf travelled as well to Tanzania. Before the field visits, the team had met with the Plantwise Program Executive, Ulrich Kuhlmann and the Program Support manager, Wade Jenner, in Delémont, Switzerland and obtained an introduction to the knowledge bank in the UK via Internet. Most of the analysis took place after the field visit. Preliminary findings were presented to and discussed with the Plantwise Program Board in Weggis on September 5 and 6.

From the Terms of Reference (Annex 1), the team derived a methodology and a set of questions to be discussed with interview partners (Annex 2). CABI staff (the respective Plantwise country coordinator) accompanied the team in the three countries. SDC staff based in-country participated in the field visits in Tanzania (U. Mauderli) and Rwanda (K. Jenny). This was useful to the evaluation and will hopefully contribute to an even better understanding of the program within SDC. The details of the schedule can be found in Annex 3.

The activities of the review team consisted in:

- Studying the documentation of the Project (i.a. CABI 2012; CABI 2013a; CABI 2013b; Danielsen and Romney 2012; Finegold and Williams 2012)
- Briefings by SDC, CABI Plantwise Executive and Plantwise Regional Coordinator Africa
- Interviews with different stakeholders in the countries
- Field visits to plant clinics with interaction with plant doctors and farmers
- Preliminary analysis of the findings and development of recommendations
- Workshop for verification and discussion of preliminary results in Weggis

The EET thanks all interviewees for the time they dedicated to the interviews, their openness, the ideas they shared with us, and their hospitality. We thank especially the Plantwise staff for the organization of the review missions and their continuous support during the review.



### 3. Plantwise in Kenya

In Kenya, Plantwise has the following partners:

Ministry of Agriculture (MoA)
Kenya Agricultural Research Institute (KARI)
Kenya Plant Health Inspectorate Service (KEPHIS)
Pest Control Products Board (PCPB)
University of Nairobi
Kilili Self-Help Group (CBO) & Dajopen (NGO)

Plantwise is locally implemented by the Department of Extension and Training of the Ministry of Agriculture MoA. As the National Responsible Organisation it is in charge of strategic planning and national coordination together with the CABI country coordinator. The Department of Extension and Training is running the majority of the plant clinics and provides extension staff as plant doctors.

The Kenya Agricultural Research Institute KARI provides diagnostic support, contributes to the training of plant doctors and delivers scientific input for fact sheets. KARI has installed plant clinics on several of its field stations. Kenya Plant Health Inspectorate Service KEPHIS supplies backstopping in pest and disease identification and the Pest Control Products Board (PCPB) provides information on registered pesticides.

All the above partners and the University of Nairobi are members of the National Plantwise Steering Committee, which manages the collaboration between the partners, discusses and settles strategic and operational issues (e.g. management, analysis and access of plant clinic data). Experts of these institutions are also participating in the data validation team, which screens the clinic data before it is entered into the data base.

Kilili Self-Help Group and Dajopen are NGOs promoting biointensive organic farming in the Western North Rift of Kenya. They were among the first to operate plant clinics for organic farming and are now part of the Kenyan plant clinics network.

The EET during its mission met among others with CABI Regional Coordinator Africa, the CABI Country Coordinator Kenya, the Director of Extension and Training of MoA, the National Coordinator of MoA and representatives of KARI and KEPHIS. In addition we visited the Plantwise data center and a plant clinic in Nderi.

#### **a) Relevance**

##### **i. Demands and interests of stakeholders**

All interviewees unanimously confirmed the relevance of Plantwise in Kenya. Plant clinics as a demand driven, easy accessible advisory service for farmers are considered to be a big success, enabling farmers to better cope with crop management and plant protection problems. With the support of plant doctors farmers make more rational decisions, optimize agricultural inputs and improve crop yield and quality.

Plantwise also makes a substantial contribution to capacity building within the national extension service. Staff being trained as plant doctors not only expand their knowledge in problem identification and solving but also improve their communication skills. It seems that the direct and personal contact between plant doctors and farmers is motivating for both sides and stimulating mutual trust.

There is general consensus that the number of clinics in Kenya has to be substantially increased in order to reach more farmers and to cover a wider area.

Plantwise with its Knowledge Bank serves as an important source of information and an early warning system for the whole plant health system in Kenya. With the structured reporting (standardized prescription and record sheet) of the plant doctors, important information on the crop health status in general, on pest and disease outbreaks and on the emergence of new or quarantine species in particular are made available to the responsible authorities. By this means it is possible to plan and implement control measures in due time. Plant clinic data are also used to monitor the efficacy of control measures, to update the national pest list data base (KEPHIS), and to monitor the use of banned pesticides (PCPB).

Plant clinic data are likely to stimulate new research activities. For example, new control strategies have to be developed for newly emerging pests and diseases and established strategies have to be validated or adapted to include new measures and technologies.

Nevertheless, it has to be kept in mind that the first plant clinic data validation workshop was just held at the end of August 2013. This is the main event when plant clinic data are analyzed in a structured way by a group of national plant health specialists. Some of the advantages of centralizing and analyzing plant clinic data mentioned above have therefore not yet fully materialized in Kenya. Several facts were picked up during self-evaluation sessions at cluster level by attentive facilitators or by CABI staff looking at unvalidated data. The validation workshop just recently yielded a list of research issues that now needs to be prioritized and fed into the planning process of respective actors.

Crop management and protection measures often need agro-inputs such as fertilizers or plant protection products. Input suppliers could benefit from plant clinic data to plan their purchases and stocks. However, input suppliers do not seem very well integrated in Plantwise in Kenya so far.

## **ii. Usefulness of materials developed**

Up to now, 97 factsheets have been developed, in their majority in collaboration with KENGAP Horticulture and filed on the Knowledge Bank. The factsheets have an attractive common layout and contain illustrated information on identification, biology and control options. The factsheets, together with complementary photo sheets (pest identification tables), are intensively used by the plant doctors as a source of information. Given the fact that plant doctors and farmers seem to have limited knowledge on IPM compatible plant protection products and their application, more detailed information on control options could be helpful (i.a. categorizing control options according to a green and yellow list, indications on correct dosage, preparation and application of recommended products). A few green and yellow lists (13) have been drafted up to now but they are not yet accessible on the Knowledge Bank.

Plant doctors document each visit in a standardized form (prescription and record sheet). This allows easy handling and analyzing of the data at national level. One copy of this form goes to the farmer, one copy is forwarded to the data center, none remains with the plant doctor. It would make sense if the plant doctor could keep a hardcopy for further follow-up and self-evaluation.

Due to the short duration of the mission the EET did not have the opportunity to attend a training course for plant doctors. However, the general feedback of the interviewees to the training modules 1-4 was very positive. The opportunity for capacity building of extension staff is particularly appreciated at the MoA, which provides the majority of the plant doctors. Based on contacts with plant doctors, the EET got the impression that the knowledge about pest and disease control options is limited and should be addressed more intensively in one of the training modules.

The Knowledge Bank (open space) is an excellent information tool for all Plantwise partners and is used intensively in Kenya. The fact that MoA is using the Plantwise Knowledge Bank as the most important Website for its e-Extension initiative demonstrates the quality of this tool.

### **iii. Impact on the plant health system**

Within a short period of two years Plantwise became an important complement of the Kenyan agriculture policy. Plantwise on the one hand led to more structure within the plant health system in Kenya, and on the other hand offered an extraordinary platform for interactions between the relevant actors. It stimulated the dialogue and cooperation and strengthened links between the relevant partners. The establishment of the National Plantwise Steering Committee and the comprehensive data validation and management working team are just two examples where different institutions (MoA, KARI, KEPHIS, PCPB and University of Nairobi) joined forces to coordinate collectively crop management and crop protection issues. By and large, the collaboration between the actors runs smoothly. In some areas a better and more formal definition of the roles of the partners could prevent misunderstandings (e.g. plant clinic data sharing with KARI).

### **iv. Adapting to local realities**

Plantwise adapts well to local realities in Kenya. For example The Department of Extension and Training of MoA imbedded the plant clinics into its network of information desks and by this means uses the established extension structure for Plantwise activities. Likewise, the Plantwise Knowledge Bank is used as the main website for e-Extension.

### **v. Partnerships (commitment)**

Plantwise fits well with the present structure of the plant health system in Kenya. The key actors, such as MoA, Extension (Department of Extension and Training), Research (KARI) and regulatory bodies (KEPHIS, PCPB) are all committed and contributing partners of the program. The forthcoming changes in the structure of national authorities (“Decentralization by Devolution”) shifting the responsibility for extension from MoA to county authorities will entail the need for contacts with new partners and a corresponding adaptation of the program structure.

## ***b) Achievements and effectiveness***

### **i. Plant clinics**

To date 52 plant clinics have been set up in Kenya, most of them concentrated in the south-western part of the country. The majority is run by MoA, but other governmental bodies such as KARI and KEPHIS and NGOs such as Kilili Self-Help Group and Dajopen are servicing clinics as well. In total 95 plant doctors have been trained and graduated in Module 1 and 2. The training of plant doctors, data managers and trainers is well structured (modules 1-4) and has a high quality. The idea has been brought forward to establish an accreditation scheme to approve the training and hence to assure sustained quality.

Most of the clinics are open on a weekly or bi-weekly basis. The EET visited a plant clinic, a neighbouring farmer and a small input-supplier in Nderi close to Nairobi. The clinic was well frequented, the clients being roughly 50% women and 50% men. Most of the queries came from vegetable crops, the problems covering a broad range of pests and diseases. The identifications of the problems by the plant doctor were by and large correct, however the severity of attack or the infestation level was not considered enough when making recommendations. The recommendations ranged from preventive cultural measures in the following crop to immediate use of pesticides. The knowledge about IPM compatible pesticides seemed to be limited.

The visit with the farmer and the input-supplier revealed two probably general constraints for a successful implementation of an IPM program:

- Small input suppliers do not have the knowledge to recommend the correct IPM compatible products, and they do not have them on stock.
- Farmers do not have the equipment for a correct application and they lack proper training for the save use of pesticide

Though it might be beyond the scope of Plantwise, the above constraints need to be addressed for a sustainable crop protection strategy based on IPM.

Plant doctors generally have good skills in problem identification. But still in special cases they would need the support of diagnostic specialists. From our observations it seems, that plant doctors are not aware of available diagnostic services or are not making use of them because of long procedures or high charges (KEPHIS charges 40\$ for a sample). Therefore diagnostic services have to be made transparent, easily accessible and free of charge for the plant doctors in order to get more reliable clinic data and solid recommendations to the farmers.

## **ii. Data collection**

Plant doctors use the standard plant clinic form (prescription and record sheet) for data collection. They fill in a form for each query. The forms are regularly collected by the cluster coordinator and forwarded to the Plantwise data center in Nairobi for data entering, compilation and validation. From here data are sent to the global database in UK. The process seems to be well established and efficient.

## **iii. Linking key actors in the plant health system**

All relevant Kenyan actors (MoA, KARI, KEPHIS, PCPB and University of Nairobi) are partners in Plantwise. The links are established and functional and the activities coordinated by the National Steering Committee. The role, responsibility and competence of KARI might need some clarification.

## **iv. Data processing and use**

In Kenya much importance is attached to data validation. A special data management and validation team with experts from all the partner institutions has the assignment to verify the incoming clinic data. Since every single form is checked the process is time consuming. Some interviewees criticized the delay caused by data validation and wished a faster access to the data.

## **v. Knowledge Bank**

The Knowledge Bank is an excellent information tool for all Plantwise partners and is used intensively in Kenya. The fact that MoA is using the Plantwise Knowledge Bank as the most important Website for its e-Extension initiative demonstrates the quality of and the urgent demand for this tool.

## **vi. Monitoring and learning loops**

In Kenya the cluster coordinators organize plant clinic self-assessment workshops on a regular basis in order to monitor and constantly improve the performance of plant doctors. Based on real examples, problem identification and recommendations are critically reviewed and discussed. By this means plant doctors get immediate feedback and common problems can be tackled jointly.

At national level, data validation workshops have a similar function. Plant doctors are trained in standard procedures and recommendations are analysed for compliance with the principles of IPM. An M&E working team has developed mechanisms to assess the progress in achievements; however, a proposed baseline survey could not yet be realized due to the lack of resources.

## **vii. Unexpected results**

The quality of plant doctor training is highly esteemed and the University of Nairobi has taken up the challenge of incorporating plant doctors curriculum in relevant courses offered. Plant clinics apparently have an excellent widespread reputation with farmers seeking advice for crop health problems. This is probably the reason that farmers from outside the program area are coming long distances to benefit from the services offered by the plant doctors. Furthermore, farmers having utilized plant clinic services very often enquire about similar services for livestock health. At political level requests are made to start running plant clinics where this service is not yet offered.

## **c) Efficiency**

### **i. Complementarity with other initiatives and bodies**

Plantwise fits well into the Kenyan landscape of agricultural research and extension. With its demand-driven approach to extension it offers an alternative to the known services of MoA. It provides additional information and solutions for plant health problems to extension programs and the agricultural information desks operated by MoA. The training programs for plant doctors and the clinic kits have substantially improved the capacity and skills of extension staff, and the plant clinic approach led to more frequent and target-oriented interactions between extensionists and farmers.

### **ii. Involving the right partners**

Plantwise cooperates with the right partners and the collaboration is well structured in Kenya. The establishment of the National steering committee helped to define the roles and responsibilities between the partners according to their competencies, and joint planning enhanced ownership and implementation of plant health activities.

With regard to the whole plant health system the integration of agro-input suppliers needs to be addressed. A more intensive involvement will be needed in order to improve the availability of IPM compatible products and to enhance the dealers' advice on correct application. Furthermore, Plantwise should seek additional partners for the independent training of plant doctors and farmers in the rational and safe use of pesticides.

The cooperation with other institutions with related activities (e.g. CGIAR-Centers, ICIPE or Biovision) could be intensified particularly in the field of diagnostics and IPM compatible control measures.

### **iii. Dealing with human resources**

Plantwise seems to deal well with human resources. The working environment is stimulating and the specific training and information material apparently motivates the extension staff. For the sake of sustainability, the replacement of retiring staff needs particular attention.

### **iv. Budget efficiency**

By and large, the EET got the impression, that the use of financial means is well planned and the priorities are set correctly. The planning and budgeting process could be more efficient, if resource availability would be known earlier. To date activity plans often have to be adapted since financial means do not correspond with expectations.

## ***d) Risks and potentials***

### **i. Medium-term risks**

In Kenya a process to rearrange responsibilities between the central and the county governments (“Devolution”) is underway. This includes decentralization of extension services and agricultural budget to counties. Therefore, most plant doctors being extension officers will no longer be employees of MoA, but of the counties, and further support and commitment for Plantwise will depend on additional decision makers. Plantwise will therefore have to include the counties as additional partners, which might complicate program management to some extent.

After donors’ phasing-out, the program will have to be completely sustained by local funds. With the expected structural changes there is a risk of gaps in national funding. County leadership has therefore to be sensitized in an early stage and encouraged to embrace and support the program.

### **ii. Resilience**

All Kenyan partners of Plantwise appreciate the big achievements and the relevance of the program for the entire plant health system. Contributing individuals from government representatives to plant doctors are highly motivated. The program is well integrated into the local structures of research, extension and regulatory bodies. The major investments (staff and salaries) as well as the institutional support and the willingness to find additional financial sources are proof that Kenya has taken ownership of the program. All this is strong evidence that Plantwise has high resilience in Kenya and chances are good that Plantwise will survive potential temporal disruptions.

### **iii. Impact potential**

Plantwise is likely to have a big impact on the entire plant health system in Kenya. It fosters the links between the important actors (MoA, KARI, KEPHIS, PCPB, UoN) and provides the setup for an efficient organization.

Plant clinics offer information and diagnostic services hitherto not accessible, to enable farmers to better cope with crop management and protection problems. Due to the qualified advice of well-trained plant doctors, crop yield and quality can be improved, plant protection can become more sustainable, less harmful to the farmer and the environment, and food security and safety can be improved.

The data gathered by the plant doctors are an excellent base for a national surveillance system for the emergence of quarantine pests and diseases and the outbreak of new species. Such a system allows the responsible authorities (e.g. KEPHIS) to react in time and plan and implement control strategies; with regard to climate change an early warning system becomes even more important. Plant clinic data can also be used by regulatory bodies (e.g. PCPB) to get a general view on the use of pesticides or the application of banned products.

## 4. Plantwise in Tanzania

In Tanzania, Plantwise works with the following partners:

Ministry of Agriculture Food Security and Cooperatives (MAFC)
Local governments
Selian Research Institute (SARI)
Tropical Pesticide Research Institute (TPRI)
Seed Unit of MAFC

The program is nationally coordinated by MAFC. The Assistant Director, Department of Crop Development is the most important contact. He appointed one of his staff, a principal agricultural officer, to coordinate Plantwise activities in Tanzania. Most important partners are the extension services hosted by local governments. The MAFC has technical responsibility for extension officers, but administratively, they respond to local governments. They constitute the lion's share of plant doctors. MAFC placed Liaison Officers at zonal level who are important for advancing the Plantwise approach at local government level and for coordinating Plantwise activities.

The two research institutes and the Seed Unit of MAFC participate in workshops for the development of fact sheets and other technical documents for plant doctors. Together with universities, they provide pest diagnostic services.

### *a) Relevance*

#### **i. Demands and interests of stakeholders**

When representatives of local governments (mostly district agricultural officers and coordinators at zonal level) were asked about relevance of Plantwise, they all stated that the plant clinics respond to a need of both, farmers and local extension services. They considered the implementation of plant clinics as a complement to existing extension services and as a big success. Many interviewees mentioned that their numbers should be increased to reach more farmers and to cover a larger area. The training of plant doctors and the development of fact sheets improved the extension services particularly in pest and disease identification and problem solving. They estimate that in the villages where plant clinics operate, a majority of the farmers know about the clinics and use their services, which increased their awareness of plant pests and diseases.

#### **ii. Usefulness of materials developed**

In Tanzania, so far about 37 factsheets have been developed (in English, and most of them already translated to Swahili). They are very useful for plant doctors and are extensively used by plant doctors. Photo-sheets (several pictures of one disease or pest in different stages and their symptoms on host plants) for disease identification at clinic level are presently being developed and will be a formidable tool for plant doctors. A workshop for the elaboration of green and yellow lists was held so far, but the EET did not see any of these lists elaborated.

#### **iii. Impact on the plant health system**

Since the first Steering Committee meeting is scheduled for December 2013 only, one would expect the impact of Plantwise on the plant health system still weak. However, all the discussions around setting up the network of plant clinics within the structures of the Tanzanian plant health system, the contact to diagnostic labs of different institutes and bodies, the joint training and joint elaboration of fact sheets and other technical documents

has triggered already substantial interactions between the different actors in the plant health system. The EET endorses the "bottom-up" approach to linking actors, starting at technical level (i.e. with joint activities as outlined above) before more formal arrangements are sought (such as in the National Steering Committee).

On the other hand, the EET is questioning if universities are sufficiently integrated in Plantwise activities. It also suggests that Plantwise could foster more links between the (primarily government-driven) network of plant clinics and international centers active in Tanzania (AVDRC, IITA, CIAT etc.) at technical level. Especially when these centers have staff based in Tanzania, they could bring additional expertise to Plantwise.

#### **iv. Adapting to local realities**

Plantwise is adapting very well to the institutional landscape in Tanzania, respecting mandates of MAFC, the extension system and other government units and institutes and working primarily through these established structures. Plant clinics are set up following the administrative boundaries in so far 4 zones.

#### **v. Partnerships (commitment)**

Commitment at national level to the cause of Plantwise is high. In a round table meeting attended by local government employees and liaison officers, it became evident that while high commitment exists at the level of technical staff (all of them have already witnessed plant clinics and some are involved directly in Plantwise activities), commitment at local political level is still a challenge. The agricultural officers discussed strategies on how to better bring on board local governments and their decision makers. This ranged from better publicizing (towards counselors and non-technical staff of local governments) the merits of plant clinics and the high satisfaction of the farmers who have easy access to them, to proper procedures for introducing fund provisions for Plantwise activities into the local government budgeting process to mobilizing villages and local leaders for the cause. The EET considers that obtaining the commitment of local governments for the Plantwise cause is a challenge and will be crucial for sustainability of the program, but the discussion is launched and goes in the right direction. Plantwise actors at local level are aware that it is crucial for progress and sustainability to inform and if possible involve their superiors. This is a major achievement of the program within less than two years and documents the commitment of those already involved.

In fact, one possibility to enhance commitment of local governments would be to try to create pressure from bottom up: Provide excellent services in the existing plant clinics and if farmers from neighboring villages visit and complain about long distances, encourage them to ask for their own clinic at the level of their counselor.

## ***b) Achievements and effectiveness***

### **i. Plant clinics**

So far, 24 plant clinics have been set-up in Tanzania. This is of course little if compared to the needs of the countries millions of farmers. Yet, it has to be considered that setting up plant clinics has to be done carefully. It starts with selecting, together with local authorities, existing extension staff knowledgeable about plant health for further training as plant doctors, running the two courses (module 1 and 2), equipping the newly trained plant doctors with the basic kit for setting up the clinic, identifying the right place (usually a village market) and rhythm for the plant clinic, and organizing follow-up of plant doctors and plant clinic sessions.

The EET had the opportunity to visit a plant clinic in the market of Kamaya. The two plant doctors (a woman and a man) attended farmers together. Between 10:00 and 14:00 they had filled in 7 forms, which can be referred to as 7 "formal" queries, but had talked to about 25 farmers informally. Advice given to farmers during our presence prioritized preventive,



cultural control measures. The doctors had a booklet with fact sheets (18 in English and 14 in Swahili). The plant clinic integrated well into the village market and during our stay there plant doctors were continuously busy (although visits receded a bit after 14:00).

## ii. Data collection

Plant doctors in Tanzania are using the Plantwise standard "data recording and prescription sheet". One copy remains with the farmer and the other is transferred to the zonal coordinator, who forwards them to the national hub.

The EET could attend a brief session of the first data management workshop (2 days) facilitated by CABI trainers in Arusha. This workshop is a preparation for the data validation group. Accordingly, the data validation process was in the centre of the workshop. During the session attended, participants were working on data harmonization, using real examples from data record sheets. The trainers were able to illustrate the challenges for harmonization, how automatized and manual procedures work together to achieve harmonization, in which cases the team would have to ask back to the plant doctors and what happens to data record sheets containing contradictory or ambiguous information. Course participants (11 men, 8 women) were plant doctors, including the persons responsible for data management. Some of the attendees will constitute the data validation working group.

The concept of the workshop perfectly fits the purpose. By mixing plant doctors (the providers of data) with data management responsables, the notion of a common cause in data collection and analysis will be created. By explaining the entire process to plant doctors, better quality of data should be achieved in the future (less rejections of data sets). During the session attended by the EET, the participants were working on the concepts of "species and varieties" of crops and of "causal agents and symptoms". During the entire session, the trainer managed to keep the discussion focused on the practical aspects without using scientific jargon (the words "species" and "causal agents" was never used), most appropriate to the background of the participants and the task at hand.

In the course of the workshop, problems of data flow and validation were addressed and respective procedures defined. With this preparation, data collection, centralization and analysis has hopefully made a step forward to streamlining of the process.

## iii. Linking key actors in the plant health system

See above

## iv. Data processing and use

In Tanzania, since data centralization is just about to be structured (see above), it is still too early to talk about data processing and use. The foundations are laid.

## v. Knowledge Bank

The Knowledge Bank section for Tanzania contains presently 37 fact sheets in English (translations to Swahili not counted). Most of them have been developed by Tanzanian stakeholders, specifically for Tanzania, while a few are taken over from Kenya. The EET discussed, to what degree it is necessary to develop own factsheets for each country. We came to the conclusion that factsheet development in-country has a series of advantages and should therefore be prioritized:

- It creates ownership for the contents (the names of the authors are included)
- It provides a platform for linking actors of the plant health system
- It allows to target contents to the prevailing political, socio-economic and farming systems contexts of the country (while ecological conditions may be similar in neighbouring countries)
- It allows to adapt the language to local terms and culture
- It allows to set priorities (which pest on which crop to address) according to national needs

Based on these advantages, the EET considers that it is worth the extra work for in-country development of factsheets. Examples from other countries (if available) can always be used as a starting point. One particular advantage of Tanzanian specialists developing their own factsheets is that all of them are field-tested. Testing extension material with farmers can be very enlightening for the authors.

#### **vi. Monitoring and learning loops**

Self-assessment meetings of plant doctors at cluster level (see Kenya) are planned and need special attention. Such meetings have the potential to provide immediate feedback to plant doctors, identify common problems (in diagnostics, recommendations and data management) and to discern in a quick and informal way some conclusions from the data collected, even before the data management and analysis process is fully operational. In Kenya and Rwanda, several conclusions were drawn based on these meetings.

#### **vii. Unexpected results**

4 plant doctors set up two clinics on their own initiative. While this is an indicator of their commitment to the cause and a laudable private initiative, it bears a certain risk that they parallel the official system. Plantwise should study such developments and their potentials and risks.

### ***c) Efficiency***

#### **i. Complementarity with other initiatives and bodies**

In Tanzania, Plantwise fits very well into the existing landscape of extension at national and local level. Since the program is still "young", there may be additional stakeholders and initiatives that could enhance efficiency if they can be brought on board.

One particular aspect in Tanzania is that the country is committed to IPM strategies. IPM is the basic policy of Plantwise. The EET got the impression that plant doctors in Tanzania have better internalized IPM principles than in other countries. Yet, this impression is based on talking to or observing just a few plant doctors. It would be worthwhile to analyze plant doctors' recommendations and factsheets regarding this issue (see 6.xx).

#### **ii. Involving the right partners**

By and large, the right partners are involved in Plantwise. At the first Steering Committee meeting (scheduled for the end of 2013) it could be worthwhile however, to open again the discussion about additional partners. The Plantwise institutional base in Tanzania is yet somewhat narrow. A careful mapping of the landscape of plant health actors should be done (if not already existing) to this end. But the EET cautions Plantwise to go too broad with its partnerships and to bring on board too many actors only loosely related to the plant health system. This carries the risk to parallel official structures with too many project-driven (and hence short-term) initiatives.

Some very initiative plant doctors have found means to access the Internet (mostly on private initiative) and link to several Websites for pest identification and recommendations, if the Plantwise Knowledge Bank cannot provide yet sufficient answers. They bring these informal contacts to the development of fact sheets. Plantwise could do more to facilitate web access and help them find the right platforms (e.g. biovision-infonet).

#### **iii. Budget efficiency**

In Tanzania, the discussion on investing national funds for the expansion of the plant clinic network has been launched.

In 2013, CABI and the MAFC signed an agreement establishing a sustainable mechanism for fund transfer to the national Plantwise coordination. This will facilitate implementation of in-country budgeted activities and put financial flows on a more rational footing.

## ***d) Risks and potentials***

### **i. Medium-term risks**

With all the pressure on Plantwise to quickly increase the number of plant clinics, there exists a risk of going too fast with out-scaling, while basic processes are not yet fully structured and mechanisms for quality assurance not yet established. On the other hand, the EET understands the desires of the extension service: If you have a novel approach to extension that works so well as the plant clinics, you want to introduce it throughout the entire service. CABI should therefore assist the national partners in designing a medium-term plan for Plantwise in Tanzania. Such a plan should be based on available funding from Plantwise global and from the different national partners. It should clearly outline conditions that need to be fulfilled (e.g. regarding Steering Committee constitution, satisfactory functioning of data management, monitoring and quality assurance of plant clinics, training of trainers, indicators of effective linking of actors) before the next step is implemented.

Tanzania is a large country not densely populated in some parts. This poses additional challenges for communication, making data flow and coordination more cumbersome. There exists a risk that data management and follow-up procedures that work in certain conditions will not be effective enough in Tanzania.

One interviewee mentioned the risk that some national partners take Plantwise for just another project which runs for some years and then closes down. The EET considers that Plantwise has made much effort to foster national ownership, yet the fact that this was mentioned may be related to a particular “project culture” in Tanzania that we did not fully understand.

### **ii. Resilience**

Since the Tanzanian government is explicitly following an IPM policy, Plantwise fits well into this context and can build on previous projects fostering IPM. If Plantwise can contribute to strengthen and consolidate IPM principles applied in farmers' fields, this will substantially enhance resilience of cropping systems. Ecologically sound crop health practices are a priori less prone to cause disequilibria and pest outbreaks; and with a proper surveillance derived from data analyses and a well-functioning network of plant health actors, eventual outbreaks can be easier detected and controlled.

### **iii. Impact potential**

Given the enthusiastic reception of the Plantwise approaches in Tanzania and the quick start the program made, it has considerable potential for impact. The EET considers the potential for getting continued commitment and funding from local governments as good, in spite of the concerns of Plantwise partners within the local governments. One issue that may limit the visits to and hence the impact of plant clinics is that in subsistence farming crop losses are concerned less of an issue. Here, plant doctors have to prove that they can also provide valuable (economically profitable) advice to farmers who cannot afford to spend much time or resources on crop protection.

## 5. Plantwise in Rwanda

Plantwise has the following partners in Rwanda:

Rwanda Agriculture Board (RAB), in the Ministry of Agriculture and Animal Resources (MINAGRI)
Ministry of Local Government
Department of Agriculture and Livestock Inspection and Certification, MINAGRI (the NPPO)
Higher Institute of Agriculture and Animal Husbandry (ISAE)
National University of Rwanda (NUR)
Umutara Polytechnic
National Agriculture Export Board, MINAGRI

The program is locally implemented by RAB. This government institution within the MINAGRI was created in 2011 by pulling together research and extension and organizing along commodities. Geographically, RAB differentiates the 4 zones East, West, North and South. Plantwise fits very well within this structure. Its most important contact is the Deputy Director of RAB for extension, who appointed his head of crop protection as Plantwise coordinator in Rwanda. Important partners are the Local Governments (district level), where extensionists are hosted. These, together with RAB staff based in the districts are trained as plant doctors. Initially, sector agronomists were trained, but these are often transferred to other sectors, which upsets plant clinic operation. Therefore, Plantwise is now increasingly training cell level agronomists as plant doctors.

All the above partners plus representatives of agro-input suppliers and farmers associations were involved from the very beginning, for instance in the Plantwise stakeholder workshop in November 2012. Since research is part of RAB, the latter has a predominant role in the development of the program. Researchers of RAB provide crop-specific diagnostic services, participate in fact sheet development, data centralization and analysis and some of them are trained plant doctors. They appreciate the opportunity to get exposed to the real problems of farmers at the plant clinics.

The EET met with RAB staff, plant doctors (both from the local government as from RAB) and the Plantwise zonal coordinator of the Eastern zone. In addition, we met a person from NPPO and visited an agro-dealer.

### **a) Relevance**

#### **i. Demands and interests of stakeholders**

Interviewees unanimously highlighted the relevance of Plantwise. They saw the biggest successes in:

- Offering a service useful to farmers and easily accessible (the plant clinics), as evidenced by their continued interest (number of visitors)
- Plant clinics reaching a high number of farmers
- Getting up-to-date information on the pest situation in the country (to keep pest lists updated and to identify new problems early; plant clinics and Plantwise detected for the first time in Rwanda symptoms that most probably represent the Maize Lethal Necrotic Disease)
- Bringing all plant health actors in the country together to do serious and tangible work (the platforms are joint plant doctor training, joint development of factsheets, specific

meeting, the stakeholder workshop and in September 2013 the National Plantwise Steering Committee will constitute itself).

## **ii. Usefulness of materials developed**

To date 12 factsheets have been developed (in English and Kinyarwanda) and printed in a booklet (press run 2000). More factsheets will follow in 2013. Presently, pest identification tables are developed. The first analyses of the plant clinic data have created a considerable interest among several stakeholders, which will be crucial for motivating people to streamline data management.

## **iii. Impact on the plant health system**

Actors in the plant health system are for the first time working together. The Steering Committee meetings to come will show, if this leads to more coherent strategies regarding plant health. So far, there is not more evidence for impact than the word of the interviewees that this linking function of Plantwise is crucial and unique. The EET could witness, however, that Plantwise exponents in Rwanda were well aware of actors and initiatives in the plant health system and had met the majority of them.

## **iv. Adapting to local realities**

Among the adaptations to local realities, "mobilizing the clinics" is noteworthy. On demand of extension, the clinic can move to a specific (unforeseen) site. This has mainly happened, where Crop Intensification Plans (CIP) were implemented. CIP goes for land consolidation to arrive at large-scale areas (in the order of hundreds of ha) grown to one single crop and one single variety of this crop. One way to achieve this is that farmers organize themselves in cooperatives and maintain their land within these CIP perimeters, but extension defines crop management to a certain extent (e.g. crop rotation, variety, fertilization). Moving the plant clinic there, at a crucial time for the specific CIP crop, provides an opportunity to reach many farmers at lower cost.

## **v. Partnerships (commitment)**

Plantwise fits well with the present structure of agricultural research and extension in Rwanda and hence incites a lot of interest among partners. One problem with commitment was that local governments sometimes gave higher priority to other tasks of their extension workers than running plant clinics. This was addressed by a broad awareness building campaign of RAB oriented towards local governments, which has created a lot of interest and demands for more plant clinics. 15 district governments have recently asked the Plantwise national coordinator to set up plant clinics in their district (on average that would be 8 clinics per district). Local governments expressed this interest being well aware about the contributions they themselves would have to make to the clinics. Setting up 120 clinics within a few years (while interest is still there) by far exceeds the capacity of Plantwise.

# ***b) Achievements and effectiveness***

## **i. Plant clinics**

So far, 14 plant clinics have been established, with 59 plant doctors trained. Two clinics are paid for by a development project. In September 2013, about 15 new plant doctors are expected to graduate. The target for 2013 is 25 plant clinics.

Presently, there are only few clinics compared to plant doctors trained (1 per 4 plant doctors). By training cell level extension workers rather than sector agronomists, the ratio between plant doctors trained and clinics set up should improve.

The plant clinic we visited had opened at 9:00 and by 12:00 they had attended to 17 queries (17 forms filled). Both plant doctors were attending individually and at times some 6 farmers

were awaiting their turn in the “waiting room” (a bench in the shade provided by the clinic). There, sometimes the zonal coordinator, himself a trained plant doctor, attended to some clients. It has to be kept in mind, that this is the dry season, hence only irrigated horticultural crops, permanent fruit crops and cassava made their way to the clinic. Interest is expected to be even higher during the rainy season.

This plant clinic operates in two different locations, in each once a month. We propose that the pros and cons of this strategy are discussed in the Steering Committee to determine, if and in which cases it is appropriate. Attending once a month only in one location may be too little to mark a "regular presence in the market".

The recommendations plant doctors give may in some cases be unrealistic or ineffective. An example is the recommendation to farmers who came with Cassava Mosaic Disease infected plants, 6 months old and 50-100% infected. They were told to uproot the plants with symptoms or to give up the entire field and plant something else. We could imagine a number of more “palatable” options for these farmers to deal with the disease (e.g. intercropping in the coming season maize and beans into the diseased cassava if soil fertility allows). However, such options, but especially the options printed in the fact sheets, should be validated first: Do they work? Do they pay? Do they fit into the cropping system?

## **ii. Data collection**

The standard plant clinic forms are used (in English). Plant doctors write the recommendations both in English and in Kinyarwanda on the forms. The forms are regularly collected by the zonal coordinator, who enters the data in the Plantwise template and sends the Excel file to the national Plantwise coordinator. Data are sent via CABI country coordinator to the global database in the UK.

## **iii. Linking key actors in the plant health system**

See above

## **iv. Data processing and use**

Data validation has not yet been set up. An assistant to the national Plantwise coordinator will soon take office and will be responsible for central data management. The data validation workgroup will soon be trained to start their work.

## **v. Monitoring and learning loops**

The zonal coordinators organize plant clinic self-assessment workshops at cluster level every 3 months. These are crucial for reviewing recommendations and identifying common problems. Often, specialists are invited to address specific issues that have come up in several clinics. Plant doctors get immediate feedback and decisions on actions to take can be taken jointly.

At national level, the data validation workshop will have a similar function. We propose that the recommendations given by plant doctors are analysed in detail according to a concept to be defined by Plantwise globally (see recommendation in section 6.b.i) for compliance with the principles of Integrated Pest Management.

## **vi. Unexpected results**

The interviewees mentioned that at the beginning they were surprised by the high number of farmers visiting the clinics. Especially the fact that men came as well, as normally men primarily participate in activities where money is involved. Also a considerable number of non-farmers (administrative staff, agronomists and vets etc.) visited the clinic, out of sheer interest or with specific pest problems.

An unexpected result of the program in Rwanda is the high interest of local governments in the plant clinic idea as a consequence of the awareness campaign and also because some

of the local governments have put targets related to plant clinics into their performance contract with the national government (Imihigo). In the future, communication will have to be more careful and targeted. The Rwandan partners of Plantwise even fear that they created, with their campaign, too high expectations among local governments, to which the program can now not live up.

The fact that most probably Maize Lethal Necrotic Disease was picked up by Plantwise is also quite surprising, considering that only few clinics were running in 2012. Of course, detecting new or upcoming problems is implicitly contained in expected result 4 of Plantwise, but one would expect this to happen only once a comprehensive network of clinics exists in a country. CABI considers the detection of MLND in Rwanda as an impact of linking plant health systems across countries. The serious problems in Kenya with MLND were shared with neighbouring countries and certainly helped to sensitize actors in Rwanda. It has yet to be confirmed that the problem detected in Rwanda is really the MLND complex. In the samples sent to CABI, only one of the two viruses responsible for the disease was found, the Maize Chlorotic Mottle Virus. This is probably related to the sampling, as no dead material was included. Yet, the other "ingredient" for the new disease, which can be any other cereal virus of the Potiviridae group (CIMMYT 2013) is present in Rwanda.

## **c) Efficiency**

### **i. Complementarity with other initiatives and bodies**

Interviewees spontaneously mentioned that Plantwise fits well into the Rwandan landscape of research and extension. We mention just three areas, where complementarity is given:

- Crop Intensification Plan: The "mobile" plant clinics in these sites fall on a lot of interest; it is one way for the government to harness the plant clinic approach for their own needs. Plant clinics there can be crucial to rationalize farmers' use of pesticides and to identify widespread plant health problems.
- Farmer Field Schools: FFS – if implemented in the original spirit ("discovery learning") - could be an excellent platform to validate the recommendations given by plant doctors. Currently, already about 70'000 farmers are reached by FFS. There is a plan for the national expansion of FFS with the ambition to set up 3 FFS groups in every village. The 45'000 groups will involve 1'350'000 households (practically all agricultural households in Rwanda) by 2018. Therefore, Plantwise needs to deal with the FFS development.
- Research: Training researchers as plant doctors, who can then either regularly or as "moving jokers" help to run plant clinics, is an excellent idea. Researchers interviewed appreciate the exposure to "real life" and can certainly derive considerable motivation and ideas for research on plant health (and other areas). It will enhance their understanding for data interpretation.

### **ii. Involving the right partners**

By and large, Plantwise works with the right partners. It is as yet a bit weak in involving agro-input suppliers. Our visit to an agro-dealer in a village points to a specific difficulty in Rwanda: Unlike in other countries, where external inputs have been used since the 1960es or 1970es (even though by far not by all farmers), their use was very limited in Rwanda until a decade ago. The agro-input provision network is therefore quite new. Nevertheless, Plantwise has made an effort to contact them and the newly formed "Association of agro-input suppliers" may be an interesting partner. Plantwise is exploring the possibility to provide some basic training to agro-dealers.

We see three areas of work with the agro-input suppliers for Plantwise:

- Inform them about the program to make clear that this is not a competition (nor should it be an "unholy alliance")

- Inform them about the most frequent problems and recommendations given by plant doctors so that they can stock the right products
- Get informed about their plans and problems so as to better advise farmers

Involving the private sector is especially important considering that the private sector's role will increase over time in Rwanda. Moreover, it might be interesting for Plantwise to explore linkages with large donor funded programs such as the SDC supports with IFDC/CATALIST2 on agribusiness development and which is among others well known for the promotion of the implementation of CIP, inputs for agricultural productivity. IFDC also runs a fertilizer and an agro-dealer program in Rwanda.

### **iii. Dealing with human resources**

Plantwise in Rwanda deals appropriately with its human resources. The zonal coordinator interviewed spends about 20% of his working time on Plantwise activities, the national coordinator about 50%. As for plant doctors, there is scope for improvement: Firstly, the program foresees to train in the future mostly cell level agronomists who are less likely to be transferred out of the area, which should reduce the proportion of plant doctors trained to clinics established. Secondly, a team of two plant doctors might run several clinics in several sites on several weekdays, thus increasing the coverage per plant doctor trained. This however needs to be approved by the local governments, to whom the plant doctors respond. In some cases, running plant clinics is not considered in the terms of reference of the extensionists and thus cannot be properly accounted for.

### **iv. Budget efficiency**

The workplan is established between RAB and the CABI country coordinator. Once the budget for Rwanda is clear (end of November), this workplan is adapted to the funds availability. Plantwise already has examples of a development project financing two plant clinics, including training of plant doctors and running the clinics. This could be a way forward to expand the network of plant clinics.

Recently, bank transfer arrangements were made between CABI and RAB and financial management within RAB concerning Plantwise was defined. Thus, fund flow is now on a more secure footing.

## ***d) Risks and potentials***

### **i. Medium-term risks**

One risk is the planned re-structuring of RAB, which foresees a 50% cut in staff. Fortunately, these plans have been shelved for the moment, but if they were implemented this could mean that Plantwise loses a good number its trained plant doctors as well as staff in the higher management committed to the cause of Plantwise. It would be a serious drawback.

### **ii. Resilience**

Rwandan agriculture has long been famous for medium productivity with a minimum of external resources. The key factors for sustainability and for a favorable input:output ratio in Rwandan agriculture are intensive intercropping, growing of varietal mixtures (especially in beans and banana), fine-tuned by very knowledgeable farmers to the diverse production conditions (both ecological and socio-economic) and the intensive recycling of nutrients. With the presently implemented "Crop Intensification Plan" (CIP), this asset is at risk. CIP goes for land consolidation to arrive at large-scale areas (in the order of hundreds of ha) grown to one single crop and one single variety of this crop. Mineral fertilizers are subsidized and pesticides are used when necessary (also subsidized in case a problem becomes widespread and serious). Thus, CIP is pushing farming from formerly highly diverse, low external input to large-scale, uniform and high external input. Crop protection specialists



suspect that this shift might be responsible for recent outbreaks of pests and diseases (e.g. the white grub epidemics on several crops).

In view of this development, Plantwise has several new roles to play:

- Advise CIP farmers on most effective and most sustainable crop protection practices
- Detect upcoming pest outbreaks early and report to the CIP management, advising them about most appropriate actions to take
- In the context of the Plant Health System raise the awareness for increased crop health risks from large-scale intensive farming
- Review fact sheets and recommendations to differentiate between the two types of agriculture (highly diverse and small-scale versus uniform, high-input, large-scale)

Pests, risks, feasibility of protection measures, economic thresholds and profitability will differ substantially between these two types of agriculture and hence recommendations need to be different. On the other hand, CIP/PSTA III promotes organic production for quite a number of high-value crops and the government is committed in developing regulation for organic agriculture.

### **iii. Impact potential**

Plant clinics in Rwanda have a strong potential for impact. As outlined above, chemical pest control is quite recent in Rwanda and knowledge of farmers on these issues is yet limited. Plant doctors reported that many farmers just use fungicides to “treat any problem” (from insect pests to viruses). The question, how widespread this behavior is (and what percentage of farmers use pesticides at all) would merit detailed study. If widespread, plant clinics could make a major impact on farm productivity and environmental hazards by clearly advising farmers not to use fungicides in cases where this is not appropriate.

The Rwandan government has recently given high priority to agricultural production. All partners of Plantwise in Rwanda are seeking to meet this expectation. This can mean a threat to Plantwise (in the case a short-term vision prevails among the actors in an attempt to fulfill the government target, e.g. pulling resources away from the plant clinics by local governments that do not see the potential these have in contributing to sustainable productivity increase). Yet it can also be a formidable chance: If Plantwise manages to convince partners that the plant clinics can increase agricultural productivity, this could mean that the number of plant clinics can increase faster, on government funds and thus more sustainably.

## 6. Cross-cutting analysis of Plantwise

### a) Relevance

#### i. Demands and interests of stakeholders

In all three countries there seems to prevail mutual and unanimous consent on the high relevance of Plantwise. Particularly the setup of easily accessible plant clinics as a new demand-driven approach to extension is considered a big success. In the neighborhood of plant clinics, farmers benefit from a significant improvement of extension services in crop protection advice. With the support of plant doctors farmers make more rational decisions, optimize agricultural inputs, reduce risks and improve crop yield and quality. The sustained high number of clinic visits is an obvious proof of farmers' appreciation of the new services.

Plantwise also contributes substantially to capacity building and motivation of extension officers. The advanced training improves their professional skills and is considered as an excellent career opportunity. Plant doctors have a good reputation and status in the agricultural community.

The principle of the plant doctors' training is based on careful selection of extension agents with experience in crop health and extension methods. The two one-week modules 1 and 2 cannot turn an ordinary agronomist into a plant doctor.

Government representatives of the Ministries of Agriculture and other actors in the plant health system highlight the potential of Plantwise as an early warning system for new emerging pests and diseases and the appearance of quarantine organisms. In Rwanda, for example Maize lethal necrotic disease (MLND) was first discovered in plant clinics. Data from a broad network of plant clinics are an excellent base for strategic decisions on crop protection at local, national and global level. This function of the plant clinic system is becoming more and more important with climate change altering the geographical distribution of pests and diseases.

Stakeholders stress the potential of Plantwise as a coordination platform for the whole plant health system and the progress already achieved in this respect to date. In all the countries visited the links between the plant health actors have been strengthened due to Plantwise. The initial stakeholder workshops, but also joint trainings and meetings to address specific issues, have provided opportunities for informal and formal exchange between plant health actors. Plantwise triggered the establishment of National Steering Committees (operational in Kenya and scheduled in Rwanda and Tanzania), which is the formal platform for interaction between plant health actors and will address rather strategic issues.

In all three countries visited (and probably in all Plantwise countries), the network of plant clinics is not yet dense enough to reach a significant proportion of the farmers and to achieve the desired impact. In Kenya for example to date 52 clinics are up and running. The Ministry of Agriculture, however, operates 1500 so-called info desks, most of which should incorporate a plant clinic in the long run according to an explicit desire of Ministry officials. Out-scaling of the existing plant clinic network to comprehensive national coverage is thus high on the agenda of national decision makers. In brief, national actors like to see Plantwise cover the entire country while CABI sees it as a pilot. The EET sees a need for clarification here. We propose that Plantwise elaborate together with national actors comprehensive country-level plans (medium-term perspectives) that are shared among all stakeholders. These country plans need to show resources (both, human and financial) that are committed by the different partners. It would go beyond the scope of Plantwise to do so simultaneously in all the partner countries. Medium-term perspectives should therefore be elaborated with

selected pilot countries. Since all the countries seem to be keen to expand their clinic network as soon and as fast as possible, the selection criteria should be carefully chosen and transparently communicated. Among the countries visited, Kenya appears to qualify best for a pilot, as it has a well-established national Steering Committee, a good number of clinics running and working groups established for validation, diagnostics and M&E.

We endorse the original idea of Plantwise to set up few plant clinics (pilot scale) as an entry point. It provides the opportunity to prove to national and local decision makers that the approach works (and to identify, where it has to be adapted), to learn about country-specific challenges and problems, to set-up and fine-tune national data management and to get different actors of the national plant health system to work together in hands-on tasks. In a way, Plantwise is now almost becoming the victim of its own success, as national stakeholders want to see it growing and clinics expanding to the entire country (which is understandable especially for the extension services, who want to replicate a successful approach throughout the country). This should be taken as indicators of national interest rather than a mandate to out-scale at all costs. We share the concern of the Plantwise Program Board that uncritical expansion of the clinic network could reduce quality by neglecting other components of the program (bottlenecks in this case could be especially plant doctors' training, data management and linking national actors). On the other hand, we urge Plantwise to address divide in perspectives between the Plantwise Program Board and Plantwise national stakeholders.

The EET suggests revising the list of countries scheduled to be newly included in Plantwise over the next years. We consider it more important to coach and support countries where Plantwise has already made progress in their out-scaling of the approach than to include a further dozen countries with new pilots.

**Recommendation 1: Identify pilot countries for out-scaling of the plant clinic network and establish comprehensive country plans together with the national partners**

## ii. Usefulness of materials developed

During the present program phase, a considerable number of factsheets for major pests and diseases has been developed with the expertise of national and international scientist in all three countries. Although they have a different specific layout in the different countries, they all contain information on symptoms, biology and control options. These factsheets together with the manuals are the most important knowledge source for plant doctors; they use them intensively for problem identification and recommendations.

To date only a few green and yellow lists have been established. They contain the recommended control options (green) and less favored but exceptionally needed alternatives (yellow) for important pests and diseases. During the visits of plant clinics, the EET got the impression that plant doctors would need a more thorough understanding of the principles of IPM. Green and yellow lists could help bridge that knowledge gap and should be more promoted.

**Recommendation 2: Further promote the establishment of green and yellow lists in order to advocate the implementation of IPM**

Clinic equipment is simple but functional. In most cases a table, chairs, an umbrella and the Plantwise-banner make the physical infrastructure. In addition, plant doctors typically have a magnifying lens, a scalpel, a knife and the relevant info-material (manuals, factsheets, photo-sheets). All visits and queries are recorded in the standardized "Prescription and record sheet". One copy of this form goes with the farmer, one is forwarded to the cluster coordinator and the data center, and none remains with the plant doctor. We recommend

adapting the form to include a hardcopy for the plant doctor in order to facilitate self-evaluation and follow-up of special cases.

Few plant doctors dispose of a computer and can access the Plantwise Knowledge Bank or other web-based info services. Where online web-access is possible, it is intensively used to expand the knowledge base. We recommend to improve accessibility to electronic information either by providing computer-facilities with online Web-access where this is possible, or to make digital info material available off-line, e.g. on smartphones, tablets or USB keys.

**Recommendation 3: Improve Web access to Knowledge bank and other relevant web sites or offline accessibility of digital info material for plant doctors**

Plant clinic data are considered very useful for decision-makers in the Ministries of Agriculture and for regulatory bodies. The data not only allow for a general overview on the crop protection situation in the regions covered by plant clinics, but also may include hints on new emerging pests and diseases, quarantine organisms or the use of banned pesticides. Due to slow communication paths and the thorough validation, data processing is rather time consuming and the flow of important information may be delayed. Furthermore, the rules for access of the different national stakeholders to the data do not seem to be settled in all cases. We therefore recommend encouraging the National responsible organization to streamline the data flow and to regulate data access with their national partners.

**Recommendation 4: Encourage National responsible organizations to streamline the flow of clinic data and to regulate data access with national partners**

The Knowledge Bank is one of the core elements of Plantwise as a centralized information platform for all actors from the Ministry level to plant doctors. In the open access part it contains identification tools and basic information on biology, symptoms, control options and distribution of pests and diseases. The restricted access part comprises the plant clinic data and corresponding analyses. The Knowledge Bank facilitates the vertical flow of validated information within a country (e.g. plant doctors<->ministry) as well as the horizontal flow between countries (e.g. plant doctors <->plant doctors; ministry<->ministry). A factsheet developed for a pest in one country may be valid in another country with similar conditions. The confirmed discovery of a new disease in one country may be a premonition for a neighboring country. In view of the importance of the Knowledge Bank for all actors of Plantwise, accessibility has to be improved particularly for plant doctors (see recommendation 4 above).

For its intended purpose the Knowledge Bank has to be managed in a centralized manner as it is presently done. The question therefore is how such globally centralized functions will be assumed after the termination of donor support. CABI considers managing the central knowledge bank as part of its global mandate. It has plans to derive and sell additional products from plant clinic data (of course properly anonymized and combined with other data to respect the data sharing agreements signed with the different countries). Other examples are quality assurance of training, data collection, fact sheet development etc., which may be partly assumed by national actors. The EET recommends that CABI addresses the issue of centralized services early on, and develops concepts for future arrangements together with national stakeholders. This will give confidence to national plant health actors that the Plantwise idea will continue after phasing-out of the donors.

**Recommendation 5: Develop and communicate concepts for future arrangements for globally centralized services (e.g. Knowledge Bank) after donors' phasing-out**

### iii. Impact on the plant health system

Within a short period, Plantwise became an important reference for agricultural policy in all countries visited. Due to Plantwise, interactions between most national actors of the plant health system have intensified and the structures and links have been strengthened. In all three countries National Steering Committees (NSC) are established or in planning, and the collaboration between the Plantwise actors is significantly enhanced. The flow of information between farmers, extension services, research and regulatory bodies substantially improved.

However, one element of the plant health system, the input suppliers, still needs a better integration into Plantwise. The visits to the plant clinics have shown that the lack of IPM compatible crop protection products often is a limiting factor for successful implementation of recommendations. While plant doctors mention that they contact local agro-dealers regularly to inform them on the operation of the plant clinic and to check on availability of products in their shops, dialogue at national level between input suppliers and Plantwise is almost absent. The dialog between plant doctors and agro-dealers should be further encouraged and linked to dialogue at national level between present Plantwise actors and input suppliers. The EET fully endorses the "Guidelines for implementation of the Plantwise policy for Engaging Agro-input Suppliers" (Plantwise draft 2013) stating for instance that agro-dealers will not be trained as plant doctors and that plant doctors are discouraged to sell agro-inputs. It is an asset of Plantwise that its plant doctors are widely considered as "honest brokers", which has to be carefully conserved. On the other hand, agro-input suppliers do play an important role in the plant health system and should therefore be brought on board in order to improve the availability of effective and safe pesticides.

#### **Recommendation 6: Strengthen links and dialog with input suppliers to improve the availability of IPM compatible crop protection products**

The stimulation of new research is an intended result of Plantwise. Observations in plant clinics are likely to reveal knowledge gaps in the field of identification, biology or control of pests and diseases. For example, new control strategies have to be developed for new emerging pests. Established strategies have to be validated and may have to be adapted as a response to climate change, developments in cropping systems or to respond to new findings on the dangers of pesticides. While the first data validation meeting in Kenya in August 2013 yielded a valuable list of research issues, the future will show how these are taken up and integrated into the on-going research activities and what impact they will have.

### iv. Adapting to local realities

Plantwise is well adapted to the local realities in the three countries visited. In Kenya most plant clinics are embedded into the nation-wide network of information desks operated by the Department of Extension and Training of the MoA. In Tanzania and Rwanda, plant clinics are run by extension staff responding administratively to local governments, but coordinated technically by MoA bodies. By this means, established and known structures are used for new Plantwise activities. In Rwanda on demand of the national extension service clinics have been "mobilized" to better suit the needs of the Crop Intensification Plans (CIP). As a consequence more farmers could be reached at lower costs and at critical moments during the year.

In all three countries, first attempts to run additional plant clinics outside the MoA network are successful. Up to now such "satellite" plant clinics are fully integrated into the network for training, data management and feedback. The EET considers this as an indication that the Plantwise concept is convincing. If in the future Plantwise moves from pilot activities towards full country coverage, additional partners will have to be brought on board for plant clinic operation. Maintaining a comprehensive program and quality assurance could then become an issue.

## v. Partnerships (commitment)

Plantwise fits well with the present structure of the plant health system in all three countries. The key actors at national level are all committed and contributing partners of the program. In Rwanda and Tanzania, where extension is already decentralized, gaining commitment of local governments is a challenge and Plantwise has made already substantial efforts in this: Local government officials are informed about the concept of Plantwise and the successes of plant clinics and Plantwise national partners seek the best ways to make sure that local level activities are included into the district or county level budgets. In Kenya, "decentralization by devolution" to county level is in preparation. This entails a shift of the responsibility for extension and the corresponding budget from MoA to county authorities. The EET proposes that Plantwise makes a conscious effort to distill lessons learned in Rwanda and Tanzania to better target awareness campaigns to local governments and to inform respective Plantwise activities in Kenya. Presently, these new actors are contacted to affiliate them to the program.

**Recommendation 7: Establish and strengthen links with local authorities (district, county, region) to ensure commitment and sustained support**

## b) Achievements and effectiveness

### i. Plant clinics

To date 91 plant clinics are up and running in Kenya (52), Tanzania (24) and Rwanda (15). In Kenya and Tanzania the objectives for 2013 (46 and 22 respectively) are already exceeded, while Rwanda is slightly behind the plan (27). In total 197 plant doctors have been trained in Module 1 and 2: In Kenya 95 (plan 95), in Tanzania 49 (plan 43) and in Rwanda 53 (plan 101), with another 15 to be graduated in September 2013.

The EET visited one plant clinic in Kenya (Nderi), one in Tanzania (Kamaya) and one in Rwanda (Kayonza). The observations did not differ significantly between countries. Without exception the clinics were well frequented, the clients being roughly 50% female and 50% male. The queries covered a wide range of crops, pests and diseases. By and large the plant doctors identified the problems correctly and their recommendations were realistic. From the small sample we got to see, we had the impression that some of the plant doctors have not fully internalized the principles of IPM. They did not inquire about the infestation level, and they did not seem familiar with the economic threshold concept. Recommended pesticides were sometimes not IPM compatible (but probably the only products which could be bought in the local shop).

The EET acknowledges that when farmers come to the plant clinic with a problem, this is often already so far advanced that preventive measures are no longer effective and a pesticide is often the only solution. This is certainly a challenge for plant doctors. It is, however, all the more important, that plant doctors analyse together with the farmer possible causes for the problem and provide advice on how to avoid it in the next season.

We do not want to generalize from a few cases observed. We rather propose that Plantwise makes a conscious effort to monitor recommendations given by plant doctors and to encourage the national plant health systems to re-assess these recommendations including the ones in the factsheets. We propose the following conceptual framework (Table 1) for this assessment. It could provide valuable information for targeted training of plant doctors.



**Table 1: Draft conceptual framework for assessing plant doctors' recommendations**

<b>Categorization of recommendations by plant doctors</b>	<b>Example (additional or alternative recommendation)</b>
No pesticide recommended	e.g. for virus or bacterial diseases (feasible preventive measures to be recommended for next season)
Recommended pesticide is dangerous or harmful to the environment	e.g. nematicides (crop rotation should be analysed instead and respective recommendations given)
Recommended pesticide is ineffective at this stage	e.g. against sweet potato weevil larvae (preventive measures and proper monitoring to be recommended for next season, chemical option at proper stage as last resort)
Recommended pesticide is not profitable on this crop at this moment	e.g. against aphids on black nightshade (economic threshold not reached, depending on market)
A pesticide needed now as only option to save the crop, but other (preventive) solutions should be strongly recommended for next season	In this case, detailed advice should be given for next season (preventive measures and monitoring), including economic considerations
A pesticide might be necessary every season (and the recommended one is appropriate)	Preventive measures and proper monitoring to be recommended for next season, chemical option at proper stage as last resort

In discussions with CABI staff involved in Plantwise, the EET heard the comment "Plantwise is not an IPM project, but a novel extension approach in the context of a better linked national plant health system". While this is true, the EET thinks that donors expect CABI to guarantee that IPM principles are observed throughout Plantwise activities, especially at clinic level.

**Recommendation 8: Assess recommendations of plant doctors as to their effectiveness, profitability and congruency with IPM principles in general and design ways of improving them**

The EET even proposes examining if recommendations should differentiate between commercial farming and small-scale subsistence farming. Economic thresholds, feasibility (means that the farmer has) and compatibility with the farming system will be different for these two types of systems.

With exception of the perceived deficit that some plant doctors have not fully internalized the principles of IPM, the training (Modules 1 and 2) seems to be thorough and of high quality. The EET could assist a training workshop in Tanzania on data management and was impressed by the student-centred, focused concept of the training session. Plant doctors are generally well prepared and do an excellent job advising farmers in crop protection issues. Their reputation with the agricultural community is accordingly high. The option of certification or accreditation of plant doctors in order to maintain and protect the quality of their services could become crucial, as soon as massive out-scaling is envisioned. It may therefore be wise for Plantwise to experiment with certification and accreditation in selected countries (e.g. where national actors are strongly advocating this). The EET does, however, not consider this a high priority for the time being.

A high priority, already discussed at various levels of Plantwise, is refresher training. The EET fully endorses the idea of targeted refresher trainings. They could address issues identified as common problems of plant doctors and include new contents regarding IPM.

Plant doctors are well trained to reliably identify most crop protection problems with their simple tools. However, in difficult cases they would need professional backstopping from a diagnostic lab. This holds particularly true for new emerging species or quarantine organisms. Nevertheless in the countries we have been visiting diagnostic labs are not easy to reach or plant doctors are not aware of their existence or services are too expensive. In view of the importance of a correct identification particularly for plant health authorities the diagnostic support for plant doctors should be improved.

It was discussed if this can be achieved by providing additional material to plant doctors (microscopes or simple disease identification kits). Yet, the EET considers that this is neither realistic nor fruitful. It would mean additional logistical challenges, considerable costs and might distract plant doctors from fulfilling their primary function, attending to farmers. We consider it important on the other hand that plant doctors, in case of doubt about a diagnosis, can consult with experienced plant health specialists and if this is not conclusive, have free access to diagnostic labs. In all countries visited, inventories of diagnostic labs are presently established as a first step to map the "diagnostic landscape". The next step will be to reach agreements with the selected labs regulating free services for plant doctors. Any support to diagnostic labs should specify, how many samples from the Plantwise clinic network will be analyzed for free in return.

**Recommendation 9: Establish agreements with referral labs in order to improve free access for plant doctors to professional diagnostic services**

Plant doctors normally operate one clinic at one site, typically once a week or once every second week. Given the fact that there is generally a big interest to expand the network of plant clinics, a simple and immediate way could be plant doctor teams to run several clinics in several locations at several weekdays. This will require extension services to relieve their trained plant doctors of other extension tasks, so that they can put to wider use the skill learned during training. The EET recommends Plantwise to explore this avenue, starting first with plant doctors who have already given evidence of impact within their extension service.

**Recommendation 10: Encourage plant doctors to operate additional clinics at different locations**

At the moment in most countries trainers are trained by international experts, typically CABI staff. In the view of scaling-out of the plant clinics network and corresponding increasing demand for plant doctors, a shift should be made from international to national training. Shining examples of plant doctors could take over the role of trainers. CABI has already moved in this direction in Uganda, but became aware that training of trainers requires new approaches and contents (e.g. facilitation and didactic skills). Presently, the respective concepts are under development. The EET suggests that Plantwise give high priority to Training of Trainers, because national stakeholders repeatedly asked for it. This means to accelerate the shift from international to national training of trainers (using shining examples of plant doctors as trainers)

**ii. Data collection**

The plant doctors use the same standard plant clinic form (prescription and record sheet) for data collection in all countries. For each query they fill in a separate form. This standardized procedure simplifies data entry, validation and analysis. The forms are regularly collected by cluster or zonal coordinators and forwarded for data entry to the national data centre. From here data are sent electronically to the global database in UK. Though the process seems to be well established and efficient, the fact that the forms have to be physically transferred slows down the flow of data. A better connection of plant doctors to modern ICT could help accelerate the process (see also access to digital information on the web above). Respective pilots are implemented presently in Kenya.

**iii. Linking key actors in the plant health system**

Most relevant key actors in the three countries are partners in Plantwise. The links are established and functional, and the activities coordinated. National Steering Committees are established or in planning (see above). The involvement of an additional partner with the competence for rational and safe use of pesticides should be considered (see recommendation 12 below)



#### **iv. Data processing and use**

Data validation is crucial to get reliable information on the crop health status and crop protection measures taken in farmers' fields. In the three countries the validation procedures are differently advanced. In Kenya a special data management and validation team with experts from all the partner institutions is verifying all the incoming clinic data, while a similar data validation process is about to be organized in Rwanda and Tanzania.

The EET proposes to continue with establishing standardized data validation procedures for clinic data in all countries

#### **v. Knowledge Bank**

The Knowledge Bank is an excellent tool for the exchange of information and knowledge management. It is highly valued and intensively used by all the Plantwise partners. In Kenya for example the Knowledge Bank is used as the main website for the e-Extension initiative of the Ministry of Agriculture. In view of the importance of this tool for the sustainability of Plantwise, plans have to be worked out to ensure the long-term centralized management after donors' phasing-out (see recommendation 5 above).

#### **vi. Monitoring and learning loops**

In all three countries, cluster or zonal coordinators organize plant clinic self-assessment workshops on a regular basis in order to monitor and constantly improve the performance of plant doctors. Based on real examples, problem identification and recommendations are critically reviewed and discussed. By this means plant doctors get feedback on their activities and shared problems can be solved jointly. It even turned out that these cluster level self-assessments were the first occasions that upcoming new plant health problems were identified and could then be fed back to national authorities.

Plantwise puts high emphasis on monitoring and evaluation, organizing respective working groups in the countries. Cluster level meetings seem to be an excellent platform to start with and plant doctors are eager to develop simple M&E tools they can use themselves.

Plant doctors sometimes get feedback from farmers, informing them if they found the recommended pesticides or to what extent the recommendation issued was effective. The EET proposes encouraging plant doctors to collect and analyze feedback on availability of recommended products and on efficacy of recommendations in a more systematic way. Yet, this should be a lean process and probably the cluster meetings are a good platform to structure it.

#### **vii. Unexpected results**

Unexpected results can be summarized under two headings:

1. The plant clinic approach works astonishingly well and fits into the different contexts of the countries visited. It makes extension services more dynamic, because farmers come to the clinics with questions beyond plant health (crop management in general, animal health etc.) and plant doctors invite them to come and see the respective specialists in the headquarters of local extension services. Furthermore, plant doctors routinely exchange cell phone numbers with farmers and thus get feedback or additional questions in between the plant clinic days or even get visits of farmers coming with samples to the headquarters.
2. At country level, national stakeholders internalize and implement the Plantwise approach to an extent probably hoped for during planning, but yet surprising. Examples are the integration of plant clinics into the info-desks in Kenya, the introduction of the concept into the curriculum of the University of Nairobi, the use of the Plantwise knowledge bank as a main source of information in the e-extension initiative in Kenya, the instrumentalization of plant clinics for the Crop Intensification Plans in Rwanda, and the set-up of satellite plant clinics in all three countries.

Further, the fact that national partners in all three countries push hard for immediate and massive out-scaling is in a way also an unintended result.

### viii. Achieving objectives and goal

Plantwise is well on track to achieving its specific objectives (expected results). Progress is not equally fast for the different outputs (Table 2), yet a good foundation exists for all. For instance central data analysis at country level has been delayed so far, because the respective working groups for validation have not yet (or only recently) been trained and set-up; therefore, researchers and policy makers have so far had only limited access to these data sets for further use (uses were so far based on CABI's rough analysis of non-validated data or direct information through non-structured channels). As for M&E, cluster meetings have provided an important platform for monitoring and mutual learning; on the other hand, baseline studies have been delayed, because the concept for impact assessment first needs to be elaborated.

**Table 2: Assessment of Plantwise's progress by output as assessed qualitatively by the EET (scale of 0 to 5)**

Output (expected result) of Plantwise	Progress	Shortcomings
1. Plant clinics are established and data are flowing back	+++++	
2. Key actors in national plant health systems are linked	++++	Agro-input suppliers missing
3. Data are centrally processed and used by actors	++	Process is slow, not much use yet
4. Comprehensive and useful knowledge banks is used	++++	Limited access of plant doctors
5. M&E is relevant and contributes to learning	+++	Concept for impact evaluation pending

Regarding the project purpose ("To strengthen the capacity of agricultural institutions and organizations to establish sustainable Plant Health Systems within their country, using the Plantwise approach as the framework for action"), it is still too early to make definitive assessment. The EET considers, however, that Plantwise is well on track to achieving this goal within a few years.

## c) Efficiency

### i. Complementarity with other initiatives and bodies

Plantwise fits well into the landscape of agricultural research and extension in all three countries and is well adapted to different local realities. It offers a complement to the existing extension services providing additional information and solutions for plant health problems at farm level. The training program for plant doctors has substantially improved the capacity and skills of extension staff, and the plant clinic approach led to more frequent and target-oriented interactions between extension officers and farmers.

The Plantwise strategy stipulates strong links with governmental institutions (e.g. Ministry of Agriculture) for program implementation. Nevertheless, there are international organizations (e.g. CGIAR-Centers, AVDRC or ICIPE) and NGOs (e.g. Biovision) with similar or complementary fields of activity, which could provide backstopping in diagnostics or in the development of control measures.

**Recommendation 11: Strengthen links and cooperation with international organizations (e.g. CGIAR-Centers, AVDRC or ICIPE) and NGOs (e.g. Biovision)**

### ii. Involving the right partners

By and large Plantwise cooperates with the right partners, the collaboration is well organized and runs smoothly. The establishment of National Steering Committees proved to be a very efficient way to foster ownership and to channel interactions at the same time. In view of the whole plant health system the involvement of input-suppliers should be intensified (see recommendation 6 above).

During the field visits in all three countries the EET observed that the farmers have generally very limited experiences in handling and properly applying crop protection products. Furthermore, application equipment was inappropriate or inefficient. Therefore, risks for human health and the environment cannot be excluded. It probably goes beyond the scope of Plantwise to address or even solve that problem. However, it seems to be advisable to search for independent institutional or private partners to improve the situation and to instruct farmers in rational and safe use of pesticides.

**Recommendation 12: Search for independent partners to instruct farmers in rational and safe use of pesticides**

**iii. Dealing with human resources**

Plantwise substantially contributes to capacity building and motivation of extension staff. Plant doctors have a good reputation and are popular among the agricultural community. Though recruitment of new plant doctors does not seem a bottleneck, the responsible authorities have to be encouraged to replace attrition due to retirement and Plantwise needs to plan in the capacity to train these replacements. The EET therefore proposes that national replacement plans for plant doctors leaving for retirement be developed in each country.

The four training modules cover the basic tasks of a plant doctor, diagnosis and recommendation as well as factsheet editing and quality assurance. To our knowledge the curriculum does not comprise management training for cluster coordinators. However, cluster coordinators have important management tasks such as data collection and the organization of self-evaluation workshops. We therefore suggest that advanced training be offered to cluster coordinators to prepare them for the additional tasks.

Progress of the program depends heavily on the CABI Plantwise country coordinator and the national Plantwise coordinator. The EET observed that CABI staff and especially the country coordinators demonstrate high facilitation skills in their work, leaving the lead in-country to the national coordinator wherever possible and intervening intelligently where needed. National coordinators are all committed to their role within Plantwise. However, as CABI has no direct influence on the selection of these key personnel, it remains a challenge to identify persons with the management, technical, facilitation and communication skills required for this demanding job.

Gender balance was good among both, the plant doctors and the farmers visiting the clinic as far as met by the EET. Once the data processing is running smoothly, Plantwise will have the opportunity to analyze the clinic data routinely for gender issues. We propose to compare for each crop proportion of men and women in clinic visits with the known responsibilities of men and women for the respective crop. This may reveal further scope for enhancing efficiency of the approach and improving the program's gender strategy (Finegold and Williams 2012).

**iv. Budget efficiency**

Based on statements by several interviewees, the EET got the impression that the use of financial means is well planned and the priorities are set correctly. The CABI country coordinator and the national coordinator do the planning and budgeting jointly. This contributes substantially to build up mutual trust and to foster motivation and local ownership. The process starts with compiling ideas for the work plan of the next year from stakeholders. This work plan is prioritized and budget figures are attached at national level (by the Steering Committee, where it exists already). However, the budget available from Plantwise for a given country is only communicated later to national stakeholders, so that the work plan needs to be modified on the go. This process could be more efficient, if resource availability would be known before activity plans are established and discussed in the Steering Committee.

### **Recommendation 13: Streamline work-planning and budgetary processes at country level**

We discussed the option of charging farmers for the consultations at plant clinics as a means to provide for sustainable funding of the plant clinic network. However, as almost all plant doctors are government employees, this would create a lot of administrative burden for collecting the fees, accounting for them etc. It could also have the effect that poor farmers do not visit the clinic anymore. We therefore concluded that this is not the proper time to launch this discussion. It is already a big achievement of Plantwise to make agricultural extension more responsive to farmers' need, more accessible to farmers and the respective staff more enthusiastic. Once plant doctors are trained and equipped with chairs and tables, there is little additional cost that the running of the clinics causes (as plant doctors are mostly extension officers financed through the national structures, no salary costs occur). However, once clinics are steadily running in a site for 2-3 years, national partners may experiment with charging fees for clinic visits. Nevertheless, this should be done at pilot level and should be carefully followed up.

## ***d) Program management***

### **i. Broad orientation**

Most interviewees at national level associated Plantwise first and foremost with plant clinics. Yet, all high-level actors in the plant health system also highly appreciated the linking role of Plantwise. In addition, structured data collection and analysis make of Plantwise much more than merely an extension initiative. The value added by these data is huge. The EET concludes that the balance between the different fields of activities is adequate.

As mentioned above, we propose to give more space to out-scaling in selected countries, at the expense of adding new countries to the Plantwise network. This will require more emphasis on training (with more responsibility for national trainers), while costs for setting up and running plant clinics should increasingly be covered from national sources. Making plant doctors' recommendations more compatible with IPM principles is a new challenge pointed out by the EET and will require resources over the next few years, for analysis, policy dialogue and subsequent refresher training. But while all these activities seem to shift emphasis to plant clinics, this does not mean that other components of the program should be neglected. The plant health system will be challenged by out-scaling and re-training and thus may mature further. The EET considers it an asset of Plantwise that linking actors could be achieved almost as a by-product of setting up plant clinics. Coordination and integration happens around real problems at hand and tangible issues rather than because it is a component in the program.

### **ii. Coherence of the multi-donor program**

Plantwise follows clear principles and these are continuously outlined in guidelines and templates for agreements. This makes it less prone to specific demands of different donors. We assume that the donor forum, where such guidelines are discussed, is a further platform to harmonize donor demands.

Donors may have specific demands regarding reporting. Plantwise is presently elaborating internal guidelines to facilitate donor-specific reporting, yet the majority of donors accept the general report of Plantwise and specific requests can be handled without much additional resources.

### **iii. Management structures**

Plantwise management structures correspond to the complexity of the program and the number of contributing partners:

- The CABI Executive Management Team approves the Plantwise strategy, allocates the resources and oversees the program delivery.
- The Plantwise Program Board reports to the CABI Executive Management Team and to the Donor Forum. It designs the Plantwise strategy, coordinates the activities in the different regions (Africa, Asia, Americas) and allocates the resources to the national programs. It is composed of the Program Executive, the Program Coordinator M&E, the Global Directors for Plant Health Systems Development, Knowledge Bank and Knowledge for Development, the Program Support Manager, the Data Manager, the Director for Strategic Partnerships, the Executive Directors Commercial and Global Operations and the three Regional Coordinators for Africa, Asia and Americas.
- The program executive and the program support manager are responsible for day-to-day management of Plantwise
- At national level a CABI country coordinator from the CABI Regional team and a national Plantwise coordinator - typically a representative of the Ministry of Agriculture - conjointly plan and manage the activities.
- The Program Board is backed by an Advisory board, which at the moment is not active. Instead of a standing Advisory Board we recommend to endow the Program Executive with the competence to seek and retrieve expert knowledge on demand and as he sees fit.

**Recommendation 14: Endow the Program Executive with the competence to seek and retrieve expert knowledge on demand and as he sees fit**

## ***e) Risks and potentials***

### **i. Medium-term risks**

When national stakeholders were asked about risks for Plantwise, they all highlighted the importance of continued commitment of national and local governments, making available staff and financial resources to the common cause. Different strategies to counter this risk of lack of national commitment were discussed (see country parts).

A related risk is the confusion about the future of globally centralized services now provided by CABI (recommendation 5).

The EET identified a further risk in the quality of diagnosis and recommendations. If plant doctors in some cases make mistakes, giving advice that is not effective or not profitable for the farmer, this will quickly lead to erosion of farmers' interest. If some give advice that increases the use of pesticides by farmers, especially if this use is not safe, this may lead to criticism of the entire program. Hence our emphasis on carefully monitoring quality of recommendations.

There exist further risks related to climate change, which may alter the pest situation so quickly that Plantwise cannot keep pace with the changes. Yet, Plantwise is well suited to cope with such changes, better than any other initiative we know of. Still, single heavy outbreaks of pests may compromise the trust of farmers and decision makers in the program.

### **ii. Resilience**

Plantwise is certainly well placed to respond to changes in the pest situation as outlined above. It thus makes the plant health system more resilient.

Resilience at farmer level can be improved by using pesticides rationally, according to IPM principles, by promoting plant health and an equilibrium between pests and antagonists in farmers fields. Here, Plantwise has the potential to make a strong contribution (hence our emphasis on IPM). It would be interesting to monitor the medium-term impact of Plantwise on

the pest situation at field level. The three countries have different policies for pest control, with Tanzania following explicitly and with emphasis an IPM approach. This may influence the degree to which Plantwise can make a difference for resilience.

### iii. Impact potential

The impact potential of Plantwise seems high, telling from the numerous appreciative statements by all national stakeholders. Yet, impact of such a program is very difficult to measure. Several levels need to be assessed:

- Impacts at policy level: Better decisions taken due to better and more up-to-date information
- Impacts at plant health systems level: Higher efficiency due to better coordination, better preparedness, higher effectiveness in reacting to new situations, better quality services in general
- Impacts at the level of the extension system: Better contacts with farmers and higher credibility
- Impacts at farm level: Less application of useless pesticides, better plant health at field level in the medium term due to ecologically more sound application, faster and better targeted reaction to pest outbreaks, all resulting in higher productivity and more sustainable food security. Yet also negative (unintended) impacts may occur depending on the quality of plant doctors' recommendations as outlined above

All these impacts are difficult to measure. Even in the seemingly simple case of impacts at farm (or household) level, challenges are numerous: Plantwise is dealing with many crops and on each crop with several pests. The issue of the counterfactual is difficult to solve, as farmers going to a plant clinic go there probably because they have a severe problem, more severe than their neighbors. Hence, it is difficult to make a valid comparison. This is one of the reasons why it is difficult to design meaningful baseline studies.

The EET discussed the issue of impact assessment with the CABI responsible for M&E. CABI has clearly invested a lot of thought in this issue. Several attempts to assess the impact of plant clinics have so far been made (Danielsen et al. 2012; Brubaker et al. 2013) and a new initiative for impact assessment at program level is being started at present.

The EET therefore proposes that lessons learned be drawn as quickly as possible and concepts for impact assessment developed and shared with national stakeholders. They are equally interested to come to grips with impact. We encourage Plantwise to go for a participatory, rather qualitative approach. Allow stakeholders themselves to define indicators or proxies for impact, in their own value systems.

An easy proxy to evaluate if farmers consider it worthwhile to visit plant clinics would be, if they come back after a first initial visit. We suggest that Plantwise elaborate such a concept so that respective data could be extracted from data sheets (of if necessary collected additionally by plant doctors). Even in this simple case, careful thinking needs to go into establishing comparisons and thresholds.

**Recommendation 15: Learn quickly from on-going impact studies to develop and share with stakeholders a concept for program impact assessment**

## 7. Conclusions and summary of recommendations

In the three countries visited, Plantwise is a highly relevant, effective, efficient, well managed program. It contributes to more efficient and sustainable crop protection at farmer level and thus to farmers' wellbeing and a more efficient national plant health system. It therefore has the potential to sustainably improve national food security.

Direct stakeholders are committed to the cause of Plantwise. The different actors of the plant health system started to collaborate efficiently on tangible issues and tasks at hand. Plant clinics attract a lot of interest from both farmers (their clients) and decision makers. Plant doctors are well trained for their tasks. Program management is efficient and forward-looking. CABI staff facilitates work at country level, but leaves the decisions to national stakeholders. Overall orientation of the program is appropriate.

Plantwise is a good example of a global approach with benefits to both, national plant health systems and local farmers. It is built on ample experience of CABI with the approach of plant clinics in several countries and lessons-learned thereof. When designing Plantwise as a global program, this experience was widely used and shaped into principles for the program that now turned out to be both, sufficiently clear and sufficiently adaptable to country needs.

The EET elaborated recommendations to further improve performance of Plantwise. These can be found in the previous chapter along with explanations and further details. They are again presented here as a summary:

### Global management

- Identify pilot countries for out-scaling of the plant clinic network and establish comprehensive country plans together with the national partners
- Develop and communicate concepts for future arrangements for globally centralized services (e.g. Knowledge Bank) after donors' phasing-out
- Search for independent partners to instruct farmers in rational and safe use of pesticides
- Strengthen links and cooperation with international organizations (e.g. CGIAR-Centers, AVDRC or ICIPE) and NGOs (e.g. Biovision)
- Endow the Program Executive with the competence to seek and retrieve expert knowledge on demand and as he sees fit
- Learn quickly from on-going impact studies to develop and share with stakeholders a concept for program impact assessment

### Local management

- Establish and strengthen links with local authorities (district, county, region) to ensure commitment and sustained support
- Encourage National responsible organizations to streamline the flow of clinic data and to regulate data access with national partners
- Strengthen links and dialog with input suppliers to improve the availability of IPM compatible crop protection products
- Streamline work-planning and budgetary processes at country level

### Strengthening plant clinics

- Establish agreements with referral labs in order to improve free access for plant doctors to professional diagnostic services
- Improve Web access to Knowledge bank and other relevant web sites or offline accessibility of digital info material for plant doctors
- Encourage plant doctors to operate additional clinics at different locations

### Capacity building plant doctors

- Assess recommendations of plant doctors as to their effectiveness, profitability and congruency with IPM principles in general and design ways of improving them
- Further promote the establishment of green and yellow lists in order to advocate the implementation of IPM



### **Discussion of recommendations with the Plantwise Program Board (Weggis)**

The EET presented its findings and preliminary conclusions and recommendations to the Plantwise Program Board meeting in Weggis. Recommendations were discussed and the participants prioritized them (Annex 4). In a brainstorming, they brought forward new ideas for improving the program (Annex 4).

Based on these discussions, the EET revised the recommendations: We dropped a few, because the Program Board convinced us that they were not relevant or not realistic. We kept others in, even if they received lowest priority by the participants, because we are convinced that they can substantially improve the program.

## **8. References**

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- Danielsen S, Romney D, 2012. Plantwise – Monitoring and evaluation strategy for Plantwise. Version 1, June 2012. CABI, 22 p.
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# Annex 1: Terms of Reference for External Evaluation



Schweizerische Eidgenossenschaft  
Confédération suisse  
Confederazione Svizzera  
Confederaziun svizra

Federal Department of Foreign Affairs FDFA

**Swiss Agency for Development and Cooperation SDC**  
Corporate Domain Global Cooperation  
Global Programme Food Security

## Terms of Reference for External Evaluation

### 1 The project in brief

CAB International (CABI – [www.cabi.org](http://www.cabi.org)), originally established in 1910, is a not-for-profit science-based development organisation, operating under an international treaty agreement amongst its, currently 47, member countries, registered with the UN. It has a Headquarters Agreement with the Government of the United Kingdom and operates through a network of centres located around the world. CABI's mission is to improve people's lives worldwide by providing information and applying scientific expertise to solve problems in agriculture and the environment.

Plantwise, a global programme led by CABI, fosters diverse partnerships that underpin and sustain global efforts to remove constraints to agricultural productivity. CABI has adopted a consultative approach to the implementation of Plantwise and has already benefitted from a considerable amount of input and advice from a number of international and national organisations as well as other relevant stakeholders.

On the ground, a global network of plant clinics will be owned and run by local organizations and will deliver advice on-demand to farmers where and precisely when it is needed. Although the relevant national organisations will be the ultimate decision-makers on standards of training and accreditation, during the process of Plantwise implementation, CABI will seek to achieve a consistent minimum level set of qualifications, quality and operating procedure.

The plant clinics will provide an entry point to creating linkages and strengthening plant health systems that enable countries to tackle plant health more effectively and provide more regular and reliable advisory services on an on-going basis. Plantwise will also provide capacity building and technical support to national plant health system actors to enable more accurate and timely identification and management of plant health problems as well as ensure fulfilment of their national responsibility to provide adequate support to farmers. Plant clinics are open to all. They operate in places that are accessible to men and women and at times when both sexes are able to visit.

The Plantwise knowledge bank will support delivery of the outcomes by providing a platform for information sharing at international, regional, national and local in-country levels. Collating feedback and observations from the network of plant clinics will provide a unique source of information on what is being seen at the local level. At critical mass of plant clinics, these data, together with analysis informed by scientific knowledge, will create a powerful global early warning system for plant health vigilance, alerting countries and regions to potential threats and permitting them to prepare improved local responses to problems and climate change.

### In countries – briefly

The Plantwise approach is being rolled out across 40 countries as funding becomes available. SDC funds contribute to program coordination, the knowledge bank and in-country activities in Tanzania, Sierra Leone, Honduras, Nicaragua, Cambodia and Sri Lanka.

**Table 1: Countries where Plantwise was active in 2012, indicating year when activities started and countries where activities will commence in 2013**

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

## 2 Objectives and leading questions for the external evaluation

So far the SDC contribution to Plantwise (PW) was split in a strategy development or planning phase (April 2011-December 2011), and the main phase (January 2012 to December 2016). However, SDC requires a mid-term review to determine whether funding should continue from 2014 onwards as planned. SDC funding represented 22% of total funding to Plantwise in 2012. The external evaluation should review the programme as a whole and shall also serve as a source of information for other present and potential future donors to base their funding decisions upon. It will provide complementary learning to an ex-post impact assessment being commissioned using DfID funds. In addition, it is expected that the findings of the external evaluation can be used as a planning basis to inform programme adjustments and activities for the next phase of the programme and of SDC funds. So far the PW programme has not undergone any external evaluation.

The objectives of this first phase evaluation are the following:

- Assess the Plantwise programme as a whole with regard to its relevance for stakeholders, effectiveness, efficiency and risks/potentials for the mid-term future, as described below. The evaluation should consider the programme as a whole, with a focus on country activities in Africa, particularly in the SDC target countries.
- Provide relevant and feasible recommendations for the improvement of country-specific interventions; global strategies and activities for subsequent SDC project phases

The following questions are considered to be the most crucial in view of project orientation and implementation in the coming years. They shall thus guide the evaluation and the recommendations:

### Relevance for stakeholders:

Project relevance shall be assessed with regard to the stakeholders' needs and interests in sustainable agriculture. The specific questions to be addressed are:

- To what extent does the programme respond to needs and interests of the different stakeholder groups (extensionists, farmers, MoA, quarantine service, etc.) from across the plant health system or could it in the future?
- What is the relevance, quality and quantity of materials provided by the programme (Knowledge bank, supporting documents, training manuals, identification tools, etc.)?

- The Theory of Change (ToC) argues that clinics provide a catalyst for stimulating positive changes in the way stakeholders interact and work together that will have positive impacts on plant health. Where does the programme stand now and/or how can the programme move effectively to this stage?
- Does the programme take account of the regional differences (within and between countries) in establishing partnerships?
- To what extent do the partner agreements (partnerships, data sharing) help or hinder the implementation of programme activities?
- Does each partner's understanding of their roles within PW match CABI expectations?

#### Effectiveness:

Project effectiveness shall be assessed in relation to the programme's objectives (goal and purpose) and expected results, measured by the indicators proposed in the log-frame. The following questions shall be addressed: e.g.

- To what extent have the expected results been achieved so far? What are the internal and external underlying factors for (likely) success or failure? Should the expected results be adapted for a next programme phase? If yes: why and how?
- Which unexpected results have been achieved?
- What is the likelihood that the programme objectives will be met? What are the internal and external underlying factors for likely success or failure? Should they be adapted for a next project phase? If yes: why and how?
- Is a monitoring system in place that allows tracking and critical assessment of achievements?
- Are measures in place to monitor and improve a) the quality of advice given by plant doctors; b) the quality, timeliness and quantity of data transmitted, analysed, and interpreted by the country teams; and c) the quality of the decisions taken by the country Plantwise steering committee based on the available data; d) the quality of the different training modules and their impact on plant doctors (is there a track record)? Where are the bottlenecks and how could they be addressed?

#### Efficiency:

The leading questions for project efficiency evaluation shall be if the expected results and objectives are addressed in the best possible way, which are in particular: e.g.

- Is the programme complementary to other projects/programmes and existing national advisory services?
- Are the most suitable partners cooperating? Do roles and responsibilities of partners take into account their respective comparative expertise? Is the intellectual, organisational and administrative input of each partner congruent with the intended roles and responsibilities?
- Do programme structures and working modes support efficient use of human resources? Are project structures and working mode participatory, transparent, interactive, iterative and empowering? Do they allow for learning processes?
- Were the financial means used in the most efficient way? Would it have been possible to achieve the same results at lower costs? Which budget adaptations should be made in the next project phase?

Programme management:

Plantwise is a multi-donor programme led by CABI, and guided by the Plantwise Programme Board in a PRINCE2 environment and the Donor Forum. Coherent with the two sections above, the assessment of the programme management aims at ensuring that the institutional set-up of the programme management allows effective and efficient programme implementation. More specific questions are:

- How are the multiple demands, programme reporting and financial management structures of different donors managed to ensure a coherent programme of activities with common aims and objectives?
- How are roles and responsibilities divided among CABI centres, project field units in relation to work in the different countries? What are the strengths and weaknesses of CABI project management? How well can the CABI Executive Board and the Donor Advisory Forum take up their guiding and advising function? Is any adjustment in the institutional set-up required?
- Are the priorities set appropriately across the themes: plant health systems (including plant clinics) and knowledge bank, diverse training modules? Are the general directions and quantitative achievements in these 2 themes in line with the programme idea and objectives, and with the expectations of donors and local partners?
- How effective and efficient are the existing structures and working processes of programme management at different levels and how could these improved?

Risks and potentials:

Given that the programme builds on a long-term approach, it is of great benefit if risks and potentials can be identified early in the programme life cycle. The first two questions below are kept open, in order to take care of all aspects that are not covered by the questions above. The core piece is to evaluate the feasibility of the proposed impact pathway together with all partners, and possibly additional stakeholders:

- What are the risks that may negatively affect programme success as per the current programme proposal in the next one to five years? How can they be addressed and minimised?
- What is the potential of the programme to deliver outcomes that contribute towards sustainable agriculture in the mid- and long term? What is required in order to realise these potentials? What would be a realistic pathway to achieve impact?
- What is the resilience of the programme towards adverse effects (political changes, social unrest, natural disasters, regional infrastructure degradation, financial shortfalls, institutional changes, staff fluctuation, etc.) that may occur during a long-term time period of 10 years?

**3 Methods to be used in the evaluation**

The evaluation will be carried out by an independent evaluation leader with international experience. The overall responsibility for the development and implementation of the methodology lies with the evaluation leader. There will be an additional evaluation team member with sectorial experience in plant health systems or agricultural advisory services in developing countries.

It is strongly wished that participatory and transparent approaches be used, in order to ensure joint learning and mutual understanding. Such approaches will also support the implementation of the recommendations.

After a consolidated draft of the terms of reference (TORs) have been made available to the evaluation team together with the documents listed below, SDC and CABI will jointly brief the evaluation leader. At the same time, the evaluation leader will elaborate on the TORs and propose a methodology and work plan showing how and when the various questions will be addressed, and who will be involved. The TORs should be finalised within 2 weeks of receiving the draft.

#### **4 Expected results of the evaluation**

##### Report

The evaluation team has to furnish a final report. The draft of the evaluation report is sent to SDC and to CABI for consultation at least four weeks before the final report is submitted. Part of the consultation will include a facilitated session at the Plantwise Programme Board meeting (early September, to be determined) and the CABI response to recommendations will be included in the final report.

The final evaluation report (max. 50 pages) contains an executive summary, a brief introduction, a description of the procedure, a comprehensive main part split into country reports, addressing the leading questions (above) based on cited evidence, logically derived conclusions and justified recommendations. Supporting information, including a travel report, a list of persons with whom talks were held, and a list of sources used, is attached. The reactions of CABI and SDC on the draft will be addressed by the evaluation team and considered where appropriate during finalisation of the report.

##### Discussion of final report

The final report will be discussed with all Plantwise donors at the Donor Forum meeting on 3 October 2013 in the Netherlands.

#### **5 Roles and responsibilities in the evaluation**

##### Evaluation leader / evaluation team:

- Clarify and finalise terms of reference together with SDC and CABI
- Develop and agree a methodology and work plan: How will the various questions mentioned above be addressed? When? Where? Who will be involved?
- Briefing of the CABI regional teams and local partners on the procedure and content of the evaluation
- Carry out the evaluation according to the work plan
- Coordinate report contributions from evaluation team members
- Present and discuss preliminary findings with the Plantwise Programme Board
- Write draft report (see above) including an executive summary and list of key action points
- Send the draft report to CABI and SDC for consultation
- Meet with SDC and CABI PW programme board to discuss the draft report
- Address comments on draft report in the final report, submit final report to CABI and SDC
- Work with CABI to plan activities and ensure submission of accountabilities for all travel and subsistence costs

##### SDC:

- Commission the external evaluation using financial provision in the CABI PW budget and drafts terms of reference

- Identifies independent external evaluator
- Comments on the draft report and participates in meeting with evaluation leader and CABI to discuss comments
- Reads through the final report and comments on it

#### CABI:

- Provides documents (see below)
- Provides logistic and organisational support
- Covers costs of travel and subsistence of evaluation team
- Briefing of the CABI regional teams and local partners on the procedure and content of the evaluation
- Project staff is available to respond to information requests from evaluation team
- Comments on the draft of the evaluation report
- Participates in the meeting to discuss the final report
- Suggests how recommendations will be implemented

#### CABI regional team and national partners :

- Are responsible for local logistic and organisational matters
- Act as social facilitators
- Are available as resource persons
- Comment on the draft of the evaluation report

## 7 Timeframe

Activities	Responsible	Involved	Time period
Respond to TOR	Evaluation leader		7 May
Submit methodology and workplan	Evaluation leader		End of May
Finalise TOR	SDC and CABI	Evaluation leader	15 May
Travel in countries	CABI and Evaluation team	Evaluation Team Member	End of August
Oral presentation of results to Plantwise Programme Board	Evaluation team	Plantwise Programme Board (PWPB meeting on 4-6 Sep.)	5-6 September
Submit draft report	Evaluation team	PWPB (feedback provided in a single report by 19 September)	13 September
Oral presentation of results to SDC	Evaluation team	SDC	16 September (to be confirmed)
Submit final report	Evaluation team		23 September
Oral presentation of results to Plantwise Donor Forum in the Netherlands	Evaluation leader	Representative of CABI or SDC if necessary	3 October

## **8 Documents to be made available to the evaluation team**

It is expected that the evaluation team treats information contents of all documents with the necessary care.

1. Plantwise strategy document (including Theory of Change and Theory of Action)
2. Programme Logframe Jan 2013 version
3. Dec 2012 Milestones document
4. June 2013 Milestones document
5. Working paper of Uganda clinics impact study
6. Working paper – DANIDA report
7. Annual donor report 2012 with 1-page country briefs
8. Request for qualifications to find suitable collaborator for impact assessment
9. Gender strategy
10. M&E strategy
11. Plantwise agreement templates
12. Plantwise policy statements

## Annex 2: Interview guide for Plantwise (PW)

	Question	Ext	Farm	MoA	PH
	How do you work/collaborate with Plantwise	X	X	X	X
	<b>Relevance for stakeholders</b>				
2.	What is your role in PW	X	X	X	X
3.	How does PW meet your needs and interest? (now, in the future)	X	X	X	X
4.	Which material (KB, documents, manuals, identific.tools) is useful	X		X	X
5.	How have plant clinics changed your way of interacting with others	X		X	X
6.	Does PW establish different partnerships in different areas			X	X
7.	Does data sharing hinder collaboration	X		X	X
	<b>Effectiveness (reality compared to log-frame)</b>				
8.	Are expected results achieved: - Plant clinics established and data are flowing back - Key actors linked - Data are centrally processed and used (by clinics / in campaigns) - Comprehensive and useful knowledge base exists and is used - M&E is relevant and contributes to learning	X x x x x	X x	X x x x x	X x x x x
9.	Are ER meaningful, should they be changed			X	X
10.	Were unexpected results achieved	X		X	X
11.	Is the program likely to achieve its objectives, are these relevant	X		X	X
12.	How is achievement of ER and objectives monitored	X	X	X	X
13.	How does PW monitor and improve quality of advice / data flow and central management / national SC decisions / training (bottlenecks?)	X			X
	<b>Efficiency</b>				
14.	Is PW complementary to projects and extension	X	X	X	X
15.	Does PW have the right partners on board (do they contribute)			X	X
16.	Are human resources used efficiently (participatory, empowering)	X			X
17.	Where could PW have saved (save) costs	X	X	X	X
	<b>Program management</b>				
18.	One objective – several donors (demands, reporting, finances) ok				X
19.	Roles and responsibilities in management ok, improvements			X	X
20.	Balance between plant health system and knowledge bank ok			X	X
21.	Management structures and processes appropriate, improvements	X			X
	<b>Risks and Potentials</b>				
22.	Risks to PW success (5 years) and how to address them	X	X	X	X
23.	Risks (10 years), resilience of PW			X	X
24.	Potential of PW to make farming sustainable, how to realize				X
25.	Realistic pathway to achieve impact				X
26.	How do you benefit from PW		X		
Ext: Plant doctors, extensionists		PH: Actors in Plant Health system, incl CABI			



## Annex 3: Schedule of the External Evaluation

Mon Aug 26 <sup>th</sup>	AM	Meeting with CABI Staff (ICRAF Complex, Nairobi) Meeting with Partners of Kenya Ministry of Agriculture
	PM	Joint meeting CABI/MoA and visit PW data centre at NARL Visit Kenya Agricultural Research Institute KARI
Tue Aug 27 <sup>th</sup>	AM	Visit Kenya Plant Health Inspectorate Service KEPHIS
	PM	Visit Plant Clinic at Nderi
Wed Aug 28 <sup>th</sup>	AM	Travel to Tanzania (Arusha)
	PM	Meeting with PW Country Coordinator and round table meeting with local government representatives
Thu Aug 29 <sup>th</sup>	AM	Meeting with PW National Coordinator Tanzania, assisting data management workshop
	PM	Visit Plant Clinic in Arusha region and travel to Nairobi/Kigali
Fri Aug 30 <sup>th</sup>	AM	Meeting with PW National Coordinator Rwanda and stakeholders
	PM	Visit Plant Clinic

## Annex 4: Plantwise Program Board Meeting Weggis

### 6.9.2013: Priorization of recommendations (number of dots) and additional issues

Recommendation <sup>1</sup> (by EET) or additional issue (bullets) brought up by participants	Dots
<b>Program Management - global</b>	
Move from “pilots” to comprehensive country plans (PW to develop with national partners medium-term perspectives for out-scaling, largely based on national funding) in selected pilot countries	9
Develop and communicate future arrangements for globally centralized activities (e.g. knowledge bank) after donors phasing-out	15
Integration of new partners for promoting safe use of (IPM compatible) pesticides	3
Strengthen links and cooperation with related institutions (e.g. CG-centers, AVDRC, ICIPE, Biovision ...)	0
<ul style="list-style-type: none"> <li>• Categorize / focus on countries for out-scaling + PHS implementation</li> <li>• Strengthen organizational change capacity in CABI and countries</li> <li>• Use of KB data: Synchronization with national objectives</li> <li>• <u>Global</u> use of PW knowledge bank</li> <li>• Increased broad PHS engagement – beyond extension services</li> <li>• Revise way in which we engage with countries – lessons learned on which activities should be done when</li> <li>• Internship program Clarify engagement of partner according to mandate</li> <li>• Consolidate focus on current operations and PHS</li> <li>• Consolidate in countries – focus on PHS</li> <li>• Connection to other extension methods to push GAP message</li> <li>• Integration of clinics and other services / service providers (complementarity)</li> <li>• Complementary extension campaigns (PHR)</li> </ul>	
<b>Program Management - local</b>	
Establish links to local governments to ensure commitment and continued support of plant clinics	11
Encourage national implementing organizations to strengthen links and to improve flow of information among contributing national institutions (e.g. KARI and KEPHIS in Kenya), advocate clear definition of their respective roles and rights (e.g. access to clinic data)	7
Fully implement National Steering Committees (Tz, Rw)	10
Strengthen links with input suppliers to improve the availability of IPM compatible pesticides	8
<ul style="list-style-type: none"> <li>• Advocacy for high level policy support – beyond activity level</li> <li>• National seminar to report progress and plan next steps and roles and responsibilities</li> <li>• In-country data management processes</li> <li>• Determine if clinic data processing can be applied to other pest monitoring and analysis undertaken in a country</li> </ul>	
<b>Program Resources</b>	
Streamline work-planning and budgetary processes at country level to be more efficient and participatory	0
Encourage plant doctors to operate additional plant clinics (e.g. in two different locations at two different week days), lobby for inclusion of plant clinic operation in their job description	12
<ul style="list-style-type: none"> <li>• Secure more funding for on-going development of the program</li> <li>• Ongoing review CABI staff Country versus Regional coordinators</li> <li>• Greater mentoring in country</li> </ul>	

<sup>1</sup> Wording, number and sequence of recommendations do not correspond to final recommendations as given in the text.

<b>Capacity building – plant clinics strengthening</b>	
Establish agreements and mechanisms with referral labs to allow easy and free access for plant doctors to diagnostic services	9
Accelerate shift from international to national training (Training of Trainers, use shining plant doctors as trainers); will be a pre-condition for out-scaling plant clinics	9
Improve information delivered fact sheets: Include more information on direct, IPM compatible chemical control options, including preparation and application	6
<ul style="list-style-type: none"> <li>• Look at the promotional aspects of clinics – how to make it more popular for optimizing attendance</li> <li>• Investigate clinic usage further</li> <li>• Linkages to climate change that farmers experience on the ground (more forward-looking, pro-active approach)</li> </ul>	
<b>Capacity building – plant doctors (including mentoring)</b>	
Implement regular refresher training for plant doctors (also for new contents)	17
Improve plant doctors' understanding and application of the principles of IPM and monitor their recommendations accordingly	7
Improve Web-access for plant doctors or make available off-line info material (electronic or hard copies)	15
Improve plant doctors' training on use of IPM compatible pesticides (choice of product and application)	4
Establish a "positive list" of "CABI-approved" (human and environmental toxicology o.k.) pesticides by pest (worldwide)	0
<ul style="list-style-type: none"> <li>• Broadening of plant doctor training</li> <li>• Attraction of being and remaining a plant doctor forever (use tablets and smart phones to increase attractiveness)</li> <li>• Improved communication with plant doctors (on-going)</li> </ul>	
<b>Monitoring and Evaluation</b>	
Establish concepts for impact evaluation by learning quickly from on-going studies in view of initiating baseline studies ASAP (concepts at country level?)	14
Collect and analyze feedback on availability of recommended products and on efficacy of recommendations (lean process)	11
Conduct baseline surveys on the use of pesticides at country level	0
Adapt "prescription and record sheet" to include a copy for the plant doctor	11
<ul style="list-style-type: none"> <li>• Quality assurance of processes and activities at plant clinics</li> <li>• Feedback of validation</li> <li>• Quality control: Operational aspects of clinics</li> <li>• Use of mobile devices for clinic data collection</li> <li>• Start research studies on M&amp;E</li> <li>• Strengthen publication record in PW</li> <li>• Frequent and targeted follow-up visits to assess progress (esp. re institutionalization capacity, ownership, procedures = soft issues)</li> </ul>	