ROLE OF PLANT HEALTH CLINICS IN MEETING THE NEEDS OF SMALL-SCALE FARMERS FOR ADVISORY SERVICES: EXPERIENCES FROM EASTERN AFRICA

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ABSTRACT
Agricultural extension has been undergoing major changes. Changing policies, declining public funding, new thinking and approaches, climate change and other environmental factors pose major challenges to public sector extension services. Pre-packaged, crop and region-biased extension approaches often failed to help remote and resource poor farmers to cope with rapidly changing realities. This has necessitated the search for alternative approaches. One such alternative, plant health clinics, has been developed and tested by the CAB International led Global Plant Clinic Alliance in many countries since 2001. Operated by staff of local organisations in locations that are easily accessible to farmers, plant clinics accept any crop problem. They provide regular, relevant and practical advisory services on plant health management. Clinic records generate useful information on priority problems and changing status of pests and diseases. The plant health clinic approach has been widely introduced in Africa under a CAB International initiative, Plantwise. In Uganda, a pilot scheme began in 2005 and has expanded to 19

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regularly operating plant clinics. Kenya established 24 plant clinics between mid-2010 and September 2011, while Rwanda started with five clinics in 2011. The clinics are run by a range of organisations, each adapting the basic model according to local circumstances but consistent with guidelines and principles established by CAB International. The approach demonstrates a number of strengths and benefits but is not without challenges. This paper discusses the lessons and experiences gained in Kenya, Rwanda and Uganda, and the implications for improving future practices and policies for plant health advisory services.

**Key words:** Plant health Problems, Plant clinics, Plantwise, Demand-responsive service

**Introduction and Objectives**

The livelihoods of the vast majority of the African population are closely associated with the performance of the agricultural sector. Efficient use of the natural wealth and potential for agricultural production has been constrained by a number of factors, including weak extension and advisory services. Enhancing productivity and food security among small-scale farmers requires access to effective, reliable and practical advisory and other support services on a regular basis, including those that enable farmers to address the threats of pests and diseases. Many African small-scale farmers are located in areas with diverse agro-ecological and socio-economic circumstances, but conventional extension approaches often fail to reach and address the diverse needs of these resource-poor farmers. Interventions by public extension agencies are often biased towards specific crops and areas, and are not flexible enough to help small-scale farmers cope with unpredictable changes and emerging challenges facing the wide range of crops they grow (Negussie et al., 2011).

Thus, in general, the majority of small-scale farmers in developing countries do not have access to adequate and timely advice on how to handle existing or emerging plant health problems (Bentley, 2009). There is much to be done to provide adequate extension services to the rural poor, overtly disadvantaged and needy groups in many parts of sub-Saharan Africa (Anderson, 2007). Government extension is often unable to provide small-scale farmers with the pertinent technologies and information they need for rural development to occur. For instance, in Kenya reductions in government services and ineffective and inappropriate extension approaches have led to serious gaps in extension of innovations to small-scale farmers (Davis, 2006). Even the best extension workers struggle to meet all their assigned clientele, and farmers have few reliable and consistent means for expressing their demands (Boa, 2007). Information on farmers’ needs and problems is often lacking at higher levels, limiting the ability of research, extension, regulatory services and policy to address relevant issues as they emerge. Moreover, different actors are poorly linked, limiting innovation, effective service delivery and flow of information.

In recent years, agricultural extension in many African countries has been undergoing a period of transition. Evolving policies, new thinking and approaches in rural development, declining public funding, climate change and other environmental issues have posed serious challenges to the public sector extension services. The notion of extension and advisory services as part of a wider system has emerged, with a shift towards participatory, pluralistic and farmer-centred approaches (Davis, 2006). The emphasis in rural advisory services is now on the quality of interaction between agent and clients, rather than on the movement of messages through a hierarchical system; flexibility and adaptability are seen as virtues rather than aberrations (Jones and Garforth, 1997). Innovation in service delivery is needed to make knowledge, information and inputs available to the millions of small-scale farmers who depend on their crops for household food security and income (Danielsen et al., 2011).

Plant health clinics are one such innovative approach. The idea of plant clinics has been developed since the early 2000s by the Global Plant Clinic Alliance, led by CAB International. About 130 plant health clinics have been
established in 12 developing countries in Asia, Africa and Latin America up to the end of 2011. This paper discusses the experiences and lessons from Eastern Africa – Kenya, Rwanda and Uganda.

What is a plant health clinic?
A plant health clinic is a form of primary health care. It gives advice and recommendations to farmers based on field diagnosis and available information. Plant health clinics provide demand-driven advice to farmers, rather than promoting pre-packaged and technology-centred solutions (Negussie et al., 2011). This approach differs from project led interventions, as clinics offer a regular service and demand is defined by the queries that farmers present, not by extension workers or researchers (Danielsen et al., 2011).

Plant clinics are run by trained agronomists or local extension workers who are familiar with agriculture and local conditions. Staff running a plant clinic (‘plant doctors’) receive basic training in field diagnostics and plant health management (Boa, 2009a). Other training courses are subsequently provided to enhance the technical competence of plant doctors and the quality of service. The clinics operate for about half a day once every one or two weeks, in a public place frequented by farmers. Often they are not in a building, so require simple furniture (e.g., tables, chairs) and shade, along with basic equipment such as photographs of symptoms, reference literature, knives and hand lenses.

A clinic accepts any problem on any crop, and is open to all farmers. Visiting farmers bring samples of their crops for diagnosis and receive on-the-spot advice on affordable and locally available management options. If diagnosis cannot be made, samples can be sent to the nearest diagnostic laboratory (Danielsen and Fernández, 2008) or other sources of technical support can be contacted and the farmer is given the result and advice at a later session. The recommendations often incorporate scientific and traditional knowledge and are tailored to the specific farm situation. Clinics recommend integrated pest management (IPM) technologies and seek to reduce pesticide use (Danielsen et al., 2011).

Information about clients and consultations, including the diagnosis and advice given, is held in a clinic register. This provides valuable information to extension, research and regulatory bodies – particularly on farmers’ priority problems and the changing status of pests and diseases. More importantly, plant clinics have the potential to play a vital role in enhancing institutional linkages and networks by bringing together different service providers with different capabilities and experience to provide better advisory services to rural people. Plant health clinics are intended to be self-supporting fixtures of the community, providing a public service that can change farmers’ livelihoods (DFID, 2010). The plant clinics tap into existing social dynamics and institutional structures and are adapted to specific local conditions (Danielsen and Fernández, 2008; Boa, 2009b).

How the idea of plant clinics has evolved
The development of the plant health clinic approach involved a series of stages, resembling the cycle of experiential learning (Kolb and Fry, 1975) involving experimentation, gaining of experience, reflective observation and conceptualisation. The approach was first started in Bolivia in 2003 (Bentley et al., 2009). Bangladesh, Uganda and Nicaragua (Danielsen and Fernández, 2008; Bentley et al., 2009; Danielsen and Kelly, 2010) soon followed, with pilot projects being set up in each country as opportunities allowed, rather than using a predefined approach. Since then, plant health clinics have been piloted in several developing countries as a new way of providing plant health services to farmers.

The plant clinics started as an experiment to try to reach more farmers with plant health advisory services (Bentley et al., 2009; Boa, 2009b), thus there were few operational guidelines in the beginning. Procedures for clinic operations have developed through experimentation and iterative learning (Danielsen and Kelly, 2010), although every situation demands a degree of local adaptation. As a result of successful experimentation with clinics, some countries started considering how to scale-
up the approach to develop a stronger plant health care system. In Nicaragua a grass roots experiment became a nationwide initiative involving local service providers, leading to the creation of a national system offering regular advice to farmers. External facilitation encouraged experimentation and bolstered growth of new alliances (Danielsen et al., 2011). Different countries proceed at different rates and in different ways, but in each case experience is gained from trying out the approach, reflecting on the results, and designing the next iteration. The nature of local institutions and working cultures can affect how the approach develops in a particular country.

Plant health clinics in East Africa

Early results in Central America inspired countries in Africa and Asia to establish pilot clinics to see whether they could meet farmer demand for plant health advice (Boa, 2009b; Danielsen and Mutebi, 2010). In 2005, four plant clinics were set up in Uganda all of which experienced a number of initial challenges: e.g., maintaining the regularity of clinics, limited ownership and institutionalisation. The need for systematic engagement and buy-in from relevant stakeholders has become evident. Results and lessons from the initial phase triggered the engagement of new districts and organisations; further clinics were established (bringing the number of clinics to 19) and more are planned (Reeder, 2011).

In Kenya, a more intensive effort resulted in the establishment of 24 plant clinics between mid-2010 and September 2011. In addition, the presence of government ‘information desks’ in rural towns was useful for the introduction of plant clinics, as there are some similarities between the two. Putting extension officers in places that can be easily reached by farmers is the basis for the public information desks, and advice and information is provided in response to farmers’ questions. However, the desks are not used as a platform for providing a flow of information to other stakeholders or to drive the plant health system. The information desks ceased operation in some districts. Thus, plant clinics were not an entirely different approach, and have even triggered reinvigoration of the information desks.

Though there were earlier pilots, the introduction of plant clinics to Rwanda is at an earlier stage than in Kenya and Uganda, with just five clinics launched in 2011. Though regularity appears to be a challenge, farmers have shown interest and enthusiasm. Reorganisation of agricultural research and extension in Rwanda may facilitate institutionalisation of the approach.

MATERIALS, METHODS AND DATA SOURCES

Different approaches were used in different countries to initiate plant clinics, though they all followed similar basic principles and procedures. The main processes and stages in setting up plant clinics in Eastern Africa include:

- identification of potential clinic implementing organisations
- consultative meetings with identified partners
- nomination of staff for training in operating plant clinics
- training of ‘plant doctors’
- joint planning of clinics (where, how many, and when to establish, role of different partners and support functions required)
- running the plant clinics
- publicity through various local channels
- information and experience-sharing between clinics through exchange visits, workshops and other methods
- monitoring quality and backstopping.

Identification of potential organisations to run plant clinics was done in two ways. In some cases, local organisations approached CAB International asking to implement plant clinics, but in most cases, CAB International approached suitable local organisations who were already involved in supporting farmers in various ways. Training and technical back-stopping of plant doctors was carried out by CAB International staff in different phases. Publicity for plant clinics was carried out both prior to set-up and during implementation of the clinics. The methods used include: posters, banners, radio announcements, meetings, agricultural shows, writing letters to churches and schools, field days, farmer groups, and
megaphone announcements in the market. The experience and views reported in this paper come from different stakeholders through a variety of approaches, including visits to clinic sites and observation; informal discussions with client farmers, extension staff and plant doctors; workshops, exchange visits and meetings; and review of secondary sources such as reports and previous articles. At this stage, the information is largely qualitative, but it forms the basis for more quantitative assessments.

RESULTS AND DISCUSSION

Coverage and outreach

In total, 48 plant clinics have been established in the three Eastern African countries up to the end of 2011. The majority of the clinics have been operating weekly or fortnightly on fixed days at fixed places such as busy market centres. A few clinic sessions were held during other events such as field days, exhibitions and agricultural shows. Earlier experience showed that running plant clinics on a regular basis is important in building client confidence, and can be taken as one indicator of the quality of a clinic. However, conducting plant clinics during other events, such as field days and agricultural shows, is useful in promoting the clinics and building awareness (Negussie et al., 2011).

Table 1 shows the number of visiting farmers and queries received on crop health problems. In Kenya, over 248 clinic sessions were held in the first six months, receiving about 5,000 queries on different plant health problems (Negussie et al., 2011). This subsequently increased to 387 clinic sessions addressing 6,540 queries in less than a year. In Uganda, from 2005 to 2010, five plant clinics held 145 sessions and received 1,947 queries from 1,123 farmers (Danielsen and Mutebi, 2010; Reeder, 2011). The clinics in Kenya were advising about 20 clients per session, while those in Uganda had fewer clients, perhaps because of irregularity.

Farmers visiting plant clinics come from surrounding villages, and from the market or other centres where the clinic is located. In Kenya, 20 clinics served clients from 1,489 villages, indicating a wide catchment. This is similar to what Danielsen and Mutebi (2010) found in Uganda, where each clinic served between 69 and 100 villages. Early studies (Boa and Reeder, 2009) also suggest that each clinic serves a population of about 2,000 households, though this varies according to location, with factors such as population density and availability of transport likely to affect the catchment area.

Crop health problems brought to the clinics vary from clinic to clinic depending on location, agro-ecology and the value farmers attach to the crop. In Kenya, maize received the largest number of queries, followed by various vegetables and fruits. In Uganda, plant clinics received a larger number of queries on banana than any other crop, again reflecting the importance of the crop in this country. In Kenya, many queries on coffee were received by plant clinics in Embu, where there is a strong coffee co-operative offering good prices to members.

The majority of clinic clients have been men. Out of the total visitors to 20 plant clinics in Kenya, 67% were men. This may be because men are often considered heads of households and tend to control access to resources and other services related to farm activities (Negussie et al., 2011).

Clinic ownership models

One of the factors that may affect the success or sustainability of an individual clinic is the type of organisation running it – the local implementing
organisation (LIO). Although operational support is given initially, overall responsibility for running the clinic is left to the LIO. Various organisations act as LIOs in the three countries. Many are government extension and research institutes, but some are non-governmental organisations (NGOs) and community-based organisations (CBOs). In some cases, the clinics are run jointly by two or three organisations, while others are implemented by an individual organisation.

In Kenya, the presence of structures and extension staff on the ground throughout the country has made clinic establishment easier, and involvement of the public extension organisation (Ministry of Agriculture) offers better opportunities for embedding plant clinics in government strategy and plans. Research institutes can play a role in backstopping plant clinics, but their role as implementers of clinics can be limited by staff shortage at suitable locations for clinics. Other constraints sometimes encountered include staff turn-over, limited capacity, ‘project mentality’ and lack of flexibility.

The experience with NGO agencies shows that they can contribute resources (funds) and motivated staff to run plant clinics. The major challenge is their limited coverage, sustainability (which depends on funding availability) and their limited capacity to influence national decision-making. The major merit with CBOs is their proximity to the community and commitment and enthusiasm to respond to their priority needs and problems. But a CBO may have very localised coverage. In most cases, CBOs have few resources, and their staff capacity and expertise on pests and diseases is weak. In Kenya, the majority of visitors to clinics run by CBOs were members of their farmer groups, while the clients of those run by the Ministry of Agriculture were farmers from various villages.

Strengths and limitations
As part of an assessment of early experience with the clinics in Kenya, we conducted semi and unstructured interviews with client farmers, plant doctors and other actors, during clinic visits, workshops and meetings (Box 1).

It was reported by extension staff (working as plant doctors) that they have benefited from using the new approach to effectively discharge their assignments and deliver effective advisory services. Running plant clinics has boosted the pride, work satisfaction and confidence of extension officers. Plant doctors also highlighted the enhanced outreach and direct identification of demand as major advantages of the plant clinics, compared to other extension methods. Researchers started benefiting from closer links with farmers via the clinics, which could lead to identification of priority research needs, but this linkage needs to be strengthened further.

Experiences in other countries also show that plant clinics filled a gap in existing services; they were the ‘missing link’ between farm families, extension workers and specialists (Danielsen et al., 2011).

An analysis of the clinics in Eastern Africa has not been conducted as yet to assess whether they are helping farmers to use environmentally friendly inputs and to reduce excessive use of agro-chemicals. In some cases farmers have been using pesticides unnecessarily, and have been advised to stop, while in other cases the use of appropriate chemicals was recommended. Studies in Bolivia indicated that advice given in plant clinics has helped farmers to harvest more, while saving money on plant protection (Bentley et al., 2011).

Costs and benefits
The cost of running plant clinics is modest, although there are significant start-up costs, particularly for training. Cost per client also depends on the number of consultations that can be conducted during a clinic session. However, the fact that farmers bring their sick plant samples to plant clinics helps reduce transportation costs for extension workers and enables them to assist more farmers than they would be able to by visiting farms. What percentage of a farming community needs to be able to access a clinic, and therefore how many clinics are needed in an area, are questions to which we do not yet have answers, but which will also determine the cost-effectiveness of clinics. However, it is likely that the
benefits of clinics will go beyond providing immediate advice to farmers. A relatively small number of clinics may be able to provide better quality information than what is currently available on what problems farmers face. This can be used to develop large-scale targeted extension campaigns, using methods such as radio with low cost per person reached. Thus, assessment of the benefits of clinics should examine both direct and indirect impacts.

The cost-effectiveness will affect whether governments wish to integrate plant clinics as part of their extension systems, or not. There are already signs that national institutions in all three countries are beginning to embed the approach in their strategies and plans. In Uganda, plant clinics are included in the ministry’s new 5-year Development Strategy and Investment Plan (DSIP).

In Kenya, with the positive response from the MoA, the district extension offices where the clinics are located have started including them in their annual performance contracts and, in several districts, plant clinics have been integrated into the ministry’s information desks. In Rwanda, a national budget for plant clinics has been approved, with clinics identified as a routine activity of the crop protection programme.

Apart from government institutions, NGOs and CBOs have also demonstrated interest in continuing and expanding the clinics. However, we envisage that the next step is not necessarily to set up more clinics, but to build links between clinics and with other parts of the plant health system, to create synergies among the various institutions.

**CONCLUSIONS, RECOMMENDATIONS AND IMPLICATIONS**

Although encouraging progress has been made, with various stakeholders reporting positive experiences with plant clinics, the process of implementing the clinics is still evolving, and there is a range of issues that require further exploration. Preliminary observations suggest that the plant clinics are a valued source of advice, helping small-scale farmers to manage their plant health problems. They offer a complementary approach to other extension approaches, rather than an alternative and so fit within the paradigm of extension services comprising a diverse range of methods.

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**BOX 1: STAKEHOLDER COMMENTS AND VIEWS ON STRENGTHS AND LIMITATIONS OF PLANT CLINICS**

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Limitations</th>
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<tr>
<td>Demand-driven and address farmers’ priority problems</td>
<td>Resource shortage – finance, local staff and transport</td>
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<td>Accessible to farmers</td>
<td>Tendency to view the initiative as a project</td>
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<td>Enhanced outreach – clinic staff solve many farmers’ problems in a few hours</td>
<td>Limited institutionalisation</td>
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<td>Deals with all plant health problems</td>
<td>High staff turn-over among local implementing (e.g., extension) agencies</td>
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<tr>
<td>Update and build capacity of extension staff</td>
<td>Workload due to other competing activities – disruption of clinics</td>
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<tr>
<td>Farmers gained confidence in extension officers</td>
<td>Limited technical capacity among some of the local staff</td>
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<tr>
<td>Enhanced interaction and collaboration among farmers and other stakeholders</td>
<td>Limited publicity for the clinics – some farmers come without samples</td>
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<tr>
<td>Can be integrated into existing structure and activities – implemented by diverse local organisations</td>
<td>Lack of effective linkages to other services such as diagnostic labs</td>
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<tr>
<td>Helped farmers gain better knowledge of managing pests and diseases</td>
<td>Dry season affects farmer turn out, while wet season affects mobility</td>
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<td>Helped farmers use appropriate control options – e.g., use of right chemicals</td>
<td>Performance of the plant clinics at times relied on the interest and</td>
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<tr>
<td>Halted to obtain lists of diseases and pests</td>
<td>commitment of some individuals</td>
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<tr>
<td>Better yield and quality produce due to timely actions, hence better prices for produce</td>
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<tr>
<td>Serve as surveillance mechanism, and help to capture emerging plant pests and diseases</td>
<td></td>
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<tr>
<td>Inform research – identify priority research areas</td>
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One key issue affecting the impact of plant clinics will be the quality of advice they provide. While this may be determined at least in part by what scientific information is available, the plant clinics can also help to tap into, and build on, local and indigenous knowledge, linking it with other sources of knowledge (Negussie et al., 2011). Some methods for evaluating clinics have been developed (Danielsen and Kelly, 2010) and will be developed further. An important aspect of these approaches is that they are participatory and geared towards service improvement, as the success of plant health clinics depends on how well they are run, the regularity of the service and the usefulness of advice given by plant doctors.

The majority of clinics in the three countries are implemented by the public extension service. The different policy and organisational contexts within the three Eastern African countries may influence the extent to which other organisations run clinics, or link with them in relation to diagnostic and research services or the supply of inputs. Our hypothesis is that while clinics themselves provide immediate benefits to their clients, a second level of benefits can accrue through different parts of the plant health system analysing and acting on the information that clinics collect, and these possibilities are being explored.

For example, clinic records are a source of information about the status of existing and emerging pests and diseases. Timely information on emerging threats can be used to inform and stimulate research priority-setting, and facilitate rapid responses from regulatory agencies, extension services and other relevant actors. New diseases have been discovered through plant clinics in various countries (Boa and Reeder, 2009) and, as climate changes, it is likely that farmers will have new pests to deal with. In principle, plant clinics can provide a useful source of vigilance in that context.

Concerted effort will be needed to seek ways to fully integrate plant clinics into existing structures and national strategies. In particular, there is the potential to increase the outreach of clinic services by linking with other extension methods and approaches. Networks of plant clinics can also enhance geographic coverage and access to effective advisory services. Plant clinics must be connected as part of a more integrated plant health system, as there is a limit to what an individual community clinic can do (Danielsen and Matsiko, 2010).

Developing a national strategy and plan for training plant doctors to meet the increased demands of an expanded network of clinics also deserves attention. It is also necessary to establish standardised methods of data management to ensure information is appropriately recorded and captured, so that it can be analysed, shared and used to support decision-making at various levels. These are all issues that need to be considered at levels above individual clinics, but that will only be feasible once the clinics are running consistently. It is also imperative to conduct a rigorous and comprehensive study to assess the impacts of the clinics on livelihoods and gather evidence to stimulate wider investment in plant health services.

**LITERATURE CITED**


Davis, K. 2006. ‘Institutional arrangements for increasing the dissemination role of farmer groups in agricultural innovation system’. Paper presented at the 22nd AIAEE Annual Conference, Clearwater Beach, Florida, USA, 14–19 May.


