14
Dissemination and Training to Extensionists and Farmers

'…while individuals within a community may actively participate in discourse about what to do and how to do it, there must be more to this process than simple discourse. First, for participation to be fully meaningful, it should be based on knowledge; hence the crucial role of education and of capacity building.'[1]

14.1 Main Findings

- A major effort was undertaken in coffee wilt disease (CWD)-affected countries to train a range of coffee stakeholders, especially extension staff, trainers of trainers and farmers.
- A total of 2578 extensionists were trained as trainers and farmer field school (FFS) facilitators.
- Training techniques involved classroom sessions, participatory group discussions, outdoor on-farm practical sessions (hands-on discovery-based learning), group-building exercises, experience sharing by coffee extension staff, and working with farmers.
- In the field, apart from diagnosing and identifying CWD-infected trees, participants discussed and shared with the farmers their perceptions and practices for the control of the disease.
- Extension workers in selected CWD hot spots and those located in the vicinity of on-farm trials were specifically trained on FFS group-extension methodology, in addition to technical training on CWD identification and management.
- Based on the training of trainers work, slightly more than 1 million farmers were trained by extensionists between 2002 and 2007.

14.2 Introduction

The chapter covers work which was carried out to develop a compatible programme of extension, information dissemination and training for smallholder coffee producers.

The chapter reports on activities for evaluating:

- Coffee management and control options for the management of CWD;
- Farmer and extension training;
- Dissemination of information on CWD through a series of methods; and
- A specialist training to build capacity of scientists from participating countries for the identification of CWD pathogen and other *Fusaria* occurring on coffee.

[1] Joseph Stiglitz, Prebisch Lecture 1998.

Phiri N. and Baker, P.S. (2009) *Coffee Wilt in Africa Final Technical Report*. CAB International.

14.3 Training for Extensionists

Training extension workers was a continuous process throughout the programme, and it took different forms. The training was organized in such a way that all the coffee-growing districts of the participating countries were covered. These trainings can be broadly categorized into:

- Training of trainers for extension workers;
- Training of FFS facilitators.

The training programmes were participatory and hands-on, and brought together coffee extensionists, researchers and farmers to provide them with the skills for identification and management of CWD, and to facilitate farmer learning using participatory training and communication approaches.

14.3.1 Training of trainers for extension staff

Training of trainers for extension staff were conducted in two different forms:

- Awareness creation and training for a large number of extension workers;
- Training of carefully selected master trainers.

Awareness training is the first type of training aimed at reaching as many extension workers as possible, who in turn train farmers in their respective operational areas and this was a continuous process that took place throughout the programme. The training attempted to acquaint the participants with issues such as causes, identification, transmission mechanisms, management options of CWD, as well as introduced participatory extension and training approaches, communication and facilitation techniques.

Training of master trainers, on the other hand, focused on carefully selected extension staff, was more detailed and of longer duration. The master trainers were trained with the aim of producing resource persons that could effectively train their colleagues, and keep the CWD activities moving even beyond the lifespan of the project. Apart from acquiring necessary knowledge and skills, they were highly sensitized about CWD and hence had shown interest and commitment to influence planning and policy issues related to CWD management in their respective regions – especially to make an effort to integrate CWD activities in their regular extension activities. Participants of this training programme were equipped with detailed information on CWD including policy issues as well as on other coffee production and protection technologies and participatory training and facilitation skills.

The training of extension workers mainly focused on the following themes:

- Historical background of CWD;
- Overview of the Regional Coffee Wilt Programme (RCWP);
- CWD epidemiology, symptoms identification, and transmission mechanisms;
- Available control/management options;
- Participatory technology development and implementation within farming communities, and other participatory training and extension approaches.

The training techniques involved classroom sessions, participatory group discussions, outdoor practical sessions (hands-on discovery-based learning) in a nearby coffee farm, group-building exercises, experience sharing by coffee extension staff, and working with farmers in real-life situations. In the field, apart from diagnosing and identifying CWD-infected trees, participants discussed and shared with the farmers their perceptions and practices for the control of the disease. In addition, it was an opportunity for the participants to apply some of the newly learnt farmer participatory tools in real-life situations.

Through the technique of open-ended questions, again learnt during the training prior to the field visit, the participants were able to identify the farmers' knowledge gaps in the management of CWD. This was very important for the next step during which the participants would, together with the farmers, set up participatory action research experiments. The participants felt that using those tools encouraged all the participating farmers to contribute openly and ensured their active participation. The use of farmers' own symbols, objects and local terms helped to bridge the gap between the farmers and the participating researchers and extensionists.

Upon completion of the training sessions, the trained extension workers were encouraged to develop action plans regarding how to conduct, and how many farmers to be provided, CWD training. As a result, extensionists went back with remarkable commitment and motivation to transfer what they had learnt about the disease. Assessment and reports show that the trained extension workers have demonstrated impressive performance in training and creating awareness among a large number of farmers and fellow extension workers.

14.3.2 Training of FFS facilitators

Extension workers in selected CWD hot spots and those located in the vicinity of on-farm trials were specifically trained on FFS group extension methodology, in addition to technical training on CWD identification and management. The primary aim of establishing FFSs was to put in place a platform for validating CWD management options that were being tested in the on-station and on-farm trials. The extensionists were further trained on priority-setting techniques and on the ways to comprehend preliminary results from the trials so that they were able to facilitate their FFS groups to make informed decisions on which CWD management options best suited their locations. Finally, the extensionists received training on how to scale up FFSs, including how to convert CWD on-farm trials into FFSs. The trained extensionists also trained their colleagues, which resulted in over 1000 FFS facilitators (Table 14.1). Apart from empowering farmers, the FFS approach indeed substantially built the capacity of extension staff. Above all, it gave an opportunity for farmers, extensionists and researchers to interact as partners in the testing, validation and adaptation of CWD management options.

During the training of FFS facilitators, emphasis was given to the following:

- Aspects of CWD – causes, identification, ways of spread, management options;
- Overview of RCWP;
- Concepts and practices of FFS;
- Development of FFS curriculum, and establishing and running FFS;

Table 14.1: Number of coffee extension workers trained both as trainers and farmer field school (FFS) facilitators in the different countries (2002–2007).

Country	Number of trained extension workers
Ethiopia	1253
Uganda	647
Tanzania	275
Rwanda	155
DR Congo	248
Total	**2578**

Note: The figures given in this table refer to those extension workers that were directly trained by the national project coordination office and CAB International staff. In addition, agricultural development offices of different regions and districts and other institutions trained a large number of extension workers. For instance, in Ethiopia an additional 4569 extension workers were trained on CWD management through the extension workers trained by the project.

- Coffee agroecosystem analysis;
- Adult non-formal education methods;
- Group development and management;
- Data collection, analysis and interpretation;
- Available improved coffee technologies that can be tested and disseminated;
- Participatory technology development, and other participatory learning, facilitation and communication skills.

14.4 Farmer Training

Training and dissemination activities constituted a core component of the RCWP, in view of the low level of awareness among farmers and other stakeholders. Various efforts were made to reach all coffee-growing farmers with relevant information about CWD. Farmers' training primarily focused on awareness creation and developing understanding of causes of coffee wilt, its damage, identification, ways of spread, measures to control it and on the importance of mobilizing neighbours for collective action. Farmers were sensitized and trained in different ways.

14.4.1 Farmer field schools

FFSs were among the prominent approaches used in training farmers and disseminating information on CWD in a participatory manner. Season-long coffee field schools (Table 14.2) were run by the facilitators after they had received technical training on CWD, participatory learning and research approaches, FFS methodology and other relevant issues. The facilitators included CWD management options in the FFS curriculum implemented through monthly meetings at the field school study plots. The FFS curriculum included all aspects of husbandry practices with emphasis on CWD management. In the middle of the season, field days were held to evaluate the performance of the various CWD management options and also to share experiences and results with the wider community and intermediary organizations. During the field

Table 14.2: Coffee wilt disease field schools established in the different countries.

Country	No of FFS groups	Male FFS members	Female FFS members	Total
Tanzania	52			1320
Ethiopia	25	599	51	650
Uganda	10	138	86	224
Rwanda	6			180
DR Congo	44			1320

school season, the facilitators distributed information and dissemination materials to farmers and intermediaries.

The FFS approach provided an opportunity for farmers to learn together and to test, validate and adapt CWD management options and other improved coffee technologies. The groups that were formed subsequently set up study fields and were responsible for their maintenance and experimentation. The FFS participatory group-learning activities promoted farmers' ability to share, gather, analyse and interpret information; to take necessary actions based on the information; and to evaluate the results in ways that would influence the next action by focusing on specific conditions and problems that farmers face in the field.

14.4.1.1 Achievements and benefits of FFS

Farmers were assisted in acquiring the skills of discovery learning in their coffee fields, including development of a crop calendar, curriculum, the running of a season-long FFS, participatory problem solving and other appropriate husbandry practices for improving coffee productivity and quality. In addition to increased awareness for CWD, FFS members learned better coffee husbandry practices, the proof of which is that their coffees are more productive than before FFS and other farmers have started copying improved technologies from the group members.

Researchers provided detailed information on the identified areas and also introduced various improved coffee production technologies. This particularly helped to enhance farmers' knowledge and boost the adoption of improved coffee technologies. Farmers proved that the performance of the coffee in plots where improved technologies and cultural practices were used were superior when compared with the plots that received local practices or technologies. Therefore, observation from the field school led to improvement of coffee in the participants' fields resulting in more household income. In general, through the activities of the FFS, farmers have learnt how to conserve natural enemies, conduct regular field observations and take recordings and interpret the data, and hence have become good crop production experts.

The approach played an important role in encouraging farmers to continuously seek new knowledge and information about CWD and other aspects of coffee production. More importantly, it enhanced the interaction between farmers and other key actors. FFSs have the advantage of being able to reach more farmers at a time than the

traditional extension officer can in several years. FFS group members have shown key interest and commitment to fight CWD. They have already started playing a key role in teaching or diffusing information and technologies and influencing other farmers.

The process has empowered participating farmers and they have become trainers of other farmers, which leads to a magnifier effect. For instance, in Tanzania, members of Manyafubu FFS conducted training in 18 villages and trained 1839 farmers since 2004. They also initiated seven farmer field schools, ten farmer groups and 20 training centres. Similarly, Chabuhora Juhudi FFS members managed to establish another five farmer groups in Nyakakiga division. In a similar manner, in Kitegalwa Kabogele Nabogesi FFS in Bugiri (Uganda) ten participants were involved in training other farmers in over three sub-counties, and Jjongoza FFS in Rakai district trained 460 outgrower farmers from Kaweri Coffee Company Limited.

Some of the groups started additional functions and benefits for their members. For instance, in Ethiopia, one of the groups formed a marketing cooperative and began to be involved in marketing members' produce in a competitive manner. In Uganda, the FFS served as a springboard for community development as farmers begin to look at other aspects of their lives with a view to improving their livelihoods. In their meetings, members discussed not only coffee farming but other issues affecting their lives. For instance, farmers in Rakai hold regular meetings and have taken on activities which comprised visits to families and presentations on special topics conducted by professional guests (lawyers, doctors, social workers, etc.) to handle issues of poverty eradication, loss of land, occupational health hazards associated with pesticide use, family planning, alcoholism, domestic violence and the attendance of children at school, to specific health problems concerned with different diseases such as dengue, malaria, and HIV/AIDS.

These activities assisted farmers in recognizing and analysing the interrelated elements of their lives, in much the same way as they apply their knowledge of ecological concepts to their fields. Moreover, groups are found to be attractive to NGOs that wish to assist farmers market their coffee. Similar to the experience in Ethiopia, more successful FFSs in Uganda also registered themselves with NGOs and were in the process of soliciting loans to improve their coffee production, sales and diversification of enterprise. This has taken place in Bundibugyo district, which obtained the idea from Jjongoza FFS in Rakai district. In the Democratic Republic of Congo (DRC), the FFSs became so effective that the members formed a coffee marketing organization to help themselves sell their coffee abroad directly.

14.4.2 Other training programmes for farmers

In addition to the efforts made through the FFS approach, a large number of coffee farmers were trained by the extension staff trained in the present project. Apart from creating awareness and understanding about CWD, the training sessions equipped farmers with better knowledge of CWD management options. Table 14.3 provides the number of farmers reached through organized training sessions in different countries.

14.4.2.1 Open/field days and exchange visits

Field/open days were organized on the FFS study sites, as well as on research station and on-farm trials. A large number of FFS and non-FFS farmers, extension staff,

Table 14.3: Number of farmers trained by extension workers on coffee wilt disease (CWD) (2002–2007).

Country	Total
Tanzania	26,843
Ethiopia	375,476
Uganda	152,708
Rwanda	4,320
DR Congo	441,489
Total	**1,000,836**

researchers, NGOs, local leaders, government officials and schoolchildren attended the events (Table 14.4). The purpose of the field/open days was to introduce CWD management options and to stimulate the interest of many farmers and other stakeholders as well as to create a situation in which informal contacts could be established and learning could take place. To this end, the events combined demonstrations, comparison and discussions on introduced techniques.

The field school facilitator worked with the host FFS and the local leaders to decide on the dates and the essential details of the open day that included selection of the study plot, the decision on technologies to be shown, division of work and responsibilities and the necessary exhibition and distribution materials. The visitors were taken around the study plot, ensuring that they saw the important points of the demonstrations. The host FFS members explained their experiences and the new technologies that were being compared with farmers' practices at each study plot.

At the end of the study plot tour, the facilitator held a group discussion with the participants about the technologies demonstrated and issues raised. The events offered great opportunity to exchange ideas, views and useful experiences, as well as helped to create awareness and stimulate interest among the neighbouring farmers. They also played an important role in sensitizing officials and policy makers.

Table 14.4: Open/field days organized on farmer field school (FFS) and on-farm trial sites (2004–2007).

Country	Number of events	Total number of attendants
Tanzania	23	20,500
Uganda	8	1,405
Rwanda	6	1,695
DR Congo	5	2,500
Ethiopia	4	5,000
Total	**46**	**31,100**

14.4.2.2 Exchange visits

In addition, exchange visits were organized for innovative farmers, extension workers and researchers to visit other districts and regions to share experiences. The exchange visits were made to areas where there was high incidence of CWD, and this clearly demonstrated the need to pay serious attention to CWD management before huge damage might be incurred. Participating farmers and extension staff were able to see the severity, incidence and damage caused by the disease, the ways in which other farmers dealt with it, experiences of on-farm trial and FFS activities, and coffee production systems and practices in other agro-ecologies. For instance, four exchange visits were organized in Ethiopia and 41 participants (farmers, extension staff and researchers) took part in the programme.

14.5 Awareness Creation and Sensitization for Government Officials, Policy Makers and Other Key Stakeholders

Major awareness creation and sensitization activities were carried out, both at formally organized events and at other available informal forums. Especially, the need to create awareness and sensitizing policy makers and government officials at different levels was frequently raised by the trained extension workers and other stakeholders.

The success of the training activities and continuity of the RCWP efforts to a large extent depended on the perception of the problem and the support provided by government officials and policy makers. To this effect, different local and national workshops were organized to sensitize local and higher-level officials, planners, policy makers, researchers and other key stakeholders. For instance, in Ethiopia, five awareness creation and sensitization workshops were organized and attended by 108 participants. These workshops indeed played an important role in sensitizing and convincing or influencing officials and policy makers, and enabled them to understand the seriousness of the problem and to put the issue of CWD at the top of their agenda and render necessary support and commitment.

As a result, extension agencies of the different countries have started incorporating CWD work in their regular activities. For instance, in Ethiopia, coffee stumping used to be implemented in a quota form and the major concern of the extension workers was fulfilling the assigned quota by indiscriminately stumping as many coffee trees as possible. It is obvious that stumping activities can play a significant role in spreading CWD unless proper care and precautions are taken. As a result of the discussions on the sensitization workshops, officials and policy makers decided to stop the quota system and to undertake stumping activities with all due care.

In DRC, according to the new constitution, there has been decentralization (federal system), and each province has provincial ministers and a local parliament. A meeting with the new Provincial Minister of Agriculture was held in July 2007 and there was a discussion on the integration of CWD management and the improvement of coffee quality and productivity. Additionally, meetings were held with coffee exporters in Beni on 5 December, and Butembo on 6 December 2007. At both meetings, agenda for including CWD management into the whole coffee programme was discussed. CAB International was represented at both meetings. The number of people who attended the meetings at Beni and Butembo was 20 and 30, respectively.

A workshop was also held in Rwanda on 27 August 2007 with the aim of promoting integration of CWD into the activities of the Ministry of Agriculture and Animal Resources. Leaders of areas sharing borders with DRC, Tanzania and Uganda were invited by the director-general of ISAR to participate in the workshop. A total number of 52 persons including one mayor and four mayoral representatives, five agronomists at district levels, 20 executive secretaries and 22 agronomists at sector level, and the director-general of OCIR CAFÉ also participated in the workshop.

Similarly, on 21 May 2003, Tanzania Coffee Research Institute (TaCRI) and a representative from the Ministry of Agriculture and Food Security were invited to attend the Regional Coordinating Committee of Kagera, chaired by the regional commissioner. The meeting was also attended by the regional administrative secretary (RAS), district commissioners, district executive directors, members of parliaments from respective constituents in Kagera region, managers from Cooperative Unions, the secretariat under RAS and other coffee stakeholders in the region. In addition, policy makers were invited during the field days. On 18 November 2006 and 23–24 May 2007 the importance and progress of CWD activities in Kagera region were presented to the workshops organized by the regional commissioner's office, chaired by the regional commissioner to discuss the strategies to improve coffee productivity.

During these forums, CWD was given a high priority to be addressed so that it should not hinder the regional goal of producing the stated amount of coffee per specified period. Both meetings were attended by more than 250 policy makers from all districts in Kagera region. It was noted that the sensitization of policy makers on CWD and its management strategies had brought a big impact in creating awareness against the danger of CWD and its management strategies.

In Tanzania, policy makers subsequently influenced the government to allocate funds that were used for an eradication campaign, training of farmers and extension workers, and sensitizing farmers and village leaders about CWD. Policy makers instructed the government to form task forces for monitoring and supervising institutionalized CWD laws, by-laws and CWD eradication campaigns.

In a similar manner, in Uganda sensitization workshops were held and attended by 342 local leaders (district, and sub-county councillors) and stakeholders in various leadership positions. Since districts are decentralized, it is anticipated that sensitization of leaders will ease the problem of enacting and enforcing by-laws on various issues affecting coffee production and quality improvement. Moreover, a national policy makers' workshop was organized on 14 December 2006 with the aim of encouraging participants to make policy recommendations for incorporation of CWD into ministry activities. A cross-section of people (86) attended the meeting from district officials, including permanent secretaries or their representatives, and some farmers. The two Ministers of Agriculture, Animal Industry and Fisheries (MAAIF), Mr Hillary Onek and Dr I. Kibirige Sebunya attended the workshop. Although at the meeting it was felt that CWD was a serious problem, a decision was made that a general policy or policies comprising diseases additional to CWD need to be considered. A committee of ten people to be chaired by Dr Fina Opio, then Director of the National Crops Resources Research Institute (NaCRRI), to further consider the issue and make recommendations to the Minister, was proposed.

Awareness creation activities also targeted schoolchildren, as they play an important role in coffee production activities. Agricultural teachers drawn from different primary

and secondary schools were invited to the training sessions held for extension workers. The trained teachers were also given different dissemination materials such as posters, leaflets and exercise books to assist them in raising awareness among their students. Moreover, schoolchildren were also invited to take part in field days. In addition, lectures and seminars were given at higher agricultural learning institutions on CWD by researchers and senior students.

14.6 Country Experiences, Uganda

14.6.1 Training of trainers

The need for information on the management of CWD and the dissemination of this information has been high. In order for farmers and extensionists to manage the disease, they needed information gathered from research. Lack of information at the beginning allowed the disease to spread rapidly. As information became available, there was a need to increase information flow between farmers, researchers and the extension systems in order to manage the disease more effectively.

Under the CFC-funded project, Coffee Research Institute at Kituza together with their partners CABI, conducted a Training of Trainers in some disease recognition and management based on available information. Coffee Research Institute in conjunction with CAB International Africa trained 75 extension staff of the MAAIF and an additional 25 extensionists belonging to National Union of Coffee Agribusinesses and Farm Enterprises (NUCAFE), coming from all coffee-growing regions including Arabica areas, and from those areas still free from the disease. These latter groups were trained in the recognition of the disease symptoms to allow early detection of the disease, and hence to improve surveillance. This is crucial for a quick response to enable effective control to be applied before the disease is widespread. These extensionists now form a basis for farmer training on CWD management.

14.6.2 Participation of leaders in the CWD control programme

Under the decentralized system of governance, the districts operate as small units with power to formulate and implement policies affecting their areas and to recommend to the central government issues, which require new legislations. It was observed that leaders in the districts would be useful partners in the campaign against CWD and therefore should be sensitized about the problem. The aim of sensitization was for them to appreciate the magnitude of the problem and its effect on the coffee farmers and the local communities in general. It was also essential to enlist their participation in sensitization and mobilization of farmers to try to manage the disease particularly where by-laws are required. Successful sensitization workshops for local leaders have been carried out in ten districts to date and are ongoing and have allowed them to influence their respective communities and mobilize and sensitize farmers effectively.

14.6.3 Information dissemination

14.6.3.1 Through mass media

Radio programmes in Luganda for farmers and other stakeholders go on air every Sunday morning at 8.30 a.m. by Uganda Coffee Development Authority (UCDA) on

Radio Simba/CBS. Information on all aspects of coffee production, crop protection, in particular CWD, and coffee trade is covered in the programme. The programmes have been sustained for over 2 years now, covering about 30,000 listeners each time the programme goes on air.

14.6.3.2 Farmer field schools approach to information dissemination

The traditional extension service is where the service provider or extension worker is the messenger between research and farmer (Ladela, 2001). The farmer is the passive recipient of this information of which he has never taken part in its generation, consequently many good recommendations have never been adopted. However, farmers are known to possess a lot of information, which they have acquired over time through experience (Marsden, 1994). Farmers, too, have the ability to analyse situations and make rational decisions.

Information dissemination through the traditional extension system is very slow as the number of extension workers is quite low compared to the number of farmers, whom they deal with one by one. To enhance farmers' ability and to accelerate information dissemination, a FFS approach was initiated. Through these participatory approaches, farmers work in groups and have the advantage of learning from each other as they share information. In an FFS, farmers make regular field observations, relate their observations to the ecosystem and apply their previous experience and any new information to make management decisions on their crop, guided by the extension worker.

A coffee FFS follows the production cycle of the crop. It consists of a group, usually 20–30 farmers, who set up a study field. The group is responsible for the care and maintenance of the study field from soil preparation to harvesting and post harvest. Such schools have been started in Bugiri, Kayunga, Mukono, Kiboga, Masaka and Rakai districts. Each of these districts has at least two active field schools. Information dissemination through FFS has been so successful, through open field days hosted by these farmers, so that in all the six districts, extension workers who have been on this coffee programme are now using the approach for other crops and commodities.

The farmers are involved in training other farmers, for instance the field school in Rakai (Jjongeza Coffee Farmer Field School) trained over 500 outgrower farmers of Kaweri Coffee Company in CWD management and other good agricultural practices in 2006.

The creation of more FFSs will greatly enhance farmers' knowledge and give a chance for the majority of farmers to get the much needed production information, within a relatively short time.

14.7 Country Experiences, Tanzania

As a part of the programme, an awareness campaign was initiated which involved CWD training for 5659 growers and 192 extension staff in Kagera, and 171 in non-CWD areas. Training encompasses symptoms identification, safe handling, and destroying diseased Robusta trees to minimize further spread. This was complemented by publication of articles in newspapers, radio and local TV in Kagera

region, and the publication of posters and leaflets alerting stakeholders (particularly farmers) to the threat from the disease. Approximately 1622 posters and leaflets have been distributed.

14.7.1 FFSs and participatory groups

Twenty-three groups have been formulated in CWD hot spots. The groups meet once a month and farmers have an opportunity to share their experiences in managing CWD. It is expected that knowledge of disease management will be disseminated to some other farmers. TaCRI has an innovative approach of participatory extension working with extension staff and farmer groups. This has assisted highly in the dissemination of technologies in minimizing the effect of CWD and boosting coffee production in the region. There are 23 participatory groups in Bukoba and Misenyi, 16 in Karagwe and 13 in Muleba. An excellent example of farmer-to-farmer extension is exemplified by Chabuhora which had 30 participants and formulated five groups for training other farmers. This shows how a participatory approach through farmer-to-farmer contact, extension workers and researchers is effective in the diffusion of coffee husbandry practices. Manyafubu is another good example of a participatory farmer approach. The group has 25 members (13 men and 12 women) and was formed in March 2004. It conducted training to allow farmers to identify Robusta trees infected with CWD, and attempted to minimize spread through an eradication campaign. To date, the group has conducted training in 18 villages in Bugabo Division and 1839 farmers including village leaders and ward representatives have been trained. Seven FFSs have been initiated, and ten farmer groups formed in 20 training centres.

14.7.2 Open/field days

On 24 September 2004, TaCRI instituted an open day at Maruku. The major emphasis was to stress the threat of CWD, its impact on livelihoods and initial steps to consider how to contain its further spread to new areas. More that 500 participants from all levels attended. Since then 23 field days have been conducted in CWD-infested areas in Kagera.

14.7.3 Sensitization of policy makers

Policy maker forums were used to disseminate information on CWD. For example, on 22 May 2003, TaCRI and representatives from the Ministry of Agriculture and Food Security were invited to attend a meeting of the Regional Coordinating Committee of Kagera, chaired by the then Regional Commissioner Major General Tumainiel Kiwelu. Highlights and strategies on management of CWD were presented. The meeting had significant impact on policy makers, who supported the eradication programme and training of extension workers and farmers using funds from district councils.

14.7.4 Prioritizing CWD research programmes

In 2003, TaCRI formulated its five-year Strategic Action Plan (SAP) 2003–2008, whose vision is contributing to the transformation of the Tanzanian Coffee Industry to sustainable prosperity with a major goal of creating a profitable and sustainable coffee industry in Tanzania. The vision of TaCRI is in line with the Agriculture Vision and the Tanzania Development Vision 2025. In this SAP, CWD has been given a high priority.

Since 2003, TaCRI has been addressing CWD by screening Robusta germplasm present at Maruku and facilitating eradication and training programmes at village levels.

14.8 Country Experiences, Ethiopia

14.8.1 Training and information dissemination on CWD management

As a large number of coffee farmers (>85%) were not aware of CWD prior to the RCWP, priority was given to training extension agents who in turn trained coffee farmers about the disease. The training courses included diagnosis and identification of CWD-infected trees based on symptoms and signs of the pathogen, transmission or spread mechanisms and control methods.

Because of the great diversity of smallholder coffee-farming conditions in Ethiopia, operating under many different socio-cultural, economic and natural conditions, a wide range of communication channels was employed. This included different types of publicity materials such as leaflets, brochures, manuals, posters, wall calendars, T-shirts, caps and stickers, with brief CWD information, which were produced and disseminated to almost all coffee stakeholders in the country. Exercise books describing CWD were provided to school students in the vicinity of most of the affected areas. There have been publications in newspapers and bulletins, and broadcasts on TV and radio (national and local FM) notifying farmers of CWD prevention and control. Efforts were made to raise awareness and sensitize policy or decision makers at various levels via conferences and national workshops.

In view of the absence of a comprehensive package of solutions for the CWD problem, the project emphasized joint learning processes and sharing of information and experiences among relevant stakeholders. Participatory on-station and on-farm trials and season-long FFSs on CWD management practices were conducted and farmer field days were organized to popularize promising results of the trials to coffee farmers in highly affected districts (weredas) in south and south-west Ethiopia.

14.8.2 Communication strategies and channels employed

14.8.2.1 Training of trainers for extension workers

Efforts were made to train a large number of extension workers drawn from the agricultural development offices of various coffee-growing areas of Ethiopia, who, in turn, trained farmers and their colleagues. The trainings covered technical aspects of CWD including its identification, cause, mechanisms of spread and control methods. The extensionists were also equipped with proper methods for training farmers such as adult learning principles, communication, facilitation skills and participatory training methodologies. The training sessions were characterized by active participation by the trainees and hands-on exercises. The training methodologies included interactive and brief lectures, brainstorming, buzz and large group discussions and presentations, videos of practical evidence, question and answer sessions, field practical, case studies and other exercises. Participants were given an opportunity to identify diseased trees, demonstrate control measures, and how to train farmers in the field. In addition, during later programmes some of the previously trained extension workers were invited to the training sessions to share their experiences, efforts made and challenges

encountered in the course of information transfer and in implementing the acquired knowledge. In total, over 6000 extension staff received the training conducted by senior staff of the project-implementing agencies (Jimma Agricultural Research Centre (JARC) and CAB International Africa) in collaboration with the agricultural and rural development offices. The training covered five regional states, 30 zones and 93 coffee-producing districts. Extension workers trained by the project staff also played an active role in training their colleagues in offices and those based in the field. During each training session, comprehensive handouts, posters, booklet and leaflets were prepared and given to participants. These were intended to help them remember the training messages and to effectively pass on the information to their fellow workers and farmers.

14.8.2.2 Training of farmers

At the end of each training session, the trained extension workers were encouraged to develop action plans to carry out training programmes for farmers in their respective operational areas. Through successive training programmes and various awareness creation forums, the trained extension workers made efforts to reach all farmers under their supervision. Farmers' training focused on awareness creation about the disease: its damage, identification, ways of spread, measures to control it and on the importance of mobilizing neighbours for collective action and integration of local by-laws to combat CWD. Some of the farmer training sessions were provided by the JARC and CAB International Africa staff directly, though most were covered by the local extension staff after being trained. In general, the trained extension workers showed remarkable commitment to reach as large a number of farmers as possible through all available means. Reports communicated to JARC indicated that close to half a million farmers received direct training in CWD management. Though it was not possible to obtain the exact figures, informal assessment and communication shows that a considerable number of farmers and extension workers were made aware about the disease through various forums. It was also expected that there would be a trickle-down and multiplier effect of information from the trained farmers.

14.8.2.3 Training of master trainers (resource persons)

Towards the end of the project, the critical need to strongly build the capacity of selected government staff to serve as resource persons was realized. To this effect, a comprehensive training of trainers for selected coffee and crop protection experts drawn from regional, zonal and district agricultural and rural development offices was conducted. This training was different from the other 'Training of Trainers' courses conducted for extension workers in several aspects, including educational level of the trainees, content, intensity and length of the training course. The master trainees are expected to serve as resource persons for their respective regions and play crucial roles in the continuation of the training and information dissemination activities. They also offer advice and support on issues related to CWD. Therefore, a 10-day intensive and comprehensive training programme was organized for 20 participants drawn from the major coffee-growing regions. The trainees were carefully selected by considering their performance, experience and educational background. During the training workshop, a number of areas related to coffee production and protection in general and on CWD in particular were presented and discussed in detail. Moreover, relevant areas such as extension, communication, adult education, facilitation and participatory training methodologies were addressed. In addition to classroom presentations,

extensive field and laboratory demonstration activities and practical exercises were carried out. Finally, participants were encouraged to make policy analysis and recommendations in relation to CWD management. Thereafter they shared responsibilities to communicate these policy recommendations to their respective regions and influence higher officials in favour of CWD management.

14.8.2.4 Participatory technology development to identify and validate CWD management options

Participatory on-farm trials were implemented for 3 years in different zones of Jimma (south-west Ethiopia), Gedeo and Sidama (southern Ethiopia). The field trials enabled farmers to test and validate different CWD management options jointly with extension workers and researchers, as well as enhanced farmers' experimentation capacity. The steps followed in the participatory technology development process can be summarized as follows:

- Holding comprehensive stakeholders' (farmers, extension workers and researchers) training on causes, symptoms, transmission mechanisms and control measures of CWD as well as on concepts of on-farm experiment, field trial design and implementation.
- Identification of local and scientific knowledge in relation to CWD management.
- Determining trial design and implementation (treatment application).
- Regular monitoring and data recording.
- Setting criteria and joint evaluation by farmers, extension workers and researchers.
- Sharing results through workshops, field days and exchange visits.
- Scaling out the promising ones through FFS and other mechanisms.

Based on the knowledge and experiences of local farmers, extension workers and researchers, as well as by considering experiences from other countries, seven management options (treatments) were identified during the workshop. Each treatment was applied on a plot with 15 coffee trees and the treatments were replicated across farmers. The various treatments and their applications are as follows:

- Use of ash: Applying 2l per tree once per annum.
- Mulch: Applying once per annum at the end of the rainy reason, preferably in October.
- Fungicide (copper) spray: Applying once per month during the rainy season and just once every 3 months during the dry season. It is mixed at the rate of 40 g/l of water.
- Fungicide (copper) stem paint: Painting the stem of a coffee tree up to 50 cm above the ground level every 4 months at 300 g of 75% WP copper formulation per litre.
- Herbicide (Roundup): Roundup 150 ml/l water, spray as needed, based on weed condition.
- Slashing plus hand weeding: Weeding with hand around the coffee tree and slashing the other parts as needed, based on weed condition.
- Slashing (control): Slashing the whole plot as needed.

After 3 years of running the trials, workshops were organized with the objective of reviewing the results of the field trials and to select those methods that can be taken to the FFS study fields (Section 14.4.1). In attendance were FFS and field trial-hosting farmers and facilitators as well as other extension staff at different levels and

researchers. Researchers presented the results of the field trials during the workshop. On-farm trial-hosting farmers and facilitating extension workers were also encouraged to share their observations and experiences. The participants were given an opportunity to visit the field trials and evaluate the performance and effectiveness of the different treatments. Then they were guided to set criteria against which to evaluate and choose the best CWD management options (Chapter 12).

After running for 3 years, some of the on-farm trials, especially those which were far away from existing FFSs, were converted into FFS study sites. These helped to sustain the field trial efforts as well as to disseminate the preliminary findings from the field trials. It also enabled the utilization and/or sharing of the knowledge and experiences of field trial-hosting farmers.

14.8.3 Ethiopian FFSs

FFSs have been used as an important participatory training and information dissemination tool for CWD management. FFS is a participatory training approach that can be considered both as an extension tool and a form of adult education (David *et al.*, 2006). The approach focuses on building farmers' capacity to make well-informed crop management decisions through increased knowledge and understanding of the agroecosystem. On the basis of this knowledge, farmers become independent, confident decision makers and experts in their own fields (Van de Fliert, 1993). The training is 'hands-on' and is carried out almost entirely in the field. The approach provides opportunity for learning-by-doing, through observation, discussion and interaction among participating farmers. Extension workers or trained farmers facilitate the learning process, encouraging farmers to discover key agro-ecological concepts and develop integrated pest management (IPM) skills through self-discovery activities practised in the field (Ooi, 1996). More importantly, it gives an opportunity for farmers, extension workers and researchers to interact as partners in the development of IPM options. The four major principles of IPM emphasized by FFS are:

- Grow a healthy crop.
- Conduct regular field observations.
- Conserve natural enemies of crop pests.
- Farmers become IPM experts.

14.8.3.1 Implementation of FFS under the RCWP in Ethiopia

The FFS implementation concentrated on areas with high incidence of CWD such as Gedeo, Jimma and Sidama zones. Apart from serving as a participatory learning platform, the FFS was also used as dissemination pathways for the results of the field trials (see Section 14.4.1). Initially, three pilot FFSs were established in 2004, with an additional 21 FFS groups being formed in 2005 and 2006 in southern and south-western Ethiopia. Some of the lately formed groups emerged from the on-farm field trials.

During the application of FFS approach to coffee, which is a perennial tree crop, some of the processes required changes and adaptations to the original FFS concepts to fit the local conditions and the crop under consideration. The ground work, formation and implementation of the FFS groups went through a number of processes and modifications.

14.8.3.2 Training of facilitators and curriculum development

One of the areas where modification was made is training of FFS facilitators. Initially, a 4-day intensive training workshop was held for FFS facilitators (mainly extension workers) to introduce concepts and practices of the FFS approach, adult education, group processes and management, communication and facilitation techniques. The technical training on CWD management was addressed in a separate session prior to the training of facilitators. Moreover, technical skills were further developed in the course of actual implementation of the FFS activities. Efforts were also made to enhance facilitators' knowledge and skills through the provision of regular backstops, refresher courses and experience-sharing workshops. At the end of the facilitators' training workshop, participants moved out to the field and developed a tentative curriculum for the FFS activities together with farmers, which basically follows the crop cycle or calendar. Although it primarily focused on IPM in relation to CWD, the curriculum tried to address a broad range of coffee management practices. The curriculum was flexible and regularly updated by FFS members to fit to local situations.

14.8.3.3 Community mobilization, FFS group formation and selection of study field

In general, FFS consists of groups of people with a common interest, who get together on a regular basis to study the '*how and why*' of a particular topic (Gallagher, 2003). To establish FFS groups, the trained facilitators went back to their operational areas and held a village assembly and briefed the community about the project, aspects of CWD, as well as explained the objectives and concepts of FFS. Then volunteers were asked to be members of a FFS group, and about 25–30 coffee farmers were registered. The selection of farmers considered interest, acceptance among the community, proximity to each other and to the study plot. Local officials, extension workers, and farmers' representatives also played a role in the selection process.

One of the important components of FFS is the study field, which serves as a training site, and experimental laboratories where participating farmers make observations, pursue discovery-based learning and experiment with various farming techniques. One of the modifications made is in terms of plot size and crop stage. The study field, which in this case was about 0.5 ha of already established coffee farm, was provided by a group member. The criteria used in selecting the study field were: accessibility to most members, proximity to the field trials (as they are expected to be a dissemination pathway for the results), trees that were relatively young and poorly managed to allow quick and clear responses to the different management practices, uniformity among trees, and occurrence of CWD in the area. The selected study field was divided into two parts: coffee in one half received the farmers' conventional practices, while the other plot received improved management practices. This allowed farmers to compare the performance of the different management practices. The improved crop and pest management practices were determined jointly by researchers and extensionists and tested by farmers. Due to clear differences in the effects of the improved practices on the incidence of CWD as well as on the performance of the coffee, farmers were convinced to try the improved practices and technologies on their own farms.

14.8.3.4 Regular meetings, facilitation and length of the group activity

Another area that required adaptation was frequency of meeting and length of the group activity. In its original form, developed for rice farming in Asia, FFS is a

season-long activity with a weekly regular meeting. However, in view of the perennial nature of the coffee crop and its slow response to treatments, the CWD FFS were designed to operate for 2–3 years. Most of the groups preferred to hold their regular meeting monthly, while some, especially those established towards the end of the project, decided to meet fortnightly. The meeting has been taking place in the morning between 8:30 a.m. and 12:00 p.m.

All the RCWP FFS groups in Ethiopia have been facilitated by trained extension workers, with support from experienced farmers and researchers. It was realized that the facilitator's role and attitude are key factors in determining the success of an FFS. His or her duties included serving as a catalyst, encouraging analysis, setting standards, posing questions and concerns, paying attention to group dynamics, serving as a mediator and encouraging participants to ask questions and come to their own conclusion (Braun *et al*., 2000). In short, the role of the extension workers is facilitating the learning, experimentation and reflection processes. However, it was noticed that facilitators often tend to teach the group members in a traditional top-down way rather than encouraging them to interact, explore, discover and learn by their own. Efforts to address this problem were made through frequent follow-ups and support by experienced project staff. Moreover, as they gained experience in running the groups, and through refresher courses and interaction with other facilitators, trainers started to improve their facilitation skills.

14.8.3.5 Why and how to conduct agroecosystem analysis

The cornerstone of the FFS methodology is agroecosystem analysis (AESA), which involves regular and systematic observation of the crop and fields. FFS knowledge generation and dissemination is basically through agro-ecological system analysis, which is a discovery learning process. The AESA process sharpens farmers' skills in the areas of observation and decision making, and helps develop their powers of critical thinking (Gallagher, 2003). During the meeting, the group was divided into small groups of five that undertook agroecosystem analysis. This involves field observations, analysis, discussion and presentations. Aspects of the agroecosystem that were observed and analysed include growth stage of the coffee tree, occurrence and incidence of CWD and other diseases, insect pests, natural enemies, weeds, weather, soil, moisture and shade conditions. Modifications made to AESA in the CWD FFS were both in terms of frequency of observation (which was in this case fortnightly and monthly) and observation of the plant itself. Observation of some of the parts such as the root system was not possible, so effort was made to make observation of the complete canopy. After conducting observation of the entire parts of the two plots, the groups had to randomly choose three coffee trees from each plot and make close observation, record and drawing. The members discuss the recommendations of the small groups and take appropriate management decisions.

14.8.3.6 The importance of special topics

The special topic is the one that participants want to learn more about. The facilitators encouraged members of FFS groups to continuously identify special topics of interest to them. The topics were then addressed either by facilitators providing information on these topics, engaging farmers in appropriate discovery learning exercises or, in most cases, inviting researchers to attend meetings to cover the topics. Researchers provided detailed information on the identified areas and sometimes introduced various

improved coffee production technologies. This particularly helped to enhance farmers' knowledge and boost adoption of improved coffee technologies. Improved coffee management practices and associated technologies applied on the improved study plot and as special topics included:

- Pruning, stumping and sucker control;
- Shade management;
- Proper intercropping practices – coffee with haricot bean or *enset*;
- Proper weeding and hoeing;
- Use of mulch;
- Planting leguminous crops, such as *Desmodium* sp.;
- Compost preparation and application;
- Proper harvesting (selective picking of fully matured beans);
- Soil and moisture conservation techniques;
- Proper use of chemicals such as fungicides and herbicides.

14.8.3.7 Achievements and successes of CWD FFS in Ethiopia

The participatory, practical and flexible nature of the FFS approach was appreciated by participating farmers and created motivation and enthusiasm to seek further information and knowledge. In general, the group-learning exercises enhanced farmers' awareness and knowledge about CWD. They have become experts in CWD diagnosis, and are able to easily identify CWD from other diseases such as root-rot, and tree death due to exhaustion and overbearing dieback. The process developed their critical thinking and experimental capacity. Members of the groups have fully realized how improved management practices increased tree vigour and yield, and thus they have started practising on their own farms what they have learnt during the group-learning activities. The process thus enhanced adoption of various improved coffee production practices. Moreover, group work helped farmers to cooperate in uprooting and burning infected coffee trees. The experience-sharing process also created interest among other neighbouring farmers to obtain new information and technologies. Thus, it has been proved that FFS groups can be promising dissemination pathways for information related to CWD in particular, and for improved coffee technologies in general. Involvement in the implementation of FFS activities provided an opportunity for extension workers to develop their technical knowledge and facilitation skills. Moreover, the process created better interactions and improved linkage among farmers, extension workers and researchers.

Another significant contribution of the approach was that one of the groups in Gera district of Jimma zone has already converted into a more permanent group that can cater for other issues. The group submitted an application to the local cooperative development office with the assistance of the facilitator. They got registered as a marketing cooperative, secured a loan of 500,000 Eth Birr and started collecting and selling members' coffee directly at the central market in Addis Ababa. During the second year, the group started purchasing other farm products in addition to coffee. Above all, the FFS process produced motivated and committed farmers who have already started making remarkable efforts to inform, teach and change other farmers. The FFS activities extend beyond the members of the FFS groups. After some suspicion in the initial stages, the FFS approach has been well received by farmers and the extension agency and now there is interest and demand for creation of more FFS groups.

14.8.3.8 Challenges and limitations of FFS in Ethiopia

The application of the FFS approach to tree crops such as coffee and the FFS approach in general is relatively new in Ethiopia. This somehow initially caused suspicion about the effectiveness of the approach and lack of experience in facilitating the learning process. There was a tendency among facilitators to teach farmers in a traditional top-down way, especially in the early stages, but this was gradually improved through mentoring, continuous backstopping and experience sharing. Apart from efforts to improve facilitation and technical skills of the extension workers, there was a clear need for change of attitude and mindset. In addition, due to lack of experience among facilitators, the use of group dynamics exercises and icebreakers during FFS meetings was minimal. High turnover of the trained and experienced facilitators negatively affected the group activities at some of the locations, with processes being slowed as new facilitators had to be trained before they started. There was also a tendency to prepare and present AESA predominantly in writing rather than in drawing, which limits involvement of illiterate farmers.

Sometimes the process posed challenges to facilitators and researchers as farmers started coming up with certain puzzling questions and comments for which they did not have ready answers. This in fact triggered further learning, information seeking and research on the part of facilitators and researchers. Lack of appropriate coffee technologies to satisfy demands of farmers in some agro-ecological areas such as Gedeo and Sidama zones was a major challenge. Another major challenge was meeting the demand for inputs such as herbicides (to control noxious coffee weeds), seeds of cover crops such as *Desmodium* sp. (for farmers' own coffee fields), etc. Moreover, lack of effective CWD-control methods such as resistant varieties or chemicals and the laboriousness and ineffectiveness of the recommended uprooting and burning practices were also among the challenges encountered in the process. The perennial nature of the crop also made change and impact slow. In other words, it takes a long time to see impacts of the improved management practices. Another limitation was the low attendance of members during harvesting seasons in some of the districts.

14.8.3.9 Awareness creation, sensitization and experience-sharing workshops and seminars

In view of the low level of awareness about CWD among different stakeholders, mass awareness creation and sensitization activities were carried out both at formally organized events and at all available informal forums. Especially, the need to create awareness and to sensitize officials at different levels was frequently raised, especially by the trained extension workers. The success of the training activities and the continuity of the efforts largely depend on the attitude held and support rendered by these officials, so their understanding was critical. As a response to this concern, workshops were initially organized for district and zonal administrators and heads of agricultural development offices at four locations of the major coffee-growing areas. The aim of the workshop was creating awareness regarding CWD, the magnitude of the problem and consequences, and briefing on overall project activities. The sessions involved introductory presentations and discussions followed by field visits to severely affected areas. In addition, national workshops were organized for higher officials, researchers, planners, policy makers and other actors. The sensitization and awareness creation activities indeed played an important role in convincing and influencing officials and policy makers. Awareness-raising helped them to understand the seriousness of

the problem, to put the issue of CWD at the top of their agenda and render necessary support and commitment. For instance, coffee stumping[2] used to be implemented in a quota form and the major concern of the extension workers was fulfilling the assigned quota by indiscriminately stumping as many coffee trees as possible. However, it is obvious that stumping activities can play a significant role in spreading CWD unless proper care and precautions are taken. As a result of the discussions on the sensitization workshops, officials and policy makers decided to stop the quota system and to undertake stumping activities with all necessary care.

In addition to the locally and nationally held workshops, researchers and project implementers attended various workshops and conferences and shared their experiences and findings with other development actors and scientists. Moreover, farmers, extension staff, researchers and other partners drawn from different countries took part in the annual regional workshops organized by the RCWP. These helped to exchange views, information and experience among participants of different countries.

Awareness-raising activities were also targeted at schoolchildren as they play an important role in the coffee sector in Ethiopia. Their contribution is especially prominent in coffee weeding, harvesting and marketing. Children play a crucial role in informing and educating their parents about new developments such as incidence of diseases, new technologies, etc. Conscious of their pivotal role, the project produced exercise books with illustrations, descriptions of the disease and control measures, and distributed these to schoolchildren. To further harness this potential, agricultural teachers of different primary and secondary schools were invited to the training sessions held for extension workers. The trained teachers went back and created awareness among their students. They were also given a large number of leaflets and posters to distribute to their students. Schoolchildren were also invited to take part in field days. In addition, lectures and seminars on CWD were given at higher agricultural learning institutions by researchers and senior students.

14.8.4 Field/open days and exchange visits

Field days were organized at some of the FFS study sites, on research stations and on-farm field trials, and a large number of stakeholders attended the events. In total, over 5000 stakeholders (farmers, extension staff, researchers, local officials and schoolchildren) took part in the field days organized by the project in different parts of Ethiopia. During the events, efforts were made to create an atmosphere in which visiting farmers can inspect, inquire, question, interact and get to know what has been done and the outcome. The hosting farmers played an active part in running the field days by explaining their experiences. The events offered great opportunity to exchange ideas, views and useful experiences, as well as helped to create awareness and to stimulate the interests of other farmers. They also played an important role in sensitizing officials and policy makers.

In addition, exchange visits were organized for innovative farmers, extension workers and researchers to visit other districts and regions to share experiences. The exchange visits were made to areas where there was a high incidence of CWD and

[2] Stumping is a rejuvenation technique whereby the stem of an old coffee tree is cut at 30–45 cm height above the ground, at a 45° angle.

this clearly demonstrated the need to pay serious attention to CWD control before huge damage has been incurred. Participating farmers and extension staff were able to see the severity, incidence and damage caused by the disease, the ways in which other farmers deal with the disease, the coffee production systems and the practices in other agro-ecologies. It was also noted that based on the experiences they gained from the project, different regional states and districts started organizing field days and exchange visits for their farmers, extension staff and officials.

14.9 Conclusions

The RCWP made a major effort to inform and train farmers and extension staff in a participatory fashion. Over 2000 extensionists were trained and they in turn trained over 1 million farmers.

Much more needs to be done, however, including awareness training in countries bordering those currently suffering from this disease. Regrettably though, extension services everywhere are weak due to the secular decline in public support for agriculture and commodities. If coffee in Africa is to resurge from its current state of decline, extension services will have to be greatly strengthened, and programmes such as those described above become routine rather than exceptions.