

The experiential learning cycle and its application towards the transformation of governmental extension services in sub-Saharan Africa

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This article focuses on the use of the experiential learning cycle in the training of staff within the governmental extension services of sub-Saharan Africa. It starts with reference to a project in Ethiopia in which the experiential learning cycle was employed in a sequential training of trainers within the Extension Division of the Ministry of Agriculture. The project involved the use of participatory approaches and gender analysis in ensuring that the extension services became more client-oriented with particular reference to women. The project objectives, training process and the complementarity between the use of participatory rural appraisal (PRA) and the experiential learning cycle are examined. Outcomes of the project in relation to experiential learning, as well as the enabling and constraining factors to the process, are reviewed. From this specific case, a more general analysis is drawn concerning the changing role of the extension worker and the consequent changes needed in both content and style of change agent training. It is suggested that experiential learning forms the basis of new extension approaches being taken up world-wide such as participatory technology development and farmer-based extension. The decentralization of extension services which is becoming more and more an issue in sub-Saharan Africa provides an opportunity for farmers to take 'centre-stage' and for farmers, agricultural research and extension to work together in partnership. The congruence between experiential learning and participatory approaches involved in this partnership can contribute to the transformation of 'top-down' extension services to those supporting sustainable and farmer based development.

Introduction

The informal adult education provided to farmers in the African continent through governmental agricultural extension services is all too often characterized by being 'top-down', male-dominated and gender blind (Axinn 1997: 19-20). Extension workers, many of whom are male, seek to transfer technological messages developed in research stations to male heads of farming households. Both female and male staff tend to bypass farming wives and to a large extent female-headed households (FAO 1993: 20, 36, Young 1993: 61). In many instances this has a negative impact on women (Jacobson 1992, Young 1993: 50-51). Yet women's increasingly recognized role in agricultural production is becoming more and more significant throughout Africa. This can be attributed to several factors including an increase in *de jure* and *de facto* female headed households through war, migration and erosion of cultural and religious traditions (Young 1993: 58-59, FAO 1993: 4). Whilst women's role in production increases, there

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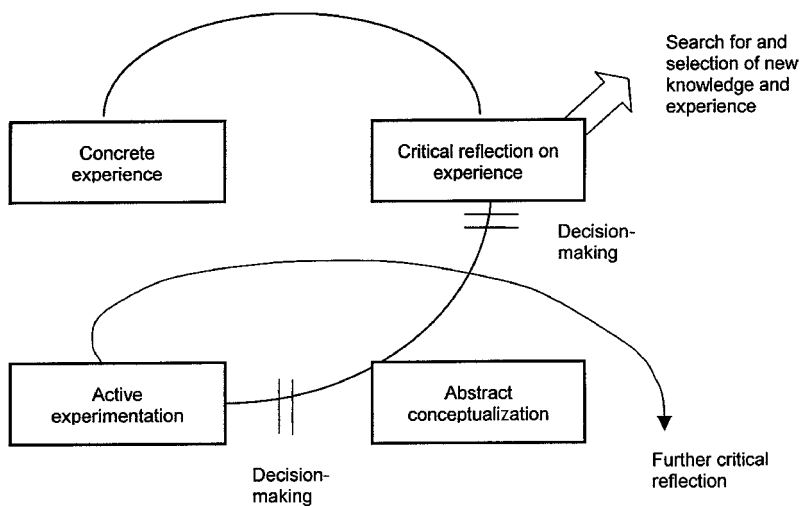
is at the same time more and more emphasis in many sub-Saharan economies on the need to attain food security. Governmental extension services with their aims to increase agricultural productivity and the standard of living of rural people are seen to be one of the keys to achieving this goal. However, if women farmers are neglected by these extension services, the goal may well be unattainable.

One way to ensure that agricultural extension reaches women farmers is to train extension staff in the use of participatory approaches and gender analysis in extension planning. This article first analyses the process of training extension staff in these topics through the employment of the experiential learning cycle with particular reference to an FAO/Ministry of Agriculture project in Ethiopia. The complementarity between the use of participatory approaches and the experiential learning cycle (ELC) is examined, as are the outcomes of the project process including the factors contributing to these. Special reference is made to gender aspects, reflecting the objectives of the project. Subsequently, lessons are drawn from the case with regard to both the evolving role of extension workers and the consequent changes needed in the content and style of their training. The article ends by referring to the ways in which governmental extension services can, and are, being transformed further and how this allows for greater congruence with the process of experiential learning.

The experiential learning cycle

Prior to examining the Ethiopian case it may be useful to clarify what is meant by the 'experiential learning cycle'. According to Kolb (cited in Rogers 1992: 14) the cycle has four stages: concrete experience followed by reflexive observation, followed by abstract conceptualization, followed by active experimentation. An adaptation of this in relation to participatory technology development is put forward by Lammerinck and deZeeuw (in Veldhuizen *et al.* 1997: 11–12) with the following stages: orientation, generation of experience, reflection, conceptualizing and formulating learning, focused learning activities, integration and translation to the work situation. Meanwhile Henderson (1989: 8) describes it simply as an ongoing cycle of experiencing – sharing – interpreting – generalizing – applying and back to experiencing. Lastly, in relation more to management than education, Handy (quoted in Ball 1991) views it as a cycle of experimentation – questioning – thinking – testing. Rogers (1996b) analyses the experiential learning cycle and points out that for abstract conceptualization to take place, there is a need to search for and select new knowledge and experience during the critical reflection stage of the cycle. This selection involves decision-making, which also has to take place at other stages in the cycle as indicated in figure 1. The cycle often involves a series of mini-cycles as will be seen in the Ethiopian case.

The ELC, as the name implies, is learner- rather than teacher-centred. It is quite different to the widespread and conventional education approaches involving transfer of information. Whereas conventional training starts off with new knowledge being 'passed on' to the learner, the ELC approach begins with the learners' experience, and provides a situation in which learners 'learn how to learn' through assessing new knowledge and experience in the light of their own experience and practice and drawing lessons from this. The contrast between conventional training and experiential learning is further discussed later in this article in relation to the training of agricultural extension workers.



Rogers (1996b:109)

Figure 1. The experiential learning cycle.

An introduction to the project

The ‘Improving client-oriented extension training’ project took place in the Extension Division of the Ministry of Agriculture in Ethiopia from 1994–1996. The project’s first objective was to improve the capability of staff to design and implement client-oriented extension training focusing on gender issues using participatory approaches. Its second objective was to develop and integrate a gender sensitive analytical framework in the planning and implementation of agricultural programmes.

The project context and rationale

At the time the project was agreed upon there was a recognition within the Ministry of Agriculture of the need to incorporate gender issues into rural planning, based partly on the findings of a survey conducted by the Planning and Programming department of the Ministry and supported by government policy. The degree to which there was a demand from the grassroots for a project of this nature is not clear to the author, perhaps because there was a delay of several years between the signing up of the project document and its actual start. However, the external evaluation of the project observed that:

The awareness raising and training activities executed under the project up till now, definitely have created a feeling for the need of gender analysis and gender planning. At all levels, from the national level to the *woreda* (grassroots) and extensionists level the evaluation team received similar remarks and examples of this. It seems that a prior need in this area had been felt, but knowledge and skills on how to go about it were lacking. (FAO 1996: 20)

The project training process

The project training process is illustrated diagrammatically in figure 2.

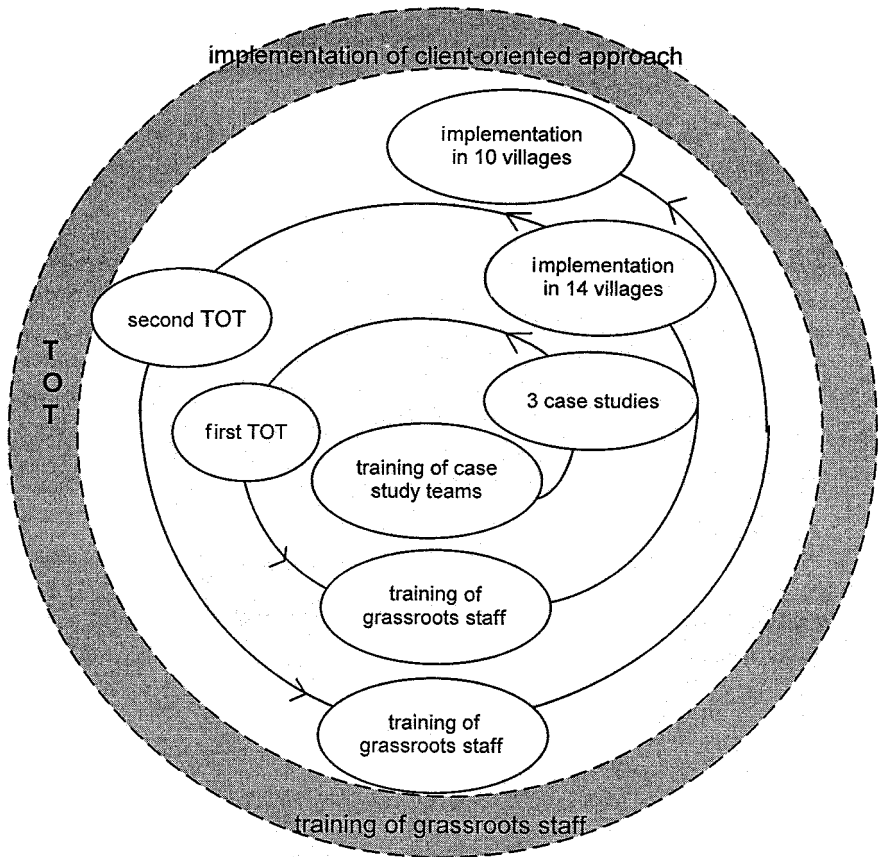


Figure 2. The training and implementation sequence.

As can be seen from figure 2 there were a number of steps within the training process which both separately and combined allowed for experiential learning. Firstly, prior to training trainers in how to implement client-oriented extension, an approach had to be developed. To do this, small multi-disciplinary teams of Ministry of Agriculture staff from local, zonal and regional levels were given a brief training in participatory rural appraisal (PRA), gender and gender analysis. After this, the teams tried out approaches in three communities in different regions of Ethiopia. In each instance there were differences in approach to allow for greater learning, and during and after each case the team reflected on the weaknesses and strengths of the approach and how it could be improved. The three experiences were compiled as case studies and formed a sound, locally derived basis for the next step in the process which was the first of two ‘training of trainers’ (TOT) programmes.

During this second step, staff from regional and zonal levels (including regional and zonal staff who were involved in the case studies) were given a two-week training in PRA, gender and gender analysis and the use of these in client-oriented extension

planning. Training was grounded not only in theory but in the experience provided through the case studies. A guide for grassroots level extension workers entitled 'How to make your extension more client-oriented', which drew on this local experience was compiled by the author, then edited by national colleagues and translated into Amharic. A video was also produced by the project's extension materials specialist and the extension department's audio-visual technician using material from all three project areas.

Subsequently, the third step involved these staff training local level extension workers in the project pilot areas, after which the approach was implemented in several villages in each region by teams comprised of local staff and their zonal (and in some cases regional) trainers. The teams took a flexible approach, adapting the process to suit the local culture and conditions.

The fourth step involved a second TOT to which not only those regional and zonal staff trained as trainers in the first TOT were invited but also one grassroots extension worker from each village in which the approach had been implemented. These grassroots level staff presented their findings along with an analysis of how the approach worked, the challenges they faced in applying it and how they consequently modified it or felt it should be modified in future use. These presentations formed the basis for critical observation and reflection on the approach, resulting in several changes being made to the approach. These changes were reflected in an updated and revised version of the guide for grassroots level staff.

From feedback during the implementation phase preceding this second TOT, it was clear that there remained a training need concerning how to incorporate findings into the routine Ministry of Agriculture planning procedures. Consequently training was provided on this during the second TOT using the field implementation reports as a basis, thus grounding the training in real life contexts. Within this second TOT time was also allocated for three of the trained trainers who had had the opportunity to study 'Participation and Development' overseas under the project, to pass on the most useful and relevant aspects of what they had learned. These included project identification and the logical framework, stakeholder analysis, people's participation in development, women in development and gender, strategic planning and 'planning for real'.

Following on from this, those trained during the second TOT once again trained other local level staff in the changes to the approach as well as how to integrate findings into local level planning. Lastly, these staff then implemented the new approach in further villages, by which time the pilot phase of the project was over. By this stage a foundation had been laid for continued growth and evolution of the client-oriented approach focusing on gender issues according to the external evaluation of the project (FAO 1996). However, the continued use of the approach in the regions depends very much on the interest in it amongst extension staff at regional and zonal levels, and on necessary allocation of funds either by the regional Bureaus of Agriculture, or through a second phase of the project. The issue of sustainability is further discussed later in the article with regard to factors constraining and supporting the application of the experiential learning cycle.

An analysis of the application of the experiential learning cycle within the project training process

Overall, two complete experiential learning cycles took place within the above process. The first cycle started with the orientation and generation of experience involved in the initial training of teams prior to the case studies and subsequent case study implementation. Reflection, conceptualization and learning formulation took place during, between and after the implementation of the three case studies. This was exemplified in three ways. First, within each case there was daily reflection on, and analysis of both the findings and the process followed. Second, reflection on each of the initial cases led to slightly different methods being employed in the next. Third, reflection on the three cases and subsequent conceptualization formed the starting point and foundation of the curriculum for the first TOT and the drawing up of the guidelines on 'how to make your extension programmes client-oriented'.

The second cycle was initiated by the first TOT which served as an orientation, as did the subsequent training of local level staff. Active experimentation or generation of experience followed during implementation by teams in several villages in each of the three pilot regions. Reflexive observation took place during implementation owing to the participatory nature of the approach as further detailed below. The second TOT provided further opportunity for reflexive observation and subsequent abstract conceptualization. The sharing of experiences, including constraints and opportunities in using the approach, and ways in which various staff had either modified it or made suggestions as to how it could be modified, all led to an active learning situation. Staff from all levels contributed to this process, with the suggestions of grassroots level staff being particularly valued because of their close contact with the community. From the abstract conceptualization came the integration and translation to the work situation referred to by Veldhuizen *et al.* (1997: 12) as embodied by the modification and revision of the approach and guide. Other actions arising from reflection and conceptualization during the second TOT included a recognition of the need to invest more funds and effort in raising the awareness of policy makers of the project process and findings, especially at local and zonal levels, and the need to ensure all staff at grassroots level were trained in how to incorporate findings into their regular programme planning activities – an area previously not budgeted for. The participatory nature of the project and its use of participatory approaches allowed for a situation in which sub-cycles of experiential learning took place as detailed below.

The complementarity between the use of PRA and the experiential learning cycle as revealed in the Ethiopian case

PRA (lately re-named as PLA: participatory learning and action, IIED 1995) has been defined as 'a growing family of approaches and methods to enable local people to share, enhance and analyse their knowledge of life and conditions and to plan, act, monitor and evaluate' (Chambers 1997: 102). PRA arose from diverse origins including rapid rural appraisal, agroecosystem analysis (Conway 1987), applied anthropology and farming systems research (Mettrick 1993, Farrington and Martin 1988). Furthermore, the activist participatory research inspired by Paulo Friere (1972) which forms the basis of later work on experiential learning (Schon 1983, Kolb 1984) also contributed greatly to the development of PRA.

It is useful to regard PRA as having three foundations or pillars as described below by Chambers (1997: 104–105):

- The behaviour and attitudes of outsiders, who facilitate, not dominate.
- Partnership and sharing of information, experience and training, between insiders and outsiders and between organizations.
- The methods, which shift the normal balance from closed to open, from individual to group, from verbal to visual and from measuring to comparing.

All three pillars hold the key to the complementarity between PRA and the experiential learning cycle. All call for a respectful, facilitative attitude amongst all taking part and require those involved to share information and learn from each other and from their joint experience on equal terms. The third pillar allows for experiential learning as many of the methods involve different client groups in drawing maps or diagrams to illustrate various aspects of their livelihoods, during and after which collaborative learning through sharing and comparing experiences, reflection and analysis takes place.

In relation to the Ethiopian case, it has been stated above that within each of the two overall learning cycles, sub-cycles of experiential learning took place. The process of PRA implementation, involving multi-disciplinary teams of staff working (and often living) in villages for up to two weeks at a time, involved a daily cycle of action and reflection. The teams or sub-teams working in the village and learning from the rural people concluded each day by compiling what they had learned and sharing this with other team members. After all sub-groups had done this, team members would reflect on, and analyse, the information. This analysis fed into the next day's work programme for the team members. Reflection also took place between 'outsiders' (team members – whether local, zonal or regional) and 'insiders' (villagers – various client groups) when villagers were asked to validate the findings and analysis made by the team, to rank village constraints and to suggest solutions. During the whole process there was usually frank assessment of how the work had gone, what logistical problems had been faced, how the community groups had received the team members, what constraints had been faced and how these could be tackled the next day. Thus during the field work the team members became accustomed to reflecting on and analysing both their findings and the process itself and acting in the light of this analysis the following day.

Project outcomes in relation to the use of the experiential learning cycle

As stated earlier, the project aimed to train extension workers in gender and gender analysis, to enable them to draw up more client-oriented extension programmes. The reasoning of the Ministry of Agriculture was that women, as clients, had not been recognized, therefore their extension needs were not being fulfilled. The consequences of employing the experiential learning technique to achieve this can be observed at several levels.

Firstly, most of the extension staff either trained as trainers or trained at the grassroots level were men, though some (principally those employed as 'home agents' or 'rural women's' affairs' agents) were women. Due to the active nature of learning, these men (and their female counterparts) learnt for themselves, through the village level gender analysis, about women's contributions to agricultural production. Through

seeing for themselves, they started to accept the findings that women in the pilot areas worked on average double the hours of men, that women do most of the 'reproductive' work, but also spend many hours on 'productive work', and that despite this women have limited or no access to extension, credit or inputs. They began to see that women cannot be treated as a homogenous group but that women of different age, wealth, marital and ethnic categories have different needs and constraints. They learnt how to identify which women are most in need of extension advice, in what areas and how best to reach these women, taking into account local norms and culture. It is acknowledged that such attitudinal changes are difficult to measure. However, the external evaluation of the project concluded that:

According to the information gathered from the participants, there was agreement that in all the training activities and case studies of the project, the training offered had improved their understanding of gender concepts and issues and of women's problems in particular. Most felt that they are now gender sensitised and have developed skills in analysing gender disaggregated data. (FAO 1996: 16)

It is unlikely that conventional training techniques such as the provision of a lecture, workshop or handout on women and extension or on gender, would have allowed for the above level of gender awareness and internalization to take place.

Secondly, from the point of view of the villagers concerned and with reference to the participatory approach employed, different client groups had, for the first time, a chance to express themselves and to analyse, select and rank a range of potential opportunities for development. This was especially interesting for women who, traditionally, rarely have the opportunity to speak. Also, through the different client groups being actively involved in analysis related to gender differences, a degree of gender awareness was achieved within some of the communities where the men acknowledged that they had been taking the relatively heavy workloads of their wives for granted. The external evaluation report states that

A number of those interviewed provided examples of changes in attitude regarding the role of women, by extension staff and even by men in the villages, based on the findings of the studies. (FAO 1996: 21)

Stepping back from the learning experiences provided at the village level to examine those gained through the two TOTs, staff gained confidence in their own ability to analyse their experiences. This was especially significant for the grassroots level staff who played a key role during the second TOTs. In a more conventional training setting, there would have been little opportunity to build on their local knowledge and experience because they would neither have felt able to contribute nor had the opportunity to do so. However, in the atmosphere of sharing and respect engendered by the use of the ELC, all staff felt free to state their opinions and share the challenges they faced when implementing the approach without fear. Meanwhile, staff knew that further development of the client-oriented approach depended to a large extent on themselves. This served to motivate them and to ensure their commitment to the process.

Lastly, the project was managed not just from the national level but by a team of regional and zonal co-ordinators working with national level staff. This team met before and after every TOT and, on the basis of what had been learned during implementation or the TOTs planned the next stages. Thus once again sharing, reflecting, generalizing and planning took place in an active and participatory way.

Factors constraining the application of the ELC in the project context

Considering first the factors which constrained the project and in particular the application of the experiential learning cycle, the most significant was the restructuring of the Ethiopian Ministry of Agriculture which was on-going throughout the project duration. For the experiential learning cycle to succeed, continuity is needed; the process suffered from the transfer of involved staff away to other duties, with staff new to the whole process coming in.

A second constraint was the fact that all the staff involved had many other duties, which meant that targets had to be changed several times. However, this did not create too much of a problem because of the participatory planning process outlined below.

A third factor was the level to which villagers were involved in the learning cycle. For many, the participatory approach gave them their first opportunity to express themselves, to analyse their constraints and to put forward possible solutions to extension staff. In PRA which 'empowers' this would be just the first stage of an ongoing process in which villagers would take control of their own development. However, in the project context, the approach was used in a somewhat 'extractive' manner (i.e. to gather information for 'outsiders' rather than to empower the 'insiders'), as the primary aim was to make the extension services more client-oriented. The danger here was that expectations could be raised regarding what agricultural extension could do to help the villagers. A response to this problem was agreed on during the reflective process in the second TOT. It was decided not to focus only on how to make extension more client-oriented, but on how to identify opportunities for development, further distinguishing between those opportunities which could be taken up by extension, those which could be adopted by other Ministries and those which could be taken up by the villagers themselves.

A final constraint was the fact that the project only lasted two years which is insufficient time for the active learning process to be institutionalized within the Ministry of Agriculture. For sustainability, the approach must feed into and provide a starting point in local level agricultural extension planning; skills in local level participatory planning must be developed amongst grassroots and zonal staff; the client oriented approach must become part of the pre-service curriculum of agricultural extension workers and stronger links are needed between farmers and extensionists with agricultural researchers.

Factors supporting the application of the ELC in the project context

Turning to the supportive factors, aside from the project objectives and expected outcomes which gave scope for both the ELC to take place and the complementary participatory approaches to be employed, there were several other factors which facilitated the positive outcomes of the project.

Firstly, the government of Ethiopia during the period of project implementation was advocating both decentralization and local level planning. This provided a conducive context for a project using participatory approaches starting off by involving local women and men in analysing the constraints and opportunities in their lives. With de-

centralization more decisions could be made closer to the grassroots where commitment to the approach was strongest (FAO 1996). Enthusiasm for and interest in the approach varied between the three pilot regions. The region showing the greatest interest in the approach allocated substantial funds of its own to training and implementation regarding the client-oriented approach, contributing to sustainability of the process.

Secondly, the Ministry of Agriculture was also promoting a new participatory extension approach, which although not participatory in the same way as the project was, allowed for the project approach to proceed smoothly.

Thirdly, the project was also run in a participatory manner so that co-ordinators from zonal and regional levels from the pilot regions contributed to the planning process alongside those running the project at national level. Combined with the flexible use of the project logframe as a monitoring tool, this allowed for the process to be sensitive and responsive to local conditions. The emphasis on participatory approaches provided scope for all staff to be actively involved, thus providing both a conducive environment for the ELC and a practical example to staff of experiential learning.

The changing role of the extension worker

Having reviewed the application of the experiential learning cycle within the specific context of the 'Improving client-oriented extension' project in Ethiopia, it is now relevant, through the abstract conceptualization and input of other criteria characteristic of experiential learning (as described by Rogers 1992: 14), to make some general points about the changing role of the extension worker and the implications of this towards the training of change agents.

Through the use of participatory approaches combined with gender awareness and analysis, the agricultural extension workers involved in the project learned, to some extent, to respect the client groups in rural communities, to listen to them, to learn from them and to take into account their opinions. The evaluation report states:

The project fulfilled a need felt by the extension service to learn how to implement, in practical terms, the policies that called for a participatory approach to extension and that incorporated gender considerations. The project has met these expectations and had an impact in improving communication between farmers and extensionists in the pilot areas, and in increasing gender awareness amongst participants. (FAO 1996: 25)

This is in contrast to traditional extension approaches, in which the role of extension agents has been to act as the 'experts' passing on information to 'backward, ignorant' farmers (Pretty 1995: 27, Chambers 1997: 78–84). Thus:

Government officials generally see cultivators as ignorant and in need of instruction on proper farm management. When they do not follow instructions, they are considered stupid, traditional and lazy. These officials are convinced of the supremacy of scientific knowledge; consider that they automatically know more than the cultivator, and look down on local knowledge. (Dusseldorp and Box 1993: 25).

Indeed, until recently farmers' local knowledge has gone largely unrecognized. It was not traditionally within the extension worker's mandate to learn from the farmer and

build on his/her knowledge (Reijntjes *et al.* 1992, Chambers 1983). This has particularly been the case for rural women (Ilkcaracan and Appleton 1995: 3–4). Consequently, there has been little opportunity for joint action and reflection between the extension worker and the farmer.

Extension staff who take up a participatory approach, take on a new role as facilitators as elaborated by Pretty (1995), Chambers (1993) and Rogers (1996a). This role allows for much greater partnership and sharing between the ‘insider’ (the farmer) and the ‘outsider’ (the extension worker). Chambers (1993: 70) refers to such extension as ‘farmer first’ and analyses the roles of farmers and outsiders within this system. Farmers’ activities include analysis, choice and experimentation, whereas the ‘outsider’ roles include convenor, catalyst, adviser, searcher and supplier, supporter and consultant. Underlying all of these are the PRA ‘pillars’ of behaviour and attitude of outsiders, and partnership and sharing of information. A decade ago Haverkort *et al.* (1988) described this new role in the following way:

The outsiders as development workers should abandon the role of missionary who transfers exogenous technology and should rather adopt the role of convenor, catalyst, colleague and consultant. The outsider convenes discussions and analysis by farm families and speeds up reactions. He or she is a colleague of farmers in their experiments and acts as a consultant who can search for and supply ideas and technologies unknown in the rural community. (Haverkort *et al.* 1988: 7)

Since then there has been a further move towards people-centred development and greater recognition of the ‘insider’s’ role in searching for and supplying ideas (Rogers 1993, Rogers 1996a, Veldhuizen *et al.* 1997). Now,

the future of agriculture extension may depend not on whether state ministries, agricultural universities, technical training schools and agricultural centres can convince farmers to adopt technologies, but whether these institutions can change their traditional role of providers to that of facilitators... The question of how to elicit farmer participation in technology generation and dissemination is turned on its head. Rather, how do professionals in agricultural development programmes identify, foster, support and participate in farmer-led processes. (Holt-Gimenez 1997: 71)

Both the expectations of, and range of skills needed by an extension worker in this context are very different to those needed to work in the more conventional ‘top-down’ setting. It is therefore relevant to examine the ways in which extension workers are, and could be, trained.

The training of agricultural extension workers

Conventionally, both pre- and in-service training of extension workers focuses on technical aspects with a strong emphasis on crop and animal production techniques, within which emphasis is given to cash crop and large livestock production respectively (bypassing the needs of many women farmers). There is little scope for experiential learning. More often, because of the limited opportunities for training, those who have benefited from in-service training wait a number of years whilst their colleagues are given a similar opportunity before they can take part in further training. Moreover, though conventional in-service training may start from a common agricultural

constraint in the area, it has a tendency to be prescriptive, providing few opportunities for reflection, joint analysis and decision making amongst the participants with regard to the constraint.

Many extension workers are employed with little training in extension itself. In a 'top-down' extension service, their main function is to pass on information to farmers as mentioned earlier. Often, they are forced by circumstances to pass on this information too late, or in circumstances in which farmers cannot access the necessary inputs thereby rendering the information useless. Such extension workers are assessed and promoted on the basis of how many meetings/demonstrations/field-days they have convened, attendance and often yields of important cash crops. There is no scope for assessing them with regard to how relevant or timely the advice they give is, or how responsive they have been to farmers' requests. There is a strong bias towards male, progressive, wealthy, heads of households, with whom results can be achieved more easily (Chambers 1983, Roling 1988, Moris 1991). Again, the extension worker tends to work individually: there are few opportunities for the team work necessary for group reflection. Pre- and in-service training of extension workers within this type of system does not equip them for the role reversal referred to above in which the agent becomes a facilitator, respecting and building on the knowledge of different rural client groups.

Extension workers trained through active learning techniques gain skills in learning from farmers themselves about perceived constraints and analysing local situations. They learn how to work in a team, respecting each other's opinions and learning from each other. They learn collectively how to reflect on and conceptualize, local experience. When provided with experiential learning opportunities such as in the Ethiopian case, they gain confidence in their own listening and diagnostic skills at the local level and in this way are able to be more responsive to local farmers' demands, rather than merely putting forward extension messages passed down to them from higher levels of their Ministries' bureaucracy. With the contemporary emphasis of most sub-Saharan African countries on decentralization and local level planning, these skills become increasingly vital.

Rogers (1996) points out that the in-service training of extension staff using active learning techniques is possible when dialogue is established with staff prior to developing the training, with training design subsequently responding to their needs and beginning from their experience. Pre-service training techniques are however harder to change due to their more formal nature, the relative lack of experience of many of the trainees and habit. However, if extension workers are to be equipped to work in a reflective and participatory way, these obstacles must and can be, overcome (Rogers 1996a: 86–102). Ways in which this can be done include participatory curriculum development, independent learning exercises, starting from student perceptions and creating new experiences (Rogers 1996a, Rogers 1998).

Despite the fact that the contemporary change agent needs skills in communication, participatory approaches, facilitation and, indeed, conflict resolution, this does not diminish their continued, indeed deeper need for training in farming systems, agricultural science and technology (Rogers 1996a: 97, Garforth and Harford 1997: 30–31). This is vital as it is far harder for an extension worker to respond to specific localized constraints in particular farming systems than to pass on centrally agreed technical messages or packages in which they have been trained.

Towards further transformation

What is the way forward for further transformation of government extension services in sub-Saharan Africa? It may well be that recent and contemporary extension approaches developing elsewhere provide an indication. These include the 'third generation' agricultural extension described by Rogers (1993), participatory technology development (PTD) described by Veldhuizen *et al.* (1997), 'farmer-to-farmer' extension originating in Latin America with the *campesino-a-campesino* sustainable agricultural movement (Bunch 1982, Holt-Gimenez 1996) and the various forms of 'farmer-led' extension springing up world-wide including the farmer field schools of South East Asia (Scarborough *et al.* 1997) and the problem census approach originating in Bangladesh (Bhuiyan and Walker 1996).

Although some of these approaches have arisen from the lack of a governmental agricultural extension service such as the *campesino-a-campesino* movement, others involve governmental extension and research institutions and farmers to varying degrees of interaction. The PTD framework described by Veldhuizen *et al.* (1997: 50–51) and founded on earlier work described in Reijntjes *et al.* (1992) is indicative of such interaction, being based on participatory foundations and emphasizing the facilitatory role of the extension worker. The framework has five components:

- Getting started,
- Understanding problems and opportunities,
- Looking for things to try,
- Experimentation,
- Sharing the results – farmer-based extension and
- Sustaining the PTD process.

Each of these stages involves partnership and sharing between farmers, between extension workers and farmers and between extension workers. The 'subject' of agricultural development, the farmer, takes centre-stage in this process, supported and facilitated by research and extension.

The PTD process allows for much more than participatory diagnosis of new possibilities and different client groups' extension needs as in the Ethiopian case. Looking for things to try involves farmers putting forward various options, setting criteria, prioritizing and establishing hypotheses for experimentation. Farmers search for and use the experiences of other farmers. Experimentation is done by farmers or farmer groups themselves within their own culture and logic supplemented in some cases by scientific knowledge put forward by the change agent. The process of experimentation allows for a continuous cycle of action–reflection–conceptualization–action and further reflection to take place. Farmer-based extension follows, ensuring that active learning takes place between farmers. Farmer-to-farmer diffusion of ideas and technologies is enhanced and an inter-community communication network evolves. The whole process does not exclude extension staff, but demands that they take up roles as facilitators, networkers, educators and trainers, co-researchers and external advisers (Veldhuizen *et al.* 1997: 52–53).

Throughout sub-Saharan Africa, governments are moving towards decentralized extension services. This context provides an ideal opportunity to move forward from the use of participatory approaches primarily to identify constraints, to the active involvement of farmers in technology generation and dissemination. The use of the experiential learning cycle in the training of farmers and extension workers for this PTD

process will foster the ability of both to continually learn, reflect and act on experience, and in this way gain confidence. The coming together of participatory approaches and the experiential learning cycle implicit in this will contribute to a transformation of former 'top-down' extension services to those supporting sustainable, 'people-centred' development.

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