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## ASPECTS OF AGRICULTURAL EDUCATION IN AFRICA: INNOVATIONS AT THE FORMAL/NON-FORMAL INTERFACE

I Wallace

### FORMAL AND NON-FORMAL ASPECTS OF AGRICULTURAL EDUCATION

Agricultural education is a complex discipline, and there are considerable difficulties in defining either its boundaries, or the interrelationships of its component parts. It may be broadly divided into formal and non-formal sectors. This paper focusses upon some of the innovations that occur at the interface between the two. Formal aspects of agricultural education are concerned principally with the longer-term training of skilled manpower at various levels to service the entire agricultural industry through education and training, extension, research, consultancy and commerce. The formal sector also covers the "professional" training of farmers, managers and skilled labour for the actual work on various types of farming enterprise. It also encompasses the teaching of agriculture, agricultural science and related disciplines within the schools sector, and the training of teachers for those disciplines. Non-formal rural education has been defined as: "any organised, systematic, educational activity carried on outside the framework of the formal system to provide selected types of learning to particular subgroups in the population, adults as well as children ..." (Coombs & Ahmed, 1974:8).

It includes all forms of agricultural extension services; training for farmers and their families; a wide range of rural organisations and groups; programmes of "vocational" training; "integrated" programmes for agricultural and rural development and various kinds of distance education aimed at rural audiences.

These lists are not exhaustive, but indicative of a broad and growing range of activities. They may be represented diagrammatically as in Figure 1 below.

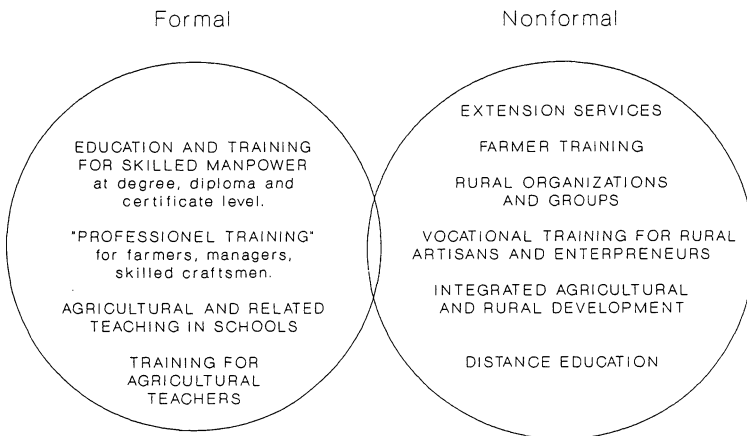
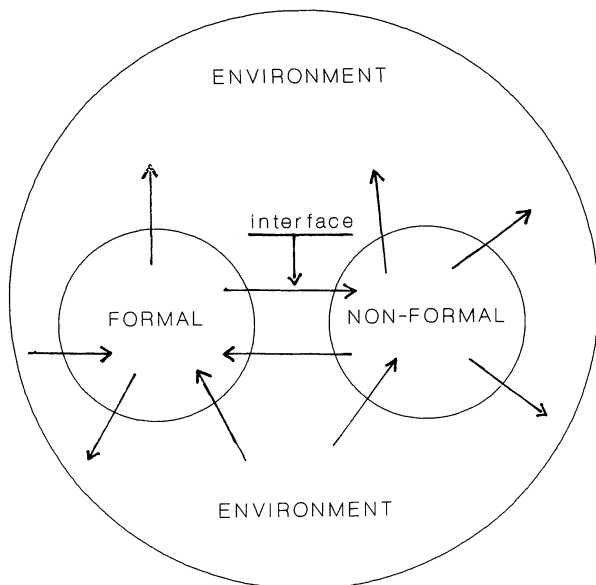


Figure 1: Aspects of agricultural education

### THE FORMAL/NON-FORMAL INTERFACE IN AGRICULTURAL EDUCATION

We may now turn our attention to the concept of a formal/non-formal interface, and observe that the two sectors do not comprise water-tight compartments - there are interactions between them across the interface. It will be helpful also to think of both sectors as being bounded by permeable membranes. There are many interactions between agricultural education and its environment. These include exchanges with policy-makers and planners, research institutions, linked academic disciplines, commercial organisations, and a broad spectrum of client groups and the organisations which represent them (Figure 2).



**Figure 2: Agricultural education: the formal/non-formal interface**

Formal agricultural education tends to have fairly stereotyped patterns of operation in most African countries, based largely on models imported from former colonial powers. Many elements in the non-formal sector are widely replicated in similar forms in much of Africa. However, the interface between the two provides scope for considerable innovation, and has implications for restructuring which can affect the whole of agricultural education. There is a wide recognition of the need to bring the realities of the "field" situation into formal teaching programmes, and to enable the human and material resources within the formal sector to contribute towards development in the rural milieu. In the remainder of this paper we examine five important examples of innovative activity across the formal/non-formal interface:

- University-based extension (research-teaching-extension linkages)
- Outreach programmes from agricultural colleges and institutes
- Student attachments or "work experience"

- Distance learning and its follow-up
- Community schools and colleges

### UNIVERSITY-BASED EXTENSION

Universities frequently operate outside their boundaries and impact upon the non-formal sector through various forms of extension, continuing education and distance learning. One of the best-known examples is the Cooperative Extension Service in the USA, based in the old "Land Grant Colleges" (now State Universities) which date back to the Morrill Acts of 1862 and 1890 (US Dept. of Agric., 1968). In Western Europe the nearest comparison has been the three Scottish Colleges of Agriculture, which until very recently combined the activities of formal teaching, research and extension for the whole farming population of Scotland (Wallace, 1976a).

Over the past two or three decades, particularly under the "institution building" influence of USAID, there has been some proliferation of "agricultural universities", modelled on the Land Grant Colleges; particularly in Asia. By and large, African universities have been inclined to follow patterns found more widely in Western Europe. However, African universities often have some concept of reaching out, and a broad doctrine of service to the community. Daane & Fanou (1989) have recently discussed cooperative efforts involving Western donors in strengthening the Faculty of Agriculture in the National University of Benin. There a small community outreach programme is envisaged, and the initiation of a farming systems research programme. The initiative is not without its problems, including the wide divergence of views amongst different departments in the Faculty about the value of outreach.

Despite enormous difficulties, the Faculty of Agronomy and Forestry at Eduardo Mordlane University in Mozambique has apparently always considered extension to be an "important activity of the Faculty" (Van der Laan & Pereira, 1989:207)

The approach adopted in Mozambique took its cue from the late President Samora Machel who, at the University's opening in 1976, said: "the university will teach there (i.e. in the countryside) and together with the labourers will work on the solution of new problems; learn new techniques, born in practices of daily life; learn to know the importance and the real value of work. Getting to know the people and unite with the people." (quoted in *ibid.* 297).

University-based extension employs educational concepts of mutual learning and distance education, participatory and collaborative research and applied aspects of science and technology. It is argued that reaching out leads to "knowledge generation founded on real-life situations and needs" and that it provides students with "empirical evidence of the real world" with which they will have to deal in their future work (Fuller & Waldron, 1989: 108-109).

Such arrangements are of course highly complex, since they involve different interest groups within universities (both across boundaries of disciplines and function) and their relationships to a host of client groups, enabling organisations, competing or cooperating institutions, and the general public. A particular philosophical dilemma for universities is that "concepts which suggest serving the underprivileged in society conflict with notions of excellence" (*loc.cit.*). Amongst the problem areas are those of conflicting attitudes (both between internal interest groups and across the interface boundaries), resource constraints leading to competition between teaching, research and outreach activities, the problems of

managing such complex structures, limited human resources and structural inconsistencies between the university and the outside world. As Fuller & Waldron put it: "society has problems; universities have departments" (*loc.cit.*).

In the Benin case study it was apparent that the Department of Agricultural Economics and Rural Sociology took a far more positive view than the science-based departments. Their students did research projects in real-life situations and needed to take a holistic approach to research "rather than concentration on a few variables". Outreach and extension opened the way to the kind of data and teaching methods necessary for that particular department (Daane & Fanou, 1989:167).

Other issues which may arise include the unsuitability (or disinclination) of some individuals to become involved in work in the external environment and the obvious needs for training in new skills, including listening to and learning from client groups, keying into indigenous technical knowledge, facilitating client participation in programme design, implementation and evaluation, and the ability to communicate effectively across the cultural divide which naturally exists between academics and village people. There is evident need for university personnel involved in outreach to embrace the "new professionalism" for which Chambers (1983) has argued so eloquently. Gibbon (1990) has suggested that university staff and students who become involved in rural development need a range of different skills, such as management and planning, recording and data management, systems analysis, monitoring and evaluation, communication and information management. They also need to be able to apply these skills in multi-disciplinary and interdisciplinary approaches to research and development. He has further argued the need for them to have a new sensitivity to rural families, and the political, social and environmental context in which their extension work is carried out, thus "an approach that focusses on people" (*ibid.*:12).

The keys to effective university-based extension include a clear commitment to the process, which should figure in an institution's statement of its aims and purposes, and be reflected in its management structures. Its management style should be such that fosters innovation and interdisciplinary teamwork (Burns & Stalker, 1966), and adequate resources need to be provided to enable the necessary retraining and redeployment of staff involved in interactions with client groups outside the university.

## **OUTREACH PROGRAMMES FROM AGRICULTURAL COLLEGES AND INSTITUTES**

There has been widespread establishment of programmes for outreach from colleges and institutes primarily concerned with the training of extension workers in Africa. Wallace (1976b) cited early examples from Tanzania, Nigeria, Uganda and Ethiopia. Several writers have reported more recent experiences in Kenya (Eroser, 1977; Marienga, 1985; Omolo, 1986) and Tanzania (Lugeye, 1989). From Asia, Saguiguit (1982) has reported a similar approach, which he defines as creating a "Social Laboratory", in Bangladesh, the Philippines, Thailand, Indonesia and Malaysia.

Such outreach programmes tend inevitably to be much more limited than the university-based extension activities - focussing on the rural communities immediately surrounding the institution (sometimes only operating in 2 or 3 villages) and much more closely linked to the learning needs of those in training. Eroser (1977) identified the overall theme of the Bukura Outreach Programme as helping to "raise the standard of family living of the outreach community". He listed five specific objectives:

- providing information for drawing up the scope, objectives and contents of a curriculum.
- providing opportunities for students to use their "academic learning experience in actual field settings", leading to development of more positive attitudes towards the problems of small-scale farmers.
- making the Institute's technical expertise available to rural families in the area.
- providing better coordination amongst agencies involved in rural development, hopefully leading to "an operational multi-disciplinary integrated rural development strategy for the area".
- providing a replicable model for application elsewhere in Kenya.

One of the most highly developed systems is that in Tanzania, where all extension training institutes have outreach programmes, with a full-time coordinator employed at Ministry of Agriculture and Livestock Development headquarters. Since 1980 a Farmer Training Project has been linked to this, and several institutes now have farmer training wings. Lugeye (1989) has listed objectives for outreach in Tanzania, which include:

- improving teaching techniques by using a problem-solving approach;
- providing rural experiences and case study village situations for use in training;
- establishing good relationships between villages and Institutes;
- improving linkages between research and training and farmers' activities in the village.

Groups of 2-6 students work with groups of up to ten farmers in villages near the institute. Amongst the advantages claimed is that students become "professionalised" by the experience.

Much of the experience suggests that there are some common constraints and problems facing such outreach programmes. Saguiguit (1982) speaks of the lack of resources (often no specific budget is provided), rapid staff turnover (due to lack of incentives and the growth of professional jealousies between departments and institutions); a lack of appropriate technologies to offer the farmers, and client-related problems such as negative attitudes, local leadership conflicts, abuse of power and lack of farm-level resources (*op.cit.*). A major problem recently cited from Tanzania (Shayo; private communication) is the repetitive concentration of outreach programmes on a few communities within easy reach of a training institution. Farmers become bored and unreceptive as a result.

Marienga (1985) evaluated the Embu outreach programme as a training tool. His findings were disappointing. The majority of trainers had failed to understand that training was the main aim of outreach, or were confused over its objectives and saw nothing in it to incorporate in their teaching. Only one out of 26 trainers had included an exam question based on the outreach experience!

On the other hand 65% of the Embu teachers did feel that outreach was a valuable field experience (*ibid.*). Omolo (1986) refers to a survey conducted amongst 15 young front-line workers in Western Kenya who all agreed that their involvement in outreach in Bukura had contributed significantly towards an overall improvement in technical skill; increased ability to develop good relations with farmers; improved performance in public speaking and proficiency in carrying out demonstrations. Lugeye listed achievements which included above average yield increases in participating villages and higher levels of adoption of new practices amongst farmers in contact with the Farmer Training Wing. Positive educational benefits included an increase in the ranges of extension methods, principles and practices taught to the trainee extension workers, who in turn reported that they had developed more interest in extension work as a result (*op.cit.*).



Thus there would appear considerable benefits to be gained from the operation of outreach programmes. Like all educational innovations, they face the possibility of becoming stereotyped, unimaginative and unattractive either to staff, students or farmers. Without high levels of commitment combined with adequate resources and enthusiastic leadership, such programmes may become stultified or may slowly die off altogether. Necessary resources include manpower. Experience at Bukura demonstrated the value of having a staff member fully committed to outreach activities - a person whose own home was in the outreach area, who could act as intermediary, ensuring a two-way flow of communication and mutual benefits between the institution and its local environment. This helped to bridge the great socio-cultural divide that exists between a team of professional/ urbanised trainers and the poor rural communities outside their gates. The mediation of such a continuing relationship across the formal/non-formal interface is probably the primary key to successful outreach activity by agricultural colleges and institutions.

### **STUDENTS' ATTACHMENTS IN AGRICULTURAL EDUCATION**

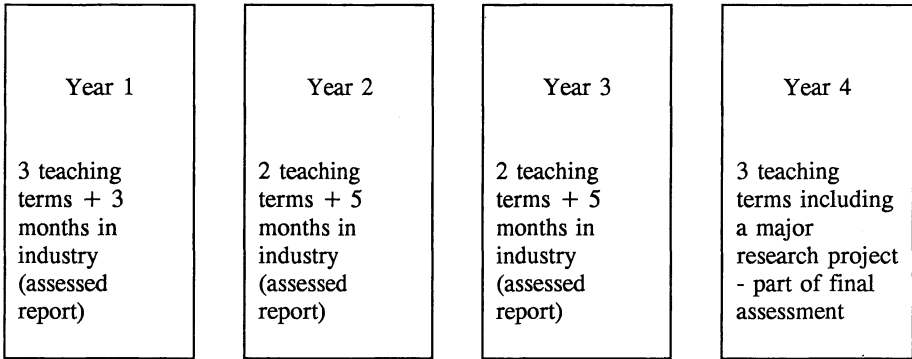
Many training programmes at both professional and sub-professional levels include some form of internship or work experience, frequently alternating with formal teaching components within an institution. This can provide an important form of activity across the formal/non-formal interface.

Daane & Fanou (1989) report that the agricultural degree course in Benin includes periods of field work lasting between 3-10 weeks each year, designed to "confront the students with the complexities of peasant production systems and extension work, and to make them aware of their own limitations", and providing a "logical sequence of problem-oriented analyses of increasing complexity" (*op.cit.*:167).

Examples from other parts of the world run all the way from work-based, skill-level training or apprenticeship, combined with periodic training days at an institution or a local centre (such as the "day-release" programmes operated by Agricultural Colleges under the UK Government's Youth Training Scheme); or combined with short periods of residential training (often known as "block release"); to full-time "sandwich" courses such as the UK's Higher National Diplomas (normally a 3-year programme with the first year spent in college, the middle year working in the industry and the final year back in college). "Sandwich degrees" are not unknown - for instance Bath University's BSc in Horticulture is a 4-year programme structured as shown in Figure 3.

Important considerations in such approaches include the need for participants to periodically adjust to changes in role between "student" in the formal sense and employee/learner; and the need to mediate a working relationship between the institution and farmers or other employers in its external environment.

In 1979 the Fiji College of Agriculture re-organised its 3-year Diploma in Tropical Agriculture course to include a 6-month period of farm experience in the first year. Each student was expected to spend periods of about 2,5 months on each of two local farms, normally living as a member of the household and working alongside the farmer. Attempts were made to establish a productive rapport with host farmers, who were encouraged to consider themselves as co-trainers with the college. A member of staff with particular social skills and local knowledge was assigned full-time as coordinator and liaison person for the programme. Host farmers were invited periodically to attend conferences, receptions, field days and other important functions at the college (Fiji College of Agriculture, 1979).



**Figure 3 Bath University - Structure of 4-year sandwich course for BSc Horticulture**

Training courses for extension work frequently include periods of field attachment with experienced workers in order to provide familiarization with the future working role. Lugeye (1989) reported that the Tanzanian training institutes include an 8-week field practical in their curriculum, where each student is placed in a village to live and work with farmers. This period is assessed jointly by tutors and the village chairman. He stressed the need for the chairman as potential user (employer) to contribute to the training, and pointed out that assessment frequently involved holding of meetings (presumably so that farmers can also contribute to the assessment of trainees).

Sensitive approaches to such attachments can help to create a common climate of interest and involvement at the interface, focussed upon the creation of a suitable learning environment for individual students, and primarily concerned with their progress as learners, their contribution to household economy, their welfare, needs and other administrative details. A spin-off benefit can then be the mutual learning which can occur as a result of regular interaction between the institution and the farm families, extension workers and community leaders who act as hosts and co-trainers.

#### **DISTANCE LEARNING AND ITS FOLLOW-UP**

An alternative to institutionally-based extension services or outreach programmes is the employment of various forms of electronic and print media to permit the "delivery" of learning materials to audiences in the external environment, without the necessity for "face-to-face" contact. In practice, effective planning, preparation and delivery of distance learning is a high-cost exercise demanding particular and often scarce skills. It is often the preserve

of organisations which specialise in this type of education - the open universities (for example in the UK, Pakistan, India and, most recently, Bangladesh); specialised distance learning centres (such as the Lesotho Distance Learning Centre); national and regional radio and TV networks (e.g. the Radio Farm Forums in Zambia and Nigeria) and non-government organisations specialising in correspondence-type courses (such as INADES-Formation, which operates across Francophone and Anglophone Africa from bases in Abidjan and Nairobi).

Some of the main advantages claimed for these and other distance learning approaches are that they provide learning opportunities to participants without the need to uproot themselves. Newer "open-learning" approaches mean that they can learn at their own pace, and in their own time, thus ensuring flexibility and minimal competition with productive work and other activities. On the other hand the use of print media is restricted to literate learners (although Vivon, 1985:12 indicates that learning groups which include a mix of literates and illiterates can make use of correspondence materials translated into local languages).

Many organisations have discovered that distance-learning methods alone achieve far less in educational terms than where they are backed up by face-to-face interactions with trained resource personnel. Young et al. (1980) have suggested that "written materials alone will not help the majority of students in Southern Africa to pass academic examinations". They identified major problems for learners in the use of a second language (often English), the poor learning environment in the home and "rote" learning habits imbibed in their primary schooling. In the case of the Lesotho Distance Learning Centre these have been tackled through the establishment of a network of local study centres, where learners meet once or twice a week with a local tutor (*ibid.*:70-71). The radio farm forums of Zambia provide for groups of listeners to meet together with their local extension agent to listen to the specially prepared programmes and then discuss them with him/her. The Allama Iqbal Open University in Pakistan uses print media and audio cassettes to reach organised rural learning groups, and employs local resource persons to give practical demonstrations and explanations of skills being taught in the lessons.

Vivon (1985) reports that INADES employs a network of trainers who organise local follow-up seminars for groups of correspondence learners. The courses have apparently led to increased knowledge, improved production methods and better management techniques among participating farmers. In addition there were social impacts such as group formation, increases in confidence and understanding in interactions with extension agents. An implication of this is that the agents, in turn, required better training, in order to be able to respond to the needs of the learners (*ibid.*:9,13).

In addition, the transfer of learning cannot be completed unless the recipients are able to apply the new knowledge and skills in their real-life situations. This depends in part on the availability of necessary inputs, favourable prices and marketing conditions for the surplus products which result.

One of the major lessons from the above cases is that, for any formal institution using distance learning methods in its interaction with the external environment, there is a need to establish proper feedback mechanisms, including provision for some face-to-face contacts. Client groups have social needs as well as purely learning ones. It is important to establish personal "rapport": learners who are struggling with new material and a range of problems require individual tuition, counsel and sheer encouragement.

In addition there is the need for a "reverse-learning" process in distance education. Institutions need to listen as well as to deliver; to learn from local knowledge, skill and experience; and to obtain evaluative feedback which can inform appropriate adjustments to both educational and research activities, which must reflect the realities of the external situation.

### **COMMUNITY SCHOOLS AND COLLEGES**

This area of innovation, sometimes termed the "ruralisation" of education (e.g. Lallez, 1974) was particularly fashionable in Africa in the 1970s and early 1980s, and generated a wealth of experience and a literature of its own (see for instance Foster & Sheffield, 1973; King, 1976). It is of more peripheral relevance but is dealt with briefly as it highlights some important concepts and lessons of direct application to interactions at the formal/non-formal interface in agricultural education. Indeed King has said: "The Community School is the interface between traditional schooling and non-formal education." (ibid.:12).

In practice this "ruralisation" has often involved adaptation in both directions across the interface - school curricula have been modified to enhance their local and rural relevance, and in some cases schools themselves have been transformed into community centres. Local skilled craftsmen have been used as resource persons to enhance the rural skills part of formal curricula. At the same time teachers have been trained or re-trained to be both that in the formal sense, and to act as change agents in the local communities. In some instances their students have also become involved in development activities within the community.

Many arguments for this type of change have been made including, for instance, the following suggested by King:

- spreading the benefits of education to the rural poor, and relating school education to the non-formal educational needs of the community
- making more cost-effective use of scarce resources including skilled manpower, school buildings, etc.
- increasing the accountability of schools to parents and to local communities
- attempting to stem urban-drift (ibid.:1-32).

Whilst some of the experiences have indicated that these arguments fail to take account of the very real difficulties involved in adapting schools to the needs of rural development in their locality, a recent example has shown that positive benefits can be obtained from community schooling. Banya (1989) has evaluated the experience of the Bunumbu project in Sierra Leone. This has involved the linking of Bunumbu teachers college and 20 pilot schools within a 20-mile radius with an Integrated Rural Development Project. The schools have been transformed into "community education centres", and teachers trained at Bunumbu to be community leaders with local communities. The aim of the project is stated to be: "To bring schooling and traditional life into a cooperative, mutually beneficial relationship .... (to) make maximum use of resources in the local community enabling skilled, experienced, local people to contribute to teaching and learning" (ibid.:114).

In order to organise this pilot project an interministerial National Advisory Committee has been established, and at college level there is a Community Development Council which includes college staff, community leaders and local chiefs. Finally, local Community Development Councils have been established at the village level. Banya claims a number of positive benefits from the project, including:

## *Wallace*

- production of an improved curriculum
- improved local language teaching
- higher pass rates in examinations
- the learning of new skills
- many local development projects initiated by the councils
- the use of local farmers as consultants by the college
- better college-community relationships

Some unanticipated outcomes included the enhanced confidence of teachers and administrators, the preservation of local culture and enhanced employment opportunities in the area. At the same time he enumerates several problems and constraints, including relationship issues such as tensions between previously trained headteachers and the newly-trained Bunumbu teachers; disenchantment with the project "at the periphery"; and increased competition and rivalry between local chiefs. Amongst lessons learned he suggests that project goals must be realistic, specific and reflect real community needs; there should be only one Ministry responsible for overall administration; over-reliance on foreign donors should be avoided; success is dependant upon the continuing commitment of leadership.

Amongst the issues raised from experience elsewhere are those relating to the localisation of curricula. King (1976) suggests that the term "relevance" may be interpreted in different ways. Whilst planners and educationists may think in terms of local needs and rural situations, parents and students are often more concerned about "relevance" to modern life, employment opportunities in government service or the urban sector. Ruralised education may come to be seen as "second-class education".

Thompson (1983) stresses the issue of the competing demands made on the teacher in community schools, and Singleton (1973), in citing case studies from Thailand and the Philippines, suggests that they will remain part of the government system and hence lack the flexibility that is needed. He further suggests that schools themselves are "an extension of attractive, metropolitan-centred, national bureaucracy" and suggests that the models presented through teachers are more likely to encourage "rural defection" (*ibid.*:134).

Watson (1983) presents case studies of rural primary school teachers as change agents and concludes that they are often "inadequately trained for teaching ... let alone being trained for a wider role" and that to expect them to fill an "innovative amateur role" often leads to sheer fright!

Amongst the other issues which he highlights are administrative and political difficulties; excessive centralisation and a top-down mode; lack of grass-roots consultation leading to local suspicions; and the failure to provide adequate resources and logistical support.

To return to a positive note, Wass (1976) suggests that "education will not make its optimum impact on development unless its various elements - whether formal, non-formal or informal - and the interrelationships between them are conceived and planned as part of a coherent overall educational strategy." (*ibid.*:327). In going on to argue the case for "community learning systems" he leads us towards concepts that are currently much more prominent in rural development thinking - the necessity of understanding and incorporating indigenous technical knowledge as a basis for teaching and research; the importance of participatory approaches in non-formal education and developmental activities; and finally the concept of learning systems leading towards recent work on Agricultural Knowledge Systems (e.g. Röling, 1988). All of these strands need to feed into current thinking about

agricultural education and to inform activities across the formal/non-formal interface.

### SUMMARY AND CONCLUSIONS

It is suggested that the FORMAL/NON-FORMAL/INTERFACE model provides a useful device for conceptualising agricultural education as a discipline, with its various components and their inter-relationships. It is important also to see it as part of wider "knowledge systems" with external linkages to related disciplines, sources of innovation, enabling structures, and, most importantly, the client systems which are the ultimate focus and end-user of its products.

Within both the formal and non-formal areas there are inherent dangers of isolation, lack of flexibility and even ossification. In considering the restructuring of agriculture, it is vital also to look at the needs for restructuring in the disciplines which service the industry, including agricultural education. It is suggested that a potential lever for change exists in the more "fluid" area at the formal/non-formal interface.

The various approaches and case studies examined have been offered as examples of innovation which may suggest avenues for possible consideration in the adaptation of agricultural education to meet the needs of both the industry and the rural sector in general.

The five areas of innovation which we have briefly explored are by no means exhaustive. However, they serve to highlight both the benefits that may result from interactions between formal institutions and their environment, and some of the issues which must be faced if they are to be realised. Each area has proved to be complex and beset by a range of constraints - some unique, and some of more universal concern.

One of the recurrent underlying themes of this paper is the need to put staff development high on the agenda in any consideration of formal/non-formal interactions. There is a cultural divide between well-resourced, modern and often urban-biased training institutions and the rural people whom they seek to "reach" - that is especially true for the small-scale subsistence farmers and their families who comprise the vast majority of client groups in Southern Africa. Professionals in agricultural education need particular skills, attributes and attitudes to effectively bridge that gap. There is a place for the "new professionalism" which will take the "Farmer first and last model" with all its implications seriously (Chambers et al., 1989).

Part of that approach involves institutional and individual learning about **indigenous technical knowledge**. Even the poorest, smallest farmer in Southern Africa has a vast store of knowledge and wisdom about his own environment. Educators and researchers need to tap into this. Institutions which reach out need to become "listening institutions". The concept of **mutual learning** has been stressed at several points in the paper. All this implies radical change in individuals and professional groups. It is unlikely to happen unless there is strongly **committed leadership**, backed up by convinced politicians and decision makers. Such changes need **resourcing** on a sustained and stable basis.

The experiences from universities particularly points to a linked issue of importance. Outreach activities tend to be "messy", and do not easily fit into neat structures of bureaucratic control. Competing interest groups both within and outside the formal institutions need to be **mediated** and **managed**. Innovation itself requires open, flexible management which facilitates two-way **communication** in both the vertical and horizontal directions.

The various experiences discussed have indicated that interface activities themselves

may face the danger of losing their initial impetus - of becoming ossified, irrelevant or even inconvenient to both the professionals and their client groups. Today's bright idea becomes tomorrow's "white elephant" or relic!! Leadership faces the challenge of constant adjustment, renewal and change if programmes are to remain both relevant and a source of inspiration to staff, students and farmers.

The distance learning experience has highlighted a further point. Whatever educational approach is adopted, the need for face-to-face contact will not be eliminated altogether. Learners have social and psychological needs, as well as those of knowledge and skills. The use of modern technology offers enormous potential for the multiplication and diversification of learning opportunities. However, it does need to be backed up by local tutors or itinerating trainers to provide opportunities to practise skills, discuss problems and give the necessary boost to flagging morale. At the same time follow-up provides a channel for vital feedback and again, much needed inputs of "**reverse-learning**" for institutions.

A further issue raised here is the fact that different forms of interface activity do cause changes in client groups which can lead to new demands upon local extension workers. Farmers who have benefited from contact with formal institutions may become more self-confident and knowledgeable, with implications for the need of **retraining** for those who service them on a regular basis - extension workers, retailers of inputs, cooperative and credit agency officials, etc. Not only do service personnel need to change, but the agencies which they serve and the products which they promote need to be adjusted if educational developments are to have their full impact. Enhanced knowledge and skills need to be matched by the availability of improved technical packages and the necessary inputs, pricing and marketing arrangements which provide incentives, and the development of necessary infrastructure.

Finally, the experience with community schooling brings us to a consideration of issues of **curriculum** and of rural **learning systems** in general. Any form of interface activity will demand curriculum change if it is to have any meaning either for the formal or non-formal side of the relationship. Questions then arise such as:

- what are the criteria for relevance?
- who sets the criteria for relevance?
- is it possible to achieve a balance between national and local interests?
- is it possible to achieve a balance between the interests of professional educators and those of parents, students or the rural communities concerned?

Curriculum planners need to be sensitive to the views of all the parties concerned, and curriculum process needs to become truly consultative; ideally with the full **participation** of local resource persons who truly represent indigenous experience, knowledge and aspirations.

The concept of Agricultural Knowledge Systems returns us to our starting point. Agricultural education is a system, or rather a subsystem: complex in itself, but with linkages to other parts of a broader knowledge system. Most of us tend to focus on our particular "bit" of the system - be it as a teacher, researcher, extensionist, etc. There is a place for standing back, observing the interlinkages around us, and looking for innovative ways of facilitating interactions which enable benefits to flow from powerful institutions to resource-poor people, whilst enhancing mutual learning and productive rapport. Examining experiences enables us to predict both the benefits that may accrue and the costs to be borne - which will inevitably include the necessity for change in ourselves and in our institutions.

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